

# Application for a customised price-quality path

19 February 2013



**Orion**  
yourNETWORK

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19 February 2013

Dr Mark Berry  
Chair  
Commerce Commission  
**WELLINGTON**

Dear Mark

**Customised price-quality path (CPP) application**

We submit our CPP application in accordance with:

- section 53Q of Part IV of the Commerce Act and
- the Electricity Distribution Services Input Methodologies.

We are applying for modifications to our regulated network prices and quality standards.

Our decision to apply has not been taken lightly given what the Canterbury community has been through. However, we believe it is appropriate for us to do so after carefully considering the long term interests of our key stakeholders – namely consumers and the broader Canterbury community.

It is well documented that the impacts of the earthquakes on the Canterbury region and our network have been severe. Our ability to withstand the impacts and our ability to restore power quickly have been widely recognised and applauded.

This is testament to our prudent network management and our investment in the resilience of our network, our systems and our people. Had we not wisely invested or been so well prepared there is no doubt that the impacts on our network, our consumers, our community and the Canterbury economy would have been far worse. This is important to note because it does provide a 'blueprint' of how we should plan and operate in the future.

As we state in our CPP proposal, we incurred (and continue to incur) significant costs to get and keep the power on and to restore our network's resilience and reliability.

Our current regulated network prices don't reflect these costs, and they don't reflect our reduced revenues post earthquake from which we must recover our costs.

Our regulated network reliability limits also need to be reset to reflect the damaged state of our network.

The regulatory regime, as set out in Part 4 of the Commerce Act, contemplates and establishes a regime that balances stakeholder interests.





The overarching Part 4 purpose statement in section 52A states:

*“The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—*

- a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and*
- b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and*
- c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and*
- d) are limited in their ability to extract excessive profits.”*

We believe that our CPP proposals are consistent with these long term objectives. We summarise how in the following paragraphs.

Importantly, we understand the quality of service our customers want. Our CPP proposals are consistent with consumer feedback, both before and after the earthquakes (including consumer feedback on our draft CPP proposals in late 2012). This feedback tells us that our consumers want a return to pre-earthquake levels of network resilience and reliability.

Our CPP proposals aim to deliver the quality of network that consumers want.

A key element of Part 4 is to ensure that we (and all EDBs) continue to have incentives to invest for the long term benefit of consumers, to a level that those consumers seek from us. Recovery of our prudent (but uninsurable) costs and losses is an essential element of retaining those incentives to continue to invest.

Our regulatory (DPP) price cap was set prior to the earthquakes and, as such, our prices do not include any component for catastrophic events such as the Canterbury earthquakes.

Price control has prevented us from quickly adjusting our prices to new cost recovery levels, as would normally happen in a workably competitive market. This regulatory delay (over three years) means that there is a significant element of catch-up cost recovery in our proposed CPP price path calculations.

If we are not able to adjust our prices to recover our prudent (but uninsurable) costs and losses then our incentives to continue to invest will be greatly diminished at the very time our community expects us to be investing to support the wider rebuild and relocation efforts. Our work to restore network resilience and reliability is not yet complete and our consumers support us completing that work, as outlined in our CPP application.

We seek simple cost recovery (not a gain or excessive profits) so that our interests continue to be aligned with consumers' long term interests. Cost recovery therefore includes recovery of our fair but not excessive cost of capital over time.

In our application we have adopted a balanced approach between the interests of consumers and the interests of the company. Within the constraints of the Input Methodologies, we have deferred our proposed cost recovery to mitigate short to medium term pricing impacts on consumers.

Examples of our balanced approach are:

- applying an alternative depreciation method within the CPP period to reduce the amount of depreciation expense to be recovered from consumers between now and FY19 by around \$30m

- delaying recovery of \$43m of our earthquake related “catch up” costs (being half of the full \$86m) until the five years to FY24 as opposed to recovering all of the \$86m in the five years to FY19.

Consumers and significant representative organisations of consumers understand and have expressed support for our cost recovery proposals.

Our CPP proposal fully sets these matters out – particularly:

- our proposal to restore our network resilience and reliability back to near pre-earthquake levels by FY19
- our proposal to increase our network prices to recover our prudent (but uninsurable) earthquake related costs and losses (including our cost of capital)
- our proposal to spread our ex post cost recovery over 10 years to mitigate the price impacts for consumers
- how we ensure our expenditure is prudent and efficient.

We look forward to engaging with you on our CPP application over the coming months.

Yours faithfully



Rob Jamieson  
**Chief Executive Officer**

cc: Grant Weston, [Grant.Weston@comcom.govt.nz](mailto:Grant.Weston@comcom.govt.nz)



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# 1 Introduction

# 1 Introduction

## 1.1 CPP application

This Customised Price-Quality Path (CPP) application has been prepared consistent with Part 5 of the Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2010 (the IMs). Subpart 1 of Part 5 of the IMs requires a CPP application to include:

- evidence of consumer consultation (as specified in Clause 5.1.2)
- verification related material (as specified in Clause 5.1.3)
- an audit report (as specified in Clause 5.1.4)
- directors' certification (as specified in Clause 5.1.5)
- the information specified in subpart 5 of Part 5 'Information required in a CPP Proposal'.

Our CPP application is structured as follows:

- Section 2 summarises our consumer consultation
- Section 3 includes the verification related material
- Section 4 includes the audit report
- Section 5 includes our directors' certification.

Additional supporting information relevant to these topics is included as appendices to this application.

Our CPP proposal, which accompanies this CPP application, includes all of the information specified in subpart 5 of Part 5 of the CPP IM, as well as further explanations and supporting information as appropriate.

## 2 Consumer consultation



## 2 Consumer consultation

### 2.1 Consultation requirements

#### 2.1.1 The CPP IMs set out our consultation requirements

Clause 5.5.1 of the CPP IMs requires us to notify our consumers, within 40 working days prior to the submission of our proposal to the Commission:

- that we intend to make a CPP proposal
- the expected impact on revenue and quality of electricity supply of our draft proposal
- how consumers can make submissions to us on our draft proposal
- how consumers can obtain further information about our draft proposal
- of consumers' further opportunity to participate in the Commission's public consultation process after receipt of our proposal.

Clause 5.5.1 provides further guidance on how information is to be made available to consumers (for example through media appropriate to our consumer base) in a manner which promotes consumer engagement and that clearly expresses information by avoiding jargon.

Clause 5.1.2 of the CPP IMs requires our CPP application to include:

- a description of how we met the requirements of Clause 5.5.1
- a list of those who responded to our consultation
- a description of all issues raised by consumers in response to our intended CPP proposal
- a summary of the arguments raised in respect of each of these issues
- an explanation as to whether our CPP proposal accommodates these arguments including:
  - if so, how; and
  - if not, why not.

#### 2.1.2 Further guidance

At the time the IMs were published, the Commerce Commission (the Commission) released a Reasons Paper setting out the rationale for its Determination. Key points of relevance to the consultation requirements for CPPs are:

- the Commission acknowledges that a supplier may have a better understanding of the need for network investment than its consumers. Thus consumer agreement to the proposed CPP is not required. Instead, the Commission will take into account the extent of support (or opposition) for the supplier's CPP proposal
- the IMs provide for flexibility in how each supplier engages with its consumers prior to a CPP proposal being submitted. This recognises that consumer engagement can be costly and that appropriate and targeted engagement strategy will depend on the characteristics of the supplier's consumer base and the reasons for the CPP proposal

- the consultation requirements are based on an 'adequate notification' approach. It is intended that the process, the medium used and the information provided to consumers is sufficient to enable consumers to engage. The Reasons Paper recognises that the appropriate notification may differ between suppliers according to the supplier's particular consumer base and the nature of the CPP proposal
- while some suppliers had sought clarification of the term 'adequate', the IMs have intentionally retained flexibility for the reasons outlined above.

### **2.1.3 Evidence of our consumer consultation**

In the remainder of this Section of our CPP application we set out our consultation and feedback evidence as follows:

- Section 2.3 describes how we met the requirement of IM Clause 5.5.1
- Section 2.4 lists the respondents who submitted feedback
- Section 2.5 describes the issues raised by consumers, presents a summary of the arguments associated with each issue and whether and how these arguments are accommodated in our proposal.

## **2.2 Summary of our consultation**

### **2.2.1 Our consultation**

On Monday 19 November 2012 we commenced our consultation on our draft CPP proposals with key consumer representative organisations. Broader consumer consultation occurred over the three weeks from 23 November 2012 to 16 December 2012. We sought feedback from our consumers and others from 23 November to 16 December 2012.

In line with the Commission's guidance, we utilised multiple media to inform consumers of our proposed CPP. These included:

- engagement briefings with key stakeholders including a PowerPoint presentation
- a media briefing
- phone briefings with other stakeholders
- packs of information sent to stakeholders and other interested parties
- extensive newspaper advertisements
- a seminar for our major customers as well as letters/packs of information sent to major consumers
- packs of information sent to local community boards and public libraries
- radio and TV interviews
- a public information day
- all relevant information being placed on our website
- Twitter updates.

We believe the extensive range of media we used, combined with the news media coverage we received, ensured that our consumers were well aware that we intend to propose increased network prices and different network quality limits for approval by the Commission.

In addition we believe that consumers have been given reasonable opportunities to find out more about and comment on our draft CPP proposals. We have informed consumers that the Commission will be assessing our proposal in 2013 and will be consulting with consumers as part of its assessment process.

We believe that we conveyed the information required by the IMs in a meaningful manner that promoted consumer engagement. We used plain English language and we presented our draft proposals in a manner that consumers would understand (for example, we discussed our draft proposed price rises in \$ per month terms rather than % increase terms).

We believe that we provided all relevant and meaningful information about our draft proposals, without overwhelming consumers with too much, irrelevant or immaterial information.

In Sections 2.5.2 -2.5.12 below we provide detail on the issues and feedback provided by the 38 consumers and consumer groups who responded. We also explain how we have taken that feedback into account before finalising our CPP application.

Two key themes are evident from the feedback. These themes are, unsurprisingly:

- how resilient and reliable our network should be
- what price we should charge consumers.

### **2.2.2 Restoring pre-earthquake network resilience and reliability**

Consumers clearly support our proposal to restore network resilience and reliability to pre-earthquake levels. The majority of respondents favoured such restoration.

Of those respondents who did not favour this, most proposed that our network should be rebuilt to higher levels of network resilience and reliability relative to pre-earthquake levels.

The overall theme of the responses we received was that our community is at risk and the wider Christchurch and Canterbury rebuild needs a resilient and reliable electricity distribution network to ensure investor and community confidence.

This feedback from consumers is in line with consumer feedback we'd received over many years prior to the earthquakes. Our consumer engagement has consistently shown that consumers expect a resilient and reliable supply of electricity and that they have been satisfied with our historical levels of service.

Based on this feedback, we believe that our proposal to restore network resilience and reliability to near pre-earthquake levels by FY19 meets our consumers' expectations.

Our proposal meets the long-term needs of our consumers because it ensures sufficient and efficient investment to restore and maintain network resilience and reliability. Our proposal provides for consistent improvements in network resilience and reliability over the CPP period, while accommodating the issues around external parties (for example contractors working around our assets) and the ongoing repairs and investment we need to make to our network.

Accordingly, we believe that consumers' feedback endorses our proposed revised CPP quality limits.



### **2.2.3 Recovery of earthquake costs and losses through price increases**

There was majority consumer support for our draft proposal to recover our earthquake repair costs by way of increased prices.

A number of respondents, mainly individual consumers, submitted that we should not increase our prices. These consumers believed that electricity prices are too high already and/or someone else should pay. A number of these consumers believed that we should have had more insurance cover for our assets and/or the government should pay for our earthquake-related costs.

Similar comments were received from consumers on the issue of whether we should recover earthquake-related lost revenue via price increases. Consumers' support for, or opposition to, recovery of lost revenue was relatively evenly split.

For reasons detailed in our CPP proposal, we did have prudent and cost effective insurance on many assets but it was not, and is still not, viable to insure overhead lines and underground cables. Where we have received insurance settlements post-earthquake, we have offset these against our proposed price increases. However, these payments do not fully cover our increased costs or lost revenue.

We have not sought earthquake-related government subsidies. As we are regulated under Part 4 of the Commerce Act, we are required to apply to the Commission for an independent assessment of our circumstances, through this CPP process. Ultimately the Commission will determine how we recover our uninsurable earthquake costs and losses.

Given there is majority consumer support for our proposal to recover our earthquake costs through higher prices, and that support for, or opposition to, recovery of lost revenue is relatively evenly split, it remains our view that we should recover earthquake-related costs, including revenue losses, from electricity consumers by way of higher prices.

Our CPP proposal has been prepared consistent with this view.

We believe that it is in consumers' long-term interests for us to recover our costs. If we are not able to recover our costs (including lost revenue) arising out of a catastrophic event then our incentives to continue to invest in the network for the long-term benefit of consumers will be diminished. Indeed, it is inherent in the Part 4 purpose statement that cost recovery is a prerequisite for ensuring owners of regulated infrastructure continue to innovate and invest to meet the long-term needs of consumers.

The benefit to consumers from ongoing investment in the network is ensuring their needs can continue to be met – now and in the future.

Full cost recovery is also consistent with the expert economic advice we have received from PWC and NERA on this issue.

## **2.2.4 Spreading our price increases over time to reduce rate shock**

A number of consumers did not address what period we should recover our costs and revenue. Most of the consumers who did address this issue supported our proposed 10-year period and opposed the alternative of 5 years.

## **2.2.5 Other comments**

We have been heartened by the support we have received from consumers to date and the positive feedback we received from many about our responses since the earthquakes and our plans to continue to improve our network for the long-term benefit of consumers and our community.

We appreciate the time that consumers took to understand our draft proposals and to prepare their feedback. We encourage consumers to continue to contact us with any further thoughts they have on our plans, and to engage further in the Commission's consultation process during 2013.

# **2.3 How we met the requirements of Clause 5.5.1**

## **2.3.1 Timing**

We prepared our draft CPP proposals during 2012. The Orion board approved our draft CPP proposals for consumer feedback; and approved the public release of supporting evidence and other relevant information on 14 November 2012.

We commenced our consumer feedback process on 19 November 2012. During the first week, we undertook face to face briefings with key consumer representative organisations and other key organisations and stakeholders.

Public notification of our draft CPP proposals occurred on 23 November (45 working days prior to submission of our CPP proposal). Our consultation extended over the following three weeks, and ended on 16 December 2012.

## **2.3.2 Communication media**

We used multiple media to inform consumers of our draft CPP proposals and the additional information regarding our consultation process, and the opportunity to participate in the Commission's consultation. These media included:

- stakeholder briefings including a PowerPoint presentation
- a media briefing
- phone briefings with other stakeholders
- information packs sent to stakeholders and other interested parties
- newspaper advertisements
- a seminar for our major customers supplemented with letters and information packs sent to major consumers
- information packs sent to local community boards and public libraries
- radio and TV interviews
- relevant information included on our website
- Twitter updates
- a public information day.

Further explanations about each medium are included below.

We believe that the extensive range of media we used, combined with the high profile news media coverage we received, ensured that our consumers were made well aware of our draft proposed new price and quality limits.

We believe that we provided adequate opportunity for consumers to provide feedback on our draft proposals, and we also explained that consumers have a further opportunity to engage in the Commission's CPP assessment processes later in 2013.

### Stakeholder briefings

We held engagement briefings with the following key consumers, consumer groups and key stakeholders.

Stakeholder briefings		
Organisation	Representative	Date of meeting
Canterbury Employers Chamber of Commerce	Peter Townsend, CEO	19 Nov
Commerce Commission	Commissioners and key employees	19 Nov
Meridian Energy	Bill Highet, Retail General Manager	20 Nov
NZ Labour Party	Lianne Dalziel, MP	20 Nov
Connetics Ltd	Connetics employees	21 Nov
Christchurch City Holdings Limited	CCHL board of directors	21 Nov
Selwyn District Council	Mayor Kelvin Coe and Councillors	21 Nov
Orion New Zealand Limited	Orion employees	21 Nov
NZ Manufacturers and Exporters Association	John Walley (CEO), Tom Thomson (Junior Vice President)	21 Nov
North Island electricity retailers	Contact Energy, Powershop	21 Nov
Christchurch City Council	Mayor Bob Parker and Councillors	22 Nov
The Christchurch Press	Paul Gorman (Associate Editor) and Glenn Conway (Chief Reporter)	22 Nov
Selwyn Investment Holdings Limited (SIHL)	SIHL board of directors	22 Nov
North Island electricity retailers	Mercury Energy, Genesis	22 Nov
Welfare agencies	Salvation Army (Major Mike Allwright), City Mission (Michael Gorman), Budget Advisory Services (Jane Green) and Grey Power (Ian Brownee)	22 Nov

These briefings included the use of a PowerPoint presentation (see Appendix 1).



Rob Jamieson, Orion's CEO, presented all briefings, except for:

- the briefings to North Island electricity retailers which were made by Bruce Rogers, Orion's Pricing Manager
- the presentation to SIHL, which was made by Orion's chairman, Craig Boyce.

We attempted to arrange engagement briefings with the North Canterbury branch of Federated Farmers, Hon. Gerry Brownlee, Minister for Canterbury Earthquake Recovery, and Hon. Amy Adams, Associate Minister for Canterbury Earthquake Recovery. These parties were unavailable to meet with us. In addition, the following welfare agencies were invited to our briefing, but were unable to attend: Cancer; Aged Concern; St Vincent De Paul; Presbyterian Support; and the New Zealand Red Cross Earthquake Commission.

Immediately following the briefings, we sent attendees a pack of written material and letters that invited feedback and that explained how to do so. Further letters were sent on 7 December to those parties that had not provided feedback by that date, encouraging them to do so, and once again explaining how to do so.

### Media briefing

On 23 November 2012 we held a news media briefing at our offices. The following table lists the news media we invited to the briefing and those who attended. The Commerce Commission was invited to attend the media briefing but declined the invitation.

Media briefing		
Invited and attended		
One News	Newstalk ZB	Radio New Zealand
The Press	Radio Live	
Invited but did not attend:		
3 News	Lifestyles	Radio Network Christchurch
Akaroa Mail	Mainland Press	Reuters
Bay Harbour News	Maori TV	Selwyn View
Central Canterbury News	MediaWorks Radio Canterbury	The Star
Christchurch Mail	Metropol	Star Canterbury
CPIT Broadcasting	National Business Review	Stuff
Ellesmere Echo	Northern Outlook	Sunday Star Times
Fairfax Digital	NZPA	
Freeman Media	NZ Newswire	

We used the same PowerPoint presentation as for the stakeholder briefings (see Appendix 1). We also provided the following information in a 'media pack' which included a USB data stick containing electronic copies of this material:

- media release
- a summary of our draft CPP proposals (see Appendix 2)
- a schedule of key questions and answers (see our CPP website)
- a plain English guide (see Appendix 3)
- a table that summarised the estimated price impacts of our draft proposals on consumers (see Appendix 4)
- the NZ Lifelines report on the value of seismic risk mitigation in Christchurch (see our CPP website).

### Phone briefings

We also briefed a number of stakeholder organisations by phone. These are listed in the table below.

Phone briefings	
Organisation	Contact person
Business NZ	Phil O'Reilly – Chief Executive
Canterbury Earthquake Recovery Authority	Roger Sutton – Chief Executive
Electricity Authority	Carl Hansen – Chief Executive
Environment Canterbury	Bill Bayfield – Chief Executive
Major Electricity Users Group	Ralph Matthes – Executive Director
Ministry of Business, Innovation and Employment	Andrew Falloon – Ministerial Advisor
Ministry of Commerce, Business Development, Investment and Consumer Affairs	Matthew Kenning – Ministerial Advisor
Ministry of Finance	Matt Burgess – Ministerial Advisor
Ministry of Local Government	Nick Kirton – Ministerial Advisor
Treasury	David Taylor – Infrastructure Team
Wider Earthquake Communities' Action Network	Rev Mike Coleman

Our CEO (Rob Jamieson) and General Manager Commercial (David Freeman-Greene) undertook these phone briefings between 19 November and 23 November. In these phone briefings they explained our draft CPP proposals, invited feedback, explained how to provide that feedback and outlined the Commission's CPP assessment process and the ability to further participate in that process.

Following the news media briefing on 23 November, we also sent an information pack to each stakeholder with a covering letter encouraging each stakeholder to provide feedback on our proposals.

### Written material sent to other interested parties

We also sent information to number of other parties, who we believed may have an interest in our CPP proposal.

Written material	
Organisation	Contact person
CERA	Hon. Gerry Brownlee
CERA	Hon. Amy Adams
Department of the Prime Minister	Rt. Hon. John Key
Domestic Energy Users Network	Molly Melhuish
Electricity and Gas Complaints Commission	Judi Jones, Commissioner
Green Party	Russell Norman
Grey Power	Roy Reid, National President
Federated Farmers	Connor English, CEO
Insurance Council	Tim Grafton
Local Government New Zealand	Laurence Yule, President
Ministry of Social Development	Hon. Paula Bennett, Minister
Ministry of Maori Affairs	Hon. Pita Sharples, Minister
Office for Senior Citizens	Hon. Jo Goodhew, Minister

This material comprised the same pack of information sent to our key stakeholders, as noted above.

### Newspaper advertisements

We ran an extensive series of prominent advertisements in The Christchurch Press and in local community papers. The table below lists our schedule of advertisements.

Schedule of newspaper advertisements		
Publication	Publication date	Size
The Press	Sat 24 Nov	Double page spread
Selwyn Times	Tue 27 Nov	Double page spread
The Press	Wed 28 Nov	Double page spread
Christchurch Mail	Thu 29 Nov	Double page spread
Mainland Press	Thu 29 Nov	Double page spread
The Press	Sat 1 Dec	Full page
Selwyn Times	Tue 4 Dec	Double page spread
Bay Harbour News	Wed 5 Dec	Double page spread
Christchurch Mail	Thu 6 Dec	Double page spread
Mainland Press	Thu 6 Dec	Double page spread

Appendix 5 includes copies of our advertisements.

We used the same visual format and style for these advertisements as for our newspaper notifications in the weeks and months after the earthquakes in relation to our network restoration and recovery efforts. We did this to help consumers identify who we are and our business context.

### Major consumer seminar

We held a major consumer seminar on 27 November. We sent invitations to approximately 175 major consumers (and all electricity retailers) which invited them to attend the seminar where we would present our draft CPP proposals to them. Those major consumers (or consumer representatives) who attended are listed in the table below.

Attendees at our major consumer seminar	
Organisation	Attendee
Christchurch City Council (CCC)	Yvonne Gilmore and Karn Snyder-Bishop
Elldex Packaging Solutions	Richard Erskine and Mike Murphy
Lincoln University	Ross Armstrong and Tony Moroney
Canterbury Clay Bricks	Murray Boyes
Propel Infrastructure Services (CIAL)	Matt Williams
University of Canterbury	Rob Oudshoorn
Canterbury District Health Board	Tim Emson
Chorus Ltd	Colin Foster
Air New Zealand	Nigel Chivers
Fereday Hydro	Campbell McMath
Moffat	Brian Perrie
Ravensdown	Sophie Kennedy and Peter Hay
A.W. Fraser	Gary Gibb
CWF Hamilton & Co	Gary Martin
Synlait Milk	Petru Hoju
Lyttelton Port Co	Mike McGlinchey and Mark Morgan
Tait Communications	Kevin Murphy
Dynamic Controls	Richard Adams
ANZCO Foods	Dallas Woodford

Business Engagement (consultant)	Richard Green
Pederson Read (consultant)	Mel Pederson
TENCO EBS (consultant)	Nick Price
Meridian Energy (retailer)	David Syme
TrustPower (retailer)	Barry Harkerss and Lucas Lormans
Genesis Energy (retailer)	Byron Weaver
Contact Energy (retailer)	Malcolm James

Rob Jamieson's presentation/briefing was similar to the news media presentation/briefing, with the addition of more detail that showed our estimate of price impacts of our draft CPP proposals on major consumers. A copy of this additional detail is in Appendix 4.

At the seminar, we provided attendees with copies of our draft proposal summary (Appendix 2) and plain English guide (Appendix 3). Following the seminar, we emailed each attendee a link to our CPP website page and a reminder encouraging them to provide feedback to us by 16 December 2012.

### **Letter to directly contracted major consumers**

The vast majority of our consumers contract with an electricity retailer for our services. However, a small number of our major consumers directly contract with us for our network delivery service (transmission and distribution) rather than with electricity retailers.

We sent an information pack, including an invitation for feedback, to our directly contracted consumers listed in the table below.

Directly contracted major consumers who received information	
Organisation	
Bridgestone NZ	Lyttelton Port Co
Elastomer Products	Metro Glasstech
Fonterra Co-Operative Group	New Zealand Army
GL Bowron & Co	Synlait Milk
Hally Labels	Tegal Foods
Lincoln University	Windflow Technology

### **Information packs available for public viewing**

We also sent copies of our summary of our proposal (Appendix 2) and our plain English guide (Appendix 3), to all Selwyn District Council and Christchurch City Council service centres, public libraries and community boards and asked them to make these copies available to any interested persons who wished to view them.

## Radio and TV interviews

Following our news media presentations, TV One ran our draft CPP proposals as the lead story on its 6.00pm evening news broadcast on 23 November 2012.

Our CEO, Rob Jamieson, also appeared on the Mike Yardley talk back radio show on Newstalk ZB on 26 November 2012.

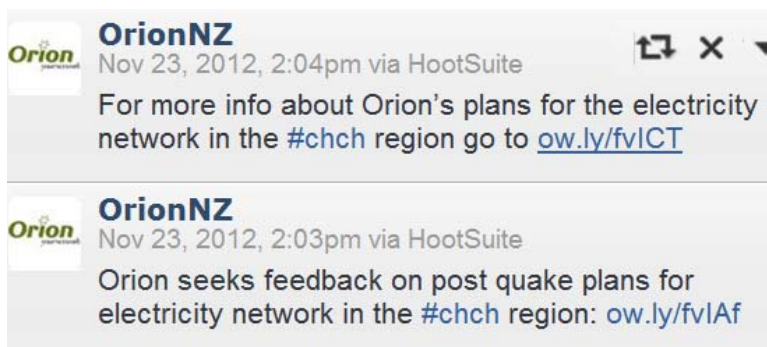
## Information on our website

We placed relevant CPP information on our website from 23 November 2012. This included:

- a summary of our proposal
- a plain English guide to our proposal
- key questions and answers
- independent report about our insurance
- independent report about cost recovery after a catastrophe
- independent report about our earthquake response
- information about our earthquake response and recovery
- 1997 lifelines report on infrastructure and natural hazards
- 2012 NZ Lifelines report on the value of seismic risk mitigation in Christchurch
- review of the Civil Defence Emergency Management Response to the 22 February 2011 Christchurch Earthquake
- National Infrastructure Plan
- our 2012 annual report
- our 2012 statement of intent.

## Social media

We also sent out Twitter updates. The tweets below were sent on 23 November.



Our first tweet above (sent at 2:03pm) linked through to our CPP news media release on our website.

Our second tweet (sent at 2:04pm) linked through to our CPP website.

Our third tweet (below) was sent on 28 November and linked through to Rob Jamieson's media briefing on our YouTube channel.



## **Public information day**

We held a public information day on 3 December 2012 at our central Christchurch office site (from 10.00am to 4.00pm). This information day had been mentioned:

- in all of our newspaper advertisements published prior to this date
- on our CPP website
- in our plain English (10 page) summary (see Appendix 2) which was sent out to key stakeholders and interested parties, as detailed above.

We invited the public along to learn more about and discuss our draft CPP proposals with our key employees. One member of the public, an ex staff member, attended.

### **2.3.3 Information provided to consumers**

In Section 2.3.2 above we describe our communication media and the information we made available to consumers.

We believe that we conveyed the information about our draft proposals in a meaningful manner that promoted consumer engagement. We used plain English and presented our draft proposals in a manner that we believe assisted consumers to understand them and their likely impacts (for example, we discussed price rises in terms of \$ per monthly bill).

Our key presentations and publications comprised:

- plain English PowerPoint presentations (see Appendix 1)
- a plain English (10 page) summary (see Appendix 2)
- a plain English (38 page) guide (see Appendix 3)
- plain English newspaper advertisements (see Appendix 5).

The topics addressed in these publications included:

- a description of Orion
- our pre-earthquake reliability and pricing
- the prudent measures we took prior to the earthquakes
- how the earthquakes impacted our network and our response to the earthquakes
- our plans to restore network resilience and reliability
- our planned major network replacement and repair programmes, with linkage to our forecast improved network resilience and reliability
- our proposed new network reliability limits and the likely impact on consumers
- our proposed changes to our network prices to recover our costs
- 'who should pay' for our earthquake-related costs and losses
- why we propose to apply to the Commission for new prices and reliability limits
- how consumers could provide feedback
- where and how to obtain further information on our draft proposed new prices and quality limits
- the opportunity for consumers to participate in the Commission's assessment and consultation processes in 2013.

We believe that our plain English documents ensured that we provided sufficient (but not too much) information for consumers to understand our draft CPP proposals and their impacts on revenue and quality of electricity distribution services. Importantly too,



it made consumers aware of the Commission's comprehensive assessment and consultation programme after we submit our application.

### **2.3.4 Seeking consumer feedback**

We asked and encouraged consumers to provide their feedback, and we provided three avenues for them to do so, as follows. Consumers could:

- complete an online survey form on our CPP website
- write to us at our PO Box 13896, Christchurch address
- email us at our dedicated CPP email address.

We also invited consumers and interested parties to contact us, via email or phone, if they had any questions or sought any further information. As stated above, we also held a public information day at our central Christchurch office.

### **2.3.5 Media coverage received**

News media coverage of our CPP proposal included:

- the lead story on TV One 6.00pm news on 23 November
- the front page story of The Weekend Press on 24 November.

The Press has an average readership of 250,000 in the Canterbury area.

During the consumer feedback period, our draft CPP proposals were also mentioned in other copies of The Press and in local community papers.

## **2.4 Respondents**

Clause 5.1.2(b) of the CPP IMs requires us to list the respondents to the consultation we undertook. Appendix 6 lists all respondents, and their means of providing feedback. Appendix 6 also includes maps showing the location of each respondent, where known.

We have assigned each respondent an identifying number (see Appendix 6). We have used these numbers throughout the remainder of this Section where we discuss the feedback received and our consideration of them.

## **2.5 Issues raised by respondents**

### **2.5.1 IM requirements**

Clause 5.1.2(c) to (e) of the CPP IMs requires us to:

- describe all issues raised by consumers in response to our draft CPP proposals
- summarise the arguments raised for each issue
- provide, in respect of the issues described, an explanation as to whether our CPP proposal accommodates the arguments raised in respect of each issue described; and
  - (i) if so, how; and
  - (ii) if not, why not.

We have reviewed all of the consumer feedback.

The following issues have been raised by consumers (or their representatives):

1. Should we restore our network's resilience to pre earthquake levels?
2. Should we restore our network's day-to-day reliability to pre earthquake levels?
3. Should we restore network resilience and reliability by FY19?
4. Should we recover our earthquake-related costs from consumers?
5. Should recover our lost revenue from consumers?
6. Should we recover our earthquake costs and losses costs over 10 years or five years?
7. What will happen to our prices at the end of the CPP period (after FY19)?
8. Should we include alternative forms of energy generation and what electricity demand response should be included in our future planning?
9. We didn't provide sufficient information to enable major consumers to fully assess our draft CPP proposals.
10. Should our major urban sub-transmission (66kV) projects be built using underground cables or overhead lines?
11. We didn't provide sufficient information on the costs we saved due to our pre earthquake strengthening investments.

In the remainder of this Section we set out, for each of the issues listed above, the arguments raised by consumers (or their representatives), and whether they are in support or opposed to a particular issue. Not all submitters commented on all issues. Where consumers have replied with a simple agree or disagree we have not replicated their responses in the following feedback tables which list comments we have received.

We have made our best assessment of what to include in this summary. In making this assessment we have endeavored to be impartial and have excluded inappropriate comments.

In respect of each issue, we have assessed the feedback and included a description of whether and if so, how our CPP proposal accommodates the feedback.

## 2.5.2 Should our network be as resilient as it was before the earthquakes?

Respondents' views					
Support	General comment in support	Oppose – should be more resilient	Oppose – should be less resilient	Neither supports nor opposes	No response
1, 2, 4, 6, 8, 10, 11, 13, 14 (NZMEA) 15 (CECC), 17, 19, 25, 29 (SDC) 30 (CCHL) 31 (ECan), 32, 33 (Genesis), 35,	20, 21, 23 (Meridian), 36 (Grey Power), 38	3, 5, 9, 12, 16, 18	7	34 ( MEUG)	22, 24, 26, 27, 28, 37

Respondents' feedback	
Respondent	Comment made
3	No. The network should be stronger than it was before the earthquakes. Need diversity of technology (overhead and underground) and location
6	If not as resilient, then community is in trouble
7	No the network shouldn't be as strong
11	A network that is at least as resilient as it was before the earthquakes is a good goal to aim for. However, taking into account more modern technology and processes, expects us to look to implement these where possible.
16	The overhead lines at Arthur's Pass are vulnerable to snow damage, falling tree branches and strong winds. Any upgrade of the network here should replace the overhead lines with underground reticulation
23 (Meridian)	We have done the right thing in continuing with essential restoration work while addressing the funding issue in parallel. Notes that we are not taking a 'gold plated' approach but are simply seeking to restore an acceptable level of resiliency for customers on the Orion network.
29 (SDC)	Strongly supports our proposal to reinvest in our network so that it can once again promise customers the certainty of supply that they depend upon in their daily lives. Without this investment, local people and businesses will be faced with the likelihood and uncertainty of more frequent and longer supply interruptions. This is something that few, if any, in Central Canterbury would willingly accept
30 (CCHL)	<p>The Christchurch community suffered greatly during and following the earthquakes of 2010 and 2011 and the aftermath of those earthquakes continues on in many ways. CCHL supports our work plans to overcome the vulnerability of the electricity network which is such a key element of needed community service.</p> <p>A secure and dependable electricity supply is very important for the economic and social well being of the community and CCHL considers that we have a significant role to play in the restoration of normal services. Wishes to see us make our contribution to a return to normalcy by giving citizens the quality of supply which was in place before the earthquakes. Considers it essential that we complete the work proposed to restore the resilience of the network following the recent earthquakes.</p>
31 (ECan)	<p>Views this matter not as a direct consumer but as an organisation with a mandate to assess the impacts on economic growth of the region and the recovery of the region following the earthquakes.</p> <p>The community is now moving from a repair phase to building future resilience back into our city. Sees a strong connection between the resilience of the city's core infrastructure and the confidence of the private sector to invest back in Christchurch and notes that the electricity network is a significant component of every part of that recovery. A considerable number of other services required for the recovery and rebuild require a resilient network, including future urban development.</p> <p>The implications of not doing this work would essentially be the same as</p>

	<p>saying that the 'customers' will have to deal with a lower level of resilience and reliability.</p> <p>Supports our proposals on the basis that the work is required to get the network back to pre-earthquake state as quickly as possible. The recovery of the city and surrounding areas will be faster based on the ability to attract new business and provide greater confidence to the community.</p>
32	Restoration of network quality is required and non-negotiable.
34 (MEUG)	Depends on the cost of the distribution alternatives to customers and if customers have cheaper non-distribution options to meet any given level of reliability.
35	<p>The only way to ensure resiliency is to ensure there is reserve capacity in transmission and network assets. Installing such reserve capacity is not "gold-plating" the network, as critics sometimes allege. It is a sensible way of increasing the ability of the network to cope with random, low-probability events.</p> <p>When considering the costs of adding reserve capacity in the network, one can argue that the low probability of its ever being needed justifies its deletion from the capital works budget. Similarly, when considering upgrades of the network to cope with increased demand, one can argue for delay, for adoption of a "just-in-time" strategy. Such arguments are misconceived, because faults occur from time to time on even the best maintained networks, and there is no guarantee that they will not occur in coincidence with a planned outage for maintenance or an extreme weather event.</p> <p>Reserve capacity is also needed for efficient implementation of a programme of planned maintenance. If there is insufficient capacity in the network, maintenance of some assets can be carried out only in periods of low demand. This may result in maintenance being deferred. Alternatively, carrying out work in a series of off-peak periods, and returning assets to service for each peak, is a very inefficient use of skilled labour.</p> <p>The life of cables and of transformers is extended if they are generally operated under a light load and operated at their rated capacity for only brief periods. Line losses increase when lines are fully loaded. Does not know to what extent these issues are relevant on our network, but, if the long-term savings can be quantified, it might strengthen the economic case before the Commerce Commission.</p>
36 (GreyPower)	Understands and accepts the need for us to get our network back into shape, to give greater flexibility in supply options, to avoid and keep outages to a minimum and to strengthen the system to make it less vulnerable to the vagaries of nature.

### Summary of arguments raised

There was clear consumer support for us to restore our network resiliency to pre earthquake levels. This is consistent with our CPP proposal.

The majority of submitters favoured this, and of those who did not, six individuals said it should be restored to a more resilient level. Only one submitter advocated a less resilient network.

The overall themes were that:

- without a resilient network our community is at risk
- the rebuild of the Canterbury economy needs a resilient and reliable electricity network to provide confidence for investors.

We note the following specific feedback comments, which we address below:

- diversity of technology (overhead and underground) and location is required
- implementation of modern technologies and processes should be adopted where possible
- any upgrade of our network in the Arthurs Pass area should replace the overhead lines with underground reticulation
- consumers may wish to use non distribution alternatives to our distribution network.

### **How our CPP accommodates the arguments**

We aim to provide services at a quality that reflects consumer demands. We aim to ensure that we provide and maintain an appropriately resilient network (in line with consumer demands) at a reasonable price. To do this we need to understand our consumers' needs.

Consumer feedback in the years prior to the earthquakes consistently showed us that our consumers expect a resilient supply of electricity. Importantly, they expressed satisfaction with our historical levels of service. Our historical consumer feedback processes and conclusions from them are described in more detail in Section 9.6.6 of our CPP proposal.

Consumer feedback on our draft CPP proposals shows that consumers strongly support a return to (at least) pre-earthquake levels of network resiliency.

Our CPP proposal addresses the long-term needs of our consumers by ensuring we undertake sufficient efficient investment to restore network resilience to pre earthquake levels.

Accordingly we believe that this feedback endorses our assumption, which underpins our expenditure plan to restore network resiliency to pre-earthquake standards.

We respond to these specific feedback comments raised as follows:

- *Diversity of technology (overhead and underground) and location is required* – We believe that network diversity is required in a number of areas – not just overhead and underground. We have built this diversity into our network planning through our security of supply standards and by using route diversity.
- *Implementation of modern technologies and processes should be adopted where possible* – We operate a smart electricity network (by using modern technologies where appropriate) and we continually seek opportunities to introduce new technologies where economically viable (refer to Section 9.5.2 of our CPP proposal for a discussion of our investment in innovation). In recent years, we:

- have implemented a fully integrated network management system, which enables us to automatically operate and monitor our network in real time
- became the first network company in Australasia to introduce ground fault neutralisers, which are designed to reduce the amount of electrical arcing at the point a fault occurs on the network, so we can maintain power supply to homes and businesses while field staff are dispatched to fix the fault
- became one of the first network companies in New Zealand to introduce corona cameras.

We intend to continue to implement new technologies and processes, as they become available and economic, if they have the potential to meet the long-term needs of our consumers for a safe, reliable and cost effective electricity distribution service.

- *Any upgrade of the network in the Arthur's Pass area should replace the overhead lines with underground reticulation* – Approximately 50% of our 11kV and low voltage network that supplies the Arthur's Pass area is underground. We have no plans to convert the remaining overhead lines to underground, which we estimate would cost approximately \$0.5m for the 11kV line and many hundreds of thousands of dollars for the low voltage lines. We do not believe this expenditure is warranted. Over the last five years there have been five planned outages for maintenance of the 11kV line (consumers were notified of these in advance) and only one unplanned outage. These outages typically affected less than 160 consumers, and four of the outages were for less than 20 minutes. The unplanned outage affected 157 consumers for 2.5 hours.

In addition to outages on our network, there have been four Transpower outages, which affected approximately 160 consumers each time. Following our request, Transpower has recently installed an auto-recloser on its line. This will help to reduce the length of Transpower outages at Arthur's Pass in the future.

- *Consumers may wish to use non distribution alternatives if these are cheaper for them* – We agree with this point, and believe our pricing structure and active consideration of non-network alternatives (as explained in Section 9.13.10 of our CPP proposal) are consistent with this objective.

### 2.5.3 Should our network be as reliable on a day-to-day basis as it was before the earthquakes?

Respondents' views					
Support	General comment in support	Oppose – should be more reliable	Oppose – should be less reliable	Neither supports nor opposes	No response
1, 2, 3, 4, 5, 6, 8, 9, 11, 12, 13, 14	20, 21, 23 (Meridian), 36, 38	16, 18	7, 10	34 (MEUG)	22, 24, 25, 26, 27, 28, 37

(NZMEA), 15  
(CECC), 17,  
19, 29 (SDC),  
30 (CCHL),  
31 (ECan),  
32, 33  
(Genesis), 35

## Respondents' feedback

Respondent	Comment made
7	Reliability should be lower if it means lowering the financial impact on me.
10	No, I want my power supply to be less reliable than it was before the earthquakes. Lights are staying on day to day now, so repair what is already working
23 (Meridian)	We did the right thing in continuing with essential restoration work while addressing the funding issue in parallel. We are not taking a 'gold plated' approach but are simply seeking to restore an acceptable level of reliability for customers on our network.
29 (SDC)	Strongly supports our proposal to reinvest in our network so that we can once again promise customers the certainty of supply that they depend upon in their daily lives. Without this investment local people and businesses will be faced with the likelihood and uncertainty of more frequent and longer supply interruptions. This is something that few, if any, in central Canterbury would willingly accept.
30 (CCHL)	<p>The Christchurch community suffered greatly during and following the earthquakes and the aftermath of those earthquakes continues on in many ways. Supports the work which we plan to do to overcome the vulnerability of the electricity network which is such a key element of needed community service.</p> <p>A secure and dependable electricity supply is very important for the economic and social well being of the community and CCHL considers that we have a significant role to play in the restoration of normal services.</p> <p>Wishes to see us make our contribution to a return to normalcy by giving citizens the quality of supply which was in place before the earthquakes.</p> <p>Considers it essential that we complete our proposed work to re-establish network resilience and reliability.</p>
31 (ECan)	<p>Views this matter not as a direct consumer but as an organisation with a mandate to assess the economic growth of the region and specifically the recovery of the region following the earthquakes.</p> <p>We are now moving from a repair phase into building future resilience back into our city. Sees a strong connection between the resilience of the city's core infrastructure and the confidence of the private sector to want to invest back in Christchurch and notes that the electricity network is a significant component of every part of that recovery. A considerable number of other</p>



	<p>services required for the recovery and rebuild are going to require a strong and resilient network, including any future urban development.</p> <p>The implications of not doing this work would essentially be the same as saying that the 'customers' will have to deal with a lower level of performance and reliability.</p> <p>Supports our proposals on the basis that the work is required to get the network back to pre-earthquake state as quickly as possible. Further, the recovery of the city and surrounding areas will be faster based on the ability to attract new business and provide greater confidence to the community.</p>
32	Restoration of network quality is required and non-negotiable.
34 (MEUG)	Depends on the cost of the distribution alternatives to customers and if customers have cheaper non-distribution options to meet any given level of reliability.
35	<p>Fully supports our proposal to restore levels of reliability to those existing before the earthquakes. Electricity has been an essential service for decades but our society is far more dependent on electricity than it was even ten years ago. This is largely because almost all commercial and administrative activities have become dependent on electronic devices. A power failure results in an immediate cessation of business at petrol stations and supermarkets. Most mobile phones cease to operate after 24 hours.</p> <p>Many homes in Christchurch are dependent on electricity for heating and cooking. It was fortunate that the most severe quake occurred in February when the days were long and the weather was warm. There was no need to heat homes and there was no hardship in cooking on a barbecue or open fire in the garden. If the prolonged disruption (three weeks in my area) had occurred in July, households with neither an open fire nor a wood burner would have been in dire straits. The relatively small number of households with an open fire or a wood burner could not have coped with the needs of all their neighbours.</p> <p>Consumer opinion surveys, public responses to power outages (such as Otahuhu in 2002), and anecdotal feedback all confirm that the public's priority is reliable supply above all other considerations.</p>
36	Fully understands and accept the need to get the network back into shape, to give greater flexibility in supply options, to avoid and keep outages to a minimum and to strengthen the system to make it less vulnerable to the vagaries of nature.

### Summary of arguments raised

There was clear support for us to restore our network reliability to pre earthquake levels. The majority of respondents favoured restoring our network reliability to the same as pre-earthquake. Of those who did not, two individuals said it should be restored to a greater level of reliability than pre earthquake.

Two individuals supported a less reliable network. One sought lower prices as a result, and the other observed that their supply was already reliable enough post earthquake.

The overall theme of the feedback was that without a reliable network, our community is at risk and the rebuild of the Canterbury economy needs a reliable electricity network to provide confidence to investors.

### How our CPP accommodates the arguments

Our response to this feedback is very similar to our response to the network resilience issue above. Our drivers are the same – to provide a network that performs to a level of service our consumers expect, at a reasonable price. This is consistent with consumer feedback we received in the years prior to the earthquakes, which consistently showed that consumers expect a reliable supply of electricity. Importantly, they expressed satisfaction with our historical levels of service.

There was overwhelming support for a return to pre earthquake levels of network reliability. Network reliability is measured by the number (SAIFI) and duration (SAIDI) of interruptions to the supply of electricity to our consumers. Our goal is to ensure that our network reliability returns to our pre earthquake performance over time.

We propose new regulatory quality limits which reflect the damaged state of our network, but also ongoing network reliability improvements to near pre earthquake levels by the end of the CPP period (by FY19).

This continual improvement is consistent our proposed expenditures to repair and restore our network up to FY19.

By FY19 we estimate we will have achieved near pre-earthquake levels of reliability, with further improvements expected in the following regulatory period.

We believe that the feedback we have received endorses our CPP network reliability proposals. We appreciate that there are costs to restoring network reliability which will increase prices. Some parts of our network are more damaged than others. Where practicable, we will prioritise our restoration efforts to the worst affected parts of our network.

#### 2.5.4 Should we restore our network resilience and reliability by FY19?

Respondents' views					
Support	General comment in support	Oppose – should take longer if it saves costs	Oppose – should be quicker	Neither supports nor opposes	No response
1, 3, 4, 5, 6, 8, 10, 11, 12, 13, 14 (NZMEA), 15 (CECC), 16, 17, 29 (SDC), 33 (Genesis)	20, 21, 29 – SDC, 31 (ECan), 32, 35, 38	2, 7, 9, 18		34 (MEUG)	22, 23 (Meridian), 24, 25, 26, 27, 28, 30 (CCHL), 36, 37

Respondents' feedback	
Respondent	Comment made
6	The most important work must be done first if the timeframe is FY19.
19	The network doesn't need strengthening at all. (We note that this submitter also stated elsewhere that the network's resiliency and reliability should be returned to pre-earthquake levels.)
32	The timeframe may need some flexibility but should not exceed the proposed timeframe.
34 (MEUG)	Depends on the cost of the distribution alternatives to customers and if customers have cheaper non-distribution options to meet any given level of reliability.
35	Has not had the time to request detailed information on Orion's proposals. However, from the information published in the newspapers and from my knowledge of electricity networks, I support the general thrust of Orion's proposals very strongly.

### Summary of arguments raised

A number of submitters did not specifically address this issue. Of those who did, there was a significant majority of support for our draft proposal by FY19. Four submitters wanted a longer restoration period (beyond FY19) on the basis that this could save some costs.

### How our CPP accommodates the arguments

The substantial majority supported our proposed restoration timeframe (FY19), and this endorses our CPP restoration timeline proposal.

We believe that this timeframe is achievable and appropriate for supporting confidence in the rebuild. The feedback confirms that public expectation for improvement in reliability does not extend over a large number of years. This is consistent with our day-to-day interactions in the community that confirm an expectation of progress.

## 2.5.5 Should we recover our earthquake costs from consumers?

Respondents' views					
Support recovery from consumers	General comment in support	Oppose recovery	Reserved position	Unclear	No response
1, 5, 6, 8, 11, 13, 14 (NZMEA), 15 (CECC), 16, 29 (SDC), 30 (CCHL), 33 (Genesis), 35	20, 21, 23 (Meridian), 38	2,3, 7, 9, 10, 17, 18, 19, 22, 24, 26, 27, 28, 36 (Grey Power)	34 (MEUG)	37	4, 12, 25, 31 (ECan)

Respondents' feedback	
Respondent	Comment made
2	<p>Comment listed who should pay:</p> <ul style="list-style-type: none"> <li>• Orion should use its savings account to pay for the costs;</li> <li>• insurance;</li> <li>• government – the public are their responsibility;</li> <li>• developers – in the new subdivisions they should bear the costs of this expansion as they are the one that benefit;</li> <li>• CCC – benefit from the new subdivisions. CCC should reduce its costs and improve efficiencies.</li> </ul>
3	No. Please do not aim to recover all lost revenue. It's a risk many local businesses have endured.
6	Price increase sounds very low considering what's being delivered.
7	Wear the costs like any other business in the private sector. Insurers should pay or cut cloth to suit new circumstances – if that means a lower level of service, then so be it. Cut high salary bill.
9	<p>Electricity is too expensive in this country already; charge Tiwai Aluminium Smelter the same as domestic households.</p> <p>Rather than consumers the following should 'pay': Australian owned insurance companies; Australian owned banks; Australian owned elderly care facilities; and all other Australian owned companies.</p>
10	<p>Hasn't recovered his costs as a wage earner – why should Orion; Orion must have insurance; the power network is not in that bad shape that this project needs to happen.</p> <p>Rather than consumers the following should 'pay': Government; Orion and their associated insurers.</p>
11	While the public in general shudder at the thought of anything to do with raising power prices, feels an acceptable consequence of these exceptional circumstances includes an attempt at recovery of the proposed costs etc.
12	The recovery should be a fixed amount per household rather than per unit of power.
13	EQ related repair costs should be covered via a mixture of insurance and consumer contribution over a given period of time.
17	Power prices are high enough already. Orion should 1) petition Government for the money needed to restore the network to the levels advised; 2) petition local government owners to not require a dividend. Totally opposed to any price rise for power – consumers are already facing higher local government rates.
18	Shareholders and government should pay.
19	<p>Rather than consumers the following should 'pay': Orion – it makes enough profit; Shareholders who consistently want more profit.</p> <p>Customers in the South Island pay more for power now than anywhere else in NZ – the proposed price increase is hardly fair when no doubt Orion will reap the benefits of the change in pricing structure between the North and</p>

	South islands announced earlier this year. It is untrue to suggest that the risk was uninsurable.
22	<p>Rather than consumers the following should 'pay':</p> <p>1) Developers: Supporting new subdivisions should not be an Orion cost but fully funded by the developers. Similarly the CBD costs should be funded by the developers of the buildings within the CBD etc. By charging the entities providing developments for the full costs, then effectively Orion is picking up insurance money from these developers.</p> <p>2) Orion: Dividends should be reduced to councils – the argument that without an increase in Orion's prices, dividends will go down and rates will go up is a politically unacceptable argument. CCC rates are a matter for the CCC, not Orion.</p> <p>Given the financial shortfall from the quakes, then as for every other commercial business this needs to be financed/worn by Orion until the business is profitable again. It is commercially unacceptable to simply take the 'easy option' of raising prices.</p>
23 (Meridian)	Regretfully someone needs to pay for this – that someone could be the taxpayer, the ratepayer or the customer. Much as we hate to have to pass on cost increases to our customers, acknowledges that the fairest option is to charge customers because costs are then appropriately apportioned according to usage
24	No mention in two page advert of insurance cover – if company didn't have insurance cover then management is incompetent. Part of running a business is making sure that part of the on-going profit is invested in keeping infrastructure up to date and maintained. You don't pay out everything. The money wasted on trimming trees is massive. Owners should be sent the bill, if they don't keep the trees they have planted trimmed. It is too easy in the wake of the earthquakes to increase prices on long suffering power consumers. We were promised cheaper power with deregulation. If I could be self sufficient with my own solar or hydro power I would do it.
26	Orion should consider self-funding the work by withholding dividend payments to local councils.
27	Orion should fund the costs instead by paying Christchurch and Selwyn Councils \$15m less a year over the next 10 years. This would force councils to curb their expenditure accordingly.
28	Since most of the country want to help and the Government is obliged to help, transfer part or all of the GST part of Canterbury power bill. This is our money put back to our services with very little cost to the rest of the country.
29 (SDC)	Is aware that Orion could potentially achieve its investment programme without the proposed price increases if its shareholders were willing to accept substantially lower dividends and the concomitant reduction in the value of their investment. However, the SDC believes that the purpose of regulation under the Commerce Act is to achieve the right balance between a fair price for a good quality service and a fair return to shareholders. If the proposed price increase is not implemented this balance would be lost and result in a distorted market. In this circumstance Orion would no longer have the right incentive to continue to invest in its network and maintain a reliable service.

	<p>It would also be inconsistent with the principal objective of an energy company under Section 36 of the Energy Companies Act 1992 to operate as a successful business.</p> <p>The SDC is keenly aware of the broader effects of the earthquakes on our community as well as the financial pressures faced by many. While the proposed price increases will be difficult for some residents, the SDC accepts that it is a price worth paying for a robust lines network.</p> <p>The programmed work to provide new sub stations and associated 66kV sub-transmission lines in the district are an important part of ensuring the network can cope with increasing demand in the district. The Council has long since accepted the principle of 'user pays' and supports the proposal that customers pay for the investment that is required.</p> <p>Shifting the responsibility for funding the restoration of the network from consumers to ratepayers through lower dividends is potentially unfair as the financial burden will be determined by the capital value of a ratepayer's property rather than the amount of electricity they consume. If dividends were further reduced council would have to either reduce its level of service or increase the general rate.</p>
30 (CCHL)	<p>Is aware that some would argue that profits from Orion should be used to offset any price increase related to strengthening the network. This is not a valid argument as the pricing should reflect the cost to the user and this should include a reasonable component of profit commensurate with the risk of investing in such infrastructure. This should be available to the investor whether they are a private company or a publicly owned entity such as CCC/CCHL.</p> <p>To illustrate this point a comparison must be made with what reasonable price path would be permitted if Orion was owned by a private investment company. A privately owned company would be entitled to a reasonable rate of return. The return allowed for Orion in its current ownership should be the same as there is no justification for penalising any shareholder over another. The rate of return for a publicly owned investor should be no different from a privately owned investor.</p> <p>While the territory serviced by Orion's network matches with the boundaries of its two local authority shareholders, the investment in the network and use of energy reticulated over the network are not necessarily proportionate to the shareholding interest of each shareholder. It is therefore important to dismiss any broad-brush assumption that the current shareholders should forego their rights to a dividend to the detriment of the shareholder investors. It is preferable that the consumers pay for the full cost of reticulating electricity to their premises and meeting their consumption needs and avoid issues of cross-subsidisation.</p>
32	<p>Orion must find some other way to pay. For example (a) apply profit to this project instead of paying dividends (b) borrow for this project (c) a mixture of the two methods.</p>
33 (Genesis Energy)	<p>Supports the use of CPP to recover planned capital expenditure, repairs, and operating costs to rebuild the network and restore its pre-quake levels of service.</p>

34 (MEUG)	<p>The consultation paper reports earthquake-related costs as \$70m. No breakdown of those costs is provided in the consultation paper. Orion should be more transparent about what the earthquake-related costs referred to in the consultation paper are for. For example, if some of those costs are for written down assets, then those costs should be borne by Orion's shareholders because:</p> <ul style="list-style-type: none"> <li>• the company, not customers, are better able to make decisions on how best to manage earthquake risk;</li> <li>• EDB shareholders can diversify their ownership risk to manage earthquake risk for any particular line company, whereas customers cannot because they can only have one line services supplier; and</li> <li>• in competitive markets earthquake costs are borne by affected businesses, not their customers.</li> </ul> <p>The above comments are MEUG's initial view. Until details are available on the breakdown, nature and materiality of those sums relative to operating costs that would have been incurred in any case, MEUG reserves its position.</p>
35	<p>Has not had the time to request detailed information on Orion's proposals. However, from the information published in the newspapers and from knowledge of electricity networks, supports the general thrust of the proposals very strongly.</p> <p>Is "sure" that electricity consumers in general would support the proposals and willing to pay the increased charges to restore the former level of reliability.</p>
36 (GreyPower)	<p>Orion should put its profits back into the network and not subject its consumers to more price rises and hardship.</p> <p>Yes, the Christchurch City and Selwyn District Councils will suffer an income loss, but that will have to be picked up by the ratepayers of those areas and the councils concerned may then be required by their ratepayers to seriously consider their spending activities.</p> <p>Yes, many consumers are also ratepayers and will be affected by any subsequent rate rises, but let's put the costs where they belong. Electricity consumers should not be subsidising ratepayers, be they the same person or not.</p> <p>Failing Orion's board accepting what Grey Power believes to be the best method of providing the necessary finance for your renewal and strengthening programme, believes as an alternative that long-term loans should be raised that will be paid off by the consumers in the long term or again by a reduced dividend take by the shareholders.</p>
37	<p>You don't need to milk Christchurch to then throw millions at the council, you and Enable need an elected smartypants board at a distance from City Hall operating as a very highly socially responsible not-for-profit trust, without executive megasalaries.</p>

## Summary of arguments raised

Responses were mixed.

Ten individuals stated that they believed we should recover our costs from consumers. Thirteen individuals believed we should not recover our costs from consumers. Of



these, a number mentioned that insurers and/or the government should pay. Another suggested alternative was that we should reduce our dividends to our shareholders.

Large business groups, namely NZMEA and CECC, and electricity retailers, Meridian Energy and Genesis Energy (who together represent 65% of our consumer base), supported recovery of our earthquake costs from consumers. Orion's owners, the Selwyn District Council and Christchurch City Holdings Limited also supported full recovery from consumers.

Grey Power opposed our proposal for cost recovery from consumers and MEUG (with eight business members located in our network area) reserved its position. Ravensdown, which is a member of MEUG, supports our proposed cost recovery from consumers.

Comments of a specific nature include:

- cost recovery should be based on a household rate rather than per unit of power.
- supporting new subdivisions should not be an Orion cost but fully funded by the developers. Similarly the CBD costs should be funded by the developers of the buildings within the CBD etc.
- long-term loans should be used.
- insurance should have been held by Orion.
- do earthquake-related costs of \$70m, as cited in the CPP consultation material, include written down assets?
- costs should be borne by Orion as in competitive markets earthquake costs are borne by affected businesses, not their consumers.
- money should not be spent and wasted trimming trees on private land.

### **How our CPP accommodates the arguments**

We have carefully considered whether we should recover our uninsurable earthquake-related costs, and if so, who we should recover costs from. We have received mixed responses on the issue of cost recovery from consumers. Some consumers submitted that someone else should pay.

In Section 1 of our CPP proposal we explain why we believe that consumers should pay for the costs of providing electricity distribution services, and why we have been prevented from recovering our efficient costs since the earthquakes due to the regulatory price constraints on us. We have sought independent expert (peer reviewed) advice on this matter and both experts support our view that we should recover our efficient but uninsurable costs from consumers.

We received 38 submissions and those submissions had a range of views, both in support of and in opposition to our draft proposal to recover our costs from consumers.

We are mindful of the impact of our proposed cost recovery on consumers and we have sought ways to smooth the price impact over time, as well as smooth our expenditure programme over time. We remain of the view that it is in our consumers' long-term interests for us to recover our costs of electricity distribution services for the reasons we set out in Section 1 of our CPP proposal.

Our response to specific comments from consumers is set out below.

- *Cost recovery should be based on a household rate rather than per unit of power*  
We favour a volume based cost recovery over a flat rate per household recovery, because flat rate recovery would:
  - adversely impact consumers who use little electricity. We think a volume based recovery is a fairer allocation of cost, as it tends to mean all consumers will pay the same percentage more
  - not encourage energy efficiency
  - in theory be different for each household, as not all households require the same capacity from us. We believe that consumption based charges are a better proxy for network capacity requirements
  - become complicated in order to accommodate non-household connections. Should each business pay the same as each household? Should all businesses pay the same amount as each other?
  - be potentially difficult, as there are regulatory constraints on maximum fixed charges for households.
  
- *Supporting new subdivisions should not be an Orion cost but fully funded by the developers. Similarly the CBD costs should be funded by the developers of the buildings within the CBD*  
We charge developers capital contributions, reflecting some of the additional costs that we face in to enable the connection to our network. We have required such contributions for a number of years. However, we will not seek 'greater than normal' contributions from developers to subsidise earthquake-related cost recovery. Any significant allocation of earthquake-related costs to developers/new connections might simply make these potential consumers move outside of our network area.  
Our electricity distribution network in the CBD has been damaged – it is not being used much at the moment but must be in a state to support the CBD rebuild.
  
- *Long-term loans should be used.*  
We use a combination of interest bearing debt and revenue from consumers and capital contributions from developers or other third parties to meet our cash flow requirements. The regulatory rules which we must apply in our CPP proposal determine how much is recovered each year from consumers by way of electricity distribution charges. Any shortfall must be met by additional borrowings. If we borrow more instead of increasing our prices we would not recover our prudent and efficient costs – and this would not be in consumers' long-term interests (as we describe in more detail in Section 1).
  
- *Insurance should have been held by Orion.*  
We insured our network assets where it was prudent and economic to do so. We also invested in network resilience before the earthquakes which minimised the damage we experienced on our assets. However, it is the nature of the electricity distribution industry that it is not possible to fully insure all assets economically. This is explained further in Section 1 of our CPP proposal and by the Marsh expert report attached to our CPP proposal. As noted above, substantial insurance proceeds have been received and offset against our costs.

- *Do earthquake-related costs of \$70m, as cited in the CPP consultation material, include written down assets?*

There are no asset write-downs included in the \$70m quoted in our consultation material.

- *Costs should be borne by Orion as in competitive markets earthquake costs are borne by affected businesses, not their consumers*

Our current prices are limited by price control regulation. These prices did not include allowances for the uninsurable impacts of catastrophic events, and regulatory constraints have prevented us from adjusting our prices to reflect our additional costs. In workably competitive markets, suppliers can charge for such risk, and they can quickly adjust prices if the industry's cost structure changes. This issue is addressed in our CPP proposal and in the independent expert reports we commissioned from Jeff Balchin of PwC (peer reviewed by James Mellsop of NERA).

- *Money should not be spent and wasted trimming trees on private land*

The Electricity (Hazards from Trees) Regulations 2003 set down legal requirements for us to trim trees. It also sets out responsibilities for private land owners in this respect. We comply with these requirements, including who should pay for any tree trimming. To avoid the need to trim trees, and reduce costs, we work with landowners to encourage them not to plant trees near our lines.

## 2.5.6 Should we recover our lost revenue resulting from the earthquakes from consumers?

Respondents' views					
Support recovery from consumers	General comment in support	Oppose recovery	Reserved position	Unclear	No response
1, 5, 6, 8, 11, 14 (NZMEA), 15 (CECC), 16, 29 (SDC), 30 (CCHL), 35	20, 21, 23 (Meridian), 38	2, 3, 7, 9, 10, 13, 17, 18, 19, 22, 24, 26, 27, 28, 32, 33 (Genesis), 36 (Grey Power)	34 (MEUG)	37	4, 12, 25, 31 (ECan)

Respondents' feedback	
Respondent	Comment made
3	Revenue that has already been lost should not be recovered. Many in our region are financially worse off, so it is unreasonable to expect Orion to recover all costs.

7	Wear the costs like any other business in the private sector. Do not have the financial resources to contribute to your losses.
13	Lost revenue should be part of an insurance claim in the same way that major users have had to contend with this very same issue.
33 (Genesis Energy)	<p>Genesis has serious concerns with Orion's proposal to recover an estimated fall in network revenue of \$30 million from its consumers via the CPP. Does not think this is justified, particularly given that in the 2012 financial year, Orion made a \$54 million profit after tax and paid a \$34 million dividend to its shareholders.</p> <p>Understands that "claw back" of a shortfall in revenue may be possible under the Commerce Commissions regulatory regime, but any proposal must be consistent with the purpose of the Commerce Act 1986, that seeks to: "promote the long-term benefit of consumers .....by promoting outcomes that are consistent with outcomes produced in competitive markets ".</p> <p>Does not consider that our proposal meets this requirement for three reasons.</p> <p>First, in a competitive market, suppliers cannot simply recover revenue lost. Competitive pressures will ensure that any such attempt is resisted. There are other options available to mitigate this type of risk arising from significant events. Therefore, we would not expect such a large dividend to be made with the knowledge that revenue had already dropped significantly and was not expected to fully recover for some time.</p> <p>Second, it is unclear how any dividend paid to shareholders will provide benefits back to Orion's consumers. While Orion's shareholders (Christchurch City Council and Selwyn District Council) represent the same consumer base, and therefore there may be an indirect trickle down benefit, we consider that Orion's consumers would get a more direct benefit from lower network costs.</p> <p>Third, does not consider that a reduced dividend in the short-term would reduce Orion's incentives to invest in the network for the long-term benefit of consumers. As noted above, supports the use of a CPP to recover costs associated with rebuilding the network. Well planned investment will be rewarded in the form of network performance and resilience, regardless of who receives a share of the profits.</p> <p>In addition the following respondents' comments made in respect of whether we should recover our earthquake repair costs (included earlier in Section 2.5.5) also apply to the issue of revenue recovery.</p> <p>Respondent 2, 6, 9, 10, 11, 12, 17, 18, 19, 22, 23 (Meridian), 24, 26, 27, 28, 29 (SDC), 30 (CCHL), 32, 34, 35, 36 (GreyPower) and 37.</p>

## Summary of arguments raised

Nine individuals submitted that they believed we should recover lost revenue from consumers.

Fifteen individuals submitted that we should not recover lost revenue from consumers. Of these, the suggested alternatives were similar to those suggested in response to

cost recovery above, namely that insurers or the government should pay, or we should reduce our dividends to our shareholders.

Large business groups, namely NZMEA and CECC, and electricity retailer, Meridian Energy (which supplies 40% of our consumers) supported revenue recovery from consumers. Selwyn District Council and CCHL did too. Grey Power and Genesis Energy (which supplies 25% of our consumers) opposed recovery of lost revenue from consumers and MEUG reserved its position. Ravensdown, which is a member of MEUG, supported revenue recovery from consumers.

### **How our CPP accommodates the arguments**

A large proportion of respondents assessed the issue of lost revenue recovery the same as cost recovery above. That is, their responses did not differentiate between the two. However, there were some respondents (for example Genesis Energy) which supported cost recovery but not lost revenue recovery.

We believe that we should recover lost revenue from electricity consumers. Our CPP proposal has been prepared consistent with this principle and we believe it is in consumers' long-term interests for us to recover our lost revenue. We explain our reasons for this in Section 1 of our CPP proposal.

Our revenue is how we recover our costs. Lower revenues and regulation that has caused a three-year delay in adjusting our prices to reflect new cost levels post earthquake has hindered our cost recovery. Non-cost recovery is not in consumers' best long-term interests because it reduces our incentives to continue to invest for the long-term benefit of consumers. Our consumers clearly want us to continue to invest to restore and maintain our network's resilience and reliability.

This issue is addressed in our CPP proposal. We sought expert advice from Jeff Balchin of PwC on the matter of recovery of lost revenue from consumers which is included in our CPP proposal. Mr Balchin's report was peer reviewed by James Mellsop of NERA.

In essence, Mr Balchin's report notes that lost revenue should be treated in the same way as increased costs arising out of the earthquake. The report states that it is important to be clear about what costs are relevant. It is not just the easily observed costs of doing business that are important, such as recurrent operating expenditures and reasonably foreseeable capital expenditures. Cost recovery should also include compensation for the less easily observed and/or uncertain costs associated with the service. Mr Balchin notes that all costs have a degree of uncertainty attached to them – and the only differentiating factor of reduced/lost revenue, due to the impact of the earthquakes, is the fact that (prior to the earthquake) this cost was less certain than normal expenses.

Mr Balchin notes that there is no conceptual difference from a regulatory perspective between adverse events that cause reduced revenues (through reduced demand) and those that cause increased costs. An unexpected (and uncompensated) catastrophic event that leads to a reduction in revenue (arising from a reduction in demand) for a firm with largely fixed costs will result in costs being unrecovered, just like an unexpected (and uncompensated) increase in costs.

In our context, a key objective of price regulation is to protect consumers from the misuse of monopoly power, while ensuring the continued and reliable provision of the service. These apparently competing objectives are almost universally settled by setting prices that permit the recovery of prudent and efficient costs, including a commercial return on investment. These tensions are reflected directly in the purpose statement for Part 4 of the Commerce Act.

Catastrophic events raise the cost of providing a service and, equivalently, lead to a loss of revenue. As noted in Mr Balchin's report, our view is consistent with the treatment of costs in general, that efficient and prudent costs (including lost revenue) caused by catastrophic events should be recovered from consumers.

If we are not able to recover costs (including lost revenue) arising out of a catastrophic event then the incentives to invest in the network are diminished. Indeed it is inherent in the Part 4 purpose statement that this cost recovery is a prerequisite for ensuring owners of regulated infrastructure continue to innovate and invest to meet the long-term needs of consumers. The benefit to consumers from ongoing investment in the network is ensuring their needs can be met now and in the future.

Mr Mellsop's peer review supports Mr Balchin's opinion.

We have also carefully considered legislative requirements. Section 36 of the Energy Companies Act requires our principal objective to be "...to operate as a successful business". Full cost recovery is fundamental to achieving this objective and continuing to invest for the long-term benefit of consumers.

We have carefully considered the (mixed) feedback we received from consumers on this issue in light of:

- legislation
- the expert advice we have received.

On balance, we believe that full cost recovery is appropriate, including for revenue loss caused by the earthquakes. Price control regulation has caused a three-year delay in us adjusting our prices to new efficient levels to reflect new realities (as would occur in workably competitive markets).

## 2.5.7 Is it preferable to recover earthquake costs over a 10-year period or a five-year period?

Respondents' views				
Support	General comment in support	Oppose - prefer a longer time frame	Reserved position	No answer given
1, 3, 4, 5, 6, 8, 11, 12, 13, 14 (NZMEA), 15 (CECC), 16, 29 (SDC), 33 (Genesis)	20, 21, 35, 38	7, 9	34 (MEUG)	2, 10, 17, 18, 19, 22, 23 (Meridian), 24, 25, 26, 27, 30 (CCHL), 31 (ECan), 32, 36, 37

Respondents' feedback	
Respondent	Comment made
7	Have a longer time frame to keep costs lower
9	A 50 year period would be fairer
33	We recommend that Orion seek to spread the price charges over the proposed 10 years, rather than the alternative of five years, as this will minimise price shock and more closely reflects the life of the assets
35	I have not had the time to request detailed information on Orion's proposals. However, from the information published in the newspapers and from my knowledge of electricity networks, I support the general thrust of Orion's proposals very strongly.

### Summary of arguments raised

A number of submitters did not address this issue.

Of those who did address this issue, a significant majority supported our proposal for 10 years rather than five years.

### How our CPP accommodates the arguments

The majority of responses support a 10 year recovery period. We believe this is a reasonable period that balances both the interests of consumers and our shareholders within the regulatory rules which apply to us. Smoothing cost recovery over a 10 year period reduces price shocks for consumers while ensuring we are able to recover our fair costs in a reasonable period. This is also consistent with providing line services which meet the requirements of current and future consumers.

Cost recovery for most of our capital expenditure costs (depreciation and return investment) is spread over the assets' lives, many of which have lives of at least 50 years. We have also proposed an alternative depreciation option which reduces our depreciation expense in the first five years, and we have proposed recovering our \$43m of our "claw back" after FY19.

We believe that our proposed approach to this issue has addressed the feedback.

### 2.5.8 What will happen to prices at the end of the CPP period?

Respondents' feedback	
Respondent	Comment made
8	Orion does not appear to say anything of what will be done to the 15% increase at the end of the rebuild period. I would have thought that given that you are looking to still receive the CPI based increase there would be a 15% decrease at the end of the re-build

### How our CPP accommodates the issue

The Commission will determine our level of revenue at the end of the CPP period, after examining our costs at that time. We will not have fully recovered our rebuild costs



within 10 years because the assets which we are building now will provide electricity services for the next 50 plus years. As explained above, our proposed prices allow for long-term recovery of those asset costs over that period.

## 2.5.9 Alternative forms of energy and demand response

Respondents' feedback	
Respondent	Comment made
2	Would Orion consider a feasibility study on wind power?
25	Solar or wind power options should be given greater consideration by Orion and perhaps some sort of incentive should be provided by Orion on these. To increase reliability of supply there should be solar options on each building.
26	Alternative forms of energy utilisation or production involving individual homeowners acting more or less independently on their own initiative, as opposed to greater dependence on reticulated electricity supply at the expense of the environment, would be potentially conducive to superior public/social outcomes overall. In short some lateral thinking is required if we, as a nation, are to have a future not bound up in endless demands for more electricity simply by turning a switch.
34 (MEUG)	Re-building Canterbury's economy is an opportunity for a customer focussed electricity supply chain where innovative new demand responsive investment in customers' premises may be as important as investment in the distribution network. The consultation paper has no insights on how Orion's plans contribute to this broader vision. Orion's proposed pricing policies mentioned above are crucial to ensuring optimal customer and distribution investment.

### How our CPP accommodates the arguments

We have a long history of actively working to promote new technologies – including demand side management and non-network alternatives (for example interruptibility agreements with irrigators). Our CPP proposals do not change our approach to these matters. We remain receptive to new ideas and forms of generation and look to accommodate these in the services we provide.

As well as encouraging consumers to reduce demand during peak demand periods, our prices encourage reliable 'distributed generation' within our network. Distributed generators are generators located at a home or business which are capable of generating electricity for that home or business's own use. They may also be capable of putting surplus electricity back into our network. These generators can take many forms; diesel generators, wind turbines and solar panels are the most common.

Distributed generators that reliably and consistently respond when our network is heavily loaded assist us in two main ways:

- they add security to our community's electricity supply

- they delay the need for us to expand our network capacity by supplying electricity close to where the power is consumed.

We provide credits for pre-approved reliable distributed generators connected to our network, based on the amount of electricity they provide during periods of high network loading. We have a standard set of credit prices for smaller generators, and individually consider credits for larger (more than 750kW) generators. Not all network companies in New Zealand pay for distributed generation. However, we believe reliable distributed generation should be encouraged as it makes our community's electricity supply more secure. We will continue to encourage distributed generation through appropriate pricing mechanisms.

Our peak load forecast assumes that an additional 2MW of peak distributed generation will be installed each year. The series of Christchurch earthquakes has led to an increase in enquiries to connect diesel generation and we anticipate a corresponding period of strong growth in the connection of diesel generation. For this to be effective in deferring network capacity, the generation capacity must be reliably available to support the network in the event of an interruption to supply. In general this requires that generation be offered to operate as and when required, which in turn necessitates that fuel is able to be stored. Distributed generation using fuel that cannot be stored does not usually substitute for network capacity unless fuel supplies are stable and reliable. Wind, solar, and run-of-river hydro are three types of generation that provide energy but do not substitute for network capacity.

We do not believe that we should subsidise solar or wind options, or undertake feasibility studies into these technologies. Other organisations, such as EECA or electricity generators, are better placed to do this.

#### 2.5.10 Information to enable large consumers to assess the CPP proposal

Respondents' feedback	
Respondent	Comment made
34 (MEUG)	<p>There is insufficient information published to enable larger time-of-use (TOU) customers to assess the effect on their individual businesses were the Commerce Commission to determine a Customised Price-Quality Path (CPP) entirely in accordance with the intended CPP proposal.</p> <p>Orion's proposed cost allocation and pricing models need to be made transparent to mitigate concerns large TOU customers, or for that matter any class of customer, may be subsidising future distribution services to other customers.</p> <p>We believe Orion should have consulted on a draft of the full suite of information required for CPP set out in the Electricity Distribution Services Input Methodologies. Without this information we have little understanding of basic key drivers that support the CPP proposal such as demand growth forecasts relative to network capacity for major sub-regions within Orion's network.</p> <p>Without having access to the above information to make an informed</p>

decision, large TOU consumers cannot support Orion's proposal.

### How our CPP accommodates the arguments

We believe we have complied with the consultation requirements of the CPP IMs and note that we extensively advised that should further information be required by any party, beyond what was provided already by us, then that party should contact us.

MEUG made no contact with us seeking further information prior to making its submission. With respect to the information sought, Orion's view was that extensive detailed information was about to be made available to consumers. Our full CPP proposal will be available to interested parties once it is submitted to the Commission. This will include the independent engineer's report, the verifier's report and the auditor's report. There will be considerably more detail on our expenditure plans. All interested parties will have a further opportunity to submit their views during the Commission's assessment process during 2013.

We also held a major customer seminar at which this issue was extensively discussed and we also sent a letter about our CPP proposals to our directly contracted major consumers.

In relation to the issue of insufficient information being provided to larger time-of-use consumers, we note that each time-of-use consumer has a different usage profile. At this stage we have only indicated the overall increase in price level that would be required. We have not considered in any detail how such increase would be spread across connection categories and pricing components within those categories. It is thus not possible at this stage to do a meaningful analysis across our individual larger consumers.

We are always mindful of potential rate shocks, and when we do come to implement any approved increases under the CPP we will carefully consider individual consumer impacts.

### 2.5.11 Underground cables or overhead lines?

Respondents' feedback	
Respondent	Comment made
30 (CCHL)	Consistent with the standards it has applied previously and in accordance with good environmental standards, Orion plans to underground its large voltage cables (66kV) as it restores and strengthens the network. CCHL supports this approach which is not only a good environmental approach but also protects the major supply from damage due to weather and other external effects
34 (MEUG)	The consultation paper (p4) states "... we plan to continue to use underground cables in most urban areas and overhead lines in most of our rural network. Our use of underground cables complies with the policy contained in the Christchurch City Council's City Plan." Underground cables are much costlier to install, more prone to earthquake damage and more expensive to repair than overhead lines. Orion should

cost the alternative of using overhead lines rather than underground cables to inform the City Council of the impact of its policies. The Council, not power users', should foot the bill for not choosing lower cost overhead lines. Otherwise there is a perverse incentive whereby the Council can impose costs on Orion's customers for benefits, such as aesthetic values, that accrue to the Council and ratepayers rather than electricity customers.

### How our CPP accommodates the arguments

As part of our network planning, and as contemplated by our subtransmission network architecture review, we have chosen to deploy 66kV underground cables as part of the network solution for certain major urban projects.

An alternative approach is to deploy overhead lines – at a lower cost. Given the greater cost of undergrounding, the technical and economic prudence of deploying underground cables is the topic of some debate.

While we could undertake overhead installation, we have not done so in the past in urban locations and we do not propose to do so. This is because:

- we need to take a balanced risk to natural hazards we face, as opposed to just focussing on, and planning for, earthquakes
- it is appropriate to replace “like with like” for communities where temporary overhead lines had to be installed as a result of the earthquakes and it is in line with the commitment the community was provided when the “temporary” overhead lines were installed
- we believe it would be against the wishes of the Christchurch city community. This belief is based on consistent feedback received over the last few decades
- it would be contrary to the local government regulations, including Christchurch City Council's objectives and policies in the City Plan. We seek to comply with the requirements of the City Plan and this undergrounding objective
- the Council has not revised its undergrounding objectives and policies in light of the earthquakes (in contrast to other aspects of the plan) despite the cost implications nor has it seen a shift in community views on this approach
- the City Plan rules and the Resource Management Act require Orion to obtain resource consent or require a designation for overhead installation, the granting of which is unknown, and in either case seems difficult if not remote in relation to installation of new overhead lines.

These reasons are further discussed in our CPP proposal in Section 9.13.9.

Taking all factors into account it is a prudent approach to underground large capacity cables in city urban areas and we note this is the approach taken by other EDBs.

### 2.5.12 Costs saved by pre-earthquake strengthening

#### Respondents' feedback

#### Respondent Comment made

34 (MEUG)	On page 13 of the consultation paper is the comment “we estimate that without our pre-earthquake strengthening work and planning, the
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earthquakes would have cost us an additional \$65m in repair and replacement costs.”

No details of that calculation are provided. We suggest Orion publish those calculations and any estimate of the counterfactual had that work not been undertaken. The counterfactual should include the savings due to lower line charges to customers.

### How our CPP accommodates the arguments

The \$65m figure was compiled after a request from the Engineering Lifelines Group. It is based on an assumption that all pre-1960s brick substations would have failed in the February earthquake and the substations and equipment within would have needed replacement, had it not been for seismic strengthening. It assumes that no post-1960s substations would have failed, and the substations and equipment within them would not have needed replacing, even if these substations had not been seismically reinforced. We therefore believe the assumption conservative.

We did not, and do not, consider it necessary to publish our calculations behind this figure and have not spent the time and resources on quantifying the cost to the community had we not undertaken the seismic strengthening. It appears reasonably obvious that the impact on the community of a failure to seismically reinforce core assets would have been hundreds of millions of dollars, if not billions of dollars, due to depopulation of large parts of Christchurch. Had we not seismically strengthened our network, power would have been out to a large number of consumers for many months, including the winter of 2011. This winter included a major snow event which could have imposed a severe health risk to communities that remained without power for heating (noting that many open fires were no longer functional because of chimney damage during the earthquakes).

### 2.5.13 Other general comments

Respondents' feedback	
Respondent	Comment made
20	Do what you need to do to provide us with a world-class electricity supply that meets the needs of our shaky environment. Orion has been outstanding throughout this difficult 2 years – keep up the good work!
21	I am a Christchurch ratepayer and resident and I lived and worked here throughout the series of earthquakes. I was grateful for the relatively short disruption to our essential power services and I understand the forethought and planning that contributed to that success. Network reliability is essential for recovery, both practically and psychologically. That is why I am I support of the proposed change structure and I hope other networks across New Zealand are taking advice from Orion as they make their own preparations for any unexpected natural disaster.
38 (Ravensdown – a major	David Blatchford (National Engineering Manager), Keith Grant, and Peter Hay have all reviewed the pricing proposal from Orion and agree that it is reasonable given the circumstances and expectations of reliability and

consumer of resilience.  
Orion and  
member of  
MEUG)

# 3 Verification



## 3 Verification

### 3.1 Verification information

Clause 5.1.3 of the CPP IMs requires that a CPP application must include, in relation to verification of the CPP proposal:

- a verification report
- any information relating to the CPP proposal, other than that included in it, provided to the verifier
- a certificate signed by the verifier stating that the relevant parts of the CPP proposal were verified and verification report was prepared in accordance with Schedule G.

The verification report, prepared by Geoff Brown Associates (GBA), is included in Appendix 7. This includes a verification certificate.

During the verification process, further information was provided to GBA by way of verbal and written explanations and other supporting documents. This information will be made available to the Commission.

### 3.2 Verification process

The final verification report issued on 18 February 2013, was completed following a three and a half month process comprising:

- provision of information to the verifier about our top ten capex and opex plans at the end of October 2012
- provision of the draft CPP proposal and accompanying template schedules and supporting material on 19 November 2012
- face to face meetings between the verifier and our staff
- selection of ten identified projects and programmes by the verifier on 3 December 2012 and provision of information about those projects and programmes to the verifier on 4 December 2012
- provision of written responses to questions raised by the verifier during November and December 2012
- receipt of a draft verification report on 31 December 2012
- meeting with the verifier to discuss the draft report on 24 January 2013
- provision of further written responses to questions raised by the verifier during January and the first part of February 2013
- provision of a final draft CPP proposal to the verifier on 30 January 2013
- provision of a final CPP proposal to the verifier on 12 February 2013
- receipt of a final draft verification report on 14 February 2013

- receipt of a final verification report on 18 February 2013.

We acknowledge that the time constraints on this project have been challenging for all parties involved, and we appreciate the efforts of GBA in meeting our project deadlines.

We briefly comment on the verifier's key comments in the Executive Summary of his final report in the section below. We have not provided a detailed response to the matters raised in the verifier's report as we will look to engage with the Commission on these and other matters should the Commission accept our application. We have found the verification process informative and useful to us in finalising our CPP proposal.

### 3.3 Verifier's findings

The verifier's key findings are summarised in the Executive Summary on pages 1-2 of the final report (the full report is included as Appendix 7). We comment on each finding below.

#### **GENERAL**

*There is a high level of uncertainty in the environment within which Orion will need to operate over the forecast period. This relates not only to the rate and location of demand growth, but also to the costs that Orion will incur in delivering its capex and opex programme.*

*Orion's procedures for the formulation and delivery of its work programmes are robust and the resources available to fund Orion's works programme will be effectively used. We also consider that the unit costs assumed by Orion in developing its cost estimates are reasonable. This would suggest that in its appraisal the Commission should focus on the need for the works described in the CPP proposal and the benefits that these works will provide consumers and other stakeholders.*

We appreciate the acknowledgement the difficulties we face in the post-earthquake period, particularly in relation to planning. We believe that our planning and project delivery procedures have served us well to date, particularly since September 2010 when our operating environment changed so considerably. We are confident that our processes will continue to enable us to deliver our works programme effectively over the CPP regulatory period.

#### **PLANNING CRITERIA**

*It is unclear whether Orion's current planning criteria are still appropriate, particularly in the post-earthquake environment. In particular we think the requirement that all 66 kV subtransmission circuits in urban areas be placed underground should be reviewed as overhead lines are much less costly to build, have significantly shorter repair times and greater earthquake resiliency. We also think Orion should consider whether its N-2 security criteria should be relaxed and this could allow the construction of some subtransmission projects to be deferred. As N-2 contingencies are relatively uncommon, this may not have a significant impact on network reliability.*

We have carefully considered our planning criteria, and have undertaken a substantial review of them since the earthquakes. Our plans have been formulated on a basis which is consistent with the requirements of our consumers, as demonstrated in

Section 2 of this CPP Application. Our CPP Proposal sets out our rationale for our system security (planning) standards (in Section 6.2.7) and our rationale for continuing to use underground reticulation in our urban sub-transmission network (in Section 9.13.9). We look forward to engaging with the Commission further on our planning criteria.

### **DELIVERABILITY**

*Over the two year period FY13-FY14 Orion's total network works expenditure is expected to increase by 84% above the level achieved in FY12 and we question whether the delivery of such a large increase in works volume over such a short period of time is achievable. Orion's actual works expenditure in FY13, and the volume of work actually delivered will be a good indicator of whether or not delivery of the works programme set out in the CPP proposal can actually be achieved.*

While we acknowledge that we are planning a significant works programme during the CPP period, we believe that our contracting model is ideally suited to meet the challenges this will involve, and we have invested in additional support systems and personnel in recognition of the programme. We also note that the works programme includes a larger number of subtransmission projects than we would typically undertake within this forecast period. As these projects include significant materials costs, the 'value' of the subtransmission works programme is not necessarily a fair indicator of the 'volume' of work.

Supporting our view that we can meet the challenges ahead we note GBA's comment above '*Orion's procedures for the formulation and delivery of its work programmes are robust and the resources available to fund Orion's works programme will be effectively used*'.

### **CAPEX FORECAST**

*Orion's major project capex forecast is reasonable on the basis of the planning criteria it is currently using. However, if the planning criteria are changed, the forecast should be revised.*

*While some increase in expenditure on asset replacement is warranted the forecast increased in asset replacement and renewal capex over past levels of expenditure appears very high. Orion should be required to provide further justification for the level of expenditure in its forecast. This could include a sensitivity analysis of the impact of lower levels of asset replacement expenditure on failure rates and supply reliability. Forecast capex in other areas is generally reasonable. However reinforcement and connections and extensions capex requirements are driven by the rate of growth in demand and the location of new customer connections and these are areas with very high levels of uncertainty in the post earthquake environment.*

We have carefully developed our capex forecast and acknowledge the verifier's conclusion that our forecasts are reasonable. We acknowledge the inherent uncertainty in the forecast period, however we have taken care to consider the impact of the earthquakes where relevant, and to refine our forecasts based on the best information we have available to us at this time. For this reason we do not believe that historical levels of expenditure are useful predictors of future costs for our network at this time. We look forward to further discussions on our capex plans with the Commission.

## **OPEX FORECAST**

*Orion's forecast fault and emergency maintenance opex is reasonable.*

*On balance, Orion's forecast scheduled maintenance opex is reasonable, except that we see no need for the maintenance contingency.*

*Orion's forecast for corporate management (CPP160) opex is reasonable and possibly conservative. The forecast for some other non-network opex line items including communications and engagement, special projects, corporate information systems, and system management and operations appears high, particularly in the latter years of the forecast period. In most of these areas, there appears to be an assumption that the resources needed to support the peak of the earthquake rebuild effort in FY14 and FY15 will need to be retained through to the end of the forecast period. We question the validity of this assumption on the basis that by FY19 aggregated network capex and opex expenditure is forecast by Orion to be 32% lower in real terms than the corresponding expenditure at the peak of the rebuild.*

We acknowledge that our maintenance programme has been found to be reasonable. We have invested in additional support opex to manage our work programme and provide a sustainable level of resources in order to reduce the exceptional workloads that our staff have experienced over the past few years.

We challenge the assumption that the rebuild resourcing should decline post FY15. As explained above while the value of major capex projects (in particular) declines, the volume of all work will remain above historical levels and the rebuilding will continue for a number of years beyond FY15.

## **OTHER MATTERS**

*We consider that Orion's forecast for capital contributions for connections and extensions is reasonable to the extent that any under-recovery is unlikely to be material. We also think that Orion should review all its cost recovery models to ensure that they accurately reflect current cost structures and are consistent with the relevant regulatory requirements.*

*We consider that the methodologies used by Orion to forecast demand and energy growth are reasonable, although we note the abnormally high level of uncertainty in the post earthquake environment.*

*We consider that the asset lives used by Orion for depreciating assets not specifically referenced in Schedule A of the IM are reasonable and that the alternative depreciation method used by Orion for some assets meets the purpose of Part 4 of the Commerce Act 1986.*

*We have reviewed the approaches and assumptions used by Orion to derive the cost escalators used in its CPP proposal and consider them to be reasonably sound.*

Our forecasts have been prepared using our local knowledge and best endeavours to accurately forecast the information required. We appreciate the endorsement of our forecasts of the matters listed above.

# 4 Audit

## 4 Audit

### 4.1 Audit information

Clause 5.1.5 of the CPP IMs requires that an audit report in respect of the matters in Clause 5.5.3 must be included in a CPP application.

This audit report must set out, in relation to this CPP application:

- the work done
- the scope and limitations of the audit
- any relationships or interests in (other than that of auditor) which the auditor has with the CPP applicant or any of its subsidiaries
- whether the auditor obtained all information and explanations required to undertake the audit with supporting explanations
- the auditor's opinion of the matters undertaken.

Clause 5.5.3 sets out the scope of the audit of the CPP proposal as follows:

- proper records to enable the complete and accurate compilation of information required by Subpart 4 have been kept by the CPP applicant
- that actual financial information relating to the current period has been prepared in all material respects in accordance with the IMs
- that forecast financial information relating to the next period has been compiled in all material respects in accordance with the IMs and the records examined
- that quantitative information provided in spreadsheets is accurately presented.

An audit report consistent with these requirements is included in Appendix 8.

# 5 Certification



## 5 Certification

### 5.1 Certification requirements

Clause 5.1.5 of the CPP IMs requires that director certification in writing is to be provided (by no fewer than two directors) in accordance with the requirements of Clause 5.5.4.

Clause 5.5.4 requires that certifications are provided in respect of the following:

- Confirmation of underlying information:
  - Information of a quantitative nature (other than forecast information) properly represents the results of financial or non-financial operations of the business
  - Information of a qualitative nature (other than forecast information) properly represents the events that occurred during the current period
  - Forecast information is based on reasonable assumptions
- Confirmation of compliance with the IMs :
  - Information of a quantitative nature (other than forecast information) was derived and is provided in accordance with the relevant requirements
  - Information of a qualitative nature (other than forecast information) is provided in accordance with the relevant requirements.
  - Forecast information was derived and is provided in accordance with the relevant requirements
- Confirmation of compliance in relation to engaging verifier and auditor:
  - Confirmation that verifier was engaged in accordance with the IMs
  - Confirmation that auditor was engaged in accordance with the IMs.

Other certifications may also be required under certain circumstances (namely those set out in Clause 5.4.10 in relation to cost and asset allocations). In this respect:

- Clause 5.4.10(1) refers to certifications where arms length deductions have been made in relation to cost or asset allocation
- Clause 5.4.10(2) refers to the application of OVABBA when allocating assets between regulated and non regulated services
- Clause 5.4.10(3) refers to the application of OVABBA when allocating costs between regulated and non regulated services.

As explained in Section 7.4 of our proposal, none of these methods have been applied by us in preparing our cost and asset information for the CPP proposal. Accordingly no such director certifications are included.

### 5.2 Our governance processes

Our board and executive management team have been closely involved in our CPP project. Our wider management and technical employees have also been closely involved in preparing aspects of our CPP proposals and CPP background/supporting materials.

Where appropriate, we have engaged external advice and assistance.

An executive management steering group – consisting of the CEO, COO, GM Corporate Services and GM Commercial – has reviewed each section of our draft proposal documents prior to those documents being submitted to the board for review and/or approval.

Our board has held extra board meetings in 2012 and 2013 to specifically review our CPP material as it has been developed. The dates of these extra board meetings are as follows:

- 19 June 2012 – decision to prepare for a CPP
- 21 September 2012
- 23 October 2012
- 29 October 2012
- 5 November 2012
- 30 January 2013.

Our CPP materials have also been reviewed by and discussed with the board at ordinary scheduled board meetings.

Our board has also received written representations from executive management regarding the matters specified in the CPP directors' certificate and the matters specified in the board's CPP representations to Audit New Zealand.

We have endeavoured to ensure that our CPP historical and forecast information (for example our capex, opex and network quality measures) are consistent with:

- our draft 10 year network asset management plan (AMP) forecasts, which will be approved by our board and published in Mar 2013 pursuant to the Electricity Information Disclosure Determination
- our past regulatory information disclosures
- our draft company NZ IFRS financial forecasts, which will form part of our draft statement of intent (SOI), to be approved and sent to our shareholders for consultation pursuant to the Energy Companies Act in late February 2013.

In this respect, 'consistent' does not mean 'the same'. These documents have different purposes and so there are inevitable differences between them. For example:

- the accounting treatment of vested assets differs between the documents because of different regulatory and accounting rules
- our draft SOI assumes no CPP revenue uplift
- our draft SOI includes our actual bank debt forecasts and interest expense but the other two documents do not.

## 5.3 Certificates

Appendix 9 contains our directors' certificate in accordance with the requirements of Clause 5.1.5.

# Appendices for CPP Application

- 1 Consultation – PowerPoint presentation
- 2 Consultation – Summary of our proposal
- 3 Consultation – Plain english guide
- 4 Consultation – Impact on major consumer prices
- 5 Consultation – Newspaper advertisements
- 6 Consultation – List of respondents
- 7 Verification report and certificate
- 8 Audit report
- 9 Directors' certificate

# Appendix 1

Consultation – PowerPoint presentation



## *Canterbury's power supply –*

## Recovery, resilience, reinvestment

Rob Jamieson  
CEO, Orion NZ Limited  
November 2012



# We own & operate the local electricity network



- 190,000 customers
- 85% are households
- 160 staff
- 400+ contractors
- 2 council shareholders:
  - 89% Christchurch City
  - 11% Selwyn District



# We're regulated

- Legal requirements
  - invest for long-term benefit of consumers
  - be an efficient, successful business
- Controlled by Commerce Commission
  - approves prices & levels of reliability
  - business as usual reviews 5 yearly
  - provision for catastrophe reviews



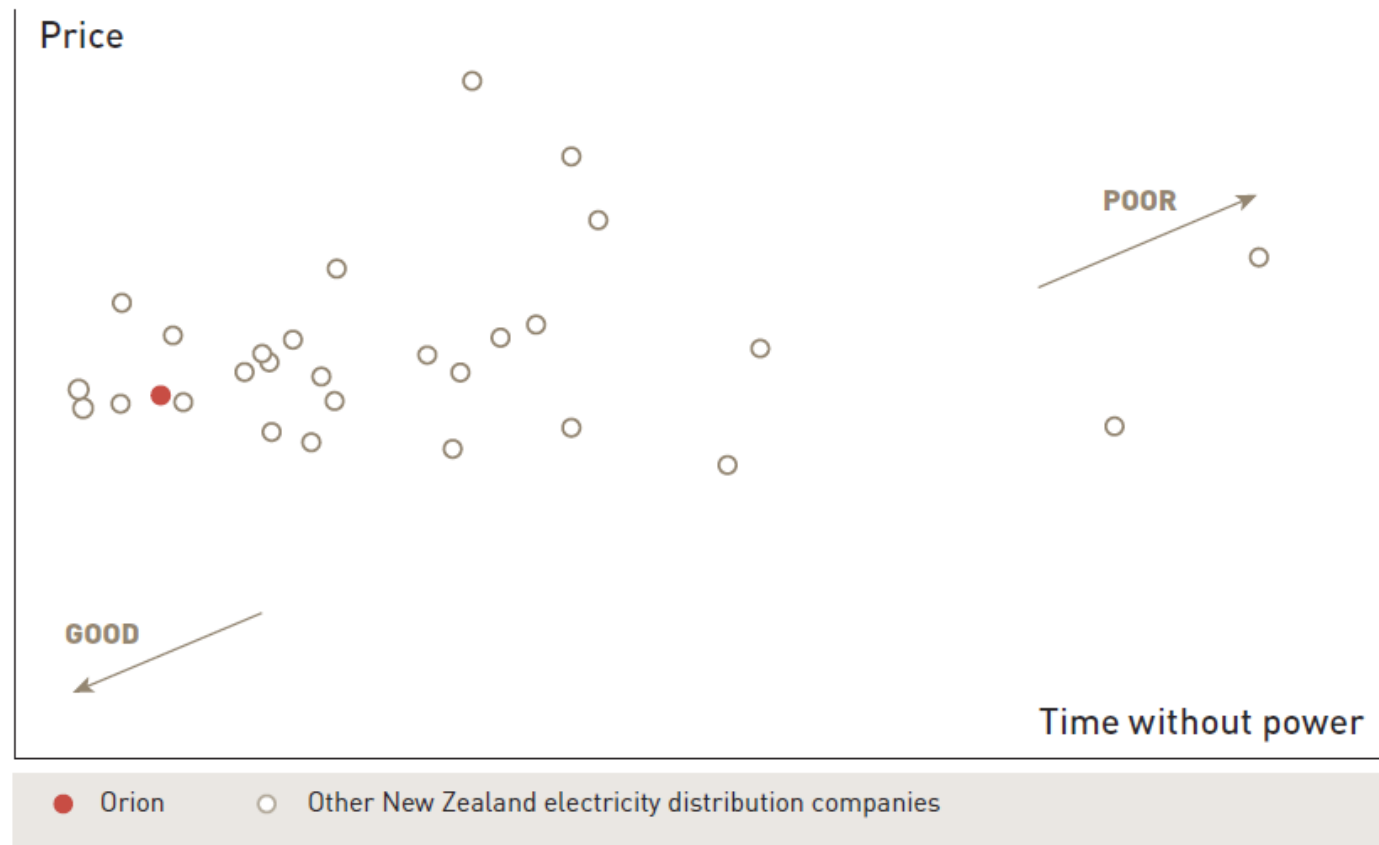
*value for money...*

**Orion**  
yournetwork



# Before the earthquakes

- high network reliability, below average prices



*split of bills...*

**Orion**  
yournetwork

# Our charges ~ 25% of power bill



why we're meeting...



- Because of the earthquakes, we need to review our prices & reliability levels

and

- We therefore propose to change both from 1 April 2014

*agenda for today...*



# What we want to cover

1. Main points – impacts and solutions
2. Our pre-earthquake preparation
3. Impact of earthquakes on network
4. Our plans: recovery, resilience & reinvestment
5. Our price and reliability proposal
6. Timeline and feedback

# 1. Main points

## ***Our seismic strengthening programme worked:***

- saved \$65m worth of damage to network
- minimised impacts on Canterbury's \$15b economy
- helped maintain community safety and confidence

## ***But:***

- damage extensive
- costs significant
- revenue down

## ***So we're proposing:***

- near pre-earthquake resilience & reliability by 2019
- new price levels from 2014

## 2. Our pre-earthquake preparation

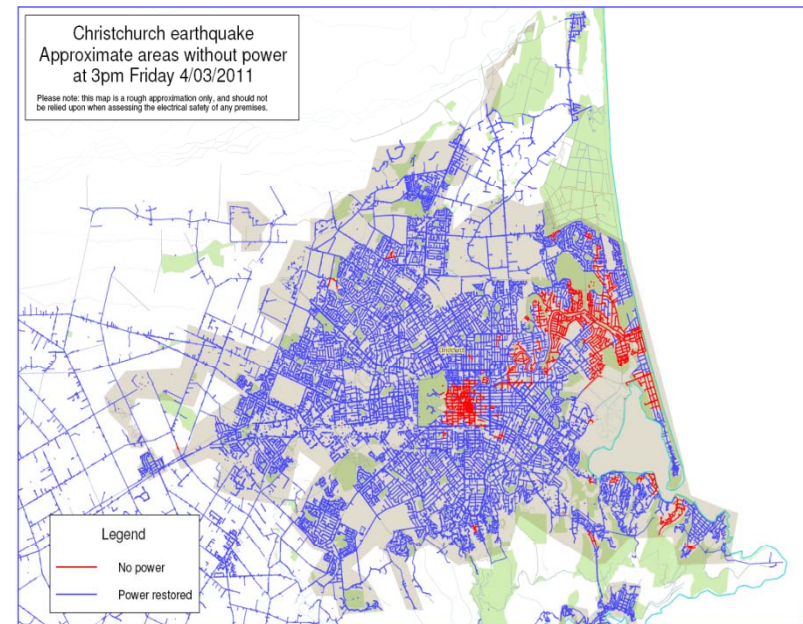
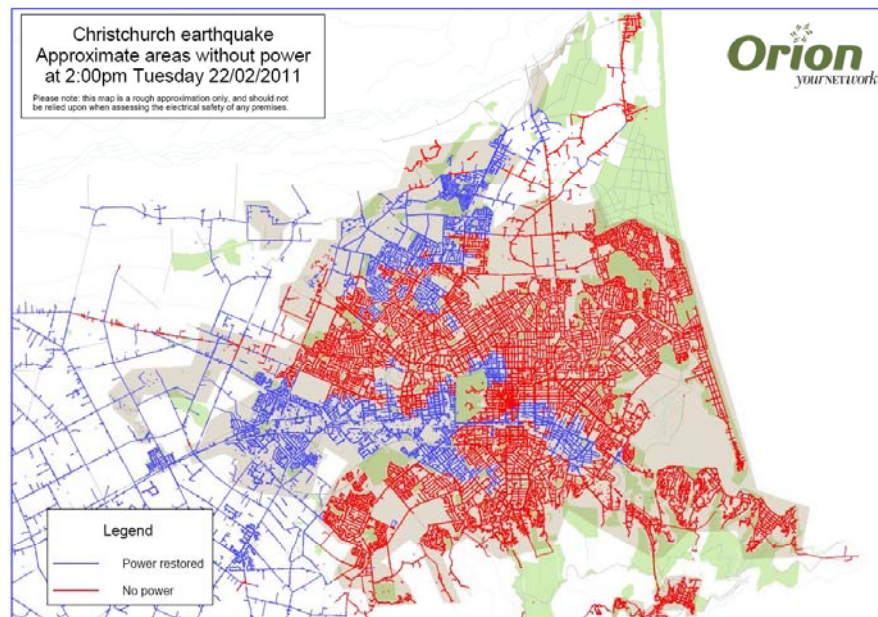
# We tackled the big risks

- Our urban network is interconnected, resilient and reliable
- 1997 study showed more resilience needed
- Invested over 15 years to reduce the risks:
  - cross-city cable laid (linked grid connections)
  - bridges strengthened
  - new technologies introduced
  - mutual aid agreements
  - back-up generation for major users
  - equipment tied down & substations braced....





# Our investments paid off for consumers



22 February compared to ten days later = 95% restored

*impact on network...*

### 3. Impact of earthquakes on network

# Our costs went up and revenues went down

- Substantial repair costs
- Lines & cables un-insurable
- Costs of shifting existing customers
- Revenues down

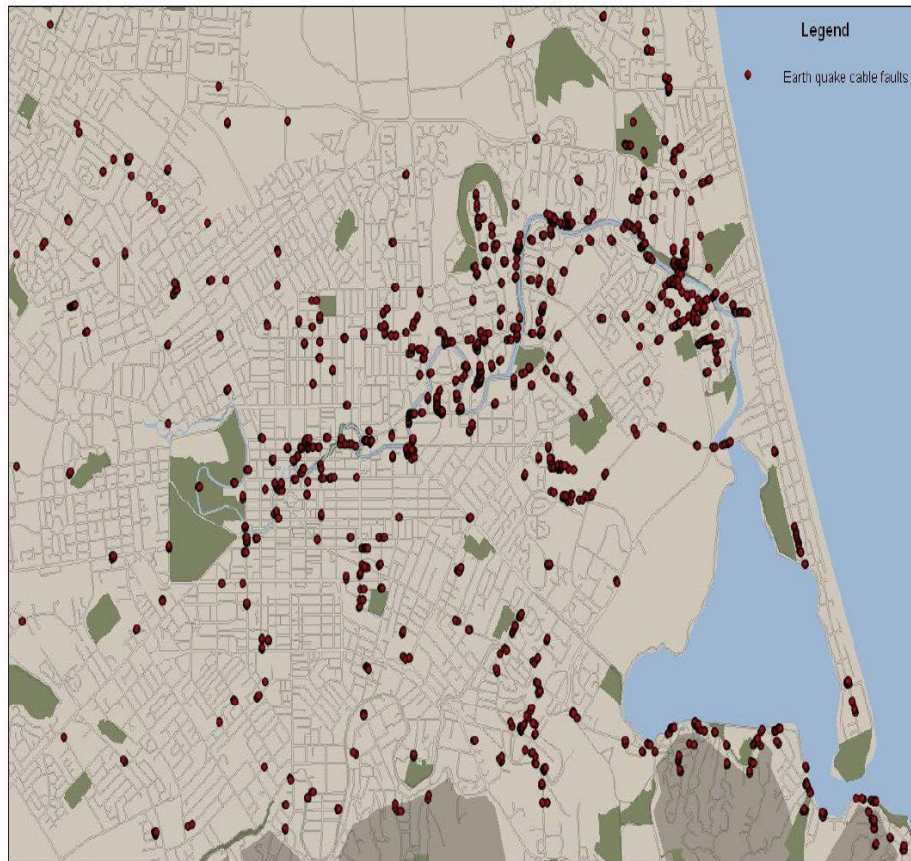
*damage...*





# Costly damage ...

High voltage cable faults from earthquakes (note 4)



# Impact on our revenue

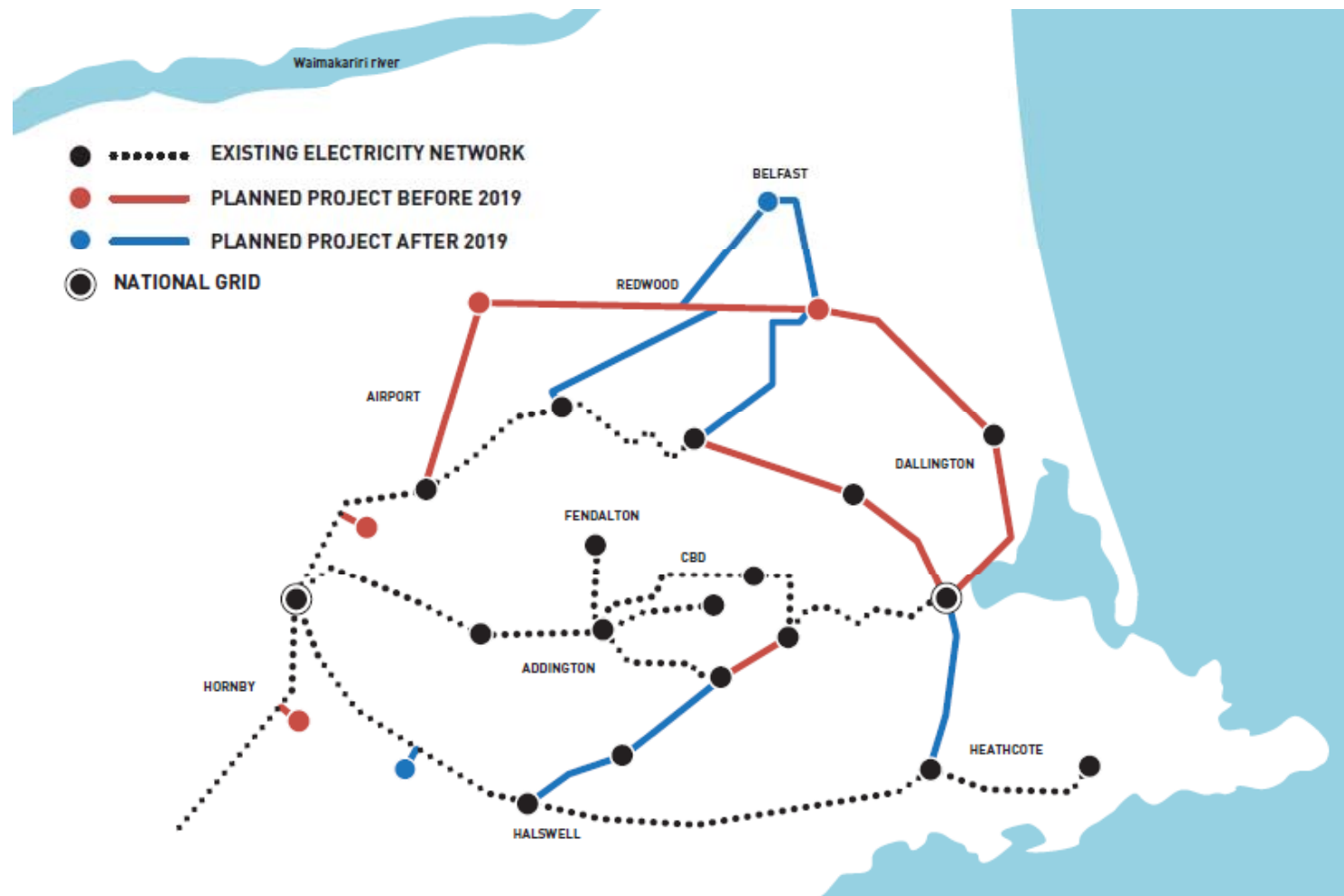


*our network plans...*

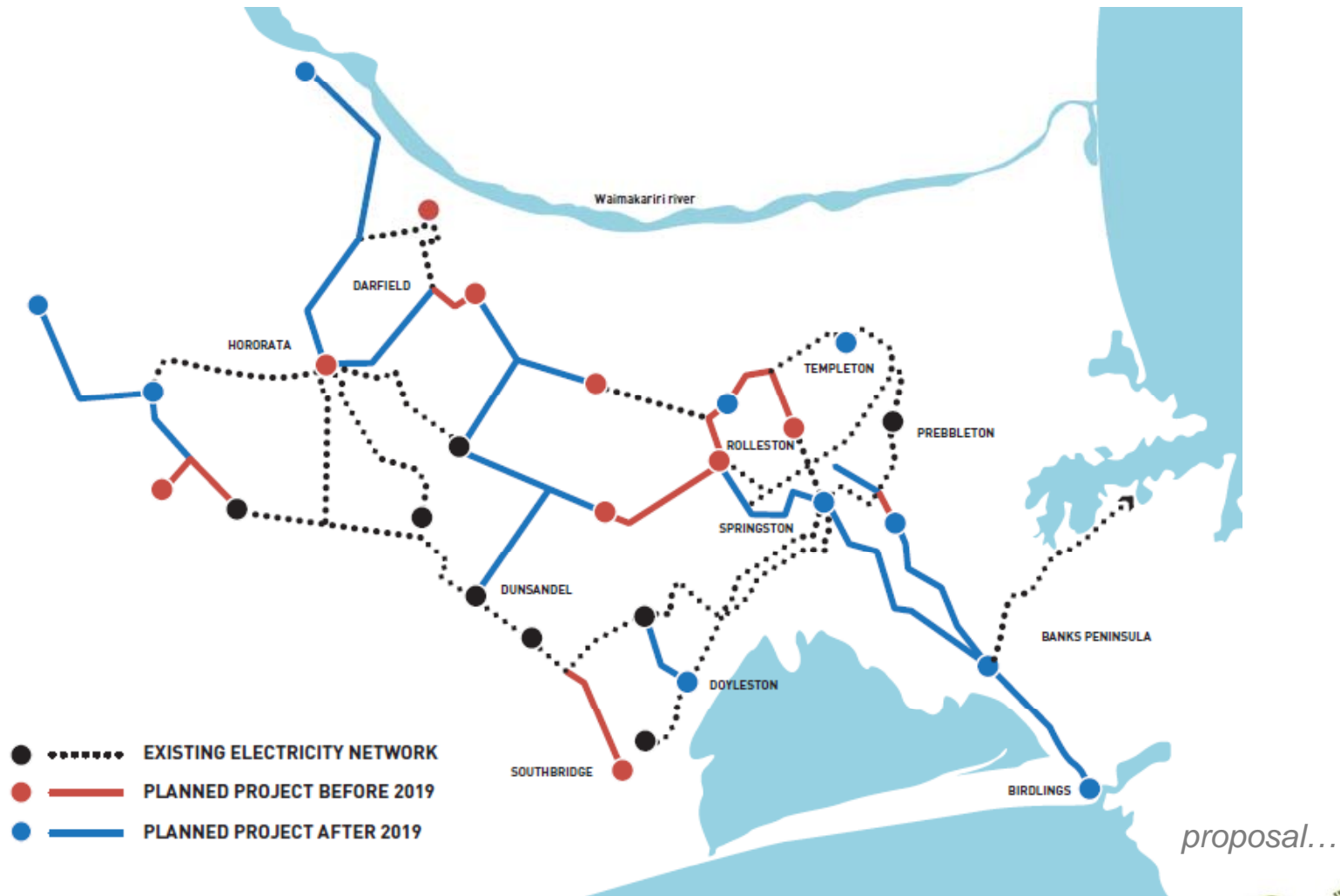
## 4. Our plans: recovery, resilience & re-investment



# Our new urban investments



# Our new rural investments



## 5. Our price and reliability proposal

# Quake losses & costs: who should pay

- Our prices are capped
  - no allowance in regulation to pre-fund disasters
  - expert view = deal with their impact afterwards
- Lines, poles & cables: essential but uninsurable
- Electricity users receive benefits, so should pay
- Retains incentives for us to keep investing
- Recover reasonable costs & do so gradually

*prices...*

# What customers will see

**Impact on a typical household monthly power bill (incl GST, excluding inflation)**

Years starting 1 April	2013	2014	2015	2016	2017	2018	2019-23
Monthly power bill	\$182	\$189	\$189	\$190	\$191	\$191	\$191
Extra per month		\$6.80	\$7.40	\$8.00	\$8.70	\$9.30	\$8.90

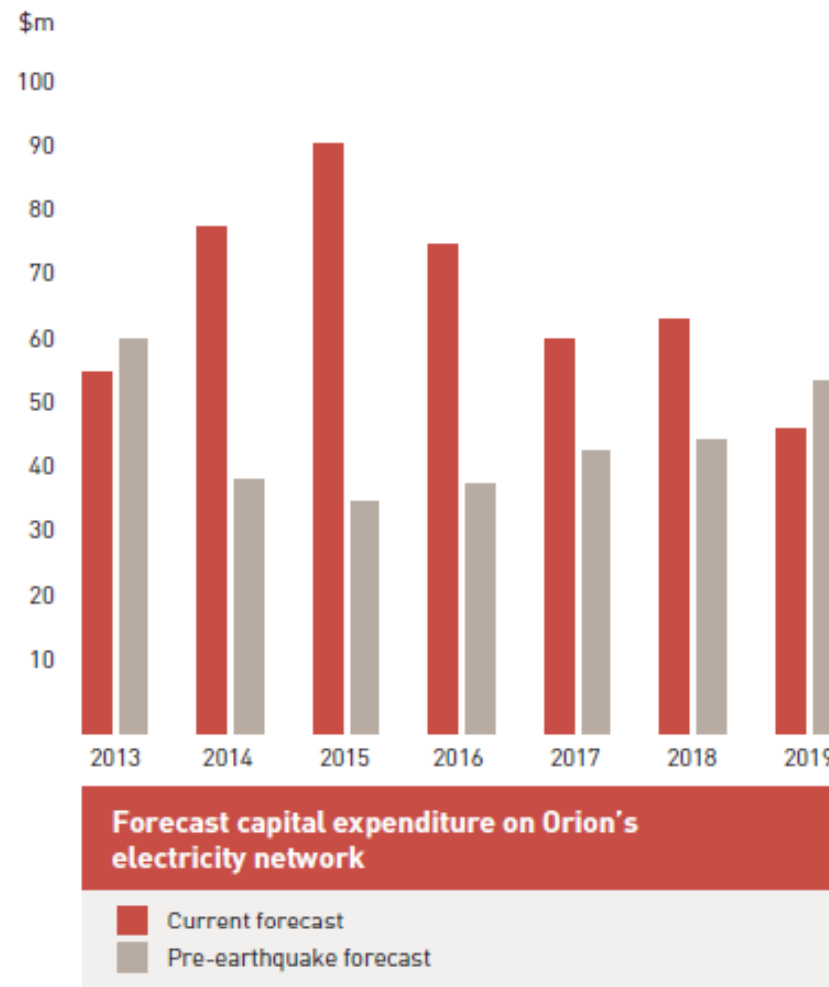


= Average \$8.50 / month (NOT cumulative)

= Our network prices: minus 1.8% to 2014, then 15% and 4 years of 1.2%

= **5%** on total power bill

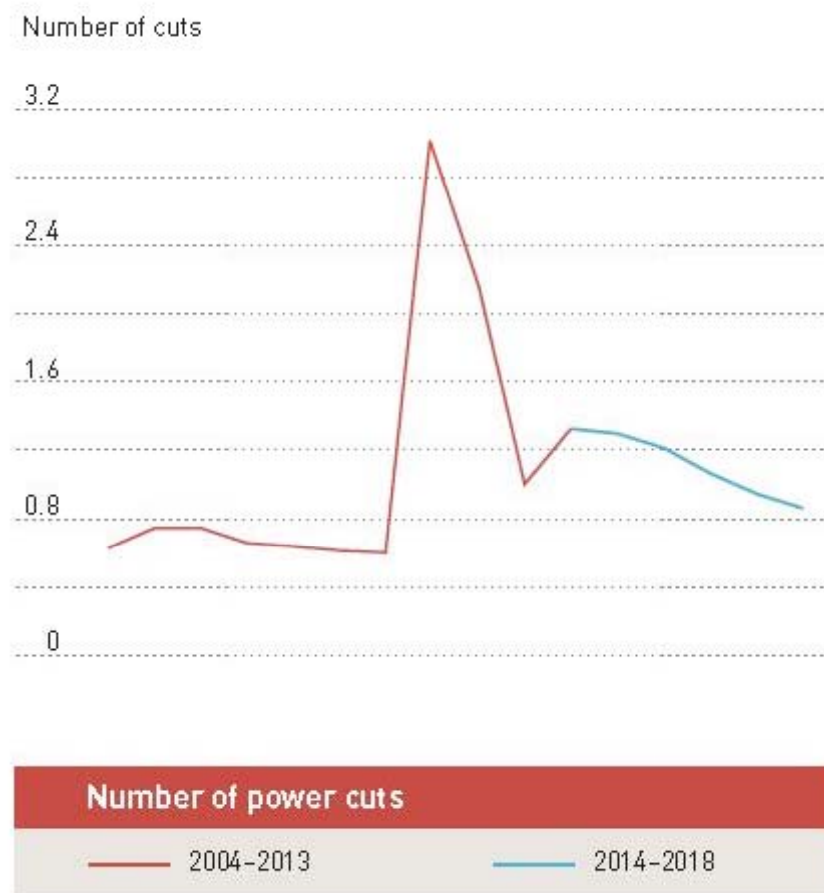
# Higher levels of investment



*reliability targets...*

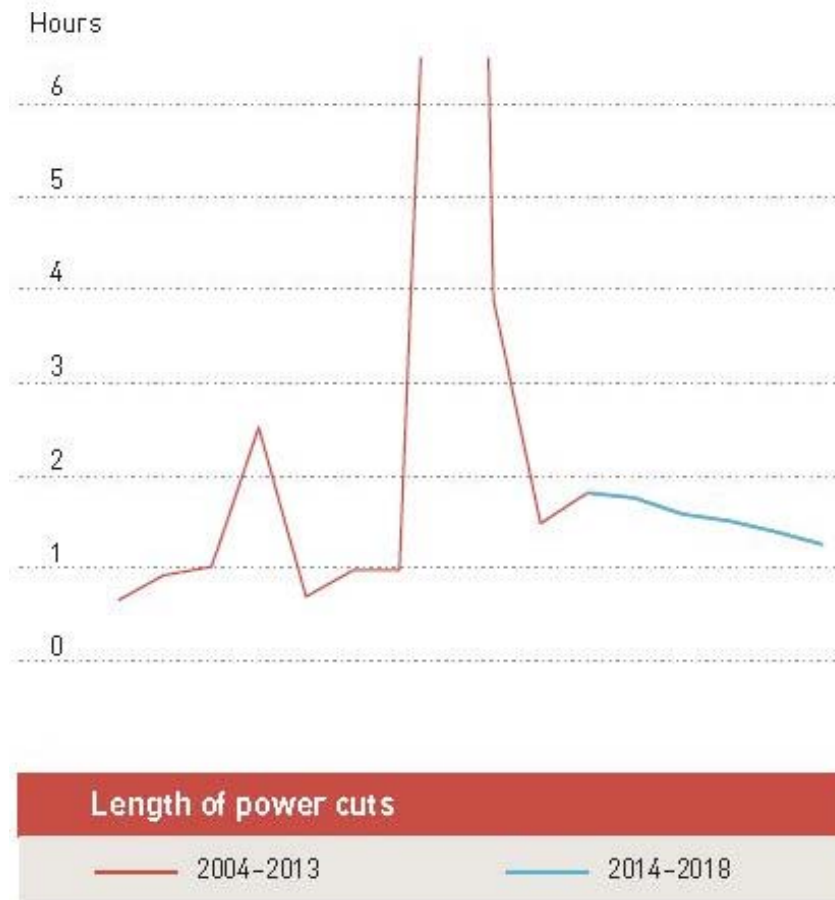


# Proposed reliability targets (frequency per annum)



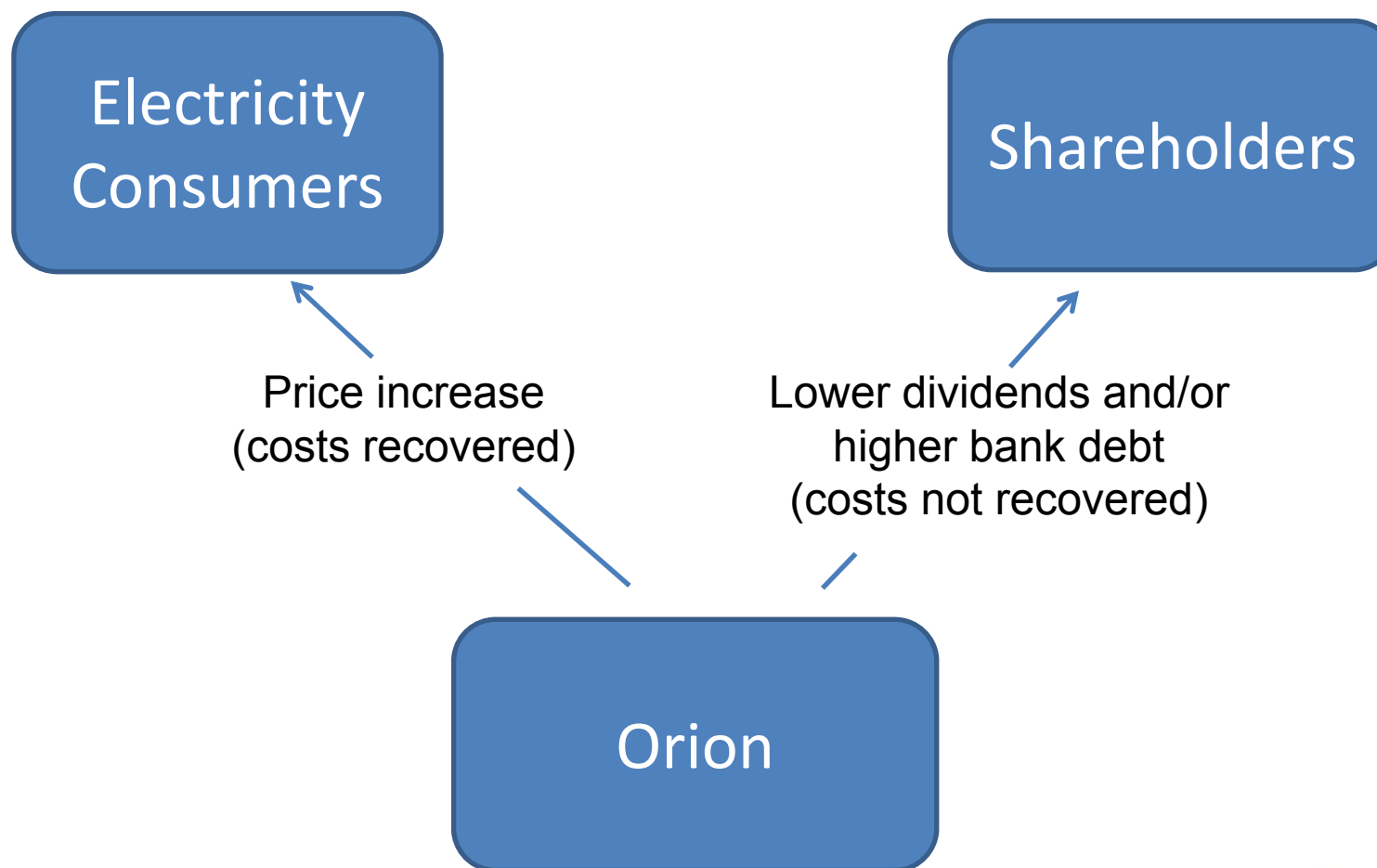


# Proposed reliability targets (total duration per annum)



*alternatives to price change...*

# Alternatives?



## 6. Timeline and feedback

# Timeline for proposal

- 16 Dec 2012 – written feedback to Orion
  - Orion modifies proposal
- 21 Feb 2013 – Orion submits proposal incl. feedback
- April to June – Commission consults on proposal
- Mid/late 2013:
  - Commission's draft decision issued
  - public consultation on draft decision
  - final decision on our proposal
- 1 Apr 2014 – any changes to prices & reliability apply

*process & feedback...*

# Feedback process

- Written consumer feedback by **Sunday 16 Dec** – online or letter
- Information on our website 23 Nov
  - [oriongroup.co.nz/cpp](http://oriongroup.co.nz/cpp)
- Plain English guide on request (40pp)
- Extensive advertising from 24 Nov
- Public information day 3 December (Q&A) *final perspectives...*

# Final perspectives

- Fit for purpose & resilient electricity network
- Consistent reduction in power cuts: 2014 – 2019
- Confidence in future, confidence to invest/rebuild



We'd like to know what  
questions you have





# Appendix 2

## Consultation – Summary of our proposal

# Summary of Orion's proposed electricity network reliability and prices



**Orion**  
yourNETWORK

# Introduction

The impacts of the earthquakes on Orion's electricity network have been significant. Our repair and recovery work continues and we are now working to support the Christchurch rebuild by providing a strong electricity network. This work will cost tens of millions of dollars.

Our network prices and our network reliability targets - our targets to keep the lights on - are set by the Commerce Commission. Our current prices and reliability targets were set before the earthquakes.

Given the impact of the earthquakes, we intend to apply to the Commission for a price increase that would start on 1 April 2014, the year after next. We also propose reliability targets that would see our network return to near pre-earthquake reliability and resilience levels by 2019.

Before we apply to the Commission, we need to know whether you want us to rebuild our network so that the lights stay on as well as they did before the earthquakes and what you think about our proposal to apply for a price increase.

We want to continue to make sound investments in our network for the long term benefit of our community, like the investments we made in seismic-strengthening which prevented an extra \$65m of damage to the electricity system in 2011. That work also prevented months of power cuts after the earthquakes, something that was very important for our whole community's social and economic well being.

Please read the information here and on our website [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp) and let us know what you think.

We thank you for your support over the last two years.

## Rob Jamieson

Chief Executive Officer

Orion New Zealand Limited



# Contents

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<b>How the earthquakes affected Orion</b>	5
<b>Reviewing our prices and reliability</b>	6
<b>Our proposed reliability</b>	7
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<b>The Commerce Commission process</b>	9
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## Key points

### What we propose

- Given the impact of the earthquakes, we intend to apply to the Commerce Commission in February 2013 for a review of our regulated prices and network reliability targets.
- We propose to target a level of electricity network reliability and resilience by 2019 that is near pre-quake levels.
- We propose a price increase, starting 1 April 2014, spread over several years. Our proposed increase, excluding inflation, equates to 5% more on the average electricity bill of a household or business. For a typical household consumer, the impact of our proposal would be an increase of \$8.50 a month including GST in today's dollars.
- These prices provide no more than a fair return and provide the right incentives for us to continue to make sound investments for the good of our consumers.

*The Commerce Commission will assess our proposal thoroughly and consult with our community before it makes any decision about our pricing and reliability levels.*

### Context

- Before the earthquakes our electricity network was reliable and resilient in line with our community's expectations, and our pricing was below the New Zealand average.
- Our prices typically amount to one quarter of an average household or business electricity bill.
- Our pre-earthquake seismic protection work and planning is estimated to have saved us \$65m in repair bills.
- Our seismic protection work also helped prevent more severe damage and cost to our community's social well being and to Canterbury's \$15b economy.
- Despite our seismic protection work, the earthquakes caused unprecedented damage to our network.
- In the three years between the earthquakes and 1 April 2014 our regulated prices will not keep pace with inflation, despite the impact of the earthquakes.



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## Who is Orion and what does it do?

Orion is your local electricity distribution company. We take power from the national grid, owned by Transpower, and distribute it to all 190,000 power consumers in Christchurch and central Canterbury. Our electricity network covers the area between the Waimakariri and Rakaia rivers, and from the Canterbury coast to Arthur's Pass.

**We are owned by the Christchurch City Council (89%) and Selwyn District Council (11%).**

Orion's electricity network can be compared to a roading network. It is made up of:

- large 66,000 volt (66kV) cables and equipment that carry power to over 100 substations. They are like ring roads round a city, but instead of traffic, transport 'bulk power' to the main areas where it's needed
- substations, where we 'step down' the voltage from 66kV to 11,000 volts (11kV) to take power to smaller areas, much like main suburban roads.
- roadside transformers at street level, which convert the power to the 230 volts that goes down the lines and cables in your street to your home or business.



Our electricity network covers a diverse geographical area that stretches from rural Banks Peninsula to Christchurch city and out to farming towns on the plains and into the hills and high country.

## How the earthquakes affected Orion

The earthquakes caused extensive damage to the roads, water, wastewater and sewage pipes in Christchurch. The cost of that rebuild is estimated at \$2 billion.

Our electricity network also suffered significant damage and our costs have increased.

**We need to spend about \$155m more in capital expenditure than was forecast before the earthquakes. We will have to repair or develop nearly every major section of our network, in Christchurch and wider Canterbury, before 2019.**

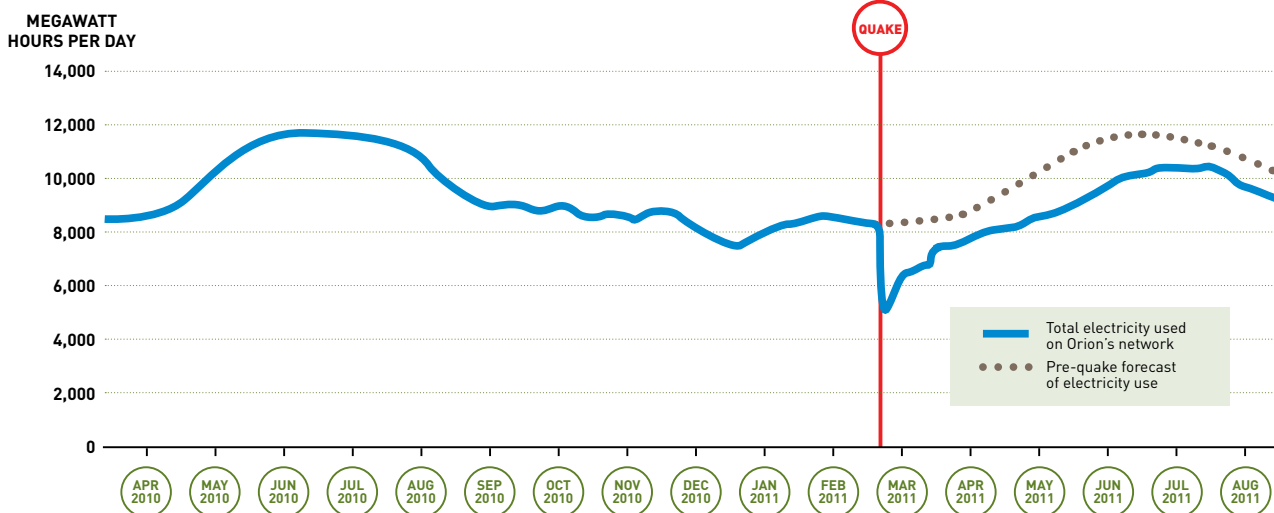
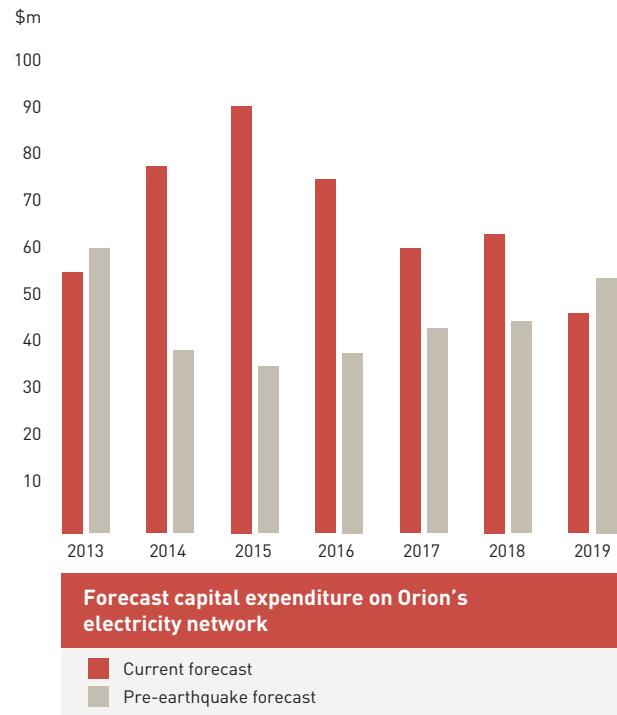
The extra expenditure is needed to restore our network in damaged areas as well as expand our network in areas such as Rolleston, Lincoln and Belfast where the population is growing as a result of the quakes. Extra investment is also needed in the badly damaged central city.

Our extensive seismic strengthening programme in the 15 years before the earthquakes reduced our repair costs by about \$65m. It also meant that power was restored much quicker after the quakes. Without this work, power would likely have been out for months in some areas.

Since the quakes the amount of power supplied on our network has dropped by about 10%, mostly due to buildings being demolished. The graph below shows the sharp reduction

after the February 2011 earthquake. That drop continues to this day.

**We estimate that our loss in revenue has been close to \$30m so far. By 1 April 2014 it will be around \$50m.**



---

## Reviewing our prices and reliability

All electricity distribution companies in New Zealand are regulated businesses. Orion is one of these and that means we come under the control of a law called the Commerce Act.

The Act controls the price and quality of goods or services in markets where there is little or no competition.

A Government organisation called the Commerce Commission administers the Act. The Commission sets targets for how reliable our electricity network should be and also sets limits for the prices that we can charge to deliver electricity around our region.

A regulated company like Orion is different from most other businesses. By law, we cannot make big gains in good times to balance out higher costs when times get tough.

As well as limits on our prices, there's no allowance in advance for the uninsurable costs of disasters.

We couldn't insure our overhead lines and underground cables before the quakes (and still can't) because it wasn't economic to do so. We are not aware of any electricity distribution company in Australasia that insures its lines and cables. Where we could economically insure parts of our electricity network, such as our buildings, we did so.

**The Commission allows us to apply for a review of our network reliability targets and prices after a natural disaster. Given the financial impact of the earthquakes, we intend to apply to the Commission for one of these reviews.**

**The review would aim to recover our costs from the people that use, and benefit from, our network. It would also change our reliability targets to reflect the state of our network while earthquake recovery is underway.**

**Any new prices and reliability targets would apply from 1 April 2014.**



Repair crews replace damaged 11kV cables on Bexley Road. Since the earthquakes we've seen more than 1,000 cable faults on our network – more faults than we usually see in a decade.



## Our proposed reliability

Even though major emergency repairs are finished, there is still much work ahead of us to build strength back into the electricity network. As power cuts will continue while recovery work is underway, we propose to apply to the Commerce Commission for new reliability targets which better reflect the damaged state of our network.

As shown in the table below, we propose that:

- the number and length of power cuts on our electricity network will reduce as we rebuild our network
- by 2019 the number and length of power cuts will be, on average, only slightly above pre-earthquake levels.

Year ended 31 March	Historical reliability performance and current targets					Our proposed reliability targets				
	2009	2010	2011	2012	Orion's current target (as set by the Commerce Commission)	2015	2016	2017	2018	2019
Length of power cuts per consumer (in minutes)	62	61	3812	231	60	102	93	90	81	72
Number of power cuts per consumer	0.6	0.6	3.0	2.2	0.8	1.4	1.2	1.2	1.0	0.9



Orion has continued to operate from the Christchurch CBD since the earthquakes. Our 160 employees came through the Canterbury Earthquake Recovery Authority cordon each day for 14 months to keep the power on. We are now on the edge of the 'red zone'.



## Our proposed prices

**Our charges make up around 25% of a typical household and business electricity bill.**

We propose to apply to the Commerce Commission for approval to increase our prices by 15% above inflation in the year after next (from 1 April 2014) and by 1.2% above inflation for the four years following.

**Based on the average household power bill of \$180 a month the average increase will be \$8.50 per month\* - this equates to a one-off 5%\* increase to the average monthly power bill.**

*\* excludes inflation*

**Our price increase proposal – the impact on an average total monthly household power bill**  
(including GST, excluding inflation)

Year starting 1 April	2014	2015	2016	2017	2018	2019 to 2023
Impact of our proposed prices	\$6.80	\$7.40	\$8.00	\$8.70	\$9.30	\$8.90
Average impact = <b>\$8.50 a month</b>						

This increase would help to pay for a repaired, resilient and reliable electricity network that's fit for purpose and that can support the Canterbury rebuild.

The figure of \$8.50 per month on average is for a typical household. A small or medium business would see an increase of about \$100 a year, excluding GST, for every 10,000kWh of power used.

We did not increase our prices at all this year and we plan to increase our prices only slightly to reflect inflation next year. So for the three years between the February 2011 earthquake and 1 April 2014 our prices will not have kept pace with inflation and we will not have recovered any quake-related costs.



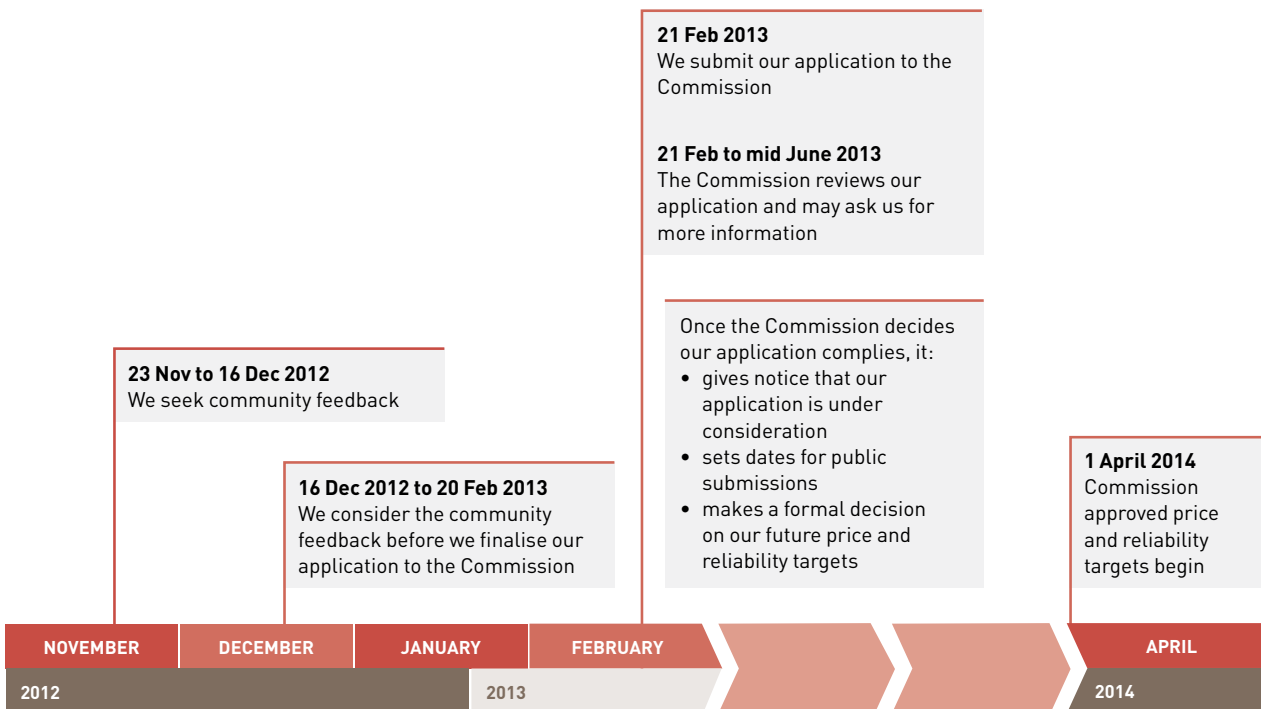
Our earthquake repairs and recovery will continue over the next six years.

## The Commerce Commission process

Depending on any comments that you and others provide, our proposal may change before we submit it to the Commerce Commission in February 2013.

Before it's submitted, a Commission-approved 'verifier' will check that the information supplied in our proposal is correct.

If the Commission decides to proceed with our application, it will then consult with our community in 2013. If it decides to approve a change to our prices and network reliability targets, the earliest we could increase our charges is 1 April 2014.



Our Keyes Road substation was quickly built after the February 2011 earthquake.

## Your opportunity to comment

We're keen to hear what you think of our proposal. **Your feedback is needed by 5pm on Sunday, 16 December 2012.** Feedback can be made online at [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp) or by post to:

CPP Feedback  
Orion New Zealand Limited  
PO Box 13896  
Christchurch 8141

You can also email your feedback to [CPPfeedback@oriongroup.co.nz](mailto:CPPfeedback@oriongroup.co.nz).

Please note that your feedback may be made public.

You're also welcome to attend a **public information day on Monday 3 December 2012** from 10am to 4pm at our offices at 200 Armagh Street, opposite Centennial Pool.

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## Need more information?

**Website:** visit our website at [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp). A plain English guide and other material is available there to help you understand our proposal.

**Phone and email:** if you would like more information please call us on **03 363 9898** or email [CPPfeedback@oriongroup.co.nz](mailto:CPPfeedback@oriongroup.co.nz).



# Appendix 3

Consultation – Plain English guide to our proposal



# Orion's post earthquake pricing and reliability

Our proposal to the Commerce Commission



**Orion**  
*your network*



# Introduction

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We aim to provide you, our customers, with a cost-effective, safe and reliable power supply.

The Canterbury earthquakes tested our ability to meet that aim. Many parts of our network suffered damage and thousands of customers lost power for several days.

The scale of the damage could have been much worse though if we hadn't seismically strengthened our network in the preceding 20 years. Our past investments in our network brought significant benefit to our community.

After the earthquakes we worked hard to get the 'lights on'. We also did our best to keep our community informed of our repair and recovery progress. We're proud of the work of our contractors and staff.

Our repair and recovery work continues and we are now working to support the city's rebuild – this includes connecting customers in new subdivisions and in the badly damaged CBD. This work, which supports economic growth in our region, costs many millions of dollars.

Our network prices and our network reliability targets are controlled by the Commerce Commission. We believe our prices and our reliability targets need to be reset in light of the earthquakes.

We now want to know what you, our consumers, think of our draft proposal. We will take your feedback into account before we make our application to the Commission next year.

I encourage you to read this guide to our draft proposal and also to read the other related documents we have placed on our website.

Your feedback is important. This is your initial chance to provide comment. You will also have the chance to participate in the Commission's own consultation process in 2013.

Rob Jamieson  
CHIEF EXECUTIVE OFFICER  
Orion New Zealand Limited  
23 November 2012

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Above: Orion chief executive Rob Jamieson with a giant scarf covered in thank you messages from 1,600 eastern suburbs residents grateful for our efforts to keep the power on last year.

Front cover image: Orion contractors replace damaged 11,000 volt cables in New Brighton. Seven hundred electricity sector workers from around New Zealand and Australia helped with our earthquake repairs.

# Highlights

## What we propose

- we propose to apply to the Commerce Commission in February 2013 for a review of our regulated network reliability targets and prices
- we propose to target a level of reliability and security of supply by 2019 that is near what we provided to our community before the earthquakes
- we propose a price increase, starting 1 April 2014, spread over several years. Our proposed price increase, excluding inflation, is the equivalent of an approximate one-off 5% increase in the average electricity bill of a household or business. For a typical household the impact of our proposal would be an increase of \$8.50 a month including GST in today's dollars
- the proposed prices would provide no more than a fair and regulated return on our investments. The Commerce Commission will scrutinise our proposal to ensure this is the case and ensure we are acting prudently and efficiently. The size of the proposed price increase is significantly lower than what it would have been had we not carried out our pre-earthquake seismic strengthening work and had prudent insurance cover

## Why we are making these proposals

- we seek to have reliability targets that reflect the state of our network after the earthquakes
- we seek to recover our earthquake related costs through increased prices to those that use our network
- if prices recover costs this provides the right incentive for us to continue to make sound investments for the good of our consumers

## Background

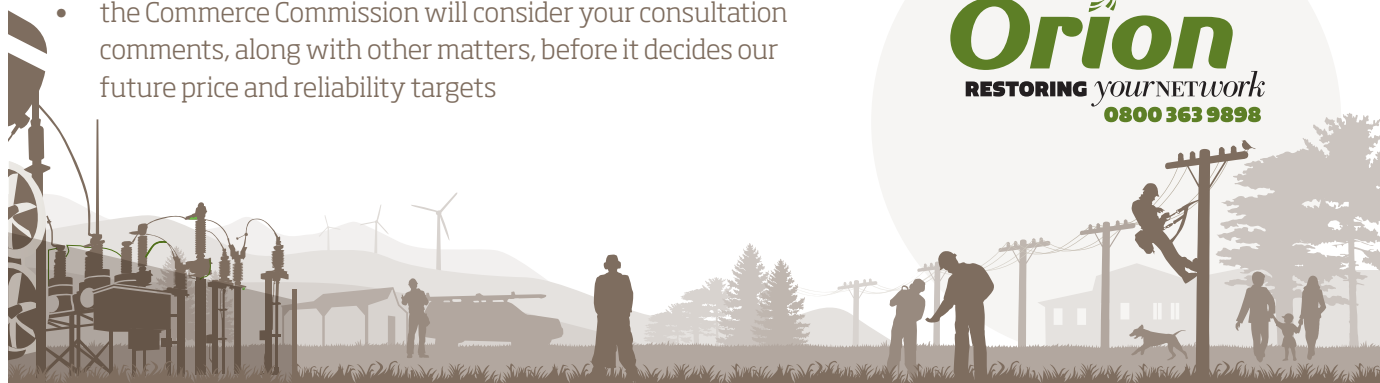
- before the earthquakes our electricity network was reliable and resilient in line with our community's expectations and our pricing was below the New Zealand average
- our prices typically amount to one quarter (25%) of a household or business electricity bill
- our pre-earthquake seismic protection and planning work is estimated to have saved approximately \$65m of damage to our network. It also avoided considerably greater damage and cost to our community's economic and social well being as it prevented more extensive power cuts
- despite our seismic protection work, the earthquakes caused significant damage to our network. The scale of the damage was unprecedented. The net result has been a significant negative financial impact on Orion
- for the three years between the earthquakes and 1 April 2014 our regulated prices will not keep pace with inflation, despite reduced revenue and significant earthquake costs

## Your opportunity to comment

- we seek your feedback by 16 December 2012 on our proposed price and reliability application to the Commerce Commission. See [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp)
- you will also have the opportunity to participate in the Commerce Commission's separate consultation process on our proposals in 2013
- the Commerce Commission will consider your consultation comments, along with other matters, before it decides our future price and reliability targets



**Orion**  
RESTORING your network  
0800 363 9898





# What we have considered in deciding to apply to the Commission

All electricity distribution companies in New Zealand are regulated businesses. Orion is one of these and that means we come under the control of a law called the Commerce Act.

The Act controls the price and quality of goods or services in markets where there is little or no competition.

A Government organisation called the Commerce Commission administers the Act. The Commission sets targets for how reliable our electricity network should be and also sets limits for the prices that we can charge to deliver electricity.

A regulated company like Orion is different from most other businesses. By law, we cannot make big gains in good times to balance out higher costs when times get tough.

As well as limits on our prices, there's no allowance in advance for the uninsurable costs of disasters. We couldn't insure our overhead lines and underground cables before the quakes (and still can't) because it wasn't economic to do so. We are not aware of any electricity distribution company in Australasia that insures its lines and cables. Where we could economically insure parts of our electricity network, such as our buildings, we did so.

The Commission allows us to apply for a review of our network reliability targets and prices after a natural disaster. Given the financial impact of the earthquakes, we intend to apply to the Commission for one of these reviews.

## The financial impacts of the earthquakes

The earthquakes have had significant financial impacts on us through:

- lost revenue due to building demolitions and people moving away from their homes and businesses
- additional repair costs, particularly in eastern Christchurch
- uninsurable damage on our network
- additional forecast capital expenditure to connect customers in new subdivisions and in the badly damaged CBD.

## Rebuilding our network

For the foreseeable future we need to spend more than usual to restore our network, if it is to be as strong and reliable as it was before the earthquakes. We believe this extra work is necessary to help the city rebuild and meet the needs of our consumers. Before the end of the decade we plan to spend \$155m more in capital expenditure on our network than was planned before the earthquakes.

In determining how to rebuild our network, we have considered many options. The balance we have struck between the different options is based on the assumption that our network should be rebuilt to a similar standard to that which our community required before the earthquakes.

For instance, we plan to continue to use underground cables in most urban areas and overhead lines in most of our rural network. Our use of underground cables complies with the policy contained in the Christchurch City Council's City Plan.

If our community tells us in the feedback we now seek that it wants different level of reliability and security in our network, we will consider that.

## Our pricing

Besides considering how strong and reliable our network should be, we have also considered who should pay for it and for the earthquake related costs we have incurred to date. This is discussed further in this guide.

We believe it is appropriate for electricity consumers, who are the beneficiaries of the services we provide, to pay for the costs of those services in both good times and bad.

So far we haven't been able to recover our uninsurable costs and lost revenue since September 2010 because of the price regulation that limits what we can do. In effect, our revenue shortfall is due to the regulatory regime not reflecting that the quakes have happened. We believe it fair for our consumers to pay for our unrecovered costs and planned rebuild costs.

In order to minimise the price impact on consumers we are planning to smooth our cost recovery over 10 years, and to defer some costs into the future. We considered a shorter five year recovery period, but, on balance, we propose the longer timeframe of 10 years so that price rises each year aren't so high.

## Continual improvement

The Commerce Commission will ultimately decide on our application. Regardless of the Commission's decision, we will continue to look for ways to improve our performance for the long term benefit of consumers in the years ahead. We will continue to improve our planning, our operations, our project execution and our maintenance and repair techniques to keep costs down.

Orion plays a crucial role in our city, but more than that, we are a committed partner in the rebuild, eager to help bring the vision for Christchurch and Canterbury to life. The best way we can do that is to continue to invest, continue to 'keep the lights on' and be ready to respond once again if disaster strikes.

# Your opportunity to comment

**We propose to apply to the Commission for a review of our network reliability targets and prices in February 2013.** The Commerce Commission regulates all electricity network companies in New Zealand. The application we intend to make is formally known as a 'Customised Price-Quality Path' (CPP) application.

We have produced this guide to help you understand our intended CPP proposal. **Should you seek any further information, please email [CPPfeedback@oriongroup.co.nz](mailto:CPPfeedback@oriongroup.co.nz) to request it, or call 363 9898.**

We seek your comment on our draft proposal. This initial feedback will then be considered before we finalise our application to the Commission.

**Please provide your written feedback to us by 16 December 2012.** We appreciate this is a relatively short timeframe, but we cannot extend it due to the February 2013 deadline for us to submit our application to the Commerce Commission.

**Comments can be made via the form provided on our website [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp) or by posting them to the address provided on page 37 of this document.** Page 37 also shows suggested questions for you to consider in your feedback and details how your feedback must include your name and address, and how it may be made public.

During 2013, the Commission will thoroughly assess our application to decide whether a change in price and reliability targets is warranted. The Commission will carefully examine what we spend, and why, to ensure we are running our network in a cost effective and efficient way. **The Commission will also run its own consultation process in 2013 which you will have the opportunity to participate in. In late 2013 or early 2014 the Commission will then make a final decision on our future price and reliability targets.**



# Contents

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This guide has five more sections after this introductory section. The purpose and content of each section is set out below.

**Section 1: The electricity industry and Orion** – these two pages provide you with background information about where Orion fits within the electricity industry and the nature of our business

- 7 | The electricity industry
- 8 | Orion network overview

**Section 2: Orion before the earthquakes** – this section describes how we operated before the earthquakes, the quality of service we provided and the prices we charged. We also discuss the extensive seismic protection work we undertook in the years before the earthquakes – seismic protection work that proved to be extremely valuable for our community

- 10 | Our network reliability before the earthquakes
- 11 | Our pricing before the earthquakes
- 12 | How we prepared for an earthquake

**Section 3: Impact of the earthquakes on our network, and our response** – this section summarises the damage the earthquakes, particularly the February 2011 earthquake, caused to our network and our efforts since then to restore and repair the network

- 15 | The damage the earthquakes caused to our network
- 17 | Our response up to September 2011
- 19 | Our response since September 2011

**Section 4: How our network plans, costs and revenues have been impacted by the earthquakes** – summarised here is the financial impact of the earthquakes on us, and the major network capital expenditure programmes we plan over the next five plus years

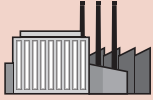
- 22 | Our infrastructure plans and proposed increase in network expenditure
- 26 | Insurance wasn't, and still isn't, a viable option
- 27 | The earthquakes have reduced electricity usage and our revenues

**Section 5: Our proposal to the Commerce Commission, the Commerce Commission process and why your feedback is wanted** – this section details why an application for a change in our pricing and reliability targets is needed, the impact of that application for you, and how you can give us feedback on our present proposal

- 29 | The regulatory environment and why we intend to apply to the Commerce Commission
- 31 | Our proposed future reliability targets
- 34 | Our proposed future prices
- 36 | The Commerce Commission process
- 37 | Your feedback
- 38 | What you can expect from us in the years ahead

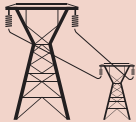
# 1.1 The electricity industry

Electricity usually moves through five steps to get from where it's generated to where it's needed. Orion is a 'distributor' in the third step of the chain below.



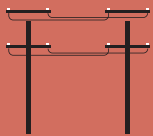
## Generators

Generators produce electricity. Almost all electricity generated for retail purposes in New Zealand is sold into the wholesale electricity market for supply to electricity retailers. Several private and government-owned companies are generators – they include Contact Energy, Genesis Energy, Meridian Energy, Mighty River Power, Todd Energy and TrustPower. Most generators are also electricity retailers.



## Transpower

Transpower is the state-owned enterprise responsible for transmitting the electricity produced by generators. It operates the national grid of high voltage power lines and tall pylons that connects to the power stations to send electricity around the country.



## Distributors

Also called lines companies or network companies, distributors own the lower voltage power lines, substations and distribution networks in local areas. Distributors receive power from Transpower's national grid and then deliver that power to local businesses and homes. They also coordinate load management and emergency (e.g. storm and seismic) response. Orion is one of 29 electricity distributors in New Zealand.



## Retailers

Sometimes referred to as power companies, electricity retailers purchase electricity from the wholesale market to sell to residential and business users. Seven electricity retailers operate in the Orion network area in central Canterbury – Contact Energy (including Empower), Genesis Energy, Meridian Energy, Mercury Energy, Powershop, Pulse Utilities, Simply Energy and TrustPower.



## Consumers

The last step in the process is providing power to your home or business. You can buy electricity from the competing retailers listed above.

## 1.2 Orion network overview

Orion owns and operates the electricity distribution network in central Canterbury, between the Waimakariri and Rakaia rivers, and from the Canterbury coast to Arthur's Pass. We operate one of New Zealand's largest electricity distribution networks. We provide electricity to around 190,000 consumers over 8,000 square kilometres. Orion bills electricity retailers for this delivery service, and electricity retailers then on-charge homes and businesses. Retailers also bill consumers for the cost of generating electricity plus a retail charge.

Orion's charges typically amount to about one quarter (25%) of an average household's electricity bill.

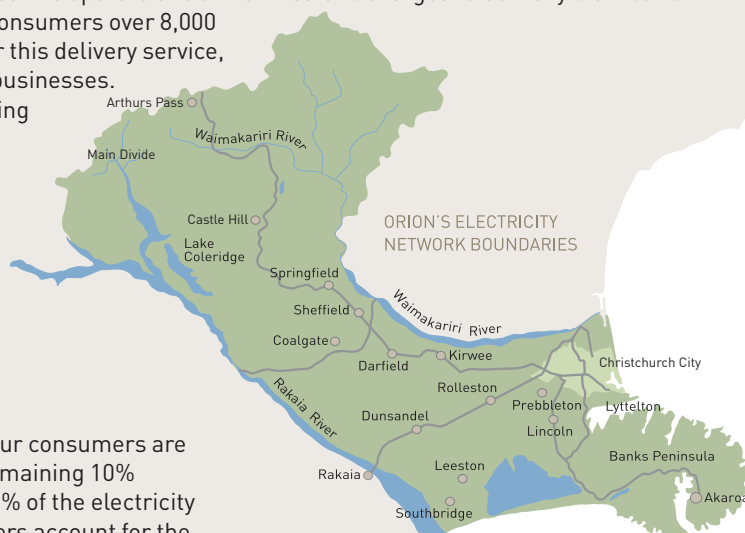
The majority of our consumers – over 85% – are residential households, with the remainder being commercial or industrial premises. Around 90% of our consumers are located in the urban area of Christchurch with the remaining 10% in rural regions. Business consumers use around 60% of the electricity delivered via our network, while residential consumers account for the other 40%.

Our network covers a varied area, from high-density urban to medium-density rural and remote rural countryside. Each of these areas is served by a technically different type of electricity network. To reach all of our consumers, we manage a sophisticated system of electrical and load control equipment, as well as multiple computer systems.

Typically, growth in maximum electricity demand is the main reason we need to continually invest in our network. For instance, in the years before 2010, increased irrigation in Canterbury's rural districts and construction activity in urban areas created strong growth in electricity demand. This in turn required considerable new investment in the network by Orion.

As a result of the earthquakes, the need for network investment in the next few years is greater than normal. We need to restore our network to a reliable standard in damaged areas – typically the eastern suburbs of Christchurch – and we need to grow our network into areas where displaced homeowners are endeavouring to re-establish their lives. For instance Rolleston, Lincoln and Belfast are growing rapidly in size. The CBD will also require new network investment, and we need to prepare for the influx of people expected to come into our network area to help rebuild Christchurch.

As was the case before the earthquakes, we will continually look to find the most cost-effective ways to do all these things.



### Network Summary as at 31 March 2012

Number of consumer connections	191,000
Network maximum demand (MW)	630
Annual electricity delivered (GWh)	3,100
District/zone substations	52
Distribution/network substations	10,700
Kilometers of 66kV line and cable	200
Kilometers of 33kV line and cable	340
Kilometers of 11kV line and cable	5,700

Our shareholders are:

- Christchurch City Council 89.3%
- Selwyn District Council 10.7%.



# Orion before the earthquakes



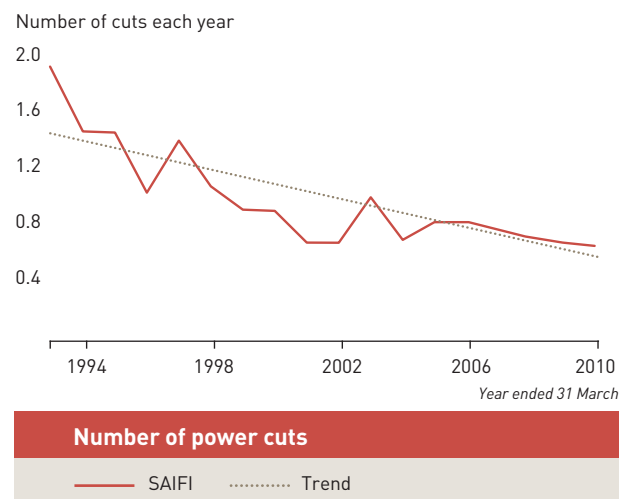
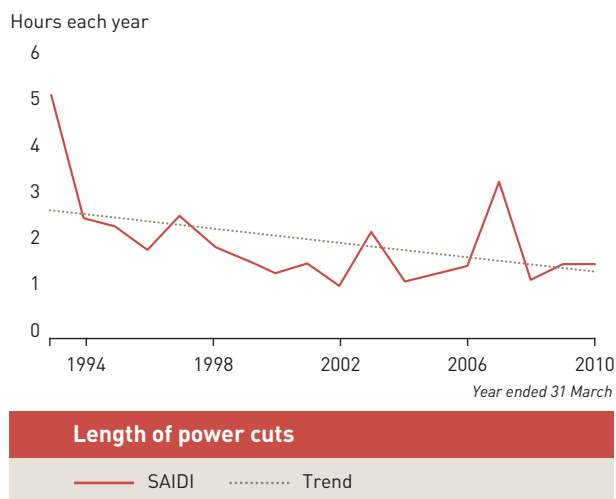
## 2.1 Our network reliability before the earthquakes

Our consumers have consistently told us that we should 'keep the lights on', keep our prices down and deliver electricity safely. There is often a trade-off between those requirements, so we have always focused on finding the right balance between costs to consumers and network investment. We've also worked hard to meet the needs and preferences of our consumers with fair and appropriate prices and performance levels.

Two measures are accepted internationally as the most important indicators of electricity network reliability performance. These measures are known as SAIDI and SAIFI.

- SAIDI, or system average interruption duration index, measures the average number of minutes per year that a consumer is without electricity (length of power cuts)
- SAIFI, or system average interruption frequency index, measures the average number of times per year that a consumer is without electricity (number of power cuts).

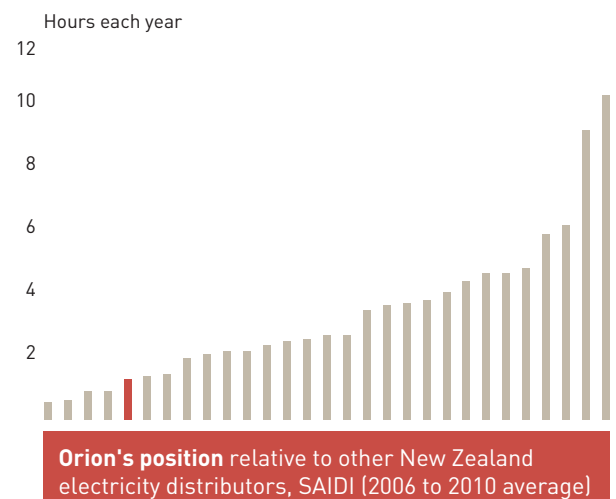
Extreme weather and other events can have a major impact on an electricity network's performance. It is therefore more meaningful to look at the long term trend in an electricity network's SAIDI and SAIFI figures, rather than look at the figures for any one year.



The trend of Orion's figures since the early 1990s showed that we continually improved our network reliability performance before the earthquakes. The last full financial year prior to the earthquakes was the year to 31 March 2010.

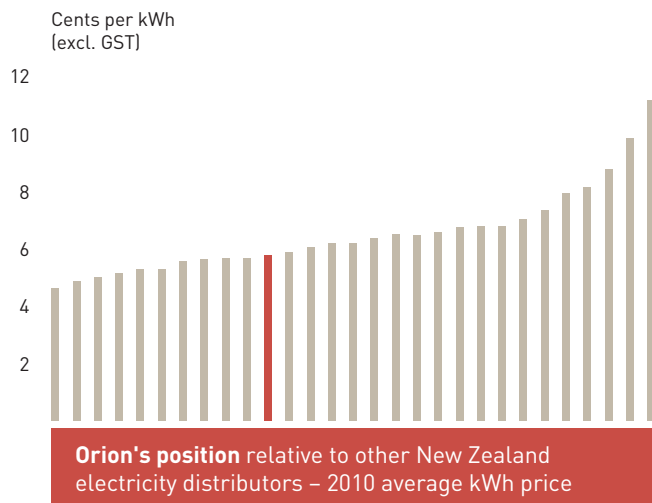
Based on the five years to 31 March 2010, Orion was the:

- fifth best performing electricity distribution company in terms of the duration of interruptions (SAIDI or length of power cuts)
- second best performing company in terms of the frequency of interruptions per consumer (SAIFI or number of power cuts).

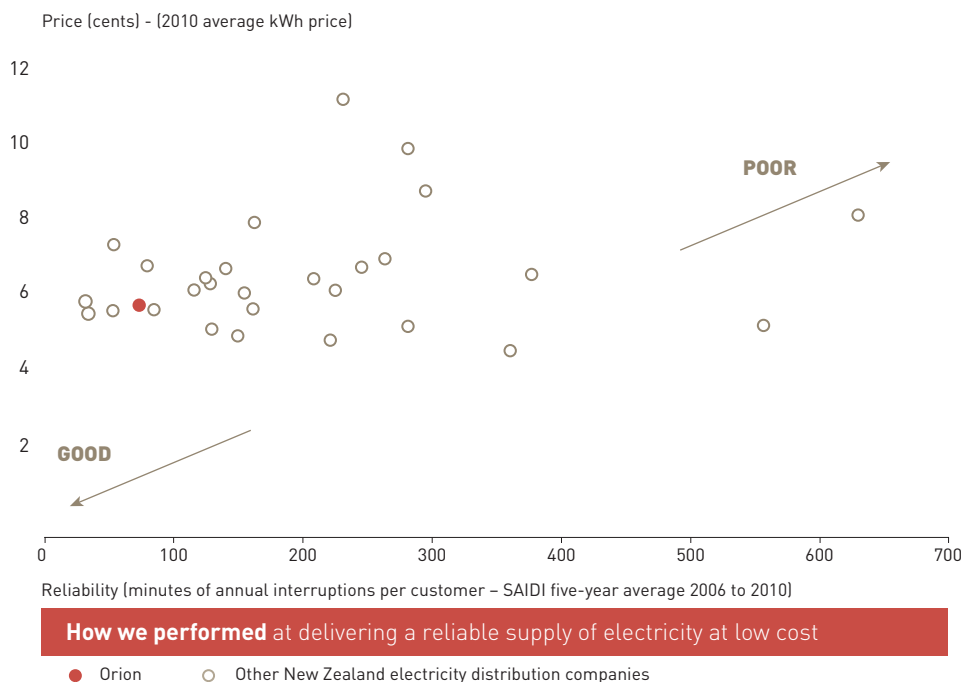


## 2.2 Our pricing before the earthquakes

One way to compare average prices of electricity distribution networks is to compare the revenue those networks receive with the volume of energy they deliver. This comparison represents an average across all residential and commercial connections, and is shown in the graph below for the year before the earthquakes.



The graph below shows that for the same level of reliability we provided pre-earthquakes, only three other network companies in New Zealand offered lower prices.



Before the earthquakes our electricity distribution network was one of the most reliable in New Zealand and our pricing compared very favourably with other New Zealand electricity distributors. We believe, based on community feedback we received before the earthquakes, that we struck the right price/reliability balance. Our community wanted a very reliable network with fair and efficient pricing.



## 2.3 How we prepared for an earthquake

Over the last 20 years an important part of Orion's planning has been to manage risk. We believed that a resilient network could play an important part in the rapid restoration of electricity supplies after a disaster. We were proven right.

Over the years, we engineered a strong electricity supply network for Canterbury. Where risk to the power supply couldn't be easily eliminated, we reduced it through better emergency training, up-skilling of staff, safer work practices, and improved planning and network design.

The electricity distribution system in Christchurch works a bit like a spider's web. Rather than have a single line or cable into an area, we have multiple links, so if one fails, there's an alternative power supply route. This spider's web approach greatly increased Orion's ability to restore power promptly after the earthquakes. It meant that power stayed on unless all the multiple links into an area failed. It also meant that if all the links were damaged, we could fix the link that was the easiest and quickest to repair.

Also, as part of our risk management in the mid-1990s, we participated in an "engineering lifelines" study. This looked at how natural disasters might affect Christchurch. That study prompted us to spend \$6m on seismic-protection and strengthening work.



For example, we reinforced bridges carrying cables across rivers. The photo above (left) shows a Dallington footbridge that was strengthened to carry a cable. It performed superbly, allowing the power to keep flowing, while an unreinforced footbridge 500 metres away was dramatically twisted (above right).



An example of how a strengthened Orion brick substation building (left) survived the earthquakes in good condition. The brick building on the right, previously used as a substation but no longer owned by Orion, was not strengthened.

We also strengthened hundreds of buildings which contained our network infrastructure. Many older brick buildings in Christchurch were hard hit in the earthquakes and ensuing aftershocks. In comparison, strengthening of Orion's 314 substations meant that only four sustained serious damage, and one of these was from a boulder falling onto it.

We also bolted our transformers down. This was a lesson we learnt from the North Island's 1987 Edgecumbe earthquake, when large transformers fell over, leaving some areas without power for weeks.

Other preventive measures cost only a few cents. 10 cent plastic ties, for example, stopped expensive batteries for our substation protection systems falling off walls and smashing. Doing these little things right made a big difference when the earthquakes hit.

We also carefully invested in good technology. For instance we installed innovative wireless communications equipment that continued to operate throughout the earthquakes. This helped us restore power in rural Canterbury three or four days sooner than we would otherwise have been able to.

Our commercial incentives to large electricity consumers, such as hospitals and the Police, had encouraged them to install diesel generators for use during periods of peak power demand. This meant they were well prepared with backup power supply when the earthquakes struck.

Prior to the earthquakes, we developed "Mutual Aid Partner" agreements with other electricity network companies to provide support in the event of large scale natural disasters. We were able to trigger these vital agreements in the aftermath of the February 2011 earthquake.

In addition, we regularly contributed to emergency readiness programmes run with Civil Defence and other utility organisations. These exercises enabled us to test our emergency procedures and make improvements from the lessons learnt.

Without all this work, the impact of the earthquakes would have been much worse. Months of power cuts would have been experienced, and the confidence of the Christchurch and Canterbury communities would have been potentially shattered.



Seismic strengthening of this substation kept the roof up. This meant the substation could remain operational while repairs to the walls were undertaken. Without the strengthening this substation would undoubtedly have been damaged beyond repair.

We estimate that without our pre-earthquake strengthening work and planning, the earthquakes would have cost us an additional \$65m in repair and replacement costs. And the damage to Canterbury's economy that was avoided as a result, was estimated at many times more by the New Zealand Lifelines Group in their June 2012 report "The Value of Lifeline Seismic Risk Mitigation".

Such was the force of the earthquakes however, that despite the strengthening work and planning, damage was unfortunately unavoidable and extensive.



# **Impact of the earthquakes on our network, and our response**



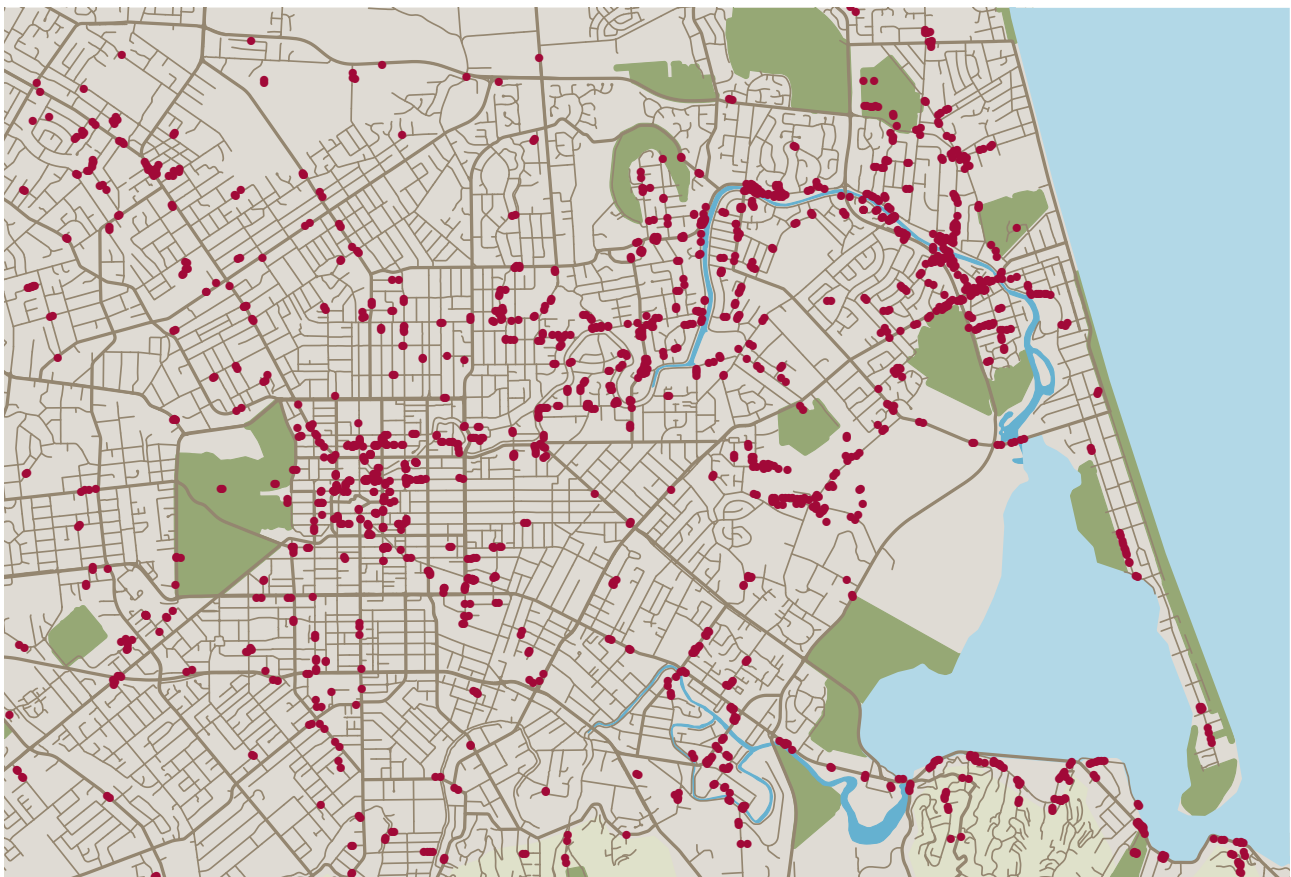
## 3.1 The damage the earthquakes caused to our network

There were extensive power cuts following the 4 September 2010 earthquake. Approximately 80% of these cuts were caused when the ground shaking tripped safety devices installed on our transformers. These devices were built into our system to reduce damage to our lower voltage network and minimise the possibility of fire. As our substation buildings were seismically reinforced, all of them remained operational, despite some cracking, sinking through liquefaction and other damage. There was also damage to lines and cables and ancillary equipment such as poles and insulators.

At the time, the damage caused by the September 2010 earthquake seemed significant; but the scale of the destruction six months later soon put this into perspective. As everyone in Canterbury knows, the 22 February 2011 earthquake resulted in one of the highest ever recorded ground force accelerations. The sheer force of it meant that the damage was about 10 times greater than the September 2010 earthquake.

The February 2011 earthquake hit properties and infrastructure hard throughout Christchurch and particularly the eastern suburbs. It also forced the virtual abandonment of the central business district, a significant portion of which remains off-limits over 18 months later.

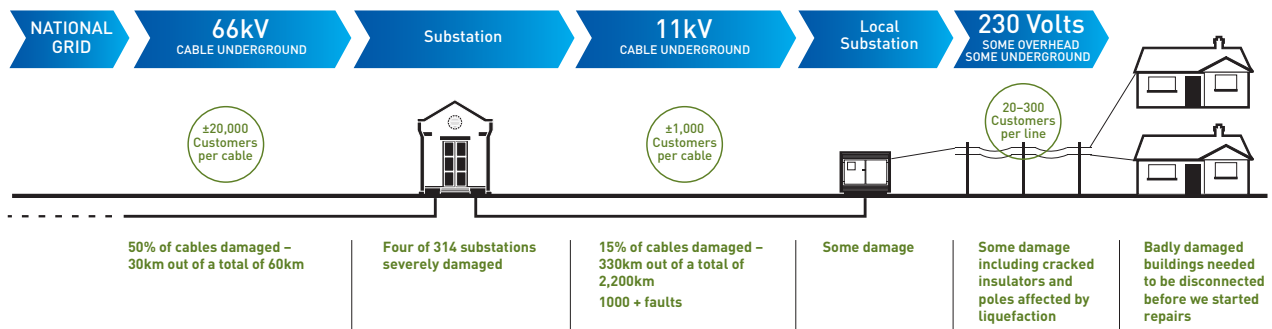
During the February 2011 earthquake, the massive lateral forces caused more faults on our underground network than we would normally see in an entire decade.



Location of high voltage cable faults after the February 2011 earthquake

Aside from underground cables stretching and breaking through ground movement, substation buildings and poles moved in areas badly affected by liquefaction. Our New Brighton substation sank into the ground, and flooding caused by liquefaction inundated other substations.

A summary of the damage that our network suffered in the February 2011 earthquake is shown graphically below.



The following series of photos gives an idea of the damage our network sustained.



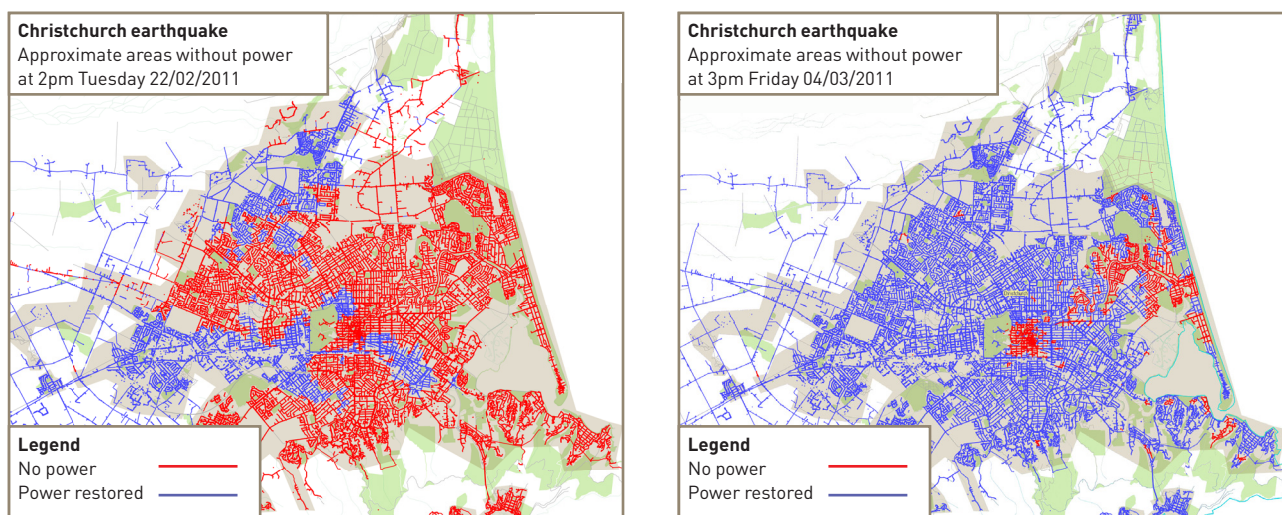
Damage was compounded by the 5.7 and 6.3 magnitude earthquakes on 13 June 2011 and the 5.8 and 6.0 magnitude earthquakes on 23 December 2011. These aftershocks caused around 10 times the number of underground cable faults than would normally occur in a week.



## 3.2 Our response up to September 2011

Approximately three quarters of consumers lost power in the 4 September 2010 earthquake. By the end of that day we had restored power to 90% of customers, and by the end of the week supply was restored to virtually everyone.

Approximately two thirds of consumers lost power in the February 2011 earthquake. By the end of the next day we had restored power to 50% of our consumers, by the end of the week 86%, and within 10 days 95%. With the exception of cordoned areas (and lines originating within cordoned areas), we restored all consumers (that could take power) within 24 days.



Approximate areas without power after the February 2011 earthquake (left) and 10 days later (right)

Following the February 2011 earthquake we:

- called on help from our mutual aid partners and local electrical contractors and diverted all resources from planned work to fault restoration. Seven hundred electricity sector workers, from more than 40 companies, put in more than 200,000 work hours in the months after the February 2011 earthquake to keep the power on
- disconnected hundreds of damaged properties from our network at the request of consumers or under the instruction of emergency services
- installed temporary generators to provide power to areas where there was severe damage to underground cables. At one point we had 24 generators operating, supplying electricity to 10,000 consumers
- built two temporary 66,000 volt (66kV) overhead lines to bypass four damaged underground 66kV cables in north-east Christchurch. These lines were needed to keep power on to 20,000 consumers
- repaired earthquake damage to 360 kilometres of high voltage underground cables – the distance from Christchurch to Queenstown
- relocated from our own office buildings, which were rendered uninhabitable, to our back up “hot site”. This was an alternative network control centre that we maintained for such an emergency
- provided a flow of information and advice to the public, with regular accurate assessments of timeframes for restoration of power. We also attended numerous public meetings to hear directly from our consumers
- built a new substation in Rawhiti Domain off Keyes Road in New Brighton to replace the severely damaged Pages Road substation. The new substation began to supply power to consumers in early July 2011.



Independent reviews, such as the 'Review of the Civil Defence Emergency Management Response to the 22 February Christchurch Earthquake', show that Orion's preparation and planning meant we were able to respond well to the earthquakes.

However, we still learnt some valuable lessons about risk management. We started implementing these in the months immediately after the February 2011 earthquake to make the electricity system more resilient if further earthquakes struck.

For instance, in March 2011 we were the first electricity distribution company in New Zealand to invest in a mobile centre to house our sensitive computer systems needed to operate and control our network. This mobile "nerve centre", custom-built in Germany, allows us to place the backup equipment at a different location from our main computer room. This mobility means we can 'set up shop' in many locations throughout the city if our main head office location were to become uninhabitable again.



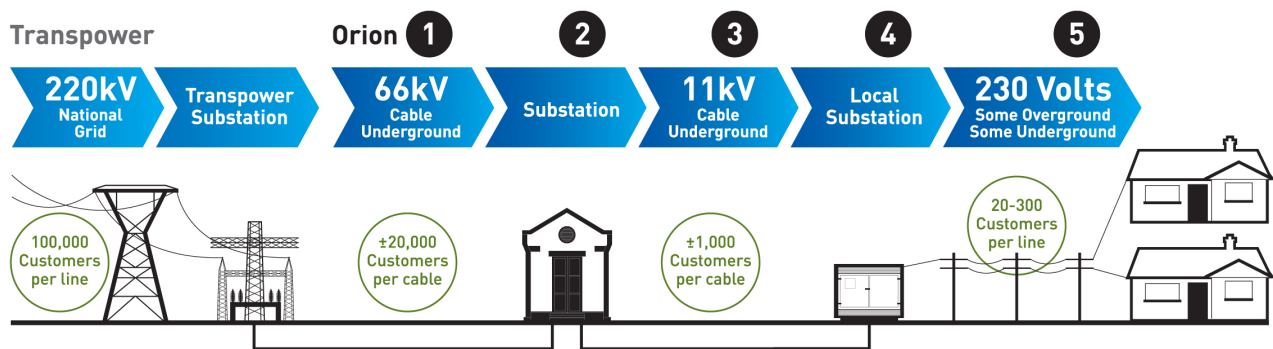
Top: Our Keyes Road substation was quickly built after the February 2011 earthquake. Above: Our new mobile control centre en-route to the city from Lyttelton port.



## 3.3 Our response since September 2011

All of our major emergency repair work was completed by September 2011. Residents and businesses across our network area (except in the CBD red zone) could use power as normal from this time. However, we have continued work on rebuilding the network since then to start restoring reliability and resilience.

This next diagram shows the five main parts of Orion's electricity network, starting with the high voltage cables (1) on the left through to the lines coming into houses on the right (5). The table on the next page shows our progress to date in repairing each of these five areas.



In addition to the work shown in the table, we also implemented the final stage of our new network management system during the last year. This allows us to keep track of the state of the electricity network in real time. This technology significantly improves our ability to manage emergencies and restore power faster when cuts occur.

The heart of the system is a computer-based model which holds information about the equipment on our network, including all the lines and cables. It helps us to better manage the system, plan maintenance in smarter ways and minimise the potential for equipment overload.

As a precautionary measure we also installed diesel generators in the north east of the city, and have a number of others on standby. This means power can still be supplied to these areas in the event of a network failure.



Installing large diesel generators in QEII park to provide backup power supply if needed.



	Impact of earthquakes	Work completed to restore power	Current level of service	Progress to date	Timeframe for full recovery
<b>66kV network</b> <b>1</b>	50% of cables known to be damaged – 30km out of a total of 60km.	Built two temporary 66kV overhead lines from Bromley to New Brighton and Dallington to replace four underground cables which were damaged beyond repair.	North-eastern Christchurch – temporary service.  Rest of Christchurch classified as impaired service while assessments are carried out.	North-eastern Christchurch – stage 1 of 3 to replace temporary overhead lines in progress  Rest of Christchurch – assess cables for damage then schedule any necessary works.  45% of assessments are complete. 26% of repairs are complete.	3 years  3 – 6 years
<b>Zone and building substations</b> <b>2</b>	Four of 314 Orion owned substations severely damaged.  268 privately owned substations have sustained some damage.	Built a new zone substation in Keyes Road, New Brighton to replace the damaged Bexley Road and Pages Road substations.  Two further substations have been repaired or replaced.	Impaired service.	All zone and building substations have been assessed.  11% of repairs are complete.  Simeon Quay landslide damaged the main substation supplying Lyttelton. CCC reviewing land options.	3 – 5 years
<b>11kV underground network</b> <b>3</b>	410 cables out of 6,622 damaged.  1000+ faults.  A further 10 cables damaged as a consequence of 23 December earthquake.	100% of all known faults have been repaired.	Classified as impaired service while repairs are carried out.	Recheck and assess cables for damage hidden underground.  0.8% of assessments are complete.  0% of repairs are complete.	3 – 6 years
<b>11kV overhead network</b> <b>3</b>	3,248 km of network. Some damage including cracked insulators.	100% of all known faults have been repaired.	Classified as impaired service while assessments are carried out.	58% of assessments are complete.  58% of repairs are complete.	3 – 5 years
<b>Local substations (kiosks)</b> <b>4</b>	3,392 local substations. Some substations have moved on their foundations.	All substantial damage has been repaired.	Classified as impaired service while repairs are carried out.	All local substations have been assessed and findings collated.  100% of assessments are complete. 6% of repairs are complete.	3 – 5 years
<b>230V overhead network</b> <b>5</b>	3,059 km of network. Some damage, including poles which have sunk or are on a lean due to liquefaction.	Repairs to make safe have been completed.	Classified as impaired service while assessments are carried out.	81% of assessments are complete.  38% of repairs are complete.	3 – 5 years
<b>Main office/ network control room</b>	Main office building badly damaged and evacuated. Computer system servers compromised by the damaged building.	Relocated control centre to our 'hot site' and established temporary accommodation.  Sourced and commissioned a portable data centre and standby generation.	Impaired service.	Build new administration centre to 'Level 4' building standard. Work on the new building on Wairakei Road has commenced.  Our 1939 and 1984 Manchester Street buildings have been demolished.	1 year

# How our network plans, costs and revenues have been impacted by the earthquakes



There are several technical terms in this next section. They are:

- **66kV = 66,000 volts.** Volts is a measure of the ability of a cable, or other equipment, to carry electricity. 66kV is the highest voltage on Orion's network.
- **33kV = 33,000 volts.** The bits of our network that are 66kV and 33kV could be likened to electricity 'highways'.
- **11kV = 11,000 volts.** The 'major roads' of our network.
- **400V = 400 volts.** The 'suburban streets' of our network.
- **Cable** = underground power cable
- **Grid Exit Points, or GXP for short.** These are the points on our electricity network where we take power from the national grid, owned by Transpower.
- **Line** = overhead power line
- **Sub-transmission network** = the combination of all our 66kV and 33kV cables and equipment
- **Substation or switchroom** = a place where we change high voltage down to lower voltage e.g. 66kV to 33kV
- **Zone substation** = a substation that caters for a large number of consumers

## 4.1 Our infrastructure plans and proposed increase in network expenditure

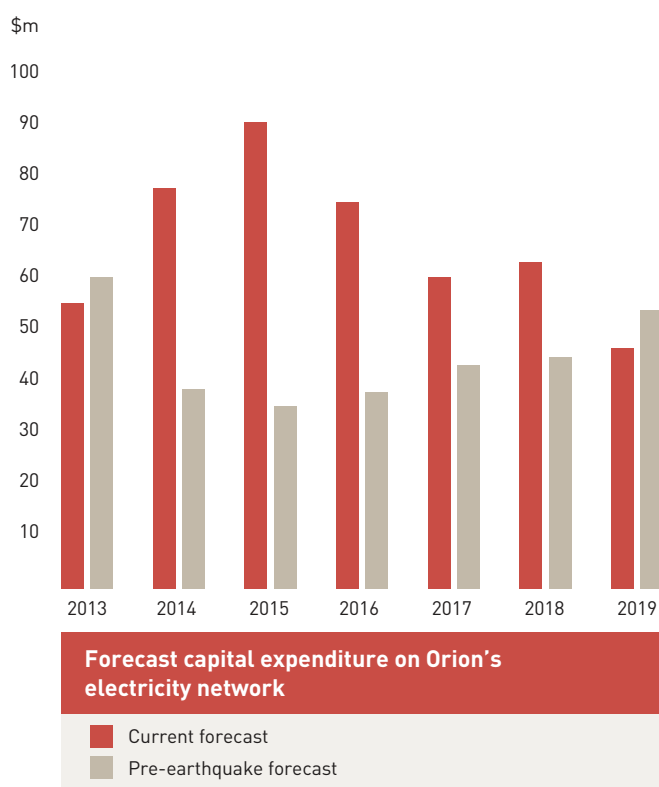
The most important contribution Orion can make to boosting both business and community confidence in Christchurch is to keep the power on where it's needed, quickly respond if it goes out, and promptly provide accurate information during major power cuts. Even though major emergency repairs are finished, we still have much work ahead to build strength back into our electricity network and to expand it to supply the many new subdivisions that have resulted from people moving.

We have needed to rethink how we configure our network and what we do to keep the power on, both now and in the future, as a result of the earthquakes. This has presented challenges, but also opportunities.

In determining how to rebuild our network, we have considered many options. The balance we have struck between the different options is based on the assumption that our network should be rebuilt to a similar standard to that which our community required before the earthquakes.

For instance, we plan to continue to use underground cables in most urban areas and overhead lines in most of our rural network. Our use of underground cables complies with the policy contained in the Christchurch City Council's City Plan.

The graph below shows how our spending plans have changed since the earthquakes. Compared to what we had forecast to spend before the earthquakes, our capital expenditure is \$155m greater now in total.



We will have to undertake repairs and/or development on every section of our electricity network, in both Christchurch and wider Canterbury, in the period until 2019 and beyond.

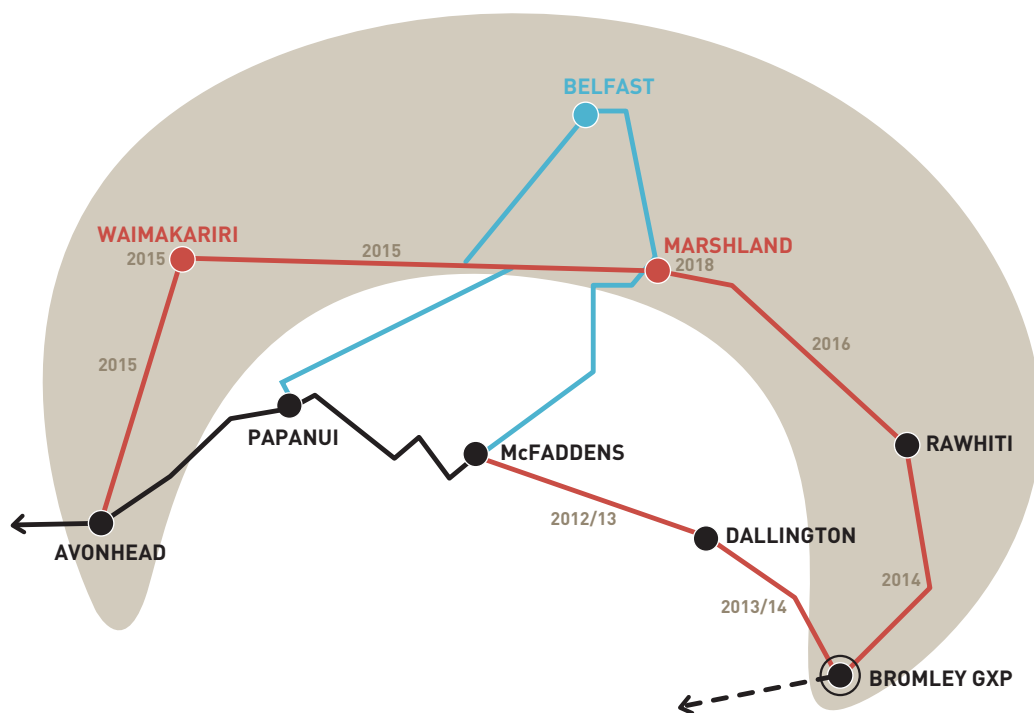
This guide does not attempt to explain all of our repair and development plans – that would take hundreds of pages. Instead we have singled out the five geographic areas of our network where we plan to undertake the biggest projects over the next few years.

## 1. North Christchurch

Before February 2011, we had planned to expand Orion's network in northern and western Christchurch. The earthquakes altered those plans. Instead of upgrading our network for 'typical load growth', we now have to replace damaged assets and provide for additional, unexpected growth. For instance, major expansion areas in the future now include the Russley-Airport area, Belfast and numerous 'Marshlands' subdivisions.

The north of the city is currently served from substations up to 7km away and the central north is supplied from a single heavily loaded stretch of network cables and substations. Further growth cannot be accommodated by simply extending the existing network without significantly reducing the level of security of power supply to this area. Consequently, to increase resilience and to provide additional capacity for expansion, we propose a future high voltage network configuration as illustrated below.

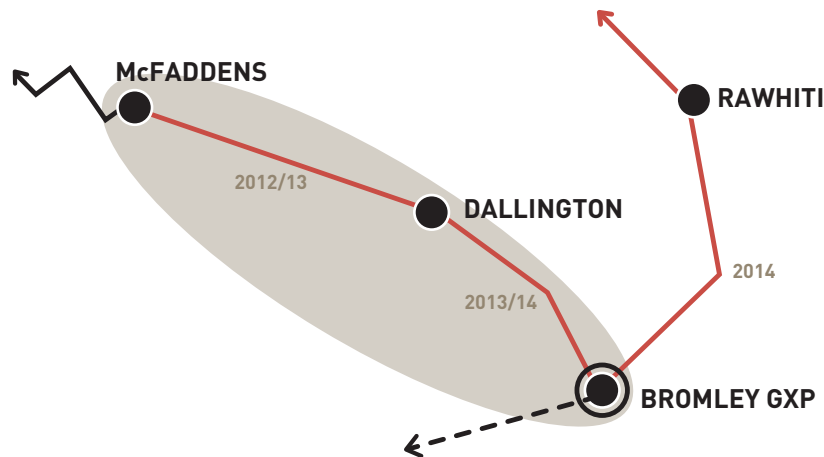
With regard to the proposed cable between Bromley and Rawhiti, before February 2011 power was supplied from the national grid to the north-east of Christchurch via two sets of parallel cables. Now, because of extensive cable damage, power is supplied to the area via individual temporary overhead lines. We installed these overhead lines in the days after the February 2011 earthquake. We promised the community these would be installed on a temporary basis only and we plan to replace them with underground cables by 2014.



## 2. Dallington and surrounding suburbs

Our goal in this area of Christchurch is to remove the temporary overhead Bromley to Dallington line, which was installed to replace damaged cables after the February 2011 earthquake, and restore network resilience to the Dallington zone substation. To achieve this we intend to install two 66kV cables, as shown below, from the McFaddens zone substation in St Albans to the Dallington zone substation, and from the Dallington zone substation to Bromley GXP, along with other necessary equipment and new switchroom buildings at both Dallington and McFaddens.

The cables will complete one of four links between Transpower's Islington and Bromley GXPs, adding further resilience to our entire network.



● EXISTING ZONE SUBSTATION

— EXISTING 66KV CABLES

— PROPOSED 66KV CABLES BEFORE 2015

- - - - TRANSPOWER NATIONAL GRID

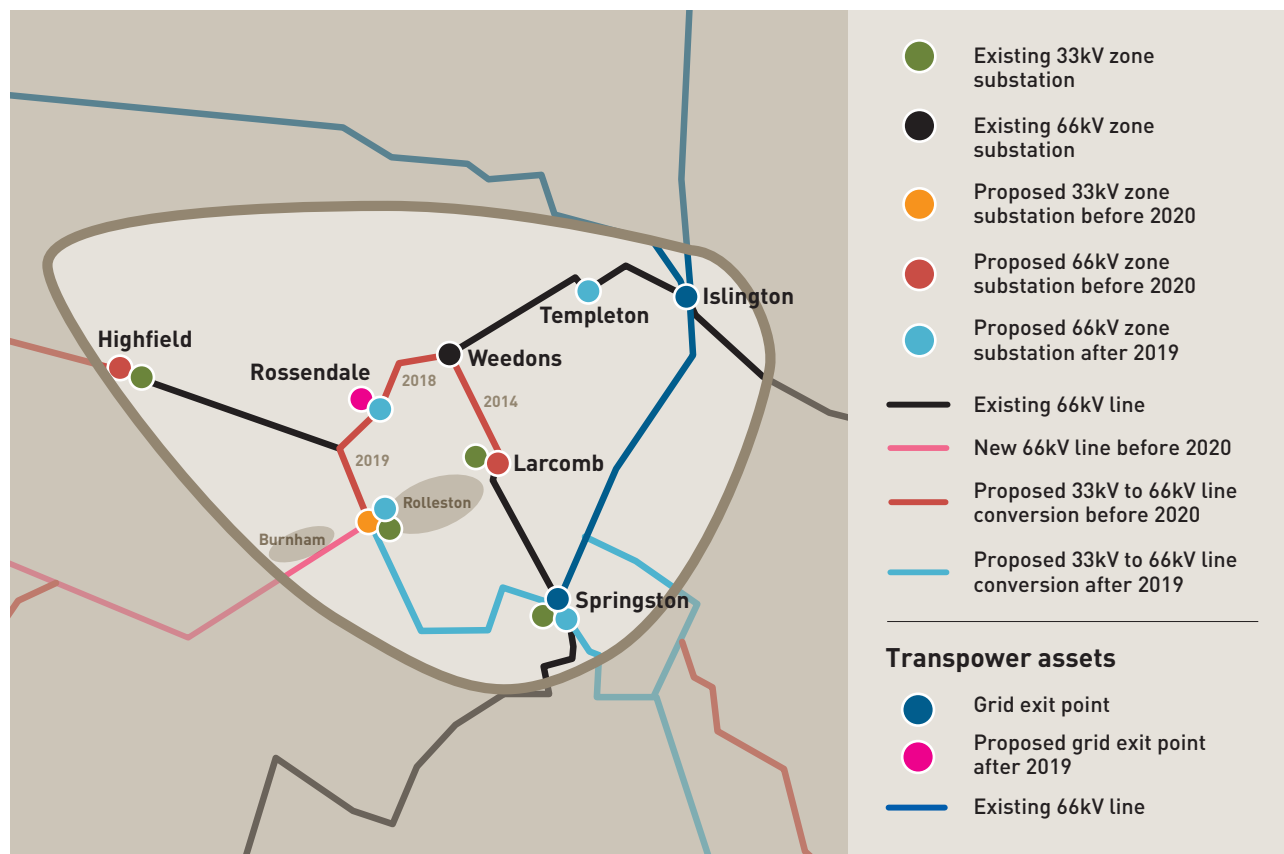


### 3. Rolleston

The Rolleston area is the hub of the Selwyn District and we need to ensure that our network infrastructure can meet the needs of the industries and families located there and moving there.

Historically, load growth in this area has been modest and our rural 33kV sub-transmission network design has reflected this. Our network plans need to reflect the transition from a small township to a major residential and industrial load centre. Consequently a number of new zone substations and associated 66kV sub-transmission lines will be established.

**A summary of our existing and proposed 66kV and 33kV network around Rolleston**



### 4. South-east Christchurch

To improve security of supply to the south-east, we plan to install a 66kV cable between the Lancaster and Milton zone substations, in Phillipstown and Spreydon respectively.

This cable will form part of the south-eastern network that would link the entire south-east of the city, including our Lancaster, Milton, Hoon Hay, Halswell, Heathcote and Barnett Park zone substations, to both Islington and Bromley GXP. By establishing this network, electricity supply to the south-east can be better maintained if supply is lost at Transpower's Islington GXP, or at Transpower's Addington GXP which runs off the Islington GXP, or at Bromley GXP. As per the discussion on page 12, multiple links will be created to improve our options to supply power to the area if one link fails.

This project will also improve security of supply to central Christchurch.

### 5. West Christchurch

The objective here is to provide for load growth in the west of Christchurch. Substantial industrial developments are planned in the South Hornby area, and residential growth is expected to occur around Templeton. The capacity of the existing zone substations in the area – Moffett, Shands and Hornby – will become insufficient as this load develops.

A number of options exist to increase capacity on our network in the South Hornby area. While the preferred solution has yet to be finally determined, it is likely that we will convert the Shands Road zone substation from 33/11kV to 66/11kV.



## 4.2 Insurance wasn't, and still isn't, a viable option

The earthquakes caused significant damage to our network.

Unfortunately it has not been economically viable to insure most of our network assets, especially our overhead lines and underground cables. This is because insurance for these assets has been, and continues to be, too expensive – in New Zealand and around the world.

The insurance market for electricity overhead lines and underground cables is very different to the insurance market for houses or a typical business. Even prior to the earthquakes, the annual premiums offered by insurers were up to 10% of the replacement value of these assets.

It would have cost us around \$100m every year to insure these assets and so insuring them didn't, and still doesn't, make sense for our community.

We're not aware of any electricity distribution business in Australasia that insures its lines and cables.

On the other hand, the insurance premiums charged for our other assets, such as our substations and buildings, make economic sense. The premiums for these in percentage terms are much more like what a homeowner pays on their house. Consequently, we continue to insure our key substations and our office buildings and other assets at full replacement cost.

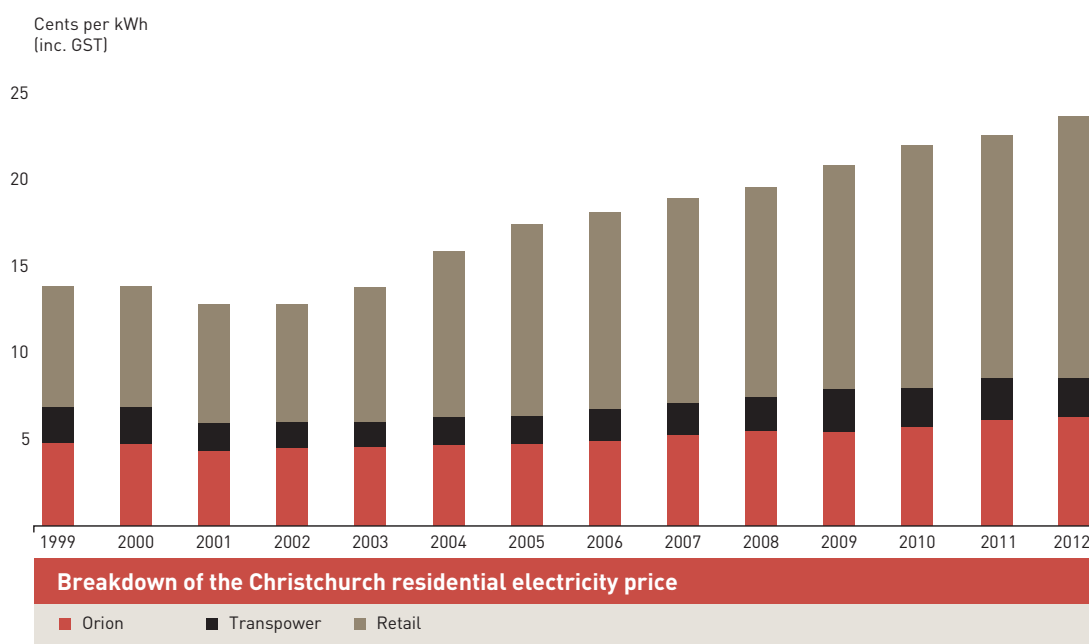
We also had, and have, good business interruption insurance related to our insured assets.

International insurance expert, Marsh, has reviewed our insurance programme. Marsh's report is publicly available on our website. Marsh concludes as follows:

"Marsh believes that Orion's approach to insurance has been:

- consistent over time
- subject to due process and due governance oversight
- appropriate, prudent and reasonable for the business and its economically insurable material damage and business interruption risks
- consistent with other New Zealand and Australian electricity distribution businesses."

## 4.3 The earthquakes have reduced electricity usage and our revenues

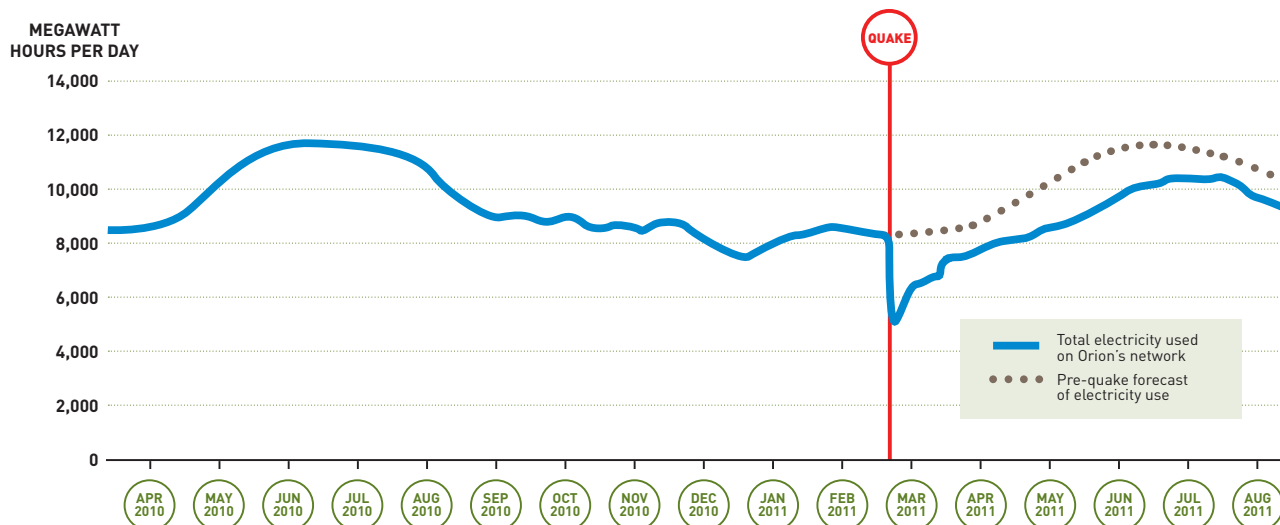


Our charges make up around 25% of a typical household or business power bill.

Unlike most other businesses, our costs do not go down significantly if the volume of product we deliver goes down. Our costs are not significantly affected if we have 100 homes at the end of a line or 110 homes. However, our revenues are significantly affected if we supply 100 homes as opposed to 110 homes.

Since February 2011, the amount of electricity used in our region has dropped by around 10%, mostly due to people moving out of the damaged eastern and hill suburbs and the central business district red zone. This reduction equates to the annual usage of about 65,000 homes.

The graph below clearly shows the sharp reduction in electricity use following the February 2011 earthquake. The reduction in electricity usage continues to this day. We estimate that to date our loss in revenue has been close to \$30m. By 1 April 2014 our loss in revenue will be about \$50m.



With loss in revenue, additional repair costs, uninsurable losses on our network and additional forecast capital expenditure of some \$155m, clearly the earthquakes have significantly affected Orion financially.

# Our proposal to the Commerce Commission, the Commerce Commission process and why your feedback is wanted





## 5.1 The regulatory environment and why we intend to apply to the Commerce Commission

Electricity distribution companies like Orion are regulated businesses under the Commerce Act.

The Commerce Act controls the price and quality of goods or services in markets where there is little or no competition. The Commerce Commission administers the Act.

The fundamental purpose of the part of the Act that applies to us is “to promote the long-term benefit of consumers”.

The Act says that the Commission must ensure that companies like Orion:

- have incentives to innovate and to invest, including in replacement, upgraded and new assets
- have incentives to improve efficiency and provide services at a quality that reflects consumer demands
- share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices, and
- are limited in their ability to extract excessive profits.

The focus of the Act is that consumers receive the benefit of the network but owners recover their costs.

To meet the purposes of the Act, the Commission sets targets for the reliability of electricity networks like ours. Those targets identify how often and how long consumers can expect to experience power cuts each year. The Commission also controls electricity network companies' prices.

Orion's prices and returns are therefore effectively limited by the Commission.

When drafting the Commerce Act, Parliament understood that in markets where there is little competition there is the need for costs to be recovered over time to ensure that, for the long term benefit of consumers, incentives to prudently invest are maintained.

The Act, recognising this need for fair recovery of costs, allows electricity network companies like Orion to apply to the Commerce Commission for a review of network reliability targets and prices to meet their changed circumstances after natural disasters.

Given the exceptional circumstances of the earthquakes, we propose to apply to the Commission for one of these reviews. This review is called a “Customised Price-Quality Path”, or “CPP”, proposal. There is no provision in Orion's current regulated prices for possible catastrophes that incur uninsurable costs.

We propose to apply for a CPP review, which would see us:

- increase our prices to recover our costs, including a regulated fair return on our past and future investments, as provided for under the Commerce Act, and
- reset our reliability targets.

The Commerce Commission will thoroughly review our proposal, consult publicly on it in 2013 and then ultimately decide what price and network reliability reset we receive.

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Our earthquake related costs do not disappear - they need to be paid. As we are ultimately community owned – by the Christchurch City Council (89%) and Selwyn District Council (11%) – the extra costs the earthquakes have caused must therefore either be met by power consumers or by our community shareholders. Given this, the choices for cost recovery are:

- 1) Fully recover our costs through price increases, smoothed over several years.
- 2) Not recover any of our costs through price increases.
- 3) Recover only some of our costs through price increases.

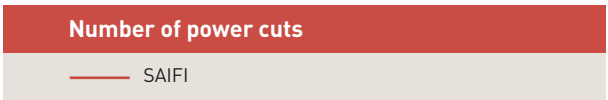
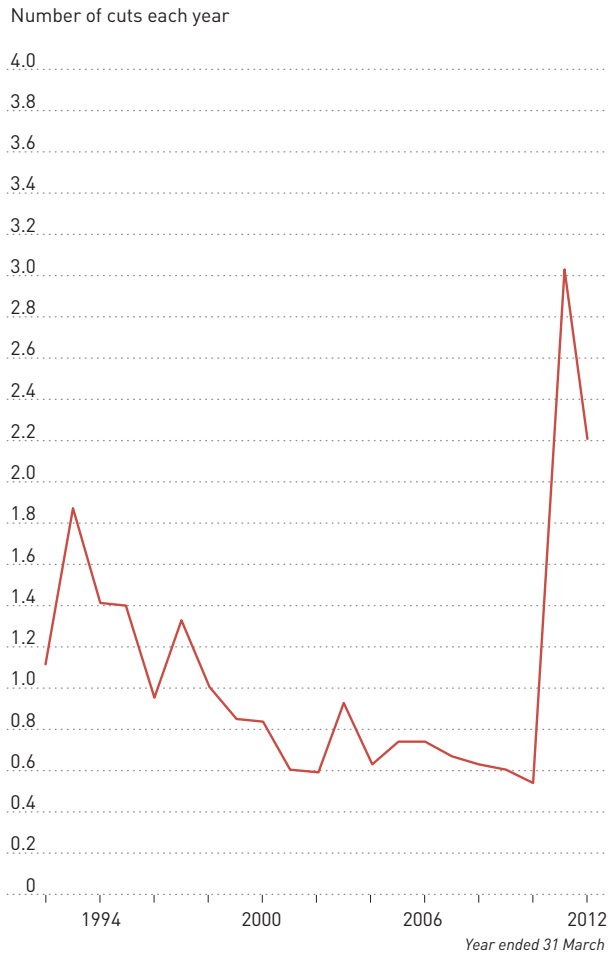
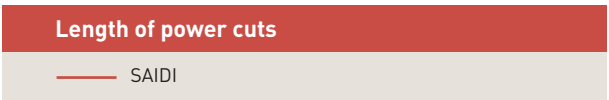
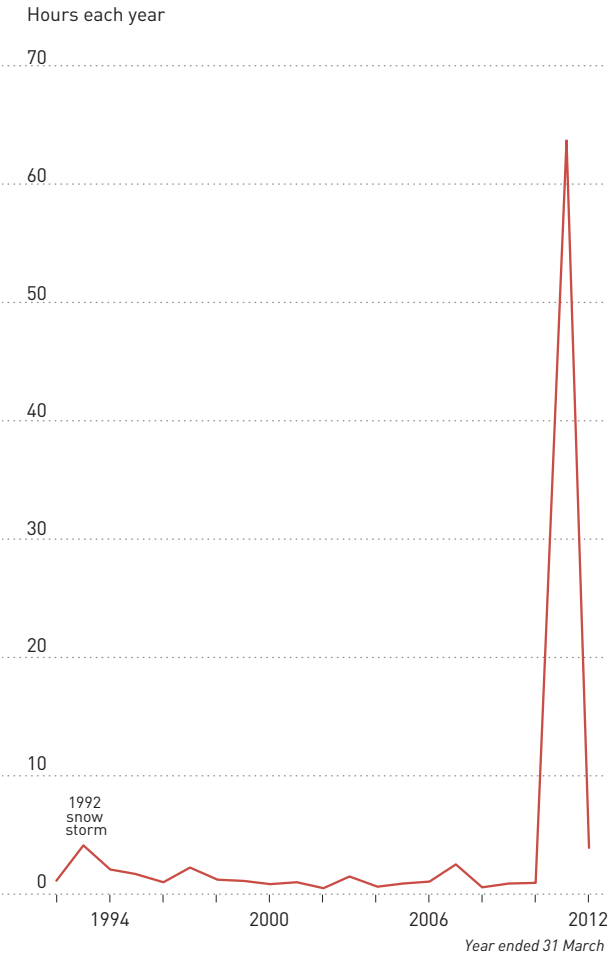
We believe that the best and fairest long term approach is for those who benefit from our network to bear the cost. We believe this approach is in the best long term interests of consumers. If prices do not recover costs this outcome removes incentives for us to continue to invest in our network to keep the lights on for consumers now and in the future. Our past investments have significantly benefitted our community – we wish to be able to continue to make sound investments in the future.

We have carefully considered an option to reduce the size of our proposed price increases and instead take on more bank debt. We have also carefully considered an option to reduce the size of our proposed price increases and instead reduce our dividends to our council shareholders. We do not favour these options because they would effectively shift our prudent costs from local electricity consumers to our local community shareholders. We believe that these options would not be in the long term best interests of consumers.

# 5.2 Our proposed future reliability targets

Even though major emergency repairs are finished, there is still much work needed to build strength back into the electricity network. Until this work is completed, consumers can expect to experience more power cuts than usual.

The impacts of the earthquakes on our reliability so far can be seen in the graphs below. In terms of the amount of time without power, the February 2011 earthquake was around 20 times worse than the 1992 snow storm, the biggest natural event to affect our network prior to September 2010.



Given the amount of work to be undertaken and the resource constraints faced, such as limitations on the number of skilled cable workers available, it will be several years before our network operates at pre-earthquake levels.



Until repairs are complete, the reliability of our network will be much lower than normal. This vulnerability means consumers will be without power more often until our recovery work is complete. Also, the impact of weather or further earthquakes is likely to be greater than usual, because the network is less robust. We don't believe this level of quality is acceptable for our residential and business consumers long term, but unfortunately it is the situation we face until we can fully restore and rebuild the network.

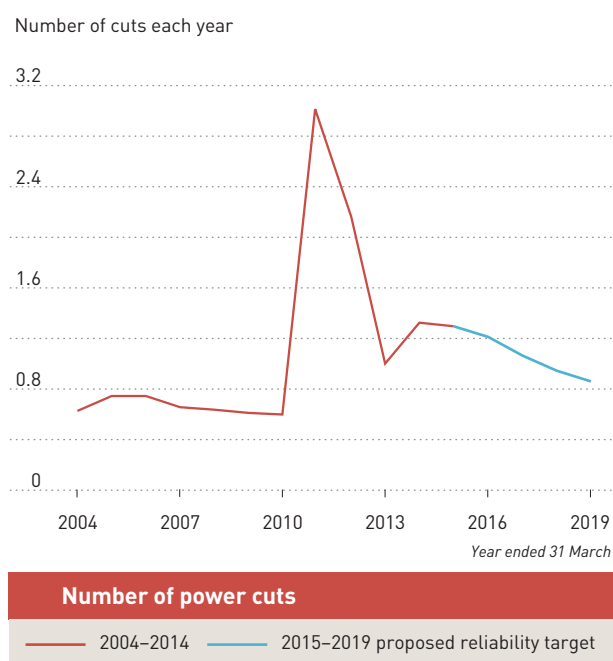
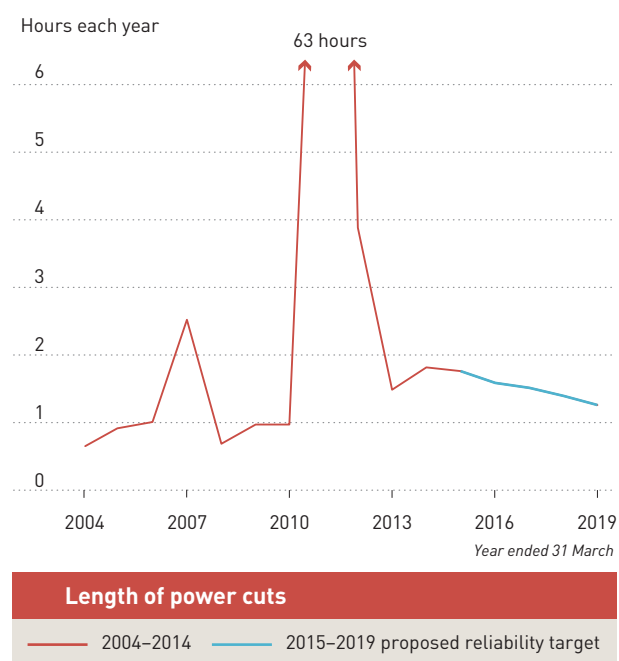
As we begin to enter a long rebuild phase in the city, the number of requests for planned power cuts will increase, as much of the rebuild work will require changes to our network.

We also expect further disruption from third parties as they work around the electricity network. The ongoing repair and rebuild of other infrastructure (roads, water and waste water services) exposes our assets to a higher than usual risk of damage. An example is a contractor who, while repairing water services in the suburb of Spreydon, struck one of our undamaged 66kV cables. In the six minutes it took us to re-route electricity supply, power was out to 9,000 customers. This cable had to be taken out of service and we needed to bring in specialist contractors from overseas to repair it.

For all of the above reasons, and many others, our consumers can expect a less stable power supply in the years ahead compared to that which they experienced before 2011.

The graphs below of our proposed reliability targets show:

- the amount of time a consumer on our network can unfortunately expect to be without power, and
- how many power cuts a consumer can expect each year until the end of the decade, if we undertake the rebuild and repair programme that we propose. Historical data is also included as a comparison.



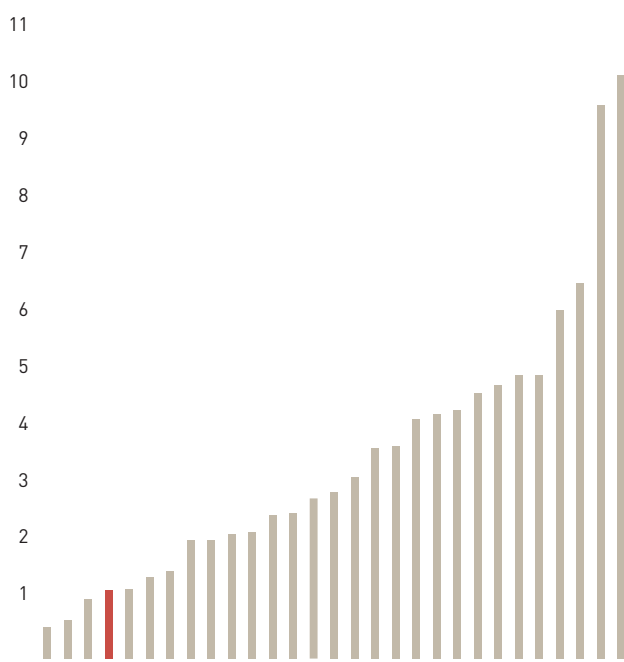
Our CPP proposal to the Commission seeks to reset our reliability targets, which the Commission monitors, to reflect the current state of our network. We seek to reduce the targets for the length of, and frequency of, power cuts that our community experiences. These targets reflect the fact that the performance of our network will improve as it is rebuilt.

If the Commission accepts our proposal, by the end of 2019 we expect to be well on the way to achieving our historical reliability levels.

Year ended 31 March	Historical reliability performance and current targets					The new targets we seek from the Commerce Commission				
	2009	2010	2011	2012	Orion's current target (as set by the Commerce Commission)	2015	2016	2017	2018	2019
Length of power cuts per consumer (SAIDI) in minutes	62	61	3812	231	60	102	93	90	81	72
Number of power cuts per consumer (SAIFI)	0.6	0.6	3.0	2.2	0.8	1.4	1.2	1.2	1.0	0.9

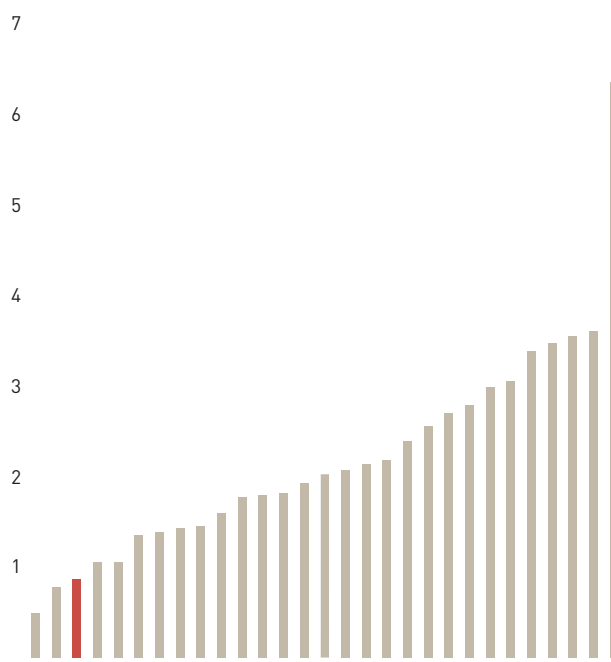
By 2019, on average, the number of minutes consumers would be without power and the number of faults a consumer would experience each year would be only slightly above pre-earthquakes levels.

Length of power cuts per consumer (hours)



**Orion's proposed SAIDI in 2019 compared to other electricity distributors' performance (historical average five years to 2011)**

Number of power cuts per consumer



**Orion's proposed SAIFI in 2019 compared to other electricity distributors' performance (historical average five years to 2011)**

As part of our CPP proposal to reset reliability targets, we are required to engage an independent engineering expert to report on our proposed reliability levels to 2019. This independent engineering company, LineTech Consulting Limited, has concluded:

"it is the reviewer's opinion that Orion has chosen an appropriate balance between expenditure on the network and the expected improvement in performance. This recognises the present damaged state of parts of the network as well as the availability of resources for the work."

# 5.3 Our proposed future prices

The final price we charge consumers for delivering electricity contains two elements:

- a distribution charge which reflects Orion’s costs for building and maintaining our local network, and
- a transmission charge which reflects Transpower’s charges for transmitting electricity along the national grid. The transmission charge is billed to us by Transpower and we then pass it on to consumers.

In this section when we mention price or charge, we are talking about Orion’s distribution prices and charges only – we are not including the transmission charge set by Transpower, or charges from generators or retailers.

Our charges make up around 25% of a typical household or business electricity bill. Around 85% of our customers are households.

We are usually permitted, through the Commerce Commission regulatory process, to change our prices on 1 April each year – roughly in line with inflation each year.

We did not increase our prices at all in 2012 and we plan to increase our prices only slightly to reflect inflation next year. For the three years between the February 2011 earthquake and 1 April 2014 our prices have not kept pace with inflation and we have not recovered any earthquake related costs.

We propose to increase our prices after 1 April 2014 and we intend to apply to the Commission in 2013 to enable us to do this. We propose to apply for approval to increase our prices by 15% above inflation in the year after next (from 1 April 2014) and by 1.2% above inflation for the four years following. In the table below we show the monthly impact, for a typical household, of this proposed price increase if it is approved.

For a household, the average, above inflation, impact of our price proposal is around \$8.50 a month.

Our proposed price increase – the impact on an average monthly household power bill (including GST, excluding inflation)						
Year starting 1 April	2014	2015	2016	2017	2018	2019 to 2023
Impact of our proposed prices	\$6.80	\$7.40	\$8.00	\$8.70	\$9.30	\$8.90
Average impact = \$8.50 a month						

For a typical current monthly household power bill of about \$180 a month, this \$8.50 a month increase equates to a one-off above inflation price increase of around 5%. This increase would help to pay for the restoration of a repaired, resilient and reliable electricity network that is fit for purpose and that can support the Canterbury rebuild and growth.

Our proposed price increase enables us to recover the uninsurable earthquake costs and revenue losses we have incurred since September 2010. So far we have been unable to recover these costs and losses because of the price regulation that limits what we can do. In effect, our revenue shortfall is due to the regulatory regime not reflecting that the earthquakes have happened.

We have considered how quickly these costs should be recovered, and whether we can defer any costs into the future in order to minimise the immediate pricing impacts. In order to do this we have spread our proposed cost recovery over 10 years rather than the standard five years allowed for by the Commerce Act. We have also deferred the recovery of some of our asset costs until after the rebuilding phase.

The figure of \$8.50 a month is for a typical household. For a typical small or medium business, we estimate the impact of our proposal to the Commission is proportionately about the same. This means that for a typical small or medium business, the above inflation impact of our proposal is about \$100 a year, excluding GST, for every 10,000kWh of power the business uses each year.

The table below shows our estimate of the percentage change in price that various consumer groups could expect from our proposed price increase.

Above inflation impact of our proposed price increases in % terms								
Year starting 1 April	2011	2012	2013	2014	2015	2016	2017	2018
Orion's proposed price increase (distribution component)	0%	-1.8%	0%	15%	1.2%	1.2%	1.2%	1.2%
Impact on a typical household total electricity bill	0%	-0.5%	0%	3.8%	0.3%	0.3%	0.3%	0.3%
Impact on a typical small or medium sized business's total electricity bill	0%	-0.5%	0%	3.8%	0.3%	0.3%	0.3%	0.3%
Impact on a typical irrigator's total electricity bill	0%	-0.6%	0%	5.3%	0.4%	0.4%	0.4%	0.4%
Impact on a typical major customer's total electricity bill	0%	-0.3%	0%	2.3%	0.2%	0.2%	0.2%	0.2%
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	No recovery of earthquake costs			Our proposal				

## 5.4 The Commerce Commission process

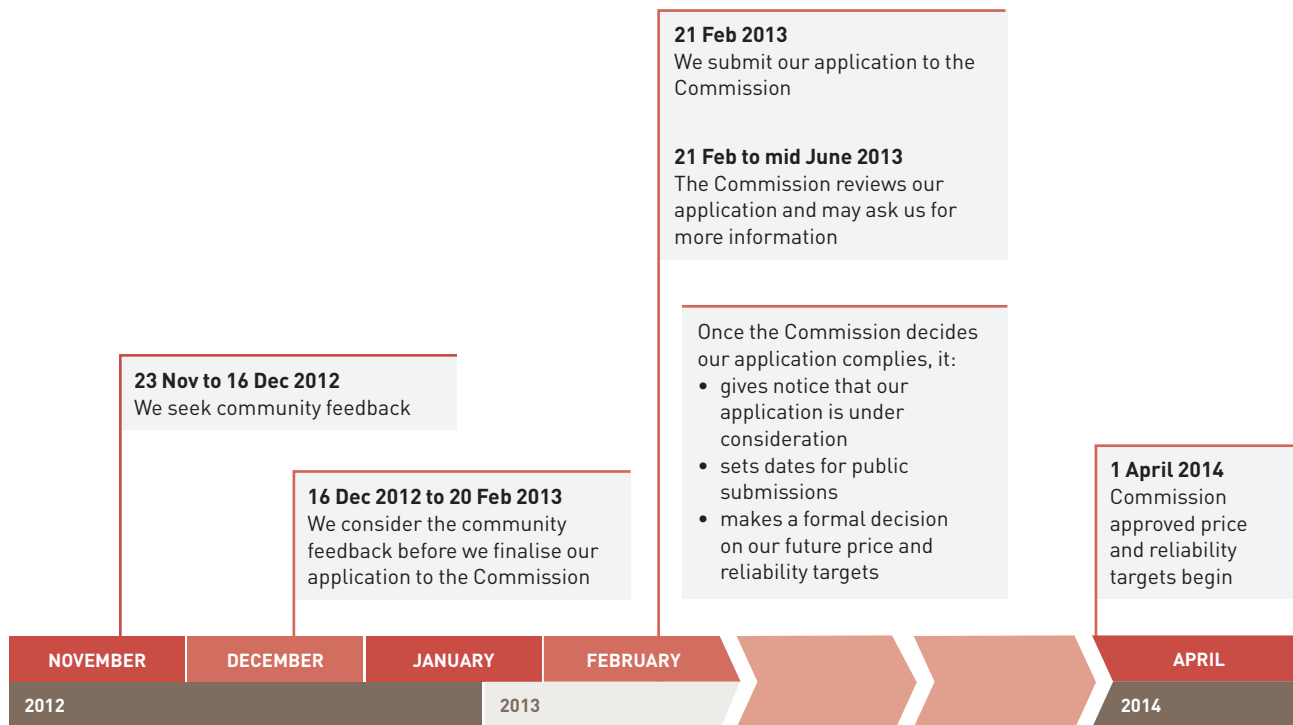
As part of our CPP proposal, we want to know what you think Orion should do at this vital juncture in Canterbury's history. We have a long history of communicating with our community and listening to what you want from us. Historically, our community's number one priority for us has been to 'keep the lights on'. Amongst other matters, we want to know whether that priority has lessened to any degree and what you think of our proposed price and reliability targets.

We require your feedback by Sunday, 16 December 2012.

Between 17 December 2012 and 21 February 2013 we will consider your feedback and build it into our proposal. So, depending on the comments you and others provide, our proposal may change before it is submitted to the Commission in February 2013.

You will also be able to comment on our final proposal. In 2013 the Commission will formally assess our proposal and consult with interested parties, including the public, before making a final decision on our new price and reliability targets. The final decision will most likely be made in late 2013 or early 2014.

Before we submit our proposal to the Commerce Commission in February 2013, a Commission-approved 'verifier' will also effectively audit our proposal (a verifier is an expert who checks that the vast amount of information supplied in our proposal is correct). An independent engineering review of our proposed reliability standard has already been carried out.



## 5.5 Your feedback

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We seek your feedback on our CPP proposal which has been summarised in this guide. If you would like further information on our proposal please email [CPPfeedback@oriongroup.co.nz](mailto:CPPfeedback@oriongroup.co.nz) or call 363 9898.

Your feedback can be made online ([www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp)) or posted to the following address:

*CPP feedback  
Orion NZ Ltd  
PO Box 13896  
Christchurch 8141*

Please ensure we receive your feedback and comments by Sunday 16 December 2012. This will give us time to consider your submission prior to our proposal being submitted to the Commerce Commission in February 2013.

Please include in your submission, which may be made public:

- your name and address, including post code
- whether you are submitting as a residential consumer or a business consumer.

To assist you with your submission, the following questions may be useful for you to consider:

- Were you happy with the quality and reliability of your power supply before the Canterbury earthquakes?
- What impacts did power cuts after the earthquakes have on you?
- How well do you believe our electricity network stood up to the earthquakes?
- In the future, for protection against any major disaster, should our electricity network be built as strong as it was before the Canterbury earthquakes? Or do you want a stronger electricity network? Or would you be happy with an electricity network that wasn't so strong?
- On a normal day-to-day basis, do you want the lights to stay on as well as they did before the earthquakes? Or do you want a more reliable power supply? Or would you be happy with a less reliable power supply?
- We propose to rebuild our network by 2019. Do you agree with this timeframe? If not, what timeframe do you suggest? Note that completing the rebuild sooner will cost more.
- Do you think we should be able to recover our earthquake-related costs?
- Do you think we should recover our earthquake-related costs from the people who use our network?
- If we do recover our costs, should it be over the 10-year period we propose or over five years (which would mean higher prices until 2019 but lower prices for the five years after)?



## 5.6 What you can expect from us in the years ahead

---

As always, we will continue to look for ways to improve our performance so that our community gets the 'best bang for buck' out of us. Orion is committed to support the rebuild of Christchurch and we intend to provide the vital platform of a secure and reliable electricity network so that the Canterbury economy can grow. We will do this in the most efficient manner possible.

We will continue to improve our planning, our project execution and our maintenance and repair techniques to keep costs down. We will also continue to adopt an innovative approach to electricity delivery pricing that encourages household and business consumers to reduce demand when our network is heavily loaded. This means less network investment and results in savings to consumers, encourages energy efficiency and minimises environmental effects.

Over the past two decades we reinforced our electricity network to cope with earthquakes. That planning and future-proofing helped us and our community enormously during the past two years – but that planning and future-proofing is as crucial now as it was then. We will think about the next 20-40 years and ask ourselves: what will help us get through the things we could face over that period?

Also, to minimise disruption and save on costs, where possible we will work with the Stronger Christchurch Infrastructure Rebuild Team (SCIRT) to collaboratively repair underground services together.

Orion plays a crucial role in our city, but more than that, we are a committed partner in the rebuild, eager to help bring the vision for Christchurch and Canterbury to life. The best way we can do that is to continue to invest, continue to 'keep the lights on' and be ready to respond once again if disaster strikes.

# Appendix 4

Consultation – Impact on major consumer prices

# Price increase in % terms

Above inflation impact of our proposed price increases in % terms								
Year starting 1 April	2011	2012	2013	2014	2015	2016	2017	2018
Orion's proposed price increase (distribution component)	0%	-1.8%	0%	15%	1.2%	1.2%	1.2%	1.2%
Impact on a typical household total electricity bill – Orion is 25% of bill on average	0%	-0.5%	0%	3.8%	0.3%	0.3%	0.3%	0.3%
Impact on a typical major customer's total electricity bill – Orion is 15% of bill on average	0%	-0.3%	0%	2.3%	0.2%	0.2%	0.2%	0.2%
	<div> <div></div> <div></div> </div>			<div> <div></div> <div></div> </div>				
	No recovery of earthquake costs			Our proposal				

= **3%** on total power bill on average for major customers (5% households)

# Appendix 5

Consultation – newspaper advertisements

# Orion's proposed electricity network reliability and prices

The impacts of the earthquakes on Orion's electricity network have been significant. Our repair and recovery work continues and we are now working to support the Christchurch rebuild by providing a strong electricity network. This work will cost tens of millions of dollars.

Our network prices and our network reliability targets – our targets to keep the lights on – are set by the Commerce Commission. Our current prices and reliability targets were set before the earthquakes.

Given the impact of the earthquakes, we intend to apply to the Commission for a price increase that would start on 1 April 2014, the year after next. We also propose reliability targets that would see our network return to near pre-earthquake reliability and resilience levels by 2019.

Before we apply to the Commission, we need to know whether you want us to rebuild our network so that the lights stay on as well as they did before the earthquakes and what you think about our proposal to apply for a price increase.

We want to continue to make sound investments in our network for the long term benefit of our community, like the investments we made in seismic-strengthening which prevented an extra \$65m of damage to the electricity system in 2011. That work also prevented months of power cuts after the earthquakes, something that was very important for our whole community's social and economic well being.

Please read the information here and on our website and let us know what you think.

We thank you for your support over the last two years.

**Rob Jamieson**

Chief Executive Officer  
Orion New Zealand Limited



Orion has continued to operate from the Christchurch CBD since the earthquakes. Our 160 employees came through the Canterbury Earthquake Recovery Authority cordoned each day for 14 months to keep the power on. We are now on the edge of the 'red zone'.

## Who is Orion and what does it do?

Orion is your local electricity distribution company. We take power from the national grid, owned by Transpower, and distribute it to all 190,000 power consumers in Christchurch and central Canterbury.

Our electricity network covers the area between the Waimakariri and Rakaia rivers, and from the Canterbury coast to Arthur's Pass.

**We are owned by the Christchurch City Council (89%) and Selwyn District Council (11%).**

Orion's electricity network can be compared to a road network. It is made up of:

- large 66,000 volt (66kV) cables and equipment that carry power to over 100 substations. They are like ring roads round a city, but instead of traffic, transport 'bulk power' to the main areas where it's needed
- substations, where we 'step down' the voltage from 66kV to 11,000 volts (11kV) to take power to smaller areas, much like main suburban roads.
- roadside transformers at street level, which convert the power to the 230 volts that goes down the lines and cables in your street to your home or business.

## How the earthquakes affected Orion

The earthquakes caused extensive damage to the roads, water, wastewater and sewage pipes in Christchurch. The cost of that rebuild is estimated at \$2 billion.

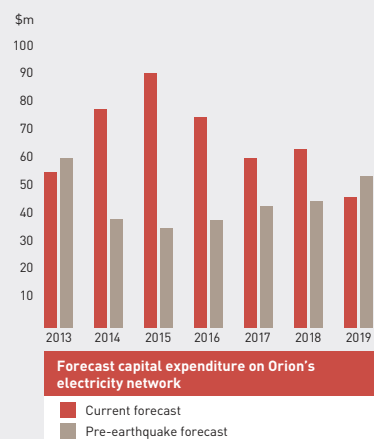
Our electricity network also suffered significant damage and our costs have increased.

**We need to spend about \$155m more in capital expenditure than was forecast before the earthquakes. We will have to repair or develop nearly every major section of our network, in Christchurch and wider Canterbury, before 2019.**

The extra expenditure is needed to restore our network in damaged areas as well as expand our network in areas such as Rolleston, Lincoln and Belfast where the population is growing as a result of the quakes. Extra investment is also needed in the badly damaged central city.

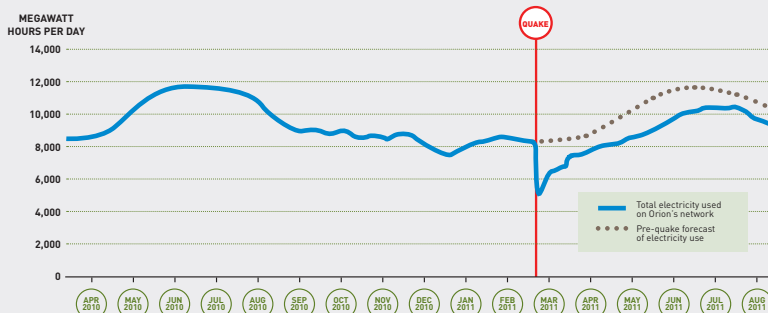
Our extensive seismic strengthening programme in the 15 years before the earthquakes reduced our repair costs by about \$65m. It also meant that power was restored much quicker after the quakes. Without this work, power would likely have been out for months in some areas.

Since the quakes the amount of power supplied on our network has dropped by about 10%, mostly due to buildings being demolished. The graph below shows the



sharp reduction after the February 2011 earthquake. That drop continues to this day.

**We estimate that our loss in revenue has been close to \$30m so far. By 1 April 2014 it will be around \$50m.**



## Summary

### What we propose

- Given the impact of the earthquakes, we intend to apply to the Commerce Commission in February 2013 for a review of our regulated prices and network reliability targets.
- We propose to target a level of electricity network reliability and resilience by 2019 that is near pre-quake levels.
- We propose a price increase, starting 1 April 2014, spread over several years. Our proposed increase, excluding inflation, equates to 5% more on the average electricity bill of a household or business. For a typical household consumer, the impact of our proposal would be an increase of \$8.50 a month including GST in today's dollars.
- These prices provide no more than a fair return and provide the right incentives for us to continue to make sound investments for the good of our consumers.

*The Commerce Commission will assess our proposal thoroughly and consult with our community before it makes any decision about our pricing and reliability levels.*

### Context

- Before the earthquakes our electricity network was reliable and resilient in line with our community's expectations, and our pricing was below the New Zealand average.
- Our prices typically amount to one quarter of an average household or business electricity bill.
- Our pre-earthquake seismic protection work and planning is estimated to have saved us \$65m in repair bills.
- Our seismic protection work also helped prevent more severe damage and cost to our community's social well being and to Canterbury's \$15b economy.
- Despite our seismic protection work, the earthquakes caused unprecedented damage to our network.
- In the three years between the earthquakes and 1 April 2014 our regulated prices will not keep pace with inflation, despite the impact of the earthquakes.

## Reviewing our prices and reliability

All electricity distribution companies in New Zealand are regulated businesses. Orion is one of these and that means we come under the control of a law called the Commerce Act. The Act controls the price and quality of goods or services in markets where there is little or no competition.

A Government organisation called the Commerce Commission administers the Act. The Commission sets targets for how reliable our electricity network should be and also sets limits for the prices that we can charge to deliver electricity around our region.

A regulated company like Orion is different from most other businesses. By law, we cannot make big gains in good times to balance out higher costs when times get tough.

As well as limits on our prices, there's no allowance in advance for the uninsurable costs of disasters. We couldn't insure our overhead lines and underground cables before the quakes

(and still can't) because it wasn't economic to do so. We are not aware of any electricity distribution company in Australasia that insures its lines and cables. Where we could economically insure parts of our electricity network, such as our buildings, we did so.

**The Commission allows us to apply for a review of our network reliability targets and prices after a natural disaster. Given the financial impact of the earthquakes, we intend to apply to the Commission for one of these reviews.**

**The review would aim to recover our costs from the people that use, and benefit from, our network. It would also change our reliability targets to reflect the state of our network while earthquake recovery is underway.**

**Any new prices and reliability targets would apply from 1 April 2014.**



Our earthquake repairs and recovery will continue over the next six years.

## Our proposed reliability

Even though major emergency repairs are finished, there is still much work ahead of us to build strength back into the electricity network. As power cuts will continue while recovery work is underway, we propose to apply to the Commerce Commission for new reliability targets which better reflect the damaged state of our network.

As shown in the table below, we propose that:

- the number and length of power cuts on our electricity network will reduce as we rebuild our network
- by 2019 the number and length of power cuts will be, on average, only slightly above pre-earthquake levels.

Year ended 31 March	Historical reliability performance and current targets					Our proposed reliability targets				
	2009	2010	2011	2012	Orion's current target (as set by the Commerce Commission)	2015	2016	2017	2018	2019
Length of power cuts per consumer (in minutes)	62	61	3812	231	60	102	93	90	81	72
Number of power cuts per consumer	0.6	0.6	3.0	2.2	0.8	1.4	1.2	1.2	1.0	0.9

## Our proposed prices

**Our charges make up around 25% of a typical household and business electricity bill.**

We propose to apply to the Commerce Commission for approval to increase our prices by 15% above inflation in the year after next (from 1 April 2014) and by 1.2% above inflation for the four years following.

**Based on the average household power bill of \$180 a month the average increase will be \$8.50 per month\* - this equates to a one-off 5%\* increase to the average monthly power bill.**

*\* excludes inflation*

Our price increase proposal – the impact on an average total monthly household power bill (including GST, excluding inflation)						
Year starting 1 April	2014	2015	2016	2017	2018	2019 to 2023
Impact of our proposed prices	\$6.80	\$7.40	\$8.00	\$8.70	\$9.30	\$8.90
Average impact = \$8.50 a month						

This increase would help to pay for a repaired, resilient and reliable electricity network that's fit for purpose and that can support the Canterbury rebuild.

The figure of \$8.50 per month on average is for a typical household. A small or medium business would see an increase of about \$100 a year, excluding GST, for every 10,000kWh of power used.

We did not increase our prices at all this year and we plan to increase our prices only slightly to reflect inflation next year. So for the three years between the February 2011 earthquake and 1 April 2014 our prices will not have kept pace with inflation and we will not have recovered any quake-related costs.

## The Commerce Commission process

Depending on any comments that you and others provide, our proposal may change before we submit it to the Commerce Commission in February 2013.

Before it's submitted, a Commission-approved 'verifier' will check that the information supplied in our proposal is correct.

If the Commission decides to proceed with our application, it will then consult with our community in 2013. If it decides to approve a change to our prices and network reliability targets, the earliest we could increase our charges is 1 April 2014.

### 21 Feb 2013

We submit our application to the Commission

### 21 Feb to mid June 2013

The Commission reviews our application and may ask us for more information

Once the Commission decides our application complies, it:

- gives notice that our application is under consideration
- sets dates for public submissions
- makes a formal decision on our future price and reliability targets

### 23 Nov to 16 Dec 2012

We seek community feedback

### 16 Dec 2012 to 20 Feb 2013

We consider the community feedback before we finalise our application to the Commission

### 1 April 2014

Commission approved price and reliability targets begin



## Your opportunity to comment

We're keen to hear what you think of our proposal. **Your feedback is needed by 5pm on Sunday, 16 December 2012.** Feedback can be made online at [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp) or by post to:

CPP Feedback  
Orion New Zealand Limited  
PO Box 13896  
Christchurch 8141

You can also email your feedback to [CPPfeedback@oriongroup.co.nz](mailto:CPPfeedback@oriongroup.co.nz).

Please note that your feedback may be made public.

You're also welcome to attend a **public information day on Monday 3 December 2012** from 10am to 4pm at our offices at 200 Armagh Street, opposite Centennial Pool.

## Need more information?

**Website:** visit our website at [www.oriongroup.co.nz/cpp](http://www.oriongroup.co.nz/cpp).

A plain English guide and other material is available there to help you understand our proposal.

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Repair crews replace damaged 11kV cables on Bexley Road. Since the earthquakes we've seen more than 1,000 cable faults on our network – more faults than we usually see in a decade.

**Orion**  
RESTORING your NETWORK  
0800 363 9898



# Orion's proposed electricity network reliability and prices

The impacts of the earthquakes on Orion's electricity network have been significant. Our repair and recovery work continues and we are now working to support the Christchurch rebuild by supplying a strong electricity network. This work will cost tens of millions of dollars.

Our network prices and our network reliability targets - our targets to keep the lights on - are set by the Commerce Commission. Our current prices and reliability targets were set before the earthquakes.

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We want to continue to make sound investments in our network for the long term benefit of our community, like the investments we made in seismic-strengthening which prevented an extra \$65m of damage to the electricity system in 2011. Those investments also prevented months of power cuts after the earthquakes, something that was very important for our whole community's social and economic well being.

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We thank you for your support over the last two years.

**Rob Jamieson**

Chief Executive Officer  
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## Context

- Orion's prices typically amount to **one quarter of an average household or business electricity bill**.
- Since the earthquakes, our prices have **not kept pace with inflation**.
- We need to spend an extra **\$155m in capital expenditure** than was forecast before the quakes.
- The amount of **electricity used on our network has dropped 10%** since the February 2011 quake.
- It is **uneconomic to insure** overhead power lines and underground cables. We are not aware of any electricity distribution company in Australasia who has this insurance.



Repair crews replace damaged 11kV cables on Bexley Road. Since the earthquakes we've seen more than 1,000 cable faults on our network - more faults than we usually see in a decade.

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Orion New Zealand Limited owns and operates the electricity distribution network in central Canterbury between the Waimakariri and Rakaia rivers. Our shareholders are the Christchurch City and Selwyn District councils.  
[oriongroup.co.nz](http://oriongroup.co.nz)

**Orion**  
RESTORING your network  
0800 363 9898

# Appendix 6

Consultation – list of respondents

## Respondents to consultation

Respondents who provided feedback via online survey							
Reference number	Name	Address or organisation	City	Individual (I) or group (G)	Residential (R) or business (B) electricity user	Comment	Presentation attendee
1	Carlin Rutherford	Unit 27, 105 Bamford Street	Chch 8023	I	B	Partner of staff member	
2	Kell Casey	70b Brynley St	Chch 8042	I	R		
3	Richard	34 Cobra St	Chch 8025	I	R		
4	Tim Emson	33 St Asaph St	Chch 8011	I	B		
5	Lucas Lormans	19 Tyne St	Chch 8013	I	R & B		
6	David Syme	55 Travis Country Drive	Chch 8083	I	R	Meridian Energy Key Account Manager	
7	G D Christie	612 Halswell Rd	Chch 8025	I	R		
8	Colin Foster	49 Sir William Pickering Drive	Chch 8053	I	R & B	Major customer - Chorus	
9	Chris Whitburn	2/6 Chardale St	Chch 8061	I	R		
10	Greg Scott		Chch 8062	I	R		
11	Greg Dodds	98 Ranfurly St	Chch 8014	I	R & B	Contract graphic designer used by Orion	
12	Darcy Mora	73 Corfe St	Chch 8041	I	R		
13	Nick Price	7 Micron Close	Chch 8051	I	R & B	Meridian employee	
14	John Walley	NZ Manufacturers and Exporters Association		G	R & B	CEO of NZMEA and previously Canterbury	Yes

15	Peter Townsend	North Canterbury Employers' Chamber of Commerce		G	R & B	Manufacturers Association CEO of CECC	Yes
16	Mike Harding	Rough Creek Rd	Arthur's Pass 7875	I	R		
17	Robin Donovan	265 Lowes Rd	Rolleston 7614	I	R		
18	Nat Clark	72 Highsted Rd	Chch 8053	I	R		
19	Bryce Paul	71 Jolie St	Chch 8062	I	R		

Respondents who provided feedback via email or letter							
Reference number	Name	Address or organisation	City	Individual (I) or group (G)	Residential (R) or business (B) electricity user	Comment	Presentation attendee
20	Mike Davis	Unknown		I			
21	Monique Deveruex	14a Francis Ave	Chch 8013	I			
22	Mel Pederson	Unknown		I	R & B	Electricity industry consultant	Yes
23 - Meridian	Meridian Energy	Meridian Energy (retailer with over 76,000 connections in the Orion network area. Represents 40% of Orion's customer connections		G		General Manager, Retail at Meridian	Yes
24	Ann Taylor	Guthries Rd	Chch 8051	I			
25	Bob Devlin	21 Kensington Ave	Rangiora	I			

26	John Hoare	76B Hackthorne Rd	Chch 8022	I		Advocate for low emission wood burners vs use of heat pumps	
27	Leigh Harris	104 Broadhaven Ave	Chch 8083	I	R & B	Communications consultant previously used by Orion	
28	G McKenzie	128 Edinburgh St	Chch 8024	I			
29 - SDC	Selwyn District Council	Ultimate 10.7% shareholder of Orion		G		Shareholder and Council for approximately 45,000 residents and 5,000 business connections.	Yes
30 - CCHL	Christchurch City Holding Limited	89.3% shareholder of Orion		G		Council for majority of residents and business connections	Yes
31 – Ecan	Environment Canterbury	Regional Council responsible for Orion network area		G		Regional Council for Canterbury	
32	D and P Foster			I			
33 – Genesis	Genesis Energy	Genesis Energy (retailer with over 45,000 connections in the Orion network area. Represents 24% of Orion's customer connections)		G		Energy Services Leader, Commercial & Technical Team, Genesis Energy	Yes
34 – MUEG	MEUG	Group representing 18 major electricity users nationwide.		G		MEUG	

		8 members have connections in the Orion network area. These members use less than 1% of total electricity supplied by Orion			
35	David Close			I	
36 – Grey Power	Grey Power Federation	Lobby Organisation for the 50 plus age group	Auckland	G	
37	Gary Graham	17a Office Rd	Chch 8014	I	
38	Ravensdown Fertiliser	312 Main South Rd	Chch 8042	G	B

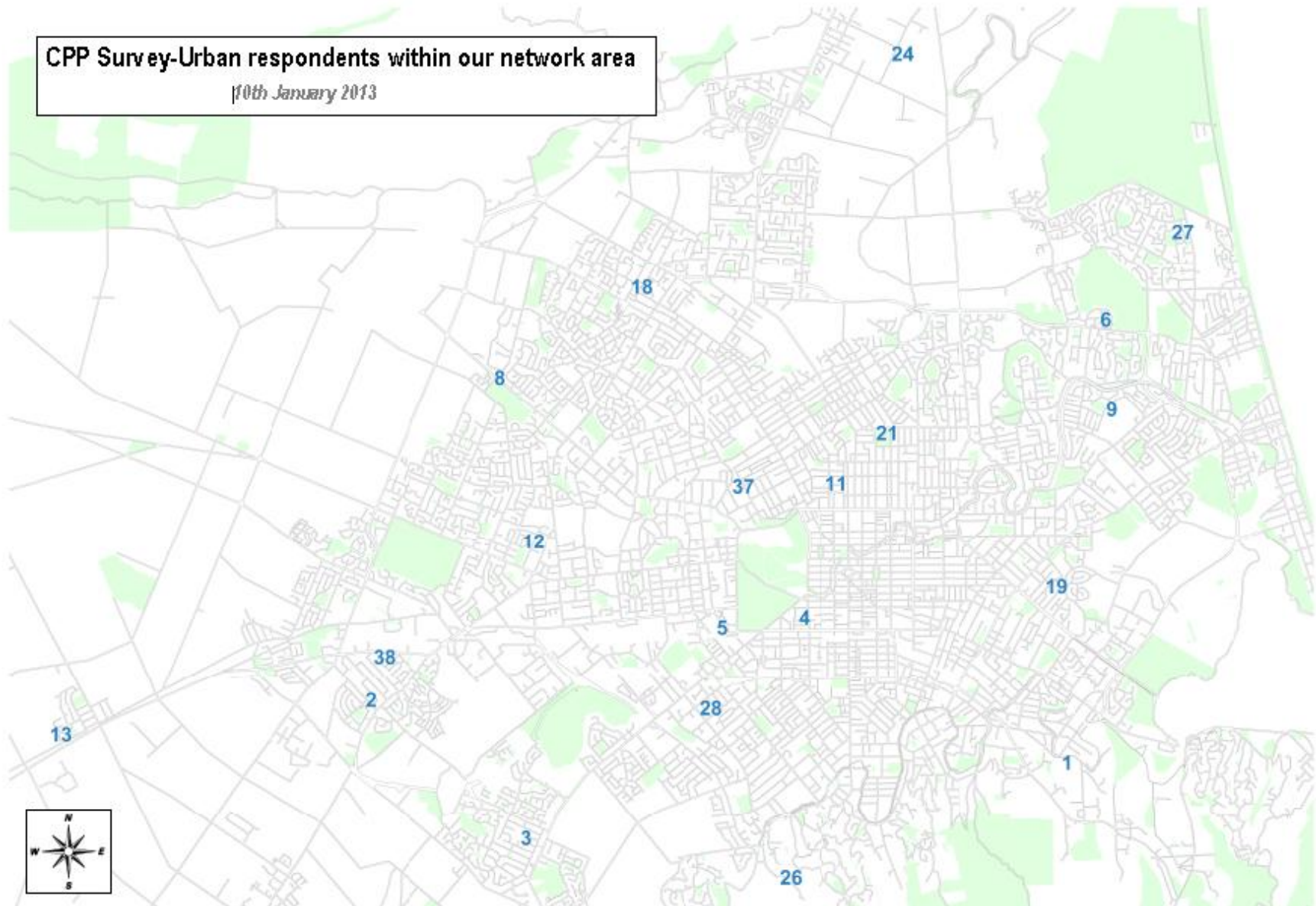
Map of respondents

The following maps show the location (where known) of the individual responses received to our consumer consultation. Representative groups with local head offices are not shown on these maps. MEUG, Genesis Energy and Grey Power have head offices in the North Island.



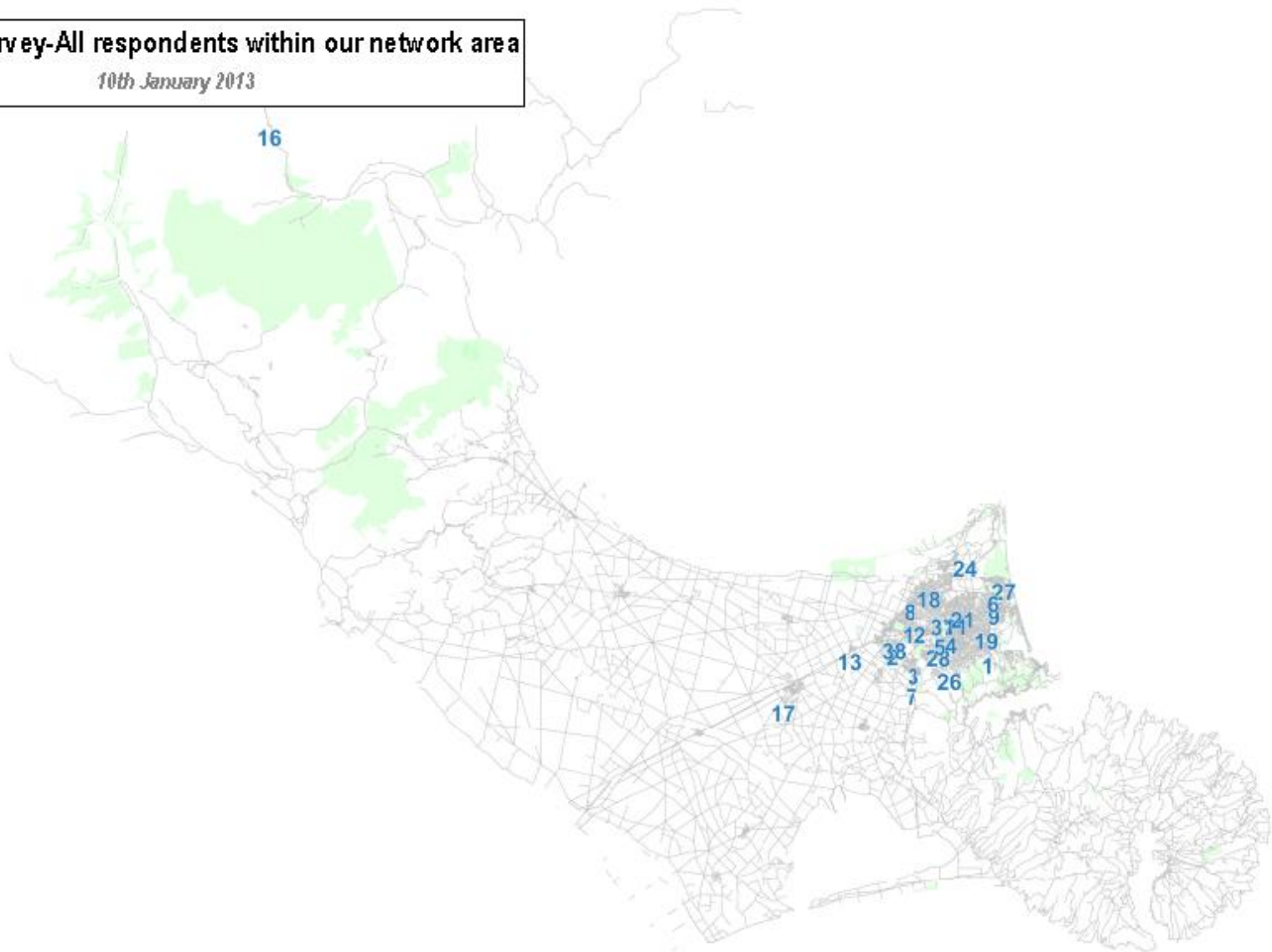
**CPP Survey-Urban respondents within our network area**

*10th January 2013*



**CPP Survey-All respondents within our network area**

*10th January 2013*



# Appendix 7

## Verification report and certificate

***Geoff Brown & Associates Ltd***

**ORION'S CUSTOMISED PRICE PATH APPLICATION**

**VERIFICATION REPORT**

**Prepared for**

**ORION NEW ZEALAND LTD**

**FINAL**

**18 FEBRUARY 2013**

Report prepared by:      Geoff Brown, Malcolm Campbell and Pieter Nel.

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## DISCLAIMER

This report has been prepared for Orion New Zealand Ltd (Orion) and the Commerce Commission (Commission) to assist the Commission's review of Orion's customised price path application. Geoff Brown and Associates Ltd accepts no responsibility to any party other than Orion or the Commission for the accuracy or completeness of the information or advice provided in this report and does not accept liability to any party if this report is used for other than its stated purpose.

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## **EXECUTIVE SUMMARY**

### **GENERAL**

There is a high level of uncertainty in the environment within which Orion will need to operate over the forecast period. This relates not only to the rate and location of demand growth, but also to the costs that Orion will incur in delivering its capex and opex programme.

Orion's procedures for the formulation and delivery of its work programmes are robust and the resources available to fund Orion's works programme will be effectively used. We also consider that the unit costs assumed by Orion in developing its cost estimates are reasonable. This would suggest that in its appraisal the Commission should primarily focus on the need for the works described in the CPP proposal and the benefits that these works will provide consumers and other stakeholders.

### **PLANNING CRITERIA**

It is unclear whether Orion's current planning criteria are still appropriate in the post-earthquake environment. In particular we think the requirement that all 66 kV subtransmission circuits in urban areas be constructed underground should be reviewed as overhead lines are much less costly to build, have significantly shorter repair times and greater earthquake resiliency. We also think Orion should consider whether its N-2 security criteria should be relaxed and this could allow the construction of some subtransmission projects to be deferred. As N-2 contingencies are relatively uncommon, this may not have a significant impact on overall network reliability.

### **DELIVERABILITY**

Over the two year period FY13-FY14 Orion's total network works expenditure is expected to increase by 84% above the level achieved in FY12 and we question whether the delivery of such a large increase in works volume over such a short period of time is achievable. Orion's actual works expenditure in FY13, and the volume of work actually delivered in FY13 will be a good indicator of whether or not delivery of the works programme set out in the CPP proposal can actually be achieved.

### **CAPEX FORECAST**

Orion's major project capex forecast is reasonable on the basis of the planning criteria it is currently using. However, if the planning criteria are changed, the forecast should be revised.

While some increase in expenditure on asset replacement is warranted the forecast increase in asset replacement and renewal capex over past levels of expenditure appears very high. Orion should be required to provide further justification for the level of expenditure in its forecast. This could include a sensitivity analysis of the impact of lower levels of asset replacement expenditure on failure rates and supply reliability.

Forecast capex in other areas is generally reasonable. However, reinforcement and connections and extensions capex requirements are driven by the rate of growth in demand and the location of new customer connections and these are areas with very high levels of uncertainty in the post-earthquake environment.

### **OPEX FORECAST**

Orion's forecast fault and emergency maintenance opex is reasonable.

On balance, Orion's forecast scheduled maintenance opex is reasonable, except that we see no need for the maintenance contingency.

Orion's forecast for corporate management (CPP160) opex is reasonable and possibly conservative. The forecast for some other non-network opex line items including communications and engagement, special projects, corporate information systems, and system management and operations appears high, particularly in the latter years of the forecast period. In most of these areas, there appears to be an assumption that the resources needed to support the peak of the earthquake rebuild effort in FY14 and FY15 will need to be retained through to the end of the forecast period. We question the validity

of this assumption on the basis that by FY19 aggregated network capex and opex expenditure is forecast by Orion to be 32% lower in real terms than the corresponding expenditure at the peak of the rebuild.

## **OTHER MATTERS**

We consider that Orion's forecast for capital contributions for connections and extensions and underground conversions is reasonable to the extent that any under-recovery is unlikely to be material. We also think that Orion should review all its cost recovery models to ensure that they accurately reflect current cost structures and are consistent with the relevant regulatory requirements.

We consider that the methodologies used by Orion to forecast demand and energy growth are reasonable, although we again note the abnormally high level of uncertainty in the post-earthquake environment.

We consider that the asset lives used by Orion for depreciating assets not specifically referenced in Schedule A of the IM are reasonable and that the alternative depreciation method proposed by Orion for some assets during the CPP period meets the purpose of Part 4 of the Commerce Act 1986.

We have reviewed the approaches and assumptions used by Orion to derive the cost escalators used in its CPP proposal and consider them to be reasonably sound.

## 1. INTRODUCTION

Orion New Zealand Ltd (Orion) is the electricity distribution business (EDB) serving the Christchurch City and Selwyn District Councils' territorial areas in the Central Canterbury region and is jointly owned by the two Councils. As an investor-owned EDB, it is subject to price-quality regulation administered by the Commerce Commission (Commission) under Part 4 of the Commerce Act, 1986 (Act). The Commission produces input methodologies, which set out the rules, requirements and processes applying to the regulation of electricity distribution services in accordance with the Act.

In accordance with these regulatory arrangements, the prices Orion charges for its services and the quality of service it must provide are currently subject to a default price-quality path (DPP) in accordance with the Commission's Electricity Distribution Services Default Price-Quality Path Determination 2010. However, under section 53Q of the Act, Orion may make a proposal to the Commission for a customised price-quality path (CPP), which would permit it to operate under a different price-quality regime than the DPP that currently applies. The Commission may allow an individual EDB to operate under a CPP if it considers that the price-quality path determined under the more generic DPP approach is not appropriate given the specific needs of the EDB. The processes and procedures that Orion must follow if it submits a CPP application are set out in the Commission's Electricity Distribution Services Input Methodologies Determination 2012 (the IM).

The series of earthquakes that hit the Christchurch region starting on 4 September 2010 caused significant damage to Orion's infrastructure. In order to fully recover the cost of rebuilding the network following these events, Orion is submitting a CPP application to the Commission in accordance with the relevant provisions of the IM. The CPP application proposes an alternative path that would regulate the price and quality of Orion's electricity distribution services over the period 1 April 2014 to 31 March 2019.

Part 5 of the IM specifies the processes that apply to the submission of a CPP application and to their assessment and determination by the Commission and also specifies the information that must be included in any CPP application. Clause 5.5.2 of the IM requires any CPP proposal<sup>1</sup> to be verified by an independent verifier, who must be engaged in accordance with Schedule F of the IM and who must verify the CPP proposal in accordance with the terms of reference set out in Schedule G of the IM. Clause F5 of the IM requires the verifier to be engaged in accordance with a deed that it enters into with the Commission that, importantly, imposes on it a duty of care to the Commission.

Geoff Brown & Associates Ltd has been contracted by Orion to verify its CPP proposal and has entered into a tripartite deed with Orion and the Commission in accordance with the requirements of Schedule F of the IM. It has reviewed and assessed the CPP proposal and other relevant information provided by Orion and has produced this verification report in accordance with the requirements of Schedule G.

It is important to note that the verification described in this report was an independent review and assessment of the information in the CPP proposal relevant to the terms of reference, which relate mainly to the expenditure forecasts on which the proposed CPP is based. It was undertaken in accordance with clause 5.5.2 of the IM and was not the audit required by clause 5.5.3. In undertaking our verification we have therefore relied on the accuracy of the information in the CPP proposal and of the other relevant information that Orion provided. That said, in undertaking this verification we sought further clarification where we considered information was inconsistent or could be inaccurate. However, where we considered that the information provided to us was reasonable, we took it at face value and did not seek additional evidence to corroborate its accuracy.

In this report unless otherwise noted, all expenditures, including actual expenditures incurred over the period FY08-FY12, are expressed in real 2013 terms. In the CPP

<sup>1</sup> A *CPP proposal* is a document setting out an EDB's proposed CPP. A *CPP application* includes the CPP proposal, the verification and audit reports and other supporting information as required by subpart 1 of the IM.



proposal only nominal actual expenditures were provided, but for comparison with forecast expenditures, we have escalated these to real FY13 values using the actual consumer price indices published by Statistics New Zealand.

We understand that this verification report will form part of Orion's CPP application in accordance with the requirements of subpart 1 of the IM.

## 2. SERVICE CATEGORIES, MEASURES AND LEVELS

The **verifier** must review, assess and report on whether-

- (a) the **CPP applicant's service category definitions** appropriately describe all activities undertaken for the purpose of **supplying** the **regulated services** as demanded by and provided to **consumers**;
- (b) the reason for any new **service category** is explained;
- (c) the **CPP applicant** has proposed **service measures** relevant to a complete range of key service attributes that are meaningful and important to **consumers**;
- (d) the **CPP applicant** has undertaken an appropriate process to determine the **service measures** and **service levels**, such as consultation with relevant **consumers**; and
- (e) any step change in any **service level** is explained and justified.

### 2.1 SERVICE CATEGORIES

Service category is defined in the IM as follows:

**service category** means one of the categories in the following list which comprises, for the purpose of a CPP proposal, a classification of the services that the CPP applicant provides to its consumers, and service categories means all of the following categories:

- (a) provide and operate network infrastructure between input and offtake connection points and deliver electricity through the network;
- (b) provide load management services;
- (c) provide connection services, including changes of connection point capacity and/or reliability;
- (d) provide for rearrangement of network assets at third party request (includes undergrounding); and
- (e) provide an additional service (or services if necessary) to those listed in paragraphs (a) to (d), specified by the CPP applicant.

In its CPP proposal Orion has indicated that some mapping and rearrangement of the services as listed in Orion's Delivery Services Agreement (DSA) document and Asset Management Plan (AMP) was required to fit the IM service categories<sup>2</sup>. However, the capex and opex breakdowns that Orion currently uses for asset management purposes does not map easily into the service categories as defined in the IM.

Notwithstanding this, Orion has attempted to allocate the different line items in its capex and opex forecasts into the standard IM service categories as discussed below. However, due to limitations in the way this has been done we have undertaken this verification on the basis of expenditure categories rather than service categories.

We do not think this has impacted our verification or affected the validity of our findings. Had the verification been undertaken on the basis of service categories we would have needed to:

- reallocate those expenditure line items where we considered Orion's allocation was inappropriate as discussed in the sections below; and
- allocate corporate and network management and operations opex across the IM standard service categories. This opex comprised approximately 70% of Orion's

<sup>2</sup> Orion's CPP proposal, Section 9.6.1.

total opex over the CPP period and any such allocation would necessarily be arbitrary.

Orion did not use any service categories other than those specified in the IM. However, in Section 8.5.2 of the CPP proposal it has shown non-network capex as well as corporate and network management and operations opex in the separate service category "provide support services". But, in completing Tables 2 and 3 of Schedule E of the IM, Orion did not allocate these expenditures to any specific service category but included them as separate expenditure line items at the bottom of each table. The prescribed IM templates were modified for this purpose.

### 2.1.1 Capital Expenditure

Orion completed Table 2 of Schedule E of the IM by allocating each line item in its capex forecast to the service category it considered most appropriate. Allocations of expenditure forecast line items were as we would have expected. As indicated above, non-network capex was not allocated to a service category.

### 2.1.2 Operations Expenditure

With a similar approach to capex, Orion completed Table 3 of Schedule E of the IM after allocating each line item in its opex forecast to the service category it considered most appropriate. No opex was allocated to the provision of connection services or the rearrangement of assets at third party request. Also, as noted above, corporate network management opex was not allocated to a service category.

## 2.2 SERVICE MEASURES AND LEVELS

Section 9.6 of the CPP incorporates Orion's IM clause D4 information response. It has indicated that its principal services are electricity distribution network delivery service, associated services and discretionary services, as outlined in its distribution services agreement (DSA)<sup>3</sup>. Some service levels and service measures are set out in the DSA, whilst some are updated via their SOI. Orion states that its DSA is a relatively static document and that it relies on its AMP to set out key service levels and measures in a "comprehensive, consistent and regularly updated format".

Orion has included relevant references to its standard DSA and relevant sections of its latest AMP in meeting the information requirements of Schedule D4 of the IM. While the mapping of the standard DSA and AMP service measures and levels do not exactly map to the IM categories, the CPP proposal incorporates a match that we consider substantive.

We note that:

- Orion has provided substantial information on the service measures and target service levels that it uses for its internal management purposes and mapped these, as appropriate, into the relevant Schedule D4 sections;
- it is not clear from the CPP proposal as to the processes that have underpinned the determination of some of the service measures and levels for various service categories, although Orion has demonstrated a long history of consumer consultation in its CPP proposal; and

<sup>3</sup> The references to its DSA in Orion's CPP proposal refer to the version published on Orion's website as at 1 October 2012 (with relevant sections incorporated in Appendix 22 of the CPP Proposal). Orion notes that this version is not entirely up to date (for example certain terms are at odds with recent changes in the Electricity Industry Participation Code). In addition not all of Orion's DSA agreements with retailers are exactly the same. Orion has stated that it has been waiting for finalisation of the model use of system agreement (MUoSA) by the Electricity Authority before publishing a new DSA.

- the establishment of some service levels and measures across the business is not always readily achievable as some of the services are provided to retailers (on behalf of their customers) under individual DSAs and not all retailers may agree to DSA changes.

## 2.3 SPECIFIC OBSERVATIONS

The following specific observations are made in relation to the CPP proposal information relating to service categories, measures and levels:

- Orion has described in detail the changes in network reliability as a result of the earthquakes and has comprehensively explained the step reduction in historical network service reliability levels as measured by metrics such as SAIDI and SAIFI.
- It has set itself the target of returning to pre-earthquake levels of supply reliability, as measured by SAIDI and SAIFI, after the end of the CPP regulatory period. The work programme and expenditure forecasts in its CPP proposal are designed to achieve this. This is notwithstanding the fact that its pre-earthquake supply reliability was amongst the best of any EDB in the country and the fact that higher reliability comes with an obvious higher cost outcome.
- Consistent with this objective, in its CPP proposal Orion has proposed SAIDI and SAIFI targets for each year of the CPP period (FY15-FY19), and it proposes that these targets form the quality standard within the new CPP. Section 6 of its CPP proposal explains in detail how these target measures are derived and Appendix 3 of the CPP proposal is an independent report from LineTech Consulting that expresses the view that Orion's proposed targets are reasonable.

While we agree that the proposed targets generally reflect the current state of the network and Orion's proposed works programme, we have noticed an inconsistency between the SAIDI targets and the SAIFI targets across the regulatory period. SAIDI is the product of the number of interruptions the average consumer experiences in the annual measuring period (SAIFI) and the average duration of each interruption (CAIDI). Hence it is a derived measure, whereas SAIFI and CAIDI are direct measures. As shown in Table 2.1, the SAIDI and SAIFI targets proposed by Orion imply that the average interruption duration will progressively increase over the regulatory period. Furthermore, Orion has a long term CAIDI target of less than 90 minutes, which does not seem a particularly useful measure of network performance given the information shown in Table 2.1.

**Figure 2.1: Target Reliability Service Levels**

	Target SAIDI	Target SAIFI	Implied CAIDI
FY14	105.1	1.40	75
FY15	102.5	1.35	76
FY16	93.4	1.20	78
FY17	89.6	1.15	78
FY18	81.0	1.01	80
FY19	72.0	0.86	84
Long Term	59.7	0.78	77

It is unclear why the average outage duration should increase over the CPP period. This is a parameter over which Orion has a relatively high level of control and we would have expected CAIDI to reduce after the earthquake recovery activity peaks in FY15 and the relative number of planned outages, which tend to be longer, starts to reduce.

We note that in its CPP proposal, Orion has not proposed CAIDI as a service measure during the CPP regulatory period. However, we would have expected the SAIDI and SAIFI targets for each year of the CPP period to reflect an implied CAIDI consistent with the level Orion could reasonably be expected to deliver.

- In its CPP proposal, Orion has included service measures for which it has not set specific service level targets. This primarily applies to network planning related measures such as capacity utilisation ratio, losses and load factor, which are incorporated into Orion's overall monitoring of network performance and asset utilisation. We believe that it is good electricity industry practice to monitor such metrics as precursors to potential network planning initiatives.
- On detailed review of the information incorporated in section 9.6 of the CPP proposal, we believe that Orion has substantively aligned its existing service categories, measures and target levels to the information required under the IM.

## **2.4 CONSUMER CONSULTATION**

The IM requires that Orion have in place appropriate processes (such as consultation with consumers) to develop its service measures and service levels. Section 9.6.11 of the CPP proposal describes this process and the consumer consultation that has taken place to support its proposed service levels. This consultation dates back to FY03 and includes engagement with stakeholders after the earthquakes.

Orion has indicated that it uses the following five primary approaches to consumer consultation:

- involving consumers in setting its security of supply standards;
- undertaking consumer surveys;
- engaging with consumers via retailers;
- obtaining direct consumer feedback; and
- consulting consumers on selected major projects.

Orion's CPP proposal incorporates substantive qualitative evidence of consultation following the earthquakes, incorporating communications on draft network plans and reliability and price impacts. However, there is no direct evidence of consultation on specific service measures and service level targets. Prior to the earthquakes, it routinely surveyed customers to establish their views on price - reliability trade-off. We note that a number of the service levels and measures are included in the DSA. Many of the DSAs are retailer specific and, with retailers representing their customer interests, the DSA negotiation process could be considered an additional, albeit indirect, form of customer consultation.

## **2.5 CONCLUSION**

We have reviewed Orion's CPP proposal with respect to service categories, measures and levels and consider that:

- Orion's service categories appropriately describe activities undertaken for the purpose of supplying regulated services. However, some amendments and additions would be required if its current management structure was to fully align with the IM requirements;
- no new service categories other than those defined in the IM would be needed to cover the regulated services and this is consistent with Orion not incorporating additional service categories into its CPP proposal;

- the target levels of SAIDI and SAIFI that Orion proposes form the quality standard within the CPP generally reflect the current state of the network and Orion's proposed works programme. Nevertheless, we think they could be adjusted to ensure that the relativity between the two measures better reflects Orion's expected CAIDI performance over the CPP regulatory period;
- Orion has processes in place, including consumer engagement, to ensure that the service levels it provides are appropriate. However, the CPP proposal is based on the premise that, notwithstanding the damage caused by the earthquakes, stakeholders expect a return to pre-earthquake reliability levels as soon as is feasible. Orion's pre-earthquake reliability was very good by New Zealand standards and we have seen no evidence that consumers would want this in preference to other price quality paths that might be available;
- there is a potential trade-off between expenditure and reliability, although quantifying this trade-off is outside our current scope. More specifically, there are indications that modifying Orion's security standard to extend restoration times following an N-2 subtransmission event could materially reduce the required network capex going forward, without having a substantial impact on reliability<sup>4</sup>. This is discussed in later sections of this report.

We suggest that stakeholder (and most particularly consumer) consultation is more helpful than consultation measuring general consumer satisfaction when there are two or more distinct alternatives to choose from. If this is the case, then stakeholder consultation as part of this CPP approval process will be most effective if consumers are presented with possible alternative price-quality paths with the impact of each alternative on both quality and price appropriately quantified.

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<sup>4</sup> This is based on the assumption that, while N-2 events would result in extended outages for the consumers affected, such events are rare. When such an event does occur, its impact on reported network reliability is reduced through the Commerce Commission's major event day normalisation process.



### 3. COST ALLOCATION

In respect of **regulated service assets values** not **directly attributable** and **operating costs** not **directly attributable** the **verifier** must provide an opinion as to whether-

- (a) the **opex forecast** has been provided in accordance with clause 5.3.5; and
- (b) **forecast values of commissioned assets** provided in accordance with clause 5.4.14 have been determined in accordance with clause 5.3.11(2)(b).

#### 3.1 INTRODUCTION

In the IM the term “directly attributable” is defined as follows:

*directly attributable means, in relation to –*

- (a) *operating costs, wholly and solely incurred by the EDB in or in relation to its supply of one regulated service; and*
- (b) *regulated service asset values, wholly and solely related to an asset used by the EDB in or in relation to its supply of one regulated service;*

Further, “regulated service” is defined as:

*regulated service means a type of service supplied by an EDB pursuant to the supply of a regulated good or service, which, for the avoidance of doubt, includes the following types of services-*

- (a) *electricity distribution services;*
- (b) *distribution services as defined in the Gas Distribution Services Input Methodologies Determination 2012; and*
- (c) *gas transmission services as defined in the Gas Transmission Services Input Methodologies Determination 2012).*

#### 3.2 ORION COST ALLOCATION

In its CPP proposal, Orion has stated that it does not have any operating costs that are not directly attributable and in fact that all opex included in its forecast is directly attributable to electricity distribution services. It has further stated that it has no activities that fall outside of the definition of electricity lines services and that it has no assets and no forecast commissioned assets or disposals that are not directly attributed to electricity lines services.

We questioned Orion in relation to the treatment of operating costs and assets associated with its wholly owned electrical contracting business, Connetics Limited (Connetics). Orion stated that Connetics, whilst being a wholly owned subsidiary, is a totally segregated business with its own Board, which provides a range of services to Orion on a competitive basis with other contracting firms. As such Connetics has its own separate set of accounts, which are separate from the Orion accounts except for any dividends that might flow from Connetics back to Orion, as owner of Connetics. In the course of our verification we found no evidence that would contradict any of Orion's claims in this regard.

#### 3.3 CONCLUSION

We have not carried out an audit of Orion's accounts but based on the information provided by Orion and our specific enquiries we believe that:

- (a) the opex forecast has been provided in accordance with clause 5.3.5 of the IM; and

- (b) forecast values of commissioned assets provided in accordance with clause 5.4.14 of the IM have been determined in accordance with clause 5.3.11(2)(b) of the IM.

## 4. IDENTIFIED PROGRAMMES

- (1) For the purpose of the assessments required by clauses G5(1)(d) and G6(1)(g), the **verifier** must select 10 **projects** or **programmes** and, in doing so, have regard to the criteria specified in this clause.
- (2) The **projects** or **programmes** must not have been already included by the CPP applicant amongst its 5 largest **capex** or 5 largest **opex projects** or **programmes**.
- (3) The selected **projects** or **programmes** must address
  - (a) a key risk that the **CPP applicant** is exposed to;
  - (b) a key driver of the need to submit a **CPP proposal**;
  - (c) an **obligation** that has a significant impact in the context of the **CPP applicant's** overall business; or
  - (d) a new **service category** or a step change in a **service level** within an existing **service category**;
- (4) The verifier must-
  - (a) notify the **CPP applicant** of its selected **projects** or **programmes**; and
  - (b) not change its selection after such notification.

Identified programmes are the capex and opex projects or programmes within the expenditure forecast that have been selected for detailed assessment in accordance with clause G5(1)(d) of the IM (for capex) or clause G6(1)(g) (for opex). Identified programmes are defined in clause D1 of the IM to include:

- the five largest projects or programmes in the capex forecast;
- the five largest projects or programmes in the opex forecast; and
- ten additional projects or programmes selected by us in accordance with the criteria set out in clause G3 of the IM.

The projects and programme reviewed in detail during the verification are scheduled in the sections below. The five largest capex and opex programmes were identified by Orion on the basis of their total forecast expenditure over the next period from FY13-FY19 although we note that the IM is not clear as to whether the selection should include projects undertaken over the next period or over the CPP period<sup>5</sup>.

In addition to the 20 projects and programmes identified as above we also reviewed in detail the forecast capex on the two non-system fixed asset expenditure categories, using the information provided by Orion in accordance with the requirements of Section D11 of the IM.

This selection is also arbitrary to the extent that it depends on the manner in which Orion disaggregated the capex and opex forecasts in the CPP application. This is discussed further in Section 5.2.2.

Summaries of the individual project and programme reviews are included in Appendix A.

<sup>5</sup> Clause 1.1.4 of the IM defines the *CPP period* as the period over which the CPP will apply, in this case 1 April 2014 to 31 March 2019 (FY15-FY19). It defines the *assessment period* as the period from the end of the most recent disclosure year prior to submission of the CPP application through to the beginning of the CPP period, i.e. 1 April 2012 to 31 March 2014 (FY13-FY14). The *next period* is defined to include both the assessment period and the CPP period and so covers the seven year period starting 1 April 2012 and ending 31 March 2019.

## 4.1 PROJECTS AND PROGRAMMES IDENTIFIED BY ORION

### 4.1.1 Capex

The five largest system fixed asset capex programmes, as identified by Orion, which we reviewed in detail are shown in Table 4.1. The two non-system fixed asset programmes that we reviewed are also shown.

**Table 4.1: Largest Capex Projects or Programmes as Identified by Orion**

Orion ID	Project or Programme Title	Forecast Capex (FY13-FY19) (\$000, real)	Appendix
<b>System Fixed Assets</b>			
CPP53	Connections and extensions	81,810	A9
CPP36	Switchgear replacement	66,419	A5
CPP01	Urban major projects - north	69,541	A1
CPP54	Spur asset acquisitions	32,916	A10
CPP50	Underground conversions	20,700	A7
<b>Non-System Fixed Assets</b>			
CPP60	Head office building	19,400	A11
CPP64	Information and technology	10,224	A12

We have the following general comments on the identified capex projects and programmes selected by Orion.

- The five identified system fixed asset programmes together make up 54% of the total forecast capex on system fixed assets over the next period and the two non-system fixed asset programmes constitute 69% of the forecast capex on non-system fixed assets.
- Expenditure on connections and extensions is partially recovered through capital contributions rather than through the CPP. This is discussed in Section 7.1.
- Spur asset acquisitions relate to the acquisition of assets from Transpower. While the acquisition of these assets will be funded through the CPP, this is expected to be offset by a reduction in the connection charges payable to Transpower, which are treated as a pass-through and do not form part of the CPP.
- Underground conversions are asset relocations undertaken at the request of external parties and are therefore largely funded by capital contributions. This is also discussed in Section 7.1.

### 4.1.2 Opex

The five largest opex programmes, as identified by Orion, which we reviewed in detail, are shown in Table 4.2.

**Table 4.2: Largest Opex Programmes as Identified by Orion**

Orion ID	Project or Programme Title	Forecast Opex (FY13-FY19) (\$000, real)	Appendix
CPP167	Infrastructure management	110,542	A22
CPP101	Scheduled maintenance – 11 kV and 400 V overhead lines	34,115	A13
CPP160	General management, administration and overheads - corporate management	25,153	A19
CPP118	Emergency maintenance – underground cables	22,000	A17
CPP109	Scheduled maintenance – buildings, grounds and substations	19,530	A15

Orion's identified programmes together make up 54% of its total opex forecast over the next period.

## 4.2 PROJECTS AND PROGRAMMES IDENTIFIED BY VERIFIER

In addition to the programmes identified by Orion for detailed review and assessment, we selected a further five capex and five opex projects for review in accordance with the requirements of clause G3 of the IM. Time constraints meant that the selection was undertaken after only a preliminary review, rather than an in-depth analysis, of Orion's draft CPP proposal, and this limited the factors that we took into account in making the selection. In hindsight, a slightly different selection may have been more informative. Given what we now know, it is unlikely we would have selected CPP02 (Dallington) since, notwithstanding its relatively high cost, it is a relatively straightforward replacement of earthquake damaged assets and the drivers for the project design were fully covered by CPP01. It is also unlikely that we would have chosen both CPP108 (transformers) and CPP112 (switchgear) due to the extent of the similarities between the two scheduled maintenance programmes.

The projects and programmes we selected, and the rationale for their selection, are indicated in the sections below.

### 4.2.1 Capex

Table 4.3 shows the five capex projects and programmes we selected and briefly indicates the rationale for our selection

**Table 4.3: Capex Projects or Programmes Selected by Verifier**

Orion ID	Project or Programme Title	Forecast Capex <sup>1</sup>	Rationale	Appendix
CPP02	Urban major project - Dallington	19,628	Second largest major project.	A2
CPP07	Rural major project - Rolleston	13,559	Largest rural major project.	A3
CPP33	Replacement – pilots and protection	17,882	Expenditure appeared high relative to both other asset replacement categories and also to pre-earthquake levels.	A4
CPP37	Replacement - transformers	14,065	Expenditure appeared high relative to pre-earthquake levels.	A6
CPP51	Urban reinforcement	19,765	Total reinforcement capex was significant but no programmes in this category had been identified by Orion for individual review.	A8

Note 1: FY13-FY19, \$000 real

In total, these five projects or programmes account for a further 17% of the total next period forecast capex for system fixed assets. As a result, a total of 71% of the system fixed assets capex forecast has been the subject of a detailed assessment.

#### 4.2.2 Opex

Table 4.4 shows the five opex programmes we selected and briefly indicates the rationale for our selection.

**Table 4.4: Large Opex Programmes Selected by Verifier**

Orion ID	Programme Title	Forecast Opex	Rationale	Appendix
CPP108	Scheduled maintenance - transformers	7,655	This was one of the higher scheduled maintenance line items and also transformers are critical assets	A14
CPP112	Scheduled maintenance – switchgear	7,667	This was also one of the higher scheduled maintenance line items and, like transformers, switchgear is a critical asset category	A16
CPP119	Emergency maintenance – network assets	9,405	Expenditure on this line item was significant. We also wanted to better understand the difference between fault and emergency maintenance and non-scheduled maintenance.	A18
CPP164	General management, administration and overheads – information systems	15,206	The forecast expenditure was significant in an area where cost management can be challenging.	A20
CPP165	General management, administration and overheads – commercial & regulatory	13,257	We wanted to better understand the activities that Orion categorised as “commercial”.	A22

Note 1: FY13-FY19, \$000, real

In total, these five projects account for a further 14% of the total next period forecast capex for system fixed assets.

However, due to the manner in which the information was provided to us by Orion, we also considered CPP166 (general management, administration and overheads – communications and engagement) and CPP171 (general management, communications and overheads – special projects) as part of our assessment of CPP165. If these two programmes are also included, our assessment of selected programmes increased to 17% of the next period opex forecast and, in total, we assessed 71% of the total next period forecast.

One area that we did not assess in detail was insurance. Insurance expenditure during the next period is forecast to be 4.6% of total opex and, on an annual basis, insurance costs are expected to be approximately 350% higher than pre-earthquake levels, notwithstanding the fact that the damage caused by the earthquakes to Orion's insurable assets was relatively small. We discuss Orion's insurance forecast briefly in Section 6.4.4.7 of this report. However, insurance is a specialist area where we do not have expertise and, in reviewing Orion's CPP application, the Commission may wish to engage an independent expert to review the basis on which Orion has forecast its premiums.

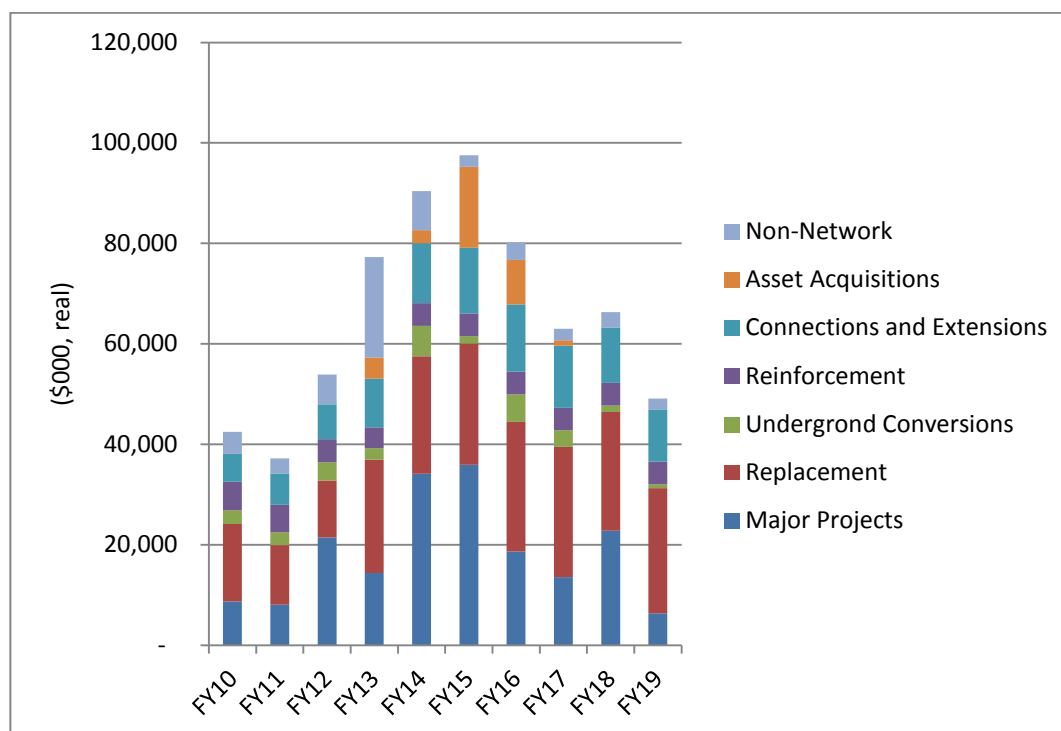


## 5. CAPEX FORECAST

### 5.1 OVERVIEW

Figure 5.1 below shows Orion's actual and forecast capex in real terms, broken down by capex category<sup>6</sup>. Orion was not able to provide its actual expenditure for all capex categories for FY08 and FY09 due to the loss of archived records as a result of the earthquakes, so actual capex is only shown for the period FY10-FY12.

**Figure 5.1: Actual and Forecast Capex (\$000, real 2013)**



Asset replacement forms the largest component of the forecast, followed by major project expenditure. Connections and extensions are also a significant contributor.

Of particular note is the non-network capex in FY13, which is primarily due to the construction of a new head office to replace the Armagh St complex, which suffered extensive damage from the earthquakes and has already been largely demolished. Asset acquisitions is an extraordinary expenditure category covering the purchase of spur transmission assets from Transpower.

The remainder of the forecast is network capex. This is forecast to increase from \$53.0 million in FY13 to \$80.0 million in FY14, due primarily to the increase in major project activity. Core network capex is then forecast to reduce progressively to \$46.9 million in real terms in FY19, the final year of the CPP regulatory period.

<sup>6</sup> Capex categories are discussed in Section 5.2.2.1.

## 5.2 POLICIES, PLANNING STANDARDS AND ASSUMPTIONS

### 5.2.1 Quality

Provide an opinion as to whether the-

- (i) **policies;**
- (ii) **planning standards;** and
- (iii) **key assumptions,**

relied upon by the **CPP applicant** in determining the **capex forecast** are of the nature and quality required for that capex forecast to meet the **expenditure objective**.

#### 5.2.1.1 Capital Expenditure Planning and Development

The quality of the analysis we have seen during the course of this verification has been very good, although we discuss in this report the use of assumptions that tend to lead to conservative or risk adverse outcomes. On many occasions Orion has introduced asset management practices that have led the way for other New Zealand EDBs. Examples are the external security review following the 1998 Auckland CBD crisis that led to the installation of the Bromley-Lancaster-Armagh cable and the introduction of ground fault neutralisers to improve the reliability of its rural network. The development of a special irrigation tariff that has allowed the upgrading of many rural zone substations to be deferred is a further example of asset management innovation.

Nevertheless, Orion does not have formal policies or procedures for the development of capital expenditure projects or programmes prior to committing the project or programme for implementation. We asked for copies of relevant policies or procedures but were advised that:

*We do not have any policies related specifically to the “planning and approval” of capex. Our process is that the Asset Management Plan is approved by our Board of Directors; actual projects are then approved by various staff under the delegated authority policy (OR00.00.11 provided previously). If the project exceeds the limits provided in the delegated authority policy then the project is referred to the Board for approval or for further delegated authority<sup>7</sup>.*

Unlike many EDBs, the AMP is an integral part of Orion's business plan. Board approval of the AMP implies in-principle approval of all identified expenditure subject to the provisions of a very comprehensive delegated authority policy. Commitment of capex (and opex) provided for in the AMP requires only ...*an approved budget and a work order issued by the Chief Operating Officer or his nominee*<sup>8</sup>. Delegated authorities for the expenditure of capex and opex are relatively high with the CEO authorised to spend up to \$2.5 million of budgeted expenditure and the Chief Operating Officer up to \$1.2 million. Delegated authorities for unbudgeted and for special categories of expenditure such as consultancy fees are significantly lower.

There is no requirement for large one-off projects to be supported by a detailed business case with a detailed comparison of alternative options or to be individually signed off by the Board. We asked to see detailed planning reports or economic studies relating to the large urban north project and were advised that these reports did not exist, although Orion noted the project had been designed in accordance with the findings of the 2012 urban network architecture review<sup>9</sup>.

The 2012 AMP contains detailed planning criteria covering in particular the network architecture and the level of security to be built into the network design for different categories and magnitudes, both of which underpin all network development planning. These criteria have recently been updated as a result of the 2012 architecture review and

<sup>7</sup> Email dated 14 December 2012.

<sup>8</sup> Delegations of Authority Policy (OR00.00.11), p8.

<sup>9</sup> This is discussed in Appendix A1.

we are confident the new criteria will be incorporated into the 2013 AMP. We are also satisfied that the development of the one-off projects that we examined in detail during the course of this verification has been consistent with these criteria.

However, within this overarching planning envelope, there is little transparency as to how these one-off projects were developed or how incremental capex budgets were set. Notwithstanding this lack of transparency and formal documentation, we found Orion's asset management practices to be of high quality. We detected a collegial corporate culture and strong communication links within system management and operations and we think this compensates for the lack of formal processes and documentation requirements. We consider that the asset management effort within Orion including capex planning and development produces appropriate, if rather conservative and low risk, outcomes. This conclusion is consistent with the finding of EA Technology when it applied the Commission's asset management maturity assessment tool to Orion's asset management system. EA Technology concluded:

*While the review finds Orion fully compliant with requirements in a number of important, high impact areas, notably asset management strategy, asset management plans and outsourcing, there are a number of areas where Orion cannot fully demonstrate that asset management systems and processes fully meet the requirements of PAS-55. While the scores allocated in many cases suggest that systems and processes do not meet PAS-55 requirements, this should not be interpreted as Orion's systems and processes necessarily being deficient or not fit for purpose. On the contrary Orion's performance and results in the face of trying circumstances provide evidence of flexible, responsive and adaptive processes that have enabled operations and services to continue with an appropriate balance of short, medium and long term focus.*

*The primary reason for the discrepancy observed in the scores presented is that the PAS-55 assessment criteria used for this review require that asset management systems and processes be formally documented as a means of ensuring consistency and to enable effective audit. In order to achieve a fully compliant score it is in most cases necessary to provide documentary evidence showing the required process and how it is being complied with...*

Our main reservation is that Orion's asset management systems and processes, and indeed its CPP proposal, are underpinned by high level assumptions that are taken for granted. In our view, the reasonableness of these assumption merit further scrutiny, and possibly public debate, as Orion recovers from the earthquakes. These assumptions have a significant impact on the outcome of Orion's asset management analysis. In particular:

- Orion's urban network architecture review assumed that all new 66 kV subtransmission circuits in the Christchurch urban area should be underground. This is despite the fact that overhead circuits are substantially less costly, more resilient to future earthquakes and have much shorter repair times when a fault does occur. The main justification provided for this assumption the Christchurch City Council's requirement that all new electricity circuits in the urban area be installed underground, although Orion has noted other benefits of underground subtransmission<sup>10</sup>. However, the Christchurch City Council requirement was imposed prior to the earthquake and, to our knowledge, there has been no substantive consideration as to whether this requirement is still appropriate in the post-earthquake environment.

Section 9.13.9 of the CPP proposal provides some background to Orion's view that underground subtransmission circuits in urban Christchurch. We acknowledge that there is a strong community preference for underground electricity subtransmission and distribution systems, which also have a number of technical advantages. However, we think these arguments need to be objectively

<sup>10</sup> Section 9.13.9 of the final CPP proposal.

balanced against the additional costs, which as indicated in Section 5.2.3.1 and Appendix A1, are substantial. We also suggest that if improved visual amenity is the overriding objective other alternatives, such as progressively undergrounding the overhead low voltage distribution system, may deliver much greater benefits for a lower cost. We also note that our analyses are based on Orion's own unit costs and that the cost of installing underground 66 kV cable is substantially higher than Orion assumed in its draft CPP proposal.

- The level of subtransmission security in non-CBD urban areas is described by Orion as “almost N-2” when a lower level of security, N-1, is generally accepted internationally as appropriate. We note that the higher level of security is largely driven by the long repair times of 66 kV underground cables.
- The EA Technology condition based risk management (CBRM) analysis, which is one driver of Orion's asset replacement capex forecast, calculates the asset replacement expenditure required to keep the risk level relatively static. However, prior to the earthquakes in the five years to 31 March 2010, Orion was:
  - the fifth best performing EDB in terms of average interruption duration (SAIDI); and
  - the second best in terms on average interruption frequency (SAIFI).

Given the outstanding SAIFI performance (and SAIFI being a measure of the number of interruptions is more relevant than SAIDI as a driver for asset replacement) notwithstanding Orion's significant rural network component, it could be that Orion should accept a higher level of asset risk going forward. In this case the CBRM report would overstate the asset replacement expenditure needed for some asset classes.

In the management of electricity distribution systems, the trade-off between price and reliability is well documented. In developing its post-earthquake CPP proposal, Orion appears to have used its pre-earthquake reliability as a benchmark and developed capex and opex expenditure forecasts that are designed to return network reliability to pre-earthquake reliability levels soon after the end of the regulatory period. Notwithstanding the robustness of any analysis used to achieve this outcome, alternative options are available to Orion that would deliver a lower level of reliability for a lower expenditure. It may be that, given the high level of Orion's pre-earthquake reliability relative to that of other New Zealand EDB's, an alternative expenditure profile may better met the needs of consumers in Orion's supply area. However, this possibility does not appear to have been given meaningful consideration in preparing the CPP proposal.

#### **5.2.1.2 Implementation of Capex Expenditure**

When we asked Orion to provide copies of the policies and planning standards relating to capex management we were provided with a number of policies related to project delivery and capex management. These documents tended to be brief and many took the form of flow charts – this is an accepted form of presentation for procedures prepared as components of quality systems conforming to the ISO 9000 series of standards and also, presumably, for the documentation of related structured work management systems such as PAS 55 for asset management systems.

The documents provided demonstrated a structured approach to contract management. While many of the documents had not been updated since 2004 or 2005 they were consistent with the tenor of our informal discussions with Orion management on its contract management strategy. While Orion strives to maintain a degree of competitive tension between the contractors working on its network, it nevertheless regards it as important that the ongoing viability of its contractors is assured and that they are incentivised to invest in staff training, plant and equipment in order to minimise the risks to Orion's business. It is therefore necessary to strike an appropriate balance between conflicting priorities.

We noted, in particular, that Orion's procedure on Authorised Contractors, NW73.10.15, which specifically identified the contractors authorised to work on the Orion network and the specific work that each contractor could do was dated October 17 2005. We suggest that either the document provided to us was out of date or the application of Orion's document control procedures could be improved.

The main relevance of the contracting procedures to this verification is that contractor prices form the basis for the cost estimates used in preparing the forecasts. The evidence we have seen indicates that Orion's contractor management procedures are appropriate and that unit costs based on its contractor rates are a reasonable basis for the CPP forecast. This conclusion was supported by additional information provided by Orion in an appendix to the CPP, as discussed below. While this evidence is dated, there is nothing to suggest that Orion's position relative to other New Zealand EDBs has deteriorated to a significant degree.

In 2010 PricewaterhouseCoopers (PwC) and Sinclair Knight Merz (SKM) on behalf of the Electricity Networks Association (ENA) collected asset construction cost evidence for standard electricity distribution assets from 16 EDBs including Orion. Together these EDBs supplied 85% of the total number of connected customers across the entire electricity distribution sector. We understand the report was submitted by the ENA to the Commerce Commission as a basis for the development of new standard costs in a revised ODV Handbook<sup>11</sup>. The appendix compared Orion's standard 2010 price, as submitted to PwC/SKM for the report with the average of all submitted asset prices for a total of 51 different asset types. In all but seven of these asset types Orion's standard prices was less, and in many cases substantially less, than the average price across the country.

## 5.2.2 Forecast Preparation

Provide an opinion as to whether the **capex forecast** has been prepared in accordance with the **policies** and **planning standards** at both the aggregate system level and for each of the **capex categories**;

### 5.2.2.1 Disaggregation of the Forecast Capex

Orion has not used the standard capex categories defined in Schedule D of the IM but has used capex categories better aligned to its network asset management planning structure, and consistent with the breakdown used in its 2012 AMP. It has modified the templates in Schedule E of the IM accordingly. Clause 5.4.31 of the IM allows Orion to use its own capex categories rather than the standard categories over a transition period that ends on 31 March 2016.

Orion's capex categories are briefly described below.

#### *Major Projects*

These are a suite of 20 one-off projects that are individually developed and managed. They are generally concerned with the development of the subtransmission network and for the most part are disaggregated by the areas that the projects will benefit<sup>12</sup>. Individual project values vary from \$60.6 million (real) for CPP01 *Urban – North* down to \$0.25 million real for CPP5 *Urban – South* and also for CPP 19 *Rural Alpine* (for period FY13-FY19). As a general rule, all one-off projects that are to be undertaken in a specific part of Orion's supply area are aggregated together in a single major project line item. Hence most major projects are comprised of a number of individual subprojects and in some cases these will extend across the full assessment period. The total value of major projects over the FY13-FY19 period is \$145.8 million (real), which represents 28% of the total capex forecast.

<sup>11</sup> In the event, no revised ODV Handbook was issued by the Commission.

<sup>12</sup> Exceptions are CPP12 *Rural Power Factor* and CPP20 *Rural Ground Fault Neutraliser* which are categorised by asset type.

Orion has not mapped these subprojects into the Commerce Commission's standard capex categories although it will be required to do so for its 2013 AMP. The most significant driver for this work is system growth, although this is by no means the only driver. For example the driver for the second biggest project CPP02 *Urban – Dallington* is asset replacement, since the objective is to provide a permanent supply to Dallington substation to replace the supply that was irreparably damaged by the earthquake. As another example, the driver for CPP20 *Rural – Ground Fault Neutralisers* is safety and reliability.

Some of the larger projects are an aggregation of sub-projects with different drivers. While the largest project, CPP01 – *Urban North* is primarily growth driven, some components have other drivers. For example, the main driver for the two cables supplying Rawhiti substation is asset replacement, while the driver for the generation at QEII Park was network reliability.

### *Replacement*

These are a suite of 14 capex programmes classified by asset type, which map directly into the Commerce Commission's asset replacement and renewal capex category. Total expenditure over the FY13-FY19 period is forecast to be \$170.3 million (real), which is 17% greater than the category total expenditure in the major projects category and represents 32.5% of the total capex forecast. Expenditure is of an incremental nature in that each programme involves the replacement of a large number of smaller assets. Assets requiring replacement are sometimes not individually identified and in these cases expenditures appear to have been forecast after considering the general condition and the age profile of each different asset class<sup>13</sup>. Asset replacement programmes are often managed at a budget level to the extent that there is generally some scope to accelerate or slow down the rate of asset replacement to meet budgetary objectives.

### *Underground Conversions*

There is a single programme in this asset category with a total forecast cost of \$20.7 million (real), or 4% of the total FY13-FY19 capex forecast. Orion's title "underground conversions" appears to be a misnomer, since while the bulk of the programme involves the undergrounding of existing assets, the primary driver is the relocation of assets at the request of external parties. It maps directly into the Commerce Commission's asset relocations capex category.

This work largely falls into two categories:

- overhead to underground conversions proactively required by territorial local authorities. Over the forecast period, Christchurch City is not expected to require overhead to underground conversion for aesthetic reasons but Selwyn District Council is assumed to maintain its current requirement of approximately \$300,000 per year; and
- asset relocations required by the New Zealand Transport Agency to facilitate the construction of the Christchurch motorways component of the Government's roads of national significance infrastructure programme.

As discussed in Section 7.1, this capex is partially recovered through third party capital contributions.

### *Reinforcement*

Reinforcement capex is incremental capex that increases the capacity of the 11 kV network to provide for projected increases in load, and to extend its reach as new areas

<sup>13</sup> This is typically the case, particularly for large EDBs. However, for at least some asset replacement line items, such as protection relays, Orion has developed a replacement plan that identifies and prioritises assets targeted for replacement during the forecast period.



are developed. The total FY13-FY19 forecast is \$31.15 million (real), or 6% of total capex. It is divided into two programmes, one covering the urban part of Orion's supply area and one for the rural part. Orion's CPP proposal states that this category most closely aligns with the reliability, safety and environment capex category in the IM but in our view system growth capex is a more appropriate IM classification for the majority of this expenditure.

This confusion over classification most likely arises from the fact that system growth is initially absorbed by the redundant capacity that is deliberately built into the design of the distribution network to ensure supply reliability. In both the urban and rural networks, this capacity is needed so that load not directly affected by a fault on the distribution network can be transferred onto neighbouring feeders. Hence, the impact of a distribution network fault on customers is minimised and supply reliability is improved as a result.

As the load on the network grows, the available redundant capacity is eroded and network reinforcement is needed if supply reliability is to be maintained. Hence, while the outcome of this expenditure is maintenance or improvement in supply reliability the primary driver is system growth.

It is likely that some component of this expenditure is not growth driven but is directly aimed at improving the reliability, safety or environmental performance of the network. A typical example of such expenditure would be a programme of retroactive installation of remote controlled switches in strategic locations to improve reliability by facilitating reconfiguration of the distribution network remotely from the control room. However, Section 9.14 of Orion's CPP indicates that the driver for most reinforcement expenditure is demand growth and we have not attempted to quantify any non-growth component.

#### *Connections and Extensions*

This is a customer driven capex programme involving installation of new assets needed to connect new customers to the network. It does not include any augmentations to the backbone 11 kV network to accommodate the additional demand generated as a result of these new connections as this is included in the reinforcement budget discussed above; nevertheless any required reinforcement of the low voltage network comes from the connections and extensions budget.

Hence, Orion's connections and extensions capex forecast maps directly into the IM customer connections capex category.

The connections and extensions forecast comprises a single programme with a total forecast capex over the FY13-FY19 period of \$81.8 million (real) or 16% of total capex. This makes it the largest capex programme in the portfolio and the first of the top 5 capex programmes identified by Orion for submission of detailed information in accordance with the identified programme requirements in Schedule D of the IM. Orion expects that approximately 13% of this budget will be funded from capital contributions from external parties.

#### *Asset Acquisitions*

Orion's asset acquisitions capex category has been created to accommodate the forecast capex for the transfer of the spur assets to be acquired from Transpower. This expenditure does not fit well into any of the capex categories used by Orion in the normal course of business and does not map into any of the standard IM capex categories.

The asset acquisitions budget amounts to \$32.9 million (real) or 6% of the total capex budget. Orion did not provide a forecast for asset acquisitions deflated to real dollars probably because its forecast used the expected value of the assets in Transpower's regulatory asset base (RAB) as at the date of acquisition. These values were advised to Orion by Transpower in nominal terms. However, in order to provide a more valid comparison with other real capex forecasts, we have deflated Orion's nominal capex forecast by the CPI assumed for the CPP proposal.

## Non-Network Capex

The non-network capex forecast for the period FY13-FY19 is \$41.0 million (real) or 8% of the total capex forecast for the period. \$19.4 million of this is for the new office building that will replace the Armagh St office complex, which was severely damaged in the February 2011 earthquake and has now been largely demolished.

### 5.2.2.2 Identification of Projects and Programmes

The approach taken by Orion in identifying individual projects and programmes within each of its capex categories is not clear and there seems to be a degree of inconsistency across the different categories. For example, in the Schedule E templates the \$81.8 million connections and extensions capex category is not disaggregated and consequently becomes the largest of the five network capex programmes identified by Orion. On the other hand the much smaller \$31.3 million reinforcement capex category was disaggregated into urban and rural, neither of which were included in Orion's five largest programmes. Had there been no disaggregation, reinforcement would have been the fifth largest capex programme.

Similarly the largest of the major projects, the \$54.1 million urban north project is an aggregation of smaller projects being undertaken over the six year period FY13-FY18 (with no expenditure in FY17). Each of these smaller projects could have been treated as an individual capex project in its own right – indeed many of these projects are significantly larger than many of the smaller projects separately identified within the major projects category in the Schedule E template. Furthermore not all of these smaller projects are growth related and some would map into non-growth IM capex categories including asset replacement and renewal and reliability, safety and environment.

### 5.2.3 Reasonableness of Key Assumptions

Provide an opinion on the reasonableness of the <b>key assumptions</b> relevant to <b>capex</b> relied upon the <b>CPP applicant</b> including-	
(i)	the method and information used to develop them;
(ii)	how they were applied; and
(iii)	their effect or impact on the <b>capex forecast</b> by comparison to their effect or impact on <b>actual capex</b> ;

#### 5.2.3.1 Urban Network Subtransmission Security

Security is a planning criterion related to the ability of a network to continue to deliver electricity to customers in the event of an outage of one or more network elements. It is a measure of the amount of redundant capacity that is provided in a network. If supply is to continue following the unplanned outage of a network component, the power being transferred through the faulted component must be diverted through alternative components, which in turn must have sufficient capacity to carry the additional load.

Typically transmission and subtransmission networks are designed so that, in the event of an outage of a single component (the so-called N-1 criterion) there must be sufficient capacity in the remaining network elements to continue to supply the peak electricity demand. However, higher levels of security may be provided for critical load – for example, networks supplying CBDs in major cities may be designed to the N-2 criterion, where there is sufficient capacity to supply the load notwithstanding an outage of two network elements. On the other hand, networks supplying smaller non-critical loads may be designed to an N-0 criterion where a supply interruption is considered acceptable until a failed network element can be repaired or replaced. Clearly the cost of building a network to supply a load with N-2 security will be significantly greater than the cost of a building a network to supply the same peak demand with N-0 security, because of the redundancy required in the more secure network.

However, specifying network security purely in terms of N-0, N-1 or N-2 criteria is simplistic as it overlooks a number of factors relevant to the level of security built into a network design. These include:

- Whether supply must continue uninterrupted following the network element failure or whether supply can be restored after a short interruption (but before the fault is actually repaired);
- The maximum duration of any supply interruption that is allowed. Interruptions can be momentary (generally considered to be less than one minute) to allow for restoration after automatic switching or they can be longer to allow for manual network reconfiguration, either through remote switching from a central control room or manual switching in the field;
- Whether common mode failures are classified as a single network element interruption. An example of a common mode failure is the failure of a transmission structure that supports two separate transmission circuits. A second example, which was experienced by Orion as a result of the earthquakes, is the simultaneous failure of two underground circuits in the one trench as a result of a single event; and
- The resilience of the network to a high impact low probability event, such as the complete loss of supply from a grid exit point.

The security criteria that applied to Orion's urban subtransmission network prior to the earthquake are set out in the table on p159 of Orion's 2012 AMP. For zone substations supplying loads greater than 15 MW within the Orion urban area (the focus of this discussion), the criteria required that there be no interruption following a single unplanned subtransmission cable, line or transformer outage. Furthermore, following an outage of a second subtransmission element, an interruption with a maximum duration of one hour was acceptable for substations supplying the CBD area and two hours for zone substations in other urban areas. This second criterion meant that there needed to be sufficient capacity within the 11 kV distribution network for any load interrupted as a result of the second element outage to be transferred to a nearby zone substation by reconfiguring the distribution network.

The AMP further signalled that:

*Given that five years have elapsed since our last security standard review and we have new earthquake related information to consider, we intend to undertake a further review of our security standard during 2012<sup>14</sup>.*

This review for the subtransmission network (also referred to by Orion as the "upper" network) was integrated into a more far-reaching review of network topologies<sup>15</sup>, which allowed alternative network architectures, and the associated levels of security, to be evaluated from a cost-benefit perspective. The review recommended a topology that provides a similar level of security to that which currently exists, but that the network be designed with more resilience to high impact low probability events. Resilience is discussed further in Section 5.1.3.2.

For practical purposes, the level of security of all urban substations, irrespective of whether or not they supply the CBD, is similar and is described by Orion as "almost N-2". Orion acknowledges that this will be more expensive than an N-1 design, which allows potential loss of all load in an N-2 event, with restoration in repair time. It suggests that simple probabilistic analysis shows that this extra cost is justified<sup>16</sup>.

While this level of security is generally considered appropriate for CBD loads, from our experience it seems high for non-CBD urban loads where N-1 security, as described

<sup>14</sup> 2012 AMP, p158.

<sup>15</sup> Network Architecture Review, 2012; NW70.60.16.

<sup>16</sup> NW70.60.16, p6.

above, is the industry norm. Orion justifies the higher security, and supports this with probabilistic analysis<sup>17</sup>, on the following basis:

- New 66 kV circuits in urban areas must be underground to satisfy Christchurch City Council requirements. The repair time for faults in underground cables is substantially longer than for overhead lines. Orion's analysis assumes that the time required to repair a 66 kV cable fault is 240 hours for XLPE cable (with solid insulation) and 330 hours (14 days) for oil-filled cables<sup>18</sup>;
- Following the earthquakes there is an increased probability of cable faults as a result of ground movement over a cable route. Orion notes that:

*The earthquakes triggered many aftershock sequences to the surprise of experts, who now warn of elevated risk for the indefinite future, decades of heightened seismic activity and significant probability of further >7.0 tremors. ... Given modern society's increasing dependence on electricity and the distress of customers left without power for days in February 2011, it would seem clear that Orion's responsibility to shareholders and customers alike is to provide a network with increased resilience to major events, provided the HILP investment premium is appropriate<sup>19</sup>.*

The limited power restoration time requires that any N-2 contingency results in a loss of supply to only one zone substation. Supply to the load lost from this zone substation would be restored by transferring it to two adjoining zone substations by reconfiguring the 11 kV distribution network. To achieve this, every second zone substation must have three incoming 66 kV circuits while other zone substations need only have two incoming circuits.

We accept the validity of Orion's analysis, given the assumptions that it has made. We agree that N-2 cable failures are possible, particularly in the post-earthquake scenario, and that in such a situation power interruptions lasting up to 14 days are not acceptable for an urban area in a developed economy.

However, the analysis is predicated on the assumption that all new subtransmission circuits will be installed underground and we question whether this is prudent from either a technical or economic perspective, given the expert warnings of *elevated risk for the indefinite future, decades of heightened seismic activity and significant probability of further >7.0 tremors*. Repair times for underground subtransmission cable faults of 10-14 days are substantially longer than the 12 hour repair time assumed for an overhead line<sup>20</sup>. In addition the installed cost of a 66 kV underground cable is more than five times greater than an equivalent 66 kV overhead line<sup>21</sup>.

We suggest that, if a repair time of 12 hours could be assumed, a lower level of security for non-CBD urban customers, consistent with international industry norms, could be acceptable. This requires the use of overhead 66 kV lines rather than underground cables. If, for example, three zone substations were supplied on a single 66 kV ring, there would be no interruption for a single element N-1 contingency. In a worst case (and highly unlikely) N-2 scenario where the circuits at each end of the ring were simultaneously interrupted, supply to all three zone substations would be interrupted until one of the circuits was repaired. While this could take up to twelve hours, in all probability a temporary repair to one of the circuits could be made much more quickly.

<sup>17</sup> The probabilistic analysis compares the cost of non-supply with the incremental cost of providing a more secure network.

<sup>18</sup> NW70.60.16, p47.

<sup>19</sup> NW70.60.16, p8.

<sup>20</sup> NW70.60.16, p47.

<sup>21</sup> This is based on the unit costs used by Orion in estimating the costs of major projects for its CPP proposal and included in NW60.70.13. This indicates an installed cost of \$130,000 per km for jaguar overhead line and \$1,107,000 per km for 630Cu cable, both rated at approximately 80 MVA. However, the overhead line costs for urban installation would be higher due to the costs of consenting an acceptable route and possibly the use of more expensive concrete or steel poles.

It can be inferred from this that the use of 66 kV underground cable carries a cost premium that includes not only the additional cost of installing a circuit underground rather than overhead but also the cost of additional circuits to provide the increased security needed to cover for the long repair times for a 66 kV cable fault.

An indicative comparative analysis showing this cost differential is provided in Table 5.1, which provides an indicative comparison of the difference in costs to supply three urban 40 MVA substations on a single ring. A typical average circuit length of 7.5 km is assumed. For the outer two legs of the ring, goat or antelope conductor would be required at an estimated cost of \$250,000 per km while the two inner legs could use jaguar conductor at an estimated cost of \$200,000 per km<sup>22</sup>. For the underground scenario 1200Cu cable is assumed for the two outer legs and 630Cu cable for the two inner legs. There would also need to be an inter-tie circuit from a neighbouring ring to the middle substation, the cost of which can be shared with the neighbouring ring. This would need to be 1200Cu since it would need to supply all three substations in the worst case scenario of loss of both outer legs of the main ring. Substation costs are assumed identical for both scenarios except that in the underground case, an additional circuit breaker bay would be required for termination of the inter-tie.

**Table 5.1: Comparison of Overhead and Underground Subtransmission Circuit Costs**

<b>Overhead Line</b>	
15 km overhead line (goat) at \$250,000 per km	\$3,750,000
15 km overhead line (jaguar) at \$200,000 per km	\$3,000,000
<b>Total</b>	<b>\$6,750,000</b>
<b>Underground Cable</b>	
18.75 km underground 1200Cu cable at \$1,387,000 per km <sup>1</sup>	\$26,006,250
15 km underground 630Cu cable at \$1,107,000 per km <sup>1</sup>	\$16,560,000
Additional 66 kV circuit breaker bay	\$367,300
<b>Total</b>	<b>\$42,903,550</b>

Note 1: Installation costs of \$700,000 per km are assumed for both cable sizes.

The network arrangement assumed for the comparison in Table 5.1 is not unlike the proposed urban north loop, although Orion's proposal makes no provision for installation of the inter-tie circuit required to fully meet its security criteria during the FY15-FY19 regulatory period. The costs used are the Orion's own estimates except that a margin has been added to Orion's overhead line cost estimates to account for the additional costs noted above. We consider these margins generous. The comparison illustrates the substantial cost premium that customers incur for the use of underground cable at 66 kV. The main benefit of underground subtransmission is aesthetic, although this is partly mitigated by the relatively small number of circuits. The overhead arrangement also carries a heightened risk of relatively widespread power outages lasting up to 12 hours although this risk should not be overstated. N-2 outages, while not unknown, are relatively rare, particularly when single circuits are used and there is little risk of a common mode disruption.

Given the additional cost and the unstable geotechnical environment that could persist for decades as a result of the earthquakes, we consider that the use of underground 66 kV circuits in the Christchurch urban area should be reviewed. It may be that a public debate is needed to establish the level of stakeholder acceptance of the additional cost of underground cabling. We note that modern 66 kV subtransmission lines constructed

<sup>22</sup>

Orion's unit cost for the construction of a 66 kV overhead line with jaguar conductor is \$130,000. However this is for a wood pole line. The additional cost provided for in this analysis allows for the use of metal or concrete poles and also for the difficulty in identifying and consenting a route in an urban environment. Orion has not provided a unit cost for an overhead 66 kV line using goat conductor and the estimated cost used in this analysis is ours. It provides for the increased conductor cost and the possible need for more robust (or additional) poles to support the greater conductor weight.



using single steel or concrete pole structures with no cross arms are much less visually intrusive than lines built to older designs using lattice steel towers.

This view appears consistent with that of the Kestrel Group, which was commissioned by Orion to carry out an independent assessment of Orion's responses to the earthquakes. Its report noted:

*Looking ahead, a balance will need to be found between longer term reliability and expenditure on security....Aesthetics may also be a factor – overhead lines generally perform better than underground cables in areas subject to liquefaction, and are easier to repair should further earthquakes occur<sup>23</sup>.*

### 5.2.3.2 Resilience

While security relates to the ability to maintain or quickly restore supply following the occurrence of commonly occurring faults, resilience relates to the ability to recover after less common high impact events that are more difficult to plan for (commonly termed high impact low probability or HILP). The Christchurch earthquakes are an extreme example.

In the mid-1990s Orion participated in a lifelines study that looked at how natural disasters could affect Christchurch city, the results of which were published in a report *Risks and Realities* by the Centre for Advance engineering at Canterbury University. The study prompted it to spend \$6 million on seismic-protection and strengthening work. This included:

- reinforcing bridges carrying cables across rivers;
- strengthening of substation buildings, many of which are of an older brick construction type;
- bolting down transformers; and
- other minor preventative measures such as tying the batteries used for control systems to substation walls.

It is clear that this investment significantly reduced the damage suffered by Orion assets as a result of the earthquakes. Most of the critical damage was to underground cables as a result of ground movement while critical substation and building damage was due to ground subsidence as a result of liquefaction rather than shaking. Damage as a result of shaking was largely superficial and was either easily remedied (as in the case of transformer trippings due to surging in mercury switches) or had no impact on supply. We have seen estimates of between \$30-\$65 million in direct cost savings to Orion as a result of this investment and the indirect cost savings to network users was undoubtedly significantly greater.

Other measures taken by Orion prior to the earthquakes to increase the resilience of its network included:

- installation of 66 kV underground circuits between Bromley GXP and Lancaster district substation and also between Lancaster and Armagh district substations to enable the CBD to be supplied from the Bromley GXP in the event that a supply from Islington GXP is not available;
- replacing joints in 66 kV cables to prevent the mechanical problems that can occur as cables warm up under load<sup>24</sup>;

<sup>23</sup> *Resilience Lessons: Orion's 2010 and 2011 Earthquake Experience; Independent Report.* Kestrel Group, September 2011, p ii

<sup>24</sup> This was a factor in the extended loss of supply to the Auckland CBD in 1998.



- signing a new investment agreement with Transpower for installation of a new 200 MVA transformer at Bromley GXP so that it will become a viable alternative point of supply to Islington;
- reducing the risk of a loss of supply at its two main communications sites, Sugar Loaf and Marleys, by replacing overhead supply lines with underground cable and installing back-up generators;
- improving security of supply to the airport by installing a cable to allow supply from both Harewood or Hawthornden district substations; and
- installing an 800 kVA generator at Lyttleton to reduce the risk of a loss of supply to the port.

The earthquakes have provided additional learnings that are now being incorporated into the subtransmission architecture to further increase network resilience. In particular:

- route diversity will ensure that incoming circuits to a single substation will not be installed in the same trench or along the same route. Supply was lost to both the Brighton and Dallington during the earthquakes as a result of common mode failures when the two incoming supply circuits to each substation were installed in a common trench; and
- all 66 kV supply rings will run between Islington and Bromley grid exit points (GXPs) and be capable of supply from either substation. There will be a normally open point in the middle of each ring but switching of this point will be automatic so interruptions will be momentary.

We support these changes to the network architecture notwithstanding the fact that route diversity implies additional cost. We note that this additional resilience can be built in to the subtransmission network architecture irrespective of whether underground cables or overhead lines are used.

### 5.3 REVIEW OF IDENTIFIED PROGRAMMES

Report conclusions of a detailed review of **identified programmes** that includes, but is not limited to assessment of-

- |        |   |
|--------|---|
| (i)    | whether relevant <b>policies</b> and <b>planning standards</b> were applied appropriately;  |
| (ii)   | whether <b>policies</b> regarding the need for, and prioritisation of, the <b>project</b> or <b>programme</b> are reasonable and have been applied appropriately;   |
| (iii)  | the process undertaken by the <b>CPP applicant</b> to determine the reasonableness and cost-effectiveness of the chosen solution, including the use of cost-benefit analyses to target efficient solutions;     |
| (iv)   | the approach used to prioritise <b>capex projects</b> over time including the application of that approach for the <b>next period</b> ;   |
| (v)    | the <b>project</b> capital costing methodology and formulation, including unit rate sources, the method used to test the efficiency of unit rates and the level of contingencies included for <b>projects</b> ; |
| (vi)   | the impact on other cost categories including the relationship with <b>opex</b> ;   |
| (vii)  | links with other <b>projects</b> ;  |
| (viii) | cost control and delivery performance for <b>actual capex</b> ; and   |
| (ix)   | the efficiency of the proposed approach to procurement;   |

As indicated in Section 4, we reviewed a total of twelve capex projects or programmes, including two non-network programmes, as part of this verification exercise. These projects had a total value over the next period of \$376.9 million and represented 72% of Orion's forecast next period capex. The projects and programmes reviewed covered a broad spectrum of project types and in aggregate were broadly representative of Orion's forecast capex over the next period.

While detailed summaries of the individual project review are provided in Appendix A, the following sections provide a broad overview of our findings. The three asset replacement capex programmes we reviewed are discussed in Section 5.5.

### **5.3.1 Major Projects**

We reviewed three major projects, with a total forecast expenditure over the next period of \$98.7 million or 64% of Orion's forecast next period.

#### *CPP01 – Urban North Subtransmission*

With a total forecast expenditure of more than \$60 million, this is the largest major project planned by Orion over the forecast period.

Given the planning criteria used as a basis for Orion's CPP proposal, the project configuration appears reasonable. We also consider that the approach taken by Orion in forecasting the costs of the project is reasonable although the assumed unit rate of \$700 per metre for cable installation and jointing over the Hawthornden-Rawhiti cable routes may be high. If a unit rate of \$650 per metre was assumed the project cost estimate would reduce by \$1.34 million (real).

If the proposed 66kV circuits were constructed overhead, we estimate that the cost of the project would reduce to approximately \$28.3 million, a reduction of more than 50%. However, installation of the Bromley-Rawhiti cable is now committed, which revises the estimated project cost to \$37.3 million, still a 38% reduction. Additional savings could be possible by deferring construction of the Marshland substation and installation of the second transformer at Waimakariri, if it is assumed that, with overhead construction, there is no need to provide for full supply restoration immediately following an N-2 contingency event.

#### *CPP02 – Dallington Subtransmission*

We consider the Orion's estimated expenditure on this project to be reasonable. However, there would be a significant reduction in the cost of this project if the new 66 kV circuits were installed overhead, rather than underground, but we have not analysed the potential savings in detail as we understand expenditure on both sections of underground cable is already committed.

The primary driver for this project is to replace assets that suffered irreparable earthquake damage and we agree that it should proceed as soon as reasonably practicable.

#### *CPP07 – Rolleston*

This was the only rural major project we reviewed. Orion's planning criteria for rural subtransmission differs from the urban network in that lines are built overhead and the security criteria are slightly less onerous.

Both the Larcomb and Burnham substation work and the Railway Rd switching stations are driven by a major new block load that is likely to be confirmed. We consider inclusion of this work in the forecast is reasonable.

The need for the Highfield 66 kV line conversion and substation upgrade is more speculative. Much will depend on the need for a new substation at Norwood, which in turn will be driven by whether or not potential new industrial load in the area materialises. While we cannot be certain, we assess the likelihood that Orion will be able to defer this work until beyond the end of the CPP regulatory period to be relatively high.

#### *Conclusion*

Given Orion's planning criteria and security standards, the projects were well formulated, notwithstanding a lack of transparency as to how this was done. We also considered the methodology used to forecast project costs appropriate and while we had reservations

about the basis for the assumed installation cost of underground cable along some routes, the unit costs used for forecasting purposes were reasonable.

Substantial savings are possible if 66 kV circuits in urban areas are built overhead. We also think some subprojects could be deferred if Orion's N-2 security criteria were relaxed, but we are unable to quantify the potential savings.

### **5.3.2 Underground Conversions**

#### *CPP50 – Underground Conversions*

This programme is possibly misnamed as it is primarily driven by third party requests for asset relocations. We believe that the approach used by Orion to forecast expenditures is reasonable given the nature of the programme.

However, we suggest that Orion:

- review its capital contribution policies, in particular the currency of its calculations with respect to contributions for Council initiated projects; and
- develop a policy (including capital contributions) that is consistent with Section 6 of the "National Code of Practice for Utility Operators to Transport Corridors".

### **5.3.3 Reinforcement**

#### *CPP51 – Urban Reinforcement*

There is a step change in urban reinforcement expenditure predicted in FY14 and FY15 arising out of new connections and extensions and underground conversion work in FY12 and FY13. However, the programme is tactical rather than strategic and no specific projects have been identified for implementation beyond FY15. Orion has confirmed that it identifies and prioritises expenditure on specific projects only after network growth actually starts to materialise.

Orion allocates a fixed amount of budget each year to be allocated between urban and rural reinforcement programmes and this reflects the ability to tactically prioritise expenditure across the whole network, notwithstanding the fact that urban and rural reinforcements are separately budgeted.

The combined forecast expenditure is comparable to historical levels and when considered in conjunction with the rural reinforcement programme the forecast expenditure levels appear to be reasonable.

### **5.3.4 Connection and Extensions**

#### *CPP53 – Connections and Extensions*

The reasonableness of the forecast for this project is contingent upon an assessment of the forecast new connection numbers. Orion's forecast for new connections aligns with the Christchurch City Council's planning basis for post-earthquake recovery and this probably represents the best available information in a situation where there is extremely high post-earthquake uncertainty. As a result we believe that the projected expenditure for this capex project is a reasonable forecast.

### **5.3.5 Transpower Asset Transfers**

#### *CPP54 – Spur Asset Transfers*

We consider that the spur asset acquisition programme is soundly based. The acquisition of the assets should result in, at worst, a break even result for Orion consumers and most likely significant savings.

### 5.3.6 Non-Network Assets

#### *CPP60 & CPP62 – Office Buildings*

CPP60 relates to the construction of Orion's new office building in Wairakei Rd, while CPP62 covers expenditure on Orion's existing Armagh St complex. We review both capex line items as information on both was provided to us in a single project summary.

Orion has no choice but to relocate its head office. We consider both the decision to construct a purpose built new office complex and the forecast cost of the building to be reasonable.

We have some reservations about the need for the ongoing \$250,000 capex provision for what will be a brand new building and we also note the contingency provision of \$800,000 in the estimated build cost of the new building. On the other hand, there appears to be no specific cost for final site works and landscaping, although this may be part of the building contract. However, some site works provision will be necessary if Orion purchases the neighbouring property.

#### *CPP64 – Corporate Information Technology*

Apart from the slightly higher expenditure for years around the earthquakes, Orion seems to maintain similar levels of expenditure from historic years into the forecast. Apart from this, it seems that Orion developed the forecast by looking at actual projects foreseen in future years based on needs or cyclical updates or renewals.

We consider that Orion's forecast corporate IT capex is reasonable.

### 5.3.7 Conclusion

There are four significant drivers for the capex forecasts described in this section.

- *Rate and location of demand growth*

This will be largely determined by the earthquake recovery in its broadest sense and there is a high level of uncertainty regarding this. Orion is coordinating closely with the Christchurch Earthquake Recovery Authority (CERA) and other agencies. It has based its forecast on the quick recovery scenario recommended by the Christchurch City Council, which seems appropriate at this time.

- *Reliability of supply*

Prior to the earthquakes Orion's reliability of supply was very good when compared to other New Zealand EDBs and Orion is aiming to restore its supply reliability to pre-earthquake levels some time after FY19. The restoration path on which the capex forecast is based is aggressive and a less ambitious path could allow some projects to be deferred.

- *Security of Supply*

Orion's security criteria for N-2 contingencies are high by international standards. It requires a high level of spare capacity to be kept available in the 11 kV distribution network and the availability of this spare capacity is often the trigger that determines the timing of major subtransmission projects. If the N-2 security criteria were relaxed, the required spare capacity in the distribution network would reduce and projects could be deferred.

- *Urban Subtransmission Circuits*

The Christchurch City Council requires new subtransmission circuits to be built underground. If these circuits were built overhead there would be substantial

cost savings as well as other potential benefits such as greater earthquake resiliency and much faster repair times. While the planned underground circuits between Bromley and McFaddens and Bromley and Rawhiti are committed, we understand that other circuits to be constructed as part of the urban north projects run through areas that have still to be intensively subdivided. Construction of overhead circuits in these areas could be considered.

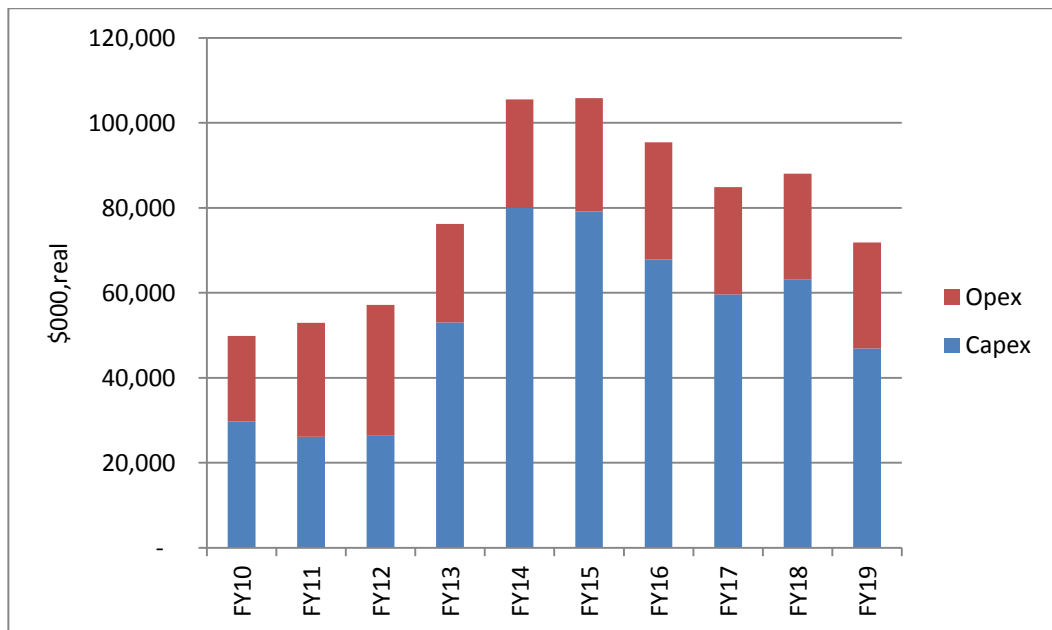
If the assumptions that Orion has made in respect of these significant drivers are accepted, then we consider that the capex forecasts discussed in this section are reasonable.

#### 5.4 DELIVERABILITY

Provide an opinion as to overall **deliverability** of work covered by the **capex categories** in the **next period**.

We did not identify any insurmountable deliverability issues in any of the individual capex projects or programmes that we reviewed. In this section we consider whether Orion's proposed capex forecast is deliverable in totality. However, since capex and opex draws largely on the same resource base, we use Orion's forecast aggregated network capex (excluding asset acquisitions) and opex, measured in real terms, as a proxy for the total work volume to be delivered. This is shown in Figure 5.2, which excludes expenditure on the acquisition of spur assets, non-network assets as well as corporate and network management and operations opex.

**Figure 5.2: Aggregated Actual and Forecast Network Capex and Opex (\$000, real)**



In the aftermath of the earthquakes Orion has already demonstrated an ability to successfully ramp up expenditure, as total network expenditure (capex and network opex) increased 15% from a pre-earthquake level of \$49.9 million (real) in FY10 to \$57.2 million in FY12.

However, as can be seen from Figure 5.2, Orion is forecasting significantly higher increases in FY13 and FY14, before levelling off and then declining in the following years. Expenditure in FY13 is forecast to increase by \$19.0 million (33%) over the previous year to \$76.2 million. In FY14 expenditure is forecast to increase by an even greater \$29.3 million (39%) to \$105.5 million. This represents an increase of 84% over the expenditure two year earlier.

Put simply, Orion is forecasting to almost double its works expenditure over a period of just two years at a time when the earthquake rebuild is gathering momentum and there is expected to be an increasing demand for construction resources. While it is apparent

that Orion has factored in deliverability constraints in some areas of its forecast<sup>25</sup>, the CPP proposal does not contain a comprehensive strategy for delivering such a substantial increase in works expenditure. Section 9.11.3 of the proposal discusses deliverability in the context of Orion's relationships with its contractors but does not discuss the downstream issue of whether these contractors will be able to source the skills required to deliver the programme.

The actual expenditure incurred in FY13 should provide a good indication of deliverability. The FY13 capex in the draft CPP proposal was based on the expected budget<sup>26</sup> and this has not been revised for the final proposal on the basis of an updated expenditure outturn. We understand the same applies to the FY13 opex forecast in the proposal. If Orion's actual expenditure in FY13 is found to be well short of the amount in the CPP proposal it may be necessary for it to revise its CPP proposal to accommodate probable deliverability constraints.

## 5.5 ASSET REPLACEMENT MODELS

Provide an opinion as to the reasonableness and adequacy of any asset replacement models used to prepare the **capex forecast** including an assessment of-

- (i) the inputs used within the model; and
- (ii) the methods the **CPP applicant** used to check the reasonableness of the forecasts and related expenditure.

### 5.5.1 Forecast Expenditure

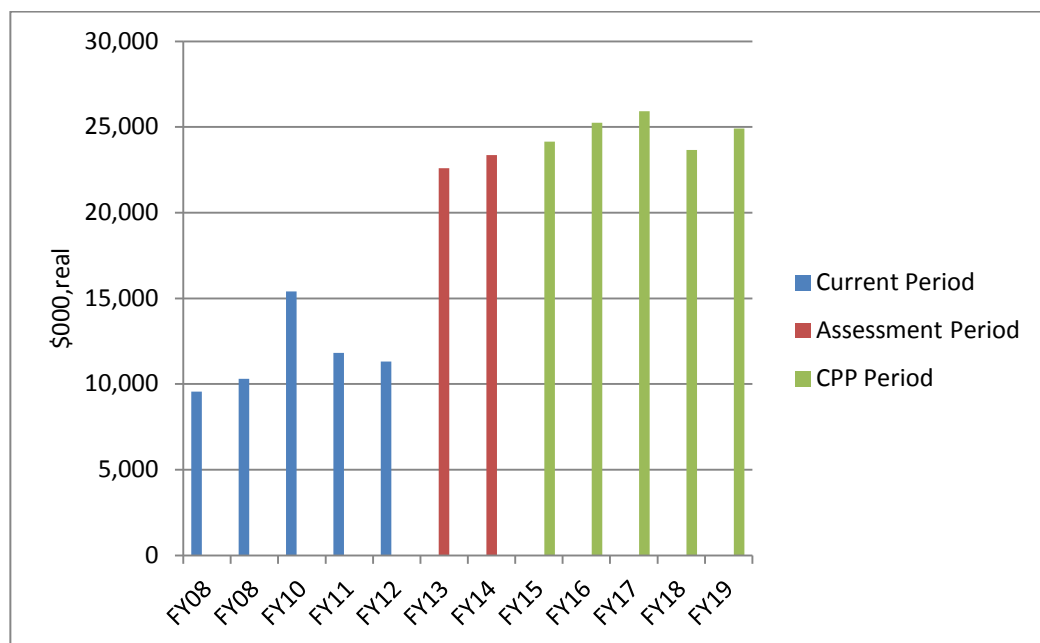
Orion's historic and forecast total asset replacement capex is presented in Table 5.2 and Figure 5.3.

**Table 5.2: Actual and Forecast Asset Replacement Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
9,552	10,305	15,401	11,817	11,308		
Assessment Period		CPP Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
22,603	23,353	24,138	25,254	25,916	23,663	24,904

<sup>25</sup> It appears, for example, to have spread 66 kV cable installation and substation construction over a number of years.  
<sup>26</sup> Response to verifier question GB106.



**Figure 5.3: Actual and Forecast Asset Replacement Expenditure (\$'000, real)**

It can be seen that prior to FY10, asset replacement expenditure was around \$10 million a year. It increased by about 50% in FY10 as a result of a deliberate strategy to increase the level of asset replacement that was signalled in the 2010 AMP. It then dropped back in the aftermath of the earthquakes and from FY13 onward Orion is planning to increase asset replacement capex by more than 100% above the FY12 expenditure and maintain this high level through to the end of the forecast period.

This reflects a substantial increase in the number of assets scheduled for replacement.

### 5.5.2 Forecasting Methodology

Forecast scheduled maintenance requirements for individual asset types were based on an assessment of the overall age and condition of the relevant assets undertaken by asset management engineers within Orion's infrastructure management division. The results of this assessment were presented in a series of asset management reports prepared in FY13 as a basis for Orion's CPP proposal. These are discussed in more detail in Section 6.4.2.4.

In parallel with this, EA Technology has developed CBRM models for the different asset classes. The CBRM approach develops a measure of the health of each asset in a particular asset class based on a number of criteria including asset age profile, asset condition, historic failure rates for different asset types and the criticality of the asset to the operation of the network. The model uses this information to develop a replacement expenditure profile for each asset class with the objective of ensuring that there is no deterioration in the health of the asset class at the end of the ten year forecast period. While the asset replacement models incorporate all of the factors noted above, the asset age profile is the primary driver in determining the health index at this relatively early stage of Orion's CBRM development phase.

Orion has then prepared an asset replacement forecast for each asset class based on its own condition based replacement analysis, internally developed reliability based replacement criteria, the EA Technology modelling results and its asset management engineering judgement. While Orion accepts that the EA Technology models are still in their infancy and need further refinement, they have indicated that a significant increase in asset replacement expenditure is necessary if the health of the asset base is not to deteriorate over time and this appears to have been a significant factor in determining the level of capex included in the asset replacement forecast.

Some of the asset replacement schedules that have emerged from this forecasting exercise are very comprehensive, identifying the individual assets to be replaced in each year of the forecast.

### **5.5.3 Identified Replacement Programmes**

We reviewed in detail the asset replacement programmes for three different asset classes. The results of these reviews, which are presented in detail in Appendix A, are summarised below.

#### *CPP33 – Communications Cables and Protection Systems*

The primary driver of the significant increase in this project expenditure is the CBRM model of the protection systems, which indicates that accelerated replacement is required. The CBRM modelling appears to be targeting an approach that maintains the current health index over time even though there is no evidence to support the hypothesis that the current health index is the optimum level for Orion. Furthermore, because of limited data on relay failure rates and condition, the model appears to use asset age as a proxy for condition. We would not normally endorse a forecast where age rather than condition is the main criteria for asset replacements.

However, there have been significant changes in protection relay technology, where electro-mechanical relays have been superseded by solid state electronic designs, which in turn have been replaced by programmable computer technology. Hence, older relays are now obsolete. In addition, Orion's protection system asset replacement plan aims to replace protection systems at the same time as their associated circuit breakers are replaced. This seems sensible.

As with all replacement programmes there is a trade off between reliability and cost. There is a lack of evidence in the documentation provided to us by Orion on current relay failure rates and the impact that this has had on supply reliability. Nevertheless, the age profile of protection systems tends to indicate a likely need for increased replacement and we are inclined to view that the expenditure forecast is reasonable.

#### *CPP36 – Switchgear Replacement*

This programme has been developed in a comprehensive manner and appears to be well planned. There is a significant increase in forecast expenditure over historical levels (even after allowing for the redeployment of resources following the earthquakes). The forecast expenditure is driven by the increased replacement volumes needed to maintain the current switchgear health index and address safety and reliability issues with certain switchgear types.

The principle question arising out of this approach relates to whether or not the current health index for switchgear (as reflected in the CBRM report from EA Technology) is an optimum one or whether a lower level of asset health would suffice. While condition rather than age should be the primary driver for an asset replacement programme, the average age of switchgear assets is very high in comparison to their expected life. This is shown in Table A5.2 and is an indicator that the overall condition of this asset class could be relatively poor, particularly once the safety and reliability problems with certain switchgear types are taken into account. This indicates that an accelerated level of expenditure on switchgear replacement is probably justified and, on this basis, we consider that Orion's forecast is reasonable.

#### *CPP37 – Transformer Replacement*

While the general principles underpinning the replacement of transformers appear to be sound, we are unable to reach a firm conclusion as to whether the level of expenditure proposed is reasonable. However, on balance, we consider that the forecast is higher than it needs to be for the following reasons:

- Orion states that its CBRM studies to date indicate that the replacement levels should be greater than assumed in its forecast. However, the CBRM model is primarily age related and does not factor in the overall condition of the assets. We have seen no objective assessment of either asset condition or failure rates and suspect that the failure rate and condition information normally used as inputs to the CBRM model is not available for this asset class.
- The magnitude of the step change between historic and forecast expenditure is substantial. Orion ascribes this as being due to a potential under-reporting of replacement transformers and an aging population but has indicated that it has much work to do in developing its distribution transformer replacement programme. In the absence of a detailed programme and a lack of certainty as to the degree of historical cost apportionment we do not consider a step increase of the magnitude proposed to have been adequately justified. In terms of presumed historic allocation issue, we have not observed any offsetting reductions in the reinforcement capex expenditure.
- The age profile of the transformers is increasing and this could indicate a need for a more incremental increase in replacement costs over time. We have seen nothing to indicate that a large step change from pre-earthquake expenditure levels is necessary.

We note that in most situations the risk to Orion of a distribution transformer failure is small. Distribution transformers have an expected asset life of at least 45 years<sup>27</sup> and each transformer supplies a limited number of consumers. We think many consumers would consider a three or four hour outage every 45 years, if their distribution transformer is replaced on failure, to be acceptable. Outage risks could be reduced for critical loads, such as hospitals, through a targeted distribution transformer maintenance and replacement programme.

#### 5.5.4 Conclusion

While we recognise that the CBRM modelling is still a work in progress, and accept that in some cases it has informed rather than driven the asset replacement forecast, we have reservations about the model as it currently exists. In particular,

- the replacement expenditure profile for most asset classes is predicated on the basis that risk levels at the end of the 10-year modelling period should mirror the current (pre-earthquake) risk levels. No consideration is given to whether this level of risk is appropriate or to differences in the level of risk between asset classes if risk was assessed from an overall business perspective.
- where robust data on actual asset condition or failure rates was not available the CBRM model defaulted to using an age based replacement profile. As a result, in two of the identified programme asset class forecasts we examined (distribution transformers and protection relays) the forecast asset replacement rate was significantly higher than historic levels when there is little evidence to support the proposed level of increase being needed to mitigate a deteriorating asset condition problem.

Overall we do not believe that Orion has been able to fully justify the increased level of asset replacement expenditure over the CPP period. We believe that an increase in expenditure on asset replacement is warranted over the forecast period but are not convinced that the forecast level of expenditure is fully justified.

#### 5.6 CONCLUSION

Based on its analysis under this clause the **verifier** must provide its opinion on whether the applicant's forecast of total **capex** meets the **expenditure objective** and, if not identify-

<sup>27</sup> Schedule A of the IM.

- |     |   |
|-----|---|
| (a) | whether the provision of further information is required to enable assessment against the <b>expenditure objective</b> to be undertaken and, if so, the type of information required; |
| (b) | which of the <b>CPP applicant's forecast capex programmes</b> for each <b>capex category</b> might warrant further assessment by the <b>Commission</b> ; and                          |
| (c) | what type of assessment would be the most effective.  |

Based on the capex review described above we conclude that:

- Orion's major project capex forecast is reasonable on the basis of the planning criteria it is currently using. However, there is a need to review these criteria to confirm that they are still appropriate in the post-earthquake environment, since relaxing the criteria currently used could result in a significant reduction in major project capex requirements. This may require further consumer consultation because it implies a trade-off between capex and supply reliability;
- While an increase in expenditure on asset replacement is warranted Orion should be required to provide further justification for the level of expenditure in its forecast. This could include a sensitivity analysis of the impact of lower levels of expenditure on failure rates and supply reliability. We understand that Orion has good data on asset performance and we think it should be able to provide at least an indicative analysis;
- Forecast expenditure in other areas is generally reasonable. However, reinforcement and connections and extensions capex requirements are driven by the rate of growth in demand and the location of new customer connections and these are areas with very high levels of uncertainty in the post-earthquake environment; and
- The magnitude of the increase in capex in both FY13 and FY14 is driving increases in expenditure that are much higher than Orion has seen in the past, even during and in the immediate aftermath of the earthquakes. It is not clear that an expenditure increase of this magnitude is deliverable, particularly in the post-earthquake environment when there is likely to be intense competition for construction resources. A better indication will be available when the actual expenditure for FY13 is known. If this is significantly lower than the level in the CPP proposal Orion could be asked to provide a detailed capex delivery plan, which should cover not only the relationship it has with contractors but also how they propose to resource the work. If deliverability is in doubt, Orion may need to reprioritise its expenditure to accommodate the deliverability constraint.

## **6. OPEX FORECAST**

### **6.1 EXPENDITURE CATEGORIES**

Schedule D of the IM specifies five standard expenditure categories into which opex should be disaggregated when preparing a CPP proposal. There is also an additional category called "other opex" to capture opex that is not readily allocated to one of the standard categories.

In section 8.5.3 of the CPP proposal, Orion indicates that its opex is grouped into the expenditure categories that it uses for network asset management planning. These differ slightly from the standard IM categories. Section 8.5.3 also includes a table showing the relationship between Orion's opex categories and the standard IM categories. The correlation between the Orion and IM categories is generally good although there are some differences in respect of maintenance activities.

In particular Orion's scheduled maintenance opex category does not differentiate between routine and preventative maintenance and refurbishment and renewal maintenance. Therefore, it is not possible for us to allocate Orion's maintenance opex across these two standard IM categories.

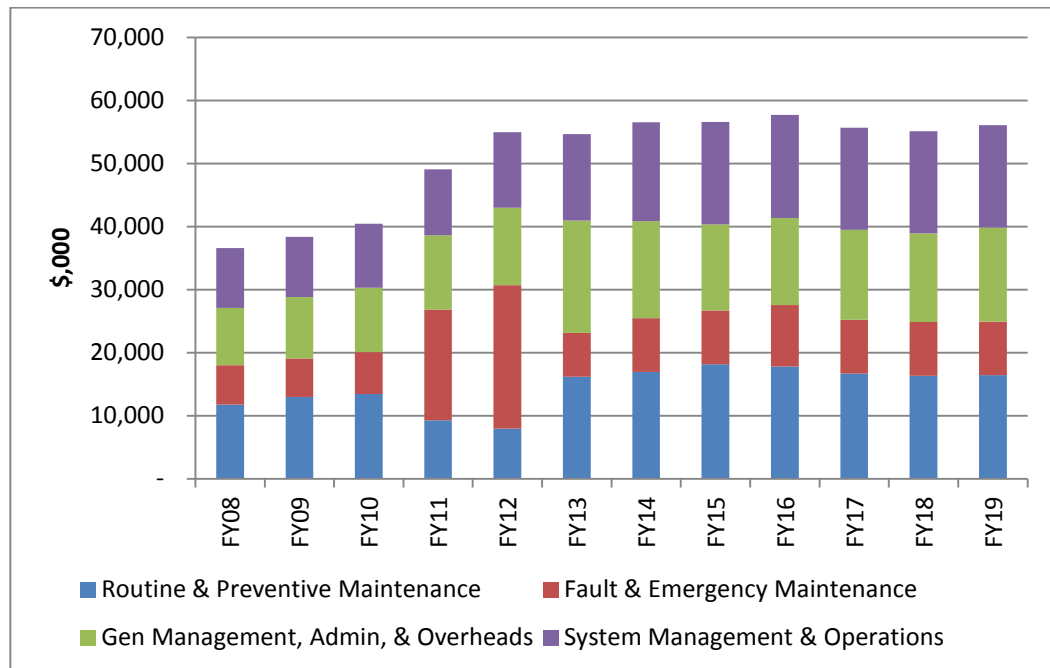
A second issue is the IM categorisation of Orion's non-scheduled maintenance expenditure. In the table in Section 8.5.3 of the CPP proposal, Orion indicates that this expenditure should be mapped into the aggregated routine and preventative/refurbishment and renewal IM categories. In our view Orion's non-scheduled maintenance expenditure, which covers maintenance undertaken in response to a fault but not as part of an emergency response, is better mapped into the IM fault and emergency maintenance category, because Orion's definition of "non-scheduled" maintenance broadly corresponds to the "fault" component of the IM "fault and emergency" maintenance definition.

Clause 5.4.31 of the IM allows Orion to use its own expenditure categories in this transitional period. However, for the purposes of this opex review, we have tried to be as consistent as possible with the standard IM categories by treating Orion's non-scheduled maintenance opex as fault and emergency maintenance.

Orion has not indicated that any of its opex should be categorised as "other opex" and we concur with this.

### **6.2 FORECAST OPEX**

Orion's historic and forecast opex, excluding real cost escalation, is shown in the Figure 6.1 below. The figure shows the total level of opex broken down, to the extent possible, into the major categories stipulated in the IM.

**Figure 6.1: Historic and Forecast Expenditure – Total Opex (\$'000, real 2013)**

Source: GBA Analysis, information provided by Orion, Statistics New Zealand. In this diagram Orion's non-scheduled maintenance has been allocated to the fault and emergency maintenance IM category.

The impact of the earthquakes experienced in FY11 and FY12 is very evident with a significant increase in fault and emergency maintenance and a somewhat smaller reduction in routine and preventative maintenance. Clearly, Orion found it necessary to reallocate its maintenance expenditure in the aftermath of the earthquakes.

It can also be seen from Figure 6.1 that Orion has found it necessary to increase its total opex spend by approximately 40% following the earthquakes and that it is expecting total opex to remain at this elevated level throughout the forecast period. While network maintenance opex increased in the immediate aftermath of the earthquakes, Orion is forecasting direct maintenance expenditure to reduce from FY13. However, this reduction is offset by increases in overhead expenditure, represented by the system management and operations and general management, administration and overheads expenditure categories.

### 6.3 POLICIES AND PLANNING STANDARDS

Provide an opinion as to whether the-

- (i) **policies,**
- (ii) **planning standards;** and
- (iii) **key assumptions,**

relied upon by the **CPP applicant** in determining the **opex forecast** are of the nature and quality required for that **opex forecast** to meet the **expenditure objective**;

Policies and planning standards describe the processes, systems and controls that ensure that all expenditure decisions are made consistent with corporate objectives and with good electricity industry practice. They provide clarity of roles and accountabilities, clear processes and criteria to support decision making, and the ongoing review and monitoring of business processes and outcomes.

Key assumptions are defined in Schedule D of the IM as any significant assumption made by Orion in the preparation of its proposal. These are considered throughout this opex review as they relate to specific programmes and expenditure categories.



The policies and planning standards included in this assessment are those required to forecast opex requirements, set expenditure budgets and control actual costs. Policies and planning standards<sup>28</sup> that were reviewed to form an opinion include:

- NW70.50.03 - Document Control Final
- NW70.60.13 - Project Budget Forecasting Process Final
- NW70.60.14 - Project Prioritisation and deliverability Process Final
- NW70.60.15 - Asset Management Lifecycle Budget Forecasting Process Final v2
- NW70.00.46 - Asset Management Policy
- OR00.00.19 - Procurement Policy
- NW73.00.03 - Contract Management
- OR00.00.11 - Delegations of Authority Policy
- NW73.10.15 - Authorised Contractors
- OR00.00.01 - Health and Safety Policy
- OR00.00.03 - Environmental Sustainability Policy
- NW70.60.01 - Asset Management Plan
- NW72.20.03 - Emergency works
- OR000013 - Information Systems Policy
- NW70.20.00 – Business Plan
- NW70.01.17 – Annual Work Plan
- Asset lifecycle management reports

There are some consultants' reports identified in the CPP proposal that relate directly to opex. The key reports that formed part of this review are listed below:

- EA Technology - Orion Networks AMMAT Review 2012
- Marsh - Orion's Network Catastrophe Insurance - An Expert Report For Orion And The Commerce Commission 9 October 2012

Orion's "Delegations of authority policy, Reference OR00.00.11" is a key policy document that comprehensively sets out the authorities and accountabilities of Orion's management staff. Individual staff members are identified by name and it is one of the most comprehensive documents of this nature that we have seen.

While the policy and planning standard documents that we reviewed appear to reflect good industry practice, most policies and processes are less comprehensive than the delegations of authority policy although we are not suggesting this is necessarily a bad thing. In many cases, the policies and procedures we reviewed were developed only recently, which could suggest they may not be well entrenched.

We further note that, while the policies and procedures relating to programme delivery were comprehensive, there was limited guidance on the planning and development of maintenance programmes and the consideration of alternative approaches. In particular, there was no requirement for a business case to be documented and approved before the issue of large works order.

This did not lead to the development of maintenance programmes that we considered technically inappropriate or inefficient. It may be that the lack of formal internal management procedures and processes relating to project and programme development is compensated by, and could even promote, a collegial corporate culture with strong communication links, particularly within the infrastructure management division. By international standards, Orion is a small network business and this collegial culture may well produce better outcomes than would be achieved if communication links were weaker and project and programme development was constrained by a need to comply with rigidly enforced business processes.

The AMP is an integral part of Orion's business plan. Board approval of the AMP implies in-principle approval of all identified expenditure subject to the provisions of the

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<sup>28</sup> Orion defines policies to mean all of their controlled documents, refer Section 9.3.1 of the CPP proposal.

comprehensive delegated authority policy. The annual work plan is simply a Gantt chart that is used as a tool to even out contractor work flows over the course of a year.

We agree with the findings of the EA Technology report, "Orion Networks AMMAT Review 2012" dated October 23, 2012, which concluded:

*That Orion's asset management operation functions so well at present is likely due to strong but informal communication processes coupled with talented and committed staff. While more fully documenting processes and requirements is not a substitute for quality staff and organisational culture, it can serve to provide support and consistency in the event that unforeseen circumstances result in substantial changes to personnel or culture.*

## 6.4 REVIEW OF INDIVIDUAL EXPENDITURE CATEGORIES

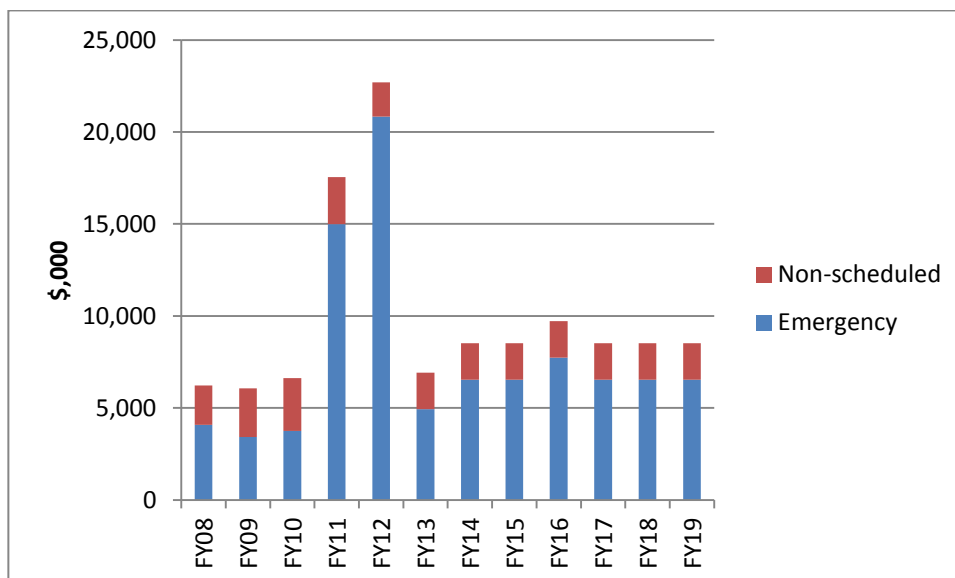
This section reviews each opex expenditure category in detail including forecast preparation, reasonableness of key assumptions, drivers not covered by key assumptions, reasonableness of forecasting methodology, opex reduction initiatives and deliverability. The section also includes the review of sections 9.18 to 9.24 of the CPP proposal, and provides an assessment as to whether the opex forecast has been prepared in accordance with Orion's policies and planning standards, at both the aggregate system level and for each of the opex categories.

### 6.4.1 Fault and Emergency Maintenance

Orion defines emergency maintenance as the response to unplanned events that impair the normal operation of network assets. As discussed in Section 6.1, for the purposes of this verification, we have included Orion's non-scheduled maintenance expenditure within the fault and emergency maintenance opex category.

Figure 6.2 compares forecast and historical emergency maintenance expenditure.

**Figure 6.2: Historic and Forecast Expenditure – Fault and Emergency Maintenance (\$'000, real 2013)**



Source: GBA Analysis, information provided by Orion, Statistics New Zealand

Orion incurred substantially higher levels of emergency opex in FY11 and FY12 to respond to the earthquakes and this is reflected in Figure 6.2. Overall, forecast expenditure is greater in real terms than actual expenditure prior to the earthquakes even though forecast non-scheduled maintenance expenditure has reduced.

We reviewed two identified programmes that fall into this expenditure category, underground cables (CP118) and network assets (CPP119). These two programmes together constitute just over 50% of forecast emergency maintenance opex and also had the biggest increases over historical expenditure. These reviews are presented in Appendix A17 and Appendix A18 respectively.

Orion prepared its underground cable emergency maintenance forecast in June 2012 based on the assumption that cable failure rates would be 30% higher than pre-earthquake levels. As of early 2013, actual failure rates are significantly higher than this, but Orion has not increased the original forecast for the final CPP proposal. There is also uncertainty as to whether cable failure rates will increase or reduce over time and Orion has assumed that they will remain constant over the CPP period. Overall we consider Orion's forecast expenditure to be realistic, given the uncertainty regarding future cable failure rates and, given the information we have seen, we think there is a possibility that the actual expenditure requirement will be higher than forecast.

We did not review Orion's expenditure forecast for the emergency maintenance of overhead lines. However, the forecast for the emergency maintenance of other network assets (CPP119) was similar in real terms to actual pre-earthquake expenditure apart from an additional provision for fixed costs associated with the emergency maintenance contracts, as discussed in Section 6.4.1.1 below.

#### **6.4.1.1 Forecast Preparation – Compliance with Policies and Standards**

Orion has prepared this forecast on the basis that the existing contractual arrangements for the delivery of fault response and emergency maintenance works will continue.

All emergency works are outsourced through two contracts with locally based contractors, which are governed by the emergency works policy. The policy states that the two contracts shall be undertaken in accordance with the current Orion design standards and technical specifications, specifically including Works General Requirements NW72.20.04, Event Reporting NW72.11.03, Contract Hazard Management NW72.20.10 and Contract Performance NW72.20.05. It is also required that the contractors shall have systems in place to understand and meet the current requirements.

The emergency works contracts were renegotiated in October 2012 and the revised contracts have additional resiliency provisions related to Orion's emergency response provisions under the CDEM Act. Contractors are reimbursed for these new requirements through payment of a fixed cost, unrelated to actual work volumes, which amounts to about \$1.1 million per year across both contracts<sup>29</sup>. This new fixed annual cost has been apportioned across the emergency response line items, CPP118-CPP120.

Non-scheduled maintenance relates to the rectification of faults that do not require an emergency response, and is undertaken by Orion's routine maintenance contractors.

The performance of Orion's contractors is monitored through auditing processes which are routinely performed at a system level, with the audit intensity determined based on the contractors' level of compliance with policies and standards.

#### **6.4.1.2 Reasonableness of Key Assumptions**

The key assumptions driving this forecast appear to be that:

- the asset failure rate for underground cables over the forecast period will be higher than pre-earthquake failure rates – Orion has indicated a 30% higher

<sup>29</sup> This is our estimate. We asked Orion to provide the exact amount (verifier question GB114) but the response only answered part of the question. We have estimated the total amount on the basis of information provided to us by Orion in a number of documents. We did not find fully consistent possibly because of errors introduced through rounding relatively small numbers and perhaps also because some information may have included other costs that were not explicitly identified.

underground cable failure rate than pre-earthquake levels and has included a provision of \$1.4 million per year in CPP118 to provide for this<sup>30</sup>;

- for the emergency maintenance line items (CPP117-119) there is also a one off aggregated fixed cost provision of \$1.2 million in FY16 due to the relocation of critical stores and spares to a new lifeline standard building managed by Connetics. This has been apportioned across the emergency response line items. Orion has confirmed that this includes only the relocation cost and not the building<sup>31</sup>;
- there is a provision of \$0.2 million per annum for additional traffic management costs for the emergency repair of underground cables; and
- apart from the above adjustments to emergency maintenance line items, expenditures (and presumably failure rates) are assumed to be constant in real terms throughout the forecast period.

We consider these key assumptions, which are discussed above and in more detail in Appendices A18 and A19 to be reasonable.

#### **6.4.1.3 Drivers Not Covered by Key Assumptions**

There are no drivers identified apart from the key assumptions discussed above.

#### **6.4.1.4 Reasonableness of Forecasting Methodology**

The forecast is an aggregation of Orion's individual emergency and non-scheduled maintenance forecasts for individual asset classes as developed in a series of asset management reports prepared specifically for this CPP proposal. In our view this is a reasonable approach, provided there is not an excessive amount in each individual forecast to provide for forecasting uncertainty. This is discussed in Section 6.4.

#### **6.4.1.5 Opex Reduction Initiatives**

Orion has advised that it did not apply any specific opex reduction initiatives other than efficiencies culminating from its competitive tendering process. However, the assumption that expenditure will remain constant in real terms could require cost efficiencies over time.

The Australian Energy Regulator (AER) accepts a scale escalation modelling approach for the top down forecasting of EDB opex requirements and this approach is generally accepted as valid for regulatory purposes. It is based in the premise that opex costs will increase as the volume of assets under management increases. While the AER model tempers this increase through the application of factors to reflect economies of scale and any capex-opex trade-off, the model generally produces an outcome where opex costs increase with increased asset volume. The rate of increase will vary with the proportion of fixed costs in a particular forecast line item.

However, in Orion's case, in the early part of the forecast period the volume of assets under active management is likely to be less than during the pre-earthquake period. In particular, Orion advises that distribution assets within the CBD red zone are still likely to be in serviceable condition but are not being actively managed. This suggests a reduction in opex could be possible in some areas.

We have not considered this potential for opex reduction and recognise that in Orion's case it is likely to be offset by extraordinary post-earthquake costs. Overall, we are inclined to the view that, all else being equal, maintaining costs constant in real terms over the forecast period notwithstanding an expanding asset base will require

<sup>30</sup> Programme summary, p7.

<sup>31</sup> Response to verifier question GB115

progressively more efficient management of the opex spend. This applies to all opex expenditure categories where this assumption has been made.

#### 6.4.1.6 Deliverability

Emergency maintenance is delivered through two emergency contracts with local contractors for a minimum contract period of three years. Even though it is not explicitly stated, with the minor increase in workload from historic years, there appears to be no delivery constraints under this category. Furthermore, the substantial expenditure increases for FY11 and FY12 is evidence that additional work could be performed with the available resources (even though this was partly achieved by reallocating resources from other expenditure categories).

From the above, no deliverability constraints are foreseen for this expenditure category.

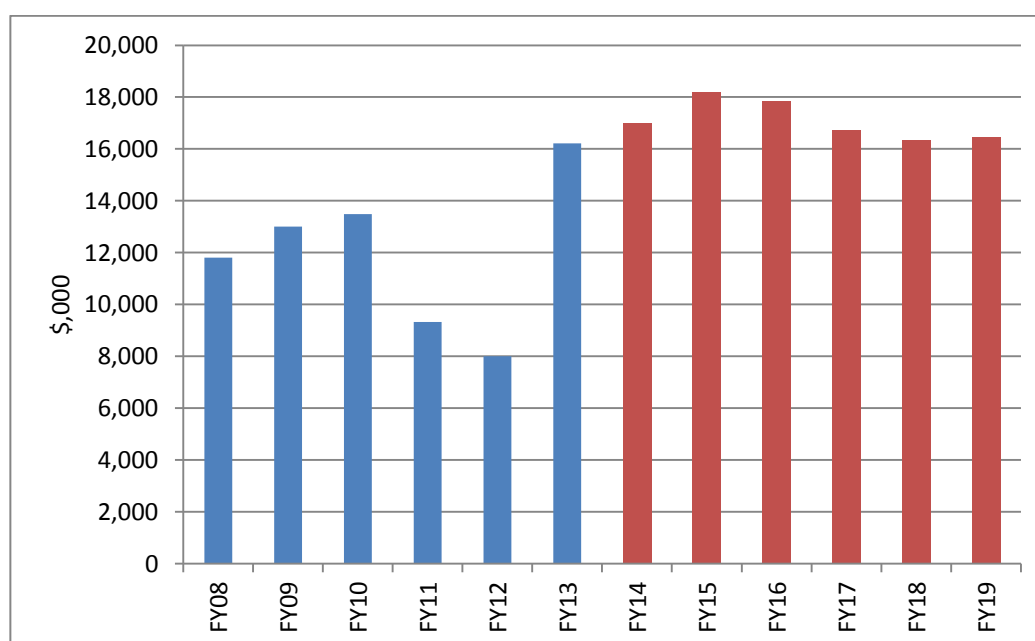
#### 6.4.1.7 Conclusion

Orion's total forecast opex for fault and emergency maintenance for FY14 and beyond is \$8.5 million (apart from FY16 where there is an additional provision of \$1.2 million for moving critical spares to a new location) compared to an average annual expenditure of \$6.3 million over the period FY08-FY10. Approximately \$2 million of this increase has been accounted for by the adjustments for increased emergency contractor resiliency, the additional cable failure rate and additional traffic management costs. We therefore consider the fault and emergency maintenance forecast to be reasonable.

### 6.4.2 Scheduled Maintenance

Orion defines scheduled maintenance as planned work including routine inspection and testing, site maintenance and vegetation management. Its scheduled maintenance category aligns with the IM routine and preventive maintenance category but also includes any refurbishment and renewal maintenance opex that is not capitalised. Figure 6.3 below compares Orion's historical and forecast scheduled maintenance opex. In real terms the forecast average annual expenditure for the period FY14-FY19 of \$17.1 million is 34% higher than the average annual pre-earthquake expenditure for FY08-FY10 of \$12.8 million. If a similar comparison is undertaken for FY19 in order to exclude earthquake recovery expenditure the increase reduces slightly to 29%.

**Figure 6.3: Historic and Forecast Expenditure – Scheduled Maintenance (\$000, real 2013)**



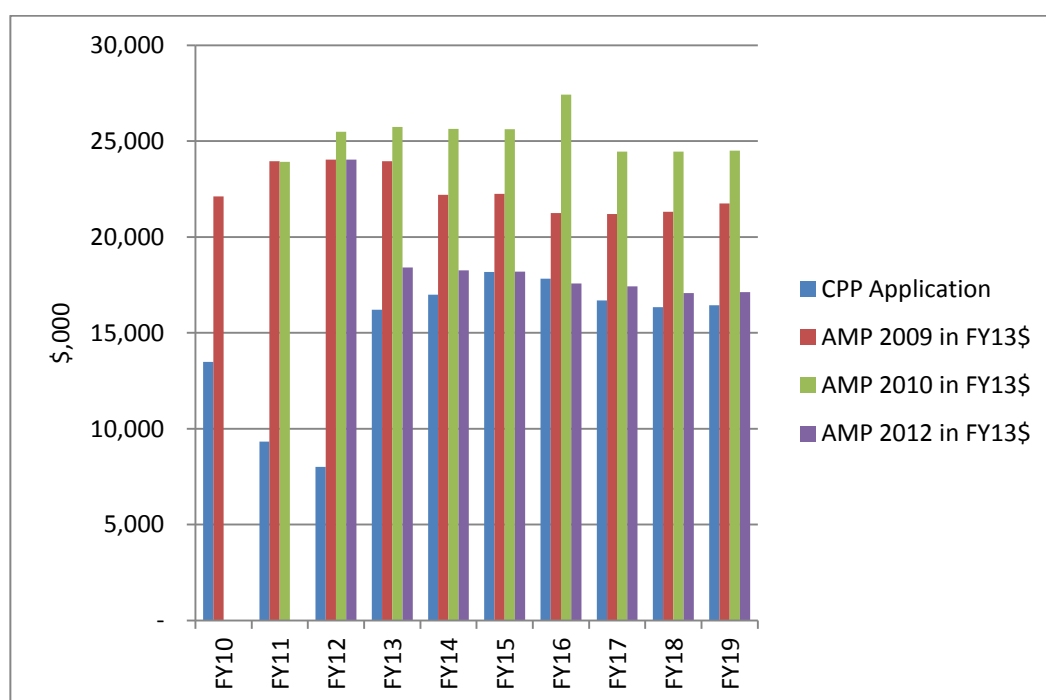
Source: GBA Analysis, information provided by Orion, Statistics New Zealand

Orion states that the lower expenditure levels in FY11 and FY12 were due to resource re-allocation to emergency maintenance opex as a result of the earthquakes. Its forecast scheduled maintenance expenditure represents an increase in average annual expenditure of more than 30% in real terms above the level of expenditure in the pre-earthquake period FY08-FY10. Orion has indicated that this is due to the additional maintenance requirement for the spur assets acquired from Transpower, its post-earthquake 11 kV cable testing programme, and provisions for the removal of assets from the red zone and CBD areas due to the earthquakes.

To assess the increased expenditure and the potential impact from the expenditure re-allocation, we calculated the reduction in expenditure in FY11 and FY12 based on the assumption that the average historic expenditure over FY08-FY10 would be maintained in FY11 and FY12. We then compared this reduction to the difference between the forecast expenditure over the period FY13-FY19 and the expenditure that would have been incurred had the historic average expenditure been maintained in real terms over the period. We found the reduction in expenditure over FY11 and FY12 had been over-recovered by a factor of almost three. This could indicate that, without the earthquakes, there would still have been a need to increase the level of scheduled maintenance opex. For this reason we investigated the forecast estimates from previous AMPs.

This analysis is shown in Figure 6.4<sup>32</sup>. It shows that Orion's scheduled maintenance forecast, while similar to the corresponding forecast in the 2012 AMP, is still significantly lower than the forecasts in both the 2009 and 2010 AMPs. We infer from this that, at a high level, the forecast is within a reasonably expected range. This may also indicate that, in preparing the CPP, Orion has made a high level strategic decision to offset an increase in capex with a reduction in opex.

**Figure 6.4: Maintenance Expenditure Comparison**



Note: All values are in real FY13 terms. CPI applied in calculating values in real terms.

<sup>32</sup> The analysis in Figure 6.4 includes both scheduled and unscheduled maintenance as Orion's AMPs currently aggregate these two categories. However, as non-scheduled maintenance only represents 10% of the costs shown we think that the high level conclusions from this analysis are valid for the scheduled maintenance expenditure category.



#### **6.4.2.1 Forecast Preparation – Compliance with Policies and Standards**

Orion has stated that it has adhered to the following policies in relation to scheduled maintenance.

- Procurement Policy OR00.00.19 and Contract management NW73.00.0;
- Delegations of Authority Policy OR00.00.11;
- Authorised Contractors NW73.10.15;
- Health and Safety Policy OR00.00.01;
- Overhead Line Structures NW72.21.11;
- Overhead Line Work NW72.21.01, Overhead Line Standard Construction Drawings NW72.21.18, Earthing Installation NW 72.28.01, Earthing Testing NW 72.28.02, Vibration Dampers NW 72.21.13;
- Overhead Conductors NW74.23.17, Treated Softwood Timber Poles NW74.23.06, Hardwood Timber Poles NW74.23.08, Cross Arms NW74.23.19 and Approved Earthing Equipment and Application NW 74.23.20; and
- NZ Code of Practice for Electrical Safe Distances (NZCEP 34).

#### **6.4.2.2 Reasonableness of Key Assumptions**

As discussed below in Section 6.4.2.4, the scheduled maintenance forecast was prepared on a bottom-up basis where individual forecasts were prepared for different asset types, generally based on their age and assessed condition. These forecasts were aggregated to the line item level. Key assumptions are more relevant to a top-down modelling approach, which was not used by Orion in this case.

#### **6.4.2.3 Drivers Not Covered by Key Assumptions**

Key assumptions are more relevant to a top-down modelling approach, which was not used by Orion.

#### **6.4.2.4 Reasonableness of Forecasting Methodology**

Forecast scheduled maintenance requirements for individual asset types were based on an assessment of the overall age and condition of the relevant assets undertaken by asset management engineers within Orion's infrastructure management division. These assessments were presented in a series of Asset Management Reports (AMRs) prepared in FY13 as a basis for the CPP proposal. All AMRs were prepared to a prescribed template but the extent of consistency in the forecasting methodology is not clear. Orion stated that individual asset type forecasts were prepared on a bottom-up basis based on current contractor unit rates but did not provide detailed forecast breakdowns disaggregated into asset quantities and unit rates. We doubt that the forecasts were always broken down to this level and that the asset type forecasts relied to some extent on the trending of historic costs and adjusting these where appropriate for changes in contractor rates over time. AMRs for each asset type also included relevant forecasts of emergency and non-scheduled maintenance.

Orion then prepared individual Project Summary Sheets for each line item of the scheduled opex forecast, which extracted relevant information from the AMRs. Project summary sheets were also prepared to a template, which was generally based on the structure of the information requirements in Schedule D of the IM. From our perspective there were limitations in this structured approach in that information that we considered very relevant was sometimes covered in a superficial manner, whereas less relevant information was presented in more detail than we thought necessary. For example, schedules of relevant policies and procedures had little impact on our verification. The procedures listed were generally technical standards and contractual procedures and there was no suggestion of any non-compliance.

Our review of the scheduled maintenance forecast, particularly at the identified programme level, was undertaken on the following basis.

- We assumed that scheduled maintenance is undertaken according to a pre-planned maintenance programme that does not change significantly over time. We would therefore expect the underlying average annual expenditure over the forecast period, which we took as FY14-FY19, to be similar to the average annual expenditure over the pre-earthquake period FY08-FY10. We would expect Orion to provide a meaningful explanation for significant differences.
- We tended to ignore the actual expenditure in FY11 and FY12 because these two years were affected by the earthquake response. As we would expect, scheduled maintenance expenditure was lower in these years as resources were diverted to emergency and non-scheduled maintenance.
- We also largely overlooked the FY13 expenditure. Our understanding is that this was the budgeted expenditure for each line item and therefore they may not reflect the currently expected actual spend. The FY13 budget was prepared before the AMRs were prepared and we suspect that may include a significant amount of earthquake recovery activity.
- For identified programmes we sought an explanation for elevated levels of expenditure in the early part of the forecast period. This trend was not unexpected as we foresaw a need to address a scheduled maintenance backlog brought about by a diversion of resources away from scheduled maintenance in response to the earthquake and also a need to develop special short term scheduled maintenance programmes in the period following the earthquake. However, for identified programmes, we expected this expenditure to be explained in sufficient detail to allow us to assess its reasonableness.
- We focused on those line items where the level of expenditure was material.

We are satisfied from our review of the identified scheduled maintenance programmes that this approach was meaningful and reflected the general trend we saw in the forecasts. Our main difficulty was that the explanations for increases in underlying expenditure and for elevated expenditures at the beginning of the forecast period were sometimes insufficiently detailed to enable us to assess whether or not they were reasonable.

#### **6.4.2.5 Opex Reduction Initiatives**

Orion did not apply any specific opex reduction initiatives other than efficiencies culminating from its competitive tendering process.

#### **6.4.2.6 Deliverability**

All scheduled maintenance is tendered out using Orion's contracting model, which limits tendering to approved contractors and requires the contract to be awarded to the lowest price conforming tenderer. Orion has stated that all maintenance work is expected to be carried out with normal contracting arrangements in conjunction with their asset replacement capex. More details of Orion's contracting arrangements are provided in Section 5.2.1.2. We have no basis on which to conclude that the forecast is not deliverable.

#### **6.4.2.7 Contingency**

CPP120 is a contingency provision of \$1.5 million (real 2013) per year over the CPP period. Orion has confirmed that there are no explicit contingency provisions included elsewhere in the forecast opex. The budget for this contingency appears to have been based on a comparison of budget with actual expenditure over a 10-year period. A

similar contingency was included in the maintenance forecast included in Orion's 2009, 2010 and 2012 AMPs.<sup>33</sup>

This provision represents 2.7% of Orion's total average opex over the forecast FY15-FY19 period and 5.8% of total maintenance opex over the same period.

#### **6.4.2.8 Discussion and Conclusion**

As noted in Section 6.4.2 the real scheduled maintenance expenditure in FY19 is 29% higher than the corresponding average pre-earthquake expenditure in real terms. Since this difference is much greater than can be explained by factors such as scale or real cost escalation we sought explanations from Orion for the main drivers of this increase. These are discussed briefly below.

##### *CPP100: Overhead Subtransmission Lines*

The forecast FY19 opex of \$980,000 is \$673,000 (120%) higher than the actual average pre-earthquake expenditure of \$307,000. Orion explains this difference as follows<sup>34</sup>:

- \$200,000 for the maintenance of the new Transpower spur assets;
- \$200,000 for tower painting and foundation maintenance, which is undertaken on an 8-10 year cycle; and
- \$150,000 for an increase in the retightening programme due to increased asset quantities.

In total this only explains \$550,000 of the \$673,000 difference. Furthermore, the progressive acquisition of Transpower assets and the cyclical nature of the tower painting work are not readily apparent from the forecast cost stream.

##### *CPP101: 11kV and 400V Overhead Lines*

This was an identified programme and is discussed in Appendix A13. The forecast FY19 opex of \$4.495 million is \$337,000 (8.1%) higher than the actual average pre-earthquake expenditure of \$4.158 million. As indicated in Appendix A13, we consider this forecast reasonable.

##### *CPP104: 11 kV and 400 V Cables*

The forecast FY19 opex of \$1.230 million is \$703,000 (133%) higher than the actual average pre-earthquake expenditure of \$527,000. Orion indicated that this was due to the incorrect coding of actual costs and if CPP104 was aggregated with the corresponding non-scheduled maintenance line item (CPP115) the historical and projected project costs are consistent<sup>35</sup>. By our analysis the forecast FY19 opex of \$1.520 million for the aggregated line items is \$330,000 (28%) higher than the actual average pre-earthquake expenditure of \$1,190 million. This difference has not been explained.

##### *CPP106: Control Systems*

No costs were allocated to this line item prior to FY13 and for comparison purposes, Orion has aggregated this with CPP123 (distribution management systems). The forecast FY19 opex of \$925,000 for the aggregated line items is \$306,000 (49%) higher than the actual average pre-earthquake expenditure of \$609,000<sup>36</sup>. Orion has identified

<sup>33</sup> For 2009 AMP see Section 3.4, p59. For 2010 AMP see Section 7.1, p251. For 2012 AMP see Section 7.1, p251.

<sup>34</sup> Response to verifier question A1.

<sup>35</sup> Response to verifier question A1.

<sup>36</sup> We have added \$330,000 to the average actual expenditure of \$289,000 to allow for the transfer of relevant IT costs from corporate to network in FY13. See Appendix A20.

increases of \$225,000 for the introduction of the distribution management system in FY13, \$30,000 as a result of the new spur assets and \$10,000 as a result of the new transportable data centre.

Due to time constraints we have not clarified this response. In particular, we have not confirmed that there is no overlap between the \$330,000 cost transfer from corporate and the increased maintenance costs of the distribution management system. It does seem, however, that the introduction of the distribution management system has significantly increased Orion's control systems maintenance costs.

*CPP107: Protection*

The forecast FY19 opex of \$615,000 is \$326,000 (113%) higher than the actual average pre-earthquake expenditure of \$289,000. Orion has provided the following reasons for this increase:

- \$65,000 as a result of the introduction of ground fault neutralisers;
- \$30,000 from the new spur assets;
- \$40,000 for the development of test procedures and standards;
- \$30,000 increase in maintenance and testing costs, due to the complexity of modern protection systems; and
- \$125,000 for increased maintenance and testing due to the higher level of performance required with the use of an integrated communications network.

This explanation accounts for \$290,000 of the \$326,000 increase.

*CPP109: Buildings and Substations*

This is an identified programme discussed in Appendix A15. The forecast FY19 opex of \$2.325 million is \$499,000 (27%) higher than the actual average pre-earthquake expenditure of \$1,826,000.

Orion has not provided an explanation for this increase<sup>37</sup>. The amount allocated to the remediation of earthquake damage is high for this line item and even in FY19 there may be some residual work in this area.

While the CPP forecast for total network maintenance over the FY14-FY19 period is lower than in previous asset management plans, it is still on average \$4.3 million (34%) per year higher than pre-earthquake levels. If the \$1.5 million contingency provision discussed in Section 6.4.2.7 is removed, it remains \$3.0 million (24%) higher. For FY19, when we expect earthquake remediation for be substantially complete, it remains 29% higher than pre-earthquake levels, reducing to 17% if the contingency provision is removed.

Some of this increase will be explained by real cost escalation through to FY13, but we have not tried to quantify this. The analysis above identifies a number of new expenditures that Orion expects to incur but in many cases these appear to be quantified at a high level and without the precision apparent in the main forecast. At a project level these new expenditures do not always account for the differences we have observed.

The high level of uncertainty going forward is discussed in Section 8 of this report and this makes forecasting difficult. However, for the scheduled maintenance opex category

<sup>37</sup> The final CPP proposal excluded rates and insurance, which were incorrectly included in the reported actual expenditure in the draft proposal, and the difference between forecast and pre-earthquake expenditure has increased as a result. See response to verifier question GB113.

this is mitigated by the fact that, in the short term, there is usually some flexibility to defer (or accelerate) work in order to match expenditure to budget.

Given this flexibility, the magnitude of the difference between the forecast scheduled maintenance expenditure requirements and pre-earthquake expenditure levels, and the lack of robustness in many of the explanations for this difference, we do not consider that the \$1.5 million contingency provision is necessary. It may be that the forecast scheduled maintenance could be reduced even further, although when the forecast is considered in its entirety, this is less clear. Our analysis indicates that, with the contingency provision removed, the forecast expenditure in FY19 is 17% higher in real terms over pre-earthquake levels. This does not seem excessive given the ten year time lag (FY09-FY19), the need to absorb approximately four years real cost escalation (FY09-FY13) and the fact that many new expenditures identified by Orion are undoubtedly valid.

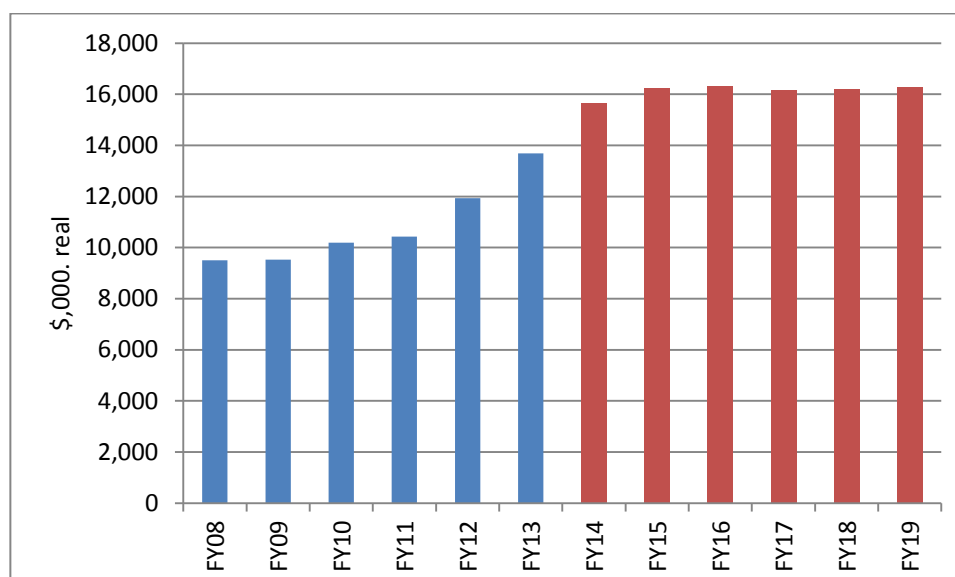
### 6.4.3 Network Management and Operations

Orion defines network management and operations (IM Category - System management and operations) as expenditure relating to the management and operation of its network. This category is fully covered by a single line item in Orion's opex forecast, CPP 167 – Infrastructure Management which is reviewed in detail in Appendix A22. Approximately 85% of the historic and forecast expenditure is allocated to staff costs and about 75% of Orion's total staff numbers are provided for under this expenditure category. Expenditure over the period FY14-FY19 is forecast to average \$16.1 million per year in real terms, \$6.5 million (67%) higher than the average pre-earthquake expenditure of \$9.7 million over the period (FY08-FY10).

Opex in this category includes internal project management costs, which Orion does not capitalise. It also includes planning costs but not detailed project design, which is normally outsourced.

Figure 6.5 below compares historic and forecast expenditure.

**Figure 6.5: Historic and Forecast Expenditure – Network Management and Operations (\$'000, real 2013)**



Source: GBA Analysis, information provided by Orion, Statistics New Zealand

Orion has stated that the main reason for the substantial increase is the increase in staff numbers over the period.

**6.4.3.1 Forecast Preparation – Compliance with Policies and Standards**

Policies and standards relevant to this forecast are listed in Appendix A22.

**6.4.3.2 Reasonableness of Key Assumptions**

The key assumption for this forecast was the schedule of increased staff requirements, which is discussed in Appendix A22. After increasing staff numbers by 23 to a total full time equivalent (FTE) of 131 over the period FY09-FY13, Orion is proposing to increase staff numbers by almost as much again, to 151 FTE by FY16 and to remain at this staffing level through to FY19. While we are unable to form a view on whether or not the peak staffing level of 151 is reasonable, we think that staff numbers should reduce again towards the end of the forecast period and this has not been factored in to the forecast. This is consistent with the trends in the network capex and maintenance forecasts in Orion's CPP proposal and reviewed in this report.

**6.4.3.3 Drivers Not Covered by Key Assumptions**

There were no drivers identified.

**6.4.3.4 Reasonableness of Forecasting Methodology**

This is discussed in Appendix A22. Our analysis indicates that the forecast in real 2013 dollars includes a real cost increase component, which we think should be captured by the cost escalators used to convert from real to nominal expenditure.

**6.4.3.5 Opex Reduction Initiatives**

Orion did not apply any specific opex reduction initiatives. The schedule of forecast staff requirements was broken down into 16 sections, each with an average existing staff allocation of nearly 8. Of these, 11 sections have indicated that more staff will be required after December 2012. There may be potential to rationalise or reorganise the department to make more efficient use of the new recruits but there is no evidence of any attempt to do this.

We acknowledge that staff have had to work under significant pressure under difficult conditions in the aftermath of the earthquakes and one of the objectives of this forecast is to relieve such pressures as the rebuild gains momentum.

**6.4.3.6 Deliverability**

Orion has indicated that there are no expected constraints in delivering the planned expenditure and that any additional employees can be recruited as required. However, during our visit to Christchurch, there was anecdotal evidence of difficulty in recruiting staff immediately following the earthquakes and some former staff left as a result of the earthquakes. We expect this problem to abate as seismic activity reduces and also note that there is an engineering school in Christchurch, which could make the recruitment of graduates easier. Nevertheless, staff in the infrastructure management section are highly skilled and increasing staffing levels by 15% over a short period, off a relatively high base, could be challenging.

**6.4.3.7 Conclusion**

We are unable to form a view in the time available on whether or not the proposed increase in staff numbers in the early part of the forecast period is reasonable. However, we would expect staff numbers to reduce in the later years of the period, and this is not the case. We also note a small but material real cost increase in Orion's forecast when it is the function of the cost escalators to reflect increases of this nature.

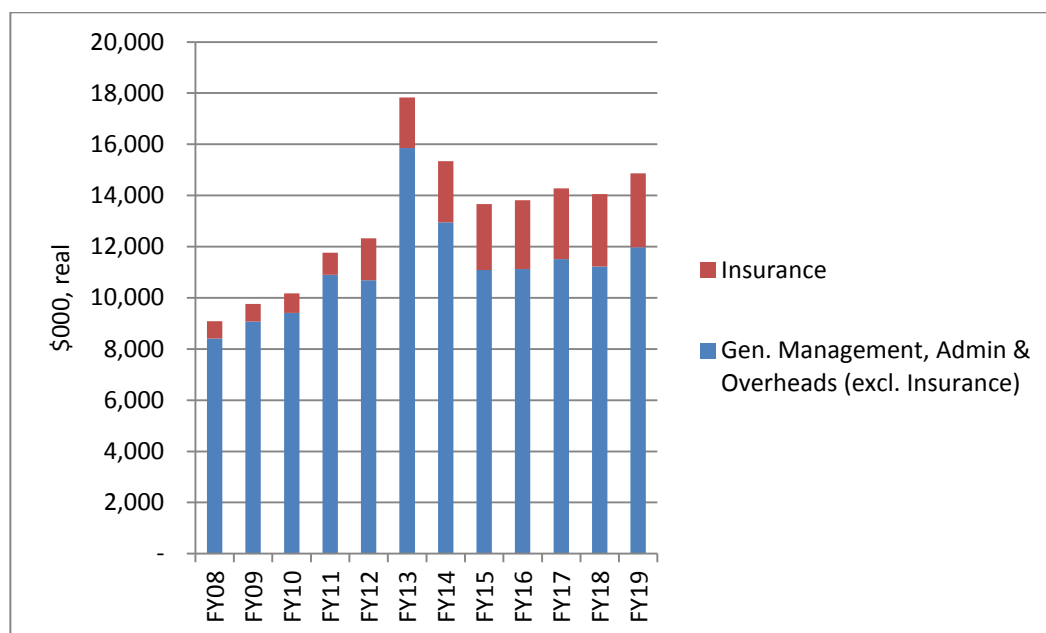
We therefore consider that Orion's forecast system management and operations opex to be high, particularly in the later years of the forecast period.



#### 6.4.4 General Management, Administration and Overheads

Orion defines general management, administration and overheads (IM Category - general management, administration and overheads) as expenditure to manage operations so that they are safe, economically efficient, reliable and cost-effective for consumers. This category of expenditure includes corporate activities, finance, corporate information systems, commercial and regulatory functions, communications and engagement, property maintenance, material damage and business interruption insurance and special projects. Figure 6.6 compares historic and forecast expenditure for this expenditure category.

**Figure 6.6: Historic and Forecast Expenditure – General Management, Administration and Overhead (\$'000, real 2013)**



Source: GBA Analysis, information provided by Orion, Statistics New Zealand

Expenditure over the period FY14-FY19 is forecast to average \$14.3 million per year in real terms, \$4.7 million (48%) higher than the average pre-earthquake expenditure of \$9.7 million over the period FY08-FY10.

The forecast increase in insurance costs, which in FY19 is anticipated to make up more than 19% of the corporate budget, is a major contributor to this. Insurance costs in 2019 are forecast to be \$2.9 million, compared to an average of \$0.7 million over the period FY08-FY10. This is notwithstanding the fact that, apart from the Brighton/Pages Rd substation complex where the damage was caused by ground subsidence due to liquefaction, the overall damage to Orion's insurable network assets as a result of the earthquakes was relatively minor. We would have included insurance as one of the identifiable programmes, but do not have the expertise to examine this specialist area in a meaningful way.

The reduction in expenditure between FY14 and FY15 is primarily due to a reduction in regulatory support expenditure following finalisation of the CPP and also a reduction in property maintenance expenditure, as the Armagh St site is relinquished. The FY19 forecast is also boosted by the one-off provision for regulatory costs associated with the DPP transition. Movements in real expenditure in other forecast line items are relatively small.

##### 6.4.4.1 Forecast Preparation – Compliance with Policies and Standards

The policies and plans for this expenditure category are numerous, mostly unrelated to the development of the actual forecast.

Orion indicated that there is no policy or guideline in relation to the development of the forecast and that the forecast was based on simple projections based upon business needs and estimates projected to include these needs.

#### **6.4.4.2 Reasonableness of Key Assumptions**

For most line items the key assumption was that there would be little change in real cost levels over the forecast period. This is a reasonable assumption in the absence of contrary information.

#### **6.4.4.3 Drivers Not Covered by Key Assumptions**

Insurance costs, which are discussed in Section 6.4.4.7, have been affected by changes in the insurance market as a result of the earthquakes. No other major drivers have been identified.

#### **6.4.4.4 Reasonableness of Forecasting Methodology**

We understand that the forecast has been prepared on a bottom up basis where current expenditure on each general ledger account component of each forecast line item is reviewed, adjusted as appropriate and then projected through the forecast period using the key assumptions detailed in Section 6.4.1.2. This is a reasonable approach especially as, for most line items, no material increase in resource requirement over the forecast period was assumed.

#### **6.4.4.5 Opex Reduction Initiatives**

Orion has not incorporated any opex reduction initiatives into its forecast.

#### **6.4.4.6 Deliverability**

Orion has indicated that there are no expected constraints in delivering the planned expenditure and that any additional employees will be recruited or re-assigned as required. Furthermore, Orion has stated that it also uses external resources where necessary, either contractors or consultants, to supplement its internal resources and expertise as required. Orion foresees no issues with being able to meet its obligations within this programme.

#### **6.4.4.7 Insurance**

As indicated in Section 6.4.4, insurance costs (CPP169) are forecast to rise from an average of \$710,000 (real) in the pre-earthquake period FY08-FY10 to a forecast \$2.9 million in FY19 and this increase is the primary reason of the forecast real increase in corporate and overhead costs over pre-earthquake levels. In developing its insurance forecast, Orion has relied on a report by Marsh Limited on the insurance market for electricity network assets and how this has been affected by the earthquakes<sup>38</sup>. While this report analyses the state of the market it does not forecast premiums.

Orion's programme summary for CPP169 provides some background to the forecast but does not include any detailed analysis about how the forecasts were derived. However, we do note that:

- Orion does not insure its lines and cables but does insure other assets for material damage (MD) and business interruption (BI). Insurance of lines and cables has been considered uneconomic and is now not available to Orion. This is consistent with our experience in working with other lines businesses;

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<sup>38</sup> Appendix 11 of the CPP proposal.

- Orion's MD/BI insurance premiums have increased by a factor of ten; from \$0.2 million on 1 October 2009 to \$2.0 million in 1 October 2012. The excess on these policies has also increased substantially;
- Orion's forecast includes its MD/BI insurance, liability insurance and broker remuneration. It also takes into account anticipated changes in the value of insurable assets over the forecast period;
- The forecast does not include any provision for self insurance.

We are not experts in insurance and have not analysed Orion's forecast in detail. However, we have seen nothing to suggest that the forecast is unreasonable.

#### **6.4.4.8 Discussion and Conclusion**

If insurance costs are excluded, general management, administration and overheads opex is forecast to be \$11.98 million in FY19, and increase of \$3.02 million (34%) on the corresponding average annual expenditure over the pre-earthquake period FY08-FY10. However, if the one-off provision of \$750,000 for regulatory support of the DPP transfer process is removed the forecast increase reduces to \$2.27 million (28%) which is a better reflection of Orion's forecast increase.

We reviewed in detail three programmes within this expenditure category.

##### *CPP160: Corporate Management*

This is discussed in Appendix A19. Forecast expenditure in FY19 was 8% higher in real terms than the average annual pre-earthquake expenditure over FY08-FY10. We consider this forecast reasonable, and possibly conservative.

##### *CPP164: Corporate Information Systems*

This is discussed in Appendix A20. We consider the forecast salary costs in this programme to be high and note that the justification focused on the cost of retaining existing staffing levels with little consideration given to whether or not this level of staffing would actually be needed.

##### *CPP165: Corporate Commercial*

This is discussed in Appendix A21. Because of the way information was presented and the need to make valid comparisons between forecast and historic expenditure this analysis also covered CPP166 (communications and engagement) and CPP171 (special projects).

While we consider the forecast expenditure for CPP165 reasonable, the forecast for CPP166 appears high in the later years of the forecast period. We also consider the CPP171 \$500,000 special project contingency over the period FY15-FY19 to be high.

We are unable to assess the reasonableness of the forecast expenditure on general management, administration and overheads in the early part of the forecast period because we are unable to quantify the impact of the earthquake rebuild on Orion's costs. However, we consider the forecast expenditure in the latter part of the CPP period to be high, notwithstanding the reasonableness of the CPP160 forecast.

### **6.5 REVIEW OF IDENTIFIED PROGRAMMES**

We have individually reviewed ten opex programmes including the five largest programmes and five additional programmes selected by us. These programmes comprise roughly 67% of the total proposed opex.

Below is a list of the projects and programmes assessed as part of this opex review for which detailed review results can be found in Appendix A:

Our findings from this review are summarised below:

**Table 6.1: Summary of Opex Programme Review Findings**

Programme	Appendix	Title	Comment
CPP101	A13	Scheduled Maintenance - 11 kV and LV Overhead Lines	We consider this forecast reasonable.
CPP108	A14	Scheduled Maintenance - Transformers	We consider this forecast reasonable.
CPP109	A15	Scheduled Maintenance – Buildings, Grounds and Substations	We have some uncertainty regarding this programme but, on balance are inclined to the view that the forecast is reasonable.
CPP112	A16	Scheduled Maintenance -- Switchgear	We consider this forecast reasonable.
CPP118	A17	Emergency Maintenance – Underground Cables	We consider this forecast reasonable and possibly conservative.
CPP119	A18	Emergency Maintenance – Network Assets	We consider this forecast reasonable.
CPP160	A19	Corporate	We consider this forecast reasonable and possibly conservative, and are uncertain as to whether the AMI stadium sponsorship should be included.
CPP164	A20	Corporate Systems	We consider the forecast salary costs to be high.
CPP165/171	A21	Commercial and Special Projects	We consider the provision for communication and engagement in the latter years of the CPP period to be high. We also consider that the provision for special projects is high. We are also uncertain as to whether sponsorship costs should be included.
CPP167	A22	System Management and Operations	We consider this forecast is high, particularly in the later years of the CPP period.

## 6.6 OPEX MODELS AND FORECASTING METHODOLOGY

provide an opinion as to the reasonableness and adequacy of any opex models used to prepare the opex forecast including an assessment of-

- (i) the inputs used within the model; and
- (ii) any methods the CPP applicant used to check the reasonableness of the forecasts and related expenditure.

Rather than using an enterprise-wide high level top-down expenditure model, preparation of the individual line item forecasts was the responsibility of the relevant general manager. Individual sections of the draft CPP proposal, including the associated forecasts were approved as they were completed by the CPP steering group and then by the Board<sup>39</sup>. One disadvantage of this approach is that it leaves little time for consideration of the full proposal, in its totality, from a top down perspective.

<sup>39</sup> Response to verifier question A4.

Each line item was generally forecast using a bottom up approach but the detailed methodology appears to have been left to the discretion of the manager concerned. This is evident from the individual project reviews in Appendix A. While some managers used a base year approach, projecting expenditure forward at a reasonably high level, others disaggregated the forecast at the general ledger account level. The base year used for a specific line item forecast was also left to the discretion of the manager concerned and we noted some variation.

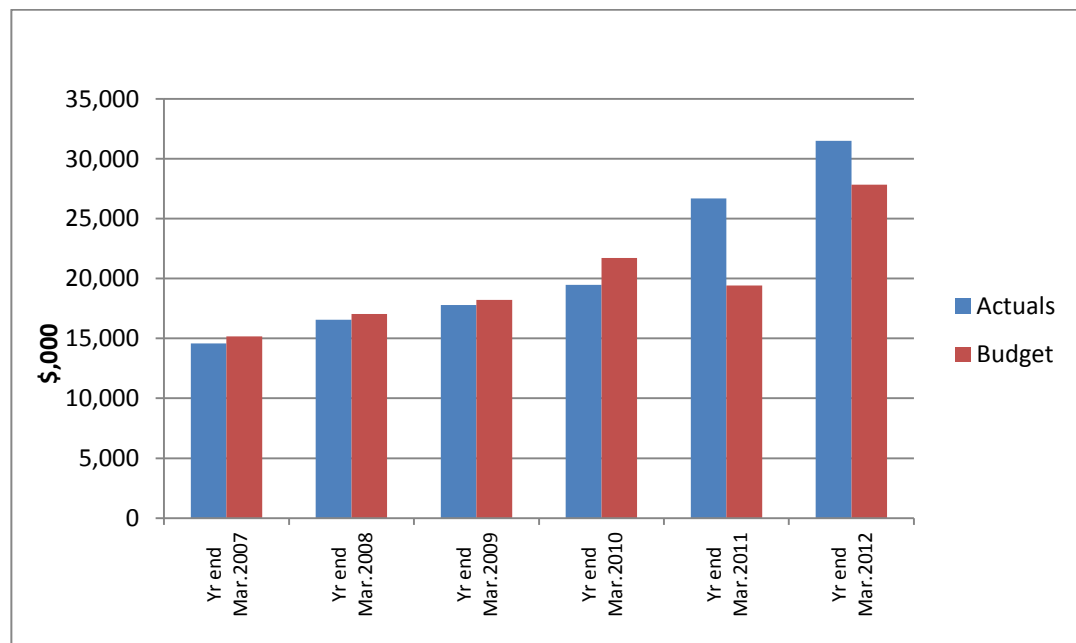
The project summaries we reviewed all contained a statement that the forecasts did not include a contingency provision. However, there is uncertainty in any forecast and this increases with time and, where forecasting is left to individual managers, there are likely to be variations in the way in which this uncertainty is reflected. This was apparent in the individual project and programme reviews presented in Appendix A.

The reasonableness of individual line item forecasts was checked by the individual department managers before release to the steering committee and then reviewed by the steering committee and finally by the Board. However, there is no indication of individual line item forecasts having to go through a formalised challenge process, external to the section concerned, before they were approved and there was little time for a detailed top down assessment of the forecast in totality. Hence, while we did not find any indication of a deliberate attempt to inflate the forecast, we consider that the high level controls to ensure that the opex forecast was both reasonable and efficient were weak.

## 6.7 DELIVERABILITY

Deliverability is discussed for each expenditure category in section 6.4. In order to further investigate deliverability we looked at the historic budget and actual expenditure in order to better understand Orion's ability to deliver on the proposed budget.

**Figure 6.7: Comparison of Actual and Budget Expenditure (\$000, real 2013)**



Source: Orion, only includes routine & preventive maintenance and fault & emergency maintenance

In relation to routine & preventive maintenance and fault & emergency maintenance, it can be seen from the figure above that Orion was effective in ramping up its maintenance expenditure during and after the earthquakes. The forecast expenditure for routine and preventive maintenance and fault & emergency maintenance in any forecast year never reached the same high level of expenditure experienced in FY12 which would indicate that there are no deliverability issues. Also, prior to the earthquakes, Orion was effective in controlling actual expenditure versus budget.

As can be seen from Figure 6.1, the forecast opex in FY13 and beyond is below the levels of expenditure achieved in the aftermath of the earthquake and, in theory, there should be no delivery constraints. The main deliverability risk is that the high forecast level of capex will divert resources from the maintenance effort. This risk is discussed in Section 5.4.

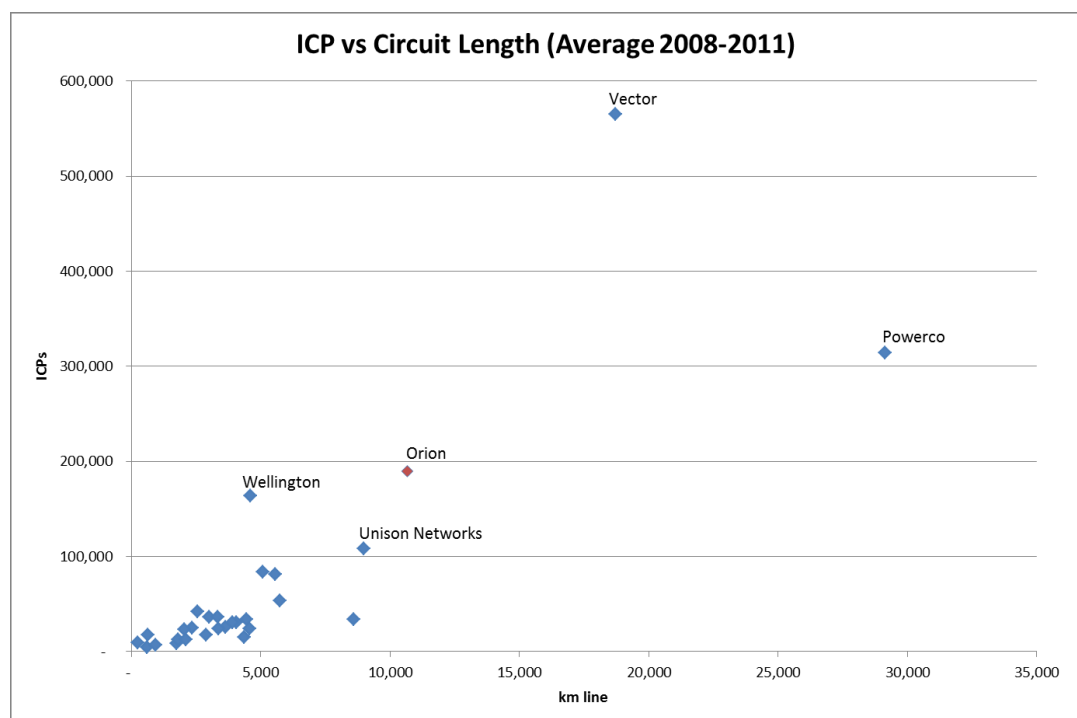
## 6.8 BENCHMARKING

Orion has included limited benchmarking (refer to Appendix 28) in its CPP proposal. It only included costs associated with general management, administration and overheads and system management and operations.

We have performed opex cost efficiency benchmarking on an aggregate level by looking at the opex efficiency of all 29 New Zealand EDBs. We have not benchmarked disaggregated costs due to potential differences in allocating costs to different disaggregated expenditure categories. The benchmarking therefore only considers total opex. It is well known that there are substantial differences between utilities for example the network size, customer type etc. For this reason we have also identified typical peer group EDBs which should more closely match the opex efficiency expected from Orion.

As the characteristics of rural networks differ from that of urban networks and each EDB has a unique combination of rural and urban networks, we used network density or consumers (ICPs) per circuit kilometre as a normalising factor to identify a relevant peer group. The figure below shows a comparison between EDBs by looking at network density and has performed this analysis by utilising the average actual values for opex expenditure and circuit length over the period 2008-2011. We also tested the method of using multiple years in the peer group selection by performing the same analysis for a single year (2010) and concluded that the peer group will remain the same.

**Figure 6.8: Peer Group Graph – ICP vs Circuit Length**



Source: GBA Analysis, information provided by Orion, Commerce Commission – Electricity Information Disclosure Summary and Analysis

From the above it is clear that, when looking at network density, Orion appears similar to the larger networks in New Zealand, which is to be expected. From this we have selected Vector, Powerco, Wellington Electricity and Unison Networks as the peer group.



**Table 6.2: Benchmarking Results**

<b>2008-2011</b>	<b>Opex/km line (Avg 2008-2011)</b>	<b>Opex/ICP (Avg 2008-2011)</b>	<b>Opex/Replacement Cost (Avg 2008-2011)</b>
Vector	5.22	0.17	2.5%
Powerco	1.98	0.18	2.4%
Orion	<b>3.81</b>	<b>0.21</b>	<b>2.9%</b>
Wellington	5.88	0.17	2.5%
Unison Networks	2.74	0.23	3.1%
Average Peer Group	<b>3.96</b>	<b>0.19</b>	<b>2.6%</b>
Average All EDBs	<b>2.91</b>	<b>0.22</b>	<b>2.8%</b>
<b>2011 only</b>	<b>Opex/km line (\$ Real 2011)</b>	<b>Opex/ICP (\$ Real 2011)</b>	<b>Opex/Replacement Cost (\$ Real 2011)</b>
Vector	5.20	0.17	2.3%
Powerco	1.91	0.18	2.2%
Orion	<b>4.47</b>	<b>0.25</b>	<b>3.2%</b>
Wellington	6.86	0.19	2.7%
Unison Networks	3.70	0.27	3.4%
Average Peer Group	<b>4.42</b>	<b>0.20</b>	<b>2.6%</b>
Average All EDBs	<b>3.08</b>	<b>0.23</b>	<b>2.7%</b>
<b>Forecast (\$ Real 2011)</b>	<b>Opex/km line (\$ Real 2011)</b>	<b>Opex/ICP (\$ Real 2011)</b>	<b>Opex/Replacement Cost (\$ Real 2011)</b>
Orion FY13	4.88	0.29	
Orion FY14	5.16	0.31	
Orion FY15	5.00	0.30	
Orion FY16	5.06	0.30	
Orion FY17	4.86	0.29	
Orion FY18	4.81	0.28	
Orion FY19	<b>4.85</b>	<b>0.29</b>	<b>2.8%</b>
Assumptions	Km line length increase at same rate observed between FY09 and FY10. Applied CPI for nominal to real value conversions.	Applied the Quick recovery growth rate as used by Orion to develop the forecast. Applied CPI for nominal to real value conversions.	Escalated FY10 RC to FY11 RC by using average growth rate from FY08 to FY10. Then calculated ratio between this new FY11 RC value and the FY11 RAB value. This ratio was then used with the FY19 Roll-Forward RAB value to develop a FY19 RC estimated value. Applied CPI for nominal to real value conversions and forecast CPI as provided in CPP application.

Source: GBA Analysis, information provided by Orion, Commerce Commission – Electricity Information Disclosure Summary and Analysis, Statistics New Zealand

EDBs in New Zealand differ substantially in size and this can even be seen for the selected peer group. For this reason there is a need to normalise the results for comparative purposes. Typical normalisers used include expenditure per circuit length, expenditure per customer connection and expenditure per overall network value (RAB or Replacement cost). We have applied all three of these normalisers to assist with obtaining better insight into the level of expenditure efficiency for Orion.

Table 6.2 above shows the benchmarking results.

The benchmarking analysis relies on high level assumptions, which mean that the results should be treated with caution. Furthermore, we realise that comparing Orion's forecast opex efficiency with historic values for other EDBs does not recognise potential efficiency gains for other EDBs over the period leading to FY19. However, we are confident that the benchmarking is sufficiently accurate to be indicative of the relative opex efficiency.

The results show a reduction in efficiency between the forecast and historic years for Orion for both opex per kilometre line and opex per ICP. This is to be expected following the earthquakes. However, the opposite is true for opex per replacement cost which we expect could be driven by the new capex over the assessment and forecast periods. Furthermore, we note that the calculation of FY19 opex per replacement cost value for Orion was only possible by applying numerous assumptions (see table above) which in itself could be questioned. For other normalisers, however, fewer assumptions were required.

The benchmarking indicates that Orion's opex efficiency following the earthquakes, even though lower than historic levels, does not appear to be an outlier when compared to its peer group EDBs.

## 6.9 CONCLUSION

Based on analysis in accordance with this clause, the verifier must provide an opinion on whether the CPP applicant's forecast of total opex meets the expenditure objective and, if not, identify-

- |  |
|--|
| <ul style="list-style-type: none"> <li>(a) whether the provision of further information is required to enable assessment against the expenditure objective to be undertaken and, if so, the type of information required;</li> <li>(b) which of the CPP applicant's forecast opex programmes for each opex category might warrant further assessment by the Commission; and</li> <li>(c) what type of assessment would be the most effective.</li> </ul> |
|--|

On the basis of the opex review described above we conclude that:

- Orion's forecast fault and emergency maintenance opex is reasonable;
- On balance, Orion's forecast scheduled maintenance opex is reasonable although we see no need for the maintenance contingency;
- Orion's forecast for corporate management (CPP160) is reasonable;
- The forecast for some other non-network opex line items including communications and engagement, special projects, corporate information systems, and system management and operations appears high, particularly in the latter years of the forecast period. In most of these areas, there appears to be an assumption that the resources needed to support the peak of the earthquake rebuild effort in FY14 and FY15 will need to be retained through to the end of the forecast period, irrespective of the fact that by FY19 aggregated network capex and opex expenditure is forecast by Orion to be 32% lower in real terms than the corresponding expenditure at the peak of the rebuild.

Orion is essentially an asset management business and the aggregated level of network capex and opex is a measure of business output. We think the linkage between overhead and network expenditure could be assessed in greater detail, taking into account the relative level of fixed and overhead costs.

## 7. OTHER MATTERS

### 7.1 CAPITAL CONTRIBUTIONS

The **verifier** must provide an opinion as to whether the forecast of **capital contributions**-

- (a) is reasonable; and
- (b) consistent with other aspects of the **CPP proposal**, in particular-
  - (i) the **capex forecast**; and
  - (ii) forecast demand data provided in accordance with clause D6.

#### 7.1.1 Introduction

In the IM capital contributions are defined as follows:

*capital contributions means, for the purpose of:*

- (a) *Part 2, money or the monetary value of other consideration charged to or received from consumers or other parties for the purposes of asset construction or enhancement;*
- (b) *Part 4, money or the monetary value of other consideration to be charged to or received from consumers or other parties for the purposes of asset construction or enhancement; and*
- (c) *Part 5, money or the monetary value of other consideration forecast to be charged to or received from consumers or other parties for the purposes of asset construction or enhancement;*

We have reviewed capital contributions from two perspectives. The first relates to the reasonableness of Orion's forecast of the quantum of capital contributions in accordance with its various capital contribution policies and the consistency of those forecasts with the capex and demand forecasts included in the CPP proposal. The second perspective relates to the manner in which Orion's capital contribution policies have been developed and then applied in respect of these policies.

#### 7.1.2 Capital Contribution Forecasts

Orion capital contributions are derived from the following two capex programmes:

- Underground Conversions
- Connections and Extensions

These categories constitute two of Orion's five largest capex programmes and are assessed in more detail in Appendix A of this report. However, we consider each in turn below:

##### 7.1.2.1 Underground Conversion Capital Contributions

Almost all Orion's underground conversion capex maps directly into the IM asset relocations capex category and covers primarily the relocation of assets at the request of third parties. Orion has forecast this category on the basis that Selwyn District Council will continue its proactive aesthetic underground conversion policy at its current rate of \$300,000 per year. It has also estimated the New Zealand Transport Agency's asset relocation requirements as a result of planned road construction under the Government's "Roads of National Significance Programme"<sup>40</sup>. Christchurch City Council is not currently

<sup>40</sup> Christchurch motorways is one of the projects in the Government's "Roads of National Significance" programme.

funding aesthetic underground conversions and Orion does not expect this situation to change.

Table 7.1 below sets out Orion's forecast underground conversion capex and associated capital contributions. The table is a summary of information provided by Orion in its CPP proposal. A capital contribution percentage has been derived as a ratio of the capital contributions to the proposed expenditure. We note that the expenditure in FY14, which is outside the CPP regulatory period, incorporates a large project for a private developer while FY16 incorporates significant NZTA relocation and associated undergrounding works.

**Table 7.1 Forecast Underground Conversion Capex (\$000, real)**

	FY13	FY14	FY15	FY16	FY17	FY18	FY19
<b>Total underground conversion capex</b>	2,300	6,100	1,500	5,500	3,300	1,250	750
<b>Capital contributions</b>	1,400	4,700	1,080	3,080	1,980	955	555
<b>Capital contribution percentage</b>	61%	77%	72%	56%	60%	76%	74%

The varying ratios of capital contributions to underground conversion capex are as a result of the different capital contribution percentages charged to the various underground conversion proponents.

#### **7.1.2.2 Connections and Extensions**

Table 7.2 below sets out the proposed connections and extensions capex expenditure and associated expected capital contributions. The table is a summary of information provided by Orion in its CPP proposal. A capital contribution percentage has been derived as a ratio of the capital contributions to the proposed expenditure. Orion has highlighted that the expenditure years FY14 to FY17 incorporate expectations of earthquake damage residential movements of around 10,000 homes in new subdivisions and relocation of businesses to new sites.

**Table 7.2: Forecast Connections/Extensions Capex (\$000, real)**

	FY13	FY14	FY15	FY16	FY17	FY18	FY19
<b>Total Connections/Extensions Capex</b>	9,650	11,915	13,095	13,435	12,335	10,985	10,395
<b>Capital Contributions</b>	800	1,831	1,831	1,831	1,595	1,406	1,349
<b>Capital Contribution Percentage</b>	8%	15%	14%	14%	13%	13%	13%

There is a change in the mix between urban/rural and business/residential extensions and connections in each year, which accounts for the capital contribution percentage changing each year of the forecast period. The capital contributions have been calculated based on the forecast numbers for each connection/extension type and the same forecast has been used in the projection of demand increases in the CPP proposal.

#### **7.1.3 Capital Contribution Policy**

As part of our review of capital contributions we examined Orion's capital contributions policies and the calculations underpinning the capital contributions forecast.

The documents we examined included:

- Orion policy NW70.01.45 – Network Connections and Extensions - This document specifies the commercial terms Orion applies for extensions to its network, for new connections in areas with existing supply, and for alterations to existing connections. The document outlines the principles underpinning the derivation and application of capital contributions;

- a spreadsheet based economic model that was used as a basis for establishing the commercial terms included in the NW70.01.45. This model has not been updated since March 2007;
- a document provided by Orion at our request (named "Underground Capital Contributions") that describes the historical basis upon which capital contributions for costs associated with the undergrounding of overhead assets at the request of Councils have been based (currently Orion meets 18.7% of the total costs); and
- Section 6 of the "National Code of Practice for Utility Operators to Transport Corridors (October 2011)" which provides guidance and legislated details associated with the apportionment of costs where a road corridor manager requires utility assets to be relocated as part of a road works programme.

In reviewing the documentation we note that:

- some of the calculations have not been updated to reflect current cost structures;
- despite detailed calculations being used in the economic model a rather arbitrary approach has been taken in calculating and publishing a final capital contribution charge. This reflects a lower capital contribution value than has been calculated from first principles, which means that standard contribution rates may not be sufficient to fully recover Orion's actual costs;
- undergrounding cost apportionments for the two territorial councils have been based on historical calculations and approaches that would appear to be outdated; and
- Orion may be better served by providing a detailed policy or procedure that is more prescriptive and consistent with section 6 of the National Code of Practice for Utility Operators to Transport Corridors.

#### 7.1.4 Conclusion

Having reviewed Orion's forecast for capital contributions included in its CPP proposal we are of the opinion that the forecast for capital contributions associated with connections and extensions, and underground conversions, is:

- (a) reasonable, to the extent that any under-recovery is unlikely to be material; and
- (b) consistent with other aspects of the CPP proposal, in particular:
  - (i) the capex forecast; and
  - (ii) forecast demand data provided in accordance with clause D6.

## 7.2 DEMAND FORECASTS

### 7.2.1 Assumptions and Forecasting Methods

The verifier must provide an opinion as to whether-

- (a) the key assumptions, key input data and forecasting methods used in determining demand forecasts were reasonable; and
- (b) it was appropriate to use the demand forecasts resulting from these methods and assumptions to determine the:
  - (i) capex forecast; and
  - (ii) opex forecast.

### 7.2.1.1 Introduction

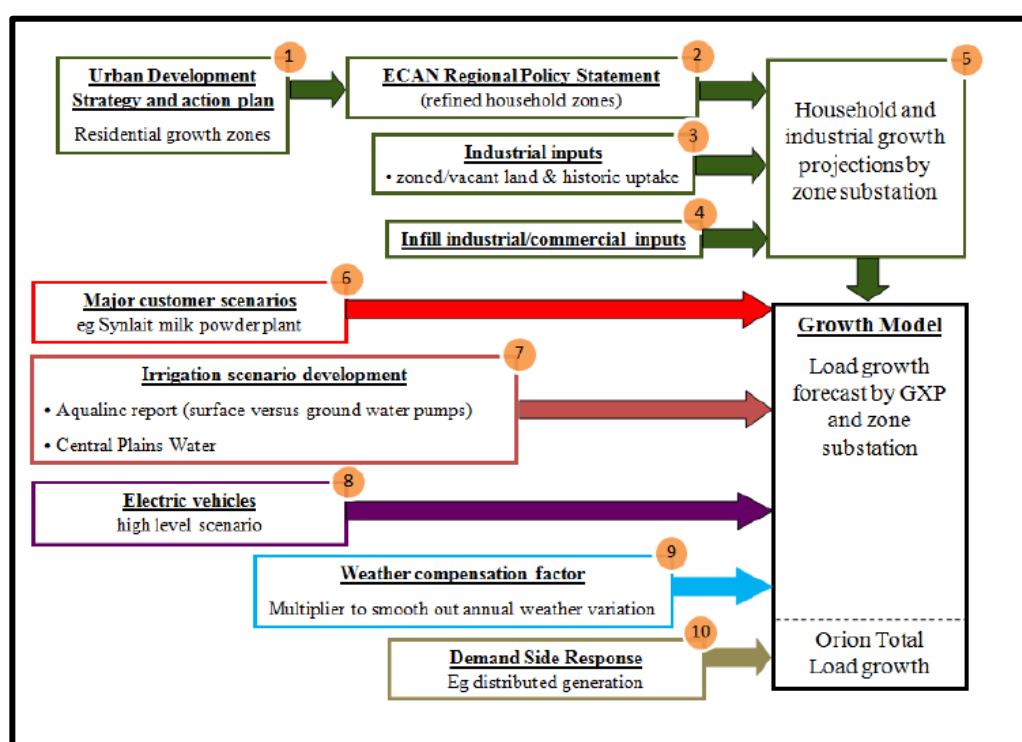
In its CPP proposal, Orion has provided two demand forecasts. The first relates to network maximum demand forecasts at various substations including the Transpower GXP's and is considered in this Section 7.2.1. The second relates to energy and demand forecasts for the purposes of calculating notional revenue to be recovered from customers via network prices. This second forecast is reviewed in Section 7.2.2.

### 7.2.1.2 Network Demand Forecasting Model

The key assumptions, key input data and forecasting methods used in determining Orion's network demand forecast are documented in Orion's process document *NW70.60.12 – Long Term Load Forecasting Methodology for Subtransmission and Zone Substations*.

We have reviewed this document and consider its approach to network load forecasting to be very soundly based. Figure 7.1 below provides an overview of the demand forecasting process and it clearly shows that Orion uses a range of inputs related to specific consumer classes as a basis for generating its maximum demand forecasts.

**Figure 7.1: Overview of Orion's Load Growth Model**



Source: Orion document NW70.60.12

The key assumption underpinning the load forecast is the demand recovery scenarios following the earthquakes. While there are other factors that impact demand growth, the most sensitive outcomes result from the assumptions of household and industrial growth after the earthquakes.

The **household growth** is derived from the Greater Christchurch Urban Development Strategy (UDS) forecast data from the Christchurch City Council, which provides forecasts of a number of households for each census area unit for each year for different earthquake recovery scenarios. Census areas are assigned to the nearest zone substation(s) and the appropriate after diversity maximum demand per household (ADMD) as assumed in the AMP is assigned to each house to give the evening peak. The daily residential profile is determined by analysing a modern residential feeder in Halswell to give the morning, evening and night peak residential load.



Post-earthquake household number projections are based on scenarios in reports commissioned as part of the UDS. The reports contemplate a range of recovery scenarios referenced as:

- Rapid recovery;
- Quick recovery;
- Moderate recovery; and
- Slow recovery.

For forecasting purposes Orion has used the Christchurch City Council recommended quick recovery scenario which contemplates a 7.5% reduction in city households at 2021 compared with pre-earthquake projections. However, there remains a very high level of uncertainty as to the rate (and to a lesser extent the location) of household growth in Orion's supply area over the forecast period.

The **industrial growth** is derived from urban industrial infill and vacant industrial land uptake, based on the annual uptake of vacant industrial land per census area unit and current vacant industrial hectares per census area unit data reflecting the UDS Quick Recovery Scenario.

We note that Orion uses 50% Probability of Exceedence (50 PoE) forecasts in the preparation of its forecasts for network planning purposes. This differs from Transpower's forecasts where 10 PoE figures are used. Orion has advised that it provides 10 PoE figures to Transpower by adding 10% to its 50 PoE forecasts. The 10% uplift factor is consistent with the increased maximum demand that occurred as a result of a very extreme snowstorm event in August 2011, which resulted in an adjusted increase in maximum demand from 550 MW to 605 MW. The details provided by Orion in relation to this event appear to support a 10% uplift as being a reasonable estimate for converting 50 PoE forecasts to 10 PoE projections.

#### **7.2.1.3 Conclusion**

We consider that the using the UDS quick recovery scenario as a basis for demand forecasting is a reasonable approach in the absence of better information and note that the Christchurch City Council uses this scenario for its own planning purposes. However, the level of uncertainty surrounding this forecast is significantly higher than we would normally expect when undertaking an EDB regulatory review.

The other assumptions incorporated in the load forecast appear to be reasonable and we consider that the load forecasting model employed by Orion is very sound.

In summary, it is our opinion that:

- (a) the key assumptions, key input data and forecasting methods used in determining network demand forecasts in Orion's CPP proposal are reasonable; and
- (b) it is appropriate to use the demand forecasts resulting from Orion's network forecasting methods and assumptions to determine the:
  - (i) capex forecast; and
  - (ii) opex forecast,

to the extent that the capex and opex forecasts rely on the demand forecasts.

## 7.2.2 Forecast Data

In respect of data, calculations and assumptions used to derive the forecast weighted average growth in quantities (as required by clause 5.3.4), the **verifier** must provide an opinion as to whether, in relation to each **demand group**-

- (a) the-
  - (i) rationale for its selection;
  - (ii) basis for the forecast growth in demand;
  - (i) basis for the assumptions used concerning the relative proportion of fixed and variable components in the **prices** charged; and
  - (ii) basis for each weighting term
 is reasonable
- (b) the forecast growth in demand is consistent with all other demand forecasts included in the **CPP proposal**; and
- (c) the assumptions referred to in paragraph (a)(iii) are consistent with the calculation of **notional revenue** in the most recent annual compliance statement made by the supplier in accordance with a **DPP determination**.

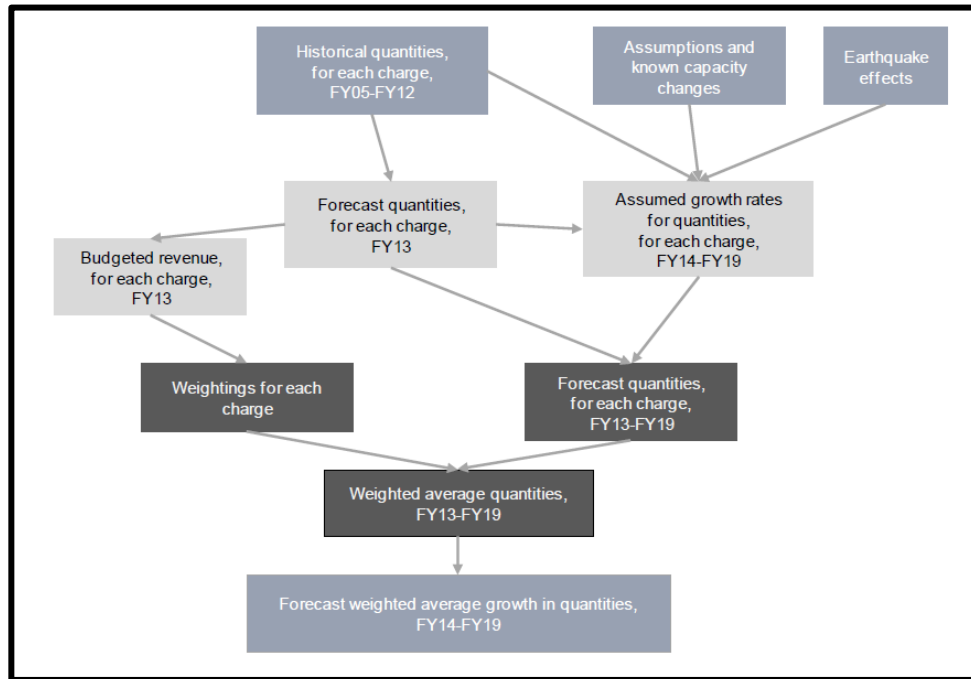
### 7.2.2.1 Introduction

Orion has provided forecast growth of demand for each demand group as part of its CPP proposal. This forecast has been used to calculate revenue outcomes for the proposed CPP period so it is important that the forecasts reflect reasonable assumptions and are based on reasonable data and modelling techniques.

### 7.2.2.2 Forecast Approach

The forecast approach used for calculating weighted average forecast quantities is detailed in section 7.2.5 of the CPP proposal. Orion does not have a formally documented policy or procedure for estimating its normal annual revenue projections for the year ahead. However, it has referenced and provided a number of supporting documents (spreadsheets and memos) that describe this process, which is well understood within the pricing team. Historically under the DPP regime forecasting has been conducted on an annual basis.

This annual revenue projection process is not designed to forecast over longer periods. Consequently Orion has developed a new approach for the CPP proposal which is used to model its revenue requirement over a period and, more importantly, the impact of the earthquakes. The approach used is shown diagrammatically in Figure 7.2 below.

**Figure 7.2: Weighted Average Energy Growth Forecast Model Overview**

Source: Orion CPP proposal, Section 7.2.5, p166.

Across the various charges and demand groups, Orion uses a combination of the following methods to calculate the forecast weighted average growth in quantities:

- extrapolation of a linear trend over the previous five years;
- adjustment to the extrapolation of a linear trend, due to earthquake effects;
- use of most recent year-to-date actual values;
- assumption of constant quantities from FY12;
- historical averages; and
- estimates of the impact of new charges

The CPP proposal details the manner in which each of these methods is used to project fixed, demand based and volume-based charges. It also incorporates a detailed explanation on the basis of the selection for each demand group, basis for the forecast growth in demand, the assumptions underpinning the relative proportions of fixed and variable pricing elements and the basis for weighting selections.

### 7.2.2.3 Consistency with Planning Forecasts

Orion has stated that the trends and forecasts used for network planning are consistent with the revenue forecasting approach, to the extent that they are comparable, as network planning forecasts half hour maximum demands across the year while revenue planning forecasts demand across a range of half hour periods and energy across all periods.

Having reviewed the models it is difficult to comprehensively align them for consistency as one set of forecasts is aimed at forecasting maximum demand for planning purposes whilst the other is designed for energy forecasting. On balance we cannot find fault with either methodology in terms of reasonableness of approach. The different modelling techniques are required to meet the different modelling objectives.

The CPP proposal states that both models used the same customer number growth projections and Orion has provided evidence supporting this consistency. In reviewing the demand growth projects we note that the overall system maximum demand is trending towards an annual increase of 1.1% per annum, while the peak demand component of the consumer demand groups is projecting a trend of 0.8% per annum. This is not unexpected given the differing modelling approaches (annual maximum demand compared to maximum demand calculated over a number of different periods) and we do not believe that this is evidence of any inconsistency that would detract from the merits of either forecasting approach.

#### **7.2.2.4 Annual Compliance Statement**

We have reviewed the annual compliance statement as at 31 March 2012 and compared the ratio of fixed and variable components to the projected fixed and variable component quantities assumed in the CPP forecasts. The comparison reflects reasonable consistency in assumptions as would be expected given the forecasting approach that Orion has espoused in its CPP proposal. The one area of inconsistency is where Orion introduced a new fixed charge for dedicated equipment for major customer connections in 2011. When allowance is made for this and the major downturn in major customer connection load following the earthquake, the ratios of projected fixed and variable charges appear to be reasonably comparable.

In Appendix 13 of its CPP proposal Orion has matched the base year forecasting numbers used for the CPP proposal with the compliance statement information for the FY12 DPP compliance year (which references audited FY10 prices given the time lag involved in the auditing process).

#### **7.2.2.5 Conclusion**

We have reviewed the methodology, assumptions and data used by Orion in order to derive forecast weighted average growth in quantities. The methodology as described in the CPP proposal appears reasonable, although subject to some uncertainty given the impact of earthquake. Orion is continually reviewing its year-to-date billing data to refine the impact of the earthquake and establish the future growth trend.

In our opinion, for each demand group we believe that the

- (i) rationale for its selection;
- (ii) basis for the forecast growth in demand;
- (iii) basis for the assumptions used concerning the relative proportion of fixed and variable components in the prices charged; and
- (iv) basis for each weighting term

is reasonable.

The two main demand forecasting models used in the preparation of the CPP proposal use different approaches to projecting growth for the reasons explained above. We consider that there is reasonable consistency between the two demand forecasting approaches as set out in Orion's CP proposal.

The assumptions referred to in (iii) above are reasonably consistent with the calculation of notional revenue in the most recent annual compliance statement submitted by Orion (FY12) in accordance with the DPP determination, to the extent that the form of the annual compliance statement allows for direct comparison.

## 7.3

## NON-STANDARD DEPRECIATION

Where the **CPP proposal** includes information pursuant to clause 5.4.12(3), the **verifier** must provide an opinion as to whether-

- (a) where an asset's proposed **asset life** is different to its **physical asset life**, the proposed **remaining asset life** better meets the purpose of Part 4 of the **Act** than would be the case were **depreciation** determined in accordance with the **standard depreciation method**; and
- (b) the proposed depreciation method better meets the purpose of Part 4 of the **Act** than the **standard depreciation method**.

## 7.3.1

## Asset Lives used for Depreciation Purposes

Orion's CPP proposal indicates that all assets in the RAB, other than land and easements, are depreciated over their useful lives. The useful lives proposed by Orion in the CPP proposal are the same as the standard physical asset lives set out in Schedule A of the IM. Orion has also confirmed that it does not depreciate land or easements, which is consistent with clause 5.3.7(3)(a) of the IM. For network assets where no standard asset life is specified in Schedule A of the IM, Orion has applied an asset life that is consistent with assets of a similar type.

Specifically Orion has used the following additional asset type lives:

- Power factor correction plant has been assigned a life of 35 years.
- Mobile substations and generators have been assigned an asset life of 15 years, which is Orion's estimate of the appropriate physical asset life for these assets.

Orion has provided an independent engineer's report supporting the use of these asset lives for depreciation purposes in Appendix 16 of its final CPP proposal.

Orion has depreciated capital contributions using an asset life of 56.4 years. This is the average of the IM standard lives for upstream assets (11kV and higher cables and lines, power transformers, distribution transformers) weighted by the sum of the initial RAB values for these asset types. In the CPP proposal Orion explains that it does not allocate capital contributions to specific assets, but rather treats them together as a negative asset. It states that in general capital contributions are used to fund upstream assets and this is the rationale for using the weighted average asset life for upstream assets for the purposes of calculating depreciation on capital contributions. Having examined the capital contribution policies and calculations provided by Orion, there is evidence that actual connection assets are at least partially funded by capital contributions and that the assumption of using only upstream assets lives may be flawed. However, given the relative asset lives involved the difference is unlikely to be material.

## 7.3.2

## Depreciation Methods used in CPP

In its CPP proposal, Orion has proposed to use the standard depreciation method for three types of assets:

- assets in the initial RAB;
- assets commissioned between FY10 and FY13 (excluding acquired assets); and
- assets acquired from another regulated supplier (Transpower is the relevant supplier in this case), regardless of the year of purchase.

Orion has proposed to use an alternative depreciation method for all assets commissioned between FY14 and FY18 (**alternative assets**), excluding those acquired from Transpower, and has proposed using the following non-linear formula to determine depreciation:

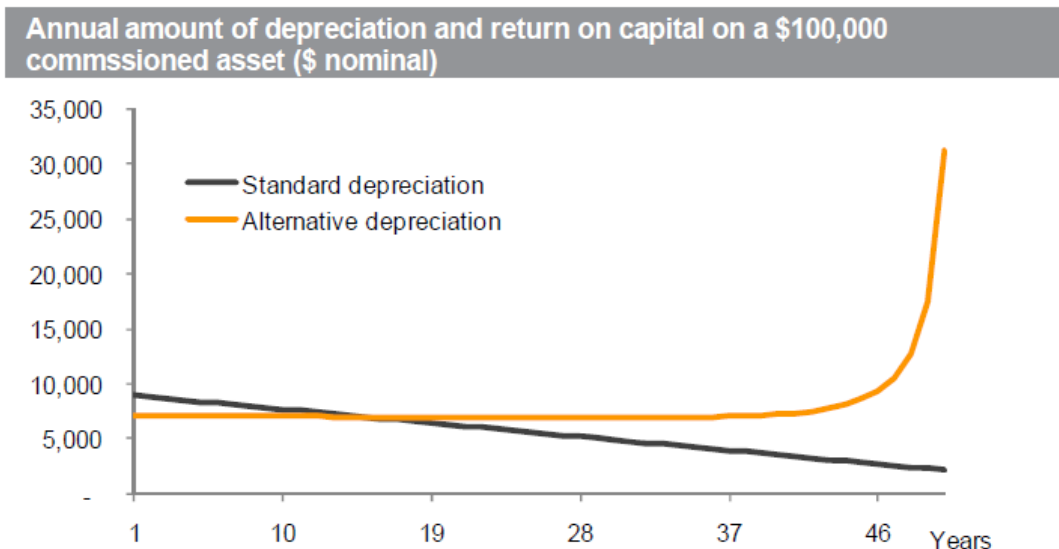
$$\text{Depreciation} = \frac{\text{opening RAB value}}{(\text{remaining asset life})^{1.6}}$$

Depreciation of the alternative assets using this formula will lessen the impact of price increases in the CPP regulatory period and smooth the price increases over a longer period. The CPP proposal explicitly states that the alternative depreciation formula does not reflect specific characteristics of the assets but suggests that the alternative treatment would “better match the depreciation profile with the expected demand for those assets over the CPP regulatory period”.

Orion justifies the alternative approach on the basis that much of its proposed investment during the CPP regulatory period is in direct response to earthquake damage. It considers that its alternative depreciation approach will better reflect the recovery phase by pushing some cost recovery into the future, rather than spreading it evenly over the assets' lives.

As illustrated in Figure 7.3, the alternative depreciation method would clearly reduce the depreciation in the early years of an asset's life, and significantly increase it in the later years (relative to the standard depreciation method). If applied over the entire asset life would result in most of the asset cost recovery occurring towards the end of the life of the asset.

**Figure 7.3: Effect of Alternative Depreciation Method**



Source: Orion CPP proposal, Section 7.5.3, p223.

In considering the implications of applying the alternative depreciation method, Orion notes that the DPP IM would prevent the continuation of the alternative depreciation approach beyond the CPP regulatory period, although the post-CPP period depreciation amounts for the affected assets would be slightly higher due to lower recovery during the CPP period. The dollar impact of the alternative depreciation approach can be seen in the following tables compiled from data provided in Orion's CPP proposal.



**Table 7.1: Impact of Alternative Depreciation Methodology (\$000, nominal)**

	FY15	FY16	FY17	FY18	FY19	TOTAL CPP
Alternative Depreciation	667	1,295	2,215	3,596	4,878	12,651
Standard Depreciation	3,290	5,719	8,589	11,081	13,681	42,360
<b>Alternative Depreciation Reduction</b>	<b>2,623</b>	<b>4,424</b>	<b>6,374</b>	<b>7,485</b>	<b>8,803</b>	<b>29,709</b>

Source: Orion CPP proposal

Orion notes that the assets in the initial RAB or commissioned before FY14 are all at least partially depreciated under the standard depreciation method prior to the start of the CPP regulatory period and, as a result, it proposes to retain the standard depreciation method for those assets.

### 7.3.2.1 **Part 4 Considerations**

Orion has stated that its alternative depreciation method is designed to reduce the initial price changes that its customers will face as a result of its CPP proposal. The CPP proposal involves a significant increase in prices to Orion's customers and Orion has stated that it has specifically searched for available mechanisms within the CPP IM to minimise the price impacts on customers within the CPP framework, while at the same time allowing Orion to provide an acceptable level of electricity distribution service.

Orion has further stated that non-standard depreciation is the only mechanism that it has found that is available for reducing the building blocks allowable revenue (BBAR) under a given expenditure plan. The effect of applying the alternative depreciation method would be that average prices will be lower within in the CPP regulatory period, and higher thereafter (as compared to using the standard depreciation methodology).

Orion notes that it has also considered whether to propose further alternative depreciation arrangements. In particular, consideration was given to:

- fully depreciating the assets which were destroyed in the earthquakes within the CPP regulatory period, and
- using a physical asset life of three years, as opposed to the standard physical asset life for the temporary 66kV overhead lines commissioned in response to the earthquakes and which have to be decommissioned after three years.

However, such depreciation arrangements would result in accelerated depreciation and would increase prices within the CPP regulatory period. This would impose further additional costs at a time when the area is recovering from earthquake impacts and, as such, using standard depreciation for these assets would be more consistent with the long-term interests of consumers.

### 7.3.3 **Conclusion**

In the CPP proposal, Orion has not used asset lives that differ from the standard physical asset life as set out in Schedule A of the IM. We consider that the standard asset lives used by Orion in its CPP proposal for assets which are not specifically referenced in Schedule A of the IM are reasonable.

It has depreciated capital contributions over the weighted average asset life of the upstream assets. Whilst we believe that using weighted average asset life is a reasonable approach, it is not clear that only upstream assets should be included in the average weighted life calculation given the manner in which the capital contributions applied by the business have been derived and calculated. However, given the relative asset lives of the asset types involved, the effect of including direct connection assets in the calculation is unlikely to be material.

Orion has also proposed a non-standard depreciation for those assets commissioned within the CPP period in order to achieve a smoother price path transition and partially mitigate price shocks to customers. The IM requires that a description be provided of any consultation undertaken with consumers on the proposed depreciation method, including the extent of any consumer disagreement and Orion's view in response. Orion has indicated that the consumer consultation material included its proposal to defer depreciation during the CPP period to minimise price increases. This specific aspect produced no direct responses. Consequently Orion has not provided any information on consumer consultation responses specifically in relation to the proposed alternative depreciation methodology.

The CPP proposal alludes to, but does not appear to specifically reference, which elements of the purpose of Part 4 of the Act that the proposed alternative depreciation method better meets.

Section 52A of the Act sets out the purpose of Part 4 of the Act as follows:

**52A Purpose of Part**

- (1) The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—*
- (a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and*
  - (b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and*
  - (c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and*
  - (d) are limited in their ability to extract excessive profits.*

Orion's stated intent in proposing the alternative depreciation method is to reduce price shocks to consumers during the CPP period and smooth out longer term price increases. This intent and the proposed application of alternative depreciation methods would appear to us to be consistent with the promotion of long-term benefit of electricity consumers consistent with the purpose of Part 4 of the Act.

## **7.4 ESCALATION RATES**

Under the IM the verifier is required, inter alia, to consider whether an assessment should be made of

- labour unit cost forecasts;
- materials forecasts;
- plant forecasts; and
- equipment unit cost forecasts.

We consider that these escalation rate forecasts are material to the overall capex and opex forecasts and have therefore reviewed the assumptions in the CPP proposal.

#### 7.4.1 Base Year

Orion has used FY13 as the base year for its CPP proposal costs and applied the different escalation rates from that year. The basis for formulating its FY13 unit cost rates is described in Section 9.13.11 of the CPP proposal.

Orion routinely updates its unit costs each year as part of its normal planning/budgeting process on the basis of:

- recent actual projects and extracting labour and material component costs from those projects;
- quotes that are obtained for items to be purchased for the next year. For example, cable prices are updated each year by cable suppliers;
- estimated movements in labour rates using actual contract rates where these are known; and
- estimated price changes for items purchased less frequently. These are based on assumptions about exchange rate fluctuations and commodity price movements. When commencing projects which contain these items, Orion seeks quotes from suppliers the year before the project is to be implemented.

We reviewed Orion's process document NW70.60.13 - *Project Budget Forecasting Process* which outlines the methodology for deriving unit costs for items used in major capital projects. Orion does not appear to have an equivalent detailed document that adequately describes the basis for developing opex forecasts.

Document NW70.60.13 describes how major project cost estimates are derived from Orion's cost estimating database, which incorporates costs for nearly 300 unit items, as well as grouped costs for common assemblies. Project costs are built up by estimating quantities of each unit required to complete a project. The document categorises unit costs into the separate CPP types and groups and Orion's AMP categories and subcategories. The FY13 costs that form a part of the major project cost estimates Orion's CPP proposal are included in Appendix A of document NW70.60.13.

#### 7.4.2 Approach to Escalation Following Base Year

Orion's forecasts project costs in real terms using the current costs in its cost estimating database and then applies an escalation factor to these database unit costs to estimate the nominal cost in the following year. For the purposes of its CPP proposal it has enhanced its cost estimating database to accept cost escalators beyond one year so as to be able to forecast project costs in nominal terms over the full CPP forecast period.

However, its base CPP proposal has been prepared with opex and capex forecasts in real FY13 terms. Since CPP expenditure allowances are specified in nominal terms, Orion then escalates the real forecasts to establish nominal forecast values.

In determining the escalation factors that are used in the CPP proposal, Orion's approach was to:

- separate cost factors into a number of groups;
- identify relevant escalation indices for each cost factor group; and
- forecast those indices for the CPP regulatory period.

This approach is consistent with practices utilised by EDBs across a range of international regulatory jurisdictions. As Orion states in its CPP proposal, using a general forecast inflation index, such as CPI, is not appropriate for universal application as input cost price movements are often quite different from movements in CPI.

In terms of disaggregating costs factors, Orion has split its forecast opex and capex input cost factors into three groups, namely

- labour;
- materials; and
- other (incorporating plant and minor material components).

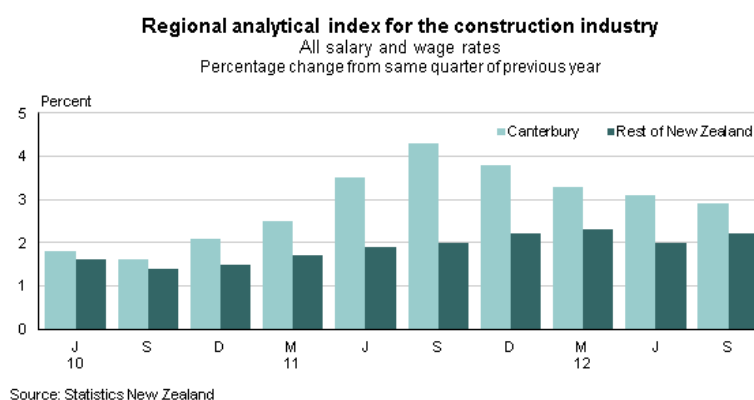
Each project or programme has been assigned a different weighting for each of the cost factors reflecting Orion's assessment of the characteristics of the work to be undertaken. For example, Orion has considered that support opex has a relatively high proportion of labour cost, whereas major project capex has a relatively high proportion of materials cost.

#### 7.4.2.1 Labour Cost Escalation

Orion's starting position for deriving labour cost indices for its CPP proposal is the Statistics NZ Labour Cost Index (LCI). However, given the impact of the earthquakes and the required recovery work, it considers that Canterbury labour costs have increased at a faster rate than indicated by the LCI.

This is confirmed by Statistics NZ, which has created six new regional analytical series from its LCI samples in direct response to the Canterbury earthquakes<sup>41</sup>. The impact of the earthquakes can be seen from Figure 7.4, below, where Statistics NZ has compared the increases in salary and wages in the Canterbury construction industry with the corresponding increases across the whole of New Zealand. It found that the mean increase for the year to the September 2012 quarter was 6.8% for the Canterbury region compared to 3.9% for the rest of New Zealand.

**Figure 7.4: Comparison of LCI increases between Canterbury and rest of New Zealand**



These cost increases are also reflected in Orion's most recent contract tenders. As a result of this impact, Orion's CPP proposal does not apply the New Zealand wide LCI index to all labour components of its forecasts. It has sought advice from local quantity surveyors, who have provide their views on estimates for annual escalation factors applying to the construction industry in Christchurch and has used this input as the basis for escalating the labour cost components of its network capex and opex forecasts.

The CPP proposal specifically references estimates provided by Rider Levett Bucknall and Davis Langdon. Both firms have suggested estimates of 5% per annum escalation in the longer term. In the period FY14 to FY16 David Langdon estimates 10% per annum

<sup>41</sup>[http://www.stats.govt.nz/browse\\_for\\_stats/economic\\_indicators/prices\\_indexes/LabourCostIndexSalaryandWageRates\\_HOTP\\_Sep12qtr/Commentary.aspx](http://www.stats.govt.nz/browse_for_stats/economic_indicators/prices_indexes/LabourCostIndexSalaryandWageRates_HOTP_Sep12qtr/Commentary.aspx)

while Rider Levett Bucknall has estimated 5% per annum for that period. The appendices to the CPP proposal also include a letter from Ian Harrison and Associates, another firm of Quantity Surveyors in Christchurch. This letter provides a more detailed sectoral projection for inflation with shorter term projections ranging from 7.5% per annum (residential sector) to 20 to 25% per annum (civil sector). Longer term projections ranged from 4 to 5% per annum (residential sector) to 7 to 8% per annum (civil sector).

In the CPP proposal, Orion has used the midpoint of the Rider Levett Bucknall and Davis Langdon estimates which equates to an annual escalation of 7.5% for FY14 to FY16, and 5% per annum for FY17 to FY19. Orion has applied these factors when deriving nominal forecasts for network labour costs. It has used the New Zealand wide LCI for the labour component of its in-house support functions of corporate and network management and operations in the absence of any supportable alternative local index for these activities.

#### **7.4.2.2 Materials Escalators**

##### *Network Capex*

The CPP proposal states that materials are the most significant component of network related capex and for these forecasts Orion anticipates that the base material cost escalation will vary according to the nature of the project. To apply capex escalation it has disaggregated projects into the following asset groups.

- 66kV underground cables;
- 11kV and 400V underground cables;
- overhead lines;
- switchgear; and
- transformers;

Orion has created materials input cost weightings for each of the above five asset groups as the basis for deriving material escalation forecasts. Table 7.4 below shows the relative material input weightings used for each asset group.

**Table 7.4: Material Input Weightings Incorporated in Orion CPP Proposal**

Materials indices weightings – for capex projects		
Asset component	Weighting	
66kV underground cables	Copper	100%
Other underground cables	Aluminium	95%
	Copper	5%
Overhead line conductors	Aluminium	95%
	Copper	5%
Transformers	Steel	45%
	Copper	50%
	Oil	5%
Switchgear	Copper	75%
	Steel	25%

Source: CPP proposal, Section 9.26.4, p259.

In order to derive the escalation values for the various commodities (copper, aluminium, oil and steel (for which an iron ore commodity proxy is used)) Orion has used the World Bank projections of future commodity prices. The World Bank produces quarterly ten-year forecasts of major commodity prices, which reflect an average of the twelve months ending in December with values denominated in USD. Orion has adjusted the World Bank forecasts to the financial year ending 31 March and converted the prices to NZD using the most recent NZIER NZD/USD exchange rate forecasts. The World Bank report used in the CPP proposal has not been included in the proposal documentation but we have sourced the report in the public domain.

#### *Network Opex*

For network opex, labour costs are assumed by Orion to be the predominant factor with material comprising either incidental components or much smaller components of major asset types. For these programmes, Orion has used the general producers price index (PPI) as its material escalation index, as it considers this index better reflects the cost of smaller material items such as crossarms, insulators and other consumables.

#### **7.4.2.3 Other**

For non-material and non-labour (e.g. plant) cost components of its CPP proposal opex and capex forecasts, Orion has used the PPI<sup>42</sup> as the most relevant cost escalator.

#### **7.4.3 Escalation Values**

##### **7.4.3.1 Escalation Sources**

The sources that Orion used for the forecast escalation factors in their CPP proposal are summarised in Table 7.5 below:

<sup>42</sup> In its draft CPP proposal, Orion was proposing to use CPI for escalation of other (non-material and non-labour) components of their project and programme costs.



**Table 7.5: Summary of Forecast Escalation Factors used in Orion CPP Proposal**

Index source		
Index	Forecast source	Date
Labour:		
- LCI	NZIER quarterly predictions	September 2012
- Canterbury construction	Composite index derived using Rider Levett Bucknall and Davis Langdon estimates	October 2012
Materials:		
- PPI	NZIER quarterly predictions	September 2012
- Copper	World Bank commodity price forecasts	September 2012
- Aluminium	World Bank commodity price forecasts	September 2012
- Steel (iron ore)	World Bank commodity price forecasts	September 2012
- Oil	World Bank commodity price forecasts	September 2012
Other		
- CPI	RBNZ monetary policy statement	September 2012
Exchange rate		
- NZD/USD	NZIER quarterly predictions	September 2012

Source: Orion CPP proposal, Section 9.26.5. p260

#### 7.4.3.2 Escalation Source Values

The values of the various escalation factors is summarised in Table 7.6, which has been extracted from the Orion CPP proposal.

**Table 7.6: Annual Change in Escalation Indices used in CPP Proposal**

Percentage change in input price indices							
Index	FY13	FY14	FY15	FY16	FY17	FY18	FY19
LCI		1.92%	1.97%	2.61%	2.16%	2.16%	2.16%
Canterbury construction labour		7.50%	7.50%	7.50%	5.00%	5.00%	5.00%
PPI		3.04%	3.32%	3.65%	3.20%	3.20%	3.20%
CPI		1.91%	2.17%	2.17%	2.17%	2.17%	2.17%
Aluminium		15.27%	9.80%	12.70%	7.37%	1.64%	0.92%
Copper		4.85%	-3.92%	-3.37%	-2.31%	-5.49%	1.66%
Iron ore		1.95%	-7.05%	-0.34%	-4.45%	-6.41%	5.48%
Crude Oil		1.02%	4.44%	9.31%	5.62%	0.21%	0.26%
NZD/USD applied in commodity indices		-0.78%	-3.68%	-8.20%	-5.08%	0.00%	0.00%

Source: Orion CPP proposal, Section 9.26.5, p262

LCI forecasts are only available until FY17 and have been extrapolated to FY19 by assuming a continuation of the last forecast value i.e. the FY17 value. A similar assumption is made with respect to PPI.

NZD/USD exchange rates are based on the NZIER quarterly predictions to the middle of calendar year 2016. After this, Orion has assumed that the exchange rate stays at the same level as the latest forecast value.

RBNZ forecasts for CPI are based on actual forecasts until the middle of calendar year 2015. Orion has assumed that the CPI remains constant at the latest forecast value for the balance of the CPP period.

We have carried out a separate independent validation of each of the sources used to compile the figures set out in table 7.6 and have been able to align the values with those included in the table as well as confirming the extrapolation approaches used.

The effect of the commodity and exchange rate escalations on derived major asset group escalations is shown in Table 7.7 below, which has been extracted from the CPP proposal.

**Table 7.7: Annual Change in Escalation Indices derived for Major Asset Groups**

Percentage change in input price indices for capex assets (material components)							
Index	FY13	FY14	FY15	FY16	FY17	FY18	FY19
66kV underground cables		4.85%	-3.92%	-3.37%	-2.31%	-5.49%	1.66%
11kV and 400kV underground cables		14.75%	9.18%	12.06%	7.03%	1.42%	0.95%
Overhead lines		14.75%	9.18%	12.06%	7.03%	1.42%	0.95%
Transformers		3.36%	-4.90%	-1.38%	-2.78%	-5.52%	3.19%
Switchgear		4.13%	-4.69%	-2.65%	-2.83%	-5.71%	2.57%

Source: Orion CPP proposal, Section 9.26.5, p262.

#### 7.4.4 Escalation Factor Proportions

Materials that are escalated using PPI forecasts comprise about one third of Orion's nominal opex forecast. Approximately another third is maintenance based field labour (Canterbury construction labour estimates escalated) with the remaining third representing office based labour escalated using LCI forecasts.

Orion states that labour (escalated using Canterbury construction escalation estimates) comprises approximately 45% of its nominal capex forecast. The balance of capex is predominantly asset group based materials escalated using forecast commodity prices and USD/NZD exchange rate forecasts.

#### 7.4.5 Escalation Factor Impacts

We carried out some sample spot checks on the applied escalation values for specific projects and programmes to check the level of escalation applied in converting real expenditure to nominal expenditure. This required some estimation in terms of particular labour/material/other mixes for each project or programme but we were only looking to check for general reasonableness. In all cases the nominal expenditure values we calculated were within a reasonable tolerance (given our approach) of the values incorporated in the CPP proposal.

Orion has advised that the application of escalation factors was included in the auditor's brief.

#### 7.4.6 Conclusion

We have reviewed the approaches used by Orion to derive the cost escalators used in its CPP proposal and consider them to be reasonably sound.

We concur with the view that a local Canterbury based labour index is appropriate for field labour costs, given the evidence (supported by Statistics NZ) that post-earthquake labour rate increases in the Canterbury region are much higher than elsewhere in New Zealand. Both quantity surveyor inputs quoted in the CPP proposal reflect longer term increases of 5% and as such we consider this escalation values to be reasonable for the

FY17-FY19 period. However, the range of quantity surveyor estimates for FY14 to FY16 from 5% to 10% is quite broad. Whilst we believe that using an escalator within the 5% to 10% range is valid, we see no strong evidence any particular value within that range. Orion has proposed a mid-point value of 7.5% which appears to be reasonable, particularly in light of the Ian Harrison and Associates letter, which was not relied on by Orion but which speculated that cost escalation could be much higher.

With Canterbury based construction labour comprising a significant component of the combined capex and opex budgets, the Commission may wish to obtain its own independent economic forecasts on local construction labour cost escalation. The quantity surveyor opinions provided by Orion were of a speculative nature and the Commission may consider that a more robust analysis is necessary. However, we note that the level of uncertainty in this area seems to be abnormally high and Orion does seem to have taken a conservative approach.

Orion has proposed that the New Zealand LCI index be applied to non-field based labour which we believe is a reasonable approach.

We also consider that approaches used for deriving the escalation rates for non-labour and non-material components (PPI) and minor materials (PPI) are reasonable. Further the approach proposed for major capex materials escalations (weighted futures commodity price estimation based) appears to be soundly based and we have seen similar approaches endorsed in other regulatory reviews we have undertaken.

The basis upon which Orion extrapolates forecasts to the end of the CPP period where forecasts are not available out until FY 2019 also appears to incorporate reasonable assumptions.

From the sanity checks that we undertook, the application of the escalators to convert real expenditure to nominal expenditure was within our range of expectations.

## 8. ASSESSMENT TECHNIQUES

When

- (a) undertaking analysis and reviews of information; and
- (b) considering the matters,

required by this Schedule, the **verifier** must use some or all of the following assessment techniques:

- (c) process benchmarking;
- (d) process or functional modelling;
- (e) unit rate benchmarking;
- (f) trending or time-series analysis;
- (g) high level governance and process reviews;
- (h) internal benchmarking of forecast costs against costs in the **current period**;
- (i) **capex category** and **opex category** benchmarking;
- (j) **project** and **programme** sampling; and
- (k) critiques or independent development of-
  - (i) demand forecasts;
  - (ii) labour unit cost forecasts;
  - (iii) materials forecasts;
  - (iv) plant forecasts; and
  - (iii) equipment unit cost forecasts.

The **verifier** must explain why particular techniques listed [above] were applied and others were not applied.

We have undertaken capex and opex forecast reviews of expenditure applications included with applications for regulatory approval of price and revenue caps for more than a decade. In our experience, Orion's proposal was unique due to the magnitude and severity of the earthquakes that triggered the CPP application. As a result, we found assessment of the proposal problematic in that many of the assessment techniques we would normally use were not appropriate. In particular:

- while there are usually high levels of uncertainty in the external environment going forward, this uncertainty is substantially higher than normal as a result of the earthquakes. This applies to many of the key drivers of the forecast capex and opex requirements. In particular:
  - there remains a high level of uncertainty as to the nature and speed of the earthquake recovery and its impact on the magnitude and, to a lesser extent the location, of the growth in demand for electricity. The high level of uncertainty in the growth in household numbers, for example, is discussed in Section 7.2.1.2;
  - the existing asset base is impaired as a result of the earthquakes and the consequences of this impairment on maintenance requirements going forward is unclear. For example, Orion is expecting 60 11 kV cable faults in FY13 compared to a long term pre-earthquake average of 21. Since Orion's experience is unique, it is not known if, or how quickly, this elevated failure rate will trend back to the long term average;
  - the impact of the earthquake recovery effort on contractor and installation costs is uncertain. This applies not only to contractor rates, which as indicated in Section 7.4.2.1 some forecasters predict could raise by up to 25% per annum in the short term, but also to costs involved in working around the recovery effort. During the course of this verification, Orion has increased its estimated 66 kV cable installation costs by approximately 45%, in part because of the costs of accommodating a SCRIT requirement that the installation of some cables be coordinated

with the reconstruction of other services and that Orion uses an alliance contracting arrangement. While this arrangement may have advantages in the context of the overall recovery effort, it means that Orion has to carry more construction risk than usual and is also required to contribute to the overhead costs of the contracting alliance.

- use of the scale escalation approach to forecasting opex and incremental capex requirements is not appropriate due to the lack of a valid base year. The most recent years for which actual costs are available, FY11 and FY12, include the costs of the immediate post-earthquake response and the costs provided in the CPP proposal for FY13 are budgetary. We would not normally use budgetary costs as a base for a scale escalation model, although we considered doing so in this case because of the exceptional circumstances. However, the extent to which the FY13 budgets included earthquake recovery costs and the extent to which it could be assumed that such costs would carry through to the CPP regulatory period were not clear. While actual costs for FY10 and prior years were available (for the most part), these costs were dated and therefore not necessarily reflective of current costs. They also do not include valid costs that Orion must incur as a consequence of the earthquakes.

Given these constraints we took the following broad approach to assessing the reasonableness of forecast expenditure.

- We reviewed Orion's governance model and its policies and processes for the management of expenditure, in order to form a view on how efficiently it is likely to manage its expenditure in a highly uncertain environment;
- As part of our review of individual major capex projects, we looked at the validity of the key assumptions, the quality of the analysis and the basis on which the individual projects were formulated and the costs estimated. The three major projects we reviewed accounted for 62% of the total capex forecasts for major projects and we assumed that the findings of these reviews applied to the balance of the major project capex;
- For opex and incremental capex line items we compared average pre-earthquake costs (FY08-FY10) in real terms, using actual CPI as the escalator, and compared it with the average forecast expenditure ((in real terms) over the CPP regulatory period. As this approach does not provide for the real escalation of historic costs, we overlooked small differences but sought explanations from Orion where the forecast increases were significant. We also focused on those line items where the total expenditure was greatest and where adjustments could have a material effect on the total expenditure requirement. In our view, there was little point in verifying issues of low materiality given the volatility of the environment in which Orion must operate and the consequent high level of uncertainty surrounding the forecast expenditure requirements.
- We note that Orion is seeking to claw back post-earthquake expenditure to the extent that it has not been recovered through the DPP or from other sources such as insurance payouts. However, we have not examined the expenditure incurred over the period FY11-FY13 in detail, since decisions regarding the earthquake response had to be made quickly, under trying circumstances, and at a time when many of those involved were under significant stress. We have been provided with copies of independent assessments of Orion's post-earthquake response, which are generally very complimentary, and we are not aware of any substantive criticism of Orion's actions in the aftermath of the earthquake.
- We have benchmarked Orion's opex forecast against the current level of opex incurred by New Zealand EDBs of similar size to Orion, using the information disclosure statistics published on the Commission's web site. The purpose of this was to assess the extent to which Orion's forecast opex was in line with the actual opex incurred by other EDB's, which we undertook as a "sanity check" on whether or not the forecast was reasonable. The benchmarking was not

intended to measure the comparative efficiency of Orion's opex spend since the benchmark EDBs are not in an earthquake recovery situation.



## 9. USE OF INFORMATION

Where, for the purpose of applying any of the techniques listed in subclause (1), the **verifier** uses information that is not provided to it by the **CPP applicant**, the **verifier** must, in respect of that information-

- (a) describe in the draft verification report its nature and source and the reason for wishing to rely on it;
- (b) subject to subclause (4), provide it to the **CPP applicant**;
- (c) when finalising the **verification report**, take into account any comments made about it by the **CPP applicant** in response to the draft verification report; and
- (d) where, notwithstanding paragraph (c), the **verifier** continues to rely on it, describe in the **verification report**-
  - (i) the nature and source of the information relied upon and the reason for relying on it; and
  - (ii) the **CPP applicant's** concerns in respect thereof.

Subclause [b] does not apply if the verifier's terms of use of the information prevent such disclosure.

In undertaking the verification in accordance with the terms of reference in Schedule G of the IM, all members of the verification team benefited from their experience working in an electricity distribution environment and, in particular, the knowledge gained in conducting similar regulatory expenditure reviews in a number of jurisdictions.

In addition to the CPP proposal and other information provided to us by Orion we used the following additional information in undertaking this verification:

- In determining overhead conductor equivalents to Orion's standard underground cable sizes we relied on conductor rating tables issued by General Cable New Zealand, which we downloaded from the General Cable web site, [www.generalcable.co.nz](http://www.generalcable.co.nz). This information was used for the overhead line cost comparison in Section 5.2.3.1.
- The Commission's Electricity Information Disclosure Summary Database 2008 to 2011 was the source of the data used in the benchmarking analysis in Section 6.8.
- Actual CPI for earlier years of the current period was obtained from the Statistics New Zealand website, <http://www.stats.govt.nz>. This information was used to escalate the actual expenditures provided by Orion in nominal terms to their equivalent real 2013 levels in order to provide a more valid comparison with Orion's real expenditure forecasts.
- World Bank commodity price forecasts were obtained from the World Bank website, <http://econ.worldbank.org>, and used to validate material cost escalations used in the CPP proposal.

## 10. COMPLETENESS OF CPP PROPOSAL

A **verification report** must-

- (a) list the information in and relating to the **CPP proposal** provided by the **CPP applicant** to the **verifier**;
- (b) state each type of information in respect of which this schedule requires the **verifier's** consideration or opinion that the **verifier** considers has been omitted from the **CPP proposal**, including information that is incomplete or insufficient, and the relevant requirement in Part 5, Subpart 4 to provide the information in question;
- (c) where information is identified as insufficient in accordance with paragraph (b), state the nature of additional information the **verifier** considers that the **CPP proposal** requires to fulfil the information requirement in question; and
- (d) state the extent to which the omission, incompleteness or insufficiency of information has impaired the **verifier's** judgement as to whether the **capex forecast** and **opex forecast** for the **next period** meets the **expenditure objective**.

Information provided to us by Orion that we relied on in preparing this final verification report was uploaded by Orion to one of its servers, to which members of our team were given confidential web-based, read only access. This information included:

- the final CPP proposal and working copies of the Schedule E templates;
- summary reports for each individual project or programme within the identified programme (as defined in the IM) together with other project or programme summary reports that were specifically requested by us;
- policies or procedures (and other documents) that were either referenced in the identified programme summary reports or were specifically requested by us.
- schedules of questions raised by us in the process of undertaking this verification and Orion's responses to these questions. There are three schedules.
  - The first relates to questions we asked prior to the preparation of our draft verification report.
  - In our draft report we asked a series of further questions, which we embedded in the report as comments, since we thought that our chances of eliciting useful responses from Orion would be greater if the questions were asked in context. Orion has extracted these questions into a second schedule using our template.
  - The third schedule relates to questions we asked Orion following receipt of the final CPP proposal.

Each question we asked is uniquely numbered for reference.

- attachments to the responses provided to some of our questions are also included onto Orion's server as separate documents.

Subject to the one exception identified below, the information uploaded to this server prior to (but not including) 12 February 2013 forms a complete record of the information provided by Orion that we relied on in reaching the conclusions presented in this final verification report.

The exception is the statement from Orion relating to the policies relating to the planning and approval of capex and quoted in Section 5.2.1.1 of this verification report. This is not on the web site as it is a quotation from an email sent to us by Orion on 14 December 2012, after we had advised it that the policies provided in response to verifier question GB11 should cover the planning and approval of capex projects and programmes as well as delivery.

On 12 February 2013, Orion uploaded an updated version of its "final" CPP proposal onto its server as well as a revision of document N70.60.15 - an earlier version of this document had previously been provided to us. This information was uploaded as this report was being finalised for review in order to meet delivery dates agreed with Orion, and we have not used these versions of the documents in preparing this report. Our understanding is that the changes in this updated version of the final CPP proposal were mainly editorial but did include the correction of minor errors, some of which we had noted, and advised Orion of, during our verification.

During the course of this verification Orion provided all the documents that we requested and responded to all the questions we asked. However, sometimes the answers were high level and did not include the depth of analysis we were hoping for. We think this was because we and Orion were both working to tight schedules and providing detailed responses takes time, particularly if the information requested was not readily available in the form required. It may also be that Orion did not always fully understand exactly what we wanted. At no time did Orion show any reluctance to provide us with information.

In some cases the judgements we have made and the conclusions that we have reached are qualified due to a lack of detailed information. This is noted in this report.

## 11. OVERVIEW OF KEY ISSUES

Based on its assessment, the **verifier** must, in the **verification report**-

- (a) provide a list of the key issues that it considers the **Commission** should focus on when undertaking its own assessment of the information to which the assessment related;
- (b) specify information identified in the **CPP proposal** that, were it to be provided, would assist the Commission's assessment of the **CPP proposal**; and
- (c) identify any other information it reasonably believes would-
  - (i) be held by the **CPP applicant**; and
  - (ii) assist the **Commission's** assessment of the **CPP proposal**.

### 11.1 CONTEXT

In assessing this CPP proposal we think the Commission should be mindful of the following two findings of this verification report.

- There is a high level of uncertainty in the environment within which Orion will need to operate over the forecast period. This relates not only to the rate and location of demand growth, but also to the costs that Orion will incur in delivering its capex and opex programme. It is possible that, as earthquake recovery activity gathers momentum, Orion finds that its costs increase at a faster rate than assumed in the CPP proposal. While this is more likely in the early part of the forecast period, these cost pressures will then flow through to the later years of the period. This could make it difficult for Orion to deliver its planned work programmes within the budget envelope, which in turn could have an adverse effect on supply reliability.
- Orion's procedures for the formulation and delivery of its work programmes are robust, since we believe that the collegial culture and strong communications links within its system operations and management division compensate for any lack of transparency. Putting aside our concerns over Orion's network planning criteria, we think that whatever resources are available to fund Orion's works programme will be effectively used. We also consider that the unit costs assumed by Orion in developing its cost estimates are reasonable. This would suggest that in its appraisal the Commission should focus on the need for the works described in the CPP proposal and the benefits that these works will provide consumers and other stakeholders rather than on the validity of the assumed input costs.

### 11.2 ISSUES FOR THE COMMISSION TO CONSIDER

While this verification process has identified a number of issues that the Commission will need to consider in its assessment we limit our discussion to key issues that we think have the potential to significantly impact Orion's expenditure requirement going forward. In comparison, adjustments the Commission might make in response to other issues raised in this verification are likely to be relatively small.

The Commission may also wish to further consider Orion's forecast insurance opex. However, we have not discussed this in detail in this section because the increase in insurance premiums as a consequence of the earthquakes has been well documented, and we think any adjustment the Commission might make to Orion's forecast insurance opex will be small in comparison to the adjustments that might arise from a more in-depth consideration of the issues below.

#### 11.2.1 Planning Criteria

In this report we have questioned whether Orion's planning criteria remain appropriate in the post-earthquake environment. Given Orion's current situation, where it has already committed to expenditure on underground circuits between Bromley-Rawhiti and

Bromley-Dallington-McFaddens, we suggest that the Commission focus on whether the 66 kV circuit between Hawthornden-Waimakariri-Marshland-Rawhiti should be built overhead or underground over all or part of the route. We understand that much of the proposed route is still not intensively subdivided and this could facilitate overhead construction, although more information is needed on the route topography. There may also be a need for further consultation to confirm that consumers, after being provided with more complete information of the costs and benefits of alternative options, are willing to pay the additional costs of an underground solution.

We also suggest further study is needed of the implications of relaxing the N-2 security criteria in both urban and rural parts of the network. We think this will allow the timing of some subtransmission development projects to be deferred, but the impact this will have on either the total capex requirement or on supply reliability as seen by consumers is not clear.

### **11.2.2 Deliverability**

Over the two year period FY13-FY14 Orion's total network works expenditure is expected to increase by 84% above the level achieved in FY12. This is a substantially greater increase than that achieved in the aftermath of the earthquakes and Orion's ability to deliver an increase of this magnitude in such a short time is unclear. If the programme proves to be undeliverable, then deliverability will become the binding constraint determining total expenditure and the projects in Orion's works programme will need to be prioritised accordingly.

The FY13 expenditure included in the CPP proposal is a budget and Orion's ability to achieve this budget will be a key indicator of the deliverability of the total programme. Fortunately, actual FY13 results will be available to the Commission during its appraisal so the Commission should be able to take this into account in making its decision. In seeking information from Orion on its FY13 outturn, the Commission should look not only at expenditure but also at work volumes in order to take account of cost variances that were not anticipated at the time the budget was set.

**APPENDIX A****IDENTIFIED PROGRAMME REVIEWS****INDEX**

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## APPENDIX A1

PROGRAMME NAME: URBAN NORTH SUBTRANSMISSION NETWORK CAPEX (CPP01)

CAPEX CATEGORY: MAJOR PROJECTS

## A1.1 PROJECT DESCRIPTION

This \$60.5 million project includes the establishment of a new underground 66 kV transmission interconnection between the Islington and Bromley GXP's to increase the capacity and security of the part of the Orion network that serves consumers in the north and north-west of urban Christchurch. It will also secure the supply to the Rawhiti zone substation, in east Christchurch, which was constructed by Orion in FY12 to replace the Brighton zone substation, which both suffered irreparable earthquake damage due to ground liquefaction. The project includes the subprojects shown in Table A1.1 below:

Table A1.1: – Subprojects – Urban North Subtransmission (\$000, real)

Orion ID	Description	Install Date	Cost (\$000)
606	<b>QEII Park Diesel Generators</b> Orion has installed 4 MVA of diesel generation to provide a backup supply for consumers normally fed from the Rawhiti and Dallington substations. This generation is used, in part, to provide a more secure supply to the Rawhiti zone substation, which is currently served by a single temporary overhead line. This generation has been installed as part of Orion's emergency earthquake response and is already commissioned.	FY13	2,899
619	<b>Bromley-Rawhiti 66 kV Cable</b> This 6.8 km circuit is being constructed along a route that minimises seismic risk and will replace the existing temporary overhead line that supplies Rawhiti substation. The resource consent permitting the construction of this line expires in March 2014. However, since it will be one of only four 66 kV circuits out of Bromley it will use 1600Cu cable giving it a rating of 160MVA. This capacity might in some contingency situations. This project is committed for construction.	FY14	10,953
521	<b>Marshlands Zone Substation Land Acquisition</b> Apart from Rawhiti, Orion is planning to construct two substations in the urban north area during the planning period, one at Marshlands and one at Waimakariri. A third substation will be constructed at Belfast after FY19. A well located site for this substation has been identified and, due to anticipated difficulties in finding an alternative suitable location, Orion is planning to secure this strategic site ahead of construction. Orion is committed to this land purchase.	FY14	500
525	<b>Waimakariri Zone Substation Stage 1</b> The Waimakariri substation will be located in the northwest of Christchurch and will provide for projected growth around the airport and further north. Apart from supporting load growth in this area it will have an asset replacement role, as it will allow the capacity of the Papanui substation acquired from Transpower to be reduced when these transformers reach end of life. It will also allow for the removal of the Bishopdale 11 kV switching station instead of replacing this asset at end of life. The substation will be constructed in two stages, with this stage providing for site development and the installation of the first 40 MVA transformer.	FY15	5,312
641	<b>Hawthornden-Waimakariri 66 kV Cable</b> One incoming 66 kV supply to Waimakariri will use one of the existing Islington-Papanui circuits, which will feed a new Hawthornden-Waimakariri cable at Hawthornden to form a new Islington-Waimakariri circuit. The second circuit of this double circuit line will be diverted to Hawthornden under a separate project allowing the line between Hawthornden and Papanui to be removed. This subproject allows for the laying of the 5.5 km of cable between Hawthornden and Waimakariri and the termination at the Hawthornden end.	FY15	7,494
651	<b>Marshland-Waimakariri 66 kV Cable</b> This subproject will install a new 9.7 km 66 kV cable between the new Waimakariri substation and the Marshland substation site.	FY15	10,738

Orion ID	Description	Install Date	Cost (\$000)
652	<b>Marshland-Rawhiti 66 kV Cable</b> This subproject will install a new 8.6 km 66 kV cable between the Rawhiti substation and the Marshlands substation site. Completion of this cable will complete the urban north interconnection between the Bromley and Islington substations and will provide a momentary break N-1 level of security to all three zone substations on the interconnection without reliance on 11 kV load transfers.	FY16	11,429
634	<b>Belfast Diesel Generation</b> The subproject provides for the transfer of the diesel generation currently situated at QEII park to the site of the future Belfast zone substation since, with the completion of the Marshlands-Rawhiti cable, they will not be required to provide contingent support to Rawhiti substation. It will also provide support to the existing 11 kV northern ring, allowing the Marshlands zone substation to be deferred by about two years.  Orion is planning to install 5 MVA of generation at Belfast. Two 2 MVA generators will be relocated from QEII Park and Orion plans to purchase a new 1 MVA generator, which will be funded by this subproject.	FY16	1,285
541	<b>Hawthornden Tee-Off</b> Hawthornden substation is currently supplied from Islington via a 66 kV double circuit tower line owned by Orion. It is planned to supply this substation from the second circuit of the Islington-Papanui line that will supply Waimakariri and to tee off one of the Islington-Papanui circuits to provide a second incoming supply.	FY18	1,300
542	<b>Waimakariri Zone Substation Stage 2</b> This subproject includes the installation of the second 40 MVA transformer and the installation and commissioning of the incoming cable from Marshlands.	FY18	2,377
488	<b>Marshlands Zone Substation</b> This subproject is for the construction of the Marshlands zone substation with 2x11.5/23 MVA transformers. Orion anticipates that forecast growth in the Marshlands, Ourhuia and Chaney's area will exceed 11 kV network capacity in contingency situations. In particular, two major subdivisions in Prestons Road may contribute over 10 VA of demand when fully developed. The zone substation could also allow the 11 kV network architecture to be rationalised, which may allow the Grimseys Winters switchgear to be relocated (although there is currently no firm plan for this).  This zone substation, along with Waimakariri will also offload the Papanui substation recently acquired from Transpower, which will allow this to become a standard 40 MVA zone substation when the transformers are replaced at end of life.	FY18	6,255
<b>Total</b>			<b>60,542</b>

## A1.2 INFORMATION PROVIDED

The table below presents the key information that has been provided by Orion that has been used in preparing this programme review:

**Table A1.2: Information Provided**

Title	Reference	Date
Project Summary	Version 7	28 January 2013
Network Architecture Review - Subtransmission	NW70.60.16	
Project Budgeting Forecasting Process	NW70.16.13	

## A1.3 DELIVERABILITY

This is by far the largest one-off capex project planned for the period FY13-FY19 period and accounts for almost 14% of total network capex, excluding expenditure on Transpower asset acquisitions. The majority of this work will be undertaken over the three year period FY14-FY16 which is the timeframe for the 66 kV cable installation.

The project includes subprojects in three separate categories, each of which require a different installation skill set. These are:

- Generation facilities at QEII Park and Belfast. These facilities are delivered to site in modular form with each module preassembled in two containers and tested by the manufacturer. On site installation work, which includes installation of the 11 kV switching equipment and other plant required to connect the generators to the network, is limited. The generators are not expected to pose a deliverability constraint.
- The Waimakariri and Marshlands substations are the only two new urban substations to be constructed during the forecast period (although CPP3 provides for the upgrade of the Shands substation to 40 MVA). Orion appears to have staggered this work over the forecast period, which should improve deliverability – the Shands upgrade is proposed for FY17, during the lull in planned substation construction work on this project.
- In addition to the 66 kV cable installation work in this project, Orion is planning to install underground 66 kV cables between McFaddens and Bromley via Dallington under CPP2 and also between Lancaster and Milton under CPP4. This programme requires the installation of approximately 10 km of cable per year over a period of up to 5 years. While cable laying projects must be well planned and supervised, there is not the requirement for the highly skilled labour that is required for substation construction work. Orion has made some effort to even out this workload but the schedule remains tight. Completing this work within the timeframe proposed will be a challenge for Orion but is not unachievable.

#### **A1.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has developed this project in accordance with its network planning criteria. In particular:

- all new 66 kV circuits are planned to be underground to meet the requirements of the Christchurch City Council.
- the project is planned in accordance with the network supply security standards set out in Section 5.3.1 of Orion's 2012 AMP. Class C2, which applies to urban loads greater than 15 MW is relevant. This requires no interruption after an N-1 contingency and an interruption of no more than 2 hours after an N-2 contingency. However, this level of security will not be fully met prior to the end of the planning period since uninterrupted N-1 security requires the McFaddens-Marshlands cable.
- the project also meets new resilience criteria that Orion has established incorporating learnings from the earthquakes. In particular the 66 kV subtransmission system is being developed to form four interconnections between Islington and Bromley, to be operated in a radial configuration with a normally open point in the middle. This will allow and zone substation to be supplied from either GXP. This also provides for route diversity with no zone substation relying on a single incoming cable route.

#### **A1.5 KEY ASSUMPTIONS USED**

The project includes new substations at Waimakariri and Marshlands to meet anticipated growth in demand in the urban north and north-west suburbs of Christchurch. While the additional substation capacity is intended to provide the capacity needed to ensure a secure electricity supply in an area of high forecast growth in demand, a number of other factors have influenced location and timing of these new substations. In particular:

## Waimakariri Stage 1

- The replacement of the Papanui transformers. Orion acquired the Papanui spur assets from Transpower in FY13 and is planning to better integrate these assets into its subtransmission network. As the existing transformers are approaching end-of life, Papanui will be converted into a standard two-transformer 40 MVA zone substation and moving some of the existing transformer capacity to Waimakariri and Marshlands, closer to the load that it will serve. While Transpower was planning to replace the existing Papanui transformers over the period FY16-18, Orion has not included these replacements in its CPP proposal.
- Orion has indicated that Transpower is planning to replace the 66 kV switchgear at Islington (FY16-18), although this is not identified in Transpower's 2012 Annual Planning Report. Construction of the Waimakariri substation, and the consequent reconfiguration of the 66 kV circuits between Islington, Hawthornden and Papanui will allow one 66 kV bay to be relinquished.
- The substation will help relieve an 11 kV load constraint in Belfast and Chaney's.
- Orion indicates that there is a need for additional 11 kV transfer capacity to cater for the loss of Ilam substation in an n-2 contingency.
- The ability of Papanui/Bishopdale to support load in the Russley/Airport area in a Hawthornden N-2 transformer event is becoming constrained by the 11 KV network

## Waimakariri Stage 2 / Marshland

- The Marshland substation will also offload the existing Papanui transformers, as discussed above.
- There is a later need to offload Hawthornden and Ilam substations to allow 11/23MVA transformers at Hawthornden to be relocated to new Yaldhurst substation in FY20.
- The Marshland substation is required to offload the Grimseys-Winters primary ring (fully loaded FY19) and McFaddens zone substation currently at full capacity).

**A1.6 ASSESSMENT OF THE METHODOLOGY USED**

Orion was unable to provide any technical planning report or economic analysis that compared the merits of its planned urban north project with possible alternative solutions. We are thus unable to comment on whether or not a more optimal and cost effective solution is available. In addition, we have seen no detailed analysis supporting the subproject timings proposed by Orion, although we note that, for this project, subproject timing is largely driven by the forecast growth in demand. As discussed in Section 7.2, Orion's demand growth projections are subject to an abnormally high level of uncertainty, due to the speculative nature of many of the assumptions around earthquake recovery.

However, Orion appears to have taken into account a significant number of emerging network constraints and we are inclined to the view that, given the planning criteria discussed in Section A1.4, this is an appropriate network development response. In Section 6.3 we discussed the collegial nature of Orion's corporate planning culture and we think it likely that this project has been discussed widely within Orion in the context of the development of a robust network that meets forecast load growth, replaces earthquake damaged assets and takes account of the learnings in the aftermath of the earthquakes. If this is the case, the planned solution may well be a better outcome than would have been achieved if development had been siloed within a small planning section that formed only a small part of the broader systems operations and management division.

An interesting feature of the project is the integration of the spur assets Orion has acquired from Transpower. One of the existing Islington-Papanui circuits is going to form part of a new Islington-Waimakariri circuit and some of the existing Papanui 66/11 kV transformer capacity is being replaced at the new Waimakariri and Marshland zone substations. In the longer term customers will benefit from a more optimal subtransmission network arrangement, which would not have been possible without the transfer of the assets concerned from Transpower to Orion.

The project costs were estimated using the standard capex forecasting unit costs that Orion developed as the basis for its CPP forecast. However, during the course of the verification process we were advised that the unit cost for 66 kV cable installation needed to be increased by 46% after receipt of additional information on civil construction costs for the rebuilding of infrastructure following the earthquakes. Orion noted that:

- The last 66 kV cable installation with a length greater than 1 km was the Lancaster-Armagh cable installed in 2002. While it has been getting manufacturer's prices for cable material costs since 2008, it has not had any recent cable installation costs to use as an estimating benchmark.
- It is required to coordinate the installation of the 66 kV cables between Bromley and Rawhiti / Dallington with other infrastructure restoration work and to have the installation civil works undertaken by alliance contractors aligned with the Stronger Christchurch Infrastructure Rebuild Team (SCIRT).
- It has worked through the installation costs SCIRT and its alliance contractors and is satisfied that \$700 per metre (up from an initial estimate of \$480) is a reasonable cost estimate for cable installation and jointing. This does not include the material cost of the cable.

We have come across situations in Australia where construction costs under alliance arrangements have been shown to be more expensive than costs using more traditional project delivery mechanisms. This appears to be because competitive tensions are absent and also because alliance agreements generally provide for all costs to be recovered with little risk to the contractor.

We have explored this issue with Orion and also note that Orion's 2010 installed subtransmission cable (albeit 33 kV) as presented in Appendix 24 of the CPP proposal is more than 60% lower than the benchmark New Zealand average. We also note that there should be some cost savings in coordinating with other network infrastructure installers – for example reinstatement should be lower. On balance, we accept the revised estimate and note that the early part of the assessment period is likely to be a time when earthquake rebuild activity peaks and contractors will have a high degree of market power. We note that SCIRT is requiring Orion to contribute to the overhead costs of the alliance arrangement and accept that this cannot be avoided.

While we accept the \$700 per meter cable installation estimate for the Bromley-Rawhiti cable, Orion has indicated that SCIRT will not be involved in the installation of the three cable sections between Hawthornden and Rawhiti and that these installation of these three cable sections can be achieved using more traditional project delivery approaches. A more competitive approach to tendering and a situation where more risk is carried by the contractor can be expected to reduce Orion's costs. We note also that approximately 40% of the McFadden-Dallington cable, which was the basis for the \$700 per metre cost estimate, required the use of flowable fill trench, specially designed for areas prone to liquefaction, which is substantially more expensive than trenches using standard thermal backfill. Furthermore much of the Hawthornden-Rawhiti cable route is across "rural urban" parts of Christchurch city that has still to be intensively subdivided.

We accept that Orion's original estimate of \$480 per metre for cable installation and jointing was too low, we think an estimate of \$600-\$650 per metre for the cable sections between Hawthornden and Rawhiti could be more reasonable than the \$700 per metre assumed by Orion. A \$650 per metre cable installation cost would reduce the project cost estimate by \$1.34 million. We suggest to Orion that its \$700 per metre estimate for

cable installation could be high but it noted that it is continuing to see cost increases and the McFadden's to Dallington cable discussed in Appendix A2, which is being constructed under the alliance arrangement and was estimated in the CPP proposal to have an installation cost of \$700 per meter, is now expected to cost \$750 per meter<sup>43</sup>.

### A1.6.1 Security

As it is not possible to operate a closed 66 kV ring between the Bromley and Islington GXP's, there will need to be a normally open point in the ring. Hence this project alone will not provide uninterrupted N-1 security at all substations. Sequencing diagrams provided by Orion indicate that this will not be available until around 2025, when it is planned to operate the northern two Islington-Bromley interconnections as two closed rings, one supplied from Islington and the other from Bromley. The Islington ring will supply Hawthornden, Papanui, Belfast, Waimakariri and a proposed new 23 MVA substation at Yaldhurst. The Bromley ring will supply Rawhiti, Marshland, McFadden and Dallington. The two closed rings will be interconnected through normally open switches at Marshland and McFadden to provide GXP interchangeability and operating flexibility.

### A1.6.2 Overhead Construction

In this section we consider the indicative cost of the project, using overhead 66 kV construction. For this analysis, we assume an urban overhead line cost of \$250,000 per km, which implies the use of goat conductor (120 MVA) in accordance with the discussion in Section 5.3.2.1. We assume goat is used for all 66kV circuits, given that provision must be made for the inclusion of the future Belfast substation in the interconnection.

On this basis a comparative analysis of the costs of the overhead and underground project costs is provided in Table A1.3 below:

**Table A1.3: Indicative Comparison of Overhead and Underground Construction Costs (\$000, real)**

Cable Section	Length (metre)	Underground Cost <sup>1</sup>	Overhead Cost
Hawthornden-Waimakariri	5,500	7,194	1,375
Waimakariri-Marshland	9,700	10,738	2,425
Marshland-Rawhiti	8,600	11,249	2,150
Rawhiti-Bromley	6,800	10,703	1,700
<b>Totals</b>	<b>30,600</b>	<b>39,884</b>	<b>7,650</b>

Note 1: As estimated by Orion. Provides for cable material and installation

The analysis indicates that with the use of overhead construction, project costs could be reduced by more than 50% to an estimated \$28.31 million<sup>44</sup>. Even if we have underestimated the overhead line construction cost, which is possible, the magnitude of the potential cost reduction will not be significantly affected.

We further caution that our comparison is not "like-for-like" and does not provide the full functionality built into the Orion design. In particular:

- The rating of the overhead Bromley-Rawhiti circuit is lower than the rating of Orion's proposed underground circuit (140-160 MVA, depending on construction). It would not be possible to build an overhead line with this rating using ACSR conductor, although this capacity could be achieved using large all aluminium (AAC) or all aluminium alloy (AAAC) conductor but these designs would likely require additional poles and therefore be more expensive.

<sup>43</sup> Response to verifier question GB109.

<sup>44</sup> This includes replacement of the temporary Bromley-Rawhiti overhead line. We assume that this line does not have the capacity required by Orion's network architecture and also, since the line was authorised under emergency civil defence authority, changes to the route will be needed.



- The lower rating of the Bromley-Rawhiti (and also Bromley Dallington) circuits could mean that it might not be possible to operate a closed Bromley-Rawhiti-Marshlands-McFadden-Dallington-Bromley ring if all substations in the ring were operating at close to their firm capacity. This is unlikely to be an issue in the medium term as all substations are unlikely to be fully loaded. However, in the longer term there may need to be some re-engineering of the project to accommodate the Bromley Dallington and Bromley Rawhiti constraints and also provide uninterrupted N-1 security.
- With an overhead design it could also be desirable to route the Waimakariri-Marshland circuit through the Belfast substation site, implying a small increase in the overhead costs shown in Table A1.3.

It is not within the scope of this verification report to present a fully optimised and costed overhead alternative to the Orion proposal, but rather to indicate the magnitude of the potential savings in project costs and what this might mean for consumers in terms of supply reliability. The capex forecast in the CPP proposal does not offer uninterrupted N-1 supply security by the end of the CPP regulatory period and in the medium term the reliability consequences of the overhead approach from a customer perspective could be a small increase in the number of interruptions due to the increased probability of overhead line faults compared to underground cable. However, these additional interruptions would be relatively small as they initially would be limited to the time taken to manually switch in the backup power supply and, by the time the project was completed these interruptions would be momentary as the necessary switching would be automatic. Eventually we would expect Orion to be able to engineer an overhead network where N-1 events did not cause a supply interruption and at that time the number of interruptions experienced by customers would be similar, irrespective of whether the subtransmission circuits are constructed overhead or underground.

In reality, we understand that Orion is already committed to building high capacity underground circuits between Bromley and Rawhiti and also between Bromley and Dallington so the capacity constraint will not apply. This means that the cost savings for the Bromley-Rawhiti circuit is therefore not available. However, if all other 66 kV circuits are included in this project are constructed overhead, the revised project cost estimate is \$37.31 million, still a 38% reduction. If it is accepted that, with overhead construction, there is no need to provide for full restoration following an N-2 event, it may be possible to defer the construction of the Marshland substation and the second Waimakariri transformer, leading to additional savings in the cost of the project. We have not investigated this in detail as the analysis would involve detailed consideration of the spare capacity in the 11 kV network.

### **A1.6.3 Historical Cost Trends**

As this is a one-off project with a unique design, historical cost trends are not relevant.

### **A1.6.4 Material Changes to Work Volumes**

As this is a one-off project with a unique design, material changes to work volumes are not relevant.

### **A1.6.5 All Network or Non-Network Alternative Projects Considered**

Orion did not provide a planning report for the project showing that all network or non-network projects were considered. It argues that its subtransmission architecture review considered alternative network configurations in detail and the project was a consequence of the findings of this review. We largely agree with this, although we note that the architecture review is high level and was not intended to optimise the design detail for a particular project. However, it is evident from the project summary that a lot of thought has gone into the development of the project and, given the collegial culture and strong communication links within the system management and operations team, we are confident that a number of different alternatives were considered through an informal

“socialised” development process. While such a process lacks transparency, we think it can lead to quality outcomes.

We note the use of generation to provide short term supply security and defer the need for some subprojects but, for a project of this size and nature, detailed consideration of non-network alternatives is unlikely to lead to different outcomes.

#### **A1.6.6 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

#### **A1.6.7 Contingency Factors**

No contingency factors have been included in this programme.

#### **A1.6.8 Step Changes from Historical Costs**

This is not relevant to a large one-off project of this nature.

### **A1.7 CONCLUSION**

Given the planning criteria used as a basis for Orion's CPP proposal, the project configuration appears reasonable, notwithstanding the absence of a formally documented planning report or economic analysis. We also consider that the approach taken by Orion in forecasting the costs of the project is reasonable although the assumed unit rate of \$700 per metre for cable installation and jointing over the Hawthornden-Rawhiti cable routes may be high. If a unit rate of \$650 per metre was assumed the project cost estimate would reduce by \$1.34 million (real).

If the proposed 66kV circuits were constructed overhead, we estimate that the cost of the project would reduce to approximately \$28.3 million, a reduction of more than 50%. However, installation the Bromley-Rawhiti cable is now committed, which revises the estimated project cost to \$37.3 million, still a 38% reduction. Additional savings could be possible by deferring construction of the Marshland substation and installation of the second transformer at Waimakariri, if it is assumed that, with overhead construction, there is no need to provide for full supply restoration immediately following an N-2 contingency event.

## APPENDIX A2

PROGRAMME NAME: DALLINGTON SUBTRANSMISSION NETWORK CAPEX (CPP02)

CAPEX CATEGORY: MAJOR PROJECTS

## A2.1 PROJECT DESCRIPTION

This \$17.0 million project includes the installation of two new incoming circuits to supply Dallington substation, one from Bromley GXP and one from McFaddens. The circuits will replace the two underground circuits from Bromley that both suffered irreparable earthquake damage and the temporary Bromley-Dallington overhead line that was constructed after the earthquakes to replace these cables. The project includes the subprojects in Table A2.1 below.

Table A2.1: – Subprojects – Dallington Subtransmission (\$000, real)

Orion ID	Description	Install Date	Cost (\$000)
490	<b>Dallington-McFaddens 66 kV link Stage 2</b> This project includes the installation of a 5 km single circuit 1000Cu cable between the two substations as well as associated substation works at Dallington, including a 66 kV switchgear building and the first of three 66 kV circuit breakers.	FY13	8,364
492	<b>Bromley-Dallington 66 kV link Stage 1</b> The project includes substation works at Dallington, including the installation of two 66 kV circuit breakers, protection and communications to facilitate the termination of the new Bromley-Dallington 66 kV cable that will be installed in FY14. We assume that this project will be integrated with the Dallington substation works associated with project 490, discussed above.	FY13	1,620
656	<b>Bromley-Dallington 66 kV link Stage 2</b> This project included the installation of 5.5km single circuit 1600Cu cable between Bromley and Dallington and the termination of these cables.	FY14	9,644
<b>Total</b>			<b>19,628</b>

## A2.2 INFORMATION PROVIDED

Table A2.2 presents the key information that has been provided by Orion that has been used in preparing this programme review:

Table A2.2: Information Provided

Title	Reference	Date
Project Summary	Version 3	28 January 2013
Network Architecture Review - Subtransmission	NW70.60.16	
Project Budgeting Forecasting Process	NW70.16.13	
Unreferenced project sequencing diagrams		

## A.2.3 DELIVERABILITY

The sequencing of this project appears to have been integrated with the urban north subtransmission project discussed in Appendix A1. The major deliverability constraint is the installation of the 66 kV underground circuits within the timeframe proposed. As noted in Section A1.3, completing this work within the proposed schedule will be a challenge for Orion but is not unachievable.

**A.2.4 RELEVANT POLICIES AND PLANNING STANDARDS**

The project has been designed in accordance with the urban subtransmission network architecture developed in document NW70.60.16. This requires that the two incoming circuits be underground and be installed over different routes. Being a two transformer two circuit substation, Dallington should also be reconfigured into a ring arrangement with three 66 kV circuit breakers.

In order to increase the resilience of the network to HILP events it must now be possible to supply Dallington from either the Islington or Bromley GXPs and this is achieved by connecting one of the incoming cables to McFaddens. Initially it is planned to supply Dallington through the Bromley cable with the McFaddens cable being kept in reserve. When the McFaddens-Marshlands cable is installed after the end of the regulatory period, Orion expects to operate the Dallington, McFaddens, Marshland and Rawhiti substations as a closed as a closed ring, providing uninterrupted N-1 subtransmission security in accordance with its security criteria for loads above 15 MVA.

All new 66 kV circuits in Orion's urban area are installed underground in accordance with the requirements of the Christchurch City Council.

**A.2.5 KEY ASSUMPTIONS USED**

This is an asset replacement project, brought about by the need to provide permanent incoming supplies to Dallington substation to replace the two supply cables that were irreparably damaged by the February 2011 earthquake. Dallington is currently supplied by a temporary 66 kV overhead line built immediately following the earthquake under Civil Defence emergency powers. Orion has agreed with the Christchurch City Council that this line will be removed by 31 March 2014.

**A.2.6 ASSESSMENT OF THE METHODOLOGY USED****A2.6.1 Cost Estimate**

The project has been designed in accordance with Orion's planning criteria and the cost in FY13 dollars for the substation and cable materials components of the project has been estimated by aggregating the standard cost modules provided as appendices to the Project Budget Forecasting Process, NW70.16.13.

As discussed in Section A1.6 the cost of cable installation was estimated to be \$480 per metre in the draft CPP proposal but this was increased to \$700 per metre in the final CPP proposal. Since all 66 kV cable in this project will be installed under the alliance contracting arrangement, we consider this increase reasonable. As also noted in Section A1.6, Orion now expects the actual installation cost of the McFaddens-Dallington cable to be \$750 per metre

**A2.6.2 Historical Cost Trends**

As this is a one-off project with a unique design, historical cost trends are not relevant.

**A2.6.3 Material Changes to Work Volumes**

As this is a one-off project with a unique design, material changes to work volumes are not relevant.

**A2.6.4 All Network or Non-Network Alternative Projects Considered**

The development of this project was seamlessly integrated with the development of the urban north project (CPP01) discussed in Appendix A1. The comments made in Appendix A1 in relation to project development apply also to this major project.

**A2.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

**A2.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A2.6.7 Step Changes from Historical Costs**

This is not relevant to a large one-off project of this nature.

**A2.7 CONCLUSION**

We consider the Orion's estimated expenditure on this project to be reasonable. However, there would be a significant reduction in the cost of this project if the new 66 kV circuits were installed overhead, rather than underground, but we have not analysed the potential savings in detail as we understand expenditure on both sections of underground cable is already committed.

The primary driver for this project is to replace assets that suffered irreparable earthquake damage and we agree that it should proceed as soon as reasonably practicable.

## APPENDIX A3

PROGRAMME NAME: RURAL NETWORK CAPEX – ROLLESTON (CPP07)

CAPEX CATEGORY: MAJOR PROJECTS

## A3.1 PROJECT DESCRIPTION

This \$13.6 million project is a continuation of an ongoing development plan to improve the capacity and security of the subtransmission network supplying residential and industrial growth in Rolleston and the surrounding area. The project includes the following components.

Table A3.1: Rolleston Rural Subtransmission (\$000, real)

Orion ID	Description	Install Date	Cost (\$000)
413	<b>Larcomb-Weedons 66kV line conversion</b> This subproject will upgrade the existing 33 kV subtransmission line between Larcomb and Weedons to 66 kV and will upgrade the conductor from dog to jaguar. This project will complete the 66 kV Islington-Weedons-Larcomb-Springston-Islington ring and allow the Larcomb substation to be upgraded to 66 kV and fed from Islington via Weedons rather than via Springston, offloading the heavily loaded Islington-Springston lines <sup>1</sup> .	FY13	507
414	<b>Convert Larcomb to 66 kV, 23 MVA</b> In addition to offloading the Islington-Springston line, this subproject is required to supply the additional Westland Milk load at the Izone industrial park near Rolleston.	FY14	3,230
429	<b>New 66 kV Bay at Springston</b> While the line between Springston and Larcomb is constructed at 66 kV, it is currently operated at 33 kV. An additional 66 kV line termination bay is required at Springston, if this line is to be operated at 66 kV.	FY14	367
500	<b>Land Acquisition for Burnham Substation</b> This is required before construction of Stage 1 of the proposed new Burnham substation (see Project 639 below) can commence.	FY14	250
528	<b>Land Acquisition for Rosendale Substation</b> Orion is discussing with Transpower the feasibility of establishing a new 220/66 kV GXP northwest of Rolleston as a strategic long term option for supplying Orion's rural load in the Canterbury Plains. While it is not envisaged that the GXP will be required until around 2025, should Transpower confirm that the proposal is appropriate, it is considered prudent to lock in the proposal with a strategic land purchase. If the GXP proceeds, Orion will construct a new zone substation adjacent to the GXP site and is coordinating with Transpower to purchase the land required for both substations.	FY14	250
637	<b>Railway Rd 11kV Switching Station</b> The new Westland Milk load will be supplied through an 11 kV switching station in Railway Rd. While the load will normally be supplied from Larcomb, the switching station will provide for an alternative 11 kV supply from Rolleston zone substation to provide the N-1 security required by the customer. The load requires significant additional 11 V cable capacity between the two zone substations and the site. While the trenches are open for this work the opportunity will be taken to upgrade the existing 11 kV network in the area.	FY14	3,144
639	<b>Burnham Substation Stage 1</b> This subproject involves the establishment of a new substation at Burnham. Initially it will be operated at 33 kV using a relocated 7.5MVA transformer and will be supplied by the Springston-Highfield line. In the short term the substation will, in effect, increase the capacity of the nearby Rolleston zone substation while in the longer term it will be upgraded to a two transformer 23 MVA substation that will replace Rolleston. The substation will be needed once the growth in the Rolleston zone substation peak demand can no longer be transferred to Larcomb or Weedons substations through 11 kV reinforcement.	FY15	3,552



Orion ID	Description	Install Date	Cost (\$000)
415	<b>Weedons to Highfield Tee 66 kV Conversion</b> This subproject provides for the upgrade of this section of 33 kV line from dog conductor to 66 kV jaguar conductor and the installation of two new 66 kV circuit breaker bays. This work is needed before the Highfields zone substation can be energised at 66 kV.	FY17	1,548
114	<b>Highfield Substation 66 kV Conversion</b> This subproject provides for the upgrade of the single transformer capacity at Highfield substation from 7.5 VA to 10 MVA. The project is driven primarily by the need to operate the Weedons-Highfield Tee circuit at 66 kV in order to supply the proposed new Norwood substation, although we also note that the peak demand at Highfield substation is forecast to approach the continuous rated capacity of the existing transformer at the end of the regulatory period.	FY18	710

Note 1: Springston is currently a Transpower owned GXP, but is to be acquired by Orion in FY14. It is the point of injection for Orion's 33 kV subtransmission system supplying the inner Canterbury Plains and Banks Peninsular and has a current peak load of 53 MVA.

### A.3.2 INFORMATION PROVIDED

Table A3.2 below presents the key information that has been provided by Orion that has been used in preparing this programme review.

**Table A3.2: Information Provided**

Title	Reference	Date
Rural Rolleston Major Project Summary	Version 7	28 January 2013
Network Architecture Review - Subtransmission	NW70.60.16	
Project Budgeting Forecasting Process	NW70.16.13	

### A.3.3 DELIVERABILITY

The upgrading of the Larcomb substation and the construction of the Railway Rd switching station in FY14 together constitute more than 46% of the estimated cost of this project and almost 13% of the total forecast expenditure in the rural area. However, there are no other major substation construction works planned for FY14, so available substation construction resource can focus on this work. As the work is needed to meet the requirements of a large new industrial customer Orion will have a strong incentive to deliver. We think this target can be met.

Stage 1 of the new Burnham substation will be constructed at the same time as Stage 1 of the proposed Waimakariri urban substation and this could be difficult. However, we have no information that would indicate that deliverability is unachievable. Nevertheless, as both substations are needed to meet incremental load growth some slippage could be accommodated, albeit with a small reduction in the network security margin.

### A.3.4 RELEVANT POLICIES AND PLANNING STANDARDS

Orion intends to undertake a formal review of its rural subtransmission network planning architecture in FY14, although there are no expectations that this will result in significant change from the existing standards. It is anticipated that the ring bus zone substation configuration now standard in the urban network will be confirmed for use in the rural area.

The following policies and planning standards have had a significant influence on the design of the project.

- The rural security criteria in the 2012 AMP will apply. All substations affected by this project are classified D2 which requires restoration of all load within 4 hours following an N-1 subtransmission contingency and restoration of 50% of the load within 4 hours and the remaining load within repair time after an N-2 event. This

does not include load on the special irrigation tariff, where a delay of up to 48 hours is acceptable following a power transformer failure.

- Unlike the urban area, subtransmission lines are generally overhead.
- Where economic to do so, new subtransmission assets are rated at 66 kV rather than 33 kV. Orion's long term goal is to transition from 33 kV to 66 kV subtransmission so all new subtransmission assets are being constructed at 66 kV. We think this is prudent, given that there is already an Orion owned 66 kV link between Springston and Hororata, which forms a backup to the Transpower circuit. While it may be that some proposed projects could be more economic at 33 kV in the short term, having two different subtransmission voltages is likely to limit longer term development options.
- Orion is planning to undertake a review of its rural network architecture in 2013, similar to the urban network architecture review it completed in 2012. However, the rural major projects included in the CPP proposal assume a very similar subtransmission architecture to the urban area with four 66 kV rings between Islington and Hororata with intermediate tie lines between adjacent rings. It is not clear to us that all these intermediate tie lines are needed in a rural situation with overhead infrastructure, but these are not planned for construction in the forecast period.

### A.3.5 KEY ASSUMPTIONS USED

This project can be divided into the following three high level components, each of which has different drivers.

- The first component includes the upgrade of the Weedons-Larcomb 66 kV line, the upgrade of the Larcomb substation and the installation of the 11 kV switching station at Railway Rd. This work is required to meet the expected requirement from Westland Milk for a 9.4 MVA connection at the Izone industrial park near Rolleston in FY14. The existing subtransmission network supplying this area does not have the capacity to supply a new block load of this magnitude. The Rolleston zone substation has a firm capacity of 10 MVA, which is already fully utilised and the Larcomb substation, which was only commissioned in 2009, has only a single 7.5 MVA transformer supplying a current peak demand of approximately 5 MVA.
- The second component is the proposed new Burnham substation. This is also driven by the Westland Milk requirement for N-1 supply security. While the Rolleston substation is currently overloaded, other options, such as offloading Rolleston to Larcomb could have been available that may have deferred the requirement for Burnham had it been only incremental load growth that had to be met. Another possible alternative would have been to proceed with Burnham but deferred the Larcomb upgrade<sup>45</sup>.
- The third component is the conversion of Highfield to 66 kV. This is driven primarily by the timing of the proposed new substation at Norwood. If this substation is to be constructed at 66 kV, consistent with Orion's strategy to exit 33 kV subtransmission, it is most economically initially supplied from Weedons. This requires Highfield to be upgraded to 66 kV. Nevertheless the need for the Highfield upgrade within the regulatory period is dependent on whether Norwood will need to be constructed by its scheduled construction date of FY19.

With this in mind we requested Orion to also provide a project summary for the Norwood substation.

<sup>45</sup> It is not necessary for us to explore this in detail. Suffice it to say that the Burnham site and the Rolleston and Larcomb substations are relatively close together.

- The project summary included a table showing the forecast transformer loadings of neighbouring zone substations in FY19. No substations would be overloaded although the project summary includes a table that shows the Brookside, Bankside and Killinchy substations being almost fully loaded by the end of the regulatory period. Highfield would also be almost fully loaded if it had not been upgraded to 66 kV.
- There are two industrial customers in the Norwood area, Malvern Abattoir and Meadow Mushrooms, both of whom have discussed plans for expansion with Orion, and it seems that Norwood will only be required if this expansion materialises. However, the timing and magnitude of any additional load at these sites is unknown and the loads are not included in the forecasts. Orion accepts that the timing of the requirement for Norwood is uncertain but it has budgeted for FY19, according to the best information available.

While the Brookside, Bankside, Killinchy and Highfield substations are all forecast to be heavily loaded by FY19, Dunsandel and Burnham/Rolleston are both multi-transformer substations that could conceivably accept some of this load. The proposed new Southbrook substation, scheduled for commissioning in FY18 is also well positioned to accept some presently supplied from Killinchy and Brookside. We therefore think that the transformer loading issue can be managed through to the end of the period without the need to construct Norwood.

The more critical issue is likely to be the capacity available within the 11 kV network to transfer load between substations, and a secondary issue is the reasonableness of the class D2 security criteria that is the primary driver for augmentation of the rural network.

All the substations in the load area except Dunsandel and Burnham/Rolleston are single transformer substations. Following an event where supply to one of these substations is lost, the class D2 security criteria requires that all load (except load on the irrigation tariff) must be restored within four hours. Essentially this allows for transfer of load to other zone substations through manual switching of the 11 kV network. This requires that there must be sufficient unused capacity in the 11 kV network and also at the neighbouring substations to accommodate the shift in load. Given that all single transformer substations are highly utilised, this means effectively that up to 10 MVA of load (less irrigation load) must be transferred to Dunsandel and/or Burnham/Rolleston.

However, should there be a second (N-2) subtransmission interruption, affecting either a subtransmission line or another substation transformer, then 50% of the additional load lost must also be transferred. This puts a much greater constraint on the network since, in a worst case scenario, it means that up to 20 MVA of transformer capacity is lost and up to 15 MVA of load must be transferred through the 11 kV network. Clearly, if the N-2 criterion was not applied, then the network could be operated at a higher level of utilisation and network upgrades could be deferred.

If the first contingency is due to a transformer outage, Orion may need to replace the transformer with a spare unit, which it carries for this purpose, and this could take up to 48 hours. Should the second contingency be a transmission line, the repair will take less than 12 hours. However, should it be a second transformer, then the repair could take another 48 hours. Power transformer failures are rare events. The probability of a transformer failure is stated by Orion on its web site as being 10%, which in our view is a pessimistic assessment. However, if this figure is used, the probability of two transformers failing simultaneously would be about 3%, or 1 in 30 years, if it is assumed that after the first failure, a failure of any one of three neighbouring transformers would have a similar network impact.

While we consider the N-1 security criteria reasonable and in line with generally accepted industry practice, it is not clear to us that designing an overhead network to cater for an N-2 contingency, even with only 50% load restoration, is cost effective. An N-2 scenario is a low probability event. If the second contingency is an overhead line failure we think a repair under normal circumstances should take much less than the 12 hours assumed by Orion in its economic analyses, and that the loss of supply could be an acceptable risk. A

double transformer outage is more serious but, given its low probability this could be treated as an emergency outside the normal network design envelope. Risk mitigation measures could include the use of emergency generation and load rationing to ensure that no customer is left without power for the whole period of the outage. Another approach would be to use a mobile substation which would limit a transformer outage to around 12 hours. The spare transformer could then be kept in reserve for the N-2 scenario.

### **A.3.6 ASSESSMENT OF THE METHODOLOGY USED**

The project has been designed in accordance with Orion's planning standards and the cost in FY13 dollars for the substation and cable materials components of the project has been estimated by aggregating the standard cost modules provided as appendices to the Project Budget Forecasting Process, NW70.16.13.

#### **A3.6.1 Cost Estimate**

The project has been designed in accordance with Orion's planning criteria and the cost in FY13 dollars for the substation and cable materials components of the project has been estimated by aggregating the standard cost modules provided as appendices to the Project Budget Forecasting Process, NW70.16.13. We consider the cost estimate reasonable.

#### **A3.6.2 Historical Cost Trends**

As this is a one-off project with a unique design, historical cost trends are not relevant.

#### **A3.6.3 Material Changes to Work Volumes**

As this is a one-off project with a unique design, material changes to work volumes are not relevant.

#### **A3.6.4 All Network or Non-Network Alternative Projects Considered**

Orion did not provide a planning report for the project showing that all network or non-network projects were considered. However, it is evident from the project summary that a lot of thought has gone into the development of the project and, given the collegial culture and strong communication links within the system management and operations team, we are confident that a number of different alternatives were considered through an informal "socialised" development process. While such a process lacks transparency, we think it can lead to quality outcomes.

#### **A3.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

#### **A3.6.6 Contingency Factors**

No contingency factors have been included in this programme.

#### **A3.6.7 Step Changes from Historical Costs**

This is not relevant to a large one-off project of this nature.

### **A.3.7 CONCLUSION**

Both the Larcomb and Burnham substation work and the Railway Rd switching stations are driven by a major new block load that is likely to be confirmed. We consider inclusion of this work in the forecast is reasonable.

The need for the Highfield 66 kV line conversion and substation upgrade is more speculative. Much will depend on the need for a new substation at Norwood, which in turn will be driven by whether or not potential new industrial load in the area materialises. While we cannot be certain, we assess the likelihood that Orion will be able to defer this work until beyond the end of the CPP regulatory period to be relatively high.

**APPENDIX A4**

**PROGRAMME NAME:** COMMUNICATION CABLES AND PROTECTION SYSTEMS REPLACEMENT (CPP33)

**CAPEX CATEGORY:** ASSET REPLACEMENT AND RENEWAL

**A4.1 PROJECT DESCRIPTION**

The work undertaken in this \$17.9 million programme involves the replacement of Orion's communication cables and protection systems.

The assets that are in this programme include:

- communication cables and distribution cabinets;
- protection systems including electromechanical relays, analogue and digital electronic relays, digital electronic relays and merging units (bricks);
- communication platforms including UHF IP radio, and cable and fibre-optic systems;
- ground fault neutralisers;
- neutral earthing resistors; and
- current and voltage transformers.

The main objectives of the programme are to ensure safety and replace on a periodic basis communication cables and protection systems for which it has been determined that replacement is the cost effective way to ensure reliability of electricity supply and meet service level targets.

**A4.2 INFORMATION PROVIDED**

Table A4.1 below presents the information that has been provided by Orion in relation to the identified programme.

**Table A4.1: Information Provided**

Title	Reference #	Date
Programme summary	Version 7	29 January 2013
Communication Cables – asset management report YE 2012	NW70.00.28	10 October 2012
Protection Systems – asset management report YE 2012	NW70.00.22	10 October 2012
Communication Cables – asset management report YE 2012	NW70.00.34	19 October 2012

**A4.3 DELIVERABILITY**

Orion has indicated that the project can be carried out within normal contracting arrangements. The scheduling of the work has been structured to take into account resource constraints and network loadings.

**A4.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has indicated that the following policies, planning standards and reports are relevant to this project:

- Asset management policy (NW70.00.46)
- Procurement policy (OR00.00.19)



- Contract management (NW73.00.03)
- Authorised contractors (NW73.10.15)
- Health and Safety policy (OR00.00.01)
- Environmental Sustainability Policy (OR00.00.03)
- Asset Management Lifecycle Budget Forecasting Process (NW70.60.15)
- Orion zone substation maintenance (NW72.23.07)
- Orion network substation maintenance (NW72.23.06)
- Orion 11kV unit protection maintenance tests (NW72.27.01)
- Testing and Commissioning of Secondary Equipment (NW72.27.04)
- Cables – Installation and Maintenance (NW72.22.01)
- Cables – Testing (NW72.23.24)
- 11kV Unit Protection Maintenance Tests – (NW72.27.01)
- Drafting and Records (NW70.50.02)
- Communication Cables – asset management report YE 2012 (NW70.00.28)
- Protection Systems – asset management report YE 2012 (NW70.00.22)

#### A4.5 KEY ASSUMPTIONS USED

This programme includes the replacement of communication cables and protection systems that have reached the end of their economic lives as a result of a number of factors such as their condition, age, obsolescence, lack of spares, lack of support. The EA Technology CBRM review included protection systems and this was factored into the proposed expenditure replacement programme.

However, communication cables were not included as part of the CBRM model as Orion was undertaking a review of its asset management practices for communication and control systems. The earthquakes have further delayed this review. It is anticipated that Orion we will develop CBRM models for these assets in the near future.

Historically the condition of the communication cables was only tested during installation and commissioning of other works. Aside from deficiencies identified during this testing all maintenance/replacement was only done once a fault was identified. Following the earthquakes a new testing programme has been developed due to the increased risk of damage to the communication cables. The cables in the eastern suburbs of Christchurch are to be tested using this new programme to determine whether the earthquakes have reduced their useful life.

Orion has identified problematic relays as part of a targeted approach to replacing protection systems. These are relays that demonstrate spurious tripping, are difficult to maintain, have no manufacturer support, are unable to be tested or do not have the required functionality (e.g. relays that fail to meet current clearance time requirements. It prioritises relay replacement based on age and functionality coupled with a risk based assessment of the consequences of relay failure.

Orion has indicated that it has based its projected relay replacement expenditure primarily on maintaining the current health index for its protection systems. It has also provided a supplementary replacement relay programme document that details the specific assets proposed for replacement on specific dates. This is a very comprehensive document with a high level of detail.

We had noted that a number of relays less than 15 years old and some less than 10 years old are scheduled for replacement even though the associated switchgear is not due to be replaced. Orion has indicated that when a substation is upgraded, its practice is to replace the whole protection system. This may result in units that have not reached the end of their economic life being replaced due to integrated nature of the substation upgrade. Units that have yet to reach the end of their life will be reused elsewhere in the network, and are put back into spares for this purpose<sup>46</sup>. This is consistent with good industry practice.

<sup>46</sup> Response to verifier question A10.

The costs on which the forecast expenditure for this programme was based were derived from costs used for an optimised depreciated replacement cost (ORDC) valuation of Orion's asset base as at 31 March 2007. This valuation was prepared in accordance with New Zealand international financial report standards and, for protection relays, brown field replacement costs were used on the basis of the replacement of relays on a like function basis with a modern equivalent asset. This approach assumed, for example, that an old mechanical relay would be replaced by modern electronic equivalent. These valuation costs were used by Orion in the preparation of forecast protection replacement costs up until 2012 and these costs had then been further escalated for the 2013 forecasts. In calculating ongoing escalation costs for this programme Orion has estimated a labour : material ratio of 40:60.

## A4.6 ASSESSMENT OF THE METHODOLOGY USED

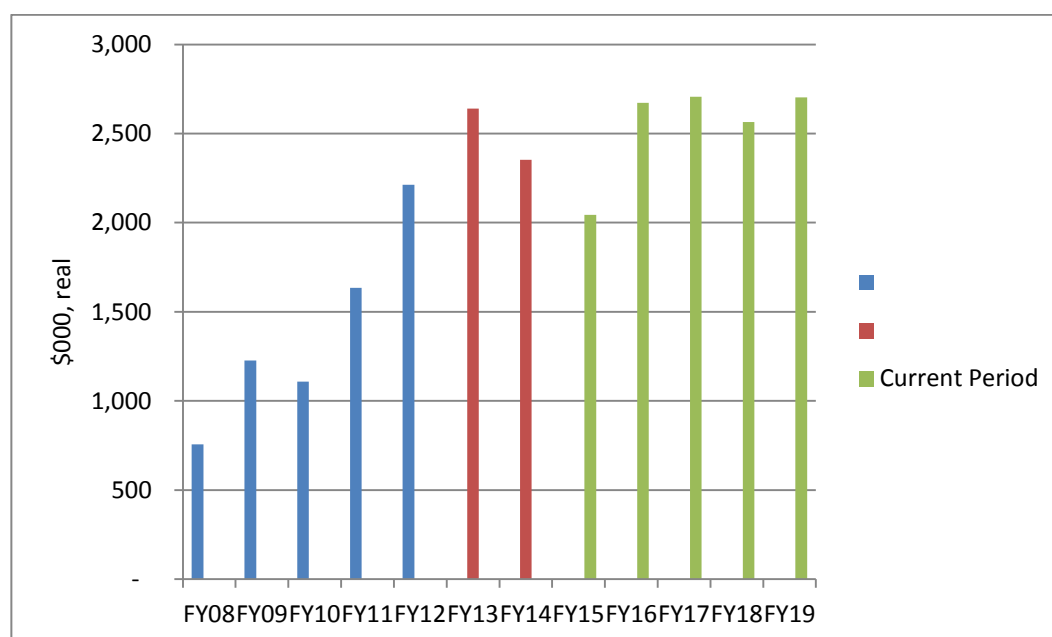
### A4.6.1 Forecast Expenditure

The basis for Orion's forecast of its protection systems replacement requirements is the CBRM model developed for Orion by EA Technology. The actual and forecast expenditure levels are shown in Table A4.2 and Figure A4.1 show the actual and forecast expenditure. It is evident that protection systems expenditure dominates.

**Table A4.2: Actual and Forecast Expenditure (\$000, real)**

	Current Period						
	FY08	FY09	FY10	FY11	FY12		
Communications	141	-	98	-	43		
Protection	615	1,226	1,011	1,635	2,169		
Total	756	1,226	1,109	1,635	2,213		
	Assessment Period		CPP Period				
	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Communications	210	210	210	210	210	210	210
Protection	2,430	2,142	2,034	2,463	2,496	2,354	2,493
Total	2,640	2,352	2,244	2,673	2,706	2,564	2,703

**Figure A4.1: Actual and Forecast Expenditure (\$000, real)**



**A4.6.2 Historical Cost Trends**

It can be seen from Figure A4.1 that pre-earthquake expenditure over FY08-FY10 averages \$1 million per year. It has increased substantially in the aftermath of the earthquakes and by FY12 had more than doubled to \$2.2 million per year.

**A4.6.3 Material Changes to Work Volumes**

Figure A4.1 above clearly shows a significant increase in work volumes which is predominantly driven by increased number of protection system replacements. It appears that Orion's asset management and condition assessment activities have identified a need to increase the number of relay replacements over the forecast period. The bottom up forecasting methodology used by Orion is detailed to the extent that it appears to have individually identified the relays to be replaced in each year of the forecast.

**A4.6.4 All Network or Non-Network Alternative Projects Considered**

Given the nature of the project no non-network solutions are relevant.

**A4.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

**A4.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A4.6.7 Step Changes from Historical Costs**

Orion notes that expenditure on the replacement of protections systems has increased since FY11 due to electromagnetic relays and analogue digital relays reaching the end of their economic lives. It also points out that from FY13 there has been an increase in forecast expenditure as a result of spur asset purchases from Transpower where Orion has identified (in conjunction with Transpower) the protection relays that require replacement.

The forecast expenditure on communication cables forecast has been based on a nominal \$0.2 million to allow for replacement of faulty cables and termination boxes identified during post-earthquake performance testing. The amount is estimated to allow for the proactive replacement of approximately 1 km of cable and the associated termination boxes. This is a step change from historical expenditure as the need for this replacement has been caused by earthquake damage. Historically there has been no proactive replacement programme for these cables and they have been replaced only on failure.

However, the main cause of the increase in replacement costs is a significant increase in a move to age based replacement of protection systems. Orion has indicated that in making their replacement decisions they use the following inputs:

- its own condition based replacement analysis;
- reliability based replacement; and
- more recently the CBRM model developed for Orion by EA Technology which is based on type – past performance, obsolescence and age in conjunction

These inputs, together with Orion's own engineering judgement, lead to the development of the replacement programme. Orion states that its engineering judgement takes into account other initiatives that may be occurring in the network and the criticality of each

asset to the operation of the network. As a result, equipment which may have a better health index and/or Orion ranking may be prioritised over an alternative replacement.

The objective is to maintain asset health profiles consistent with current levels. Failure to maintain asset health profiles consistent with current levels will over time lead to a gradual reduction in reliability, increase the risk of equipment failure, and result in increased network safety risk if protection systems do not operate correctly.

We would not normally endorse a replacement programme that places a heavy weighting on asset age, as opposed to condition and it does appear that age has been used as a proxy for condition because limited information was available on historic failure rates. However, protection relay technology has changed significantly in recent years in parallel with advances in digital electronic and computer technology and older relays do not have the functionality of modern units. Hence we accept that age based replacements can be justified, especially in locations where reliable protection is more critical to network operation.

#### **A4.7 CONCLUSION**

The primary driver of the significant increase in this project expenditure is the CBRM model of the protection systems, which indicates that accelerated replacement is required. The CBRM modelling appears to be targeting an approach that maintains the current health index over time even though there is no evidence to support the hypothesis that the current health index is the optimum level for Orion. Furthermore, because of limited data on relay failure rates and condition, the model appears to use asset age as a proxy for condition. We would not normally endorse a forecast where age rather than condition is the main criteria for asset replacements.

However, there have been significant changes in protection relay technology, where electro-mechanical relays have been superseded by solid state electronic designs, which in turn have been replaced by programmable computer technology. Hence, older relays are now obsolete. In addition, Orion's protection system asset replacement plan aims to replace protection systems at the same time as their associated circuit breakers are replaced. This seems sensible.

As with all replacement programmes there is a trade off between reliability and cost. There is a lack of evidence in the documentation provided to us by Orion on current relay failure rates and the impact that this has had on supply reliability. Nevertheless, the age profile of protection systems tends to indicate a likely need for increased replacement and we are inclined to view that the expenditure forecast is reasonable.

**APPENDIX A5****PROGRAMME NAME: SWITCHGEAR REPLACEMENT (CPP36)****CAPEX CATEGORY: ASSET REPLACEMENT AND RENEWAL****A5.1 PROGRAMME DESCRIPTION**

This \$66.4 million programme incorporates the ongoing replacement of Orion's switchgear which comprises high voltage and low voltage switchgear and high voltage circuit breakers including:

- Ring main units (epoxy insulated, switches (fused and non-fused)
- Oil switches, fused and non-fused (Fuse Switch/OIS)
- Air break isolators
- Sectionalisers
- Low voltage switches
- HV Circuit breakers

The main objectives of the project are to:

- Ensure safety around switchgear.
- Replace high voltage and low voltage switchgear and high voltage circuit breakers that have been determined to be at the end of their economic lives.

**A5.2 INFORMATION PROVIDED**

The table below presents the information that has been provided by Orion in relation to the identified programme:

**Table A5.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 7	28 January 2013
HV and Low Voltage Switchgear – Asset Management Report YE2012	NW70.00.24	
High Voltage Circuit breakers – Asset Management Report YE2012	NW70.00.33	
Application of CBRM with Orion New Zealand – EA Technology Report No. 76500 Issue 1.		March 2012
Asset management policy	NW70.00.46	30 October 2012
Switchgear Replacement Comparison Spreadsheet		16 October 2012

**A5.3 DELIVERABILITY**

Orion has stated this ongoing replacement programme can be carried out under its normal contracting arrangements. The scheduling of the work has been altered to take into account resource constraints and network loadings.

**A5.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has indicated that the following policies, standards and reports are relevant to and have been applied to this project:

- Asset management policy NW70.00.46
- Procurement policy OR00.00.19
- Contract management policy NW73.00.03
- Authorised contractors NW73.10.15
- Health and Safety policy OR00.00.01
- Environmental Sustainability Policy OR00.00.03
- HV and Low Voltage Switchgear – Asset Management Report YE 2012 (NW70.00.24)
- High Voltage Circuit breakers – Asset Management Report YE 2012 (NW70.00.33)
- Application of CBRM with Orion New Zealand – EA Technology Report No. 76500 Issue 1 : March 2012

## A5.5 KEY ASSUMPTIONS USED

The work to be undertaken involves the replacement of switchgear assets that have reached the end of their economic lives as a result of a number of factors such as their condition, obsolescence, lack of spares and/or lack of support.

The programme is closely related to the switchgear maintenance programme. Asset management reports for 'HV and LV Switchgear' and also for 'HV Circuit Breakers' are both relevant to the programme.

The main drivers for the programme are:

- that switchgear is replaced in a timely and cost effective manner to meet acceptable target levels of safety and provide acceptable levels of network reliability
- the prudent cost effective management of switchgear assets and associated risks

Table A5.2 sets out the anticipated asset replacements under this programme for the forecast period together with a summary of the average age of the assets. The table clearly shows the assets on average are near the end of their expected economic lives, as specified in the IM for depreciation purposes.

**Table A5.2: Forecast Switchgear Replacement Numbers**

Asset Types	FY14	FY15	FY16	FY17	FY18	FY19	Total No.	Avg Age (yrs)	IM Standard Life
66/33kV switchgear	-	3	-	-	-	-	3		
Spur asset CB replacement (excludes Islington)	2	2	2	2	2	2	12		
11kV Zone CB	19	15	53	-	35	52	174	49	45
11kV Network CB	60	52	27	57	52	37	285	48	45
11 kV Swgr (MSU)	2	23	42	140	34	71	312	49	40
11kV Swgr (Fuse Switch)	17	10	11	-	8	-	46	47	35
11kV Switchgear (OIS)	-	6	2	-	-	-	8	39	40
Urban LV SWGR	80	80	80	80	80	80	480		
Rural LV SWGR	55	55	55	55	55	55	330		
ABI's	35	35	35	35	35	35	210		
Addington 11kV Swgr	-	8	-	-	-	-	8		

Source: Orion programme summary for CPP36, Section 4.2.



In formulating the above replacement numbers Orion has factored in a number of approaches including:

- time based replacement;
- condition based replacement;
- reliability based replacement; and
- the CBRM model developed for Orion by EA Technology.

Orion has indicated that the CBRM model is still being refined and this has guided, rather than driven, the replacement forecasting approach. Nevertheless, Orion has confirmed that the overall objective of the forecast expenditure is to maintain asset health profiles consistent with current levels.

The unit costs used in the forecast were derived on a brown field basis assuming like for like replacement with a modern equivalent asset. These unit costs were valid in 2008 and have been inflated by 8% in 2013<sup>47</sup>. Orion has used an approximate 40:60 labour : material ratio in the development of their forecasts.

## **A5.6 ASSESSMENT OF THE METHODOLOGY USED**

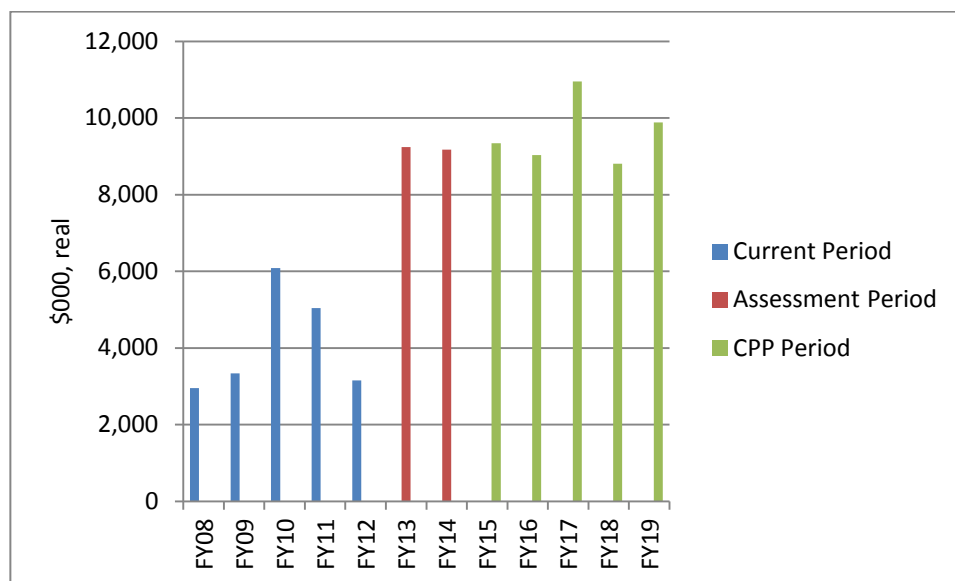
### **A5.6.1 Forecast Expenditure**

Table A5.3 and Figure A5.1 shows the actual and forecast expenditure for this programme in real terms. It can be seen that, with the exception of an increase in FY17, expenditure is expected to remain relatively constant over the forecast period.

**Table A5.3: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
2,956	3,337	6,084	5,043	3,155		
Assessment Period		CPP Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
9,239	9,170	9,343	9,030	10,949	8,808	9,880

<sup>47</sup> We suspect these were the costs prepared for the 2007 asset valuation discussed in Section A4.5 but we have not confirmed this with Orion.

**Figure A5.1: Actual and Forecast Expenditure (\$000, real)**

About 41% of the expenditure relates to 'HV and LV Switchgear' and 59% of the expenditure relates to 'HV Circuit Breakers'.

#### **A5.6.2 Historical Cost Trends**

It can be seen that switchgear replacement expenditure increased 82% between FY09 and FY10, possibly indicating that Orion had identified a need to accelerate its rate of switchgear replacement even before the earthquakes. However, expenditure declines following the earthquakes as resources were diverted to other work. Orion has said that the earthquakes had little impact on the serviceability of its switchgear assets.

#### **A5.6.3 Material Changes to Work Volumes**

The increase in expenditure on switchgear asset replacements from FY13 on is almost entirely due to significant increases in projected switchgear replacement numbers compared to historical replacement levels.

The forecast assumes that Orion will purchase the Islington 33 kV assets and these 33 kV circuit breakers will need replacing in FY17. There is also an assumption that at least two 66 kV circuit breakers relating to spur assets will be replaced annually.

#### **A5.6.4 All Network or Non-Network Alternative Options Considered**

Given the nature of the project no non-network solutions are relevant.

#### **A5.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

#### **A5.6.6 Contingency Factors**

Given the manner in which the forecast has been calculated no contingency factors have been included in this project

#### **A5.6.7 Step Changes from Historical Costs**

Forecast expenditure in FY13 is 52% higher than the FY10 pre-earthquake expenditure and expenditure is expected to remain at this higher level throughout the forecast period. The step change is explained by Orion as being due to:

- additional replacement requirements as a result of the acquisition of spur assets from Transpower;
- additional safety concerns. We understand this is largely driven over increasing industry concern over the safe operation of Magnefix composite insulated switchgear;
- increased material costs;
- carrying over work scheduled for FY12 into FY13;
- bringing forward some projects from later years due to increased urgency of replacement.

The continuing high level of expenditure after FY13 is reflected in the implementation of a step increase in switchgear replacement originally signalled in the 2010 AMP to occur in FY14, due to the overall age of these assets, modified using engineering judgement to prioritise the spend.

Table A5.4 reflects some of these factors with each row representing a particular year's AMP forecast for switchgear replacement. References to TP refer to the switchgear assets included in the Transpower spur asset acquisition programme (2013 AMP onwards)

**TableA5.4: Historical and Current AMP Switchgear Replacement Forecasts (\$'000 real)**

	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
FY10 AMP	4,933	5,224	5,507	5,722	8,117	9,214	9,720	9,390	9,584	9,876
FY11 AMP		6,714	7,253	7,797	7,965	9,423	9,629	9,312	9,299	9,680
FY12 AMP			7,099	7,604	7,901	8,114	8,430	8,300	8,572	9,116
FY13 AMP				9,794	9,706	9,917	10,550	11,721	10,088	10,658
FY14 AMP					9,672	9,854	9,525	11,549	9,290	10,422
FY13 no TP				9,242	9,155	6,949	9,999	9,050	9,537	10,107
FY14 no TP					9,124	8,588	8,977	8,891	8,742	9,874
FY14 TP					548	1,266	548	2,658	548	548

Source: Spreadsheet provided by Orion in response to verifier question MC6.

Note: Orion did not publish a FY12 AMP. However, the table above uses analysis that was undertaken before Orion was exempted from this requirement.

As with all asset replacement capex programmes, Orion has indicated that in making its replacement decisions it uses the following inputs:

- its own condition based replacement analysis;
- reliability based replacement analysis; and
- more recently, the CBRM model developed for Orion by EA Technology which is based on the past performance of different asset models, obsolescence and asset age.

These inputs together with its own engineering judgement lead to the development of its forecast replacement programme. Orion states that its engineering judgement takes into account other relevant factors and the criticality of each asset to the operation of the network. As a result, an asset which may have a better health index and/or Orion ranking may be prioritised over an alternative replacement.

The objective is to maintain asset health profiles consistent with current levels. Failure to maintain asset health profiles consistent with current levels will over time lead to a gradual reduction in reliability, increase the risk of catastrophic equipment failure, and increased safety risks.

This approach and other issues discussed above have translated to significant increases in expenditure being forecast for switchgear replacement capex.

#### **A5.7 CONCLUSION**

This programme has been developed in a comprehensive manner and appears to be well planned and constructed.

There is a significant increase in forecast expenditure over historical levels (even after allowing for the redeployment of resources following the earthquakes). The actual expenditure level is driven by increased replacement volumes in order to maintain the current switchgear health index.

The principle question arising out of this approach relates to whether or not the current health index for switchgear (as reflected in the CBRM report from EA Technology) is an optimum one or whether a lower level of asset health would suffice. While condition rather than age should be the primary driver for an asset replacement programme, the high average switchgear age shown in Table A5.2, together with the failure rates and safety issues associated with certain switchgear types, does indicate that an accelerated level of expenditure on switchgear replacement is probably justified. On this basis we consider that Orion's forecast is reasonable.

**APPENDIX A6****PROGRAMME NAME: TRANSFORMER REPLACEMENT (CPP37)****CAPEX CATEGORY: ASSET REPLACEMENT AND RENEWAL****A6.1 PROGRAMME DESCRIPTION**

This \$14.1 million programme involves the replacement of Orion's transformers. Within the forecast period, the only assets that Orion is planning to replace are the distribution transformers (and one voltage regulator) although, more generically, the transformer replacement budget also includes the replacement of power transformers and voltage regulators.

The main objectives of the programme are to:

- ensure safety; and
- replace on an annual basis high voltage regulators, and power and distribution transformers for which it has been determined that replacement is the cost effective way to ensure reliability of electricity supply and meeting service level targets

**A6.2 INFORMATION PROVIDED**

Table A6.1 presents the information that has been provided by Orion in relation to the identified programme:

**Table A6.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 13	29 January 2013
Voltage Regulators – Asset Management Report YE 2012	NW70.00.41	10 October 2012
Power Transformers – Asset Management Report YE 2012	NW70.00.23	10 October 2012
Distribution Transformers – Asset Management Report YE 2012	NW70.00.40	10 October 2012

**A6.3 DELIVERABILITY**

Orion has indicated that the replacement programme can be carried out within normal contracting arrangements. The scheduling of the work has been structured to take into account resource constraints and network loadings.

**A6.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has indicated that the following planning standards, policies and reports are relevant for the transformer replacement programme:

- Asset management policy (NW70.00.46)
- Procurement policy (OR00.00.19)
- Contract management policy (NW73.00.03)
- Authorised contractors (NW73.10.15)
- Health and Safety policy (OR00.00.01)
- Environmental Sustainability Policy (OR00.00.03)
- Asset Management Lifecycle Budget Forecasting Process (NW70.60.15)
- Voltage Regulators – Asset Management Report YE 2012 (NW70.00.41)
- Power Transformers – Asset Management Report YE 2012 (NW70.00.23)
- Distribution Transformers – Asset Management Report YE 2012 (NW70.00.40).

## **A6.5 KEY ASSUMPTIONS USED**

This programme consists almost entirely of distribution transformer replacements. Orion has indicated that its larger distribution transformers are fitted with maximum demand meters and when the transformer utilisation exceeds 130%, transformers are scheduled for replacement with a larger transformer or transferred to stock or another substation. Where utilisation is less than 50% with no load growth predicted, an economic decision is made as to whether replace the transformer with a smaller one.

Orion has indicated that in some cases it has old single phase transformers which are scheduled to be replaced with more reliable three phase units, but usually only in conjunction with other work.

Orion has indicated that it purchases transformers for replacement, reinforcement and connections as a group and actual purchase costs are allocated to reinforcement, connection and replacement capital budgets. It believes, based on a recent analysis of actual transformer disposal numbers, that its historical transformer replacement costs may have been under reported as a consequence of this allocation process.

Notwithstanding this, Orion's historical expenditure on transformer replacements has been significantly lower than forecast over the next period, as a result of engineering judgement. The CBRM models being developed suggest a much higher replacement rate, which is only partially included in this project.

Orion is currently developing a CBRM model for distribution transformer replacements but this has not been used to form an asset replacement plan for the forecast period. The CBRM model is strongly influenced by age profiles and the use of this model would signal a switch towards more of an age based approach than used historically. However, Orion's view is that the model in its current state does not currently accurately reflect the observed condition of the assets. In the interim Orion, has forecast what it considers to be a prudent level of increased replacement that accounts for the ageing asset population but with a lower rate of asset replacement than indicated by the CBRM model.

Orion notes that the CBRM model reflects typical failure rates on different types of transformers but does not failure rates specific to Orion. Orion also indicates that to date it has not analysed historical distribution transformer failure rates to determine the extent to which failures are age related.

Orion notes that its approach to replacement of pole transformers is a reactive one related primarily to car accidents, lightning strikes and other external physical failure mechanisms.

Orion has used a labour to material ratio of 40:60 as the basis for preparing its estimated expenditure. It has also assumed that approximately 50% of its projected transformer purchases will be for replacement with this being split 50:50 between pole transformers and pad mounted transformers.

## **A6.6 ASSESSMENT OF THE METHODOLOGY USED**

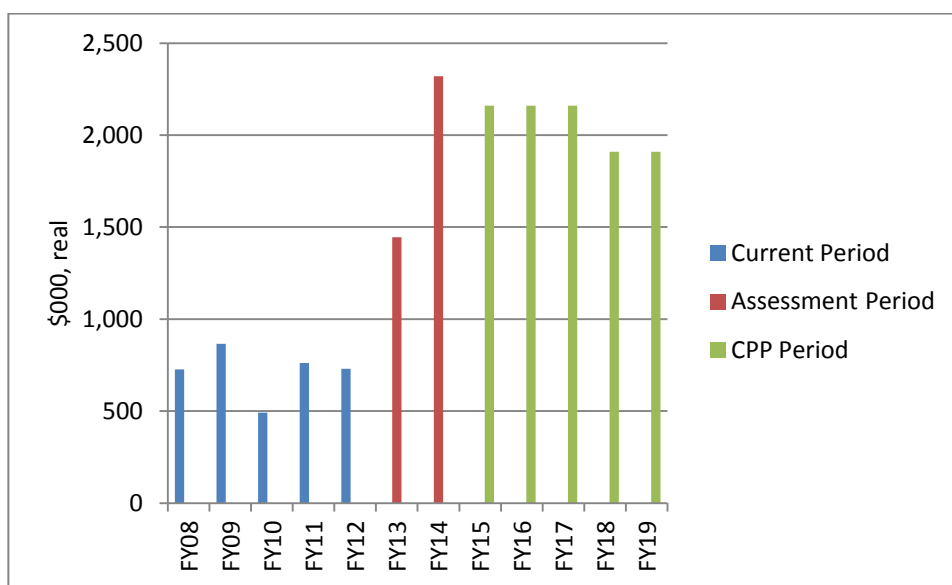
### **A6.6.1 Forecast Expenditure**

Table A6.2 and Figure A6.1 shows the actual and forecast expenditure for this programme in real terms.



**Table A6.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
727	865	492	761	730		
Assessment Period		CPP Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,445	2,320	2,160	2,160	2,160	1,910	1,910

**Figure A6.1: Actual and Forecast Expenditure (\$000, real)****A6.6.2 Historical Cost Trends**

Actual expenditure on transformer replacements over the period FY08-FY12 has averaged \$715,000 and has shown no significant trend.

**A6.6.3 Material Changes to Work Volumes**

Table A6.2 reflects an anticipated significant increase in work volumes over the forecast period as this is the driver for the forecast expenditure increases.

**A6.6.4 All Network or Non-Network Alternative Projects Considered**

Given the nature of the project no non-network solutions are relevant. Alternative network solutions are only available to the extent of reducing or increasing the quantum of replacements carried out.

**A6.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project. Typically there are trade-offs between maintenance expenditure, capital expenditure, system reliability and safety levels in terms of asset replacement considerations. Orion has not attempted to quantify the benefits of selecting its proposed replacement strategy.

It refers to the fact that CBRM studies would tend to indicate that it should aim for a higher level of replacement but that has used engineering judgement to set the forecast at a lower level.

**A6.6.6 Contingency Factors**

Orion states that there are no contingency factors in its expenditure forecasts for this programme.

**A6.6.7 Step Changes from Historical Costs**

Figure A6.1 above shows a step change in replacement expenditure on transformers. The increased replacement rate was scheduled to commence in FY11 and FY12 but was delayed until FY13 due to the earthquake impacts. Orion notes that the reduction in FY17 is consistent with slightly lower activity of replacement works being undertaken with other development works.

The average forecast annual expenditure over the period FY14-FY19 is \$2.01 million, almost three times the average expenditure over the period FY08-FY12. Orion has indicated that this step increase in expenditure from is due to a number of factors including:

- an increase in the replacement of ageing distribution transformers, particularly larger transformers; and that
- the historical transformer replacement costs have potentially not been apportioned correctly and may have been under reported. However, in our view there appears to be an element of speculation here as the analysis to support this contains assumptions which are not well supported.

Orion has also advised that there have been very few failures of distribution transformers due to its preventative approach to transformer replacements. The obvious question arising from this response is one relating to the impact on supply reliability of not replacing the transformers as frequently as proposed or even as frequently as has been done historically. We note that many EDBs have a run to failure policy on the maintenance of distribution transformers.

**A6.7 CONCLUSION**

While the general principles underpinning the replacement of transformers appear to be sound, we are unable to reach a firm conclusion as to whether the level of expenditure proposed is reasonable for the reasons given below. However, on balance, we consider that the forecast is higher than it needs to be for the following reasons.

- Orion states that its CBRM studies to date indicate that the replacement levels should be greater than those forecast. However, the CBRM model is primarily age related and does not factor in the overall condition of the assets. We have seen no objective assessment of either asset condition or failure rates.
- The magnitude of the step change between historic and forecast expenditure is substantial. Orion ascribes this as being due to a potential under-reporting of replacement transformers and an aging population but has indicated that it has much work to do in developing its distribution transformer replacement programme. In the absence of a detailed programme and a lack of certainty as to the degree of historical cost apportionment we do not consider a step increase of the magnitude proposed to have been adequately justified. In terms of presumed historic allocation issue, we have not observed any offsetting reductions in the reinforcement capex expenditure.
- The age profile of the transformers is increasing and we would expect a more incremental increase in replacement costs over time.

We note that in most situations the risk to Orion of a distribution transformer failure is small. Distribution transformers have an expected asset life of at least 45 years<sup>48</sup> and each transformer supplies a limited number of consumers. We think many consumers would consider a three or four hour outage every 45 years while their distribution transformer is replaced to be acceptable. Outage risks could be reduced for critical loads, such as hospitals, through a targeted distribution transformer maintenance and replacement programme.

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<sup>48</sup> Schedule A of the IM.

**APPENDIX A7****PROGRAMME NAME: UNDERGROUND CONVERSIONS (CPP50)****CAPEX CATEGORY: ASSET REPLACEMENT AND RENEWAL****A7.1 PROJECT DESCRIPTION**

This is a \$20.7 million programme that covers the relocation of assets at the request of third parties. While most of these asset relocations result in the conversion of overhead assets to underground, this does not appear to be the primary driver for the programme.

Orion has confirmed that it does not have a programme in place to proactively remove all overhead assets from the urban network and indicates that capex in relation to undergrounding is largely driven by regulatory requirements. Christchurch City Council's policy, as set out in the city plan, is for all new reticulation in urban areas to be underground. Selwyn District Council has a similar policy for its urban areas.

Orion indicates that its estimates of annual costs for the forecast expenditure are derived from historical trends and forecast installation rates and provides for underground conversions in the following situations:

- where required by New Zealand Transport Authority or local councils as part of road upgrades;
- where required by local councils as part of neighbourhood planning and improvements. Christchurch City Council is currently not proactively funding underground conversions for amenity purposes although it has some conversion requirement for other reasons, such as road safety. The Selwyn District Council is spending \$300,000 per year on underground conversion and it is assumed that this programme will continue over the forecast period; and
- at the request of private individuals or property developers.

The forecast work primarily includes the replacement of existing 11 kV and/or low voltage overhead conductors with underground cables. Where necessary, pole-mounted transformers and isolators are replaced with ground-mounted units. Apart from the 11 kV replacements, the forecast includes a New Zealand Transport Agency (NZTA) initiated project for 66 kV underground cable installation and a developer initiated project for the replacement of a 66 kV double circuit tower line with cable.

**A7.2 INFORMATION PROVIDED**

Table A7.1 presents the information that has been provided by Orion in relation to the identified programme.

**Table A7.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 9	31 January 2012
Orion's Document Control for design standards, technical specifications and policies	NW 70.50.03	30 October 2012
Non-Major Network Project Urban Reinforcement	CPP51	24 October 2012
Non-Major Network Project Rural Reinforcement	CPP52	24 October 2012
Connections and Extensions Capex Project	CPP53	30 October 2012
Information on Capital Contributions Related to Council Undergrounding in response to GBA questions	Various Historical Correspondence	1996 through to May 200
Excerpt from Section 6 of the "National Code of Practice for Utility Operators to Transport Corridors"		October 2011

**A7.3 DELIVERABILITY**

Orion states that undergrounding uses the same contracting resource as reinforcement and connection-extension work. While undergrounding works are usually driven by external parties, which mean that there is typically less flexibility, work schedules are generally known well in advance. Orion does not foresee any deliverability issues.

**A7.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion indicates that any new underground assets will be installed according to its design standards, technical specifications and policies. Furthermore, most undergrounding projects are small in scale and the overhead assets are typically replaced on a like-for-like basis.

Orion states that, while cables are more susceptible to seismic damage and take longer to repair, there has been no change to the Christchurch city plan's requirement for all new reticulation to be underground, or to the policy of undergrounding overhead assets where appropriate. Furthermore, Orion states that its policy of undergrounding most urban extensions to their network will be reviewed following the earthquakes.

Orion has a long standing approach of requiring Councils to pay 81.7% of the total cost for undergrounding projects.

Section 6 of the "National Code of Practice for Utility Operators to Transport Corridors" sets out a governing set of principles setting out how capital contributions by affected parties are determined. These standards prevent Orion from fully recovering the cost of the work. Determination of capital contributions is discussed further in Section 7.1 of this report.

**A7.5 KEY ASSUMPTIONS USED**

The forecast was developed from a combination of historical trends and the forecast cost of known undergrounding projects likely to be undertaken during the forecast period. There are two projects, a developer-initiated project and the Government's Christchurch motorways project, where expenditure well above historical trends is anticipated. A breakdown of Orion's forecast, shown the impact of these two projects can be seen in Table A7.2.

**Table A7.2: Disaggregation of the Underground Conversion Forecast**

Project/Programme	FY13	FY14	FY15	FY16	FY17	FY18	FY19
NZTA	1,900	-	-	-	-	-	-
Southern Motorway Stage 2	-	-	-	1,900	-	-	-
Southern Motorway Stage 3	-	-	-	2,000	2,200		
Western Bypass	-	1,700	300	-	-	-	-
Northern Arterial/QEII	-	-	-	500	-	-	-
Other	-	-	100	-	-	150	150
Christchurch City Council	-	300	300	300	300	300	300
CBD	-	500	500	500	500	500	-
Selwyn District Council	400	300	300	300	300	300	300
Private Developer	-	3,300	-	-	-	-	-
<b>TOTAL</b>	<b>2,300</b>	<b>6,100</b>	<b>1,500</b>	<b>5,500</b>	<b>3,300</b>	<b>1,250</b>	<b>750</b>

Source: CPP50 Documentation from Orion CPP proposal

The level of certainty associated with these projects is key to the overall forecast. Clearly the private developer project is significant and Orion has provided details of recent meetings that confirm the likelihood of this project proceeding.

Another assumption made by Orion is that the pre-earthquake policies of the Christchurch City Council and Selwyn District Council in respect of underground conversions will not change over the forecast period, notwithstanding experiences from the earthquakes. Selwyn District Council has indicated that they will continue with its current level of expenditure for proactive overhead to underground conversions. Orion has included a provision in the forecast of \$300,000 for work requested by the Christchurch City Council. This work is driven by factors such as road safety with no allowance for amenity based underground conversion.

## **A7.6 ASSESSMENT OF THE METHODOLOGY USED**

### **A7.6.1 Cost Estimates**

Table A7.3 presents the total historic and forecast expenditure and the forecast capital contributions forecast for this programme:

**Table A7.3: Actual and Forecast Expenditure and Forecast Capital Contributions (\$000, real)**

	Current Period						
	FY08	FY09	FY10	FY11	FY12		
	Expenditure	Note 1	Note 1	2,775	2,551		
	Assessment Period		CPP Period				
	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Expenditure	2,300	6,100	1,500	5,500	3,300	1,250	750
Capital contributions	1,400	4,700	1,080	3,080	1,980	955	555

Note 1: Actual expenditure prior to FY10 is not available as archived records were destroyed by the earthquakes.

The real cost estimates are based on a combination of specific projects that were individually costed and historically based annual provisions for recurring programmes such as council initiated undergrounding.

### **A7.6.2 Historical cost trends**

We have not analysed historical cost trends firstly because costs prior to FY10 are not available and also because the most of the cost estimates are project specific. Historical costs are not relevant to project specific cost estimates.

### **A7.6.3 Material Changes to Work Volumes**

The material changes to historical work volumes are the project specific works identified in Table A7.2.

### **A7.6.4 All Network or Non-network Alternative Projects Considered**

Given the nature of the project, no non-network solutions are relevant. In terms of alternative network solutions the most obvious is to retain overhead solutions. Orion has explained issues with easement procurement associated with overhead relocations for NZTA proposed projects although these should be considered on a case by case basis in our view. In terms of Council and private party initiated undergrounding, it is our view that capital contributions should offset the undergrounding costs.

### **A7.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project. We note that the capital contribution required to be paid by Councils for projects initiated by them is covered by an historical calculation based, among other things, on tax benefits that Orion receives from depreciation. The calculations refer back to the late 1990s and as



discussed in Section 7.1 of this report we believe that these calculations should be reviewed and capital contributions bases re-evaluated.

#### **A7.6.6 Contingency Factors**

Given the manner in which the forecast has been calculated no contingency factors have been included in this project

#### **A7.6.7 Step Changes from Historical Costs**

No step changes in historical underlying costs are specifically evident in this capex project although we note that major contributors to the forecast both include 66 kV cable based undergrounding/relocations. Orion has specifically indicated an increase in its 66kV cable installation costs arising from increases in civil construction costs related to post-earthquake logistics and wage pressures.

In terms of overall costs, step changes are explained by two major projects that have been included in FY14 (outside of the CPP regulatory period) and FY16.

#### **A7.7 CONCLUSION**

This programme is primarily driven by third party requests for asset relocation and we believe that the approach used by Orion to forecast expenditures is reasonable given the nature of the programme.

The level of capital contributions received for underground conversions aligns with Orion's capital contributions policies. However, we suggest that Orion:

- review its capital contribution policies, in particular the currency of its calculations with respect to contributions for Council initiated projects; and
- develop a policy (including capital contributions) that is consistent with Section 6 of the "National Code of Practice for Utility Operators to Transport Corridors".

## APPENDIX A8

PROGRAMME NAME: URBAN REINFORCEMENT (CPP51)

CAPEX CATEGORY: SYSTEM GROWTH

## A8.1 PROGRAMME DESCRIPTION

This is a \$19.8 million programme for the incremental reinforcement of the distribution in situations where a major network expansion requiring a large one-off project is not needed. System growth is first accommodated by spare network capacity but, as a result of incremental load growth over time, the security of supply provided by the network is gradually eroded and eventually capex is needed before security of supply standards are violated. Network reinforcement is also sometimes required when new load is connected and there is insufficient upstream network capacity.

Investment on 11 kV projects of subtransmission magnitude is made from individual major project capex budgets. All other 11 kV investment, which is not part of the connections and extensions or underground conversion budgets, forms part of the reinforcement programme capex investment. Orion budgets urban reinforcement separately from rural. The programme discussed in this appendix only includes reinforcement investment in urban areas.

Typical investment for this programme involves the installation of 11 kV cable and additional or higher capacity ground mounted distribution substations. The aim of the programme is to increase the capacity of the 11kV urban network to provide for projected increases in load, and to extend network reach as new areas are developed.

## A8.2 INFORMATION PROVIDED

The table below presents the information that has been provided by Orion in relation to the identified programme.

Table A8.1: Information Provided

Title	Reference #	Date
Programme Summary	Version 3	24 October 2012 <sup>1</sup>
Rural Reinforcement Capex	CPP52	24 October 2012
Connections and Extensions Capex Project	CPP53	30 October 2012
Underground Conversions Capex	CPP50	31 October 2012

Note 1: Orion provided a revised programme summary at the same time as it submitted the final CPP proposal but it did not update the document control. We have used the revised programme summary for this review

Orion has indicated that the level of work involved with urban reinforcement is strongly influenced by the level of connections and extensions capex and also the level of underground conversions and rural reinforcement work. It has also indicated that urban reinforcement is carried out in response to customer or developer applications, or as a result of modelling general load growth on the existing network to identify constraints. Budgets are generally set on the basis of historical trends and growth forecasts.

Orion differentiates reinforcement work from new connections work as follows:

- Urban reinforcement arises from load growth resulting in a network constraint (or imminent constraint) remote or further upstream from the load growth connection area.
- Extensions or new connections work typically relates to expenditure to connect customers or subdivisions to the adjacent network. If there is no adjacent

network or the network cannot support the new load, then the necessary works come under the category of reinforcement.

### A8.3 DELIVERABILITY

Orion has indicated that it does not anticipate any issues with the deliverability of this programme as reinforcement work uses similar contracting resources as those used in connection and undergrounding work and is managed as part of the overall contracting workflow. It also notes that work on the winter-peaking urban network is typically done in the summer while rural works are often undertaken in winter providing a natural work balance.

### A8.4 RELEVANT POLICIES AND PLANNING STANDARDS

Orion has indicated that urban reinforcement projects incorporate a large variety of work and the detailed design and construction is in line with Orion's design standards which are summarised in NW 70.50.03 – *Document Control*.

Orion prioritises its projects as described in section 5.3.4 its 2012 AMP and expanded further in NW 70.60.14 – *Project Prioritisation and Deliverability Process*.

### A8.5 KEY ASSUMPTIONS USED

In response our questions, Orion has indicated that it caps its combined rural and urban reinforcement budget at around \$4.5 million in real 2013 terms, as reflected in the CPP proposal. Hence, the increase in urban reinforcement shown in Table A8.2 below is offset by a decrease in the rural reinforcement budget.

### A8.6 ASSESSMENT OF THE METHODOLOGY USED

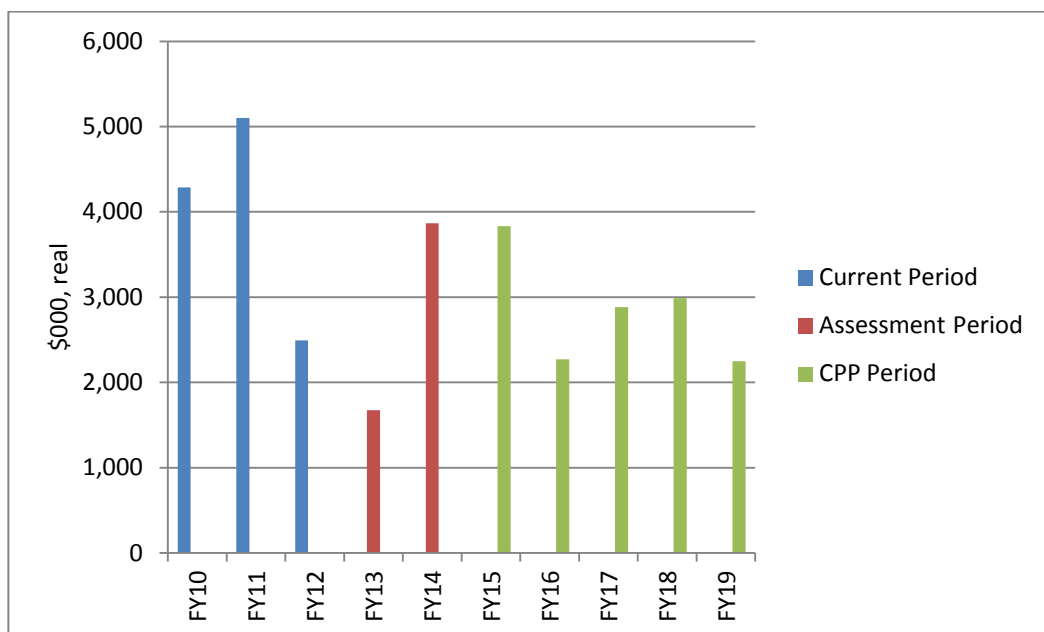
#### A8.6.1 Forecast Expenditure

Table A8.2 and Figure A8.1 show the historic and forecast expenditure for this programme.

**Table A8.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
Note 1	Note 1	4,285	5,101	2,494		
Assessment Period		CPP Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,673	3,866	3,831	2,270	2,885	2,990	2,250

Note 1: Actual expenditure prior to FY10 is not available as archived records were destroyed by the earthquakes.

**Figure A8.1: Actual and Forecast Expenditure (\$000, real)**

Orion has indicated that, as urban reinforcement involves multiple smaller tactical projects, no firm plans for specific projects are made more than two to three years out. This partially explains the decision to step down expenditure on urban reinforcement from FY16 onwards and estimate a constant expenditure level.

#### **A8.6.2 Historical cost trends**

As is seen from Figure A8.1, expenditure increased in FY11 and then dropped significantly in FY12. The reason for the increase in expenditure in FY11 is not clear.

#### **A8.6.3 Material Changes to Work Volumes**

Orion has identified a material increase in work volumes for FY14 and FY15 arising out of increased connections in FY12 and FY13. Most of the increased work is related to underground cable reinforcement work as indicated in the table below and in the project summary.

**Table A8.3: Breakdown of Forecast Expenditure**

	Real FY13 \$000						
	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Sub-transmission network	8	74	-	28	28	28	28
Distribution lines and cables	1,483	2,510	3,014	1,776	1,776	1,776	1,776
Distribution substations including transformers	392	428	583	326	326	326	326
Switchgear (All voltages)	23	-	60	83	83	83	83
Low voltage distribution network	17	-	10	5	5	5	5
Supporting or secondary systems	6	137	-	24	24	24	24
Non system fixed assets	2	50	-	9	9	9	9
<b>Total</b>	<b>1,931</b>	<b>3,199</b>	<b>3,667</b>	<b>2,250</b>	<b>2,250</b>	<b>2,250</b>	<b>2,250</b>

Source: Project Summary, Section 5.1.

This increase in underground cable work is consistent with increased connections in urban areas.

**A8.6.4 All Network or Non-Network Alternative Projects Considered**

Orion has not identified any non-network solutions as part of this project work. It has initiated some demand side initiatives in general, but none specifically related to this project. The project budget covers multiple small projects ranging in cost from the less than \$10,000 up to \$1 million. Each of these projects addresses constraints in security or power quality issues.

**A8.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project as the project consists of multiple smaller projects and is primarily driven by new connections and extensions.

**A8.6.6 Contingency Factors**

Orion has included no contingencies in this project.

**A8.6.7 Step Changes from Historical Costs**

Urban reinforcement forecast expenditure is closely related to connections and extensions expenditure.

Orion has an expectation of additional reinforcement requirements in urban areas as a consequence of new residential and commercial relocations arising from the earthquakes. The additional expenditure in FY14 and FY15 reflects increased reinforcement of the upstream network required to address the prior years' load growth arising from the surge in new connections. Forecast expenditures for FY16 to FY19 reflect more recent historical averages as the best proxy for uncertain work volumes.

However, we are not clear why expenditure is expected to reduce in FY16 when new connections are forecast remain at sustained high levels until FY17. We note that there has been a corresponding reduction in rural reinforcement in earlier years consistent with Orion's statement that they making a reasonably uniform allowance across combined rural and urban reinforcement work.

**A8.7 CONCLUSION**

We note that there is a step change in urban reinforcement expenditure predicted in FY14 and FY15 arising out of new connections and extensions and underground conversions work in FY12 and FY13. We also note that the new connections and extensions expenditure is expected to increase further in FY14 though to FY17 but that the urban reinforcement work reduces from FY16 onwards. However, the programme is tactical rather than strategic and no specific projects have been identified beyond FY15. Orion has confirmed that it identifies and prioritises expenditure on specific projects only after network growth actually starts to materialise.

The fact that Orion allocates a fixed amount of budget each year to be allocated between urban and rural reinforcement programmes reflects the ability to tactically prioritise expenditure across the whole network, notwithstanding the fact that urban and rural reinforcements are separately budgeted.

The forecast expenditure is comparable to historical levels and when considered in conjunction with the rural reinforcement programme the forecast expenditure levels appear to be reasonable.

## APPENDIX A9

**PROGRAMME NAME:** CONNECTIONS AND EXTENSIONS (CPP53)

**CAPEX CATEGORY:** CUSTOMER CONNECTION

### A9.1 PROGRAMME DESCRIPTION

This \$81.8 million programme provides new assets to connect customers where the capacity of the existing subtransmission and backbone 11kV network is sufficient to provide for the additional load with the appropriate security of supply. If separate investment is also required to reinforce the upstream network, then this expenditure is covered by the urban or rural reinforcement budgets (CPP51 or CPP52). However, any expenditure required to reinforce the low voltage network to allow the connection of new customers is provided from this connections and extensions budget.

The Christchurch city plan policy requires that all new reticulation in the urban area is to be underground. The same applies in the Selwyn District for rural townships and for new residential subdivisions of urban-type densities. With the exception of a small number of major customers all connections are made to the low voltage network.

Customers seeking a new or upgraded connection are required to make a capital contribution which offsets in part connections and extensions expenditure<sup>49</sup>. This capital contribution is in the form of either a direct payment to Orion or, in the case of new subdivisions, the contribution is made by the gifting of assets.

The work primarily involves the installation of 11 kV and low voltage overhead conductors and pole substations (in rural areas), and 11 kV and low voltage cable, ground-mounted transformers and switchgear housed in kiosks (in urban areas). Street light assets are included in new subdivisions.

### A9.2 INFORMATION PROVIDED

The table below presents the information that has been provided by Orion in relation to the identified programme:

**Table A9.1: Information Provided**

Title	Reference #	Date
Programme Summary	Revision 7	29 January 2013
Urban Reinforcement Capex	CPP54	24 October 2012
Rural Reinforcement Capex	CPP52	24 October 2012
Underground Conversions Capex	CPP50	31 October 2012
Connections and Extensions Policy	NW70.00.45	03 February 2012

### A9.3 DELIVERABILITY

Orion has indicated that it anticipates no issues in delivering this programme. It has indicated that 11 kV connection works use the same contracting resource as reinforcement and undergrounding work and are managed as part of the contracting workflow. Low voltage works have an even wider pool of contracting businesses available to carry out the work.

Connection work is by nature customer related and Orion therefore assigns it a high priority.

<sup>49</sup> To avoid doubt, the \$81.5 million forecast expenditure is the gross amount, before capital contributions are netted off.



**A9.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion states that the nature of connections and extensions work is varied across asset classes and assets are installed according to Orion's design standards, technical specifications and policies as summarised in NW70.50.03.

The policies associated with connections and extensions, in particular, are set out in the Orion document NW70.00.45 – Network Connections and Extensions which provides, amongst other things, details of capital contributions required.

**A9.5 KEY ASSUMPTIONS USED**

As a result of the earthquakes, Orion has seen, and is further anticipating, the relocation of existing residential and commercial customers. The relocation of businesses to the Addington/Airport area and the increasing residential development in the north-east, Rolleston and west of Christchurch is expected to increase connection and extension volumes.

Forecast expenditure includes all works and materials required to connect new customers or upgrade existing connections. This work typically involves trenching and civil works, laying of cable, installing poles and overhead lines, kiosks with their sites and concrete pads, low voltage distribution hardware, plus livening agent work.

The forecast costs are derived from input costs with the cost mix as set out in Table A9.2 below.

**Table A9.2: Input Cost Mix for Deriving Unit Costs**

	Labour	Cables	Transformers	Switchgear	Other
11kV overhead lines (wood pole)	60%	40%	-	-	-
11kV underground cables (XLPE)	60%	40%	-	-	-
Distribution transformers (pole, 1ph/2ph/3ph)	50%	-	50%	-	-
Distribution transformers (pad)	-	-	100%	-	-
Distribution substations mount (pad)	60%	-	-	-	40%
Distribution substation mount (building & in customer building)	60%	-	-	-	40%
Indoor circuit breakers and switchgear (66/33/11kV)	-	-	-	100%	-
LV underground cables (XLPE)	60%	40%	-	-	-
Link pillars and LV customer service connections	60%	-	-	-	40%

Source: Project Summary, Section 2.1.

The key drivers for this project are customer or developer applications with forecasts based on historical trends and growth forecasting of both demand and customer connection numbers

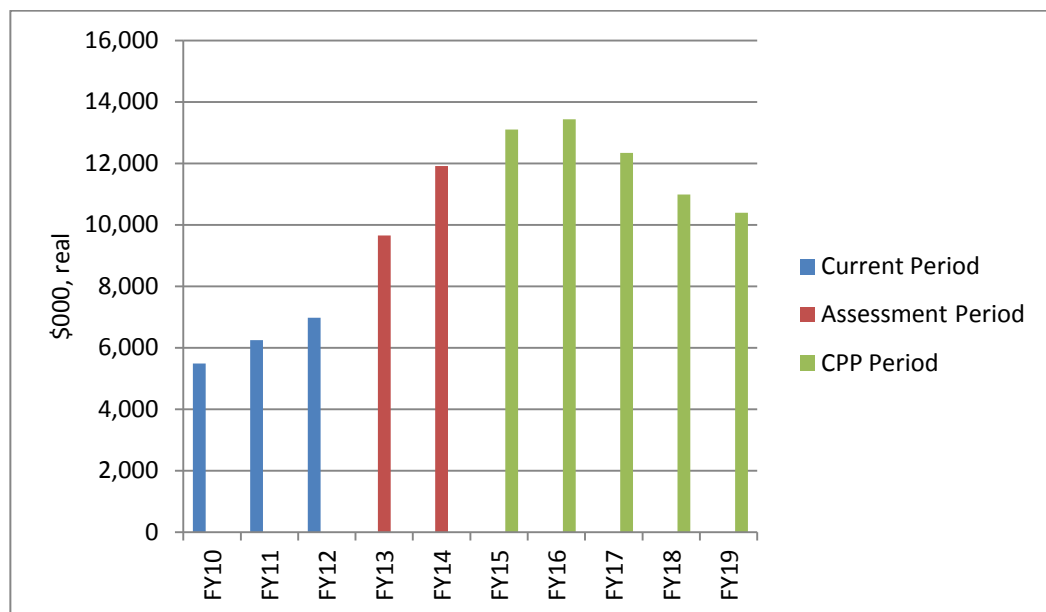
**A9.6 ASSESSMENT OF THE METHODOLOGY USED****A9.6.1 Expenditure Forecast**

Table A9.3 and Figure A9.1 show the actual and forecast costs for this programme.

**Table A9.3: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
Note 1	Note 1	5,483	6,244	6,976		
Assessment Period		CPP Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
9,650	11,915	13,095	13,435	12,335	10,985	10,395

Note 1: Actual expenditure prior to FY10 is not available as archived records were destroyed by the earthquakes.

**Figure A9.1: Actual and Forecast Expenditure (\$000, real)**

The forecast expenditure was prepared on a disaggregated bottom-up basis as is apparent from Table A9.4 below.

**Table A9.4: Disaggregation of Expenditure Forecast (\$000, real)**

Category	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Urban 400V- Connection Up to 100A	950	950	950	950	750	750	750
Urban 400V- Street Lights / Other	15	20	20	20	20	20	20
Urban Large Connection - 400V	380	500	500	500	500	400	360
Urban Large Connection- Kiosk	650	750	750	750	750	600	500
Urban Large Connection - Building Substation	150	1200	1200	1200	1200	1200	750
Connection Agent Costs	40	50	50	50	50	50	50
Rural 400V - Up to 100A Connection only	25	25	25	25	25	25	25
Rural 400V - Up to 100A Connection New Line / Substation	40	40	40	40	40	40	40
Rural Large Connection	100	150	150	150	150	150	150
Subdivisions	5250	5250	5250	5250	4350	3750	3750
Switchgear purchase	700	1020	2160	2500	2500	2250	2250
Distribution transformer purchase	1350	1960	2000	2000	2000	1750	1750
<b>Total</b>	<b>9,650</b>	<b>11,915</b>	<b>13,095</b>	<b>13,435</b>	<b>12,335</b>	<b>10,985</b>	<b>10,395</b>

Source: Project Summary, Section 7.2.

**A9.6.2 Historical Cost Trends**

Pre-earthquake actual expenditure is not available prior to FY10. As is apparent from Table A8.2 and Figure A8.1, actual expenditure increased by 27% between FY10 and FY12, notwithstanding the earthquakes.

**A9.6.3 Material Changes to Work Volumes**

Orion has stated that the forecast expenditure is based on estimates of local population growth, subdivision applications and commercial developments flowing from the Council urban development strategies. The increase in expenditure, as shown in Table A9.3 for FY14 through to FY17, reflects anticipation of the expected relocation of approximately 9,000 households to new subdivisions and businesses relocating to new sites. This includes 5,000 of the approximately 6,500 earthquake driven relocations within the Orion network. In addition the UDS quick recovery scenario is projecting an increase of 1,000 dwellings per annum from 2014 to 2017 (4,000 new connections in total). Orion expects the expenditure to remain higher than historic levels for the CPP period as households and businesses relocate over an extended period of time.

In addition, continuing incremental growth in customer numbers in the Selwyn District Council area is anticipated.

**A9.6.4 All Network or Non-Network Alternative Projects Considered**

As a connection based programme the only non-network alternatives are off-grid solutions which Orion does not provide. However, for larger connections, Orion incorporates non-network solutions such as customer-owned generation in discussions as part of overall supply options.

**A9.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

#### **A9.6.6 Contingency Factors**

Orion has stated that no contingency factors have been built into this programme's expenditure forecasts.

#### **A9.6.7 Step Changes from Historical Costs**

In formulating its forecasts, Orion has reflected a move away from Magnefix switching units (MSU) on the 11 kV network as a result of safety considerations. The MSU will be replaced in new installations by a fully enclosed ring main unit (RMU) with full arc containment and vacuum interrupters.

The RMU technology will involve an increase in capital cost per unit. The transition will begin in FY14 and the switchgear budget component of this project takes into account the estimated cost increase.

This phase out of MSU equipment is also discussed in Appendix A5.

#### **A9.7 CONCLUSION**

The reasonableness of the forecast for this project is contingent upon an assessment of the forecast new connection numbers. Orion's forecast for new connections aligns with the Christchurch City Council's planning basis for post-earthquake recovery and this probably represents the best available information given the extremely high post-earthquake uncertainty. As a result we believe that the projected expenditure for this capex project is a reasonable forecast.

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**APPENDIX A10**
**PROGRAMME NAME: SPUR ASSET TRANSFERS (CPP54)****CAPEX CATEGORY: OTHER (ASSET ACQUISITIONS)****A10.1 PROGRAMME DESCRIPTION**

Orion acquired the Papanui GXP and associated spur asset lines from Transpower in August 2012. This programme is a continuation of this initiative and includes the acquisition of eight Transpower spur asset GXPs and associated lines.

The proposed spur assets to be purchased include the:

- Islington to Springton 66 kV lines and Springton 66 kV and 33 kV GXPs;
- Islington to Addington 66 kV lines and Addington 66 kV and 11 kV GXPs;
- Middleton 66 kV GXP;
- Arthurs Pass 11 kV GXP including the 66/11 kV transformer – the new change of ownership boundary will be at 66 kV;
- Castle Hill 11 kV GXP including the 66/11 kV transformer – the new change of ownership boundary will be at 66 kV;
- Hororata 33 kV GXP. The Hororata 66 kV assets will remain in Transpower's ownership
- Bromley 66 V and 11 kV GXPs. The Bromley 220 KV assets will remain in Transpower's ownership; and
- Islington 33kV GXP. The Islington 220/33kV transformers will remain in Transpower's ownership.

The spur assets to be acquired are a subset of Orion's transmission connection assets and are 66 kV or less. They supply only Orion and do not form part of Transpower's interconnected network.

Orion considers that a change of ownership of its Transpower spur assets would enable synergy and efficiency benefits to be achieved through integration into Orion's network asset planning, management, maintenance and operations. Our review of the urban north subtransmission development project (CPP1) is an example of this. The network development configuration planned for this project might not have been possible had the Papanui GXP and its incoming 66 kV lines remained in Transpower ownership.

The acquisition cost of the spur assets will increase Orion's regulatory asset base (RAB) and its operations and maintenance costs will increase to reflect the lifecycle costs of owning the assets. However, Orion considers that, over the lifetime of the assets, the synergy and efficiency benefits associated with Orion ownership of these assets will mean that the increase in Orion revenue (to make a return on RAB and cover operations and maintenance) will be lower than the equivalent Transpower ownership charges.

In Orion's view the key drivers for this project are:

- facilitating the return of its network to a state that meets its security of supply standard in the most cost-effective way possible (as set out in the subtransmission architecture review);

- avoiding Transpower's investment in the replacement of assets where this could occur more cost-effectively through Orion rationalising the assets (e.g. from contracting and design efficiency); and
- in the case of the Springston GXP, facilitating the parallel operation of the assets with an existing Orion 66 kV line and therefore delivering an N-1 security of supply to the wider Rolleston area. This is discussed in Appendix A3.

## A10.2 INFORMATION PROVIDED

Table A10.1 presents the information that has been provided by Orion in relation to this programme:

**Table A10.1: Information Provided**

Title	Reference #	Date
Project Summary	Version 6	30 October 2012
Orion Asset Management Plan – 1 April 2012 to 31 March 2022		2012
Various Asset Class Management Reports	Various	2012
Spreadsheet – “Replacement 10 year Plan 2014”		2012
Spreadsheet – “Maintenance 10 year Plan 2014”		2012

Note 1: Orion provided a revised programme summary at the same time as it submitted the final CPP proposal but it did not update the document control. We have used the revised programme summary for this review

## A10.3 DELIVERABILITY

The project requires the payment of financial considerations for the transfer of assets and as such does not present any obvious issues associated with deliverability. However, there will be additional maintenance and asset replacement work required as a result of the asset acquisitions. The volume of work in this regard is relatively small in comparison to the overall Orion capex and opex programmes and should present no major foreseeable issues with respect to deliverability. In addition Transpower already contracts out much of this work to a similar contractor resource base that is currently used by Orion, so the net increase in overall contractor resources required is low. The programme may in fact lead to a reduction in overall field work requirements if Orion is able to better co-ordinate work within a broader work programme.

## A10.4 RELEVANT POLICIES AND PLANNING STANDARDS

Given the nature of the project, the major policy impact will be in the treatment of the assets from an accounting and regulatory basis. Orion's CPP proposal states that it will pay for the assets and take them into their account at the Transpower RAB value on the date of transfer.

Orion has stated that it will apply its own planning and asset lifecycle management standards to the assets once acquired.

## A10.5 KEY ASSUMPTIONS USED

In acquiring the Transpower assets, Orion has stated that the assets will be valued and paid for at the projected Transpower RAB value for those assets as at the date of the asset transfer. In its CPP proposal Orion has used Transpower's estimated values for the forecast acquisition prices.

As a result of acquiring the assets there will be an increase in costs to Orion as a result of increased maintenance opex and asset replacement capex. The two tables below summarise the anticipated expenditure increases.

**Table A10.2: Forecast Asset Replacement Expenditure resulting from Transpower Asset Transfers (\$000, real)**

	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Addington 11kV switchgear	-	1200	-	-	-	-	-	-	-
Springston - protection upgrade	235	-	-	-	-	-	-	-	-
Addington - protection upgrade	-	240	235	235	-	-	-	-	-
Addington Building	-	500	-	-	-	-	-	-	-
Arthurs Pass	-	-	-	-	-	1500	-	-	-
Castle Hill	-	-	-	-	-	-	-	1000	-
Papanui – communications. upgrade	100	-	-	-	-	-	-	-	-
Springston - communications upgrade	100	-	-	-	-	-	-	-	-
Bromley - communications upgrade	-	100	-	-	-	-	-	-	-
Addington - communications upgrade	-	150	200	-	-	-	-	-	-
ISL - Co-location service agreement	20	50	50	50	50	80	80	80	100
GXP Meters	50	50	100	-	-	50	-	50	-
<b>Total</b>	<b>505</b>	<b>2290</b>	<b>585</b>	<b>285</b>	<b>50</b>	<b>1630</b>	<b>80</b>	<b>1130</b>	<b>100</b>

Source: Orion Spreadsheet – Replacement 10 year Plan 2014



**Table A10.3: Forecast Maintenance Associated with Transpower Asset Transfers (\$000, real)**

		FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
66kV OH	Papanui Spur Assets	35	35	35	35	35	35	35	35	35
	Springston Spur Assets	70	70	70	70	70	70	70	70	70
	Addington Spur Assets	0	95	95	95	95	95	95	95	95
Protection	Springston Spur Assets	5	5	5	5	5	5	5	5	5
	Addington Spur Assets	0	5	5	5	5	5	5	5	5
	Bromley Spur Assets	0	5	5	5	5	5	5	5	5
	Documentation updates	20	20	20	20	10	10	10	10	10
Comms. & Control	Papanui	5	5	5	5	5	5	5	5	5
	Springston	5	5	5	5	5	5	5	5	5
	Addington	0	5	5	5	5	5	5	5	5
	Bromley	0	5	5	5	5	5	5	5	5
	Documentation updates	10	10	10	10	10	10	10	10	10
Switchgear.	Papanui	5	5	5	5	5	5	5	5	5
	Springston	5	5	5	5	5	5	5	5	5
	Addington	0	5	5	5	5	5	5	5	5
	Bromley	0	5	5	5	5	5	5	5	5
	Documentation updates	10	10	10	10	10	10	10	10	10
Transformers	Papanui	5	5	5	5	5	5	5	5	5
	Springston	5	5	5	5	5	5	5	5	5
	Addington	0	5	5	5	5	5	5	5	5
	Bromley	0	5	5	5	5	5	5	5	5
	Documentation updates	10	10	10	10	10	10	10	10	10
Buildings & Enclosures	Papanui	200	10	10	10	10	10	10	10	10
	Springston	10	10	10	10	10	10	10	10	10
	Addington	0	10	10	10	10	10	10	10	10
	Bromley	0	10	10	10	10	10	10	10	10
Grounds	Papanui	20	20	20	20	20	20	20	20	20
	Springston	10	10	10	10	10	10	10	10	10
	Addington	0	10	10	10	10	10	10	10	10
	Bromley	0	10	10	10	10	10	10	10	10
<b>Total</b>		<b>430</b>	<b>415</b>	<b>415</b>	<b>415</b>	<b>405</b>	<b>405</b>	<b>405</b>	<b>405</b>	<b>405</b>

Source: Orion Spreadsheet – Maintenance 10 year Plan 2014

Orion has stated that the main aim of this project is to secure a change of ownership of spur assets so that future network efficiency and synergy gains will ultimately flow through as benefits for its customers. It quotes the example of the ownership and replacement of the Papanui 11 kV switchgear, which lead to a 20% saving (approximately \$1 million) to Orion. This saving was then able to be passed on to customers by reducing the annual operating expenditure of the Papanui switchgear by approximately 14% (\$140,000). The more recent purchase of the 66 kV at Papanui will also enable Orion to defer the replacement of the 66/11 kV transformers and achieve greater flexibility in the developing architecture of the subtransmission network. Orion expects this to lead to an NPV saving of more than \$5 million. Similar benefits are expected across all spur asset purchases.

The capital funding, maintenance and operations costs associated with Transpower owned spur assets is charged to Orion as part of its transmission connection charge. Orion passes these charges through to consumers. When the spur asset change of ownership occurs, Transpower will no longer charge a connection charge in respect of the transferred assets.

The proposed spur asset transfer dates have been agreed by Transpower and Orion to avoid unnecessary asset replacement investment. The purchases have been staggered across the period FY13 to FY17 to even the workload for asset management staff at both Orion and Transpower.

## **A10.6 ASSESSMENT OF THE METHODOLOGY USED**

### **A10.6.1 Forecast Expenditure**

The table below sets out the scheduled acquisition costs and timings for each proposed spur asset transfer. Orion has liaised with Transpower and the costs below represent Transpower's forecast RAB values as at the proposed transfer date.

**Table A10.4: Forecast Transpower Asset Transfer Expenditure (\$'000, nominal)**

	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>
Papanui GXP and 66kV lines	4,188				
Springston GXP and 66kV lines		2,700			
Addington GXP and 66kV lines			13,809		
Middleton GXP			340		
Arthurs Pass 11kV and 66/11kV transformer			1,977		
Castle Hill 11kV and 66/11kV transformer			658		
Hororata 33kV and 66/33kV transformers				593	
Bromley 66kV and 11kV				8,827	1,198
Islington 33kV					
<b>Total</b>	<b>4,188</b>	<b>2,700</b>	<b>16,784</b>	<b>9,419</b>	<b>1,198</b>

### **A10.6.2 Historical Cost Trends**

Historical cost trends are not relevant to this project.

### **A10.6.3 Material Changes to Work Volumes**

The additional asset replacement and maintenance costs associated with the spur assets are set out above. While they result in an increase in work volumes to Orion, they also result in a decrease in work volumes for Transpower.

### **A10.6.4 All Network or Non-Network Alternative Projects Considered**

Given the nature of the project, no non-network or network solutions are relevant. The alternative is to leave the assets in Transpower's control. The rationale for the project is to improve efficiencies for both Orion and Transpower and as such the project should achieve net benefits for consumers.

### **A10.6.5 Cost-Benefit Analyses**

No specific cost benefit analysis has been provided as part of this project. While Orion has provided details of cost increases at its end, it has not provided an overall cost

benefit analysis to support its claims that there will be increased efficiencies as a result of the transfer of assets. However, it has referenced some examples as evidence of efficiency gains in terms of reduced connection charges, reduced asset replacement and maintenance costs, improved operations co-ordination and more flexibility to achieve optimum planning outcomes.

In relation to the Papanui asset transfers, Orion states that it has not done a detailed NPV business case because "it became obvious through discussion and a high level review with Transpower that the benefits clearly outweighed the costs". It expects the NPV savings to be greater than \$5 million and has used this number as its conservative and high level estimate of the savings. Orion has included additional information in the project summary appendices that supports this statement.

In terms of costs, there should be no additional asset value based costs as the removal of the assets from the Transpower asset base to the Orion asset base at the same RAB value should result in no material overall change in return on investment or depreciation costs. In addition we believe that Orion should be able to maintain the assets (including asset replacements) more efficiently and better integrate the assets into its overall planning strategies.

#### **A10.6.6 Contingency Factors**

Given the nature of the project no contingency factors have been included in this forecast.

#### **A10.6.7 Step Changes from Historical Costs**

There will be a step change from historical asset replacement capex and maintenance opex to Orion as a result of the asset acquisitions. This forecast additional expenditure is shown in Tables A10.2 and A10.3 above. However, these cost increases should be offset by a decrease in Transpower's connection charges, which are paid by consumers as a pass-through. Hence, while Orion's costs will increase as a result of these transactions there should be no material change to the aggregated transmission and distribution charges paid by consumers.

#### **A10.7 CONCLUSION**

We consider that this spur asset acquisition programme is soundly based. The acquisition of the assets should result in, at worst, a breakeven result for Orion consumers and most likely significant savings.

## APPENDIX A11

PROGRAMME NAME: NEW HEAD OFFICE BUILDINGS (CPP60 AND CPP62)

CAPEX CATEGORY: OTHER (NON-NETWORK)

## A11.1 PROJECT DESCRIPTION

This \$21.46 million forecast includes two non-network capex projects that Orion accounts for separately. CPP160 provides for the construction and fit out of Orion's new head office building in Wairakei Rd, West Christchurch. CPP162 provides for expenditure on Orion's existing temporary premises at 200 Armagh Street to make this site suitable for temporary occupation prior to the completion of the new Wairakei Rd building. It also includes an annual provision for capex on the new Wairakei Rd building to ensure that it continued to meet Orion's ongoing requirements after occupation.

The requirement for a new building arises from the fact that Orion's two head office buildings, which were also located on the Amagh Street site, were severely damaged in the 22 February 2011 earthquakes and were never occupied again. The repair cost of the old office buildings were estimated at around \$14 million, but even after restoration they would not meet current lifeline standards. Orion successfully reached a cash settlement of over \$20 million under its material damage insurance policy and the old buildings were demolished.

In the meantime, Orion staff are occupying another building located on the same Armagh Street complex, but improvements had to be made to increase the resiliency of the building and to refurbish it to meet Orion's needs. The Canterbury Earthquake Recovery Authority (CERA) now plan wishes to purchase Orion's as part of its CBD recovery plan.

Orion purchased 7,700m<sup>2</sup> of land at 565 Wairakei Road for \$5.2 million in June 2012 and are building a two storey "lifelines standard" (Importance Level 4, IL4) building on site with a 1,550m<sup>2</sup> footprint. The plan is to move into the new offices in June 2013.

## A11.2 INFORMATION PROVIDED

Table A11.1 below presents the information that has been provided by Orion in relation to the identified programme:

Table A11.1: Information Provided

Title	Reference #	Date
Project Summary	Version 6	16 January 2013
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012

Although the following consultants' reports were not supplied or requested, they were used in the development of this project:

- "Categorisation of Post-Disaster Facilities – A Guidance Note for use with AS/NZS 1170: Part 0 Table 3.2". SESOC Journal Volume 20 No.2, September 2007. Developed by a working group convened by David Brunson and supported by the DBH;
- "Orion Communications Network Resiliency Report", Dr Murray Milner, Milner Consulting Ltd, May 2011; and

- “Christchurch Central Recovery Plan”, Christchurch Central Development Unit, 30 July 2012.

### **A11.3 DELIVERABILITY**

The contract with Apollo Projects, the key build contractor, has been signed and construction is well underway. There is no indication of any deliverability issues.

### **A11.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Even though there was no specific policy or guideline in relation to the selection of a new office building, Orion, with the assistance of external consultants, considered options to refurbish and upgrade the existing offices to IL4 standard in light of CDEM Act requirements. It was decided that it was not economically feasible to do so and, in any case, the site of the existing head office complex is located in the proposed green zone so is no longer available.

Orion indicated that it has complied with its procurement policy and undertook a competitive tendering process to select the key building contractor, in this case Apollo Projects.

### **A11.5 KEY ASSUMPTIONS USED**

Apart from the assumed annual expenditure for FY14-FY17 in relation to anticipated minor changes on the Wairakei Road property, there are no real assumptions made for this project, rather a set of requirements that formed part of the selection criteria as listed below:

- Orion requires a land area of about 10,000m<sup>2</sup>. The new site is only 7,700m<sup>2</sup> but Orion is currently attempting to purchase a 2000m<sup>2</sup> block of land at the back of the site, the cost of which is included in the CPP160 forecast, as indicated in Table A11.3. It believes that the additional adjacent land is strategically important, but not critical. If it is unable to acquire the land it will consider other options – principally, placing some equipment (e.g. generator trucks) at its new Papanui site (although there may be some consenting issues as the local area is largely residential), and it will also continue to look in the area close to Wairakei Rd.
- Orion required the correct business zoning for the site of the new building;
- Orion required dual road access to the new building for purposes of risk management; and
- Orion requires dual fibre communication access also for purposes of risk management.

The selected site meets all these requirements, except for land area.

### **A11.6 ASSESSMENT OF THE METHODOLOGY USED**

#### **A11.6.1 Cost Estimate**

Table A11.2 below presents the historic and forecast expenditure proposed for these two projects in real 2013 dollar terms:

**Table A11.2: Actual and Forecast Expenditure (\$000, real)**

	Current Period						
	FY08	FY09	FY10	FY11	FY12		
Existing complex	365	410	128	36	1,044		
	Assessment Period		CPP Period				
	FY13	FY14	FY15	FY16	FY17	FY18	FY19
CPP160 – Wairakei Rd new build	14,900	4,500	-	-	-	-	-
CPP162 – Existing complex	560						
CPP162 – Wairakei Rd ongoing capex		250	250	250	250	250	250

A breakdown of the \$19.4 million CPP160 capex forecast, as provided by Orion in its project summary, is given in Table A11.3 below.

**Table A11.3: Breakdown of CPP160 Capex Forecast. (\$000, real)**

Item	Cost	Source
Initial land purchase	5,200	Actual Cost
Additional land purchase	1,100	Expected cost based on current negotiations
Building	10,000	Based on contract with Apollo Projects Ltd
Costs to shift to new site	500	Estimate – approved by the Board
Furniture	600	Estimate – approved by the Board
Communications systems and equipment	400	Estimate – approved by the Board
External advice (legal, consultants etc)	700	Estimate – approved by the Board
Other sundry costs (generator, signage etc)	100	Estimate – approved by the Board
Contingency	800	Estimate – approved by the Board
<b>Total</b>	<b>19,400</b>	

**A11.6.2 Historical Cost Trends**

The new head office building is essentially a once-off cost and therefore historical cost trends do not apply.

**A11.6.3 Material Changes to Work Volumes**

With the construction of the new head office building, there is naturally a material change to work volumes which is mitigated by appointing sub-contractors.

**A11.6.4 Alternative Programmes Considered**

No alternative programme was considered.

**A11.6.5 Cost-Benefit Analyses**

No formal cost benefit analysis has been provided as part of this project.

**A11.6.6 Contingency Factors**

As shown in Table A11.3 below, a contingency of \$800,000 has been included in the CPP160 forecast. Apart from the explicit maintenance contingency (CPP120), no other forecast line item has a similar contingency provision.

**A11.6.7 Step Changes from Historical Costs**

Given the nature of the project, step changes from historical costs are expected.

**A11.7 CONCLUSION**

Orion has no choice but to relocate its head office. We consider both the decision to construct a purpose built new office complex and the forecast cost of the building to be reasonable.

We have some reservations about the need for the ongoing \$250,000 ongoing capex provision for what will be a brand new building and we also note the contingency provision of \$800,000 in the build cost for the new building. On the other hand, there appears to be no specific cost for final site works and landscaping, although this may be part of the building contract. However, some site works provision will be necessary if Orion purchases the additional land



**APPENDIX A12****PROGRAMME NAME: INFORMATION TECHNOLOGY (CPP64)****CAPEX CATEGORY: OTHER (NON-NETWORK)****A12.1 PROGRAMME DESCRIPTION**

This \$10.2 million capex programme supports the corporate business information systems and productivity software including financial systems, employee management systems (e.g. HR, payroll, health and safety) and personal productivity software (desktop applications, email, web and document management). Furthermore, the programme includes infrastructure for client devices, individual physical servers, virtual servers, attached storage, and corporate data network devices. It also includes mobile and fixed communications. The equipment included under this programme supports the "office" end of Orion's computer and data networks, which can be demarcated between office and engineering systems, typically by the firewall between these business areas.

The programme includes expenditure associated with licensing agreements for information systems, with 80% of licensing fees attributed to capex.

**A12.2 INFORMATION PROVIDED**

Table A12.1 below presents the information that has been provided by Orion in relation to the identified programme:

**Table A12.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 5	15 November 2012 <sup>1</sup>
Communication systems equipment specification	NW74.23.21	17 July 2007
Information systems	OR00.00.13	6 June 2012
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012

Note 1: The project summary was revised for the final CPP proposal but the document control was not updated. We have relied on the revised summary for this Appendix.

**A12.3 DELIVERABILITY**

Orion states that the ongoing programme can be carried out within normal contracting arrangements and we have seen nothing to suggest otherwise.

**A12.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Apart from the policies identified in the table above, Orion states that, for major changes to their information systems, there is a three-stage approval process comprising proposal, business case and business requirements and formal project management. This approval process was not provided in any policy document; rather it was given in a presentation format. It is therefore difficult to assess how entrenched this approval process is within Orion. It is also not clear what the definition of a major change to the information system is and how this was applied to develop the forecast.

**A12.5 KEY ASSUMPTIONS USED**

Orion has indicated that its key assumption for the development of the forecast was that there will be no significant change to its current business model over the forecast period and that there will be continued growth in data storage and reliance on information systems.

These assumptions seem reasonable.

## A12.6 ASSESSMENT OF THE METHODOLOGY USED

From the information provided by Orion, the expenditure was based on actual capital expenditure foreseen in future years and that a bottom up approach was used to develop the forecast.

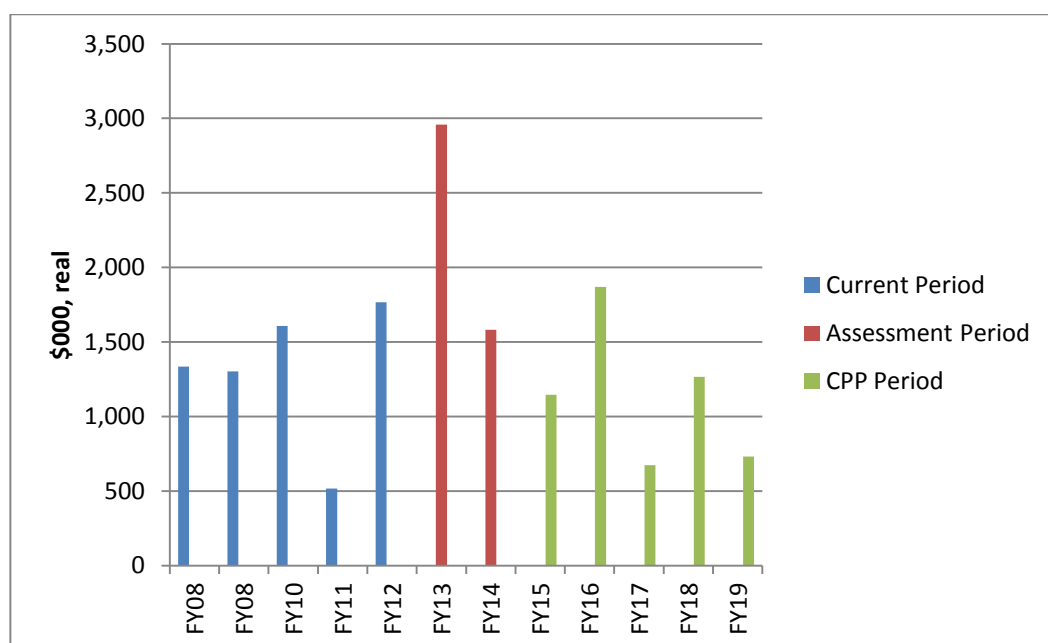
### A12.6.1 Cost Levels

Table A12.2 And Figure A12.1 below present the historic and forecast expenditure for this programme in real 2013 dollar terms:

**Table A12.2: Actual and Forecast Expenditure (\$000, real)**

Current Period							
FY08	FY09	FY10	FY11	FY12			
1,335	1,303	1,608	516	1,766			
Assessment Period		Forecast Period					
FY13	FY14	FY15	FY16	FY17	FY18	FY19	
2,958	1,581	1,145	1,869	674	1,266	731	

**Figure A12.1: Actual and Forecast Expenditure (\$000, real)**



The expenditure shown in Table A12.2 and Figure A12.2 includes only non-network IT capex. Prior to FY14 network IT capex was included in a single corporate IT budget. However, from FY14 onwards Orion is managing the network IT systems capex as a separate budget. Based on information provided by Orion, we have excluded the network component of expenditure from the actual and budgeted capex shown in Table A12.2 for the period FY08-FY13.

### A12.6.2 Historical Cost Trends

Figure A12.1 indicates that, in real terms, forecast costs per annum are reasonably consistent with historic costs, if the earthquake related expenditure in FY13 is overlooked.

**A12.6.3 Material Changes to Work Volumes**

There appears to be no material change to work volumes over the assessment and forecast periods.

**A12.6.4 Alternative Programmes Considered**

No alternative programme was considered.

**A12.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

**A12.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A12.6.7 Step Changes from Historical Costs**

No step changes from historical costs are foreseen when looking at forecast annual costs.

**A12.7 CONCLUSION**

Apart from the slightly higher expenditure for years around the earthquakes, Orion seems to maintain similar levels of expenditure from historic years into the forecast. Apart from this, it seems that Orion developed the forecast by looking at actual projects foreseen in future years based on needs or cyclical updates or renewals.

We consider that Orion's forecast corporate IT capex is reasonable.

## APPENDIX A13

<b>PROGRAMME NAME:</b>	<b>SCHEDULED MAINTENANCE - 11 kV AND LOW VOLTAGE OVERHEAD LINES (CPP 101)</b>
<b>OPEX CATEGORY:</b>	<b>ROUTINE AND PREVENTIVE MAINTENANCE</b>

### A13.1 PROGRAMME DESCRIPTION

This \$34.1 million programme involves the scheduled maintenance of Orion's low voltage (400 V and 230 V) and 11kV overhead lines, which also includes the associated poles, crossarms, and insulators.

Maintenance work for 11kV overhead lines includes:

- conductor replacement (including some crossarms, insulators and ties) of approximately 130 km per year;
- a safety inspection of poles on a 5-year cycle in accordance with NW72.21<sup>50</sup>;
- a live line retightening programme. Lines are retightened within 12-18 months of installation and after that at 20 year intervals;
- full inspection of 20 year old equipment including remedial work as required. Maintenance is carried out on six feeders (150 km) per year;
- maintenance of approximately 4 km of 11 kV overhead lines as part of the sub transmission overhead lines maintenance programme;
- replacing crossarms and insulators at approximately 300 sites per year;
- retensioning of conductors for uneven sagging approximately 72 sites; and
- tree clearing for approximately 60 feeders per year.

Maintenance work proposed for low voltage overhead lines includes:

- retightening programme undertaken on a street by street basis. Lines are retightened at 30-year intervals;
- inspection of 30 year old equipment including remedial work as required. This involves approximately 2,000 poles per year;
- replacement of cross arms and insulators as required;
- retensioning conductors for uneven sagging for approximately 130 sites per year;
- tree clearing for approximately 5,000 street properties per year; and
- assessment of additional loading to poles.

<sup>50</sup> Response to verifier question A31.

**A13.2 INFORMATION PROVIDED**

Table A13.1 below presents the information that has been provided by Orion in relation to the identified programme:

**Table A13.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 6	29 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
11kV Overhead Lines – Asset Management Report	NW70.00.27	10 October 2012
Low Voltage Overhead Lines – Asset Management Report	NW70.00.25	10 October 2012

**A13.3 DELIVERABILITY**

Orion has indicated that the project can be carried out within normal contracting arrangements. It has also indicated that a smooth expenditure forecast assists their contractors in resource planning. Provided the removal of line assets in red zone areas can be resourced, we do not see deliverability as a significant issue, since the volume of work required is similar to pre-earthquake levels.

**A13.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has indicated that it has used its condition assessment survey and time-based and reliability based maintenance approaches combined with its in-house engineering knowledge and experience to forecast asset maintenance. The overall budget for this programme has been approved by the Board, and approval for the actual expenditure is made in compliance with the Delegations Authority Policy.

Orion follows the Procurement and Contract Management Policies which requires that any work valued over \$20,000 are competitively tendered. Moreover, only authorised contractors are allowed access to Orion's network based on the Authorised Contractors Policy.

Lastly, Orion follows the health and safety requirements; works towards environmental sustainability in its operations; and follows the inspection and assessment procedure for overhead lines.

**A13.5 KEY ASSUMPTIONS USED**

While the asset management reports provide extensive information on the condition of the existing asset base, they did not include a succinct explanation as to how the forecast was prepared and the key assumptions that were relied on for its preparation. However, Orion has advised that<sup>51</sup>:

- Expenditure in FY10 was used as the base from which the forecast was developed;

<sup>51</sup> Response to verifier question A35.

- Between FY09 and the budget was adjusted to provide for increased costs for tree cutting (\$0.3 million), pole retightening and mains (rural over boundary) (\$0.5 million). These increases have been carried through to the forecast period.
- Over the three year period FY14-FY16 Orion has added a provision of \$835,000 per year for the removal of overhead lines in the red zone in accordance with CERA requirements.

We note that these adjustments are reasonably consistent with the forecast trends, as shown in Figure A13.1.

## **A13.6 ASSESSMENT OF THE METHODOLOGY USED**

Overhead lines are an asset class where we would expect asset volumes to be reducing over time as Orion is not permitted to construct new overhead lines in urban areas. While new construction in rural areas is allowed, Orion's network development philosophy is to construct new single transformer zone substations. These provide additional points of injection into the existing 11 kV infrastructure, which allow it to serve larger loads. Hence we would not expect asset volumes to increase over time as a consequence of scale escalation. Indeed, Orion has indicated that assets are being removed as they will no longer be needed following the earthquakes and this reduction does not appear to be reflected in the forecast.

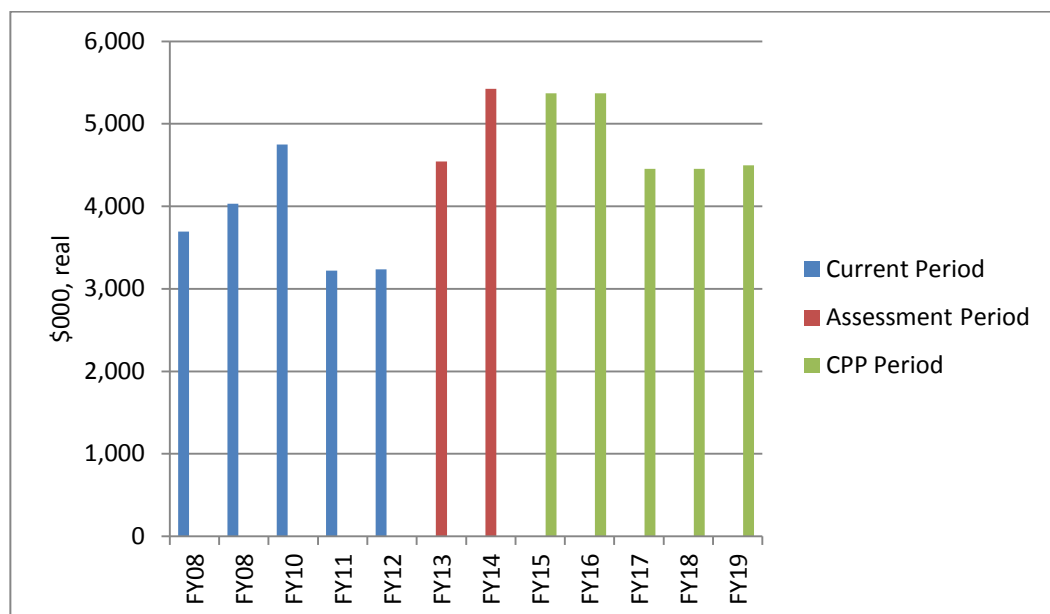
We have not seen any explicit provision in the forecast for an accelerated or enhanced inspection regime following the earthquakes.

### **A13.6.1 Expenditure Forecast**

Table A13.2 and Figure A13.1 present the historic and forecast expenditure for this project in real 2013 dollar terms:

**Table A13.2: Actual and Forecast Expenditure (\$000, real)**

A20.						
FY08	FY09	FY10	FY11	FY12		
3,694	4,030	4,749	3,219	3,237		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
4,545	5,425	5,370	5,370	4,455	4,455	4,495

**Figure A13.1: Actual and Forecast Expenditure (\$'000, real)**

Orion has indicated that its resources were constrained following the earthquakes as staff and contractors were diverted to deal with the immediate aftermath of the events which is evident in FY11 and FY12. This resulted in a reduction in the scheduled maintenance programme for those years. However, due to the relatively long cycles for scheduled overhead line maintenance, the backlog that was created in the aftermath of the earthquakes will be addressed over a long period and the backlog recovery is therefore not evident in the forecast<sup>52</sup>.

The increase in expenditure for FY14-FY16 according to Orion is due to the removal of redundant assets from earthquake damaged residential zones (red zones) which is a CERA requirement. Orion has estimated that approximately 55 km of overhead low voltage line, together with associated ground mounted distribution boxes is to be removed<sup>53</sup>.

#### **A13.6.2 Historical Cost Trends**

Apart from the reduced expenditure in FY11 and FY12 and the increased expenditure in FY14-FY16 as discussed in A13.6.1, expenditure remains relatively consistent with that in the FY10 base year.

#### **A13.6.3 Material Changes to Work Volumes**

Apart from the increased costs due to the removal of redundant assets, there appears to be no material change to work volumes over the assessment and forecast periods. The removal of redundant assets will result in a reduction in the overall size of the asset base, but we would not expect this to result in a short term reduction in work volumes, due to the long maintenance cycles.

#### **A13.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A13.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

<sup>52</sup> Response to verifier question A32.

<sup>53</sup> Responses to verifier questions A33 and A34.



**A13.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A13.6.7 Step Changes from Historical Costs**

The step change from historic levels over the period FY14-FY16 is due to the need to remove redundant assets from red zone areas in accordance with CERA requirements. Given the volumes of assets to be removed, the forecast additional costs seem reasonable.

**A13.7 CONCLUSION**

Orion has satisfactorily explained the basis on which the forecast was prepared. As can be seen in Figure A13.1, ongoing costs are marginally lower than the FY10 base year. While this base year cost is higher than earlier years the reason for this has been explained. The reason for the step increase in expenditure over the FY14-FY16 period has been explained and we consider the magnitude of this increase reasonable.

Overall we consider Orion's forecast expenditure on this programme over the next period FY13-FY19 to be reasonable.

**APPENDIX A14****PROGRAMME NAME: SCHEDULED MAINTENANCE - TRANSFORMERS (CPP 108)****OPEX CATEGORY: ROUTINE AND PREVENTIVE MAINTENANCE****A14.1 PROGRAMME DESCRIPTION**

This \$7.7 million programme involves the scheduled maintenance of Orion's voltage regulators and its power and distribution transformers.

The work to be undertaken for voltage regulators includes annual and four-yearly tap-changer maintenance; and an eight-yearly cycle maintenance of 4 MVA regulators.

Scheduled maintenance works for power transformers include the regular testing and maintenance of power transformers in zone substations; half-life refurbishment at 40 years; online maintenance techniques; and tap changer replacement/maintenance after 300,000 operations for vacuum tap changers 150,000 operations for oil-filled tap changers. Since Orion's rural transformers are subjected to more tap operations per annum, the older style oil tap changers on these units have been replaced with vacuum tap-changers so the frequency of maintenance on rural tap-changers can be extended.

Lastly, the work to be undertaken for distribution transformers includes some on-site maintenance of larger units installed within buildings; and maintenance of distribution transformers when they are removed from service for loading reasons or because of maintenance work.

**A14.2 INFORMATION PROVIDED**

The table below presents the information that has been provided by Orion in relation to the identified programme:

**Table A14.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 7	31 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Asset Management Lifecycle Budget Forecasting Process	NW70.60.15	26 October 2012
Asset Management Report – Voltage Regulators	NW70.00.41	10 October 2012
Asset Management Report – Power Transformers	NW70.00.23	10 October 2012
Asset Management Report – Distribution Transformers	NW70.00.40	10 October 2012

**A14.3 DELIVERABILITY**

Orion has indicated that the project can be carried out within its normal contracting arrangements. While the scheduling of work can be altered to some extent to take into account resource constraints and network loadings, Orion has indicated that they expect no constraints due to forecast workloads.

The contracting model allows the contractors to bring in additional resources to assist them in completing their contracted works. Orion indicates that they have multiple contractors working in the different asset classes that ensure that under normal circumstances that there is more resource available than required.

We note that the forecast expenditure in real terms is comparable to historic levels which would suggest that the deliverability of this programme should be achievable.

#### **A14.4 RELEVANT POLICIES AND PLANNING STANDARDS**

The following relevant planning standards and policies were taken into account in the development of the forecast expenditure:

- Time/age, reliability and condition based maintenance approaches are used to forecast asset maintenance requirements;
- Work with a value over \$20,000 is competitively tendered in accordance with Orion's procurement and contract management policies;
- The overall budget is approved by the Board and when the expenditure is incurred, approval for the actual expenditure is made in compliance with the delegations of authority policy;
- Only authorised contractors are allowed to access the network consistent with the authorised contractors' policy;
- Health and safety requirements embodied in the health and safety policy is followed to ensure the safety of the public, and Orion's personnel and contractors;
- Orion works towards environmental sustainability in its operations consistent with the environmental sustainability policy; and
- The asset management and lifecycle budget forecasting process is used as reference in the budgeting approach for maintenance and replacement programmes.

#### **A14.5 KEY ASSUMPTIONS USED**

As a result of the earthquakes Orion lost two substations which housed transformer assets. The Brighton half-life refurbishment was brought forward by approximately three years because the substation sunk approximately one metre and the transformer was covered in silt and water. There were also some spurious trippings caused by mercury switches fitted in Buchholz relays. A project was carried out to replace all these with a seismically rated type. Otherwise the earthquakes had little effect on Orion's transformers assets as reflected in expenditure in FY11 and FY12.

On this basis, there appears to be no reason for the forecast expenditure to be significantly different from historic levels in real terms.

#### **A14.6 ASSESSMENT OF THE METHODOLOGY USED**

Orion has not described in detail how the expenditure forecast was prepared. Nevertheless transformers are key assets and high failure rates would present a significant risk to the business. We would therefore be concerned if it significantly reduced its maintenance expenditure on power transformer maintenance.

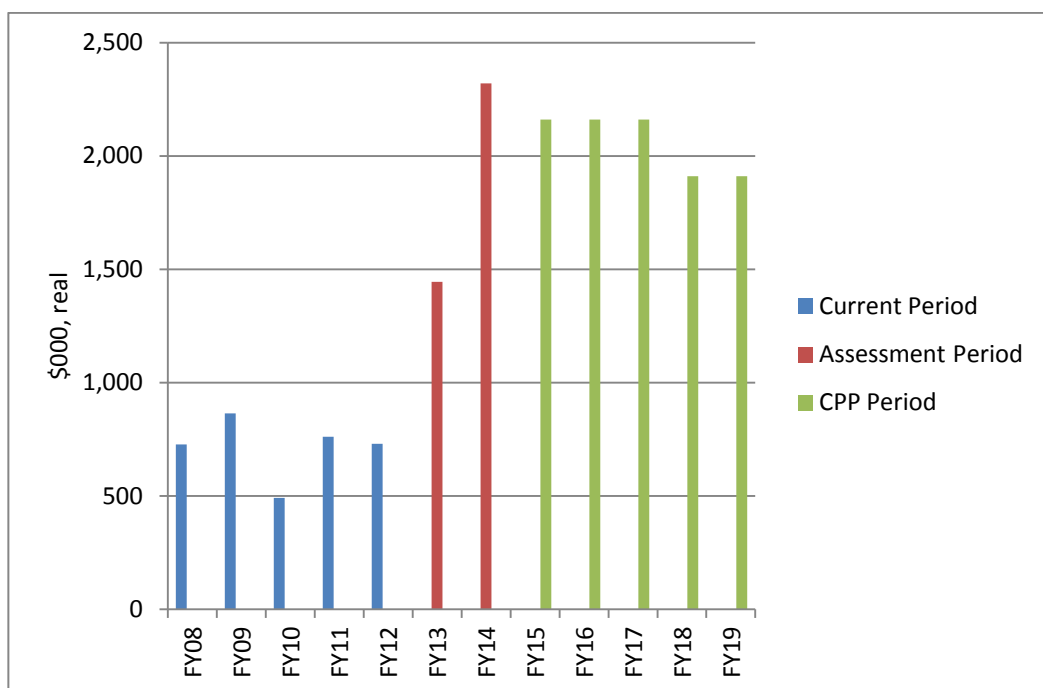
Orion's aggregated average annual scheduled maintenance expenditure forecast over the FY14-FY19 forecast period for both power and distribution transformers is only 0.5% higher than the corresponding actual expenditure over the FY08-FY12 historical period.

##### **A14.6.1 Forecast Expenditure**

Table A14.2 and Figure A14.1 below present the historic and forecast expenditure proposed for this programme in real 2013 dollar terms:

**Table A14.1: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
985	1,026	1,231	987	1,154		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,165	1,090	1,080	1,080	1,080	1,080	1,080

**Figure A14.1: Actual and Forecast Expenditure (\$000, real)**

Approximately 75% of the forecast expenditure relates to power transformer maintenance.

#### **A14.6.2 Historical Cost Trends**

As can be seen from Figure A14.1, forecast annual expenditure in real terms is comparable to historic levels.

#### **A14.6.3 Material Changes to Work Volumes**

There appears to be no material change to work volumes over the assessment and forecast periods.

#### **A14.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A14.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

#### **A14.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A14.6.7 Step Changes from Historical Costs**

No step changes from historical costs are foreseen when looking at forecast annual costs.

**A14.7 CONCLUSION**

We consider Orion's forecast expenditure for this opex programme to be reasonable.

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**APPENDIX A15**

**PROGRAMME NAME:** **SCHEDULED MAINTENANCE - BUILDINGS, GROUNDS AND SUBSTATIONS (CPP 109)**

**OPEX CATEGORY:** **Routine and Preventive Maintenance**

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**A15.1 PROGRAMME DESCRIPTION**

This \$19.5 million programme involves the scheduled maintenance of Orion's buildings, grounds and substations. The assets included in this programme are limited to the property and buildings used to house electrical equipment (e.g. network related buildings and kiosks such as zone substations, network substations, distribution building substations, and distribution kiosks). The programme excludes the assets housed within the substations and also excludes non-network property.

The programme is an amalgamation of the following three sub-programmes, each of which is budgeted separately.

- Buildings include the control and switchgear buildings in zone substations and the enclosures in which distribution substations are housed;
- Grounds include the landscaped area, boundary fences and driveways; and
- Substations include switchyard structures and pads, battery chargers and other miscellaneous equipment housed within a substation. It includes inspection of all substation assets.

Orion has identified the following risks to its network property and buildings and has proposed maintenance activities to address these risks:

- seismic movement;
- liquefaction;
- defective drainage;
- guttering;
- roof leaks;
- vegetation/tree roots;
- vandalism;
- rust;
- subsidence;
- extreme weather conditions; and
- fire.

Orion's five-year maintenance plan includes the repair of all buildings that have suffered earthquake damage. Earthquake damage to buildings was relatively minor due to the seismic strengthening programme put in place by Orion and completed in 2009. Critical repairs have now been completed but some work remains.

Buildings are inspected regularly and minor repairs are undertaken as they are identified while major repairs and maintenance work are scheduled and budgeted for. The

programme also includes upgrading rural zone substation buildings in order to improve weather tightness and security, upgrading substation buildings that have been prone to leaking; levelling of the foundations of older kiosks; repainting to deter rust on the coastal areas; and removal of graffiti.

## **A15.2 INFORMATION PROVIDED**

Table A15.1 below presents the information that has been provided by Orion in relation to the identified programme:

**Table A15.1: Information Provided**

<b>Title</b>	<b>Reference #</b>	<b>Date</b>
Programme Summary	Version 6	31 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Substations – Asset Management Report	NW70.00.44	10 October 2012
Network Related Property – Asset Management Report	NW70.00.43	10 October 2012
Application of CBRM – EA Technology Report No. 76500		March 2012

## **A15.3 DELIVERABILITY**

Orion's ongoing maintenance programme is carried out as part of a wider substation maintenance contract which allows a smooth expenditure forecast, which in turn assists Orion's contractors in their resource planning. According to Orion, the programme does not require specialised labour, and, given its existing relationships with a large number of contractors, it does not envisage that they would be unable to source the necessary manpower resources.

## **A15.4 RELEVANT POLICIES AND PLANNING STANDARDS**

In accordance with Orion's asset management policy, maintenance priorities are determined following the general principle that assets supplying the greatest number of consumers receive the highest priority. It is, however, worth noting that the expenditure for this project is not disaggregated into specific assets therefore it is not possible to assess if the expenditure was prioritised accurately.

The overall budget for this project has been approved by the Board, and approval for the actual expenditure is made in compliance with the delegations authority policy.

Orion follows the procurement and contract management policies, which require that any work valued over \$20,000 are competitively tendered. Moreover, only authorised contractors are allowed access to Orion's network in accordance with its authorised contractors' policy.

Lastly, Orion follows the health and safety requirements and works towards environmental sustainability in its operations.

## **A15.5 KEY ASSUMPTIONS USED**

We are not aware of any key assumptions relating directly to this forecast. The assets affected by this programme already exist, their numbers are relatively small (except in the



case of kiosks) and their condition is known. The rate of deterioration of these assets is more predictable than for some other asset classes, which means that a scheduled maintenance programme can be developed with a relatively high degree of certainty.

## A15.6 ASSESSMENT OF THE METHODOLOGY USED

The project summary indicates that the forecast was developed by using a base year approach with specific refinements for known issues such as the planned disestablishment of CBD assets, repairs to Papanui assets and earthquake repairs on other substations.

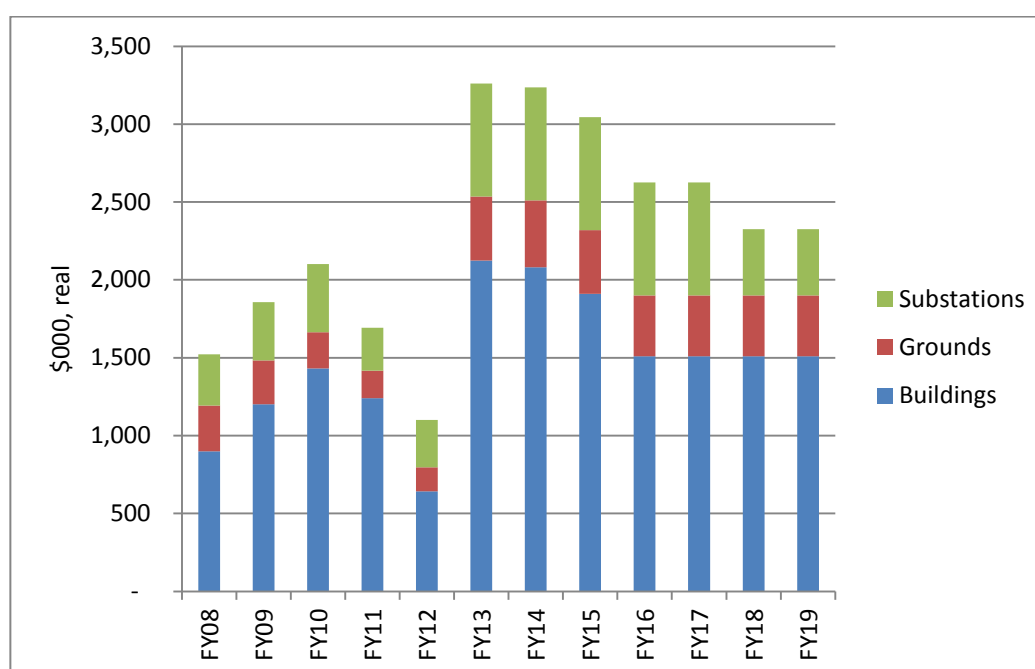
### A15.6.1 Forecast Expenditure

Table A15.2 and Figure A15.1 below present the historic and forecast expenditure for this programme in real 2013 dollar terms:

**Table A15.2: Actual and Forecast Expenditure (\$000, real)**

	Current Period							
	FY08	FY09	FY10	FY11	FY12			
Buildings	899	1,202	1,432	1,241	643			
Grounds	295	281	233	176	155			
Substations	328	373	437	274	304			
Total	1,522	1,856	2,101	1,692	1,101			
	Assessment Period		CPP Period					
	FY13	FY14	FY15	FY16	FY17	FY18	FY19	
Buildings	2,215	2,080	1,910	1,510	1,510	1,510	1,510	
Grounds	410	430	410	390	390	390	390	
Substations	725	725	725	725	725	425	425	
Total	3,350	3,620	3,430	3,020	3,020	2,710	2,710	

**Figure A15.1: Actual and Forecast Expenditure (\$000, real)**



**A15.6.2 Historical Cost Trends**

Scheduled maintenance of building, grounds and substations increased by 38% between FY08 and FY10 but the reason for this is not clear<sup>54</sup>. As can be seen from Figure A15.1 expenditure reduced significantly following the earthquakes as resources were reallocated to emergency and non-scheduled maintenance.

**A15.6.3 Material Changes to Work Volumes**

Additional expenditure has been provided in the early part of the forecast period for work that includes:

- the repair of residual earthquake damage to substation buildings over during FY14 and FY15;
- the repair of damage to grounds, including fences and gates;
- reinforcement of the workshop and buildings at Papanui substation to meet current earthquake requirements. We are unclear as to why this work is not being capitalised;
- the disestablishment of assets in the CBD and red zone areas. This programme will continue through to FY17.

After FY17, Orion expects expenditure on this programme to revert to more normal levels.

**A15.6.4 Alternative Programmes Considered**

No alternative programme was considered.

**A15.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

**A15.6.6 Contingency Factors**

No contingency factors have been included in this project.

**A15.6.7 Step Changes from Historical Costs**

Increased expenditure on this programme over the period FY13-FY17 is required to address a legacy of minor earthquake damage to building and grounds, which has not been sufficiently serious to require urgent repair. Expenditure has also been allocated to earthquake strengthening of Papanui buildings acquired from Transpower and the disestablishment of assets that are no longer required. We consider these explanations reasonable, although we have not assessed the magnitude of the forecast expenditure.

Forecast expenditure in FY18 and FY19 is 27% higher than the average pre-earthquake expenditure over the period FY08-10 but only 11% higher than the actual expenditure in FY10. Whether or not this is reasonable depends on the reasons for the 38% increase in expenditure between FY08 and FY10, and whether it was necessary to sustain the expenditure at the elevated level. This is not clear. However, the discussion on this programme in Section 9.15.1 refers to a need to increase the weather-tightness of substation buildings due to legacy design issues and a need to level older kiosk foundations to relieve stress on associated cables. The urgency of this work is unclear.

Orion has indicated that the increase in expenditure in FY13-FY15 is due to the planned disestablishment of CBD assets, repairs to the Papanui assets (\$280k over 2 years), and

<sup>54</sup> Verifier question requested comment on this but no response was provided.

earthquake repairs on other substations. These costs include earthquake repairs to buildings of \$1.5 million over the three years, disestablishment of buildings and kiosks in the CBD of \$1.2 million over 5 years as well as ground repairs which includes fences and gates of \$140,000 over 3 years.

Orion confirmed that the expenditure in the current period does not include earthquake strengthening because costs relating to strengthening is capitalised. Orion indicated that the increase from FY8-FY09 to FY10 is due to numerous factors including increased costs in leases, rates and insurance as well as kiosk locks and maintenance.

#### **A15.7 CONCLUSION**

We would need a more in-depth investigation in order to reach a firm view on whether or not the forecast is reasonable. This could be because this is an area where maintenance work is needed but where there is some flexibility in scheduling the work. It may be that deferring some of the work may increase longer term costs but not seriously undermine the integrity of the network in the short term. On balance we are inclined to the view that the forecast is reasonable.

**APPENDIX A16****PROGRAMME NAME: SCHEDULED MAINTENANCE – SWITCHGEAR (CPP 112)****OPEX CATEGORY: ROUTINE AND PREVENTIVE MAINTENANCE****A16.1 PROGRAMME DESCRIPTION**

The \$7.7 million programme involves the scheduled maintenance of Orion's switchgear. The assets included in this programme are the high and low voltage switchgear including Magnefix switch units (MSUs), ring main units (RMUs), fused and non-fused oil immersed switches, air break isolators (ABIs), sectionalisers high voltage circuit breakers low voltage switches.

Scheduled maintenance funded through this programme includes the following.

- 11kV MSUs with close proximity to the sea are maintained every four years;
- RMUs and oil switches in indoor situations are maintained four or eight yearly;
- Checks on the operation of ABIs;
- Sectionalisers are maintained every eight years, with an annual external inspection;
- Substation low voltage panels are inspected every six months, while other switches are inspected on a five yearly basis. Orion is half way through a four-year programme to install safety barriers over open live busbars and switches; and
- HV circuit breakers are checked during the substation maintenance rounds, and most circuit breakers are maintained following operation under fault conditions.

**A16.2 INFORMATION PROVIDED**

Table A16.1 below presents the information that has been provided by Orion in relation to the identified programme:

**Table A16.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 7	31 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Asset Management Lifecycle Budget Forecasting Process	NW70.60.15	26 October 2012
Asset Management Report – HV and LV Switchgear	NW70.00.24	9 October 2012
Asset Management Report – HV Circuit Breakers	NW70.00.33	9 October 2012

**A16.3 DELIVERABILITY**

Orion has indicated that the programme can be carried out within normal contracting arrangements. While the scheduling of work can be altered to some extent to take into account resource constraints and network loadings, Orion has indicated that they expect no delivery constraints.

The contracting model allows the contractors to bring in additional resources to assist them in completing their contracted works. Orion indicates that they have multiple contractors working in the different asset classes that ensure that under normal circumstances that there is more resource available than required.

Even though the forecast expenditure is higher than historic levels, the increased workload is not seen as very material and Orion should be able to deliver the project as planned.

**A16.4 RELEVANT POLICIES AND PLANNING STANDARDS**

The following relevant planning standards and policies were taken into account in the development of the forecast expenditure:

The use of time/age, reliability and condition based maintenance approaches to forecast asset maintenance;

- Competitively tendering out work with a value over \$20,000 consistent with the procurement and contract management policies;
- The overall budget is approved by the Board and when the expenditure is incurred, approval for the actual expenditure is made in compliance with the delegations of authority policy;
- Only authorised contractors are allowed to access the network consistent with the authorised contractors' policy;
- Health and safety requirements embodied in the health and safety policy is followed to ensure the safety of the public, and Orion's personnel and contractors;
- Orion works towards environmental sustainability in its operations consistent with the environmental sustainability policy; and
- The asset management and lifecycle budget forecasting process is used as reference in the budgeting approach for maintenance and replacement programmes.

**A16.5 KEY ASSUMPTIONS USED**

Orion indicated that the earthquakes had little effect on Orion's switchgear assets. However, as discussed below, Orion has introduced some new maintenance initiatives and the cost of these is reflected in the forecasts.

**A16.6 ASSESSMENT OF THE METHODOLOGY USED**

We understand that the scheduled maintenance forecast was developed using a bottom up approach. A detailed breakdown of the forecast showing the individual components is included on page 7 of the project summary.

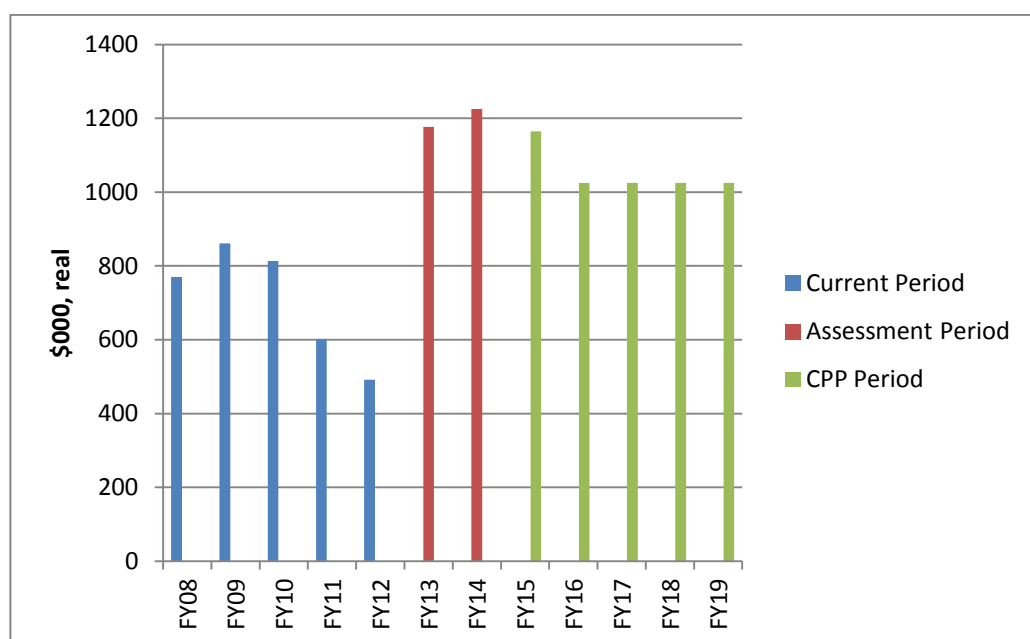
### A16.6.1 Expenditure Forecast

Table A16.2 and Figure A16.1 below present the historic and forecast expenditure for this programme in real 2013 dollar terms:

**Table A16.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
770	861	813	601	492		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,177	1,225	1,165	1,025	1,025	1,025	1,025

**Figure A16.1: Actual and Forecast Expenditure (\$000, real)**



### A16.2 Historical Cost Trends

Figure A16.1 shows that expenditure levels were relative constant in real terms prior to the earthquakes. Orion has indicated that its resources were constrained following the earthquakes which then resulted in a reduction in the planned maintenance programme for FY11 and FY12 as resources were diverted to higher priority areas.

### A16.6.3 Material Changes to Work Volumes

The underlying forecast expenditure is about 26% greater in real terms than the average FY08-FY10 pre-earthquake expenditure. A small part of this is a result of the need to maintain the additional switchgear acquired from Transpower. Orion has also noted that its switchgear is aging and has identified a need for additional testing and maintenance as a result<sup>55</sup>.

There has also been additional expenditure forecast for the period FY12-FY14. Orion has indicated that this is the result of a programme to earth kiosk doors (a safety issue)

<sup>55</sup> Response to verifier question A40.

and also a requirement to repair link boxes damaged by demolition works within the CBD.<sup>56</sup>

**A16.6.4 Alternative Programmes Considered**

No alternative programme was considered.

**A16.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

**A16.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A16.6.7 Step Changes from Historical Costs**

The drivers for the differences between forecast expenditure and actual pre-earthquake costs are discussed in Section A16.6.3. Orion has indicated that it has allocated \$70,000 per annum to the kiosk door earthing programme up to FY14 and \$140,000 per annum through to FY15 for link box repairs. Additional ongoing maintenance and testing costs are estimated at \$350,000. We have not fully reconciled these numbers from the forecast but do not consider them to be unreasonable, noting the importance of switchgear to the operation of the network. We also acknowledge the advanced age and deteriorating condition of many switchgear assets, which is apparent from the age and condition profiles included in the relevant asset management reports.

**A16.7 CONCLUSION**

We consider that Orion's forecast expenditure for this opex programme is reasonable.

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<sup>56</sup> Response to verifier question A39.



**APPENDIX A17**

**PROGRAMME NAME:** **EMERGENCY MAINTENANCE - UNDERGROUND CABLES (CPP 118)**

**OPEX CATEGORY:** **FAULT AND EMERGENCY MAINTENANCE**

**A17.1 PROGRAMME DESCRIPTION**

The \$22.0 million programme involves the emergency maintenance of Orion's underground cables. The assets included in this project are the 66kV and 33kV subtransmission underground cables, 11kV underground cable, as well as 400V low voltage underground cable, link boxes and boundary boxes. The work involves the reinstatement of failed network assets because of third party damage, equipment failure or equipment malfunction/mal-operation. Orion also indicated that the emergency spares are managed by Connetics.

**A17.2 INFORMATION PROVIDED**

Table A17.1 below presents the information that has been provided by Orion in relation to the identified programme.

**Table A17.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 9	31 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Asset Management Report – LV Underground Cables and Hardware	NW70.00.29	10 October 2012
Asset Management Report – 11kV Underground Cables	NW70.00.30	10 October 2012
Asset Management Report – 33kV Underground Cables	NW70.00.31	10 October 2012
Asset Management Report – 66kV Underground Cables	NW70.00.32	10 October 2012
Application of CBRM – EA Technology Report No. 76500		March 2012

**A17.3 DELIVERABILITY**

The project will be carried out via Orion's emergency contracting arrangements given that the timing of the work is random and cannot be planned in advance. However, it has been indicated that the scheduling of the work can be altered to a certain extent in order to take into account resource constraints and network loadings.

Orion has indicated that it has contracts in place with two contractors (Connetics and Independent Lines Services) for short-term emergency response, and can access additional contractors in the event of a major emergency. From this, Orion has indicated that it is able to meet restoration service targets in the case of typical small failure events, as well as is able to respond to major emergencies (such as the earthquakes).

We think that Orion has demonstrated its ability to effectively respond to emergency situations through its performance in the aftermath of the FY11 and FY12 earthquakes.

## **A17.4 RELEVANT POLICIES AND PLANNING STANDARDS**

The following relevant planning standards and policies were taken into account in the development of the forecast expenditure:

- Competitively tendering out work with a value over \$20,000 consistent with the procurement and contract management policies;
- The overall budget is approved by the Board and when the expenditure is incurred, approval for the actual expenditure is made in compliance with the delegations of authority policy;
- Only authorised contractors are allowed to access the network consistent with the authorised contractors' policy;
- Health and safety requirements embodied in the health and safety policy is followed to ensure the safety of the public, and Orion's personnel and contractors; and
- Orion works towards environmental sustainability in its operations consistent with the environmental sustainability policy.

Apart from the policies highlighted above it seems that there are no policies or guidelines on the planning process or on how the forecast should be developed.

## **A17.5 KEY ASSUMPTIONS USED**

While the forecast excludes provision for further catastrophic events, it takes into account higher rates of cable failure as the underground cable assets are not as resilient as they were prior to the earthquakes. By extrapolating the number of 11 kV cable faults experienced year to date, Orion is expecting 60 such faults in FY13, compared to a long term yearly average of 21<sup>57</sup>. Furthermore, the total number of underground equipment faults in FY13 is projected to be 975 compared to a pre-earthquake average of 395.

It has also been assumed that the current fault rate will be maintained unchanged over the forecast period. However, we understand that Orion is proactively testing, and where necessary repairing its 11 kV cables in areas where there was significant ground movement and we think this should over time lead to a reduction in cable faults.

It also includes a provision from FY14 for an increase in contractor fixed costs as a result of revising Orion's emergency response contracts to include additional resiliency requirements to meet Orion's responsibilities under the CDEM Act and also a small provision for additional traffic management costs.

## **A17.6 ASSESSMENT OF THE METHODOLOGY USED**

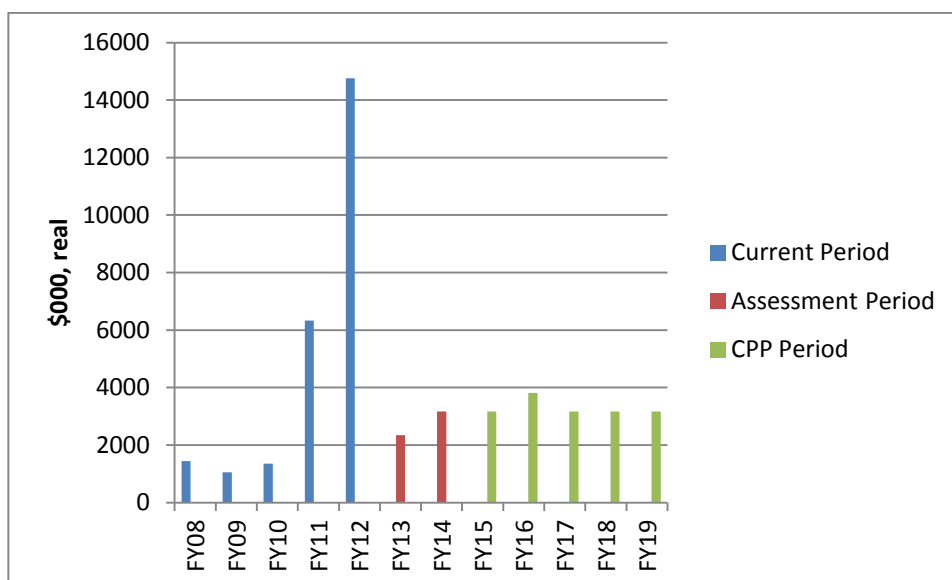
### **A17.6.1 Expenditure Forecast**

Table A17.2 and Figure A17.1 present the historic and forecast expenditure proposed for this project in real 2013 dollar terms:

<sup>57</sup> Response to verifier question A41.

**Table A17.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
1,440	1,050	1,352	6,329	14,755		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
2,340	3,170	3,170	3,810	3,170	3,170	3,170

**Figure A17.1: Actual and Forecast Expenditure (\$000, real)**

A further breakdown of the above forecast costs is given in Table A17.3 below.

**Table A17.3: Breakdown of Forecast Expenditure (\$000, real)**

	FY13	FY14	FY15	FY16	FY17	FY18	FY19
66kV	50	70	70	85	70	70	70
33kV	40	55	55	65	55	55	55
11kV	1,200	1,625	1,625	1,950	1,625	1,625	1,625
400V	1,050	1,420	1,420	1,710	1,420	1,420	1,420
<b>Total</b>	<b>2,340</b>	<b>3,170</b>	<b>3,170</b>	<b>3,810</b>	<b>3,170</b>	<b>3,170</b>	<b>3,170</b>

### A17.6.3 Historical Cost Trends

As can be seen from Figure A17.1, pre-earthquake emergency cable repair costs were relatively static in real terms prior to the earthquakes. The impact of the earthquakes on these costs is readily apparent.

### A17.6.3 Material Changes to Work Volumes

In the project summary Orion indicated that its forecast was prepared in July/August 2012 and assumed a 30% increase in the number of faults over pre-earthquake levels. However, as discussed in Section 17.5, this appears to have been an under-estimate as actual fault rates experienced through to January 2013 have been almost three times higher than the pre-earthquake levels. What is not known is whether this trend will persist through the CPP period or whether it will stabilise and trend back to pre-earthquake levels. Orion believes that its experience is unique and it has not found

another electricity distributor (presumably with a predominantly underground distribution network) that has been though a similar experience and that can therefore be used as a basis for predicting future fault tends.

We note this uncertainty and consider that an increase in faults over time from the current level, while perhaps unlikely, cannot be ruled out. We also note that Orion did not change its forecast for the final CPP proposal, notwithstanding the fact that its current fault rate is significantly higher than assumed at the time the forecast was prepared.

#### **A17.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A17.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

#### **A17.6.6 Contingency Factors**

No contingency factors have been included in this project.

#### **A17.6.7 Step Changes from Historical Costs**

The step change between forecast and pre-earthquake costs can be attributed to a number of factors.

- The assumed increase in the number of faults. This is discussed in Section A17.6.3. Orion has included a provision of an additional \$1.4 million in its forecast to cover this.
- A \$0.2 million per annum increase in the costs to cover additional "road access" compliance requirements. We assume this relates to traffic management.
- A \$0.3 million per annum increase in contractor establishment costs. These are related to renegotiated emergency response contract arrangements to better meet Orion's responsibilities under the CDEM Act as discussed in Section 6.4.1.1.
- A one-off provision of \$0.64 million in FY16 related to the relocation of critical stores and spares to a new lifelines standard building managed by Connetics. This is discussed in Section 6.4.1.2.

The increase in contractor fixed costs has been apportioned across all three emergency response opex line items.

#### **A17.7 CONCLUSION**

We note that cable and associated underground equipment failure rates are currently significantly higher than the rates as the basis for the forecast, but Orion has not changed the forecast from that used in the draft CPP proposal.

There is significant uncertainty as to whether cable failure rates will reduce over time and we think Orion's assumption that they will remain constant over the CPP period is not unreasonable. Overall we consider Orion's forecast expenditure to be realistic, given the uncertainty regarding future cable failure rates.

**APPENDIX A18****PROGRAMME NAME: EMERGENCY MAINTENANCE - NETWORK ASSETS (CPP 119)****OPEX CATEGORY: FAULT AND EMERGENCY MAINTENANCE****A18.1 PROGRAMME DESCRIPTION**

This \$9.4 million programme involves expenditure incurred in responding to unplanned events that impair the normal operation of specified network assets. The assets included in this emergency maintenance line item are:

- protection systems;
- power and distribution transformers<sup>58</sup>
- distribution substations;
- distribution switchgear;
- load management;
- SCADA and control;
- communications equipment; and
- generators.

The forecast is an aggregation of the emergency maintenance forecasts in the 2012 asset management reports prepared within Orion's asset management group. There are also significant provisions for contract management expenses that are intended to cover fixed cost components of Orion's contracts with its emergency fault response service providers.

**A18.2 INFORMATION PROVIDED**

Table A18.1 below presents the information that has been provided by Orion in relation to the identified programme.

**Table A18.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 3	31 January 2013
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Asset Management Lifecycle Budget Forecasting Process	NW70.60.15	26 October 2012
Asset Management Report – Protection Systems	NW70.00.22	10 October 2012
Asset Management Report – Power Transformers	NW70.00.23	10 October 2012

<sup>58</sup> Orion does not distinguish between power and distribution transformers in its emergency and non-scheduled maintenance categories but does for other maintenance categories.

Title	Reference #	Date
Asset Management Report – Switchgear HV and LV	NW70.00.23	9 October 2012
Asset Management Report – Underground Cables – Communication	NW70.00.28	10 October 2012
Asset Management Report – Circuit Breakers	NW70.00.33	9 October 2012
Asset Management Report – Communication Systems	NW70.00.34	19 October 2012
Asset Management Report – Distribution Management Systems	NW70.00.36	10 October 2012
Asset Management Report – Load Management Systems	NW70.00.37	15 October 2012
Asset Management Report – Metering	NW70.00.38	10 October 2012
Asset Management Report – Generators	NW70.00.39	10 October 2012
Asset Management Report – Transformers – Distribution	NW70.00.40	10 October 2012
Asset Management Report – Voltage Regulators	NW70.00.41	10 October 2012
Asset Management Report – Property – Network	NW70.00.43	10 October 2012
Asset Management Report – Substations	NW70.00.44	10 October 2012

### A18.3 DELIVERABILITY

Orion has indicated that the project can be carried out within normal contracting arrangements. Furthermore, Orion states that additional costs associated with the emergency works are largely related to support and facility services and that these can be provided without impact on direct response resources.

We do not expect deliverability constraints for this programme.

### A18.4 RELEVANT POLICIES AND PLANNING STANDARDS

The following relevant planning standards and policies were taken into account in the development of the forecast expenditure:

- Competitively tendering out work with a value over \$20,000 consistent with the procurement and contract management policies;
- The overall budget is approved by the Board and when the expenditure is incurred, approval for the actual expenditure is made in compliance with the delegations of authority policy;
- Only authorised contractors are allowed to access the network consistent with the authorised contractors' policy;
- Health and safety requirements embodied in the health and safety policy is followed to ensure the safety of the public, and Orion's personnel and contractors;
- Orion works towards environmental sustainability in its operations consistent with the environmental sustainability policy; and
- Emergency contracts for short-term emergency response (two contractors) and major emergency response (multiple contractors) will be retendered and awarded consistent with the Asset Management Lifecycle Budget Forecasting Process.

### A18.5 KEY ASSUMPTIONS USED

Orion has indicated that the expenditure is based on historical quantum and nature of work, and analysis of recent market prices. We understand from this that, while the forecast was generally prepared on a bottom up basis and that a detailed forecast breakdown by asset type is provided in Section 6.1 of the project summary, it is assumed

that failure rates over the CPP period will be constant and will not be materially different from pre-earthquake levels.

## A18.6 ASSESSMENT OF THE METHODOLOGY USED

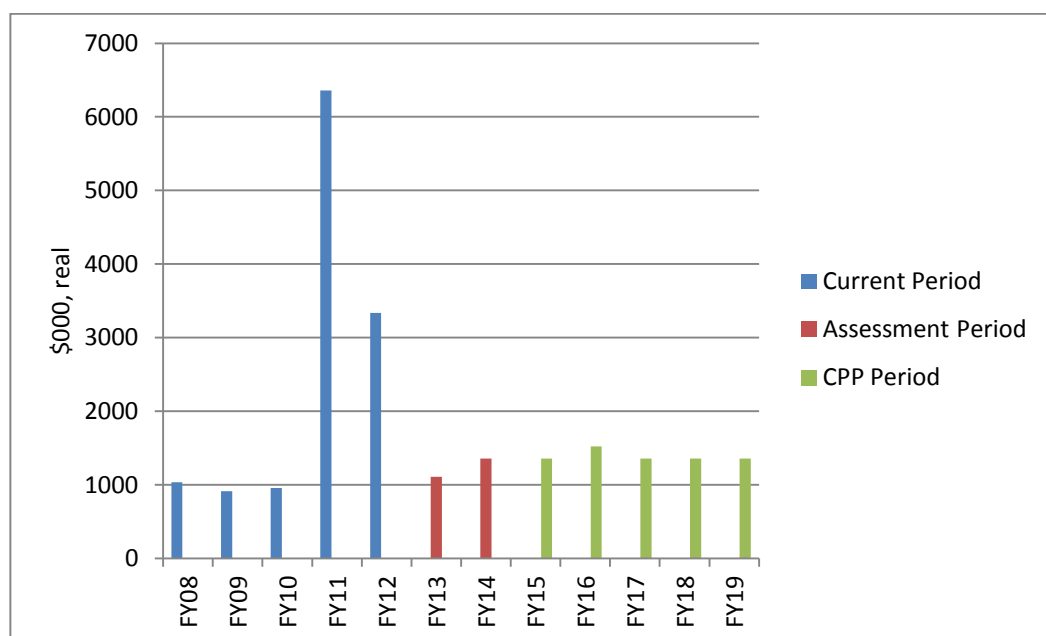
### A18.6.1 Forecast Expenditure

Table A18.2 presents the historic and forecast expenditure proposed for this opex programme in real 2013 dollar terms:

**Table A18.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
1,032	914	957	6,358	3,334		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,110	1,355	1,355	1,520	1,355	1,355	1,355

**Figure A18.1: Actual and Forecast Expenditure (\$000, real)**



### A18.6.2 Historical Cost Trends

As indicated in Figure A18.1, pre-earthquake expenditure on this programme was relatively constant in real terms. The impact of the earthquakes in FY11 and FY12 is readily apparent.

### A18.6.3 Material Changes to Work Volumes

As noted in Section A18.5 there is an underlying assumption that during the CPP period, equipment failure rates for all asset types will not be materially different to pre-earthquake levels.

### A18.6.4 Alternative Programmes Considered

No alternative programme was considered.



**A18.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this programme.

**A18.6.6 Contingency Factors**

No contingency factors have been included in this programme.

**A18.6.7 Step Changes from Historical Costs**

The step change between forecast and pre-earthquake expenditure can be attributed to a provision of approximately \$0.3 million towards the fixed contractor establishment costs associated with Orion's new requirement that its emergency maintenance contractors are in a position to meet Orion's obligations under the CDEM Act. This is discussed further in Section 6.4.1.1, where it is explained that these new fixed contractor costs have been apportioned across all three of Orion's emergency fault response opex line items. Orion has indicated in the project summary that costs not related to these new fixed contractor costs are less than \$0.1 million higher in real terms than pre-earthquake levels.

The one-off increase apparent in FY16 is the provision for the relocation of stores and spares to a new lifelines standard building managed by Connetics. This is discussed in Section 6.4.1.2.

**A18.7 CONCLUSION**

We consider that Orion's forecast opex for this programme is reasonable.

**APPENDIX A19****PROGRAMME NAME: CORPORATE MANAGEMENT OPEX (CPP 160)****OPEX CATEGORY: GENERAL MANAGEMENT, ADMINISTRATION AND OVERHEADS****A19.1 PROGRAMME DESCRIPTION**

The \$25.2 million expenditure for this programme is not directly incurred in the physical operation and maintenance of the network but rather supports these activities. It includes expenditure related to the board, the corporate management team, human resources and fleet management.

The programme excludes management and overhead costs that are specifically earthquake related as these costs are captured in a separate line item, CPP170. While these earthquake related costs are discussed in this section to provide additional context to historical cost comparisons, they do not form part of the review in this appendix.

The programme includes expenditure related to the key departmental managers as well as the CEO. Hence general management remuneration is not included in the budgets of the individual departments and, in particular, the Chief Operating Officer's remuneration is not included in the CPP167 Infrastructure Management forecast.

**A19.2 INFORMATION PROVIDED**

Table A19.1 below presents the information that has been provided by Orion in relation to the identified programme:

**TableA19.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 5	22 January 2013
10-year Asset Management Plan	-	1 April 2012
Human Resources Policy	OR00.00.05	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Motor Vehicle Policy	OR00.00.09	6 June 2012
Information Systems Policy	OR00.00.13/1	6 June 2012
Business Plan	NW70.20.00	11 September 2000

**A19.3 DELIVERABILITY**

The proposed project spend is relatively fixed over the forecast period as it relates mostly to remuneration of Board members, executives and current personnel. It has been indicated that any additional employees will be recruited if required and it has been further indicated that there are no expected constraints in delivering the proposed expenditure.

**A19.4 RELEVANT POLICIES AND PLANNING STANDARDS**

While several policies are taken into account by the board, corporate management, human resources and fleet management to assist in performing their duties, there are no relevant planning standards and policies taken into account and complied with or incorporated in the project.

## A19.5 KEY ASSUMPTIONS USED

The key assumption in preparing this forecast was that the business environment would remain stable over the forecast period and there would be no requirement for any change to the current level of cost when measured in real terms. We think this assumption is very reasonable, given that the current level of costs on which the forecast is based excludes earthquake related expenses.

## A19.6 ASSESSMENT OF THE METHODOLOGY USED

### A19.6.1 Cost Levels

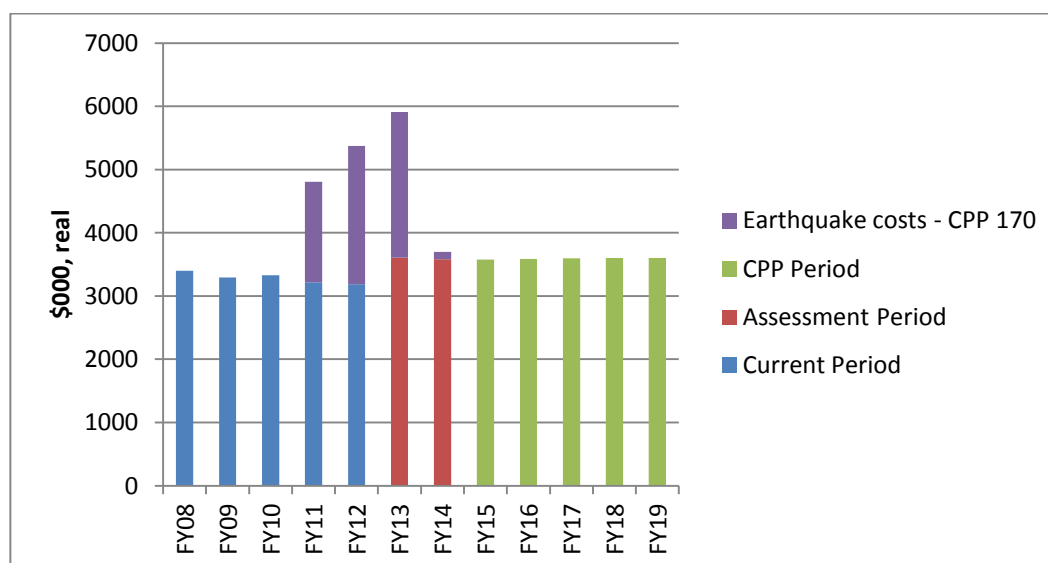
Table A19.2 presents the historic and forecast expenditure proposed for this project in real 2013 dollar terms. Figure A19.1 also shows earthquake related management costs, as captured under opex programme CPP170 in order to provide more context to the historic cost stream.

**Table A19.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
3,400	3,291	3,330	3,215	3,187		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
3,607	3,580	3,576	3,589	3,597	3,604	3,600

Note: Earthquake related costs allocated to CPP 170 are not included.

**Figure A19.1: Actual and Forecast Expenditure (\$000, real)**



### A19.6.2 Historical Cost Trends

Corporate management costs have declined slightly in real terms over the historic period FY08-FY12, if earthquake related costs are excluded. This is shown in Figure A19.1.

We included CP170 in Figure A19.1 because we were surprised that corporate costs in FY11 and FY12 continued to reflect the declining trend of earlier years, notwithstanding the earthquakes. We have not studied the basis for allocating costs to CP170 but, given that the trend shown in A19.1 does not reflect any significant diversion of resources from business as usual to earthquake response, we suspect that CPP170 reflects only additional costs that would not have been incurred were it not for the earthquakes. We

also suspect that Figure A19.1 overstates the relative impact of the earthquakes on corporate management costs as a significant proportion of the costs included in CP170 may relate to other corporate opex line items.

#### **A19.6.3 Material Changes to Work Volumes**

As noted in Section A19.5, the forecast assumes no material changes in work volumes apart from those identified in Section A19.6.7 below. We consider this a conservative assumption as it implies that corporate management will be able to continue business as usual and manage issues relating to the earthquake rebuild using its existing resource base.

#### **A19.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A19.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

#### **A19.6.6 Contingency Factors**

No contingency factors have been included in this project.

#### **A19.6.7 Step Changes from Historical Costs**

There is a \$0.45 million increase in expenditure from FY12 to FY13 due to the following:

- \$0.2 million for the sponsorship agreement with AMI Stadium;
- \$0.1 million for an increase management training/development for the corporate management group;
- \$0.1 million for an increase in medical and occupational health (and to a lesser extent host expenses); and
- sundry increases, including pay rises and increased travel and accommodation expenditure.

The step change between FY12 and FY13 which represents a little over 1% of the total forecast and this is retained for the duration of the forecast. Given this is the only material real cost increase over an 11 year period, we do not consider this unreasonable. However, Orion is a natural monopoly that does not need to compete for business. While the AMI stadium sponsorship cost is not large, the Commission may consider that this is a cost that should be funded by the shareholders, rather than passed through to consumers

#### **A19.7 CONCLUSION**

We consider the forecast opex reasonable and possibly conservative. However, we have some reservations as to whether sponsorship costs should be recovered from revenue included in the CPP.

## APPENDIX A20

PROGRAMME NAME: CORPORATE INFORMATION SYSTEMS (CPP164)

OPEX CATEGORY: GENERAL MANAGEMENT, ADMINISTRATION AND OVERHEADS

## A20.1 PROGRAMME DESCRIPTION

The \$15.2 million programme includes expenditure for operating and maintaining Orion's business information systems, data and personal communications, productivity software and physical computer infrastructure, and the salaries of the information solutions group.

The programme can be disaggregated into three separate areas:

*Corporate line-of-business systems and productivity software*

Corporate line-of-business systems and productivity software support cross-organisational processes within Orion. These include financial systems, employee management systems (e.g. HR, Payroll, Health and safety) and personal productivity software (desktop applications, email, web and document management).

The costs in this section are largely related to 20% of the cost of software licenses. This portion of the software license is attributed to maintenance including patches and fixes as well as a small component that pays for support. The bulk of the license payment (80%) is regarded as a prepayment for future upgrades and therefore appears in the capex budgets.

There are no significant step changes in these costs during the forecast period.

*Physical computer infrastructure*

Orion's computer infrastructure:

- hosts its information systems;
- maintains the connections between systems required for an integrated environment; and
- provides the networks and devices for users' access to its information systems.

It is Orion's policy to own and manage computer infrastructure rather than outsource to third parties because of the critical nature of some of its information systems and the need for them to be continuously connected in real time to equipment on the electricity network.

Orion has few maintenance agreements associated with hardware, typically choosing to manage maintenance ourselves or to ensure that equipment is current and within warranty.

There are no significant step changes in costs during the review period.

*Information Solutions*

Salaries represent around 50% of overall costs in this category. Changes (increases and decreases) in this review period reflect the retirement of a number of key employees and Orion's response to provide continuity of service.

Information Solutions is an "in-sourced" service provider of all IT and business change-related activities. The group is comprised of a business change / software development section, an infrastructure section and a section dedicated to the administration of control systems.

Information Solutions workload is forecast to remain stable over the forecast period but salary expenditure is forecast to rise slightly in FY13 and FY17 as new staff are recruited to train alongside and then replace key employees that are forecast to retire.

The increase in FY13 is also due to increased software license costs for the recently installed network management system. Up until FY13, GIS, PowerOn and the Foxbro Load Management System have been included as part of normal software maintenance. From FY14 onwards, PowerOn and Foxbro software maintenance costs are included with Load Management Systems (CPP121) and GIS will be included with information solutions – asset management systems scheduled maintenance programme (CPP122) and information solutions – asset management systems replacement programme (CPP42). The drop in the forecast expenditure from FY14 onwards is due to the transfer of these costs to CPP121, CPP122 and CPP42.

## **A20.2 INFORMATION PROVIDED**

Table A20.1 below presents the information that has been provided by Orion in relation to the identified programme:

<b>Title</b>	<b>Reference #</b>	<b>Date</b>
Programme Summary	Version 5	15 November 2012 <sup>1</sup>
Human Resources Policy	OR00.00.05	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Fraud and Theft Policy	OR00.00.08	6 June 2012
Motor Vehicle	OR00.00.09	6 June 2012
Information Systems	OR00.00.13/1	6 June 2012
Procurement	OR00.00.19	6 June 2012

Note 1: The project summary was revised for the final CPP proposal but the document control was not updated. We have relied on the revised summary for this Appendix.

## **A20.3 DELIVERABILITY**

Orion has indicated that the management of computer infrastructure is done in-house and the major risk to programme deliverability is the retirement or resignation of key personnel. Orion, however, indicates it is developing a succession plan to ensure that gaps due to the retirement of personnel are addressed.

## **A20.4 RELEVANT POLICIES AND PLANNING STANDARDS**

The relevant policies and documents that apply to the Information Solutions group are:

- Statement of Corporate Intent;
- Business plan and financial forecasts;
- Health and safety policies;
- Emergency management;
- Key governance control policies as follows:
  - Delegations of Authority OR00.00.11
  - Human Resources OR00.00.05
  - Fraud and Theft OR00.00.08
  - Employee Travel OR00.00.04

- Motor Vehicle OR00.00.09
- Information Systems OR00.00.13/1
- Housekeeping OR00.00.05
- Procurement OR00.00.19

## A20.5 KEY ASSUMPTIONS USED

The key assumption is that budget costs in FY13 will apply through the forecast period with no material change in real terms, apart from the expenditure reallocations in FY14. This implies that it will be business as usual throughout the forecast period and there will be no material changes in expenditure requirements over this time. This assumption is reasonable in the absence of contrary information.

The apparent reduction in expenditure between FY13 and FY14 is due to the reallocation of costs for network management support software, including the PowerOn network management system, the GIS and the Foxboro load management system from corporate to network expenditure.

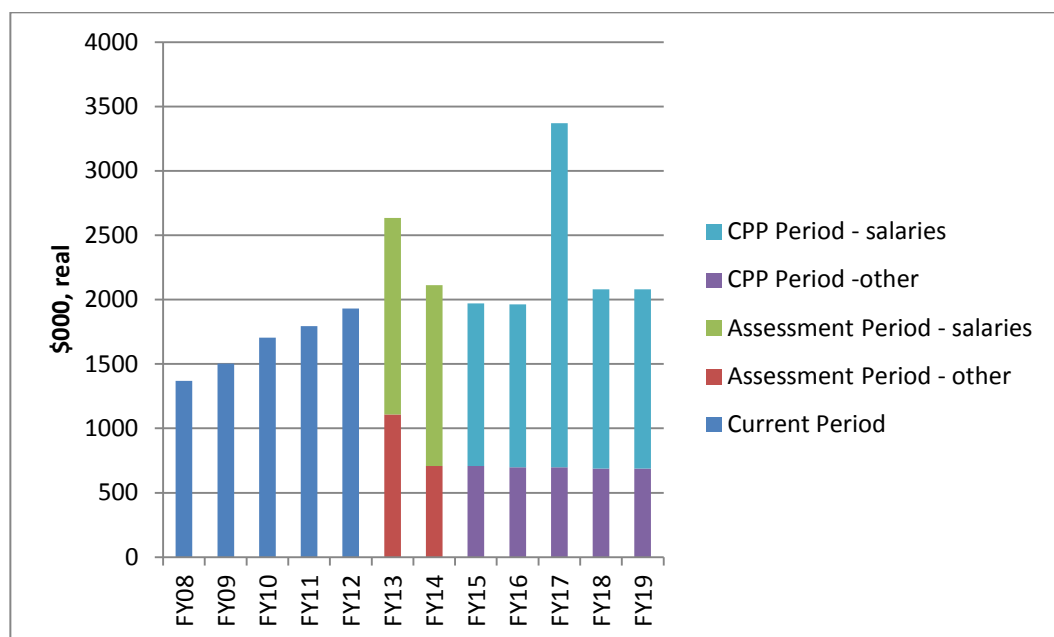
## A20.6 ASSESSMENT OF THE METHODOLOGY USED

Table A20.2 and Figure A20.1 below presents the historic and forecast expenditure proposed for this project in real 2013 dollar terms:

**Table A20.2: Actual and Forecast Expenditure (\$000, real)**

Current Period						
FY08	FY09	FY10	FY11	FY12		
1,368	1,503	1,705	1,794	1,930		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
2,634	2,111	1,971	1,962	2,370	2,079	2,079

**Figure A20.1: Actual and Forecast Expenditure (\$000, real)**





The programme summary indicates that the FY13 budget was prepared on a bottom up basis during FY12. Forecast expenditure for subsequent years is based on the FY13 budget. As is apparent from Figure A20.1, for most forecast years more than 65% of department costs are salaries. It is clear from the project summary that the forecast took account of how staffing might change over the forecast period and in particular took account of the need to manage the replacement of potential retirees. The higher salary cost projected for FY17 provides for a perceived need for a lengthy handover period prior to the retirement of experienced and long standing staff.

#### **A20.6.2 Historical Cost Trends**

As can be seen from Figure A20.1, the pre-earthquake cost of the programme has progressively increased in real terms, from \$1.39 million in FY08 to \$1.71 million in FY10, an increase of 23% in just two years. There has been a further increase of 13% to \$1.93 million in FY12. Orion has indicated that these increases relate to the implementation of new network software, including the PowerOn project (2009-2013), Upper South Island Load Management(2010), a GIS upgrade (2011), and also to the Microsoft Dynamics NAV FMIS that was implemented in 2010<sup>59</sup>.

#### **A20.6.3 Material Changes to Work Volumes**

Operating costs for network software will be transferred to the networks section from FY14 and this is the explanation for the forecast reduction in expenditure from FY13 to FY14.

#### **A20.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A20.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

#### **A20.6.6 Contingency Factors**

No contingency factors have been included in this project.

#### **A20.6.7 Step Changes from Historical Costs**

The step increase in expenditure from FY13 is due to:

- an increase of salaries of \$290,000 due to a redundancy and three new employees recruited during the year;
- a reduction of \$40,000 in recoveries to capital projects as we expect that the software developers will not contribute to any capital projects during FY13.
- an increase of \$80,000 in consultancy costs. Orion expects that consultancy costs will increase due to the new software it is installing requiring significantly more outside assistance to maintain and integrate with our systems. For example Orion now has significant dealings with General Electric due to the PowerOn system.
- an increase of \$140,000 in the cost of interdivisional sales. This is due to a change in an accounting policy. The telephony costs used to be spread across the business units, but are now all recognised in this programme.

<sup>59</sup> Response to verifier question A44.

- An increase of \$170,000 in the cost of licensing the PowerOn and GIS systems. These are a required and set cost of running these systems. These costs have been delayed following the installation of the systems as there is a period of 1-2 years following installation where no licensing fees are payable.

We have some concerns about this rationale. The rapid and progressive increase in costs prior to FY13 is largely due to increases in the cost of supporting network software, which are costs that will be transferred to other programmes from FY14. Also FY13 saw the recruitment of three new staff members and an increase of \$80,000 in consultancy costs even though it is expected that "the software developers will not contribute to any capital projects during FY13". The only justification provided for this in the programme summary is:

*We expect that there will be an increase in business activity in areas of the business associated with recovery and new developments (central city and new subdivisions). Apart from scale we do not expect there will be a significant change in the kinds of activities undertaken.*

It appears to us that a primary aim of the forecast was to measure the cost of retaining the existing staffing levels and little consideration has been given to whether this level of staffing is still appropriate, given the expected work volumes going forward. This would suggest that the forecast salary costs for FY14 and beyond are high.

We have not pursued this further since any reduction is unlikely to be more than about \$250,000 per annum, which we do not consider material in the context of the total opex forecast.

## **A20.7 CONCLUSION**

We think that the forecast salary costs in FY14 and beyond could be high.

## APPENDIX A21

**PROGRAMME NAME:** CORPORATE - COMMERCIAL (CPP165) AND SPECIAL PROJECTS (CPP171)

**OPEX CATEGORY:** GENERAL MANAGEMENT, ADMINISTRATION AND OVERHEADS

### A21.1 PROGRAMME DESCRIPTION

As indicated in Section 4, we identified CPP165 for detailed review, in accordance with clause G3 of the IM. However, the programme summary provided by Orion covered both CPP165 and CPP171 and we have therefore reviewed both programmes in this appendix.

Forecast expenditure on these programmes totals \$20.0 million and includes the salaries and overheads of the commercial team, which is responsible for billing; pricing review and development (including market monitoring); monitor, submit and manage regulatory matters; and managing commercial matters. CPP165 covers the routine expenditure incurred in undertaking these commercial functions while CPP171 covers non-routine expenditure. This non-routine expenditure is related primarily to the regulatory function and includes the cost of participating in regulatory consultation programmes and costs associated with the preparation of the CPP application.

In the aftermath of the earthquake Orion identified a need place greater focus on the management of stakeholder communications and in FY13 the commercial function was split in two, with communications and stakeholder engagement becoming the responsibility of a new General Manager, Communications and Engagement. This role includes responsibility for the management of stakeholder communications programmes, the preparation of the annual and other reports, and sponsorship. Hence, while communications costs are included in CPP165 up to and including FY13, from FY14 these costs are allocated to a new communications and engagement line item, CPP166.

### A21.2 INFORMATION PROVIDED

Table A21.1 below presents the information that has been provided by Orion in relation to the identified programmes:

**Table A21.1: Information Provided**

Title	Reference #	Date
Programme Summary	Version 5	1 November 2012 <sup>1</sup>
Asset Management Policy	NW70.00.46	30 October 2012
Contract Management Policy	NW73.00.03	8 March 1999
10-year Asset Management Plan	-	1 April 2012
Human Resources Policy	OR00.00.05	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Fraud and Theft Policy	OR00.00.08	6 June 2012
Motor Vehicle	OR00.00.09	6 June 2012

Note 1: The project summary was revised for the final CPP proposal but the document control was not updated. We have relied on the revised summary for this Appendix.

### A21.3 DELIVERABILITY

It has been indicated that Orion has a very lean regulatory team (1 FTE) and this is augmented with independent experts when required.

We note that Orion was able to engage an expert to provide advice on the price and quality control and information disclosure requirements in the past and therefore we foresee that there will be no issues in the deliverability of the project in FY13, FY14 and

FY19 when expenditure levels are forecasted to increase significantly and expert services will be required.

#### A21.4 RELEVANT POLICIES AND PLANNING STANDARDS

The forecast has been prepared on the basis that the commercial team will continue to comply with all relevant policies and planning standards.

#### A21.5 KEY ASSUMPTIONS USED

The key assumption is that budget costs for FY14 will continue through the forecast period with no material change in real terms, apart from the expenditure reallocations in FY14 and the one-off provisions relating to the CPP application and the transition from a CPP to a DPP at the beginning of FY20. This implies that it will generally be business as usual throughout the forecast period and there will be no material changes in expenditure requirements over this time. This assumption is reasonable in the absence of contrary information.

#### A21.6 ASSESSMENT OF THE METHODOLOGY USED – CPP165

##### A21.6.1 Forecast Expenditure

Table A21.2 presents the historic and forecast expenditure proposed for this programme in real 2013 dollar terms.

**Table A21.2: Actual and Forecast Expenditure CPP165 (\$000, real)**

CPP165 Commercial & Regulatory - Current Period						
FY08	FY09	FY10	FY11	FY12		
2,196	2,243	2,477	2,560	1,939		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
1,461	1,961	1,961	1,991	1,961	1,961	1,961

It appears that Orion has prepared this budget by forecasting its costs for FY14 from the bottom up at the general ledger account level and then applied the key assumption that there will be no material change in expenditure, measured in real terms, over the remainder of the forecast period. While actual costs in previous years will have influenced Orion's view of its 2014 requirements, two other factors have been taken into account:

- In FY11, FY12 and probably FY13, some commercial department costs have been considered earthquake related and included in CPP171. This applies particularly to communications expenditure; and
- From FY13 Orion established a separate in-house communications department, headed by a General Manager, Communications and Engagement. Costs associated with this department are no longer included in CPP165 and are now included in CPP166.

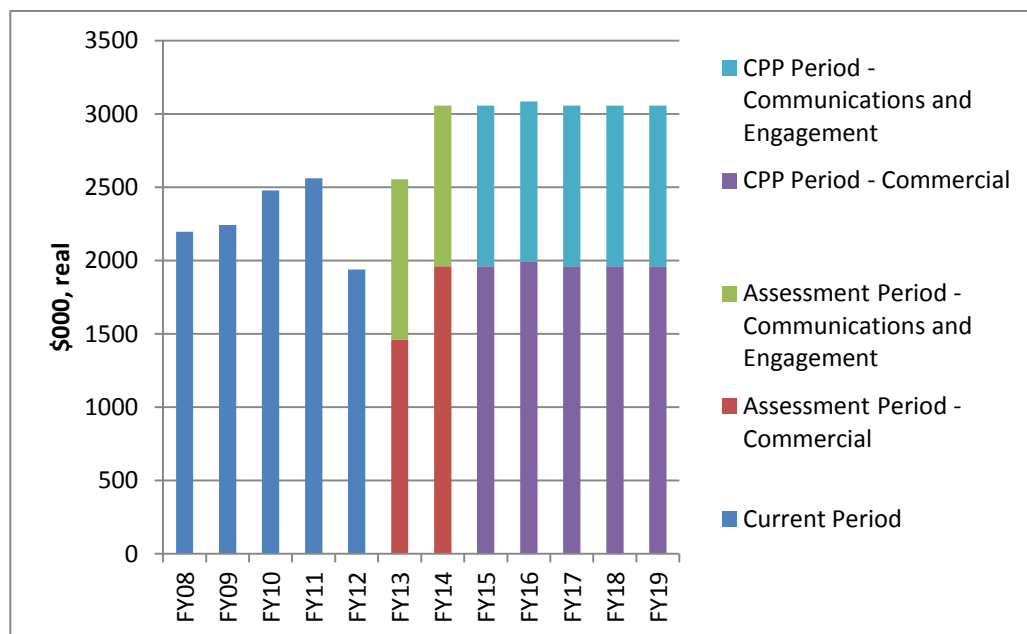
We requested further information from Orion and were advised that FY11 and FY12 were not good years for comparison and therefore:

*...for these activities it is best we compare 2010 with 2013 or 2014 – and of course the world has changed dramatically in the duration. Post-quake and with a CPP [proposal] underway the environment has simply changed, and the need for us to engage with and inform our customers has expanded – as signalled by the return in-house of a GM Communications and Engagement. We considered*

*FY13's budget in light of our new circumstances, and believe a similar level is appropriate in FY14 and beyond<sup>60</sup>.*

Given the split of the commercial function into two departments in FY13, it is not valid to compare historic and forecast costs unless CPP165 and CPP166 are considered in aggregate. This aggregated comparison of historical and forecast expenditure is shown in Figure A21.1. On aggregate the forecast expenditure is 33% higher than the average annual level over the period FY08-FY10. In addition there is a new General Manager, Communications and Engagement, whose costs are included in the corporate budget.

**Figure A21.1: Aggregate Costs – CPP165 and CPP166**



#### A21.6.2 Historical Cost Trends

As can be seen from Figure A21.1, commercial and communications expenditure increased by about 13% in real terms over the two-year period FY08-10 but then levelled out in FY11 and decreased significantly in FY12. We think this trend reversal in FY11 and FY12 was due to the recognition of expenditure in the special earthquake line item CPP171 rather than an actual expenditure reduction. In fact, we would have expected actual expenditure in this area to have increased in the aftermath of the earthquakes. We also acknowledge that some relevant FY13 costs may have been recognised in CPP171.

#### A21.6.3 Material Changes to Work Volumes

It would be misleading to correlate work volumes with reported expenditure for FY11-FY13 because of the allocation of earthquake related expenditure to CPP171. From FY14, we understand that all costs will be allocated to either CPP164 or CPP165 and CPP171 will no longer be used. We would therefore expect the apparent work volume to increase from FY14 onwards and this is reflected in Figure A21.1.

#### A21.6.4 Step Changes from Historical Costs

As noted in Section A21.6.1, the aggregated commercial and communications costs are forecast to increase by 33% over the average annual level for the period FY08-FY10. Furthermore there is an additional general manager working in this area, whose costs are included in the corporate budget.

<sup>60</sup> Response to verifier question PN50.

We think this would be excessive in a business as usual scenario. However, the environment has changed post-earthquake and there is a need to “sell” the CPP proposal and its pricing implications to stakeholders. In the short term will also be a need to manage the interface between Orion's network infrastructure and the earthquake rebuild activity. Given that this is an abnormal situation, there are no benchmarks available to help us assess whether or not the Orion's short term forecast is reasonable. However, we would expect the resources required to manage the rebuild interface to diminish over time – well within the forecast period. The forecast does not reflect this.

#### **A21.6.5 Sponsorships**

While the General Manager, Communication and Engagement is responsible for Orion's sponsorship programme, the Jade Stadium sponsorship is allocated to the corporate management opex line item (CPP160) in what appears to be a historical anomaly. This sponsorship is discussed in Appendix A19.

Other sponsorship expenditure primarily involves support of Community Energy Action, a Christchurch based charitable trust dedicated to improving energy efficiency in the homes of low income earners, which (according to its web site) Orion has supported since 1994. Sponsorship expenditure, excluding the Jade Stadium sponsorship, averaged approximately \$200,000 per year over the period FY08-FY12, and is forecast to be \$275,000 per year over the next period<sup>61</sup>.

#### **A21.7 ASSESSMENT OF THE METHODOLOGY USED – CPP171**

The special projects budget (CPP171) appears to be primarily intended to cover the abnormal costs, and in particular external consultancy costs, of regulatory engagement, particularly with the Commerce Commission and the Electricity Commission.

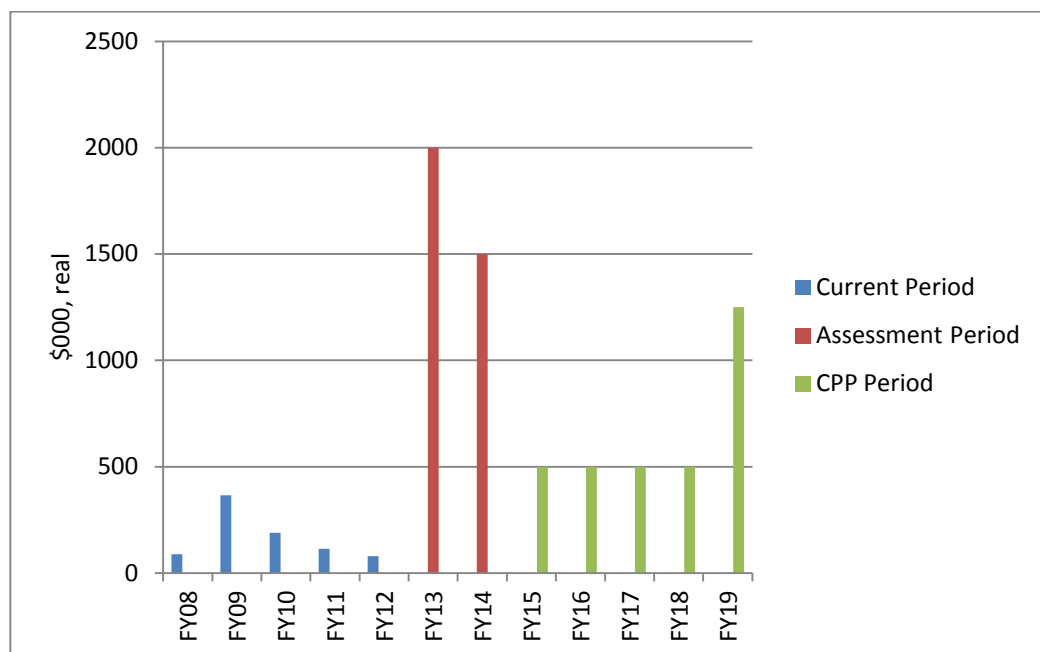
##### **A21.7.1 Forecast Expenditure**

Table A21.3 and Figure A21.2 present the historical and forecast special projects expenditure.

**Table A21.3: Actual and Forecast Expenditure CPP 171 (\$000, real)**

CPP171 Special Projects - Current Period						
FY08	FY09	FY10	FY11	FY12		
88	365	190	114	80		
Assessment Period		Forecast Period				
FY13	FY14	FY15	FY16	FY17	FY18	FY19
2,000	1,500	500	500	500	500	1,250

<sup>61</sup> Responses to verifier questions A45-A46.

**Figure A21.2: Actual and Forecast Expenditure CPP 171 (\$'000, real)****A21.6.2 Historical Cost Trends**

Expenditure over the period FY08-FY12 relates to the costs of participating in regulatory consultation programmes, including those initiated by the Commerce Commission, and we understand is comprised primarily of consultancy fees.

**A21.6.3 Material Changes to Work Volumes**

Orion has stated that the forecast includes a contingency of \$500,000 per year over the period FY14-FY19 for regulatory consultation costs and other special projects. The \$2 million in FY13 is the estimated cost of preparing the CPP application and there is a provision of \$1 million in FY14 to support the Commission's review of this application. There is also a provision of \$750,000 in FY19 for regulatory costs associated with the transition from the CPP back to a DPP.

Orion considers that costs associated with the preparation and review of its CPP application are difficult to forecast and notes that the cost of preparing the CPP proposal is already higher than budgeted. We don't doubt this. While the bulk of Orion's CPP costs are likely to be spent in preparing the application, which will be completed in FY13, it will still need to engage with the Commission as it considers the application and respond to the draft determination. The provision will also need to cover the Commission's costs, which are not known at this stage.

We consider it reasonable that Orion continue to actively participate in the regulatory consultation process and consider that previous contributions have been well reasoned and useful. However, over the period FY08-FY10 Orion's expenditure on regulatory participation ranged from \$88,000 (real) in FY08 to \$365,000 (real) in FY09. The average expenditure was \$214,000. On this basis we consider the provision of \$500,000 for each year of the forecast period excessive.

There is also a provision of \$750,000 to cover Orion's input to the regulatory process of transitioning from a CPP to a DPP. We don't consider this unreasonable, given the current lack of clarity as to what this will involve.



**A21.8 OTHER MATTERS**

**A21.8.1 Alternative Programmes Considered**

No alternative programmes were considered.

**A21.8.2 Cost-Benefit Analyses**

No cost benefit analysis has been provided.

**A21.8.3 Contingency Factors**

No contingency factors have been included in these programmes, apart from the special projects contingency included in CPP171 and discussed in Section A21.7

**A21.7 CONCLUSION**

The forecast expenditure for CPP165 seems reasonable. It is difficult to assess whether or not the short term forecast expenditure for CPP166 is reasonable because in the aftermath of the earthquake there is no suitable benchmark against which the forecast can be measured. However, we do think these costs should reduce over time and this reduction is not reflected in Orion's forecast.

The \$500,000 special projects contingency provision included in CPP171 for the years FY14-FY19 seems high given that it is 134% higher than the average actual expenditure of \$214,000 over the period FY08-FY12.

**APPENDIX A22****PROGRAMME NAME: INFRASTRUCTURE MANAGEMENT (CPP167)****OPEX CATEGORY: SYSTEM MANAGEMENT AND OPERATIONS****A22.1 PROGRAMME DESCRIPTION**

This \$110.5 million programme covers the operating cost of the system management and operations group, which is responsible for the engineering management and operation of the Orion network. This group includes 75% of the company's current employees and represents approximately 25% of Orion's total annual opex. The main support activities undertaken by the group include:

- safety and risk management;
- lifecycle management;
- network strategic planning;
- network asset management;
- operations management; and
- engineering support.

**A22.2 INFORMATION PROVIDED**

The table below presents the information that has been provided by Orion in relation to the identified programme:

**Figure A22.1: Information Provided**

Title	Reference #	Date
Project Summary	Version 4	- <sup>1</sup>
Disaster Resilience Summary	NW70.00.14	31 May 2012
Network Code	NW70.00.15	4 August 2009
Document Control	NW70.50.03	30 October 2012
Asset Risk Management Plan	NW70.60.02	21 November 2005
Contract Management Policy	NW73.00.03	8 March 1999
Authorised Contractors	NW73.10.15	17 October 2005
Communication System	NW74.23.21	17 July 2007
Health and Safety Policy	OR00.00.01	6 June 2012
Environmental Sustainability Policy	OR00.00.03	6 June 2012
Human Resources Policy	OR00.00.05	6 June 2012
Fraud and Theft Policy	OR00.00.08	6 June 2012
Motor Vehicle Policy	OR00.00.09	6 June 2012
Delegations of Authority Policy	OR00.00.11	6 June 2012
Procurement Policy	OR00.00.19	6 June 2012
Information Systems Policy	OR00.00.13/1	6 June 2012
10-year Asset Management Plan	-	1 April 2012

Note 1: The project summary was revised for the final CPP proposal but the document control was not updated. We have relied on the revised summary for this Appendix.

### **A22.3 DELIVERABILITY**

The proposed project spend is relatively fixed over the forecast period as it relates mostly to remuneration of current personnel. It has been indicated that any additional employees will be recruited using normal human resource practices.

Priority has been given to additional expenditure which will reduce the burden for employees who have high challenging workloads. This is proposed to be addressed through employing additional personnel where required.

We think the forecast is deliverable provided Orion is able to recruit the additional staff it requires, particularly in the early part of the forecast period.

### **A22.4 RELEVANT POLICIES AND PLANNING STANDARDS**

Orion has indicated several policy documents that were used as the basis for the forecast expenditure. It is, however, unclear how all these policies were taken into account. Furthermore, Orion indicated that there are no policies or guidelines to assist with the development of the forecast or projected staff numbers. Rather, Orion states that planning is done as part of their annual estimating cycle from which an annual plan and budgets are produced.

It is, however, worth noting that 85% of the cost for this project is for employee remuneration while the remaining 15% is made up of training, vehicle equipment, uniform costs, and recruitment costs. Given that the salaries of personnel have remained at the FY12 level, then the only relevant forecast related planning policies that would have an effect on the forecast is for the remaining 15%.

### **A22.5 KEY ASSUMPTIONS USED**

In calculating the forecast expenditure Orion has made the following assumptions:

- The job market will reasonably similar to FY12, and remuneration levels do not significantly change in real terms;
- There will be continued investment in technology;
- There will be a continuation of higher post-earthquake levels of communication with customers;
- There will be a similar regulatory environment;
- There will be an increase in business activity in areas of the business associated with recovery and new developments (central city and new subdivisions);
- FTE employees who leave are able to be replaced with a suitable candidate in a timely manner;
- The earthquake recovery will not be fully complete by FY19;
- The majority of current full time employees will stay on for the medium to long term.

We think that for forecasting purposes these assumptions are reasonable, although we would expect that the resource that needs to be allocated to earthquake recovery activities will peak in the early part of the forecast period and reduce over time.

**A22.6 ASSESSMENT OF THE METHODOLOGY USED**

In the calculation of the forecast expenses due to the increase in employees, Orion has used the FY12 remuneration for full time employees. All other additional expenditure (recruitment, vehicle, etc.) have been calculated using historical averages.

Orion has highlighted the need to use highly skilled and experienced staff to undertake the required activities for this project. While hiring temporary employees or contractors has been considered as an alternative, Orion is of the view that the most appropriate alternative is to hire full time employees given that it has become significantly more difficult to attract staff with the relevant skills and experience on a temporary basis.

Orion indicated that the requirement for additional full time employees was determined by each of the section managers reviewing their forward needs on a year by year basis. The section managers were required to prepare work volume estimates based upon increasing workloads driven by customer demand in support of new recruits. Consideration was given throughout this assessment to limiting the overtime or additional hours worked by employees as a key health and safety objective.

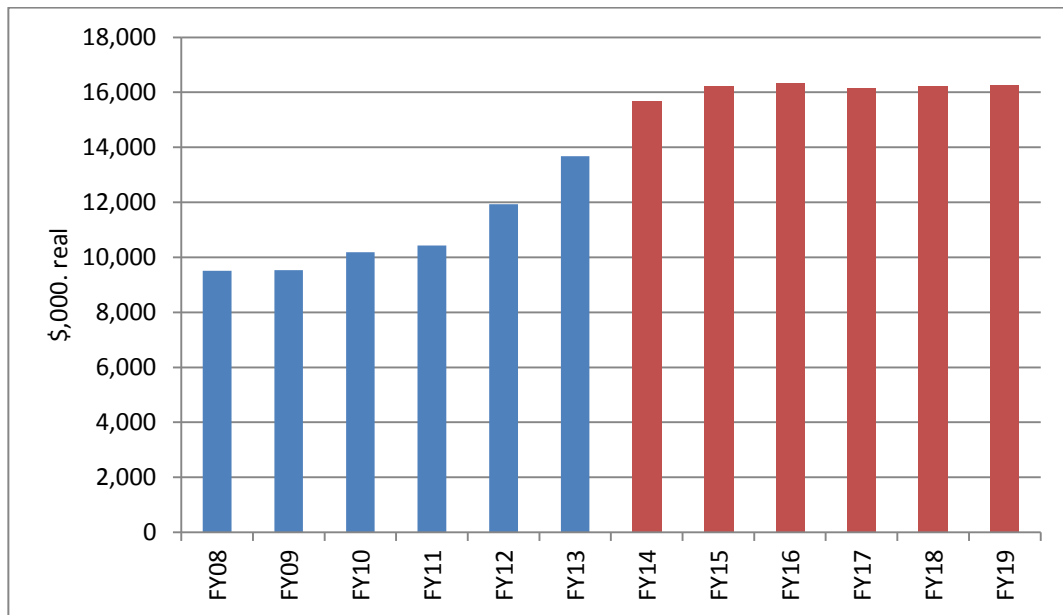
Regarding the impact of earthquake recovery has on the number of additional employees required employees, Orion experience is the on the basis of the progress made to date it is becoming more apparent that the full recovery will be take five years or longer rather than the originally estimated three years. Its experience to date is that more issues than previously anticipated are arising and stakeholder expectations are higher than anticipated. Orion states that the recovery progress so far has been slow and has been impeded by insurance problems, EQC negotiations and other planning delays.

**A22.6.1 Forecast Expenditure**

Table A22.2 and Figure A22.1 present the historic and forecast expenditure for this programme in real 2013 dollar terms:

**Table A22.2: Actual and Forecast Expenditure (\$000, real)**

Current Period							
FY08	FY09	FY10	FY11	FY12			
9,506	9,531	10,186	10,433	11,930			
Assessment Period		Forecast Period					
FY13	FY14	FY15	FY16	FY17	FY18	FY19	
13,681	15,665	16,226	16,326	16,160	16,208	16,276	

**Figure A22.1: Actual and Forecast Expenditure (real)**

It is clear that there were substantial increases in expenditure over the period FY11-FY13 as a result of the earthquakes. Even so, expenditure is forecast to increase by a further 19% through to FY19.

#### **A22.6.2 Historical Cost Trends**

In June 2010 there were 108 staff under this expenditure category with an approximate cost per employee of \$88,000 including non salary costs and based on the FY09 spend. This had increased to 131 by December 2012 with an approximate cost of \$104,000 per employee (with both costs being measured in real 2013 dollars). We are not surprised at this apparent 18% increase in real costs given the need for Orion to recognise the achievements of its staff under very difficult conditions.

#### **A22.6.3 Material Changes to Work Volumes**

We have not measured work volumes directly. However, Orion has indicated a need to reduce the pressure under which its staff are expected to operate and therefore we would not expect work volumes to increase at the same rate as staff costs.

#### **A22.6.4 Alternative Programmes Considered**

No alternative programme was considered.

#### **A22.6.5 Cost-Benefit Analyses**

No cost benefit analysis has been provided as part of this project.

#### **A22.6.6 Contingency Factors**

No contingency factors have been included in this project.

#### **A22.6.7 Step Changes from Historical Costs**

After increasing staff numbers by 23 to 131 over the period FY09-FY13 Orion is proposing to increase staff numbers by almost as much again, to 151 by FY16 and to

remain at this staffing level through to FY19<sup>62</sup>. The primary reasons given by Orion for the proposed increase in staff numbers are earthquake recovery; increasing safety compliance; development of a CBRM approach; and support for protection systems.

In assessing whether this is reasonable two issues need to be considered; firstly whether the proposed additional staff are actually required and secondly whether the proposed expenditure is a fair reflection of the cost of running the larger department.

Given the time available to us we were unable to assess the need for an additional 20 FTE staff by FY16. However, even if the earthquake rebuild continues for longer than currently planned, as anticipated by Orion, we would expect the volume of rebuild activity to abate toward the end of the forecast period. This abatement is reflected in the Orion's own CPP forecasts – Figure 5.1 (network capex) and Figure 6.3 (scheduled maintenance opex) both reflect this. However, in suggesting that staff numbers must be sustained at their peak through to the end of the CPP period, Orion is arguing that its own forecast reduction in activity will have no impact on the work within its system management and operations department. We do not accept this, and consider that the forecast staff numbers in the final years of the forecast period are high. We are not suggesting that staff be engaged as temporary contractors or made redundant as we anticipate that reductions in the total can be managed through attrition and reallocation of work.

The second issue is whether, given the proposed staff numbers, the forecast expenditure is reasonable. While the required expenditure is forecast to increase by 19% between FY13 and FY19, staff numbers are forecast to increase by only 15% (from 131 to 151). The cost per staff member (including non-salary costs) is forecast to increase from \$104,000 in FY13 to \$108,000 in FY08, representing real cost escalation of almost 4%. If a portion of the non-salary costs are considered fixed, then the real cost escalation built into the variable cost component of the forecast will be slightly higher.

In our view, Orion should not be allowing for real cost escalation in this forecast as this should be the function of the cost escalators used to convert from real to nominal. Furthermore labour cost escalation should be considered at an enterprise rather than an individual level. While existing staff may be granted regular real salary increases, at an enterprise level this cost increase is offset (to a greater or lesser extent) by the regular replacement of senior or experienced staff with more junior staff with lower salary levels.

## **A22.7 CONCLUSION**

We are unable to form a view in the time available on whether or not the proposed increase in staff numbers in the early part of the forecast period is reasonable. However, we would expect staff numbers to reduce in the later years of the forecast period, and this is not the case. We also note a small but material real cost increase in Orion's forecast when it is the function of the cost escalators to capture increases of this nature.

We therefore consider that Orion's forecast system management and operations opex to be high, particularly in the later years of the forecast period.

<sup>62</sup> Information provided by Orion on staffing levels is not fully consistent. The table on p14 of the programme summary shows a staffing level of 151 if the five "technical engineers" are included and this is conformed in the response to verifier question PN102. However the table on p68 of the programme summary shows only 145 employees. Orion state in the response to the verifier question that "technical engineers" are funded from the CPP167 budget but utilised across the business.

**Geoff Brown & Associates Ltd**

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18 February 2013

**VERIFICATION CERTIFICATE**

We certify that:

- i. the relevant parts of the customised price path proposal prepared by Orion New Zealand Ltd and dated 30 January 2013 have been verified by us and a verification report was prepared in accordance with Schedule G of the Electricity Distribution Services Input Methodologies Determination 2012; and
- ii. the findings from this verification are documented in Geoff Brown and Associates Ltd report titled *Orion's Customised Price Path Application Verification Report* and dated 18 February 2013.

This certificate is provided in accordance with the requirements of clause 5.1.3(1)(b)(iii) of the Commerce Commission's Electricity Distribution Services Input Methodologies Determination 2012.

**GEOFF BROWN AND ASSOCIATES LTD**



**G F Brown  
DIRECTOR**



# Appendix 8

## Audit report

## **Independent Auditor's Report**

### **To Orion New Zealand Limited and to the Commerce Commission**

The Auditor-General is the auditor of Orion New Zealand Limited (the Company). The Auditor-General has appointed me, Scott Tobin, using the staff and resources of Audit New Zealand, to provide an opinion, on her behalf, on the extent to which the Customised Price-Quality Path Proposal (the CPP Proposal) prepared by the Company and dated 19 February 2013 complies with the Electricity Distribution Services Input Methodologies Determination 2012 (the Determination).

#### **Company's responsibilities**

The Company, being the CPP applicant, is responsible for the preparation of the CPP Proposal in accordance with the Determination, and for such internal control as is necessary to enable the preparation of the CPP Proposal that is free from material misstatement, whether due to fraud or error.

#### **Auditor's responsibilities**

Our responsibility is to express an audit opinion on the CPP Proposal, as required by clauses 5.1.4 and 5.5.3 of the Determination. We conducted our audit in accordance with the External Reporting Board Standard on Assurance Engagements 3100: *Compliance Engagements*. This standard requires that we comply with ethical and quality control requirements and plan and perform the audit to obtain reasonable assurance as to whether or not:

- (a) as far as appears from an examination of them, the Company has kept proper records to enable the complete and accurate compilation of information required by Subpart 4 of the Determination;
- (b) in the case of actual financial information relating to the 'current period', that information has been prepared in all material respects in accordance with the Determination;
- (c) in the case of forecast financial information relating to the 'next period', that information has been compiled in all material respects in accordance with the Determination and with the records examined pursuant to paragraph (a); and
- (d) in the case of quantitative information provided in spreadsheets, that information is accurately presented.

An audit involves performing procedures to obtain audit evidence about the matters on which we are required to form an opinion. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the CPP Proposal, whether due to fraud, error or non-compliance with the Determination. In making those risk assessments, the auditor considers internal control relevant to the Company's preparation of the CPP Proposal in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.

## **Limitations of the audit**

### ***General limitations***

Because of the inherent limitations in evidence gathering procedures, it is possible that fraud, error or non-compliance with the Determination may occur and not be detected. As the procedures performed for this audit are not performed continuously throughout the year and the procedures performed in respect of the Company's compliance with the Determination are undertaken on a test basis, our audit cannot be relied on to detect all instances where the Company may not have complied with the Determination. Our opinion has been formed on the above basis.

### ***Our examination of the Company's records***

For the purpose of forming our opinion as to whether or not, as far as appears from an examination of them, proper records have been kept to enable the complete and accurate compilation of information required by Subpart 4 of the Determination, we carried out the following work:

- Our work on the records underlying historical information was limited to assessing the design of the Company's systems, processes, procedures and records and in carrying out limited tests to assess whether the Company's systems, processes and procedures were operating as intended.
- Our work on the records underlying forecast information was limited to assessing whether adequate documentation had been retained that records the assumptions underlying the forecasts and that shows how the assumptions had been applied to produce forecast financial information, in accordance with the Determination.

### ***Assessing whether actual financial information has been prepared in accordance with the Determination***

The work we carried out, for the purposes of assessing whether the actual financial information relating to the 'current period' has been prepared in all material respects in accordance with this Determination, was limited as follows:

- Work in respect of amounts and disclosures that were audited under the financial statement and default price-quality path compliance statement audits was limited to agreeing the amounts and disclosures to the underlying records, and, where possible, to the audited financial statements or to the default price-quality path compliance statements of the Company, and that the information presented has been prepared in accordance with the Determination, in all material respects.
- Work in respect of amounts and disclosures that were not audited under the financial statement and default price-quality path compliance statement audits was planned and performed to obtain all the information and explanations we considered necessary in order to obtain reasonable assurance that the actual financial information relating to the current period has been prepared in accordance with the Determination, in all material respects.

***Assessing whether forecast financial information has been prepared in accordance with the Determination and with the Company's records***

For the purpose of forming our opinion on whether or not, in the case of forecast financial information relating to the 'next period', that information has been compiled in all material respects in accordance with the Determination and with the Company's records, our procedures were limited to checking that the forecast financial information had been calculated in accordance with the assumptions adopted by the Company and in checking that the forecast financial information complies with the Determination, in all material respects.

We have not assessed the reasonableness of the assumptions adopted by the Company. Actual results are likely to be different from the forecast financial information since anticipated events frequently do not occur as expected and the variation could be material. Accordingly we express no opinion as to whether results consistent with the forecast financial information will be achieved.

***Quantitative information provided in spreadsheets***

For the purpose of assessing whether for quantitative information provided in spreadsheets that information is accurately presented, our procedures were limited to checking that the spreadsheets reflected the historical information and forecast information required by the Determination, in all material respects. That information is subject to the limitations noted in the preceding paragraphs.

We also assessed whether the spreadsheets submitted accompanying the CPP Proposal were the final spreadsheets prepared, and were materially consistent with the content of the CPP Proposal.

**Use of this Independent Auditor's Report**

This independent auditor's report has been prepared solely for the Company and the Commissioners of the New Zealand Commerce Commission (the Commissioners). We disclaim any assumption of responsibility for any reliance on this report to any persons or users other than the Company and the Commissioners, or for any purpose other than that for which it was prepared.

**Independence**

We have no relationship with, or interests in the Company other than carrying out the annual audit and in providing regulatory reports to the Commerce Commission, which are compatible with those independence requirements.

**Information and explanations sought to complete our audit**

We confirm that we have obtained all information and explanations that we required to undertake our audit.

## **Our opinions**

In our opinion, as far as appears from an examination of them and subject to the limitations of the audit noted above, the Company has kept proper records to enable the complete and accurate compilation of information required by Part 5 Subpart 4 of the Determination.

In our opinion, in the case of actual financial information relating to the 'current period' and subject to the limitations of the audit noted above, that information reported in the CPP Proposal dated 19 February 2013 has been prepared in all material respects in accordance with the Determination.

In our opinion, in the case of forecast financial information relating to the 'next period' and subject to the limitations of the audit noted above, that information reported in the CPP Proposal dated 19 February 2013 has been compiled in all material respects in accordance with the Determination and in accordance with the Company's records.

In our opinion, in the case of quantitative information provided in spreadsheets in the CPP Proposal, dated 19 February 2013, and subject to the limitations of the audit noted above, that information is, in all material respects, accurately presented in accordance with the Determination.

Our audit was completed on 19 February 2013 and our opinion is expressed as at that date.

A handwritten signature in black ink, appearing to read 'Scott Tobin', with a horizontal line extending from the end of the signature.

Scott Tobin  
Audit New Zealand  
On behalf of the Auditor-General  
Christchurch, New Zealand

# Appendix 9

## Directors' certification

## CERTIFICATION OF INFORMATION FOR CPP PROPOSAL

In accordance with clause 5.5.4 of the Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2010 (*Determination*), we, Craig David Boyce and Paul Jason Munro, being directors of Orion New Zealand Limited (*Orion*), certify in respect of Orion's CPP proposal dated 19 February 2013:

### Information of a quantitative nature

That, in the case of all information of a quantitative nature, other than forecast information, provided in accordance with Part 5 of the Determination, we believe that:

- a) the information was derived and is provided in accordance with the relevant requirements and
- b) it properly represents the results of financial or non-financial operations as the case may be.

### Information of a qualitative nature

That, in the case of all information of a qualitative nature, other than forecast information, provided in accordance with Part 5 of the Determination, we believe that:

- a) the information is provided in accordance with the relevant requirements and
- b) it properly represents the events that occurred during the current period.

### Forecast information

That, in the case of all forecast information provided in accordance with Part 5 of the Determination, we believe that:

- a) the information was derived and is provided in accordance with the relevant requirements and
- b) the assumptions made are reasonable.



**Verification and audit**

That, to the best of our knowledge:

- the verifier was engaged by Orion in accordance with Schedule F of the Determination
- Orion provided the verifier with all the information specified in Part 5 of the Determination, including its schedules, relevant to Schedule F of the Determination
- the information referred to in the paragraph immediately above, save that relating to projects or programmes meeting paragraph (c) of the definition in Schedule D of the Determination of identified programme, was provided to the verifier in advance of the verifier's selection of projects or programmes meeting paragraph (c) of the definition in Schedule D of the Determination of identified programme, in accordance with clause G3 of the Determination
- the matters the auditor was engaged to audit included the matters specified in clause 5.5.3 of the Determination
- the auditor was instructed to report on at least the matters described in clause 5.1.4 of the Determination and
- the audit report provided pursuant to clause 5.1.4 of the Determination, verification report provided pursuant to 5.1.3 of the Determination and other certifications in this document all relate to the same CPP proposal.

For and on behalf of the board:



Craig Boyce  
Director

19 February 2013



Paul Munro  
Director