



# TRANSMISSION TOMORROW ::

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TRANS - TASMAN BUSINESS CIRCLE

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Last century's dinosaurs?

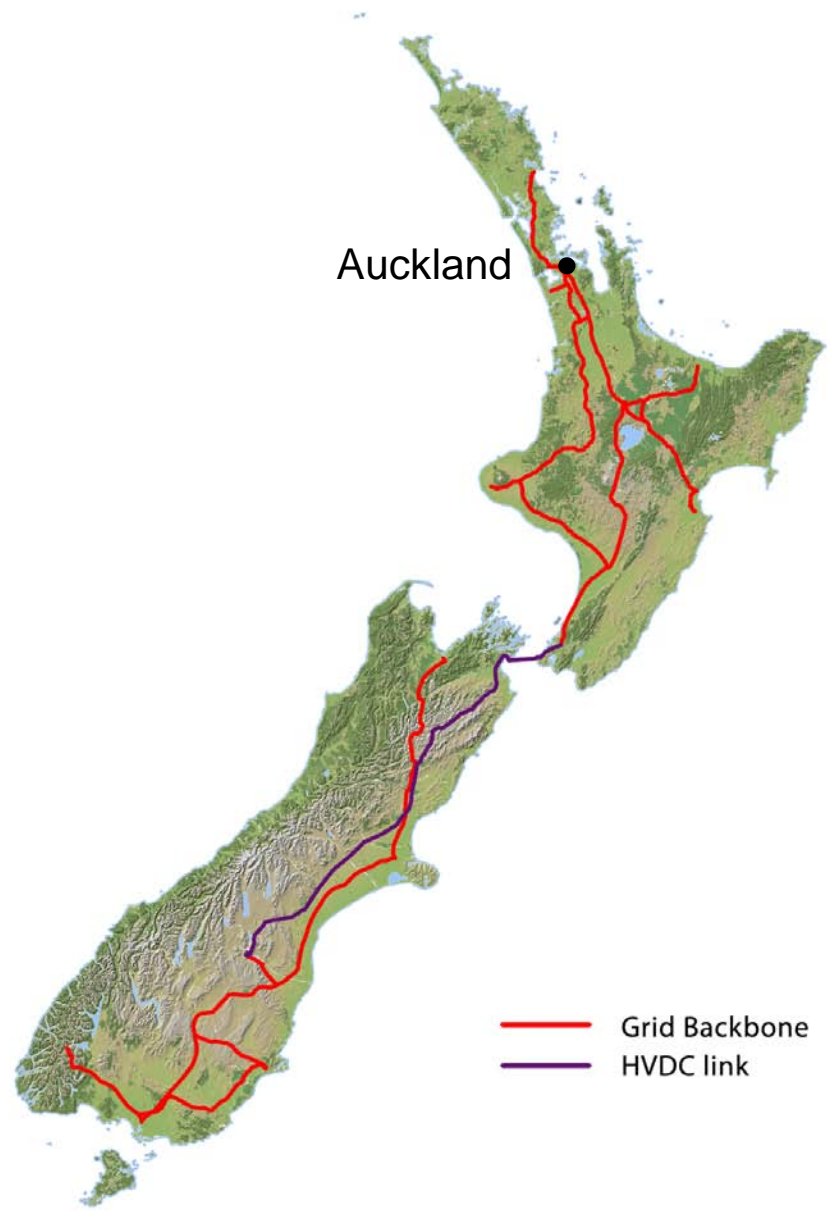
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# New Zealand's place in the world





Auckland

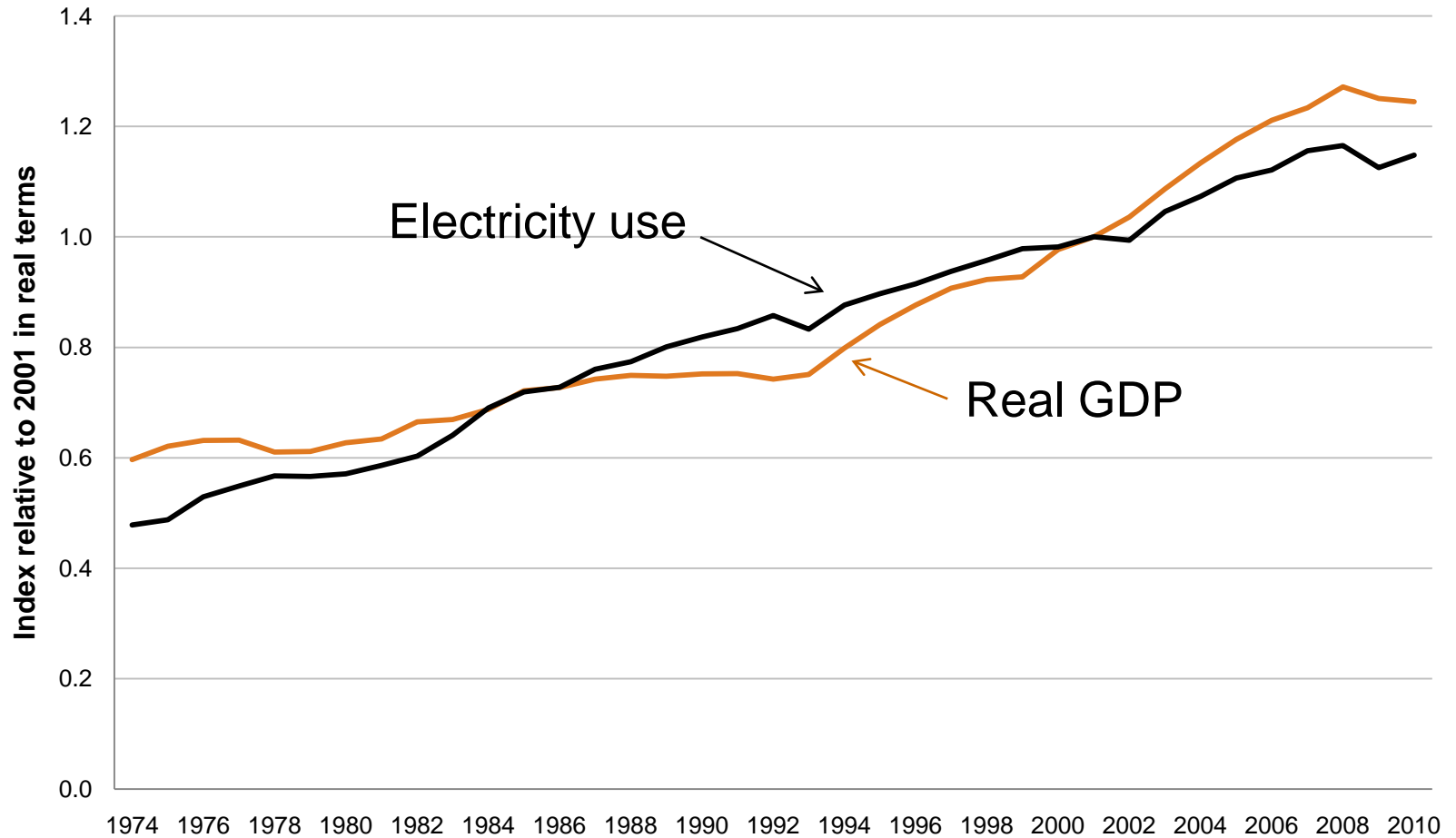
- Grid Backbone
- HVDC link

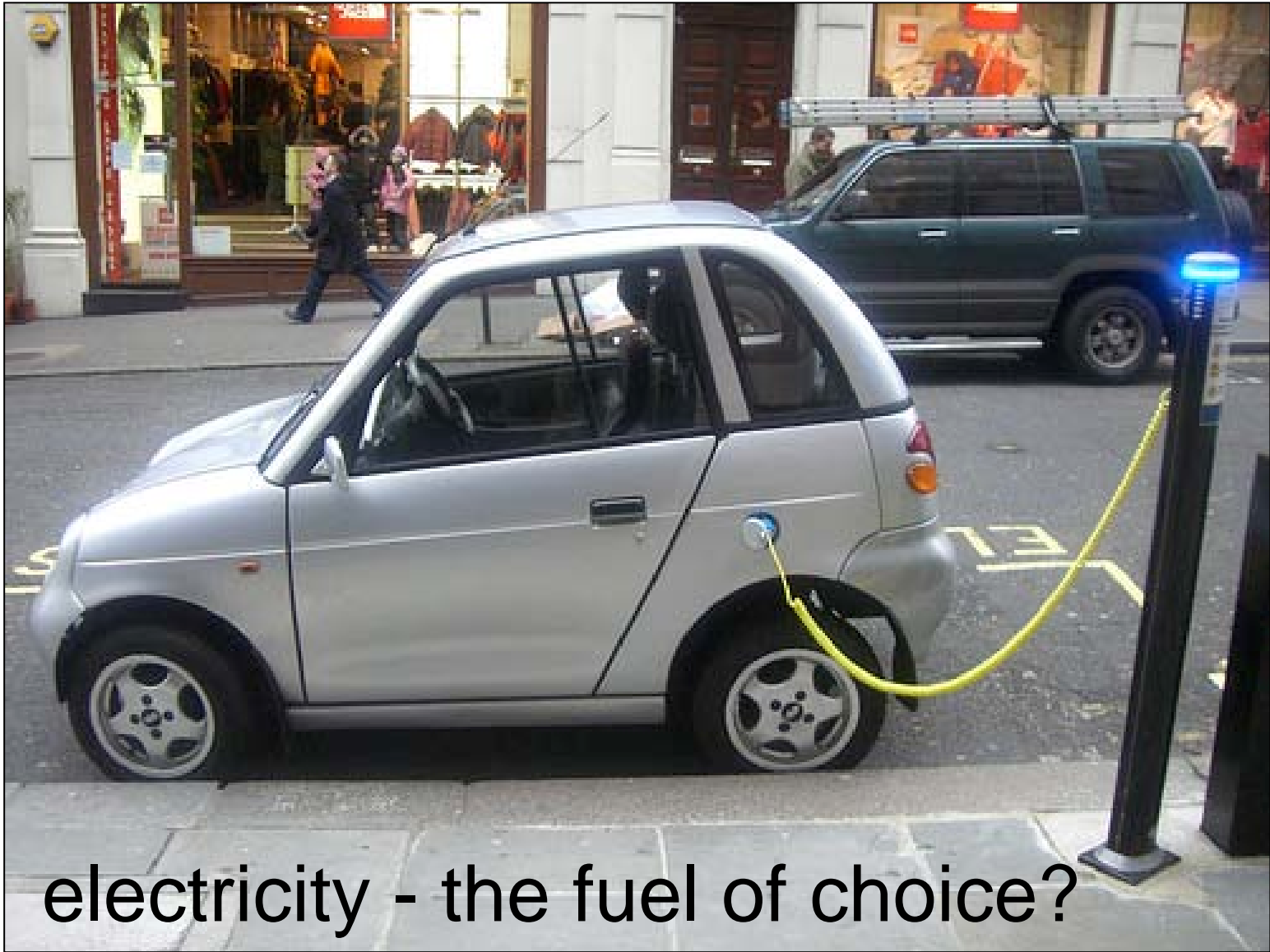


New Zealand – 6,700 MW  
NSW/Victoria – 23,200 MW  
England & Wales – 60,200 MW

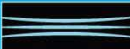


# New Zealand electricity





electricity - the fuel of choice?



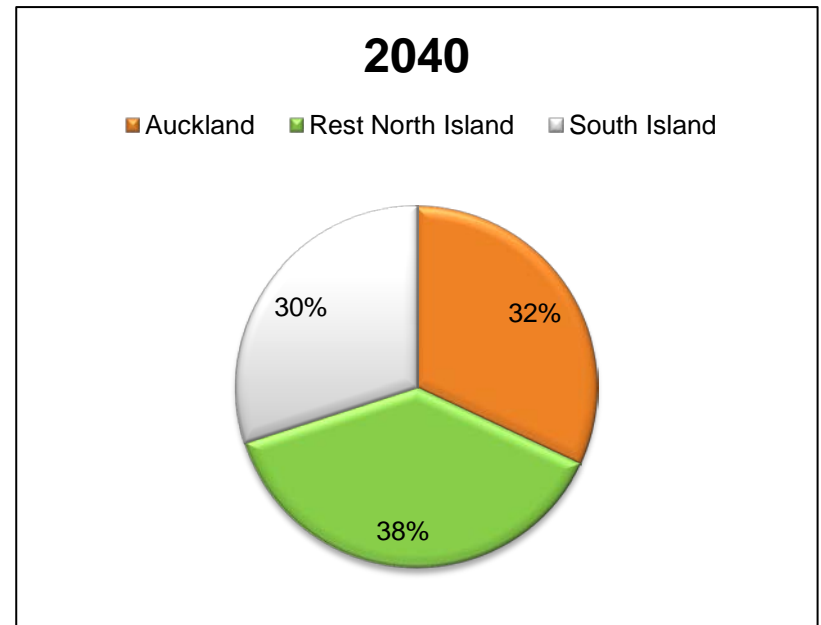
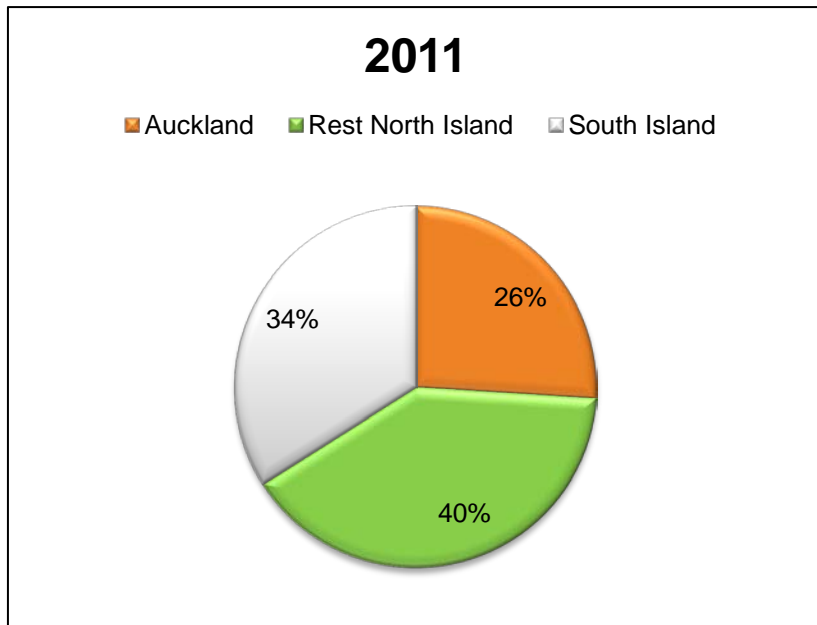


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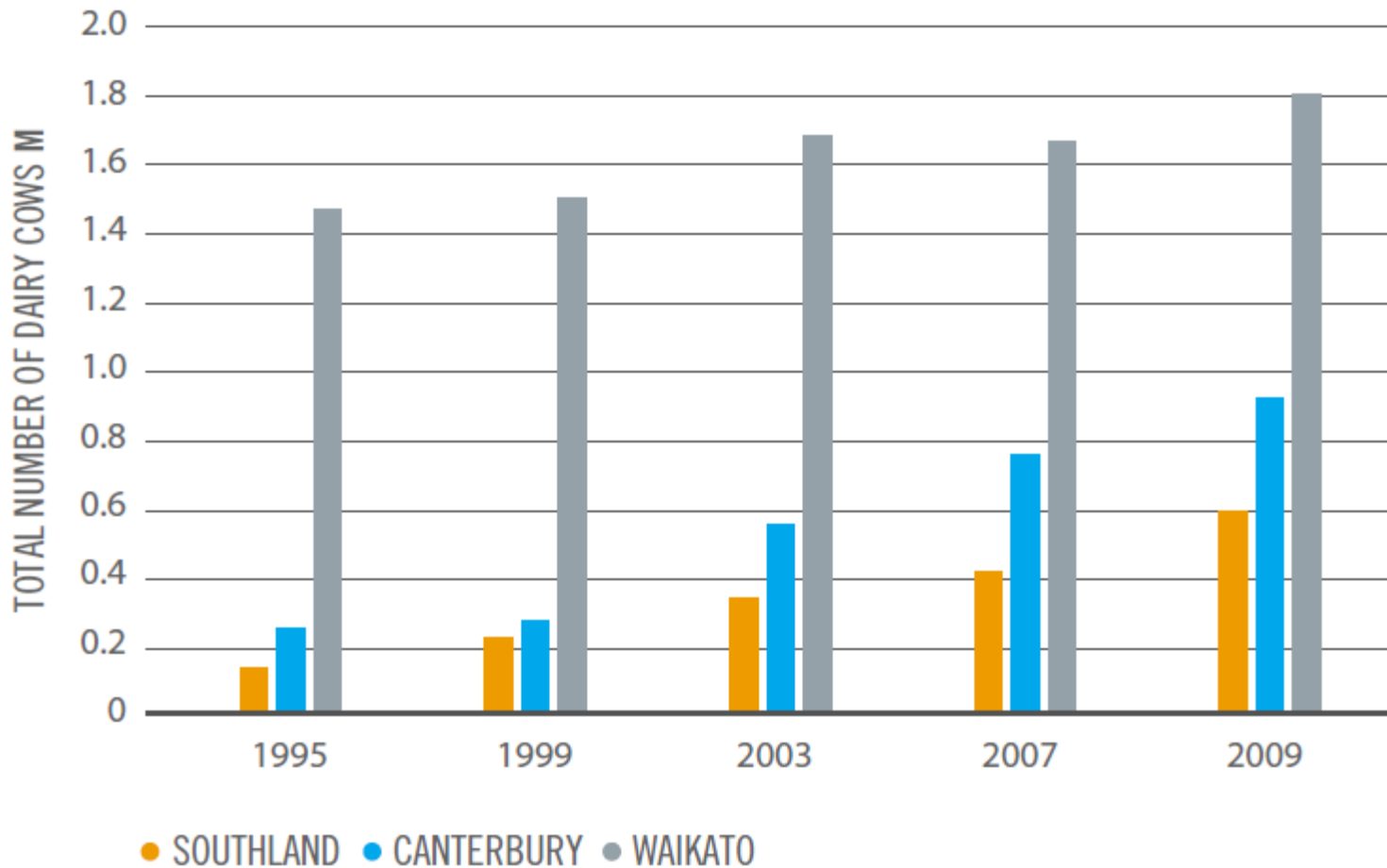


# Peak demand



# GROWTH OF DAIRYING

SOURCE: STATISTICS NEW ZEALAND AGRICULTURAL PRODUCTION STATISTICS 1995-2009



# Where does the generation come from?

- Embedded, micro generation will increase, but won't change the playing field in the immediate future
- Large scale remote generation will dominate for the immediate future



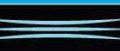
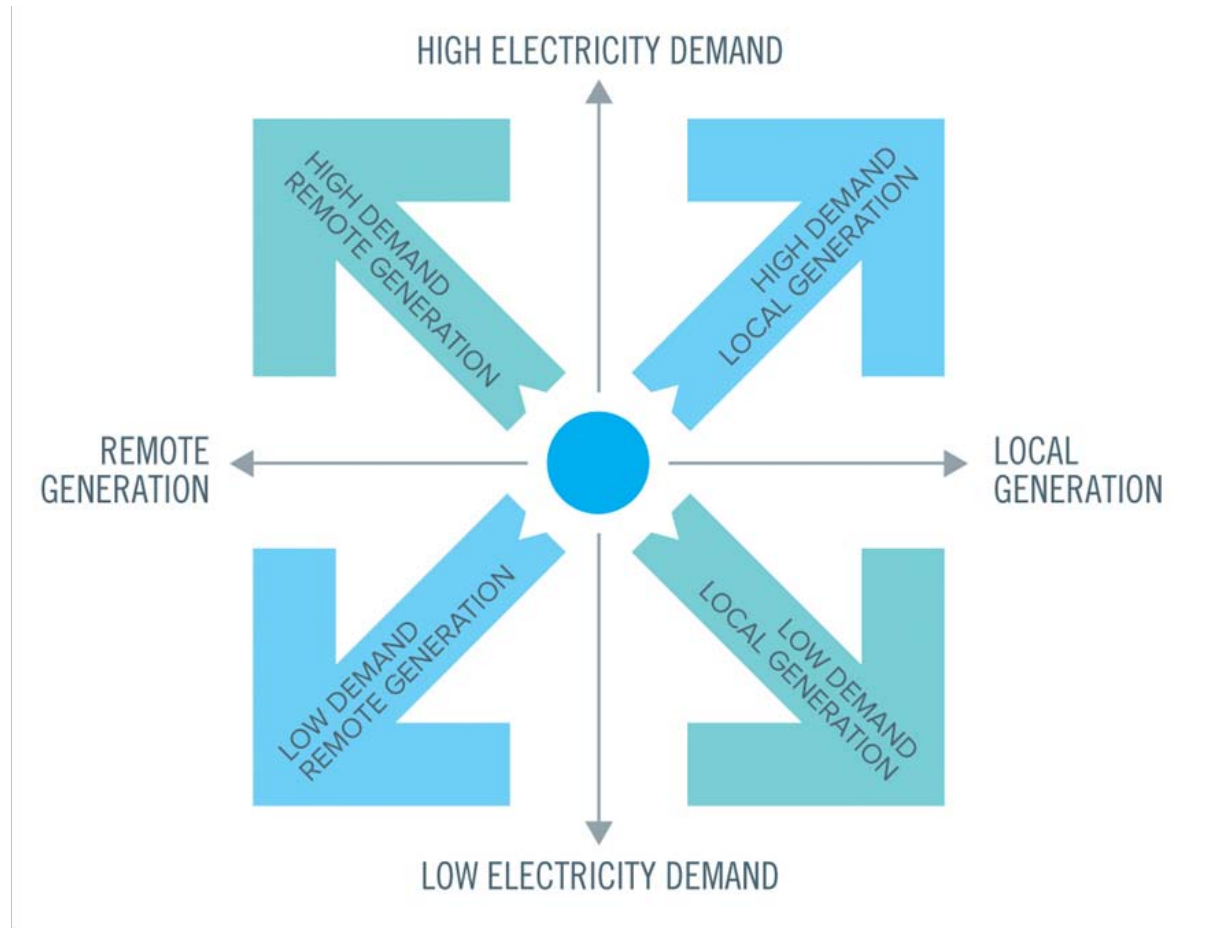


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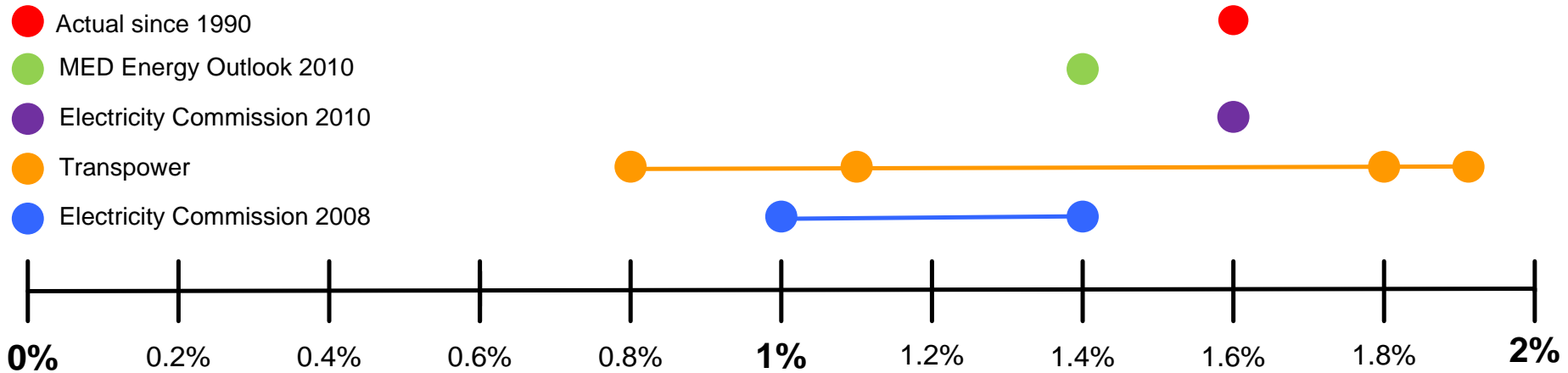
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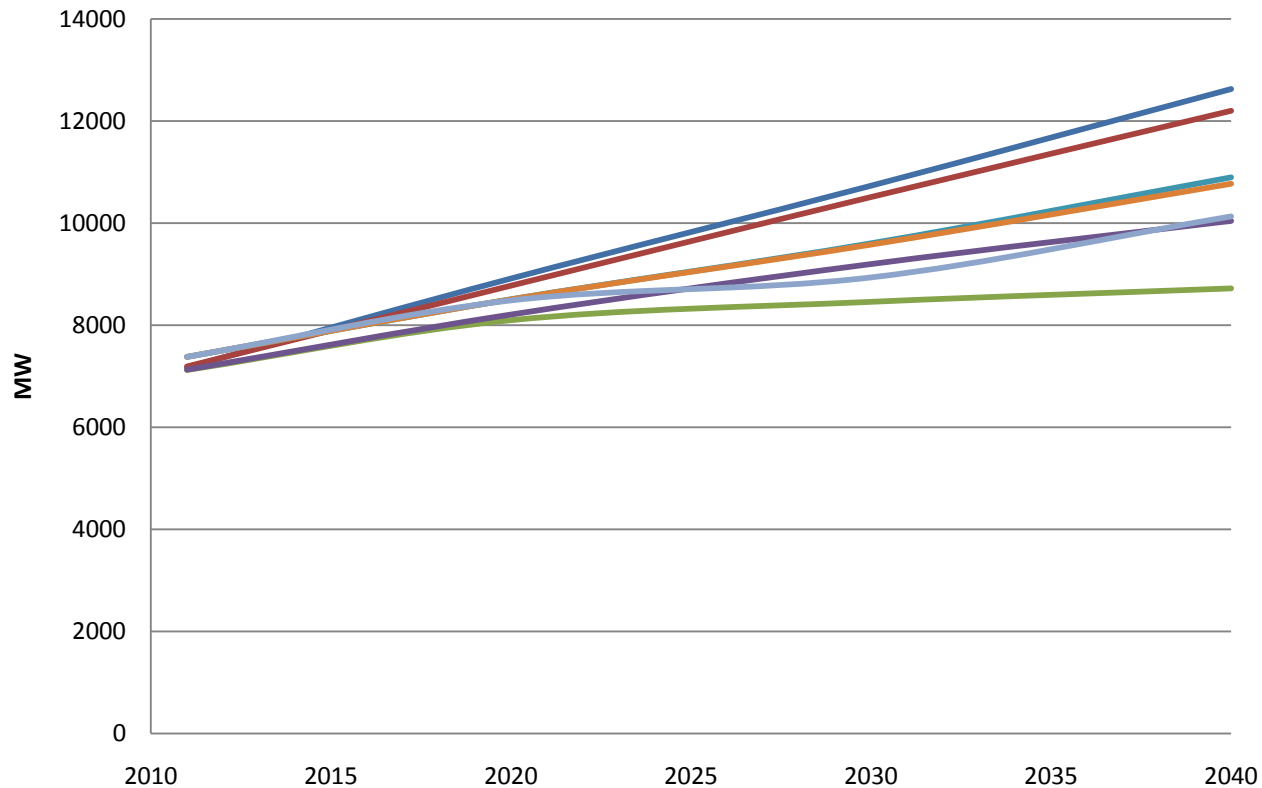
# The scenarios



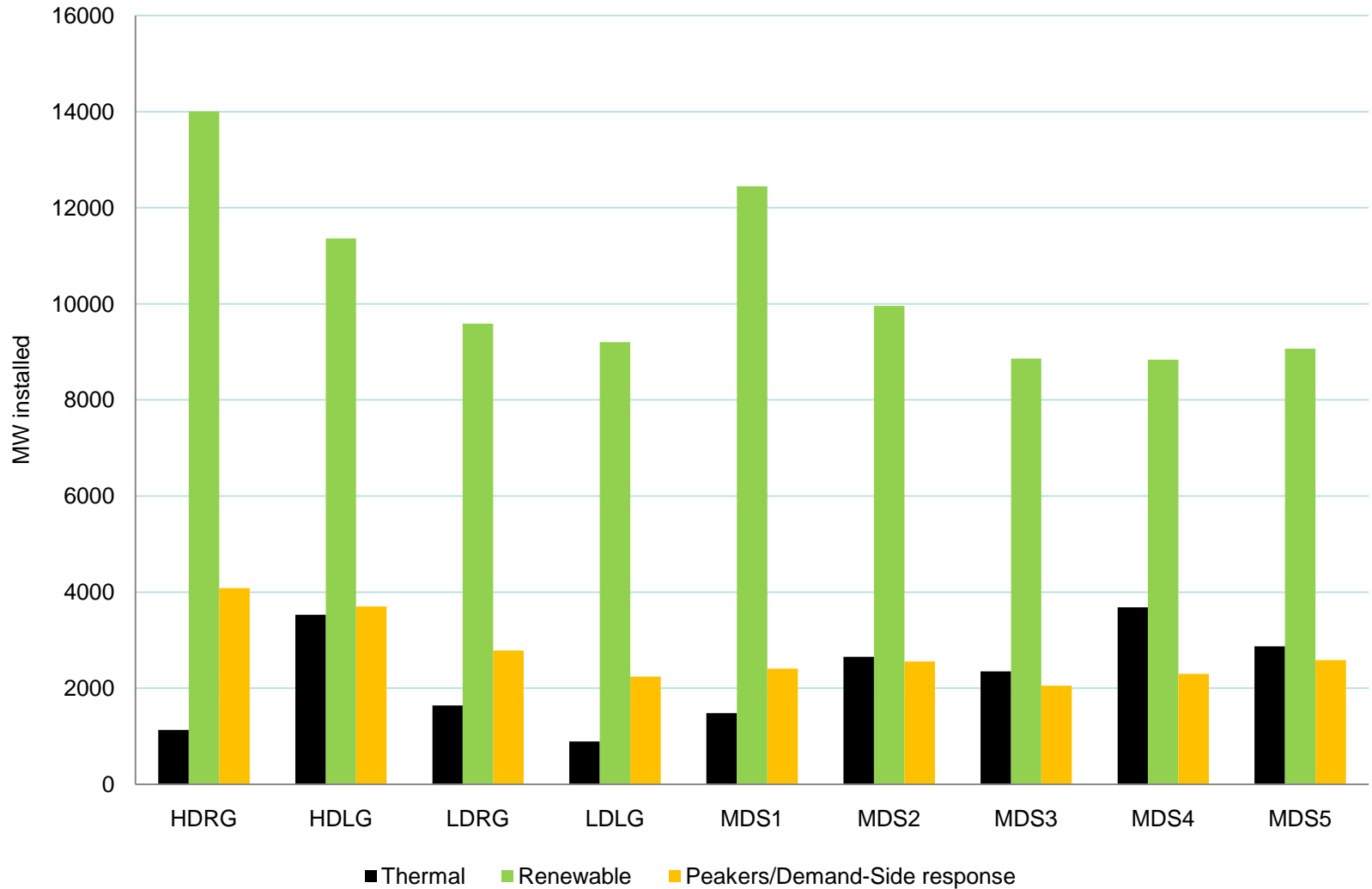
# Comparison of various NZ electricity demand forecasts



# New Zealand peak demand



## Installed generation and demand-side response in 2040




# Peak flows between Waikato and Auckland



- Continued south to north flow
- Significant growth on the core grid under some scenarios
- An enduring need for the grid







~~Last century's dinosaurs?~~

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# 21<sup>st</sup> century infrastructure

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# Going forward

- The grid will always be long and stringy, and moving electrons a long distance
- We will probably have to transport more electrons!
- Increased variability is a given, due to hydro and wind
- Uncertainty is higher



- We can not afford to meet the future by building more of the same!
- Instead, we are seeking to maximise our utilisation of existing assets and corridors through technology, before we build more



# Our strategies

**LIFTING GRID  
PERFORMANCE**

**LIFTING SYSTEM  
PERFORMANCE**

**IMPROVING RELIABILITY  
AND RESILIENCE**





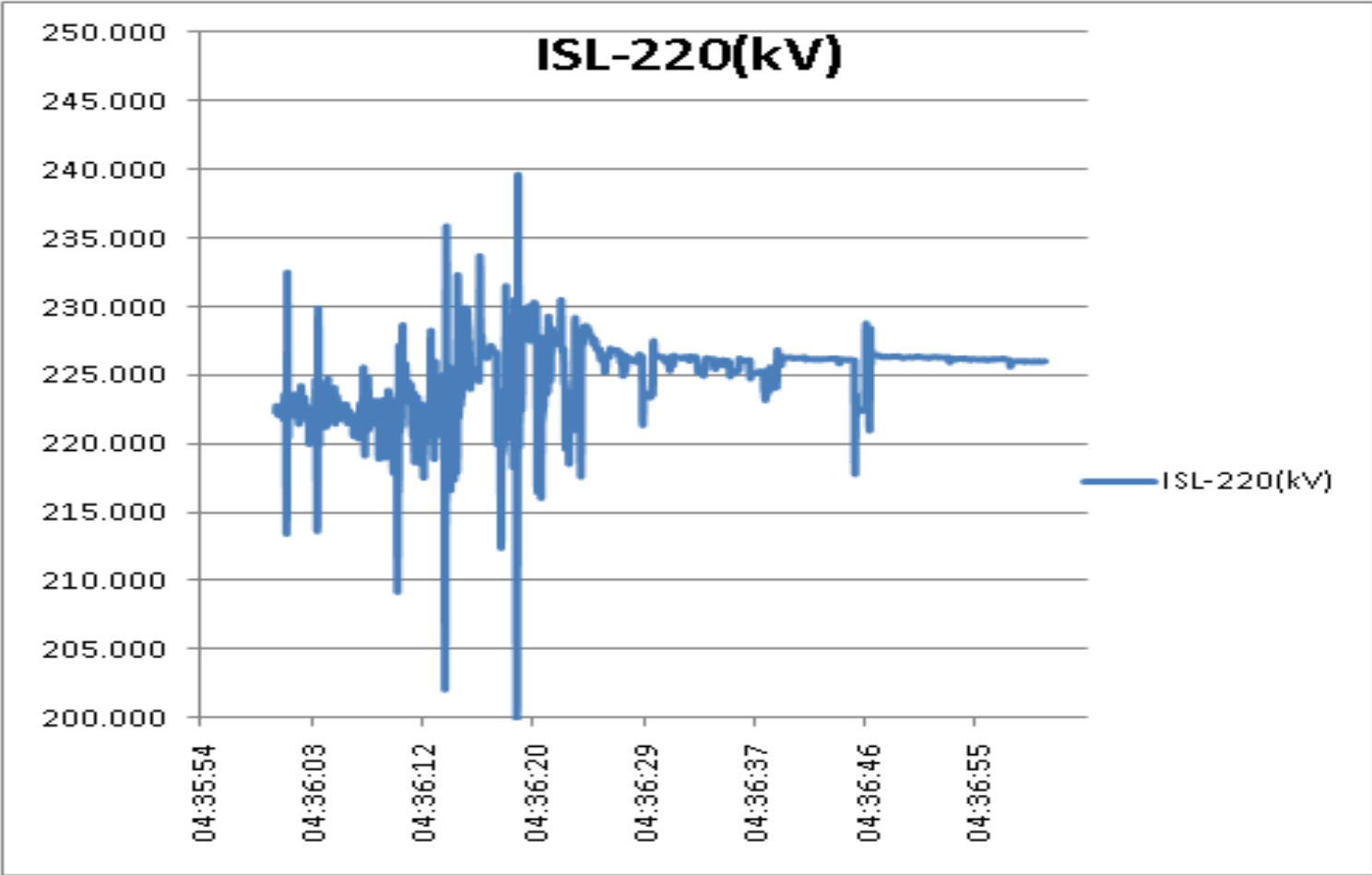
# First STATCOM in New Zealand

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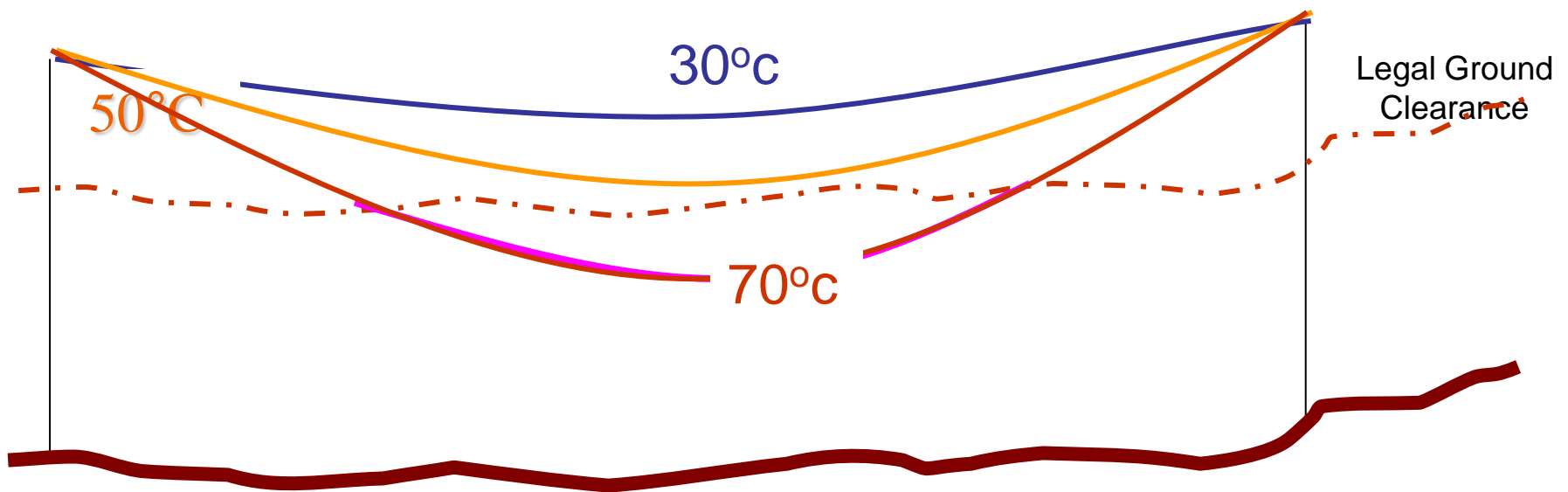
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# Post-September 2010 earthquake

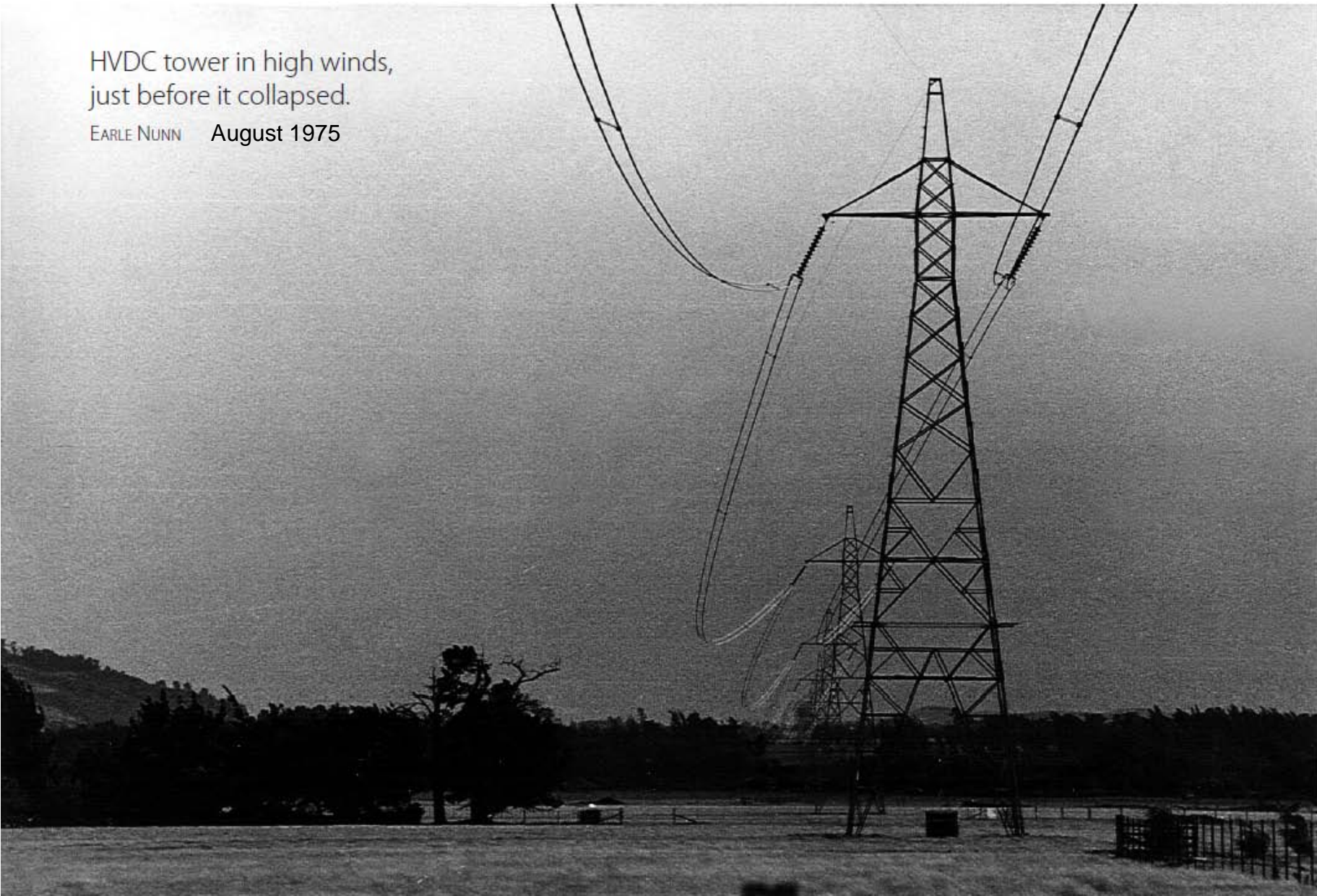


# Variable line ratings

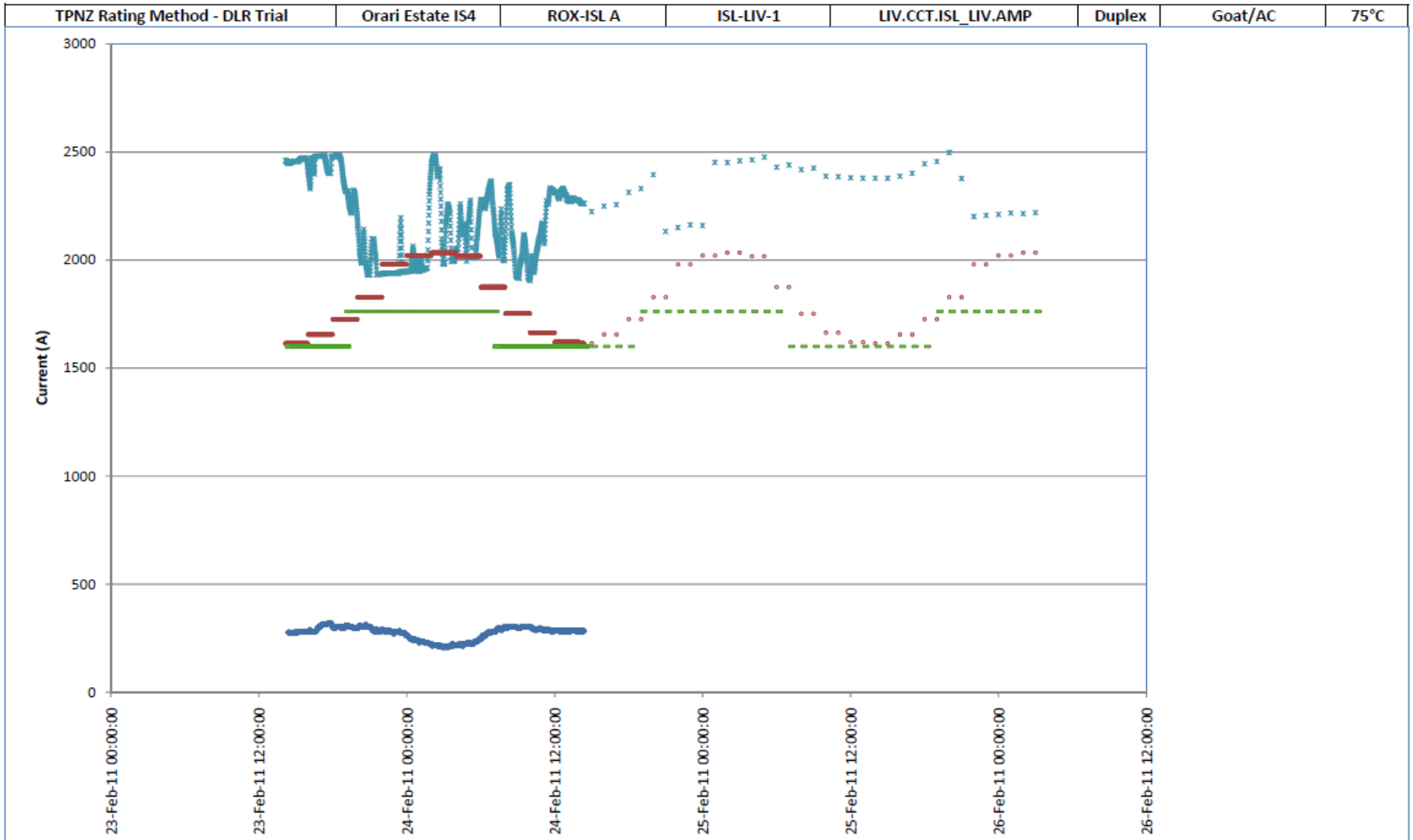


HVDC tower in high winds,  
just before it collapsed.

EARLE NUNN August 1975



# Actual variable rating





# HVDC Pole 2/3 Control System



# The platforms

- **THE NETWORK PLATFORM**
- **ASSET INFORMATION PLATFORM**
  - **PEOPLE**
  - **CORRIDORS**



# The two way grid - consumer response

- The grid is already smart!
- Our ability to interact with all but the largest customers is limited, except for ripple control
- Further gains will be gradual, as distribution grids become interactive



# The two way grid – “fly by wire”

