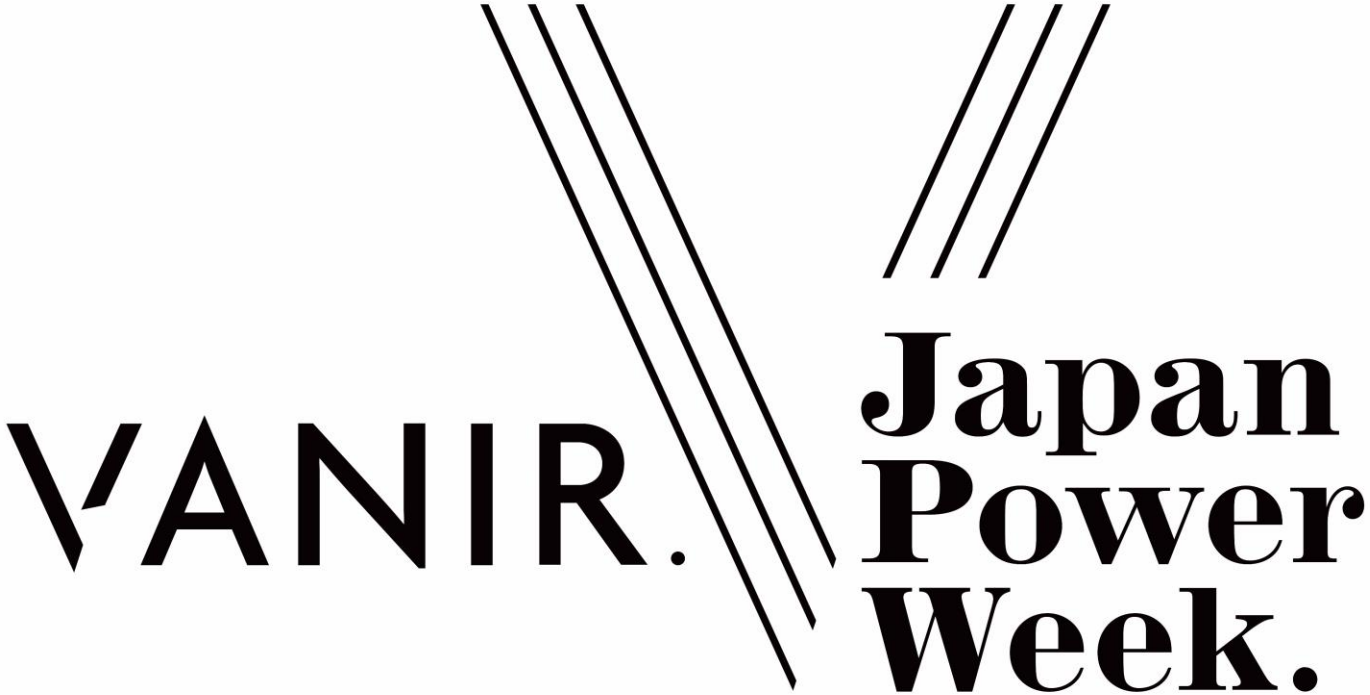
Welcome to



Who are **TESLA** Forecasting Solutions?

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

Helping over **175** clients across the globe with offices in the **US, UK** and **New Zealand**

Not to be confused with Tesla Motors

Forecasting in Japan since 2017

- Awarded **2nd place** out of **100+** participants in **TEPCO Forecasting Challenge** in **2017**
- **First time** forecasting load in **Japan**, with **minimal weather data** – we now use **49 weather stations** from **multiple weather vendors**
- **TESLA** now forecasts for all **9 regions** in **Japan** to over **10 clients**

TEPCO

Prizes

Best award ¥1,500,000

TOSHIBA Corporation

Comments from Judging Committee

Load forecasting methods based on weather forecasts are easily affected by times of seasonal change, such as the period during which the contest was held. This team successfully dealt with that shortcoming by using weather forecasts from multiple locations. The entry also employed ensemble learning to achieve even greater precision, impressing the judges with its ingenuity and potential. We are looking forward to future developments.

2nd place ¥500,000

TESLA Asia Pacific, Ltd.

Comments from Judging Committee

Although this team had limited access to the weather forecast data in Japan and were not able to use a local weather vendor during the Actual Forecast, they derived very high accuracy in both forecast of the Annual Forecast and the Actual Forecast. This suggests that if the weather data from a local weather vendor was used, this team may improve their performance in the prediction.

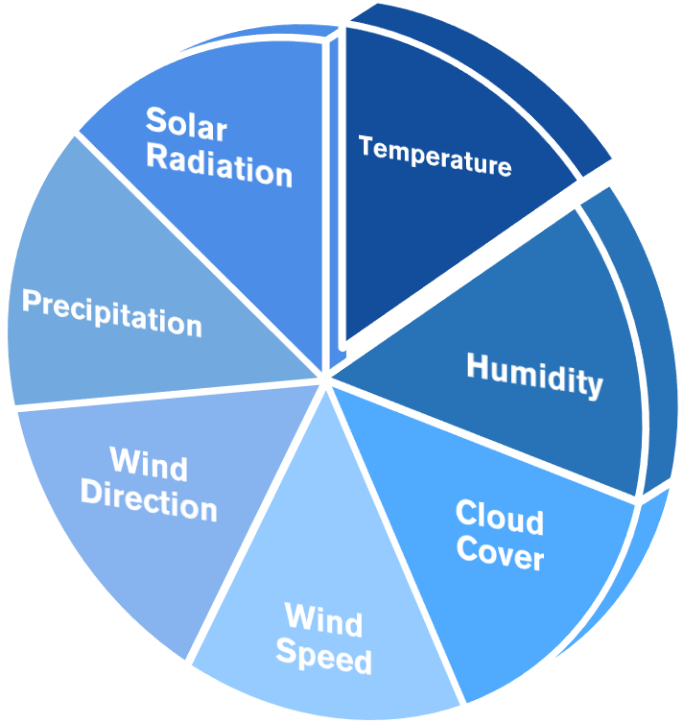
3rd place ¥300,000

Japan Meteorological Corporation

Comments from Judging Committee

We took note of concepts such as temperatures weighted for each region's population. Although it is simple, this highly precise method holds promise for the future.

Weather Drives Power Demand



- **DTN, JWA** and **MetraWeather** provide **weather forecasts**, updated every hour, for **14 day horizon**
- Typical model contains **several hundred** hourly **weather variables**, not just temperature
- **Beyond 14 day horizon, demand forecast is scenario based, guided by a long-range weather view**

Powered by DTN · Japan Weather Association · MetraWeather

Historical Power Demand Growth

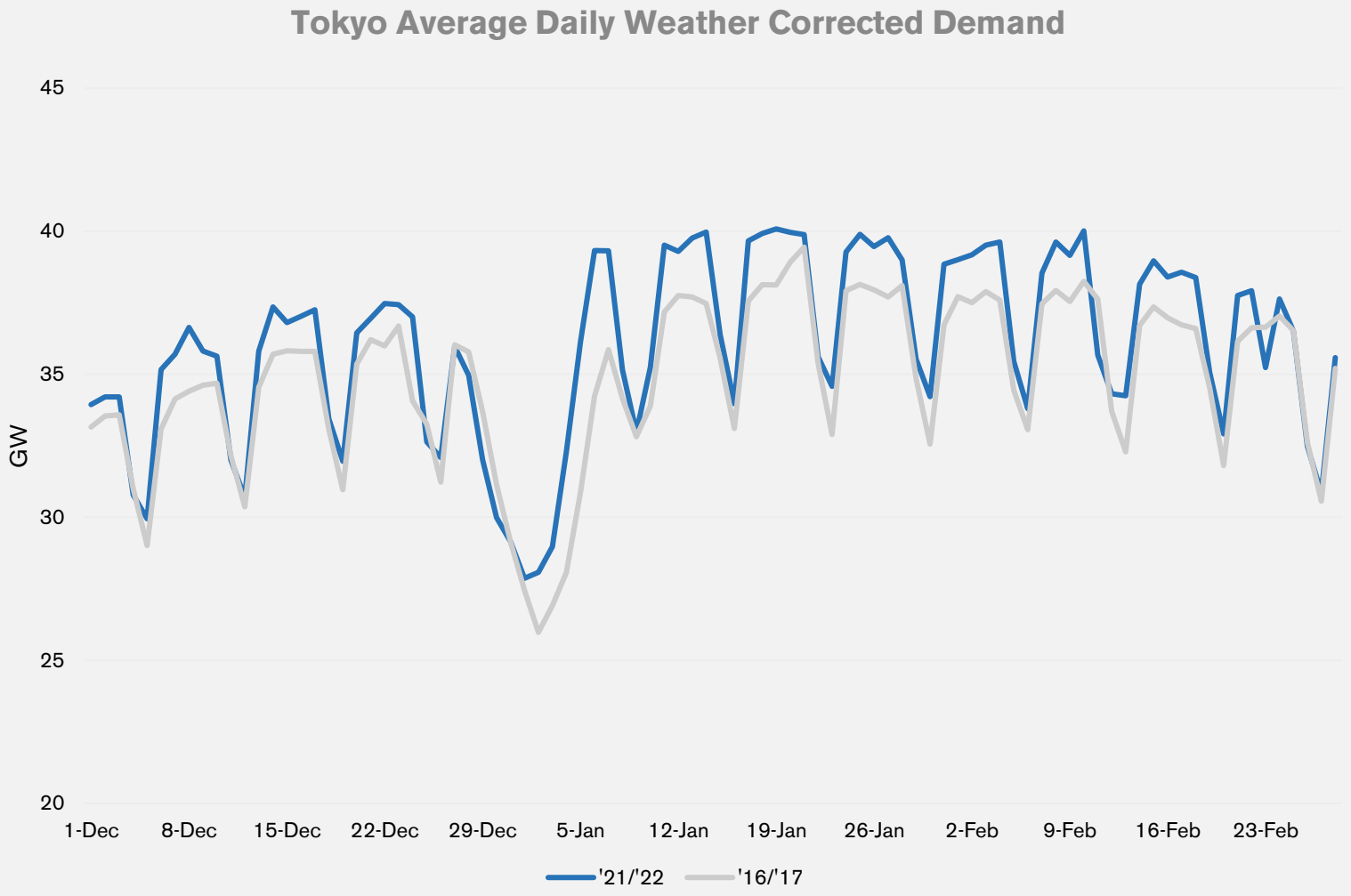
- **Weather Adjusted Load adjusts** historic demand series to climatic **average "normal" weather conditions**
- **Prevents cold or mild winters from** distorting **underlying demand trends**
- Although overall annual **power demand** in **Japan** has been **flat** or **decreasing, winter demand** has been **rising**
- Strongest growth seen in **Tokyo** and **Tohoku**

Underlying demand growth since '16/'17 Winter

	Dec	Jan	Feb
Hokkaido	-3.3%	-0.5%	-0.8%
Tokyo	2.7%	4.2%	3.0%
Tohoku	3.1%	4.6%	3.2%
Hokuriku	1.4%	1.5%	1.0%
Chubu	2.6%	3.1%	2.2%
Kansai	0.0%	1.7%	1.3%
Chugoku	-1.2%	-2.0%	-1.6%
Shikoku	-0.7%	1.1%	0.1%
Kyushu	0.9%	2.2%	0.6%

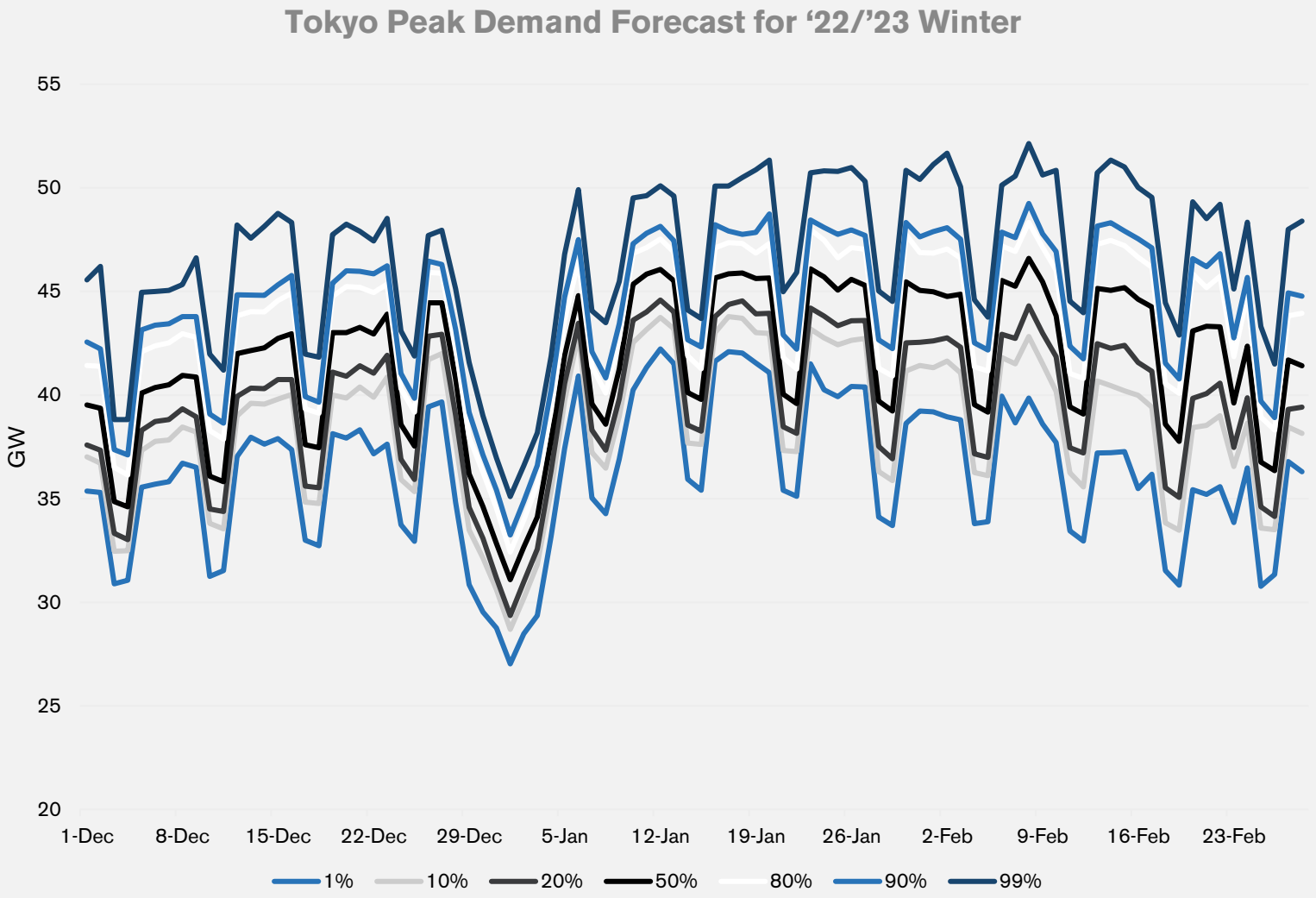
Zooming in on Tokyo

- Strong growth can be seen during all three months, but particularly in early January
- Data must be shifted to align day of week
- Both series are normalized to 10 year seasonal normal weather



Weather Risk

- **Same model** - longer term **scenarios consistent** with short term. **Evidence based trends from demand data** incorporated into the future
- Hourly **weather forecast** reverts to seasonal normal weather beyond 2 weeks. Rather than **seasonal normal weather**, we transplant 10+ years of **historical weather data** and solve the model hundreds of times. The **percentile distribution** is graphed.
- Coupled with long range **weather view** to guide decisions



Summary Weather View from DTN

- Traditional analog signal analysis indicates greater than normal chances of cooler than normal temperatures (most of Japan apart from Hokkaido) on a trend-corrected basis (i.e. compared to todays warmer climate)
- But with a weakening La Nina forecast by seasonal models, there is a conflicting (weak) signal of warmer temperatures
- Optimal accuracy gained by combining analog analysis / multiple seasonal forecast models
- With the transition into winter, regularly updated forecasts will add further refinement, as more robust signals emerge

World Climate Service
A SINGLE SOURCE FOR
CLIMATE ANALYSIS, MONITORING, AND PREDICTION

DTN prosper in a dynamic world

Summary Weather View from MetraWeather

- We are moving into the northern hemisphere winter with La Nina continuing to be in place, this for the third year running. Therefore, it is envisaged that conditions across Japan may well be very similar to that from the previous winter and we can, therefore, gauge the upcoming winter with reasonable confidence in terms of the broader patterns and evolutions
- Temperatures are likely to be near or slightly below average for the winter as a whole, especially across Hokkaido, Tohoku, Kanto, Chubu and Kinki regions, so many central and northern areas of the country are at risk of colder than average conditions at times
- Temperatures may be near or slightly above average though across Chugoku, Shikoku and Kyushu regions
- Low pressure and more unsettled conditions are, overall, likely to dominate the winter, but perhaps especially during December and January, driven by the ongoing La Nina

MetraWeather

Contact us for a free trial

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