ELECTRIC VEHICLES

THEIR HISTORY AND FUTURE USE IN CANTERBURY

At the beginning of last century, electric vehicles were tipped to become the successor to the horse and cart. Canterbury's Electricity Department purchased its first electric vehicle (pictured) in 1919.

However, as the price of petrol powered vehicles dropped and their speed increased, the internal combustion engine began to take over.

Today's rising petrol prices and environmental concerns over vehicle emissions indicate the demand for electric vehicles will only increase. In Canterbury, Orion is already planning for that possibility.

Orion owns and operates the electricity distribution network in central Canterbury.

THE PAST

The first electric vehicle used in Christchurch was purchased in 1915 and owned personally by E. E. Stark, the City Electrical Engineer. Stark was also behind a scheme to introduce electric vehicles to the wider community as he considered them to be ideal for "the doctor, the businessman, and for the delivery of goods about a town or city".

Around this time, The Press newspaper reported that haulage by electric vehicles was 10-25% cheaper and 100% faster than horse delivery. It also noted the vehicles were not only "clean, noiseless, dignified and efficient but with their distinctively up-to-date appearance had a splendid advertising value".

Stark's goal was to increase load on the electricity network during off-peak times by offering a low tariff for charging the vehicles between 10pm and 7am. The Electricity Department even offered hire-purchase agreements to assist companies and individuals to purchase electric vehicles. Petrol-operated vehicles were still at an early stage of development and were prone to breakdowns.

In 1919 the Department built a new garage and provided improved charging facilities for both city council and privately-owned vehicles. It also proposed constructing charging stations between Christchurch and Ashburton, at Little River, at Rangiora and along the highway to Dunedin.

The popularity of electric vehicles in Canterbury peaked in 1921 with 51 being charged by the Department, 40 of which were privately-owned. However the cost of petrol vehicles began to decline and their speed increased.

The last electric vehicle operated by the Electricity Department (then known as the MED) was a half-ton Walker. This Walker, which was purchased in 1919 for general carrying duties, was taken out of service in 1947 after completing 200,000 miles (320,000km). It was then converted into a mobile lunch room for the Cables Department and was eventually replaced altogether by a caravan in 1964.

For many years, The Walker remained parked up but by 1983 it had been fully restored by the MED's in-house mechanics, carpenters, fitters and turners, and test room technicians. It is capable of a top speed of 14 miles per hour (23km/hr) and has a 60km range.

Orion uses The Walker for various vintage displays and Santa processions. It is understood to be one of only two surviving Walker electric vehicles in the world however two chassis and wheels have been found in a farm shed in North Canterbury.

A FUTURE FOR ELECTRIC VEHICLES?

New Zealand is facing a future where the continual production of greenhouse gas emissions will become progressively less acceptable. Electric vehicles have been identified as a possible pathway for the transport sector to reduce its emissions and therefore improve air quality.

Electric vehicles will allow us to take advantage of New Zealand's natural endowment of renewable electricity. As emissions created by electric vehicles are derived from the electricity source, increasing our renewable sources of electricity will provide the most gains in emissions reduction.

And because they can be charged at night outside periods of peak electricity demand, the introduction of electric vehicles will not require additional investment in the electricity grid. However, some public charging facilities may be required in the future as uptake levels increase and vehicles gain capacity to travel further.

Vehicle owners will benefit from lower running costs compared with internal combustion engines. The conversion of electrical energy into motive power is significantly more efficient than burning fuel and as electricity costs significantly less than oil, the operating cost per kilometre is a fraction of that in a petrol car.

Electric vehicles have less power than internal combustion vehicles but this is not a major issue locally, given Christchurch's flat environment and relatively short travel distances. In fact Christchurch's landscape and relatively small size make electric vehicles ideal for our community.

Electric vehicles known as 'plug-in electric hybrids' are tipped to achieve widespread application in New Zealand. They feature an electric engine that allows the vehicle to operate independently on electric power at low speeds until its charge is expended and the conventional car engine takes over. They have an advantage over pure electric vehicles in that they are able to travel greater distances and have more power to get up hills. Hybrid cars have the added benefit of still being able to be run on petrol, even if there is an electricity outage.

Plug-in electric hybrids differ from conventional hybrid cars because short trips and slow speeds are covered independently by the electric engine, removing the reliance on petrol for most daily driving. At the same time, their ability to run on petrol alone means they can help reduce electricity demand in dry years when New Zealand's hydro lake levels run low.

Electric vehicles that look and operate like existing internal combustion cars also exist and include the Tesla (pictured here), the Venturi and the Phoenix. However these are expensive and are not currently mass produced. Battery capacity advances will be the key to progressing range, power and recharge time for these cars.

Above: The electric Tesla Roadster can achieve a range of 400km and reaches 100km per hour in just under four seconds.

Far left: The entire fleet of electric vehicles garaged by the MED in 1921.

Front cover: The Walker truck, photo: christchurchcitylibraries.com

WHY IS ORION INTERESTED IN ELECTRIC VEHICLES?

We believe that demand for electric vehicles will slowly increase. By planning for their introduction now, we can benefit our community through smart pricing and ongoing careful management of the network.

Part of this process involves avoiding the potential for over-investment in our network assets. This means encouraging the charging of electric vehicles during off-peak periods, such as through the night. Another method would be to install smart meters at each home or business which are capable of reading the level of demand on the electricity network and then adjust the timing of the charging process accordingly. A similar outcome is achieved with a timer device that ensures electric vehicles will only recharge at night. Both technologies would deliver reduced electricity costs to consumers.

Another possibility that technology allows is for customers to recharge their car at night when electricity prices are low and then discharge their car's electricity back into the network during the day when electricity prices are high. The customer would receive payment for the electricity price difference and the network operator would benefit from a reduction in daytime peak electricity load.

Orion is proud of its reputation as one of the best electricity network operators in the country. We typically have fewer power outages per customer than in any other area in New Zealand.

WHO IS ORION NEW ZEALAND?

Our electricity distribution network traverses 8,000 square kilometres, from the Waimakariri to the Rakaia rivers, and from the Canterbury coast to Arthur's Pass. This diverse geography incorporates Christchurch city, Banks Peninsula, farming communities and high country.

We transport electricity from 10 Transpower grid exit points to more than 186,000 homes and businesses. We charge electricity retailers for this network delivery service and retailers, in turn, charge electricity consumers.

A reliable and safe supply of electricity is of critical importance to the community we serve. Our priority is the continued, cost-effective improvement of our network performance.

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