Electric vehicles (EVs) are coming to displace carbon

There are clear synergies between EVs and our electricity supply, with are supply capacity off-peak. Further supply is available with geothermal and wind generation consented or under construction.

Accelerating the uptake of EVs can happen through:

- Government fleet purchases being a pipeline to bring more EVs into the country and then on to the second hand market.
- Bulk buying for Northland business fleets and individuals.
- Free EV parking.
- Continued development of the charging network.
- Electric bikes for commuting and further developments of the cycle/walkway network.
- Introduction of electric buses.

Our electricity network

One third of Top Energy network has a low population density making the network very expensive to maintain. A solution could be community networks based on local generation, but still connected to the network.

Generation options include roof-top solar and larger geothermal and wind generation. Smart pricing and smart control will improve the efficiency of the network. (Economic and multi-value streams).

<table>
<thead>
<tr>
<th>Other trends</th>
<th>2018</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
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<tbody>
<tr>
<td>Individual action</td>
<td>Purchase own vehicle</td>
<td>MAAS</td>
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<td>Northland action</td>
<td>Educational EV service staff/ new trade requirements</td>
<td>Pricing/ tariff – 4 – energy</td>
<td>Develop an off-peak charging Internet of Things technology</td>
<td>TT test lab</td>
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<td>Tai Tokerau</td>
<td>2018</td>
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<tr>
<th>Economics</th>
<th>Power price</th>
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<tbody>
<tr>
<td>Generation</td>
<td>Consented wind on stream</td>
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</tbody>
</table>

**Policy**
- off-peak tariffs
- controlled by utility
- fossil fuel tax / natural price rise
- fee-bates (dirty to clean vehicles)

**Economics**
- Scrapping incentives (5k per old car)
- Euro 5 standard

**Generation**
- Consented wind on stream

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**Ev barriers**
- Indifference
- Battery replacement
- Battery disposal
- Car love
- Lack of education
- Range
- Cost
- Government uptake
- Utility type vehicles
- Made in NZ?
- Electric bus with carpark for rural
- Higher priced parking in centre free on outside
- Walking only areas
- Culture change
- Generate second hand market