



**MINISTRY OF BUSINESS,
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HIKINA WHAKATUTUKI

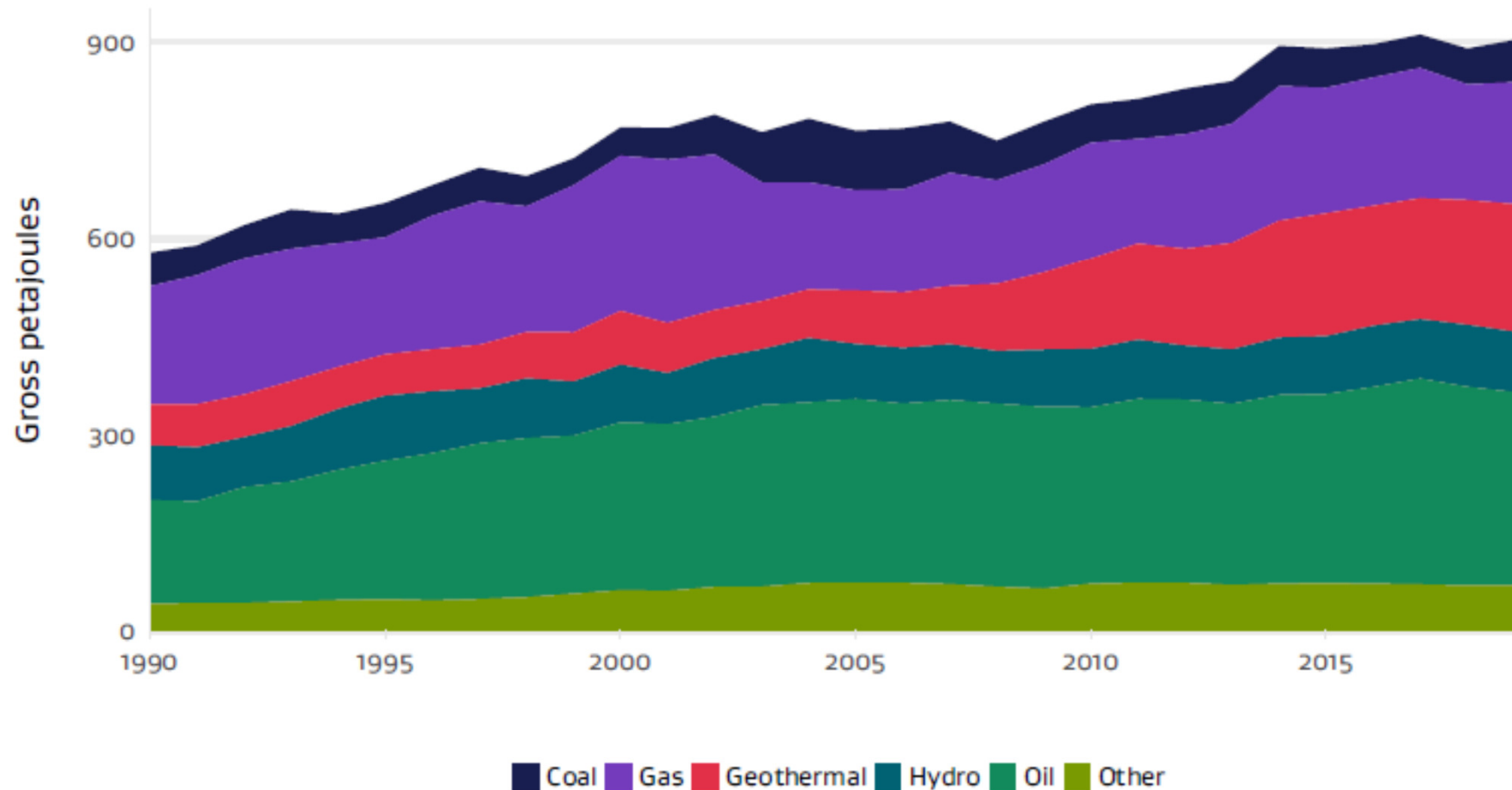
Geothermal resources in New Zealand

**18th APEC Workshop on Energy Statistics
15-17 December 2020**

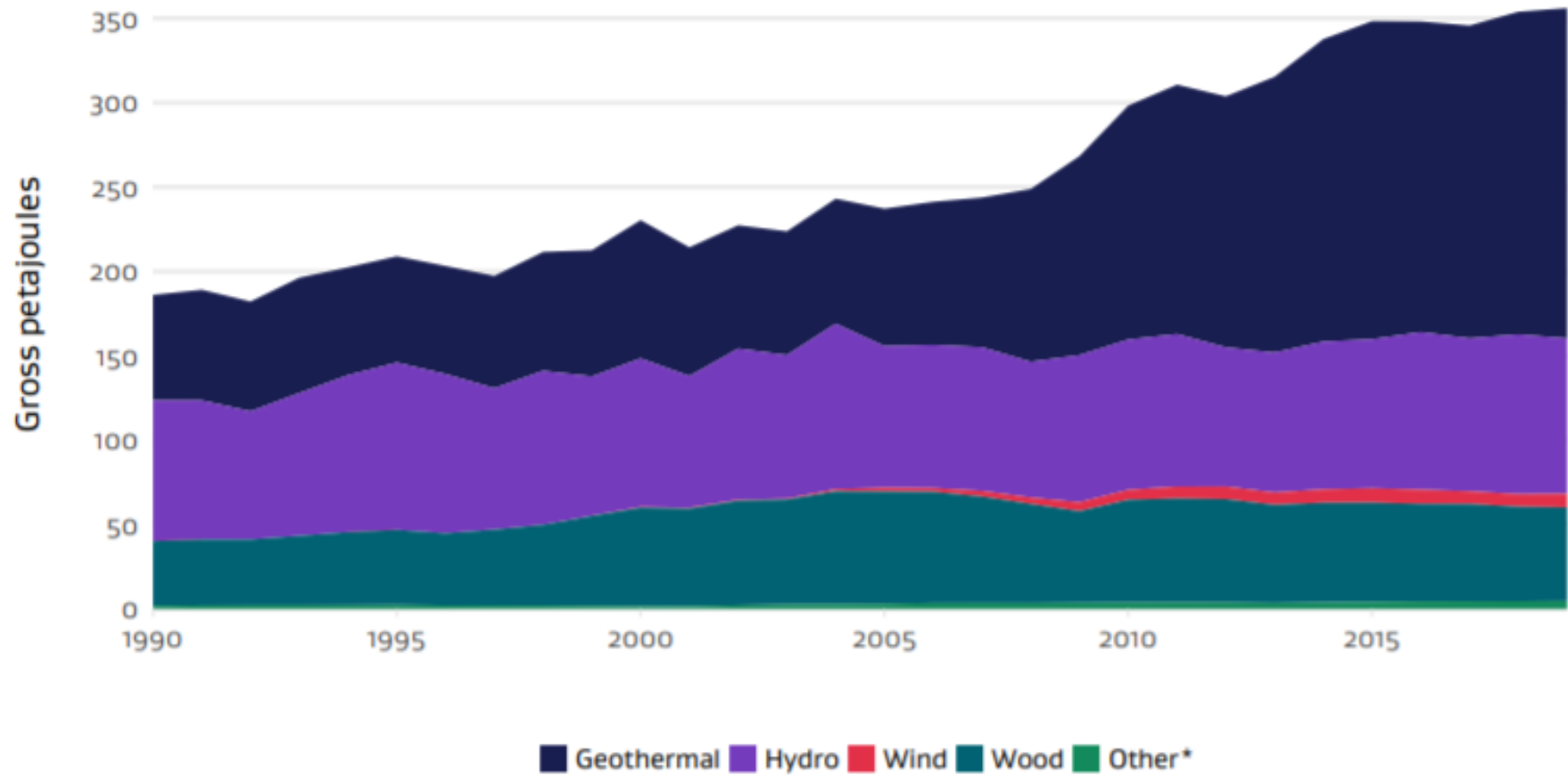
Daniel Griffiths
Manager – Markets
Evidence and Insights



Total Primary Energy Supply



Renewable Primary Energy in New Zealand

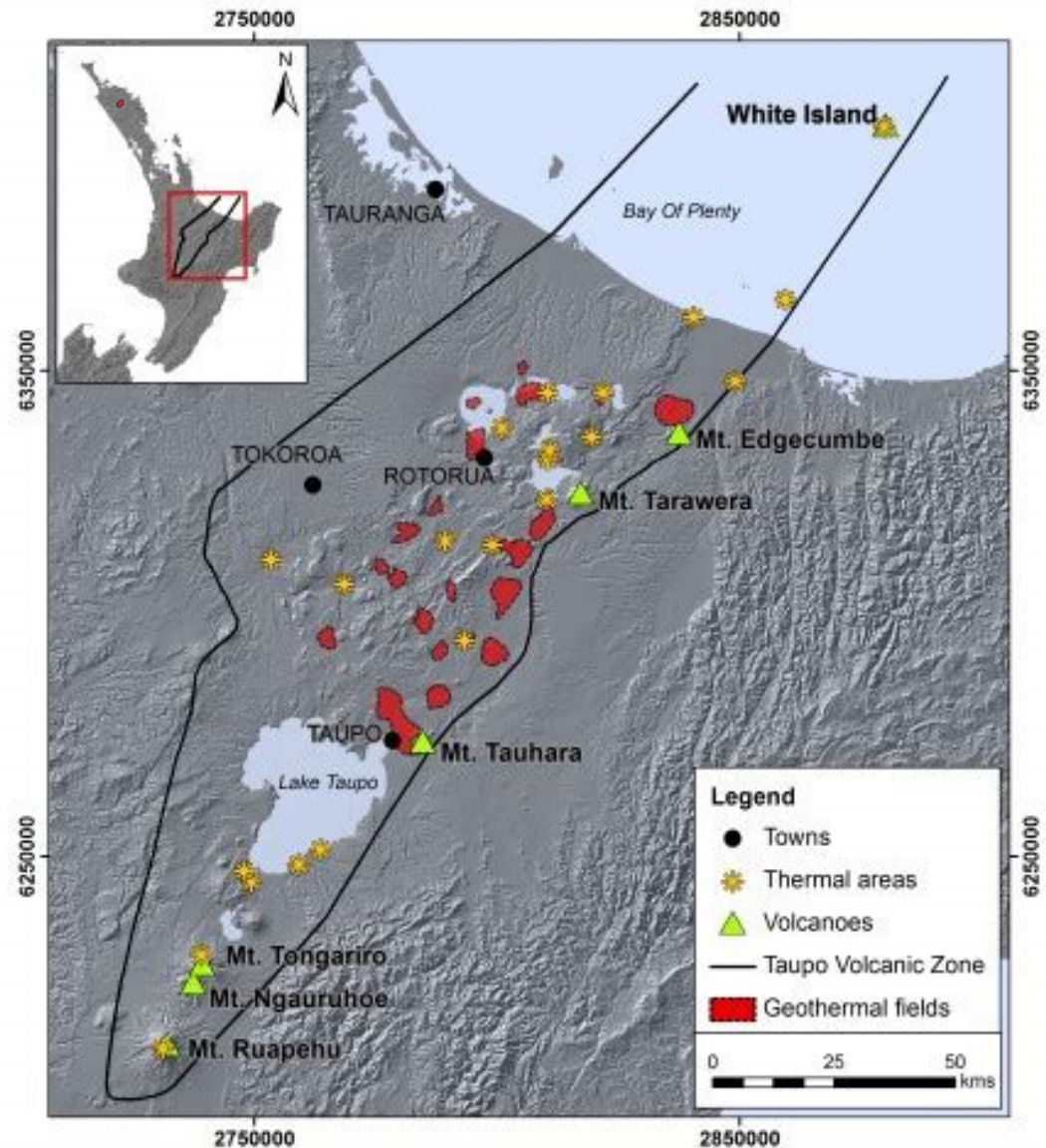


*Other includes biogas, liquid biofuels, and solar

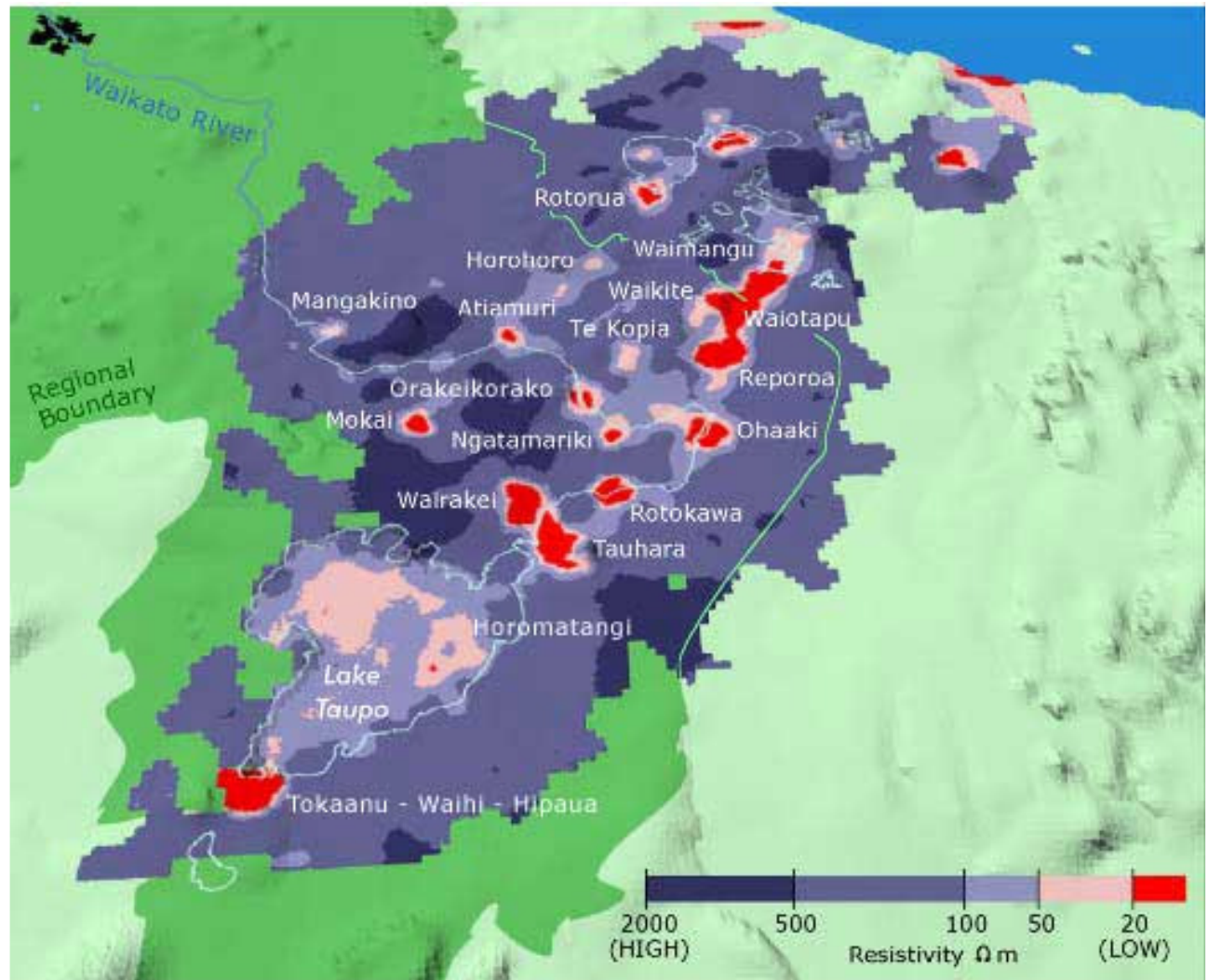


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Geothermal resources in New Zealand



The Taupō Volcanic Zone



Electrical resistivity imagery supplied by Institute of Nuclear and Geological Sciences. Copyright reserved.



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Geothermal energy

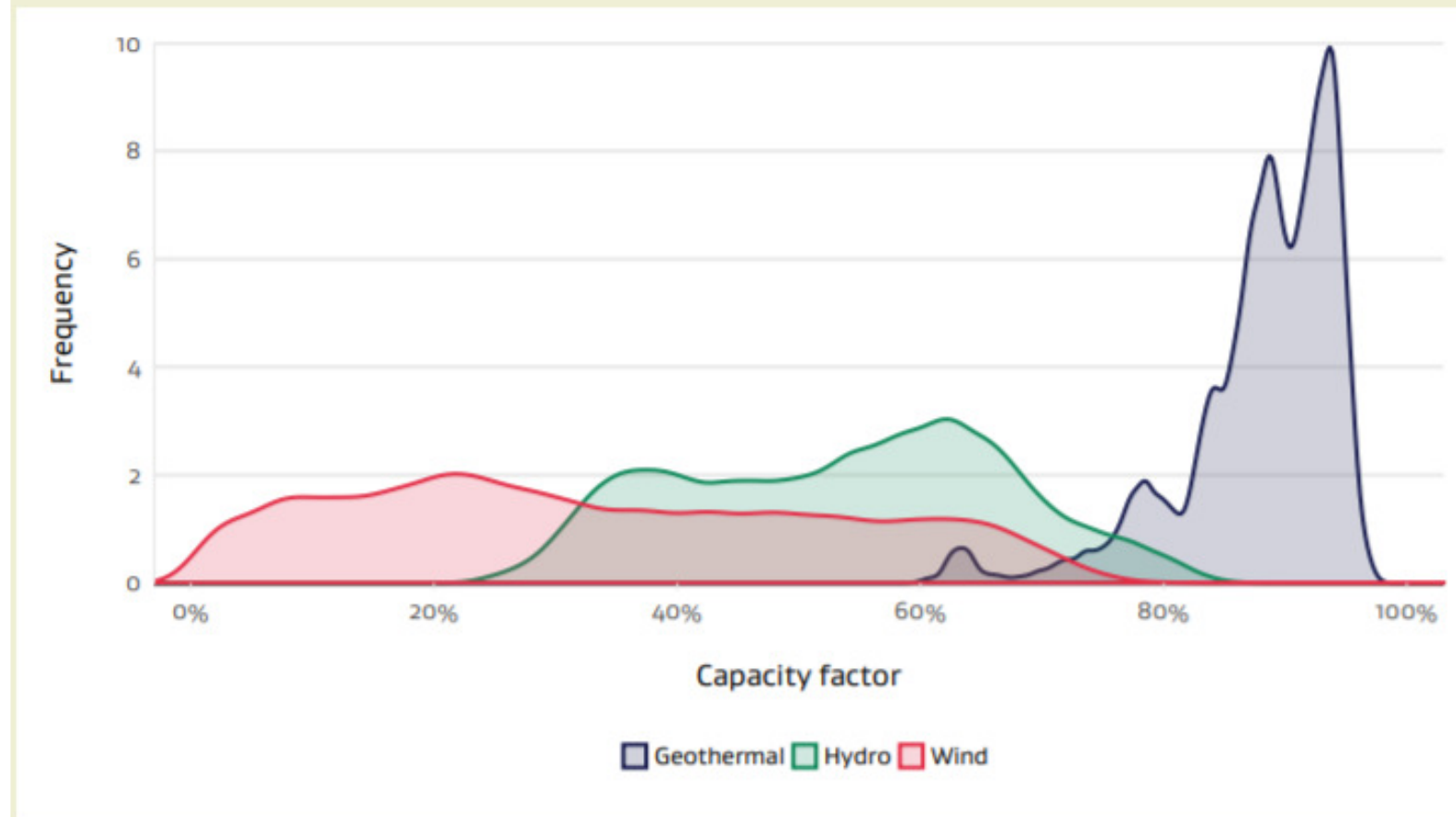
- IEA definition of geothermal primary energy:

Production of geothermal energy is measured by subtracting the heat of the fluid reinjected into the earth's crust from the heat of the fluid or steam upon its extraction from the earth's crust.



Geothermal baseload electricity

Figure 1 Capacity factor of wind, hydro and geothermal generation over 2018



DG1

FM DG2

FM3

FM4

Geothermal energy for direct use

- Direct use refers to the use of geothermal heat directly, without a heat pump or electricity generation facility
- Other examples of geothermal direct use in New Zealand include:
 - Timber drying
 - Aquaculture and tourism
 - Horticulture
 - Milk drying
 - Space heating.



Slide 8

DG1 Did we not update this ffigure in ENZ2020...

Daniel Griffiths, 12/12/2020

FM1 What figure?

Finbar Maunsell, 14/12/2020

FM3 Oh the 8Pj, my mistake i didnt change the year to 2019. In 2019 there was 7.941 Pj compared to 7.915 Pj in 2018

Finbar Maunsell, 14/12/2020

FM4 Btw i changed the figure for you to show 2019 in your speech section

Finbar Maunsell, 14/12/2020

DG2 Proportion of energy or geothermal energy?

Daniel Griffiths, 12/12/2020

Renewable but not free of GHG emissions

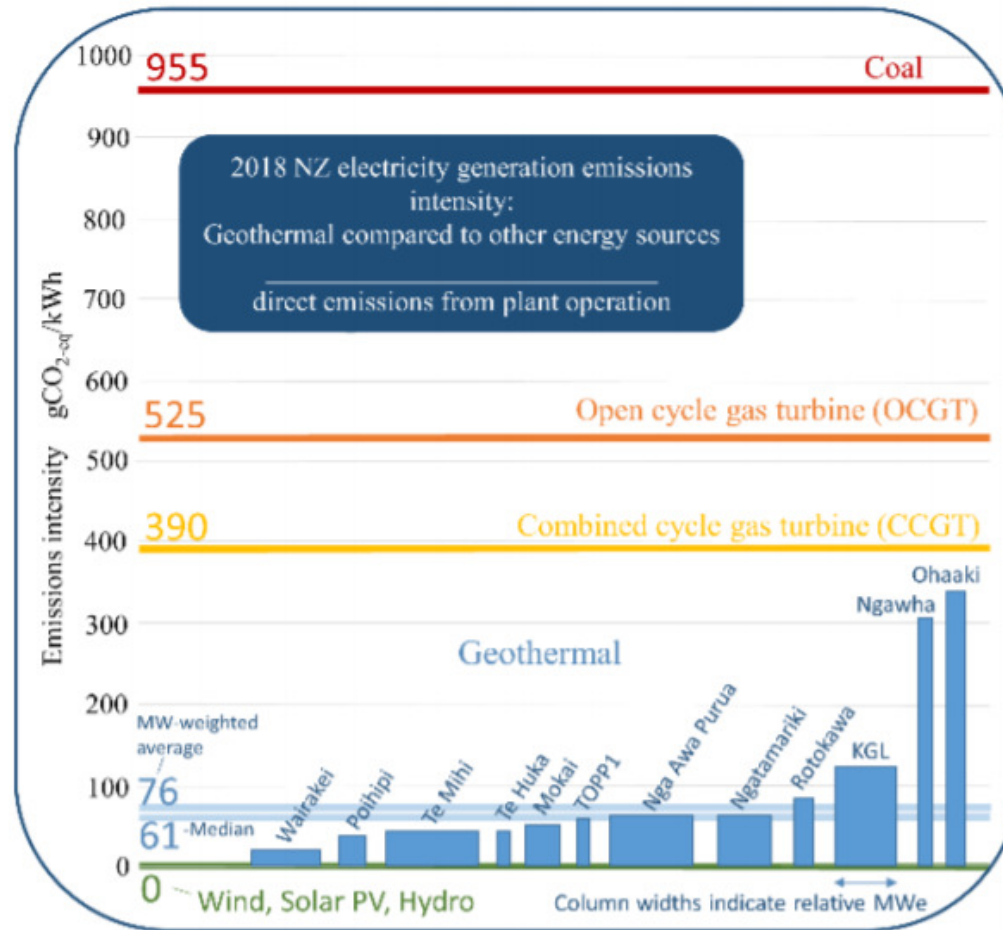
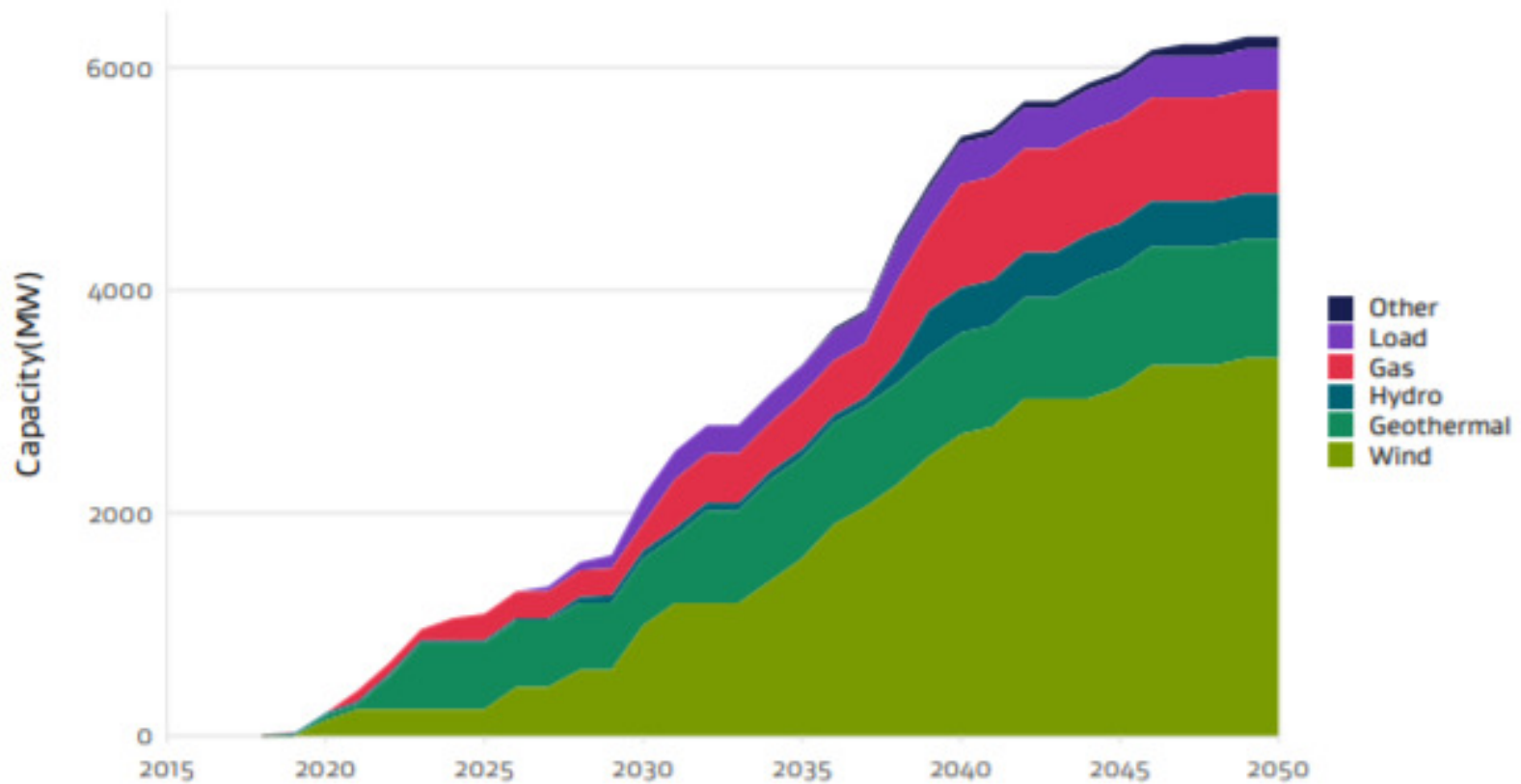


Figure 3: Graphical chart comparing the operational emissions intensity of geothermal power stations in New Zealand to other types of electricity generation (source: McLean and Richardson 2019)



Future geothermal use – EDGS?

Box C.2 Figure 2 Cumulative new build generation



Thank you for your attention



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