NZ Power Demand Trends for YEPN
8th Feb 2024

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Agenda

- Introductions

- Factors influencing power demand trends

- Introduction to Weather Adjusted Load

- Seasonality in NZ's power demand

- Current growth trends
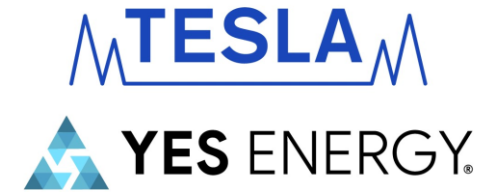
- Weather sensitivity changes

- Q&A

Who are **TESLA** Forecasting Solutions?

Experts in **electricity** and **gas demand forecasting** since 1992 – this is our niche

Helping over **200** clients across the globe with offices in the **US, UK, NZ** and **Japan**

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YES ENERGY®

Now part of **Yes Energy**, a leader in power market data

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About me

- 12 years of power and gas demand forecasting experience in APAC and North America

- Academic background in Econometrics/Statistics

- Started my career as an intern => analyst => team lead => business development

- Former Co-chair of YEPN

- World Energy Council Future Energy Leader

Factors influencing power demand

- Weather (Heating/Cooling, irrigation, rooftop PV)

- Population trends

- Economic growth

- Electrification Trends (EVs, transition from gas to electricity, etc.)

- Efficiency trends (insulation, new appliances, new lights, etc.)

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Removing the weather variability component

- **Weather Adjusted Load adjusts** historic demand series to climatic **average "normal" weather conditions**

- **Prevents cold** or **mild winters from** distorting **underlying demand trends**

- Year-on-Year change can indicate **network growth** or **shrinkage**

- Useful for **network** and **financial planning**

- **Great** for **analysing** Year-on-Year **underlying load growth (average demand)**

- **However**, since it shows Year-on-Year demand **growth** during **seasonal average weather,** it naturally **underestimates peak demand growth.**

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Winter vs Summer – NZ Total Conforming Monthly Average
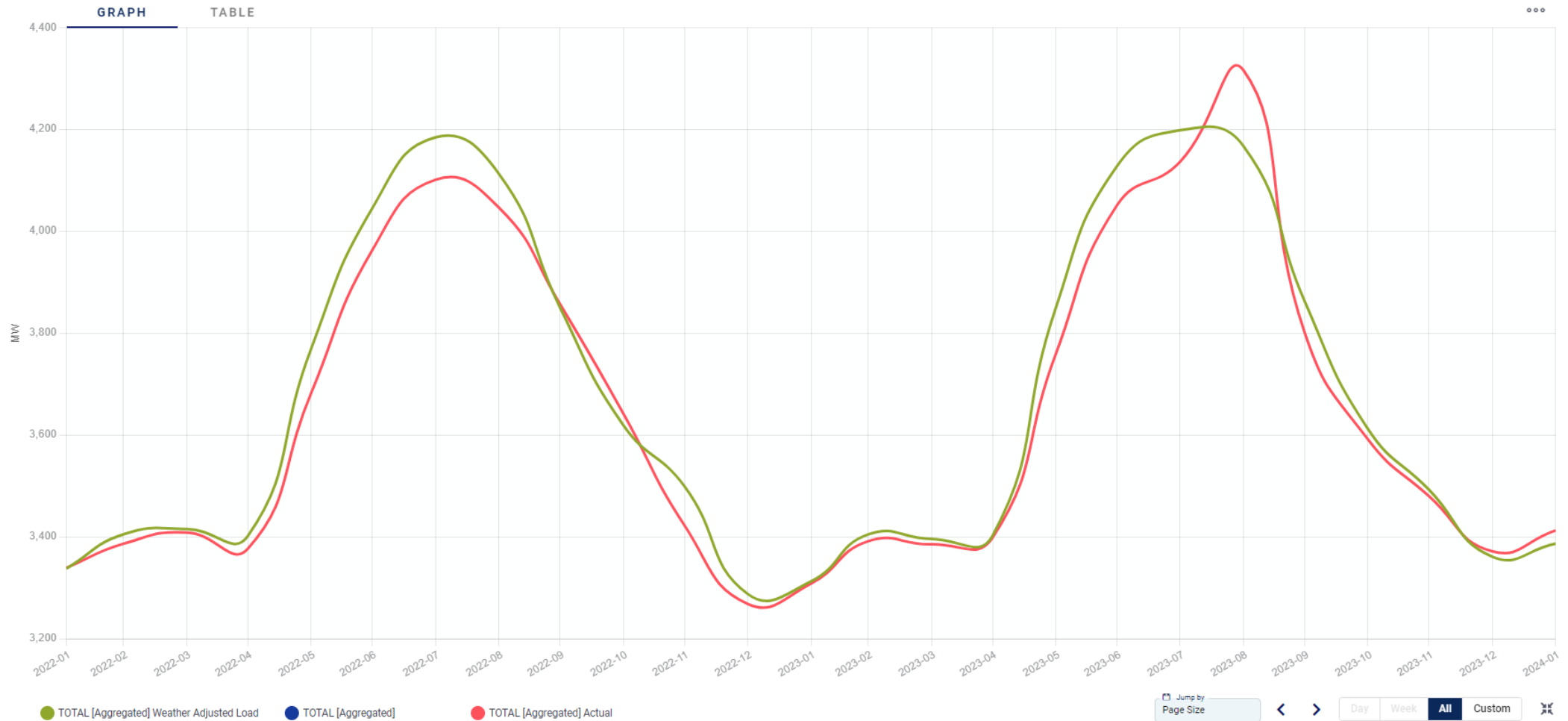
NZ Total Conforming Monthly YoY Load Growth

NZ Total (Conforming) YoY Load Growth
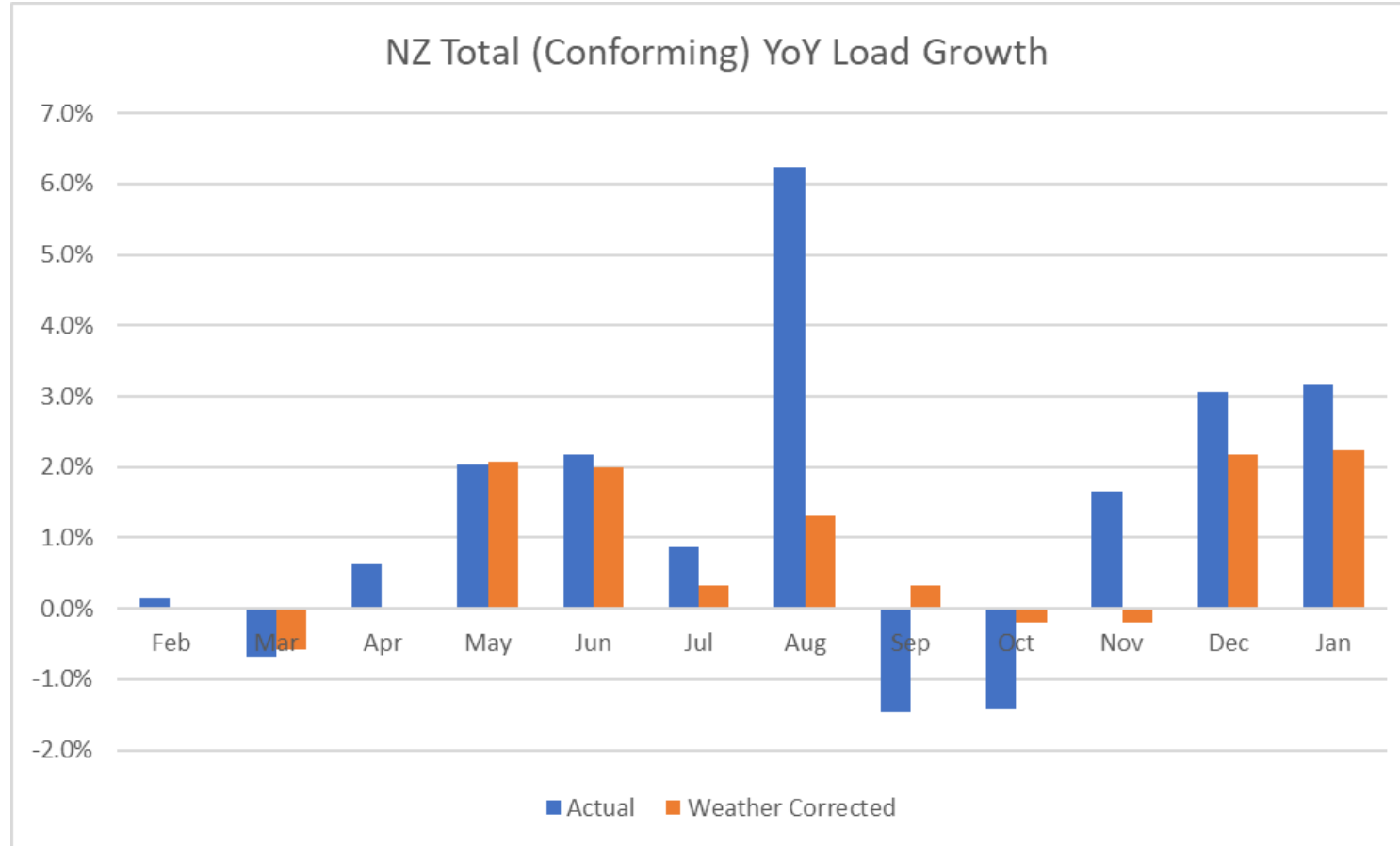
YoY Underlying Load Growth by Region

Actual

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Northland	-15.1%	-5.8%	2.3%	4.5%	4.1%	2.8%	7.7%	0.6%	2.8%	-4.9%	-0.8%	1.1%
Auckland	0.1%	-0.7%	0.6%	2.0%	2.2%	0.9%	6.2%	-1.5%	-1.4%	1.6%	3.1%	3.2%
Hamilton	-5.1%	-0.9%	2.0%	3.0%	4.0%	1.7%	6.6%	-0.1%	1.1%	0.1%	2.9%	2.6%
Bay of Plenty	0.3%	-2.4%	1.4%	3.2%	1.1%	0.0%	4.2%	-6.9%	-3.4%	0.1%	2.4%	1.8%
Napier	-15.0%	-8.2%	-3.8%	-2.9%	-0.1%	-1.0%	5.5%	-7.4%	-5.6%	1.8%	2.8%	5.9%
Palmerson North	-2.8%	-0.7%	-0.5%	1.7%	2.7%	1.6%	5.3%	-2.0%	-1.5%	0.3%	0.8%	1.3%
Wellington	-1.0%	3.4%	3.0%	0.3%	-1.4%	-0.2%	7.7%	-4.0%	-2.2%	5.5%	2.5%	0.9%
West Coast	12.5%	0.7%	-1.9%	1.0%	-1.7%	-2.6%	4.3%	-0.3%	-0.7%	4.9%	8.6%	3.0%
Invercargill	12.5%	0.7%	-1.9%	1.0%	-1.7%	-2.6%	4.3%	-0.3%	-0.7%	4.9%	8.6%	3.0%
Christchurch	9.3%	1.0%	-0.6%	0.3%	-0.3%	-1.8%	6.6%	1.4%	-5.2%	6.4%	9.2%	8.0%

Weather Corrected

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Northland	-14.9%	-6.3%	0.0%	2.4%	2.6%	0.0%	2.2%	1.1%	1.8%	-4.8%	-1.2%	0.2%
Auckland	0.0%	-1.7%	0.6%	2.0%	0.7%	-0.7%	0.1%	-5.9%	-3.4%	0.4%	2.0%	0.8%
Hamilton	-1.9%	-0.4%	0.9%	2.8%	1.2%	0.6%	1.0%	1.0%	0.6%	-0.4%	2.0%	0.0%
Bay of Plenty	0.0%	-1.7%	0.6%	2.0%	0.7%	-0.7%	0.1%	-5.9%	-3.4%	0.4%	2.0%	0.8%
Napier	-12.6%	-6.7%	-3.6%	-1.4%	-0.7%	-3.0%	-0.5%	-4.7%	-3.6%	0.2%	0.6%	2.7%
Palmerson North	-1.9%	-0.5%	-1.1%	2.4%	2.1%	0.9%	-0.6%	-0.9%	-1.5%	-1.1%	-0.6%	0.6%
Wellington	-0.4%	1.7%	2.1%	1.1%	1.1%	-0.1%	1.3%	-2.4%	-0.9%	1.3%	2.3%	1.1%
West Coast	10.0%	1.7%	-2.1%	2.1%	-1.0%	-0.4%	0.3%	3.6%	2.3%	-0.2%	7.6%	3.9%
Invercargill	10.0%	1.7%	-2.1%	2.1%	-1.0%	-0.4%	0.3%	3.6%	2.3%	-0.2%	7.6%	3.9%
Christchurch	4.2%	-0.4%	-1.0%	2.2%	2.5%	0.6%	2.9%	4.6%	0.2%	1.8%	7.2%	7.7%

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NZ Total Conforming exceeded the 99ᵗʰ Weather Risk Percentile 8 times in Jan
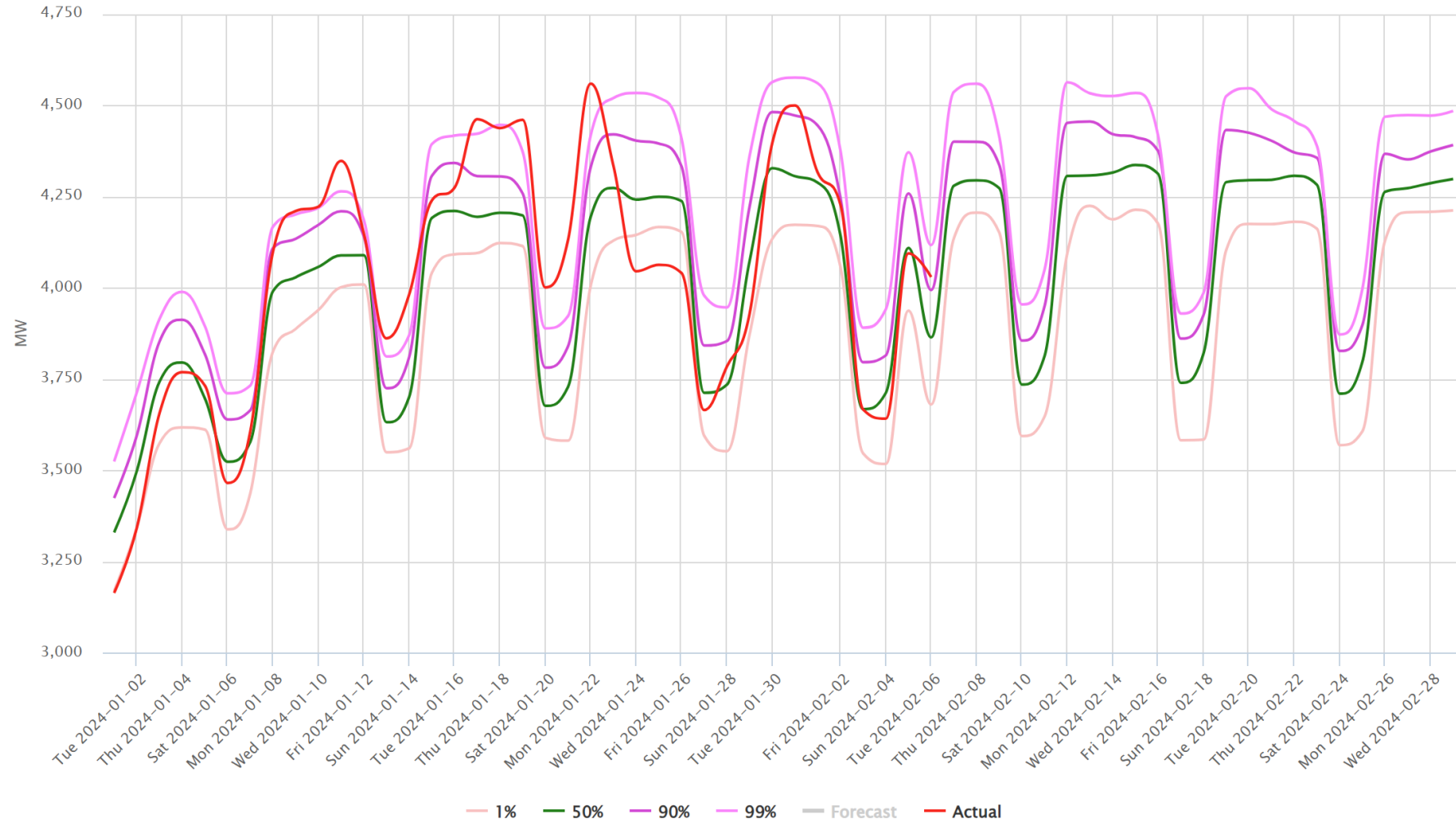
Forecasting by www.teslaforecast.com

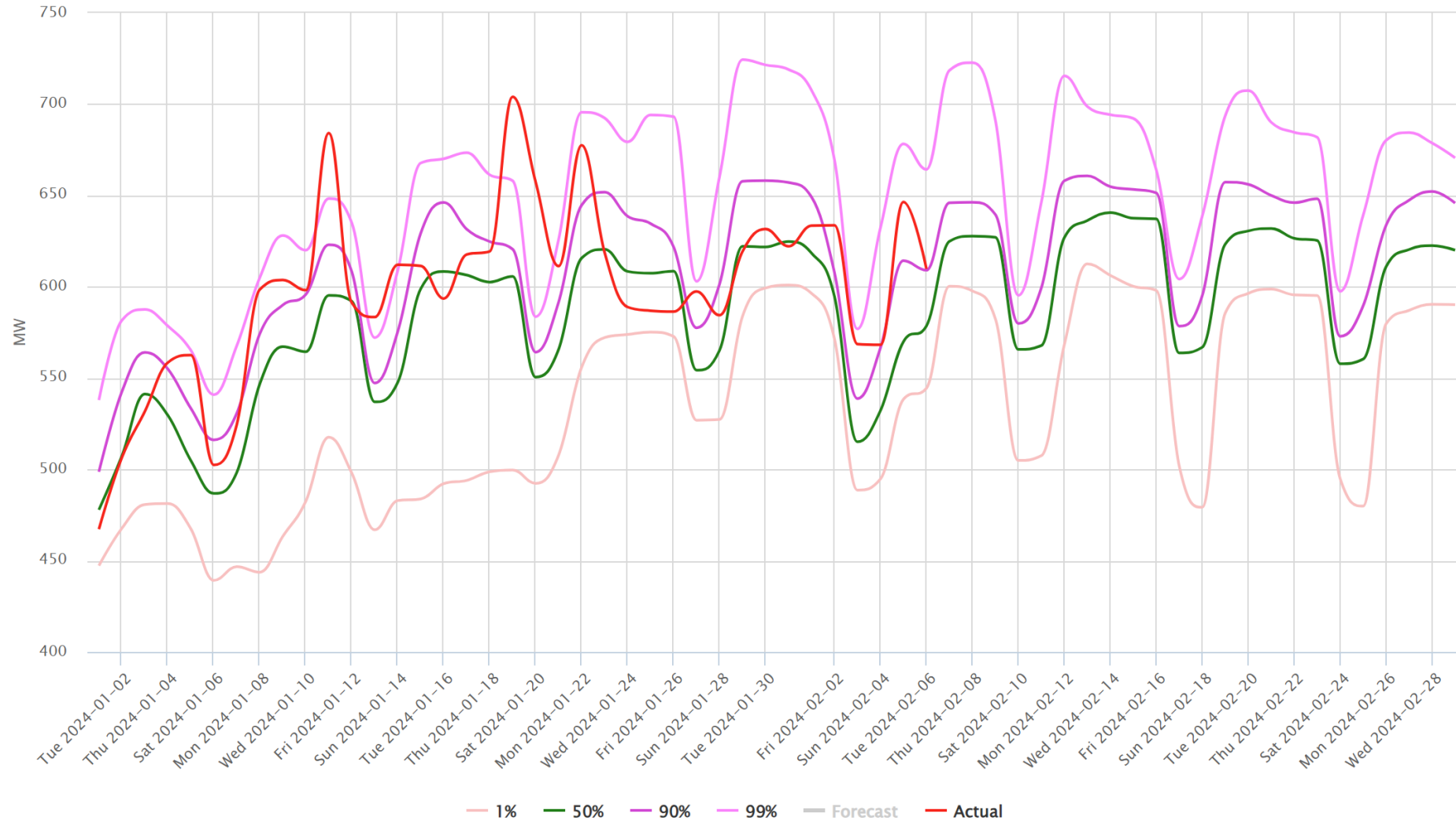# Jan 99ᵗʰ percentile exceedance unequal across country

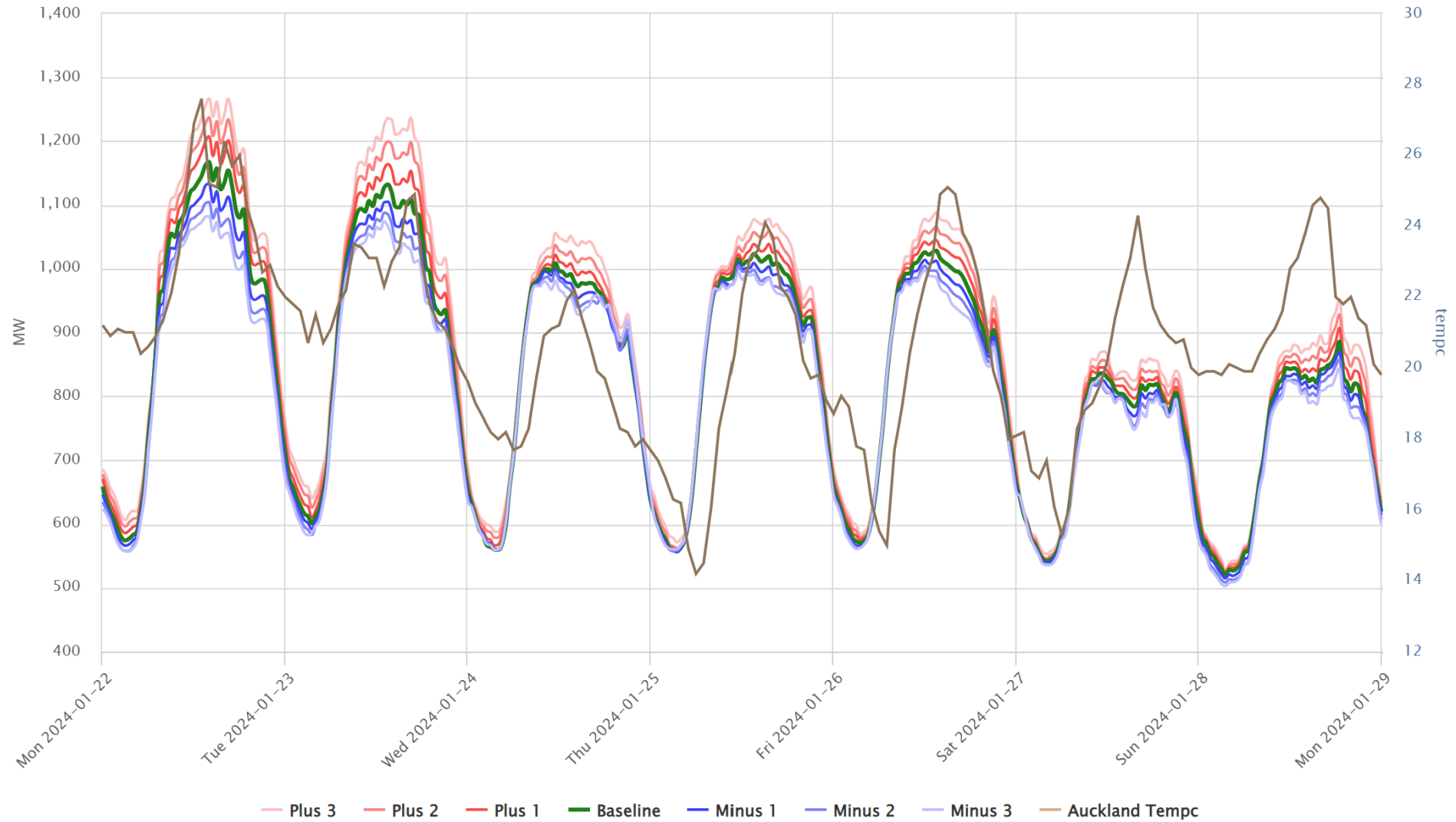|	
Napier	**8**
Northland	**7**
Auckland	**7**
Hamilton	**3**
Bay of Plenty	**2**
Christchurch	**2**
Palmerston North	**1**
Wellington	**0**
West Coast	**0**
Invercargill	**0**
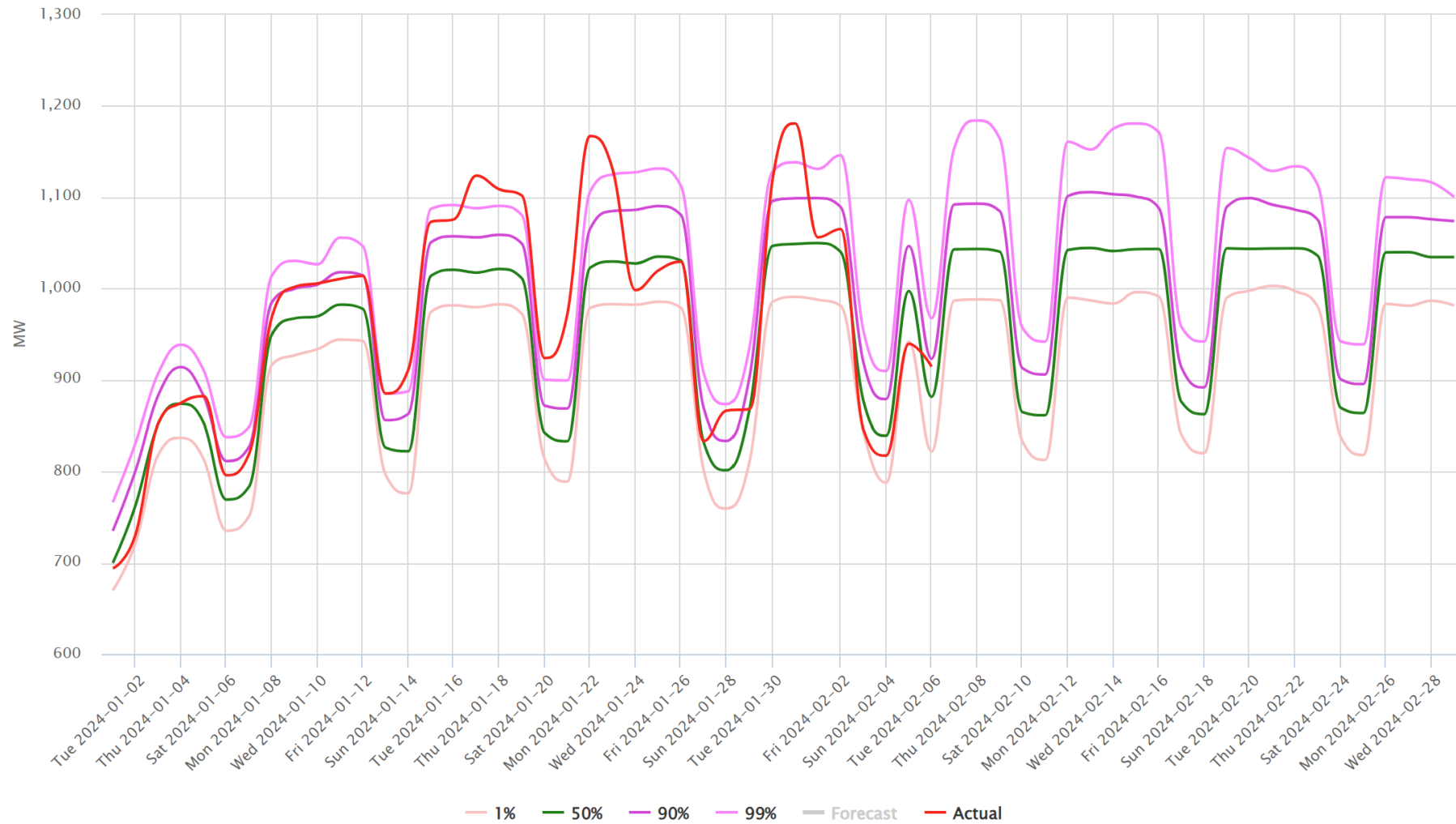
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Christchurch – only 2 instances but extreme

Forecasting by www.teslaforecast.com

Temperature Sensitivity is nonlinear – Auckland Example
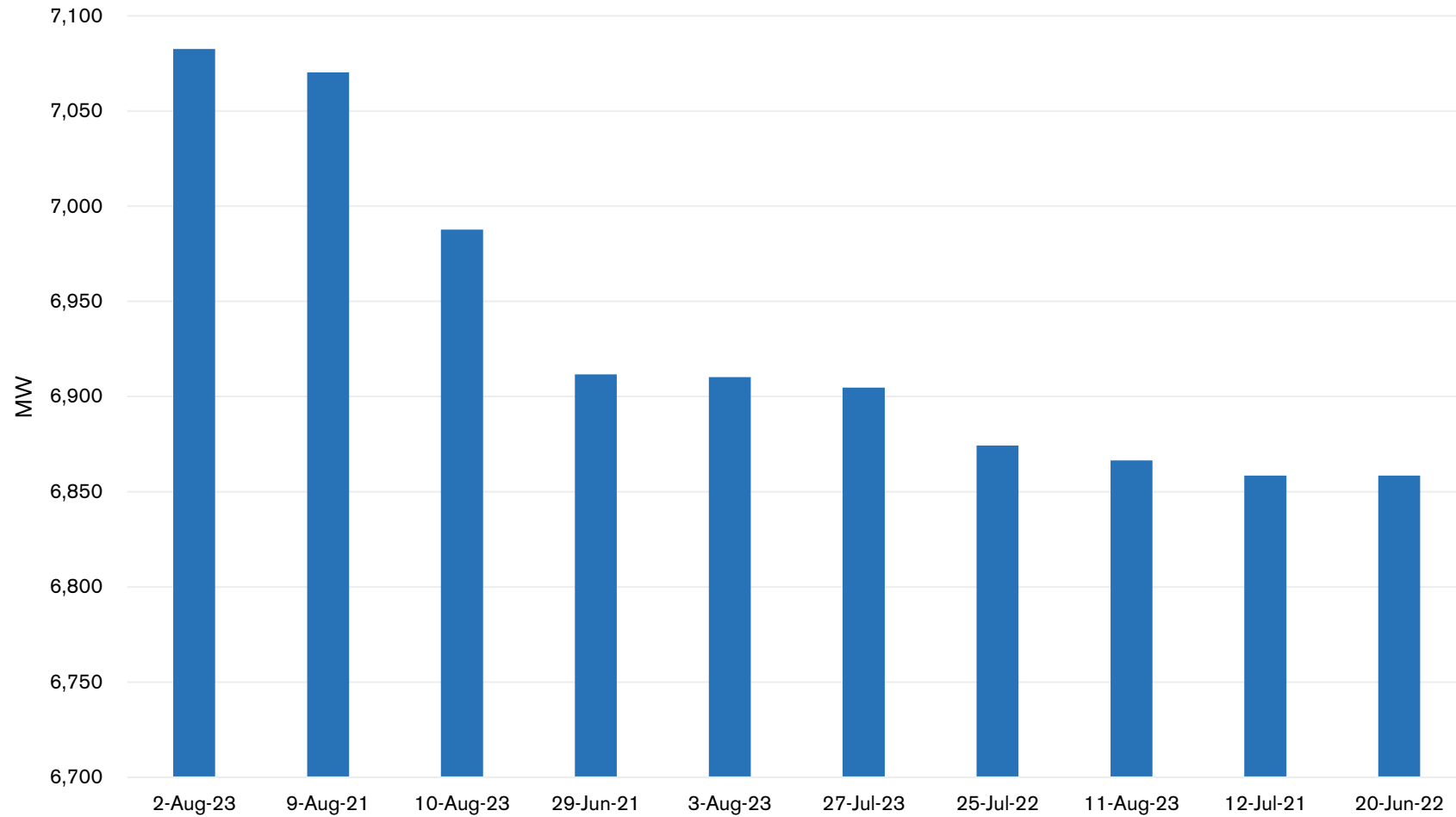
Why is underlying demand growing?

- Healthy homes = more heating and cooling demand

- Something we're seeing across the globe as economies have hybrid work-from-home environments (heating in homes and offices during the day) and electrification trends (Electric Vehicles, heat pumps, etc.)

- Heating demand moving from gas to electricity – new builds rarely have gas connections

- Unique to New Zealand is the removal of RCPD – less incentives for EDBs and large energy users to load control/curtail consumption during peak demands. This only affects the winter.

- More Time of Use Retail Plans could be contributing to higher average demand but not necessarily higher peak demand. More flexible hybrid WFH environments offer more flexibility

Q&A

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