



S&P Global Nodal Trader Conference
Yes Energy Workshop

Unlocking Market Intelligence: Tools, Insights, & the Future of Power Trading

Workshop Introduction
President & CEO, Michael McNair
Oct 22, 2025



Is Power Market Data “Commoditized”?

Michael McNair's History in Energy

- **1998: Worked with NEPOOL and NYISO market data**
- **2001: Built (the first?) web-based product for North American Power markets at *FriedWire***
- **2004: Developed products for DA and RT markets at Energy Velocity (Ventyx → ABB → Hitachi)**
- **2008: Founded Yes Energy to serve Nodal Market Traders and Asset Managers, especially in FTRs**
- **2009: Attended my first Nodal Trader conference**
- **2010: Yes Energy has sponsored of every Nodal Trader conference since**

Nodal Power Market Data used to be special

My Boss in 2004:

Do customers
need data for ALL
the nodes?

Me:

Yes they do!

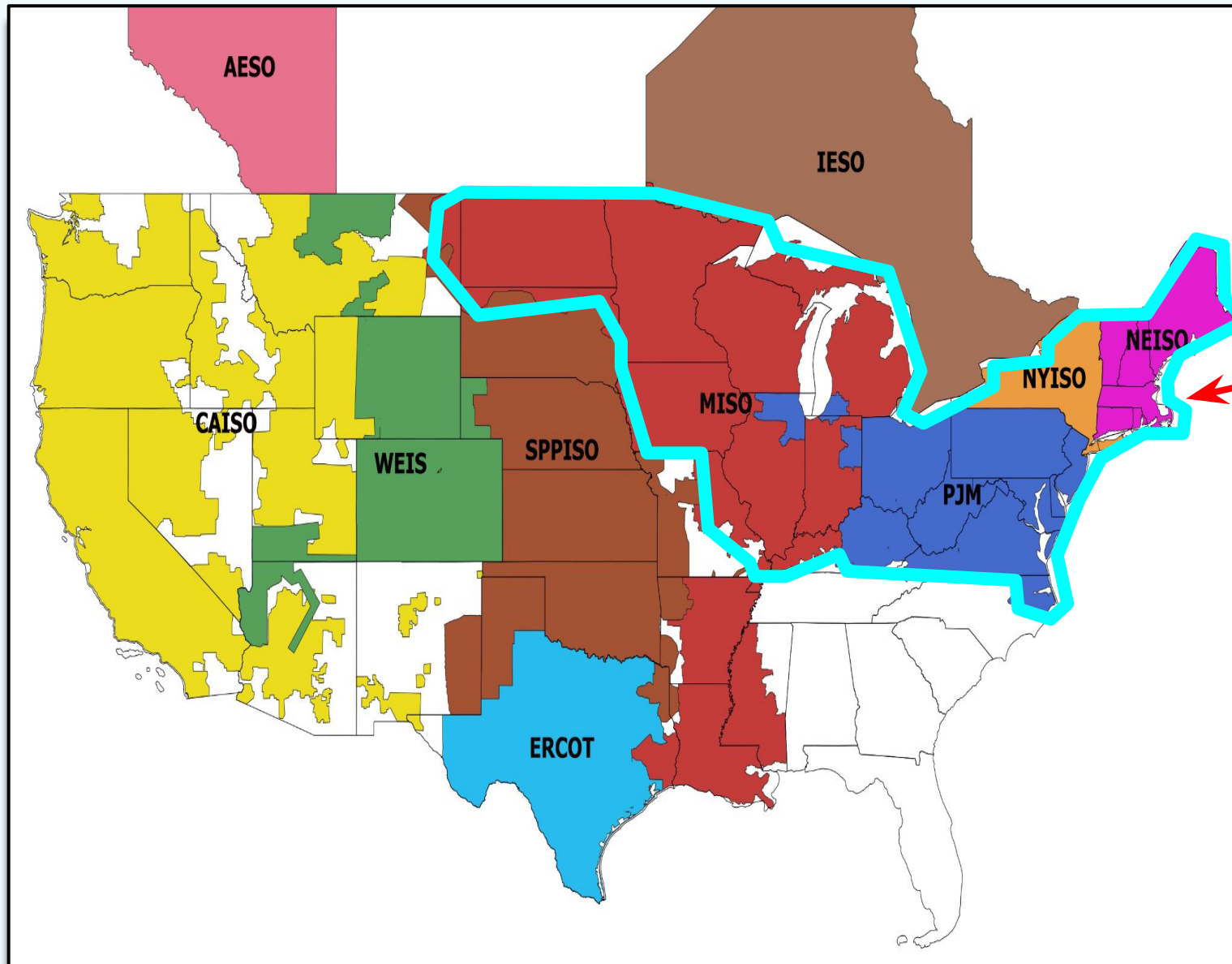


My Interesting Times in Power Markets

Highlights:

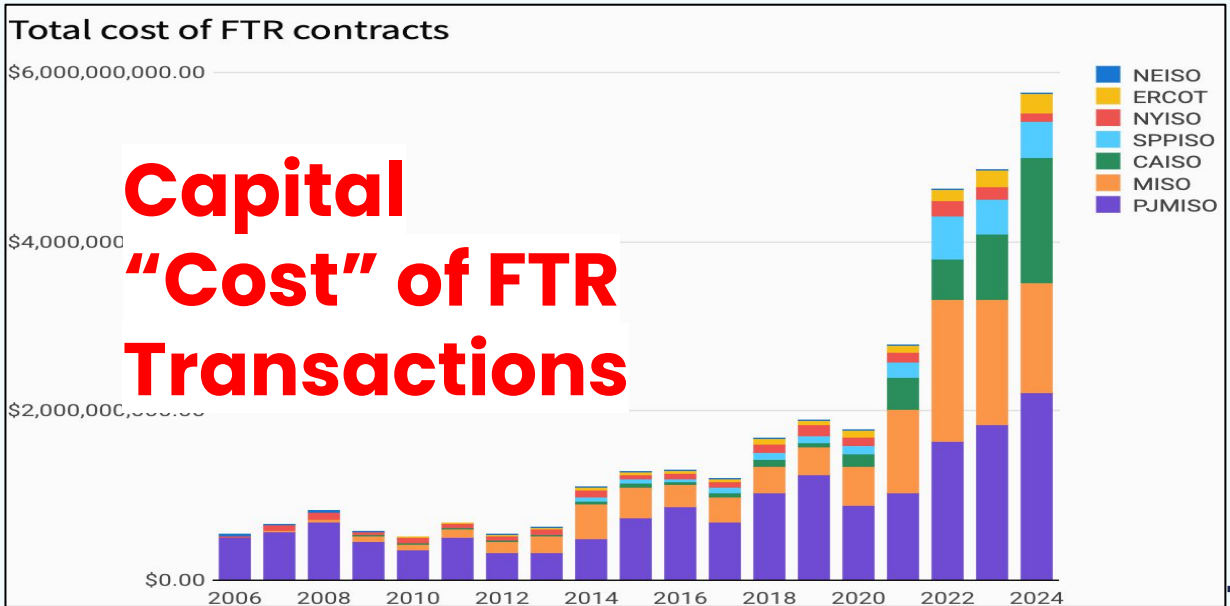
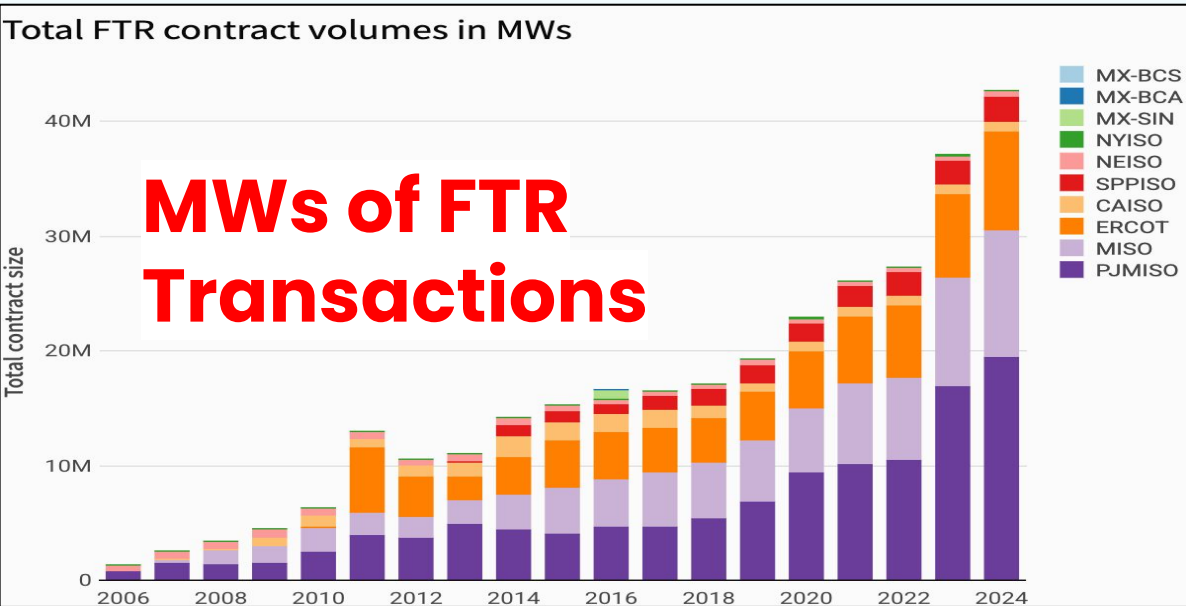
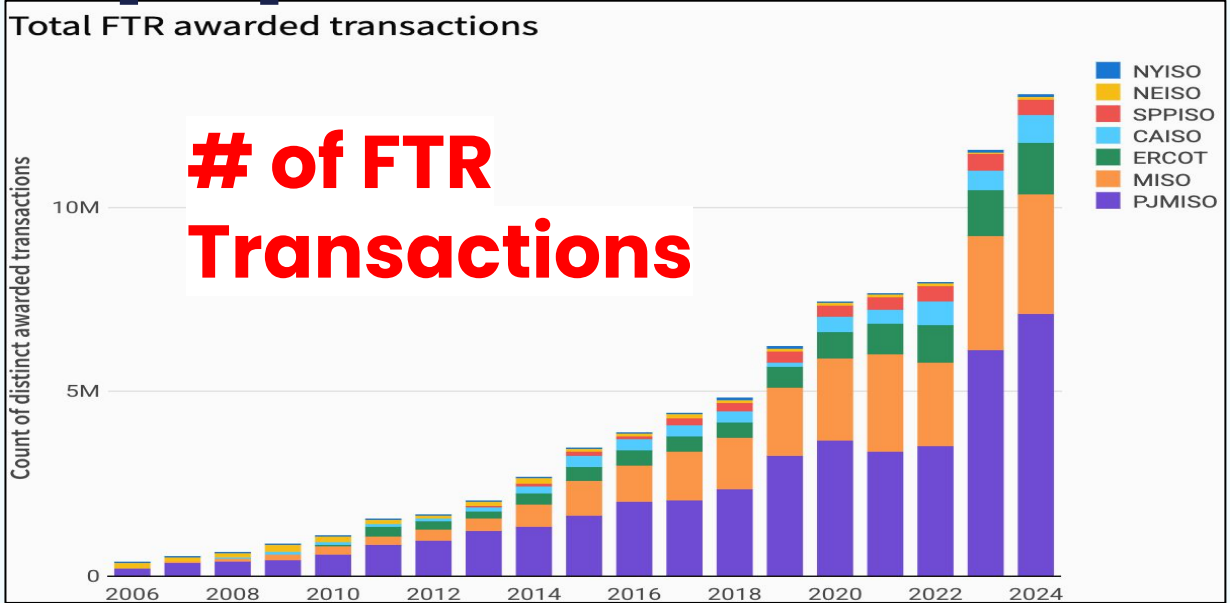
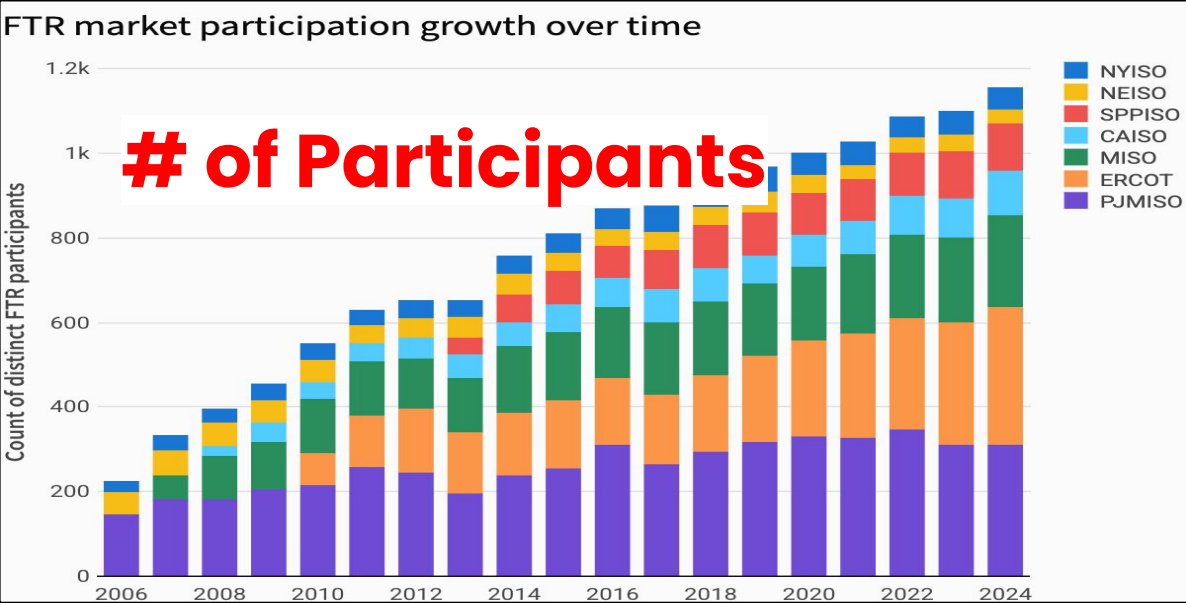
- **Sold products to Enron**
- **Launch of 7+ RTOs**
- **Many RTO expansions**
- **2003 Blackout**
- **Hurricanes & Polar Vortices**
- **Birth and death of PJM Upto Congestion**
- **Several major defaults incl. Greenhat**
- **Dodd/Frank rules**
- **FTR Underfunding**
- **\$14/MMBtu Nat Gas**
- **Fracking technology widespread**
- **Coal/Nuke Retirements vs Wind, Solar, Storage!**

Power Markets are bigger than ever!



**Competitive
Power
Markets in
2008**

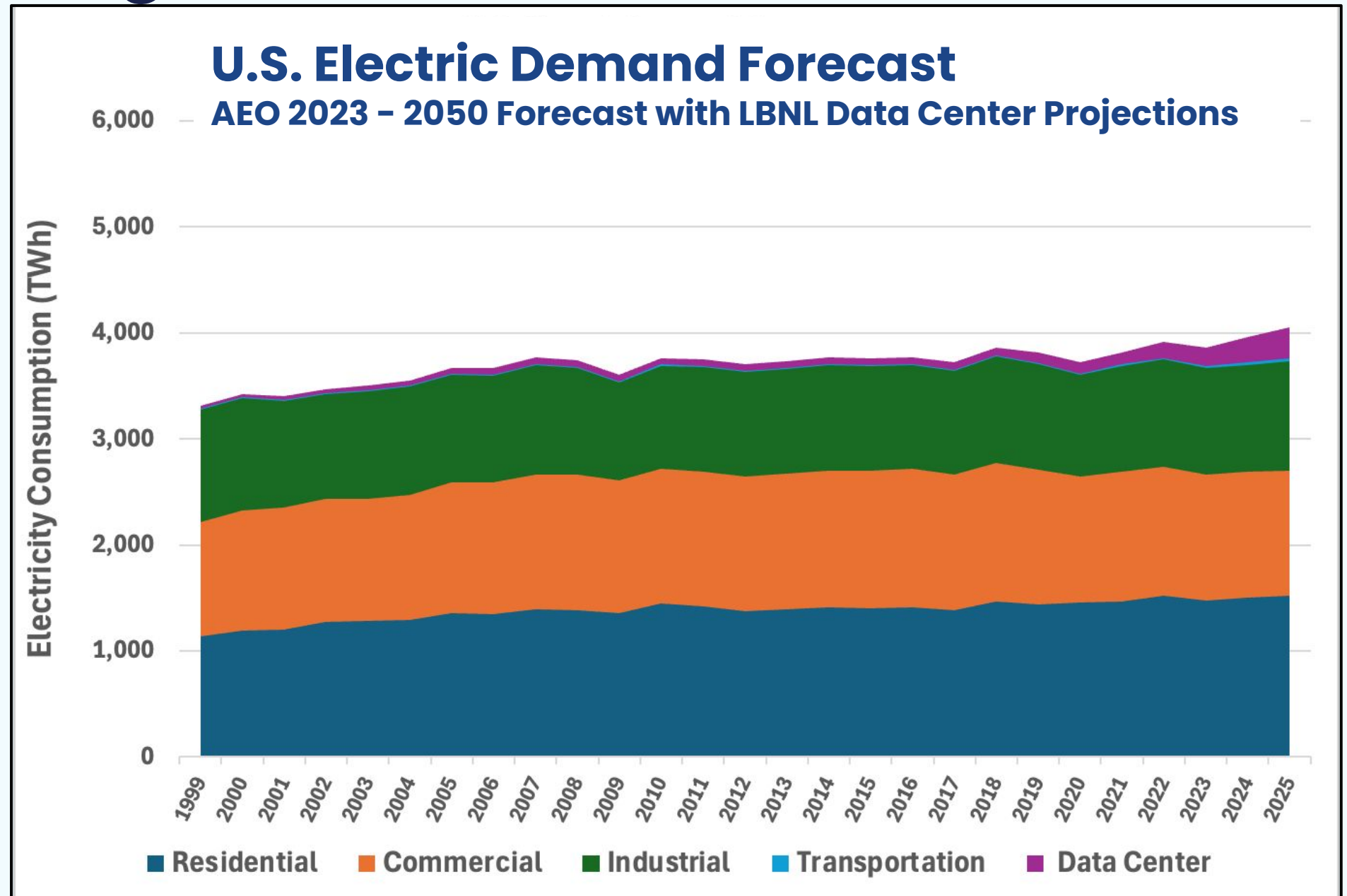
Power Markets are more popular than ever!



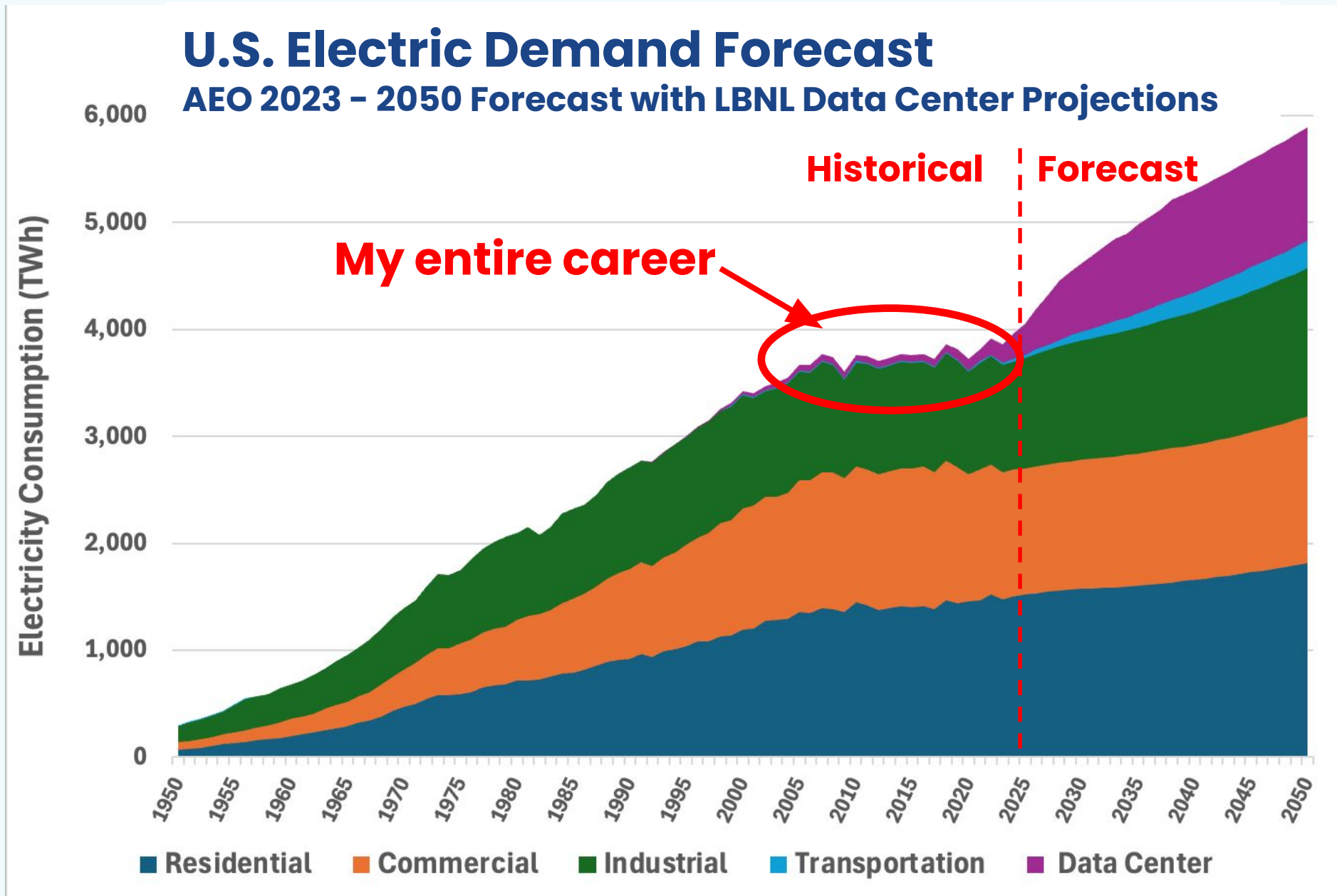
My *Interesting Times* in Power Markets

Highlights:

- Sold products to Enron
- Launch of 7+ RTOs
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- Birth and death of PJM Upto Congestion
- Several major defaults incl. Greenhat
- Dodd/Frank rules
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- \$14/MMBtu Nat Gas
- Fracking technology widespread
- Coal/Nuke Retirements vs Wind, Solar, Storage!



A 30-Year Pivot Period?



Is Power Market Data “Commoditized”?

Nodal Power Market Data is Still Not for Chumps

**Almost 4 Million
active “objects”**

**4,800 types of
data**

**1,100 Data
Sources**

**400k–600k Data
Collections per
day**

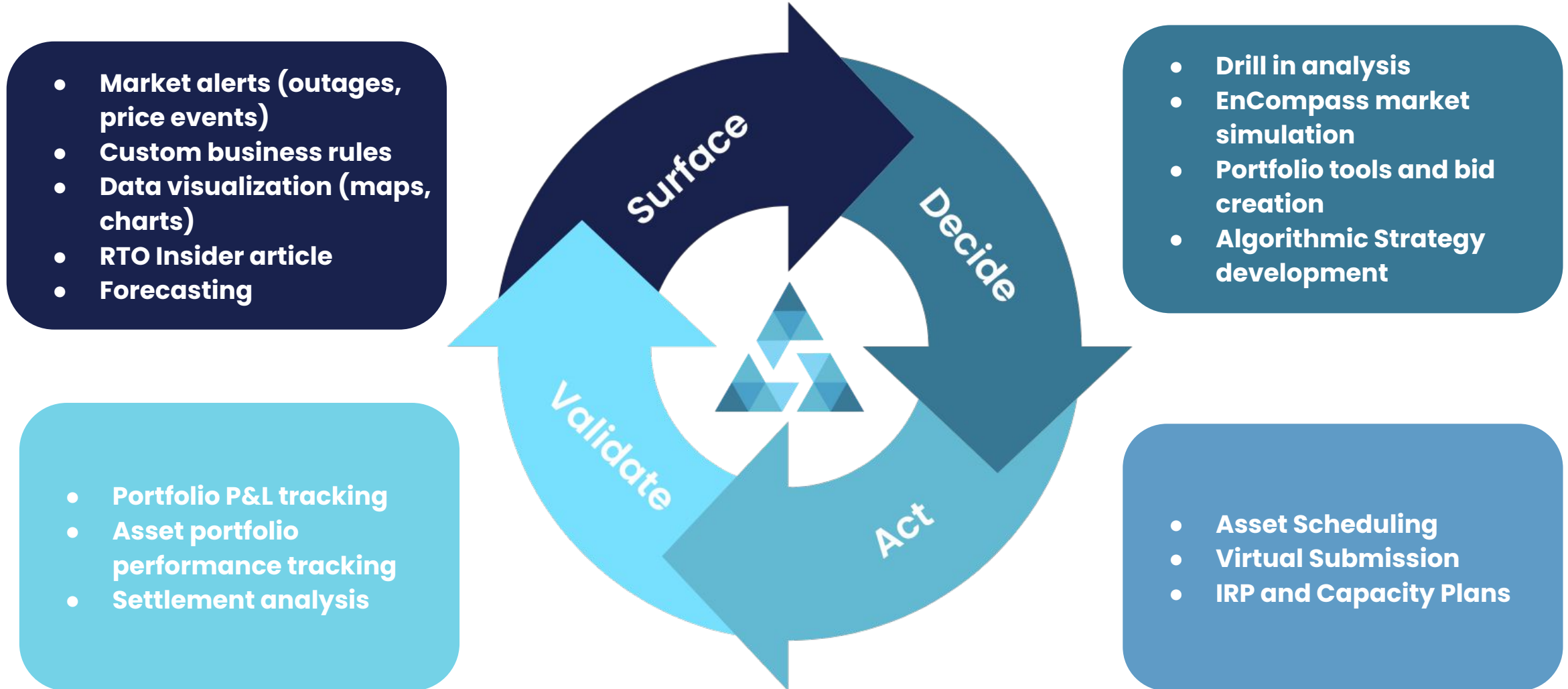
**750k Data
“Checks” per
day**

**150+ Million rows
of data loaded
per day**

**~20 TB of
historical data;
incl “use or lose”**

**1 – 2 Million
customer
queries per day**

Power Market System Workflow



Integrating Diverse Product Offerings: “Greater than the sum of its parts”



PowerSignals

Enables users to leverage high-quality data for market analysis and informed trading, hedging, or dispatching decisions.



DataSignals

Delivers powerful data to nodal power market participants



QuickSignals

Translates market noise into customizable insight, enabling the user to visualize changes in the market using easy-to-navigate dashboards



PowerCore

Bid to Bill Offers visibility into trading risk & performance and provides valuable oversight of trading activities



Live Power

Delivers fastest-in-industry reporting of power generation and transmission flow data



RTO Insider LLC

Brings critical moments in energy market policy-making to those with a financial interest in the wholesale energy markets



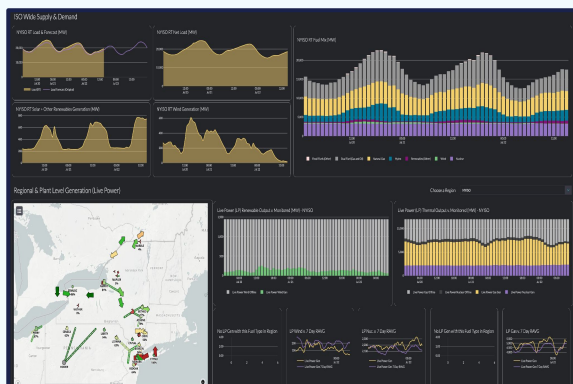
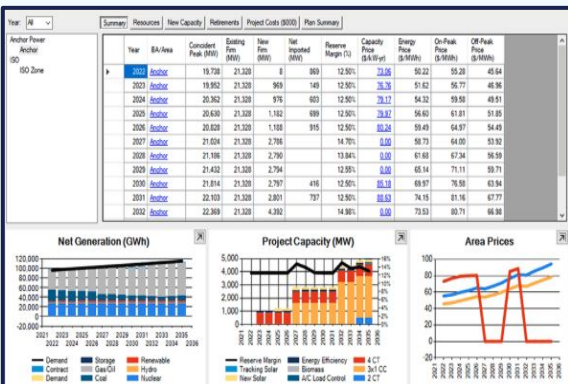
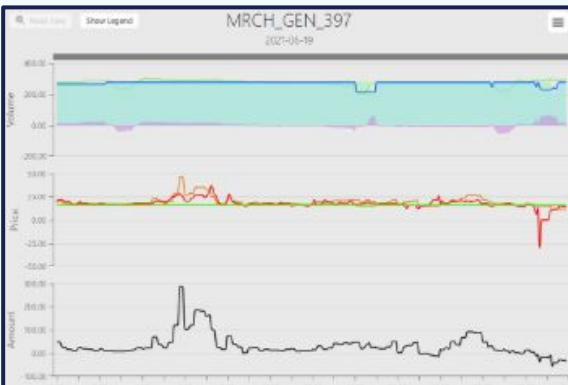
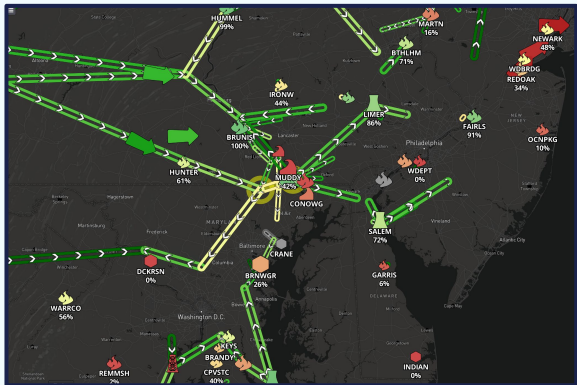
Demand Forecasts

Feeds comprehensive and exclusive information into proprietary algorithms to ensure accurate & reliable forecasts



EnCompass

Combines power plants and complex contracts' operational detail into a simulation software





RTO Insider

YOUR EYES AND EARS ON THE ORGANIZED ELECTRIC MARKETS

CAISO ■ ERCOT ■ IESO ■ ISO-NE ■ MISO ■ NYISO ■ PJM ■ SPP

Trump Officially Names Rosner, a Democratic Appointee, FERC Chair

President Trump picked Democratic Commissioner David Rosner, nominated by former President Biden, to run FERC over Republican Commissioner Lindsay See, a surprise to many stakeholders. Trump has nominated two Republicans to fill the two currently open seats on the commission.

CONTINUED ON P4

IRS Guidance on Wind and Solar Credits Not as Bad as Feared (p.12)
Advanced Nuclear Fast-track Effort Gets First 11 Projects (p.41)
FERC Rules Costs of Mich. Coal Plant Extension Can be Split Among 11 States (p.20)



MISO

MISO States Split on FERC Complaint to Unwind \$228 Long-range Tx Plan (p.12)



Stakeholder Forum

Nexamp Complains of Unfair IC Cost Increases by National Grid (p.20)



NYISO

New York PSC Denies NYISO's Clean Path Transmission Priority Status (p.31)



CAISOWEST

BPA Preparing to Deliver Power Under New Multiyear Contracts (p.18)

Integrating Diverse Product Offerings: “Greater than the sum of its parts”



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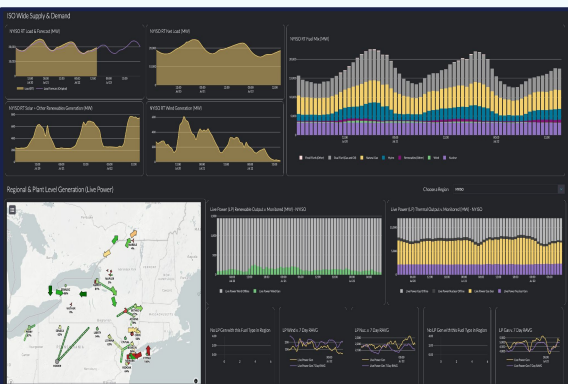
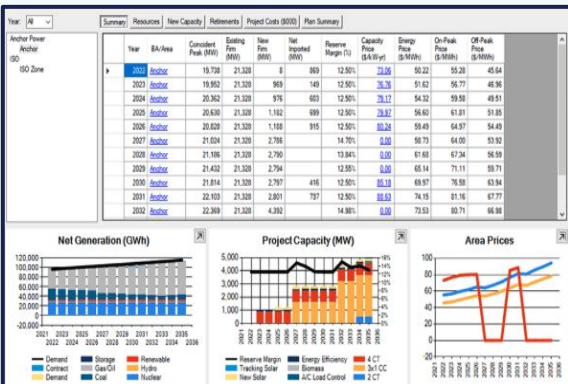
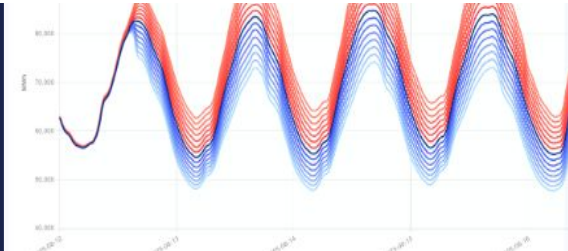
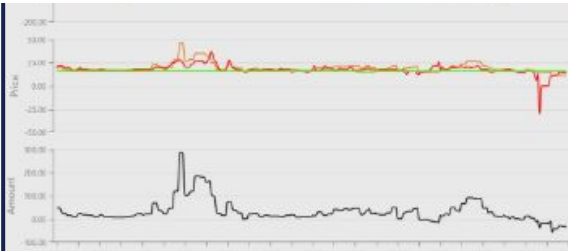
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“Power Market Operating System”



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MISO

MISO States Split on FERC Complaint to Unwind \$228 Long-range Tx Plan (p.18)
The Organization of MISO States is divided over a complaint filed by several of its members on the RTIO long-term transmission planning.



STAKEHOLDER FORUM

Recent MISO Complaint Undermines Regional Transmission Planning Framework (p.31)



NYISO

Nexamp Complains of Unfair IC Cost Increases by National Grid (p.21)
The complaint alleges that National Grid inflated New York PSC requirements for distributed energy resource interconnection.



CAISOWEST

BPA Preparing to Deliver Power Under New Multiyear Contracts (p.16)
With the expiration of BPA's previous contracts, the agency now has contracts and options in place it hopes will serve for the next two decades.

BPA Issues Final Long-term Power Contract, Updates Strategic Plan (p.10)

Launch Your Trading: Surface, Decide, Act



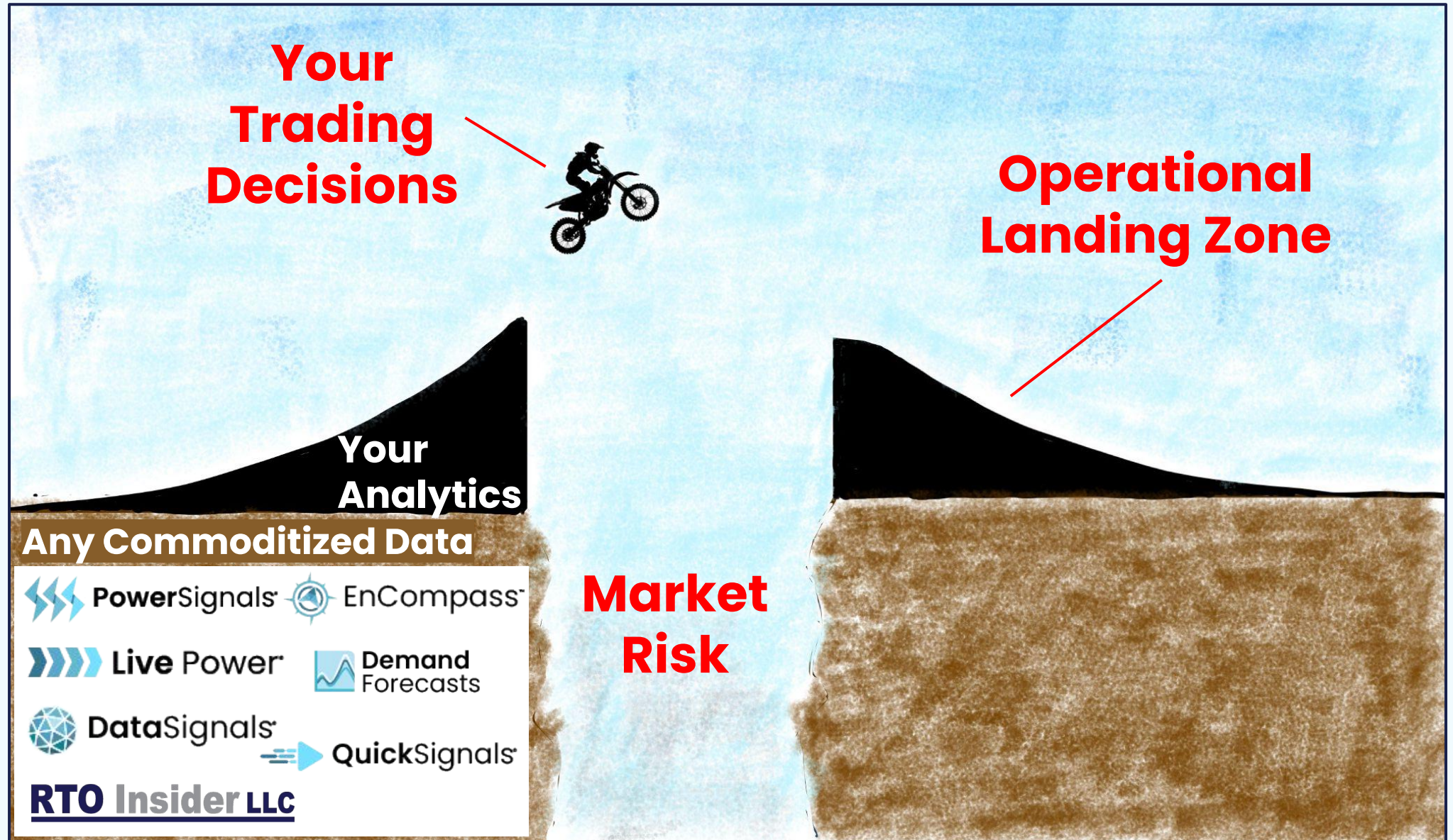
Surface, Decide, Act with a Better Ramp



Surface, Decide, Act with a Better Ramp

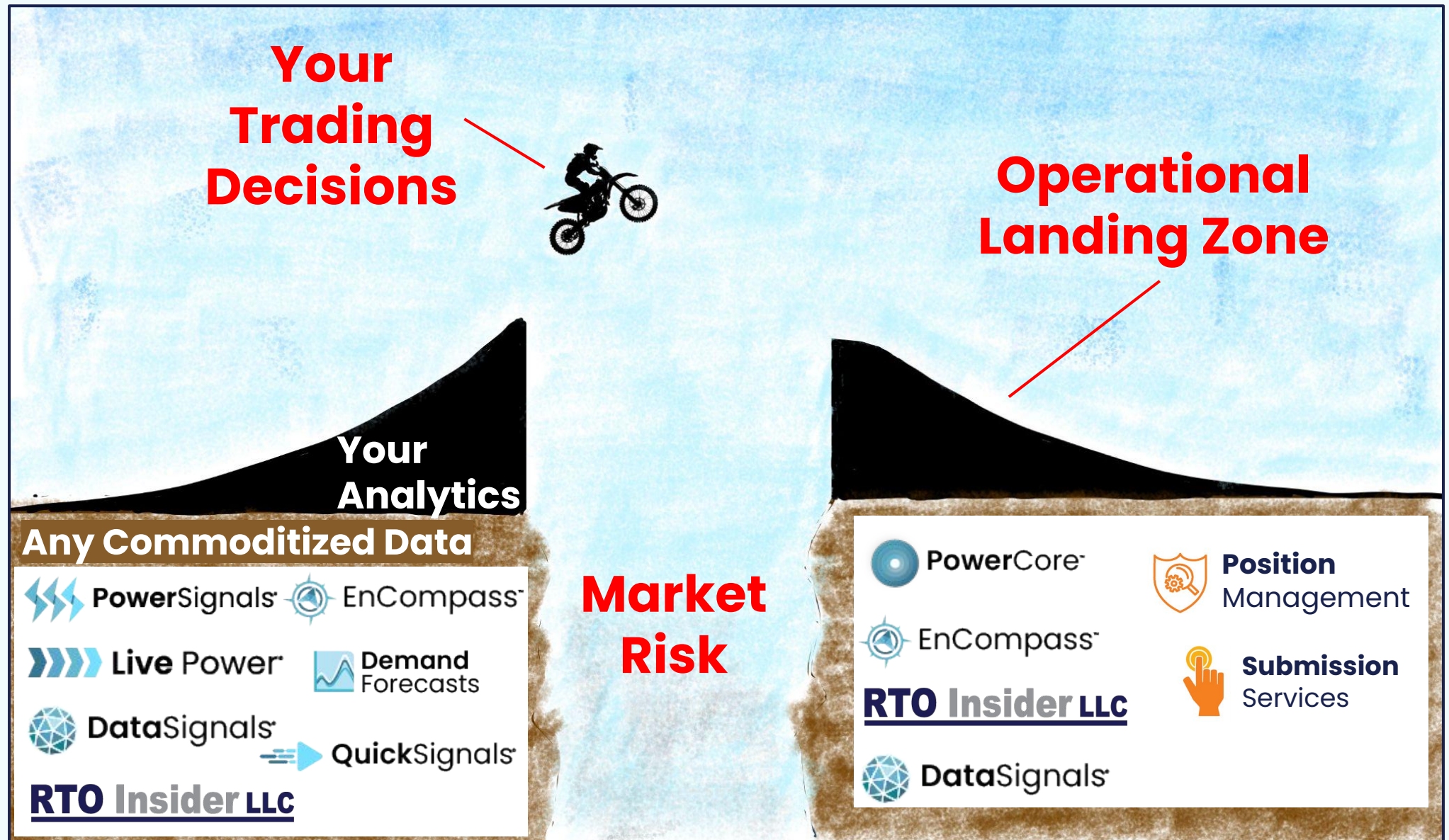


Launching, Landing & Learning (Validating)



Surface, Decide, Act

Validate





YES ENERGY®

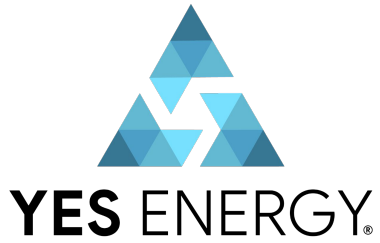
**VISION:
PURPOSE:**

BRAND PROMISES

STRATEGIC PRIORITIES

CORE VALUES

CORE COMPETENCIES



CORE VALUES

Yes Energy Believes:



Nerds are cool. Our ultimate team of nerds is motivated by curiosity and is passionate in the pursuit of knowledge.



We care deeply about the quality of our work. We take pride in the expertise we bring and the confident decisions it enables. We know our work makes a difference in the world around us.



We have the highest ethical standards. Our critical information and perspectives are accurate and unbiased and we do not allow our integrity to be compromised.



We embrace and drive change, and are undaunted in that pursuit. Our teams are bold, brave and tenacious, in relentless pursuit of the right solutions for our customers



We Are One Team Built on Respect. Believing in each other is a competitive advantage. We collaborate with trust, empathy and humility, to solve problems and build meaningful relationships.



Work well, play well, be well. Our professional and personal activities are complementary. Each energizes the other.

Yes Energy's Power Market Nerd Herd

~350 Nerds serving more than 1,000 customers

Centuries of Power Market Experience + a "Next Generation" of Power Market Skills



Yes Energy's Power Market Nerd Herd

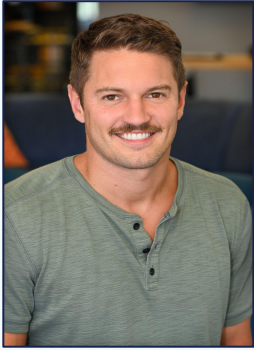
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Experienced: Insights & Support

Insights from “Today’s Nerds”



Quinn Gray, *Sr. Product Manager*
ERCOT RTC+B, Yeah You Know Me



Ben Perry, *Sr. Product Manager*
It's Gettin' Hot in Here: Evaluating Electricity Demand Sensitivity to Temperature in Low Summer Demand Regions



James Downing + Rich Heidorn
The Regulatory and Political Implications of Load Growth/Price Increases



Alex Bennitt, *Product Manager*
Complex Load Growth



Sam Lockshin, *Product Manager*
Data and Analytics Best Practices for Power Market Participation



Laura Fletcher, *Associate Product Manager*
Infrastructure Insights – Your Crystal Ball into Upcoming Changes to the Grid

Is Power Market Data “Commoditized”?

- **I don’t know and it depends – moving target**
- **Trading workflow: Surface, Decide, Act, Validate**
- **Market Risks → Calculated Risks using Specialized Data and Analytics**
- **Operational Risks → A safe landing zone where you can learn and validate**
- **What is the product? Insights and Support**

Thank you



YES ENERGY®

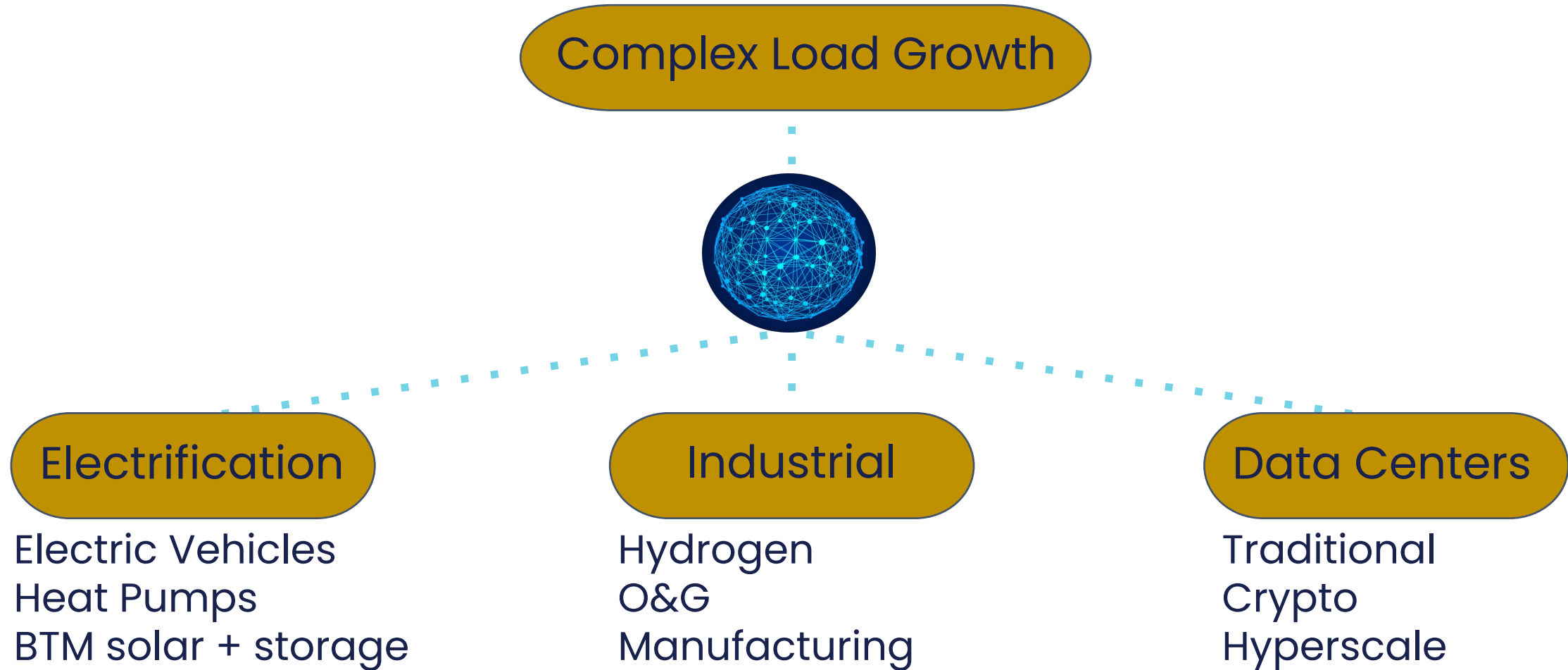


YES ENERGY®

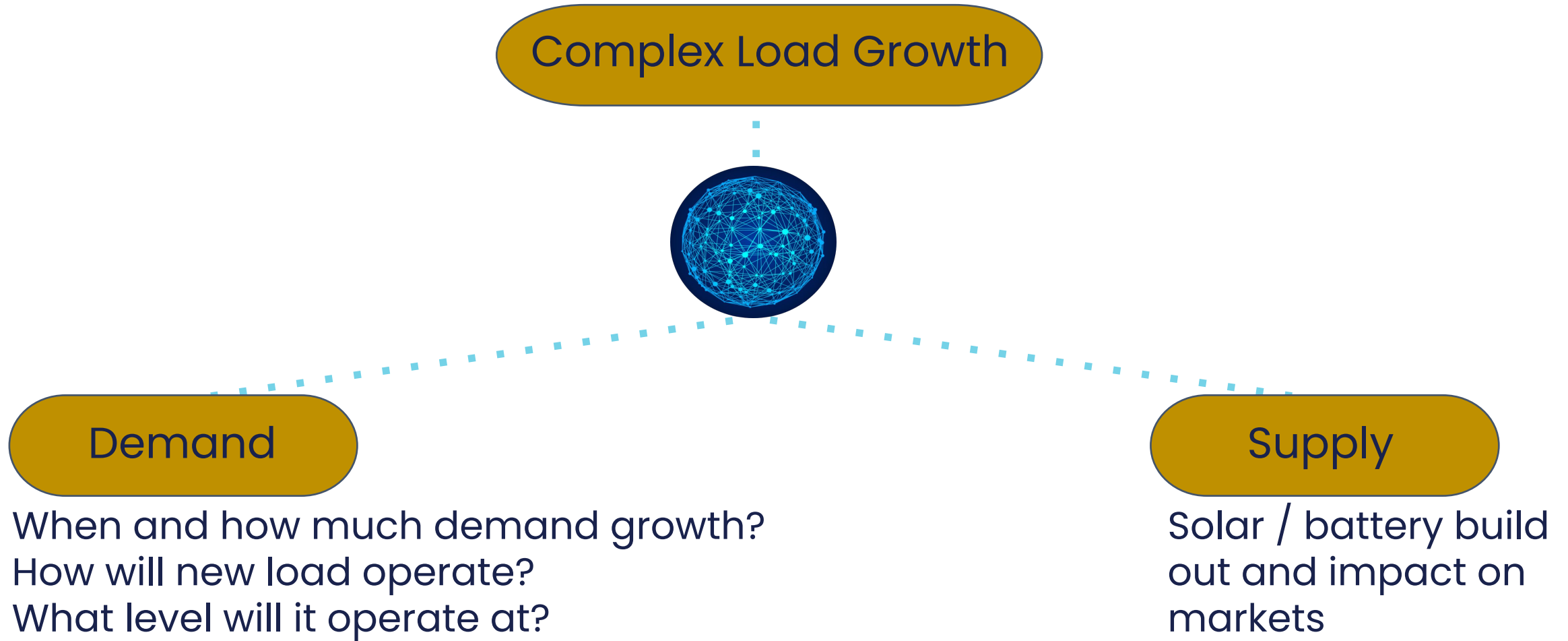
Complex load growth

Alex Bennitt
Product Manager – Yes Energy

DEMAND A GROWING PART OF MARKET EQUATION

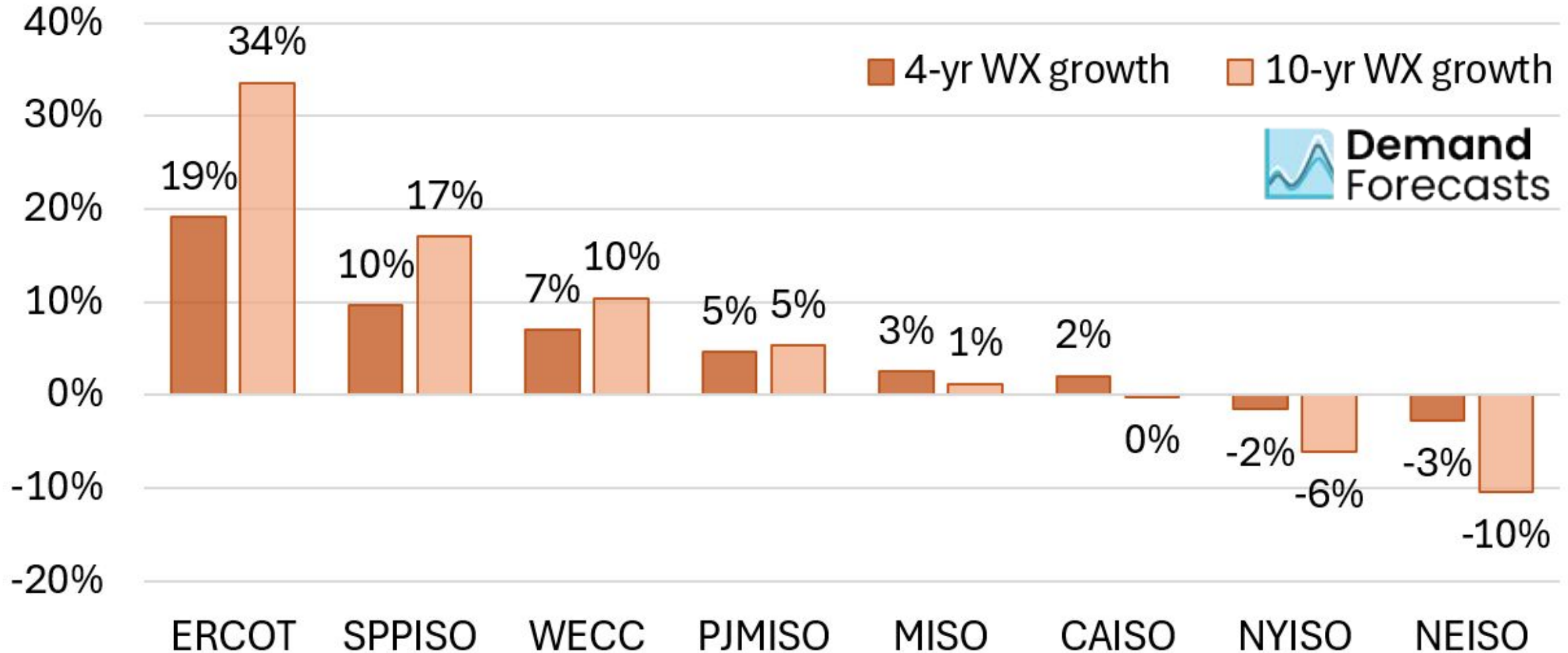


OVERVIEW



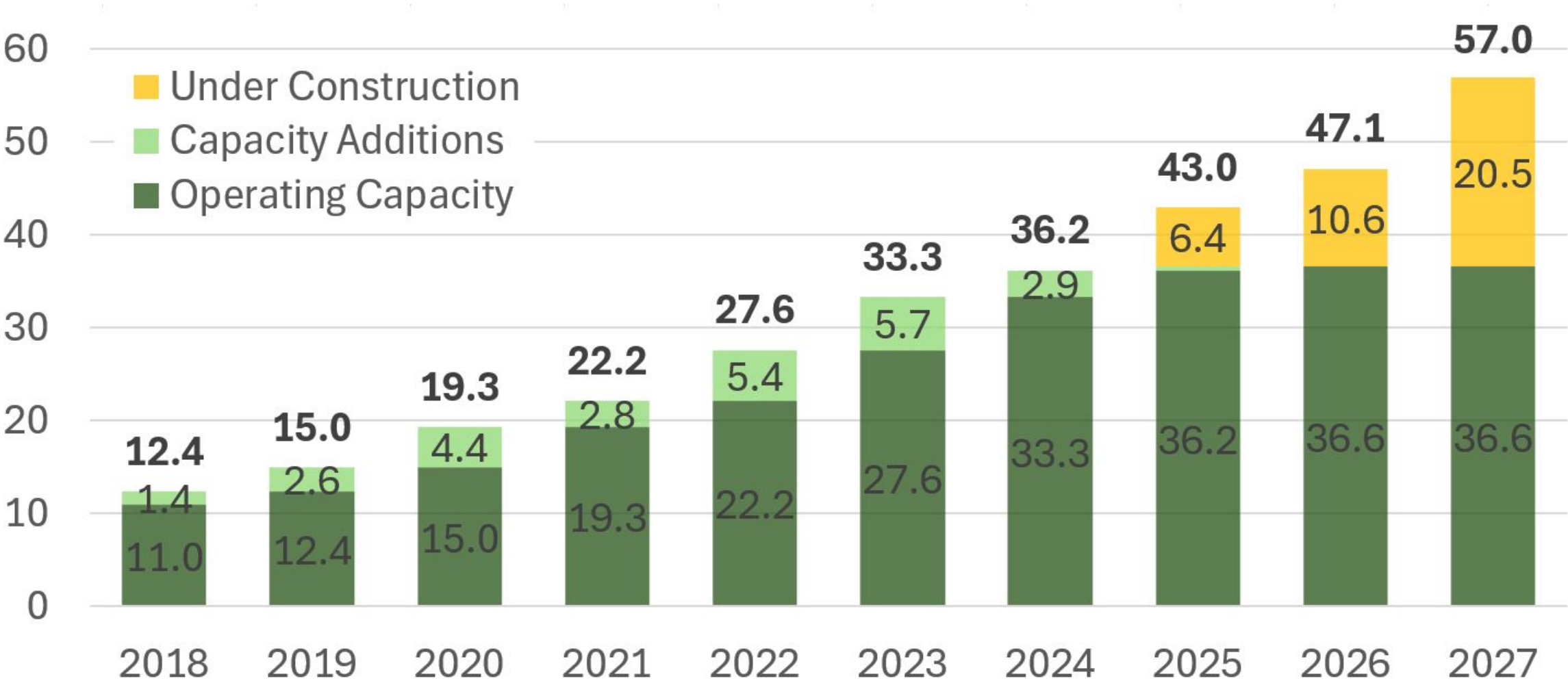
LOAD UP 19% IN ERCOT OVER 4-YEAR PERIOD

Yes Energy demand forecast weather adjusted Jul-Aug load growth by region, %



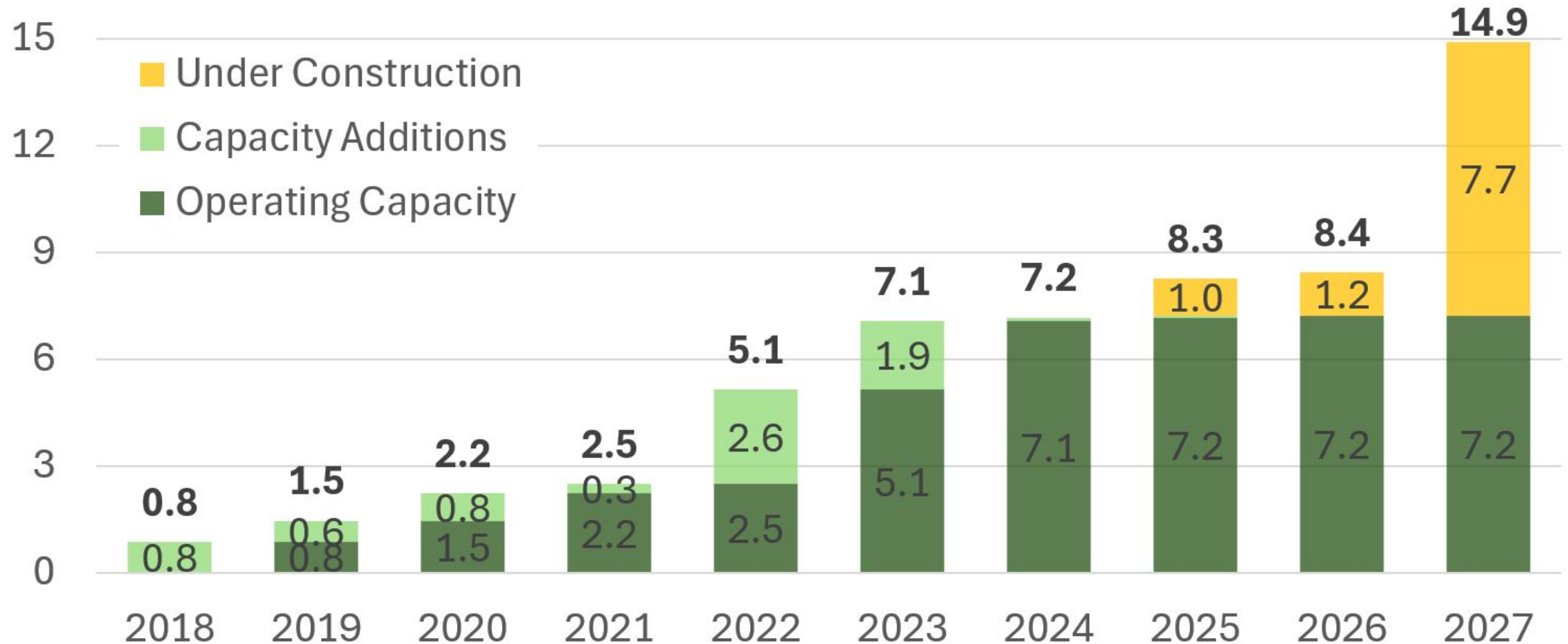
DATA CENTER CAPACITY TRIPLED SINCE 2018

Infrastructure Insights data center growth and under construction projects, GW



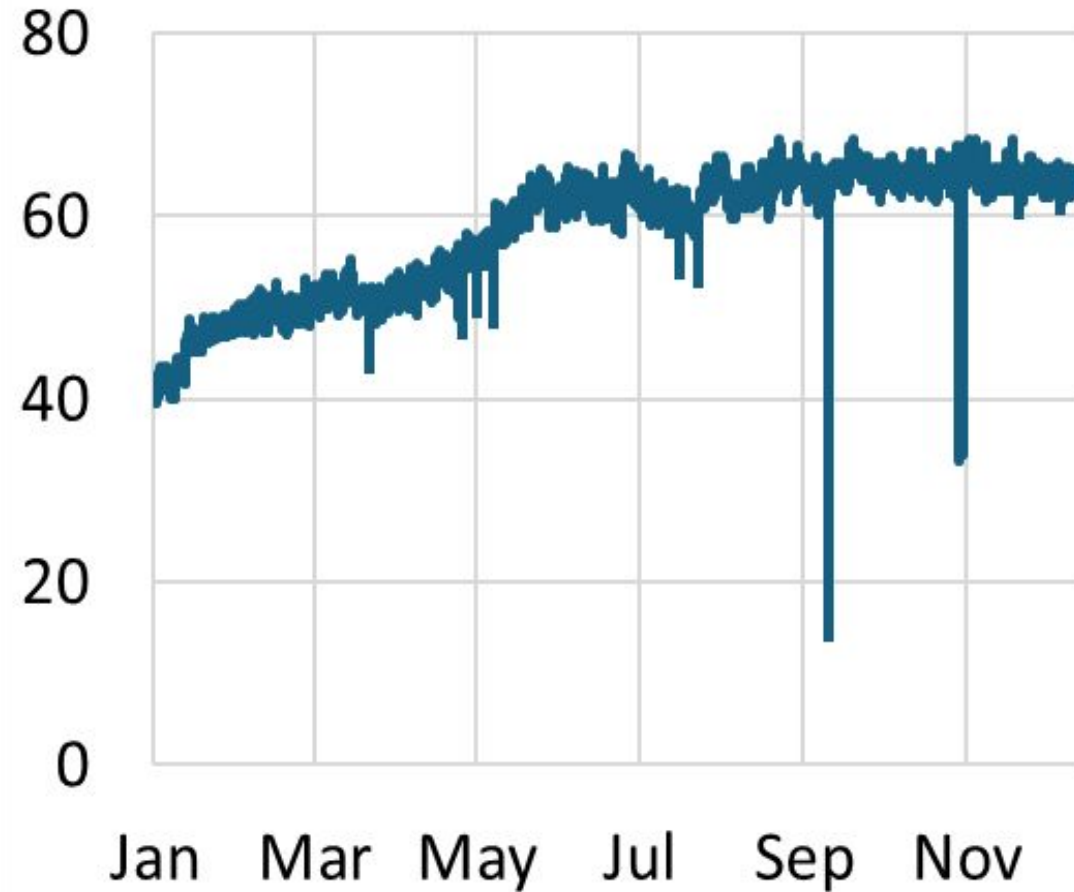
CRYPTO DRIVING 30% OF DATA CENTER GROWTH

Infrastructure Insights crypto growth and under construction projects, GW

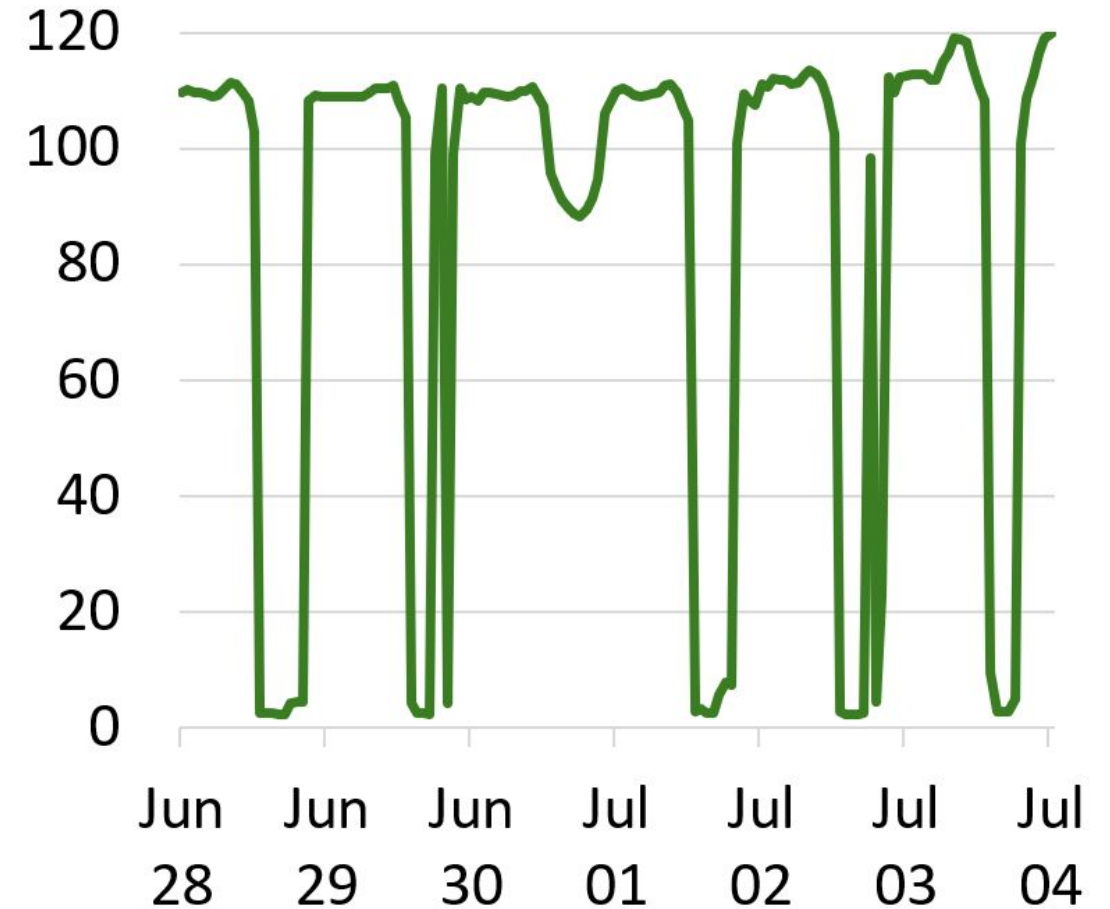


DATA CENTERS SHOW LARGE OPERATIONAL VARIANCE

*2024 Hourly Google Midlothian Sharka
Data Center load, MW*

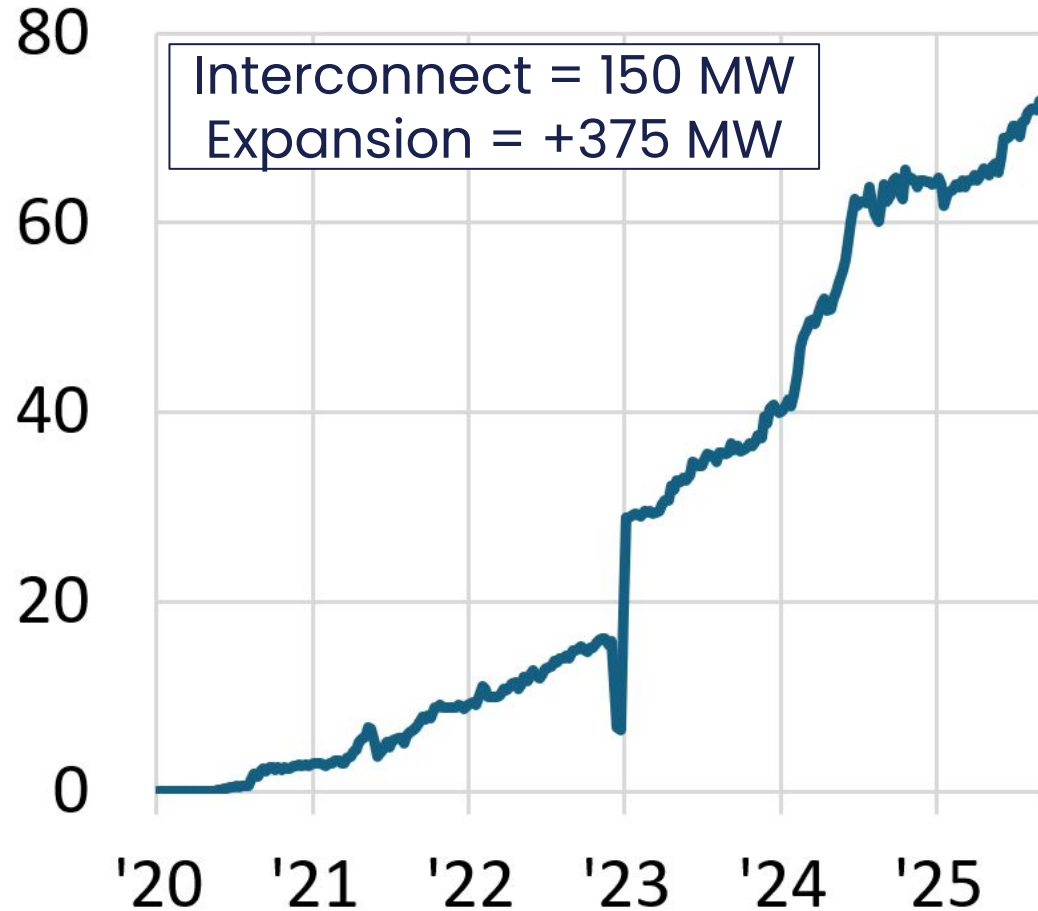


*2024 Hourly Core Scientific Denton
Crypto Data Center load, MW*

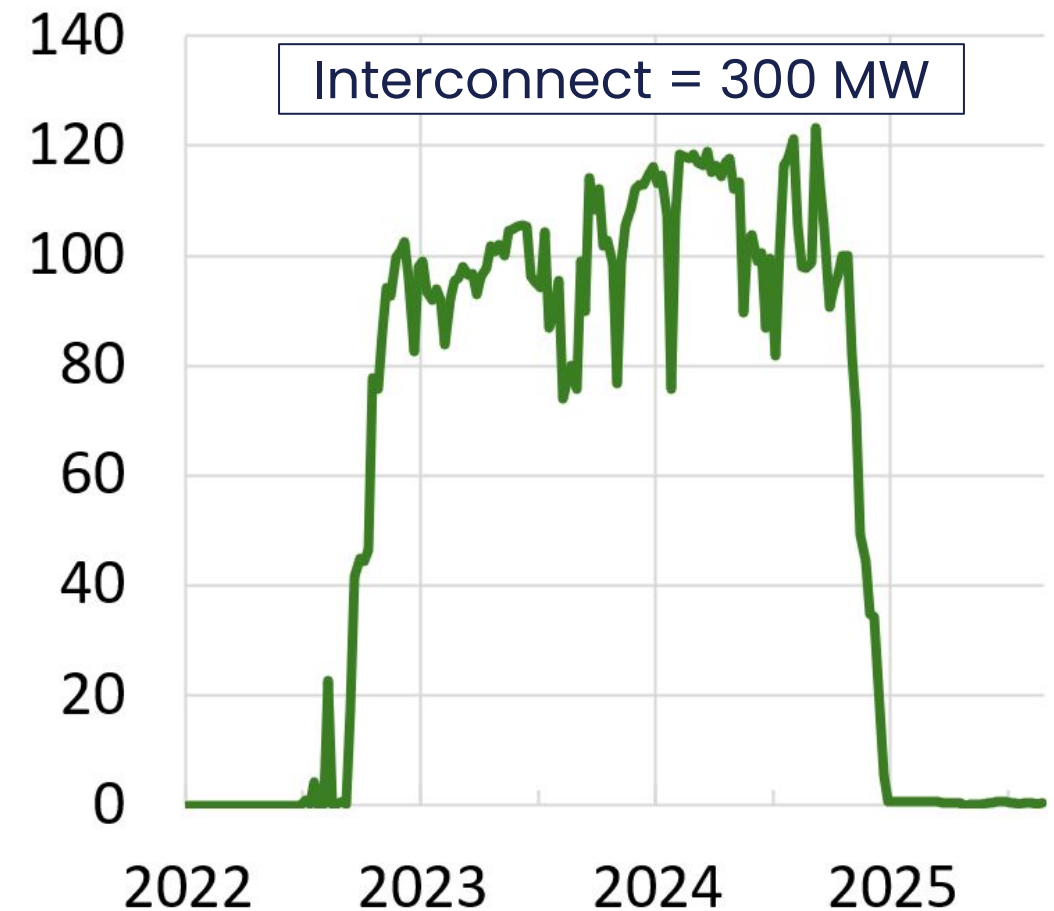


DATA CENTERS RUNNING WELL BELOW MAX DRAW

*Weekly Google Midlothian Sharka
Data Center load, MW*

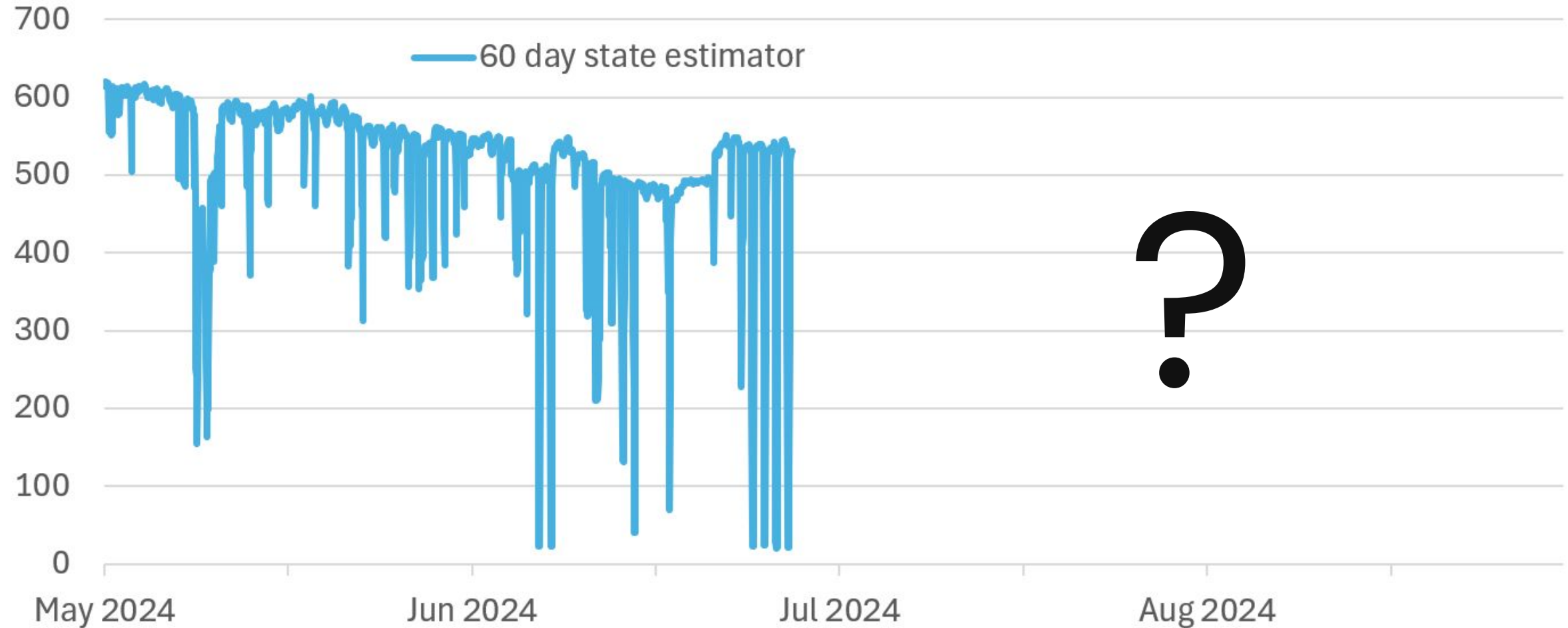


*Weekly Core Scientific Denton Crypto
Data Center load, MW*



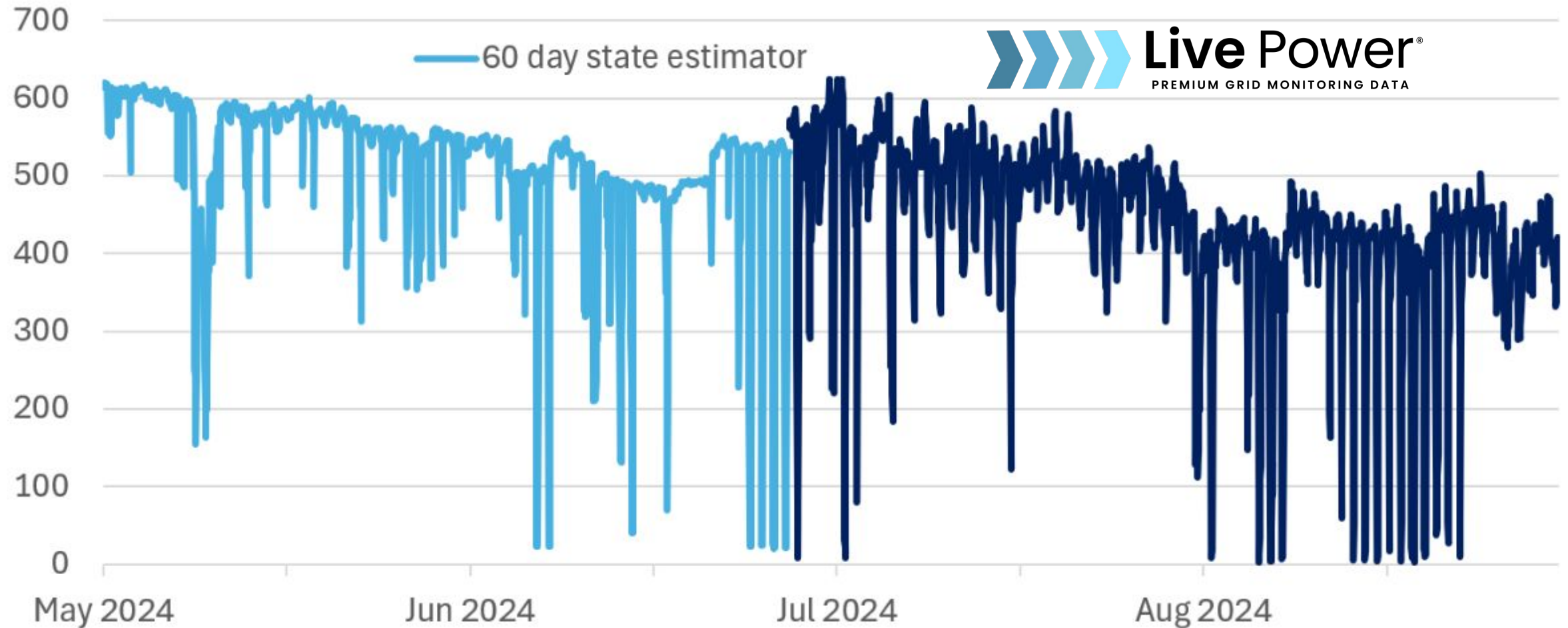
INSIGHT INTO LOAD CENTER OPERATIONS IS LIMITED

Hourly RIOT Rockdale crypto load, MW

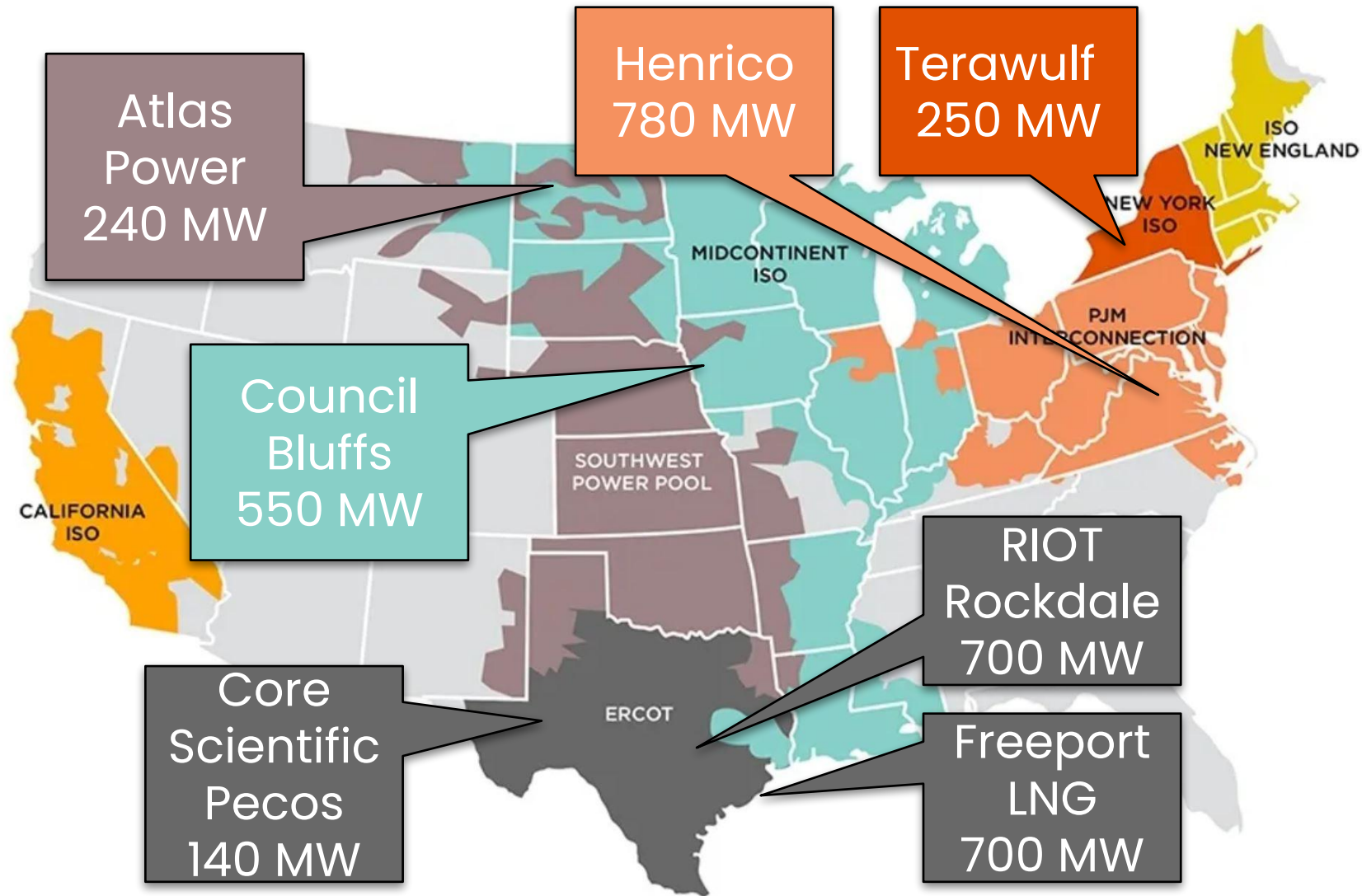


LIVE POWER DATA PROVIDES RT OPERATIONAL VIEW

Hourly RIOT Rockdale crypto load, MW

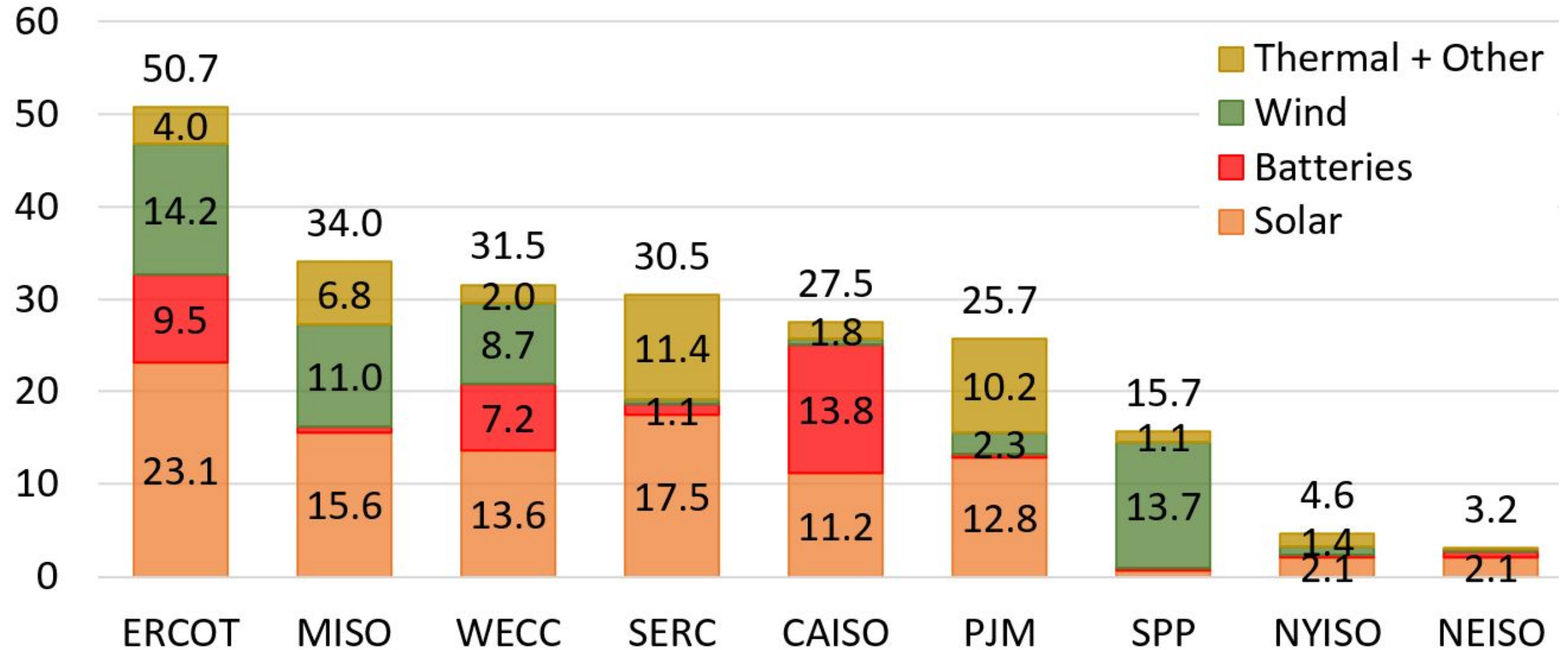


LIVE POWER DEMAND CENTER COVERAGE



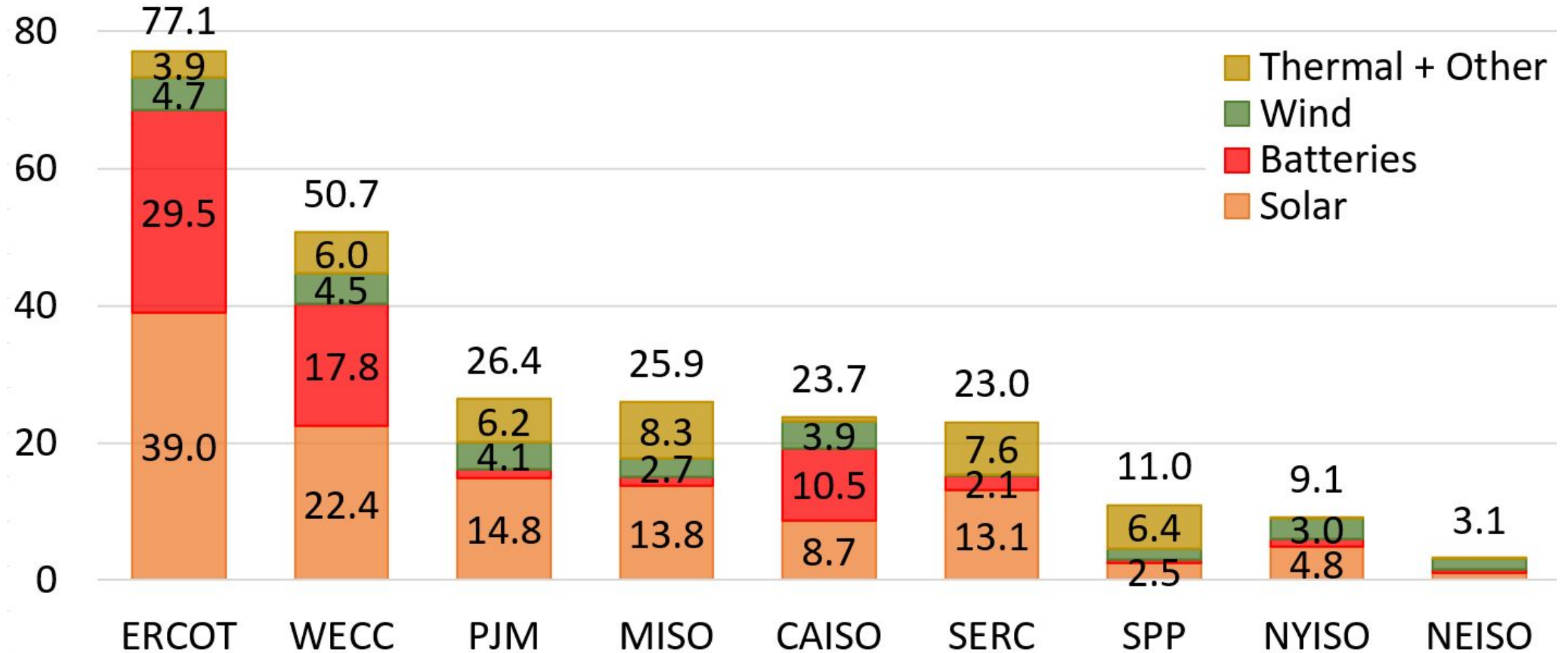
SOLAR CAPACITY +98 GW IN 5 YEARS

EIA 860M capacity growth by technology, 2020-current, GW



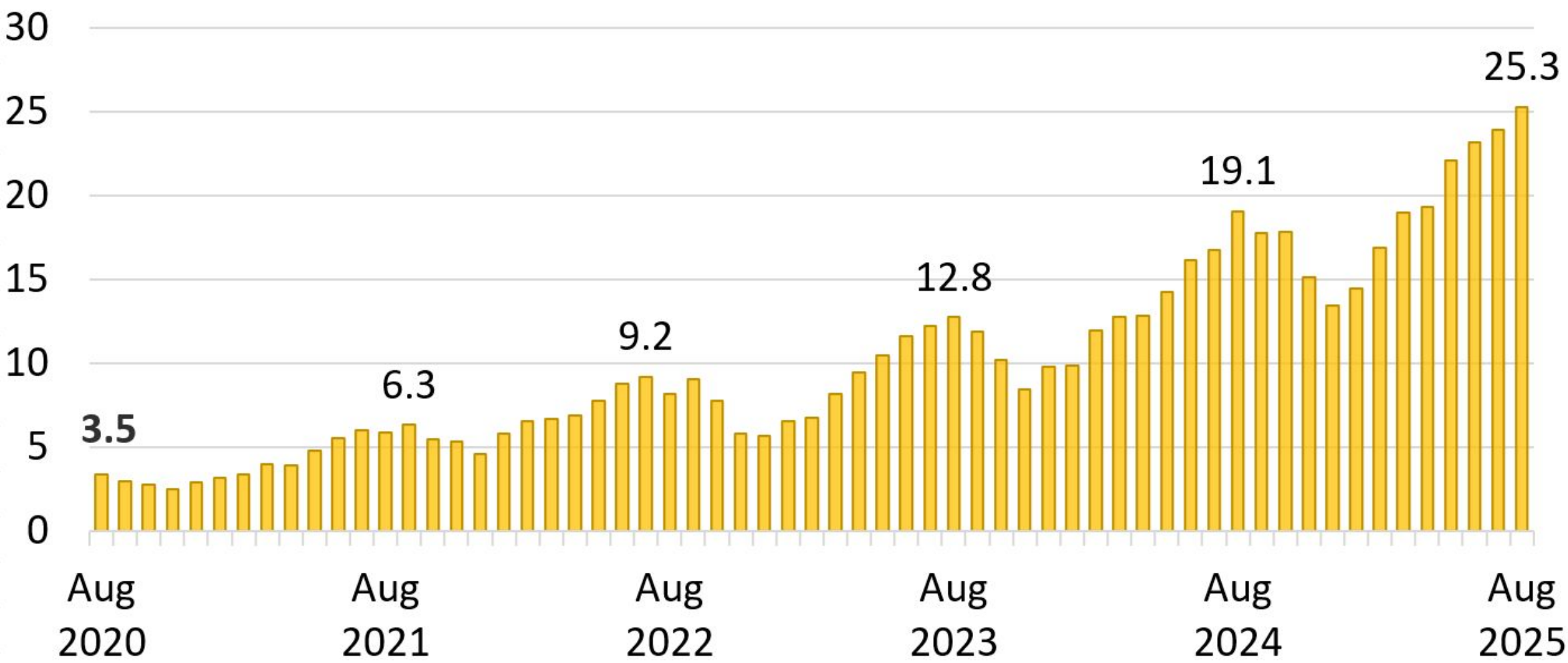
TIP OF ICEBERG FOR SOLAR AND ESR GROWTH

EIA 860M planned capacity additions by technology, planned by 2030, GW



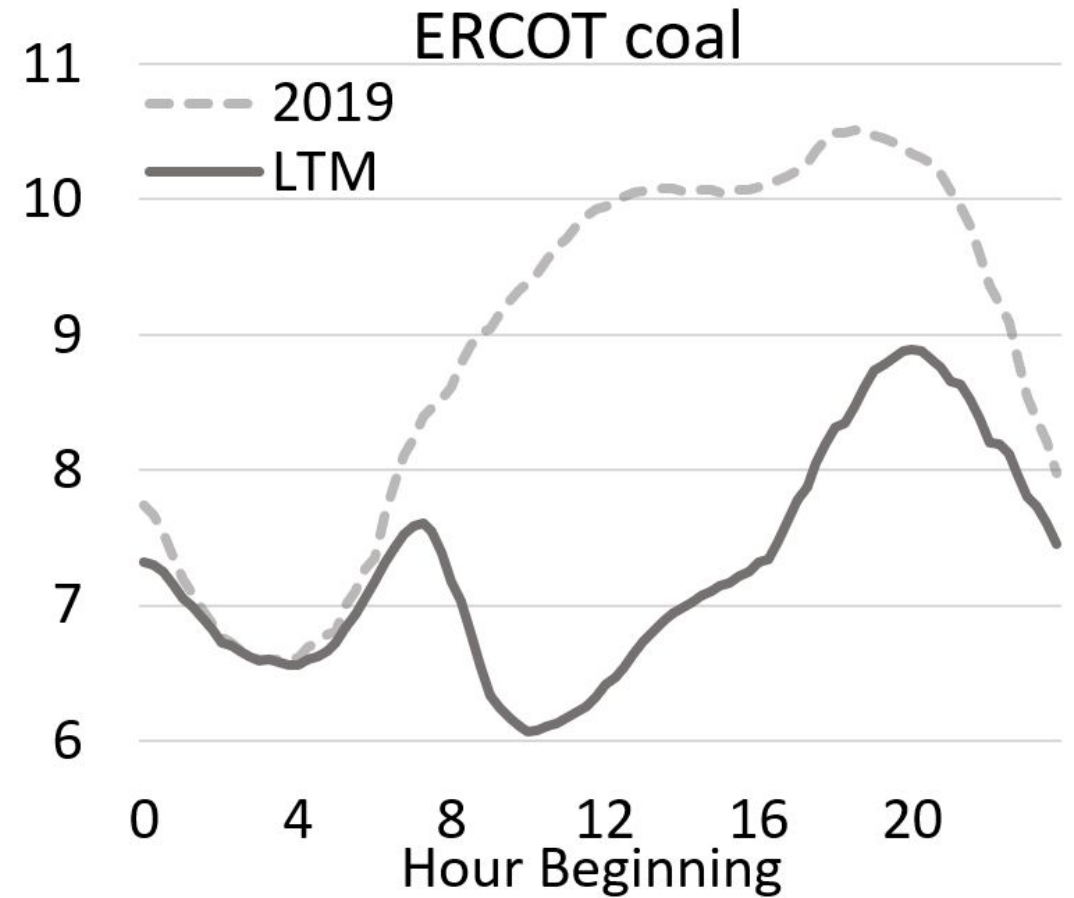
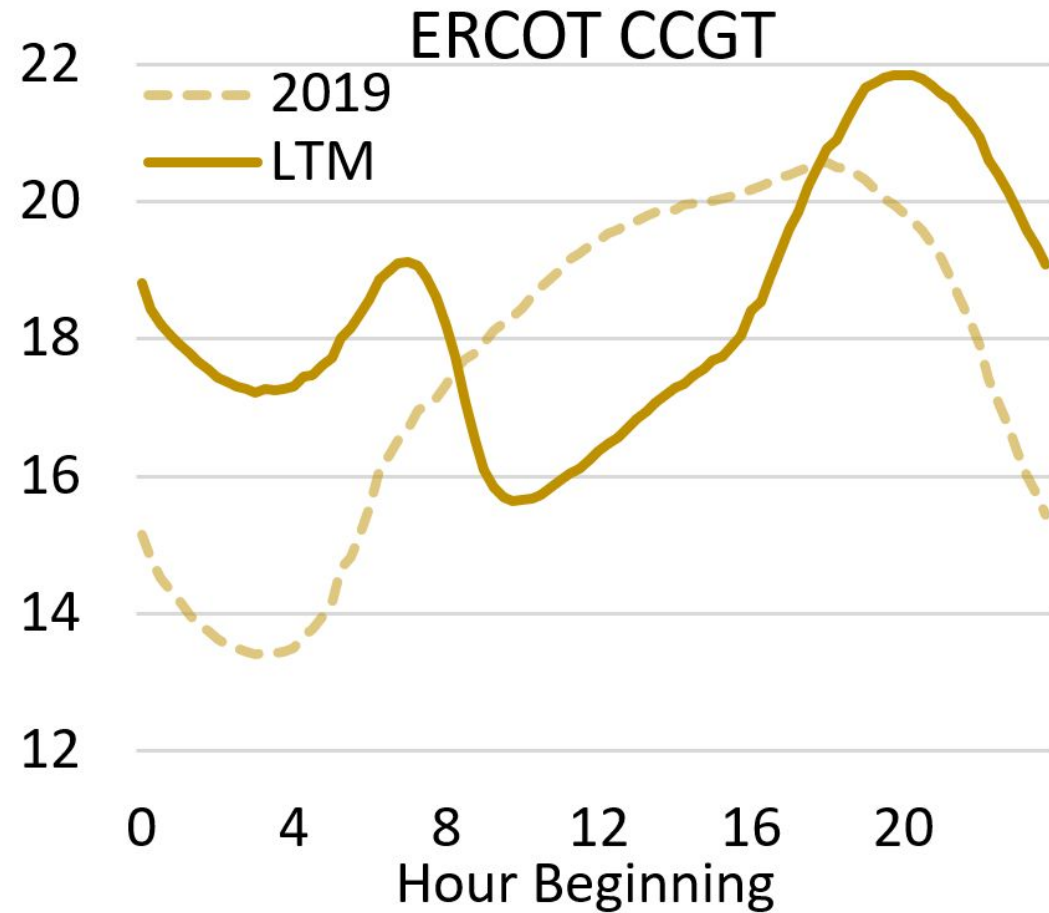
ERCOT AVG PEAK SOLAR GEN HITS 25 GW

ERCOT monthly average daily peak solar gen, Aug 2020-Aug 2025, GW



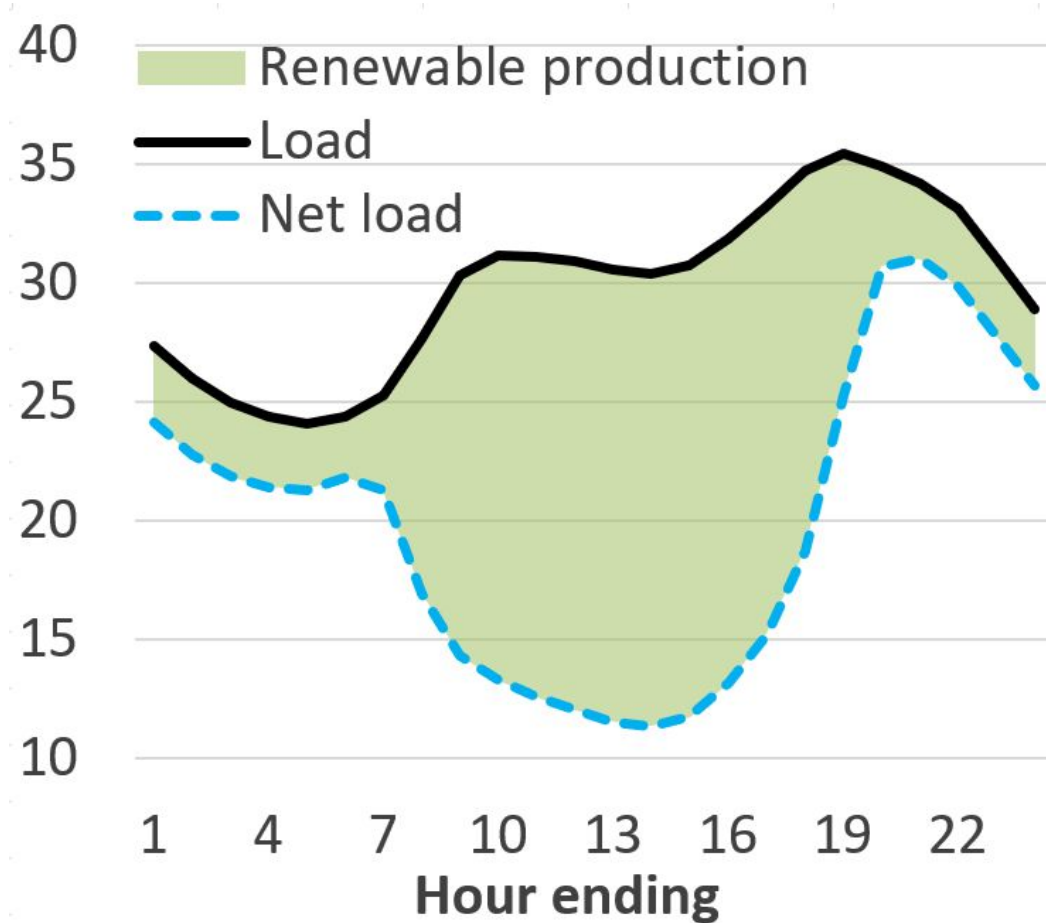
AGING THERMAL FLEET FACING INCREASED CYCLING

ERCOT hourly generation profile for CCGT and coal, 2019 vs last-twelve-months (LTM), GW

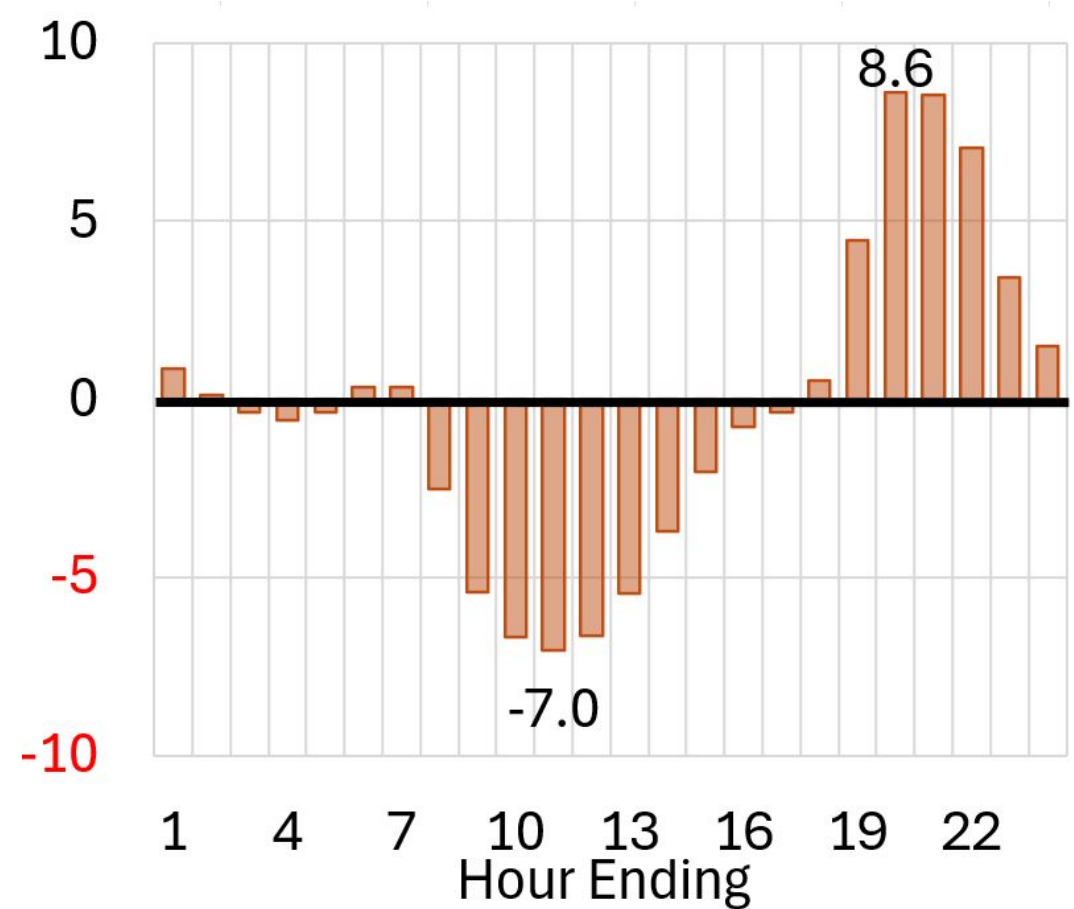


BATTERIES ENTERING PICTURE TO OFFSET SOLAR

CAISO Jul-Aug load, renew., & net load, GW

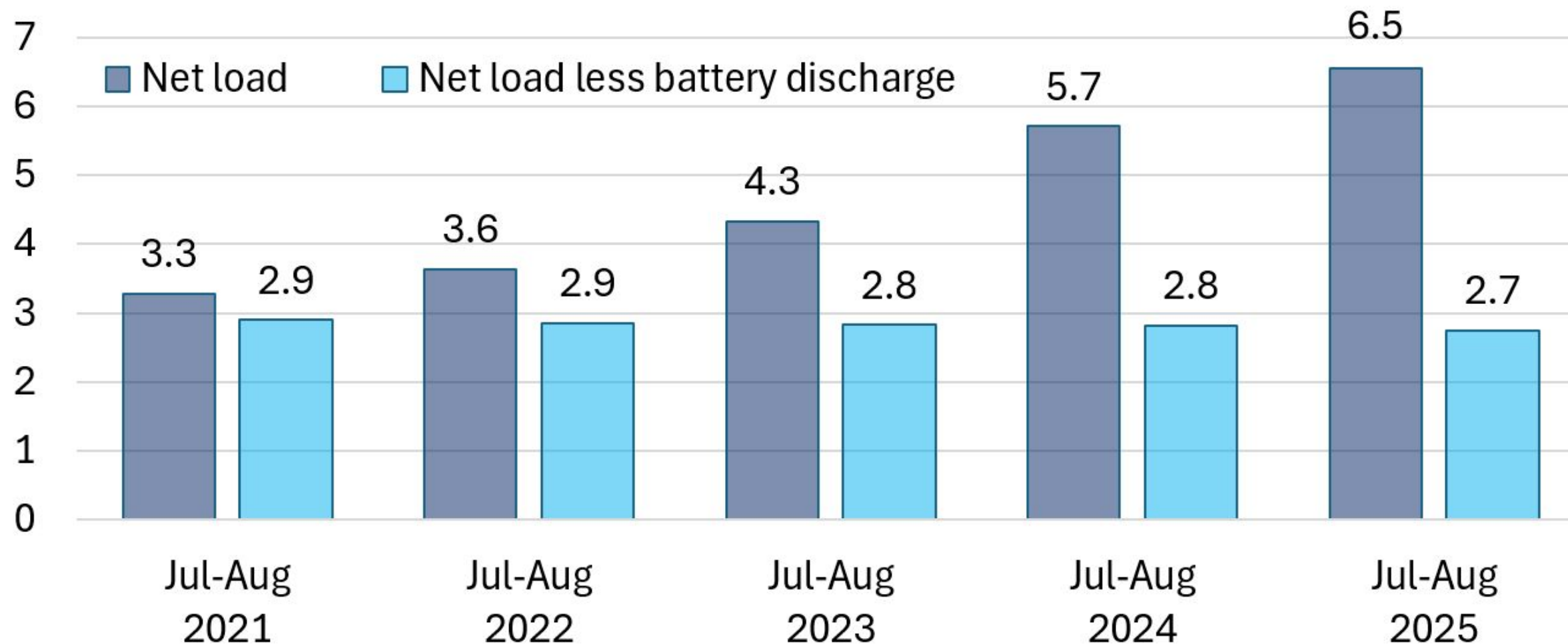


CAISO Jul-Aug hourly battery gen, GW



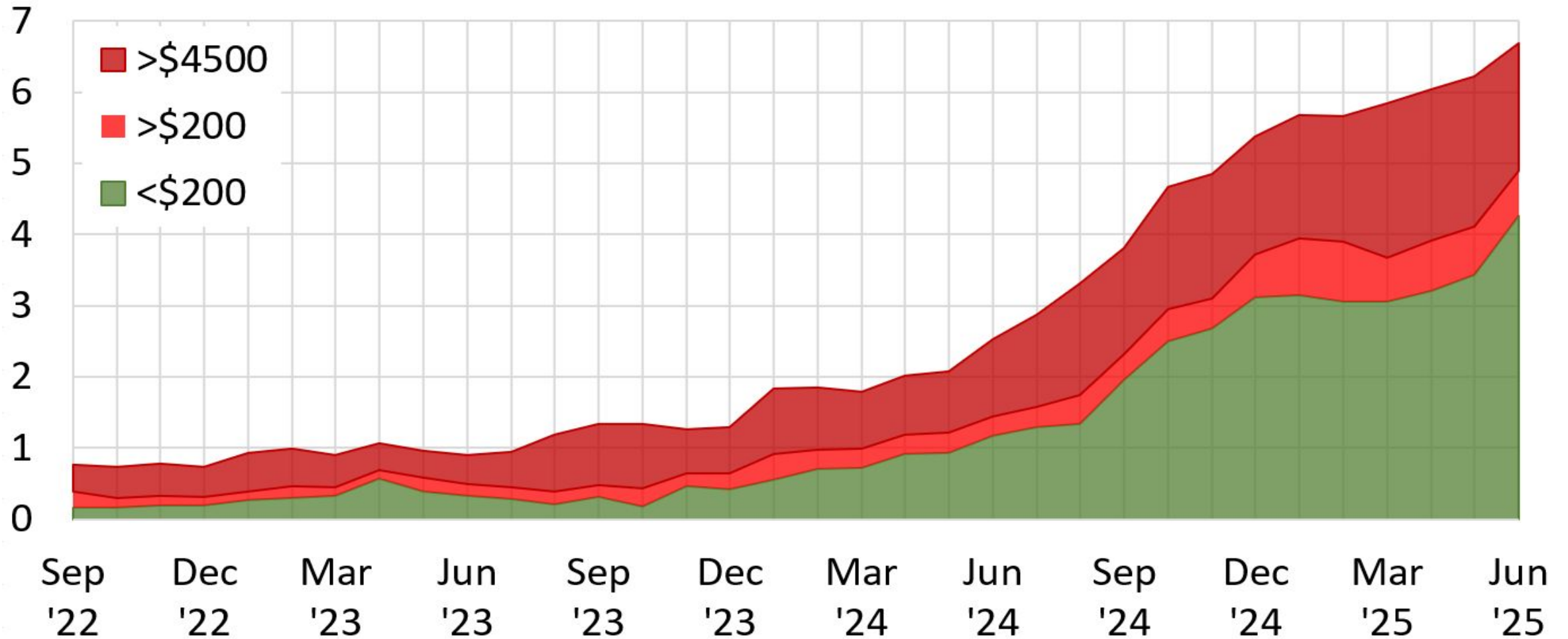
BATTERIES DROPPED NET LOAD RAMP RATES IN CAISO

CAISO Jul-Aug 1-hour net load ramp rates in HE 19, GW



ERCOT SEES BATTERY OFFER LEVELS FINALLY COOL OFF

Monthly avg. SCED RT ESR energy offer capacity by price level, Sep 2022–Jun 2025, GW



Thank You!



Alex Bennitt
PRODUCT MANAGER

alexb@yesenergy.com

(512)-971-8494



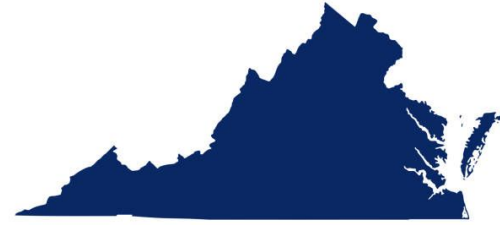
YES ENERGY®

It's Gettin Hot in Here

Evaluating Electricity Demand Sensitivity to
Temperature in Low Summer Demand Regions

I ❤️ Air Conditioning

- I grew up in Virginia
- I am a perspirer
- My wife's family is from New England
- They do not have air conditioning 🥵



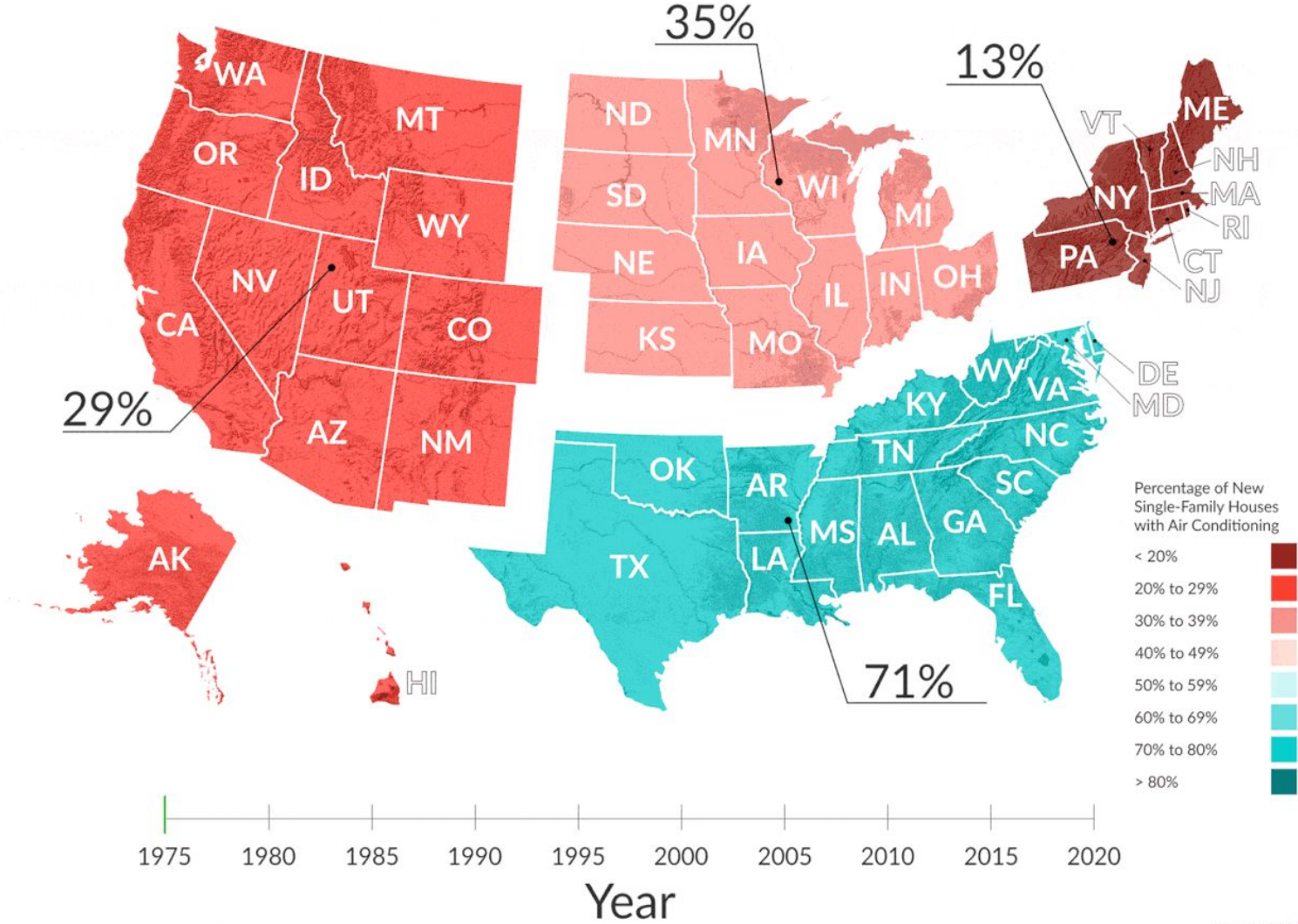
Agenda

How does temperature impact power demand?

How can we measure changes in the relationship between temperature and power demand?

Where has temperature sensitivity been changing the most recently?

Presence of AC Units in New Single-Family Homes Over the Last 45 Years



www.fixr.com/blog | Data Source: U.S Census Bureau



Temperature Tour



Texas



Vermont

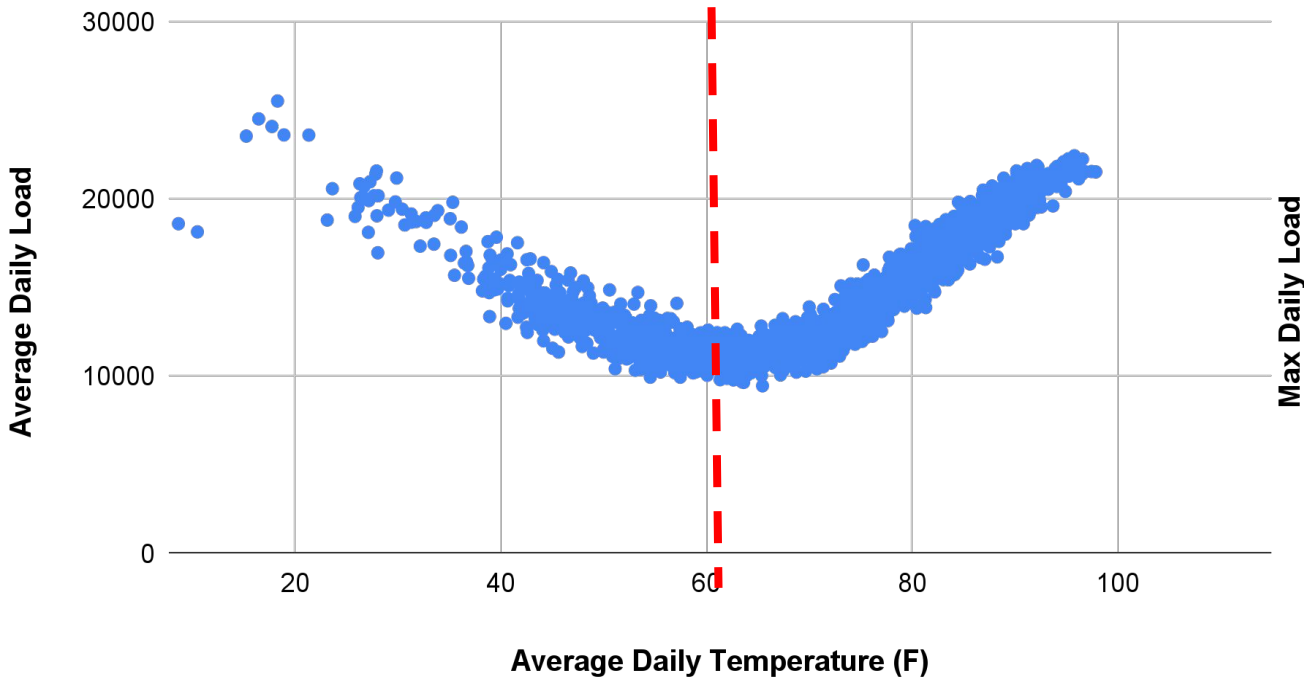


Washington

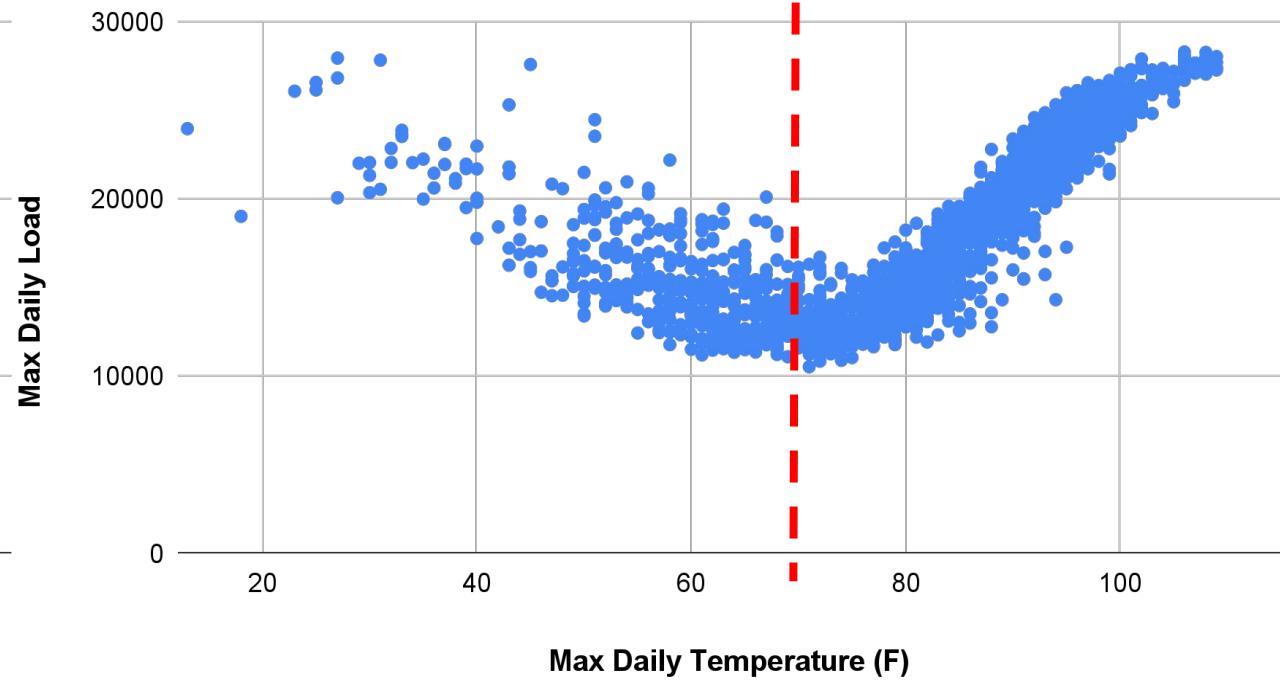
Temperate Effects

Temperature & Power Demand

ERCOT North Central

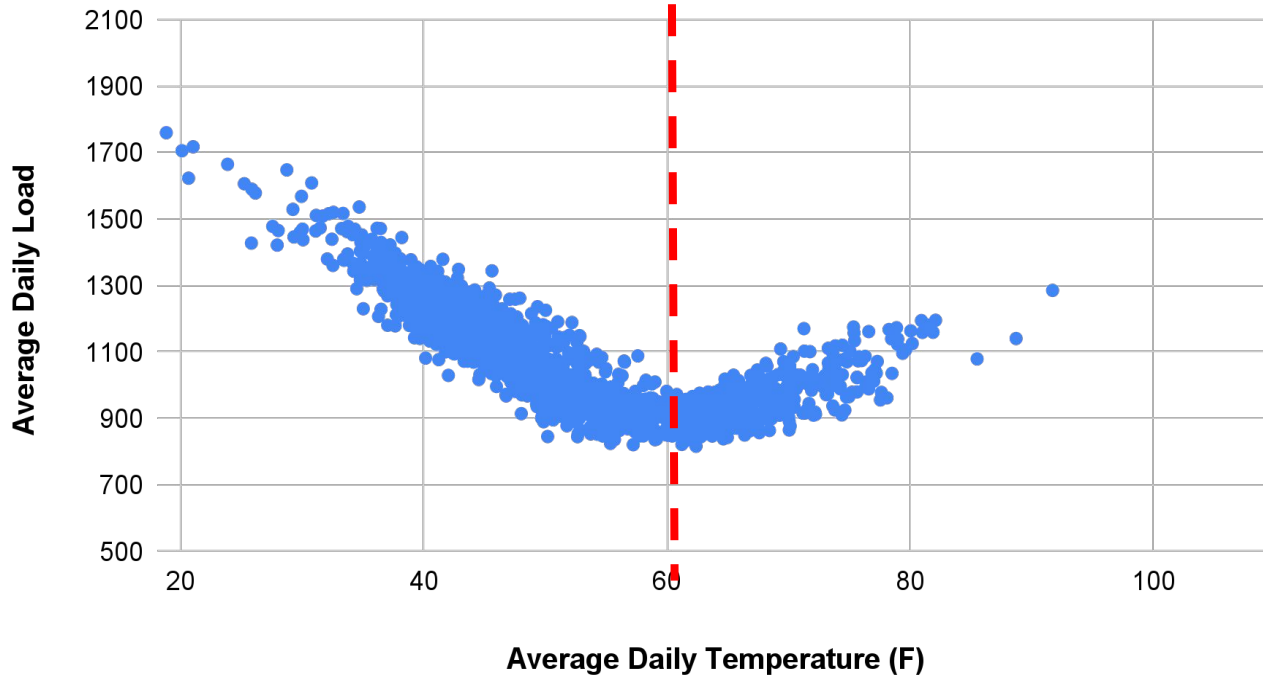


ERCOT North Central

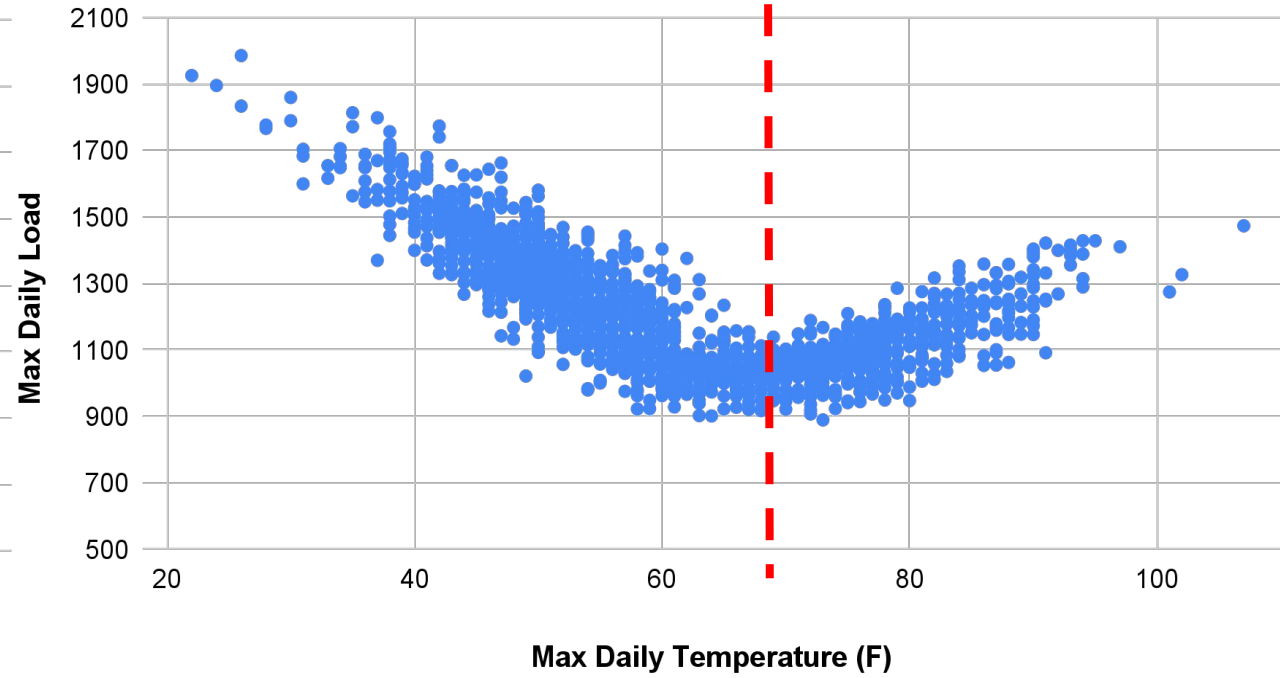


Temperature & Power Demand

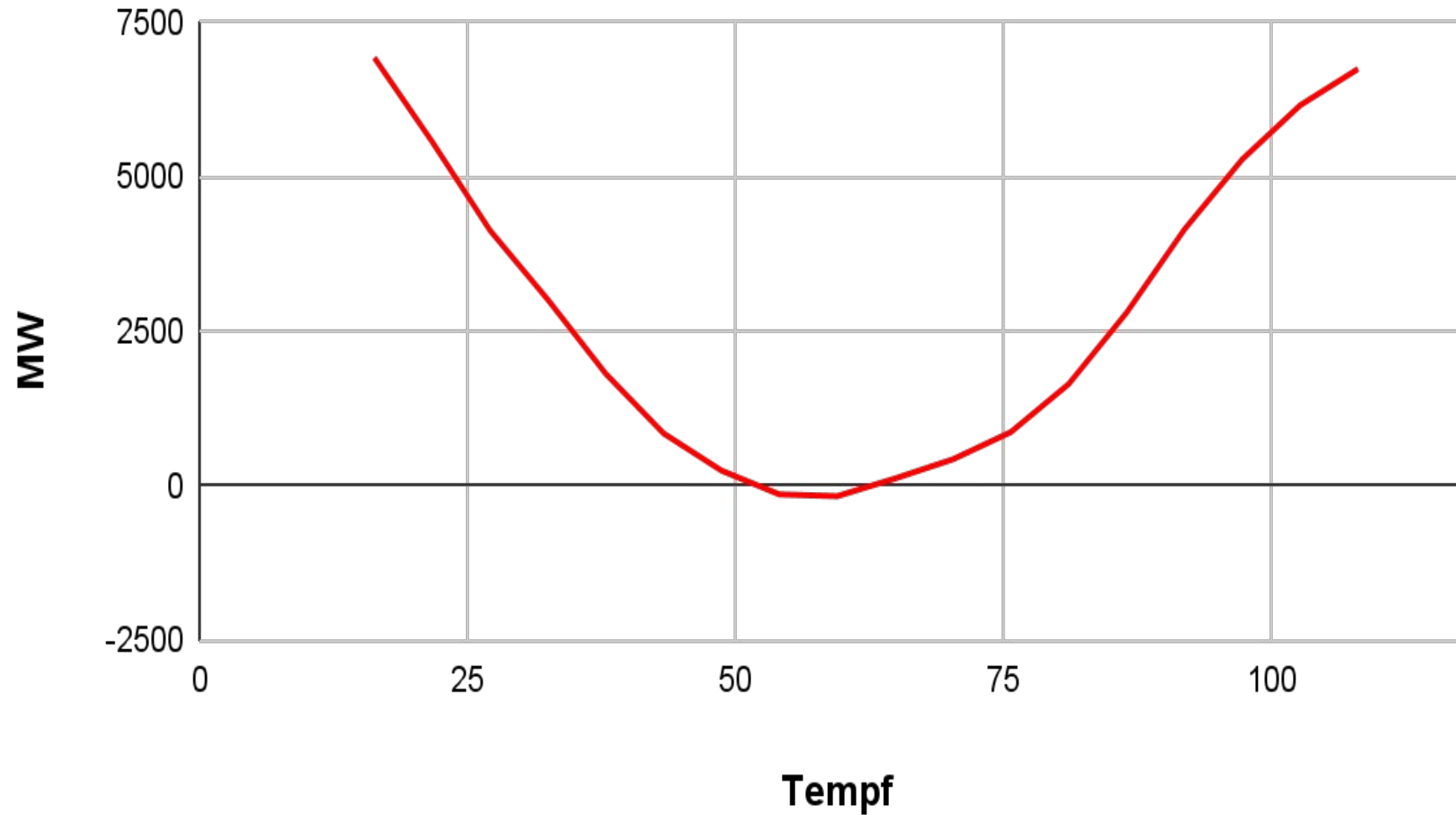
Seattle City Light



Seattle City Light

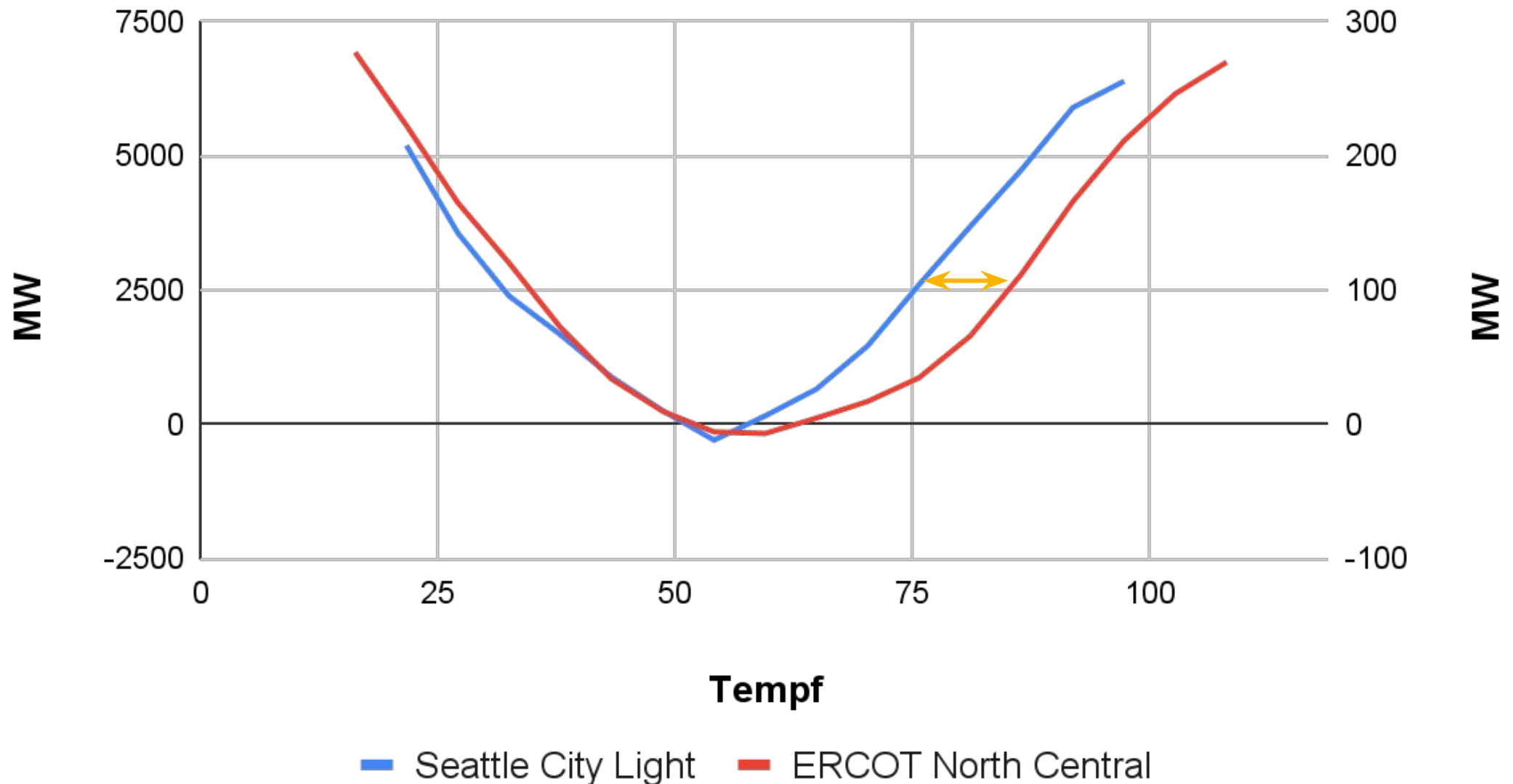


Temperature Response Curve

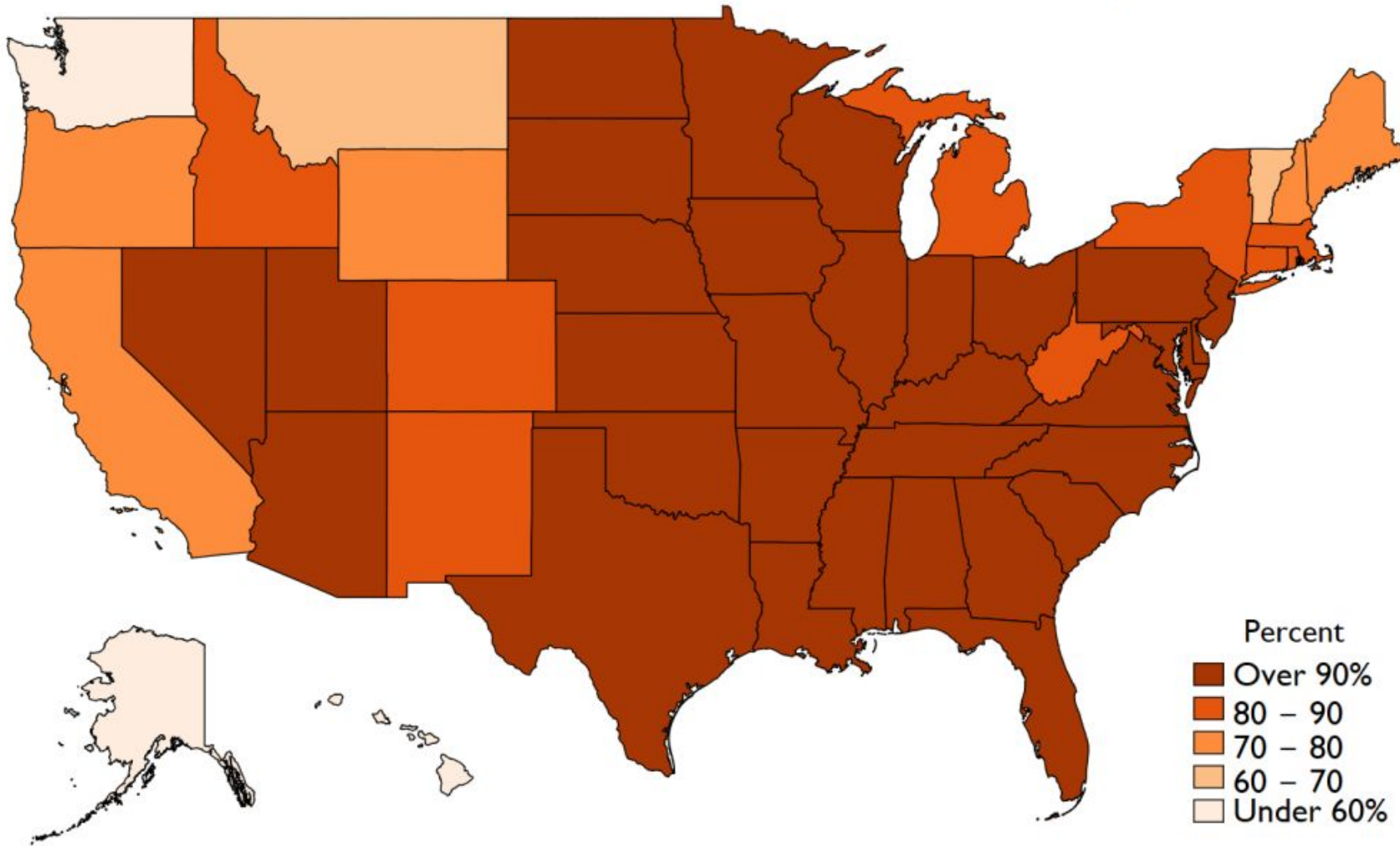


— ERCOT North Central

Temperature Response Curve



Percent of Households With Air Conditioning

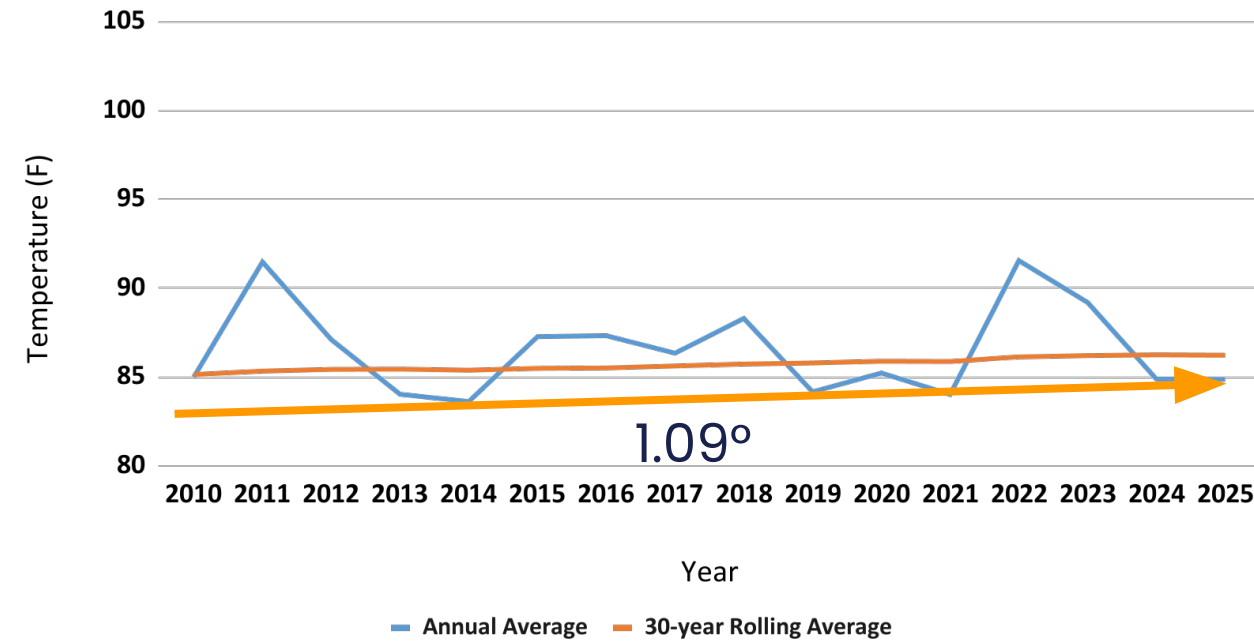


Source: Energy Institute Blog

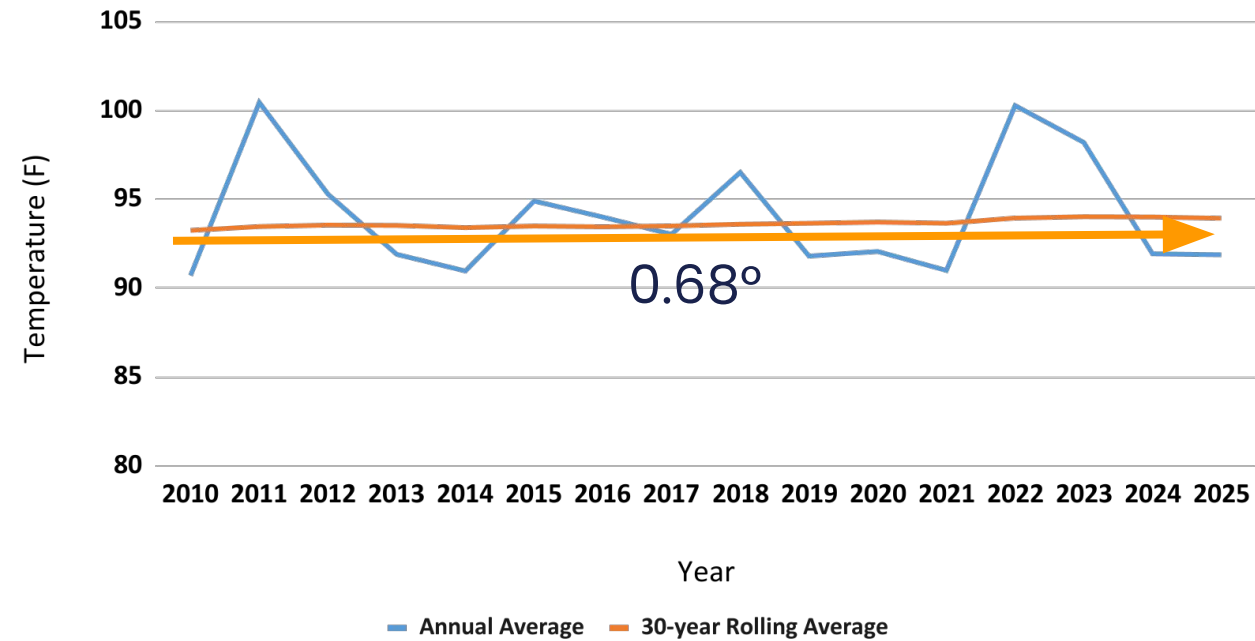
The Ten Least Air Conditioned States

1.	Alaska	7%
2.	Washington	53%
3.	Hawaii	57%
4.	Montana	65%
5.	Vermont	67%
6.	Maine	70%
7.	Wyoming	71%
8.	California	72%
9.	Oregon	76%
10.	New Hampshire	77%

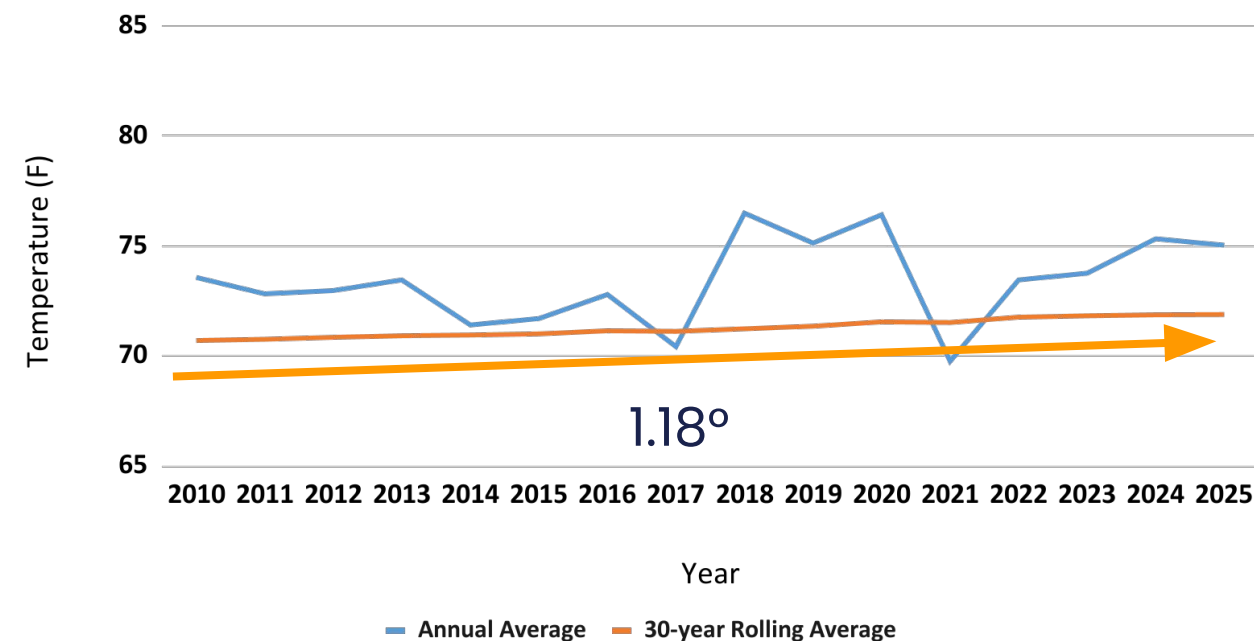
July Temperatures in Dallas, TX



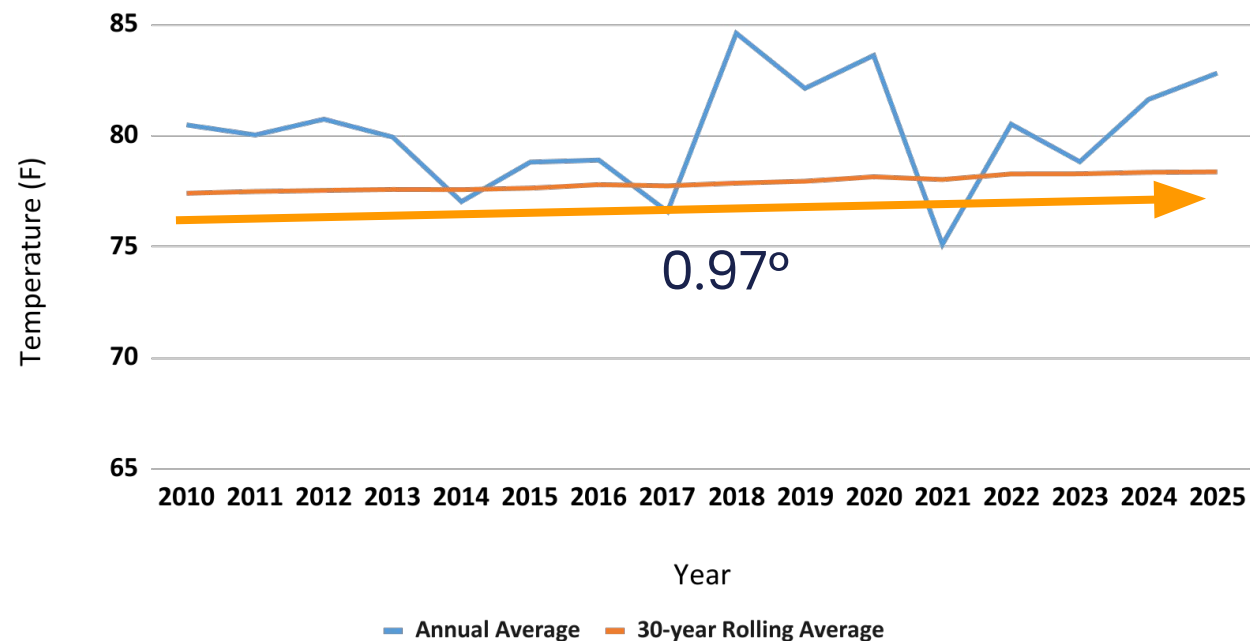
July Peak Temperatures in Dallas, TX



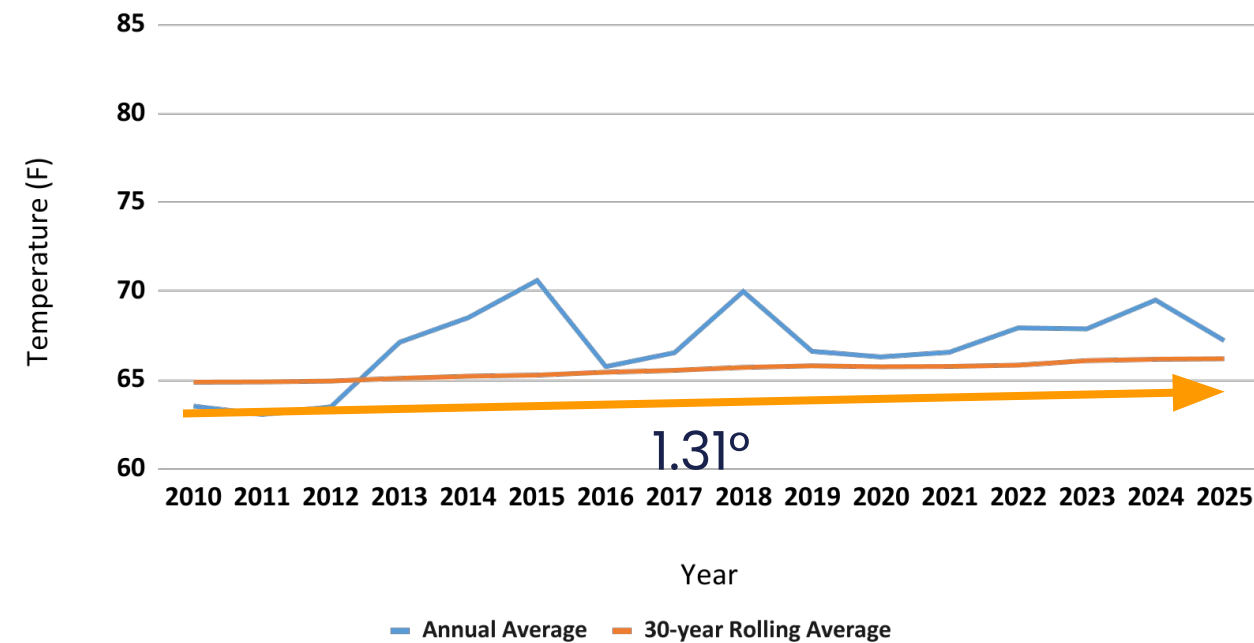
July Temperatures in Burlington, VT



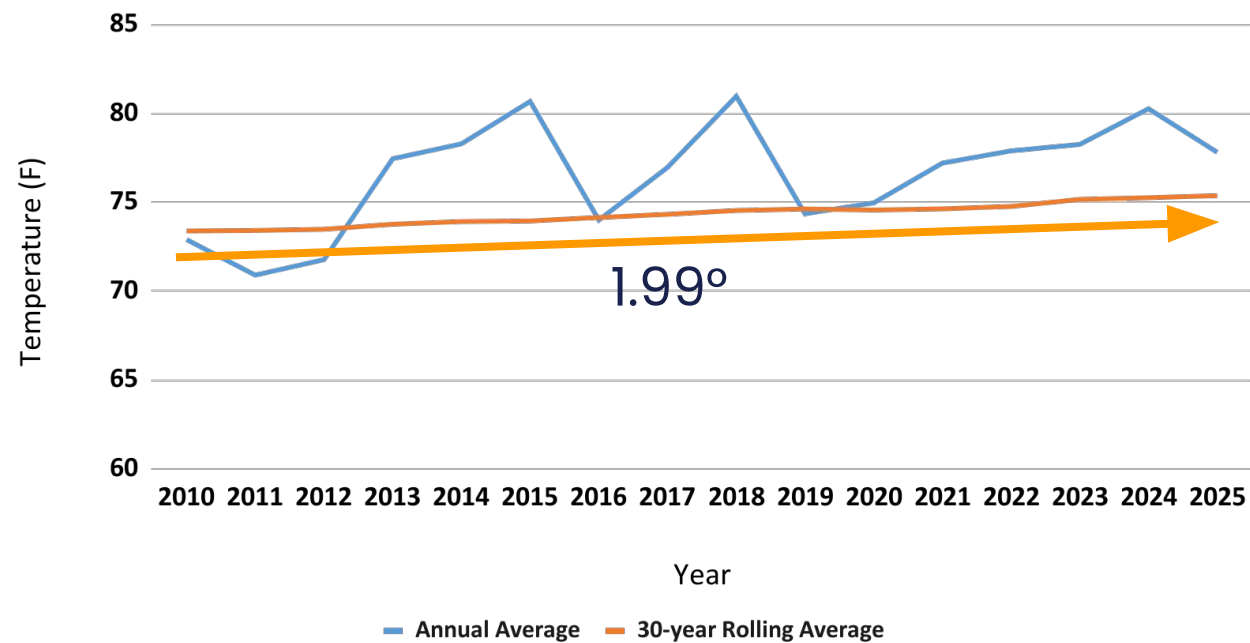
July Peak Temperatures in Burlington, VT



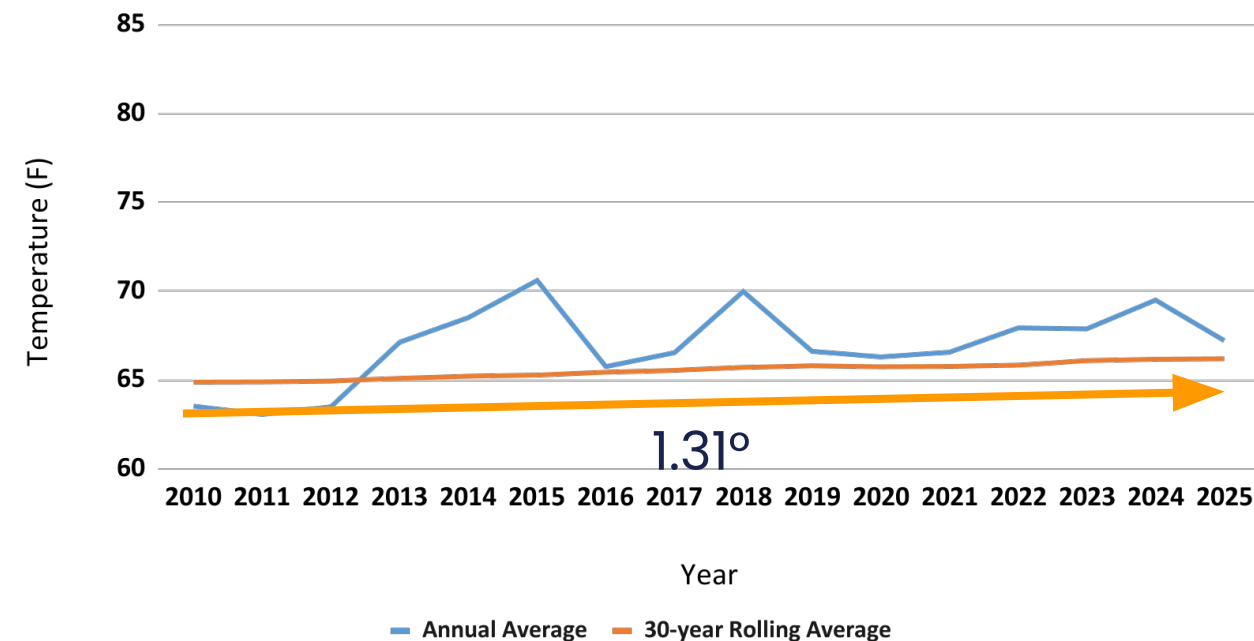
July Temperatures in Seattle, WA



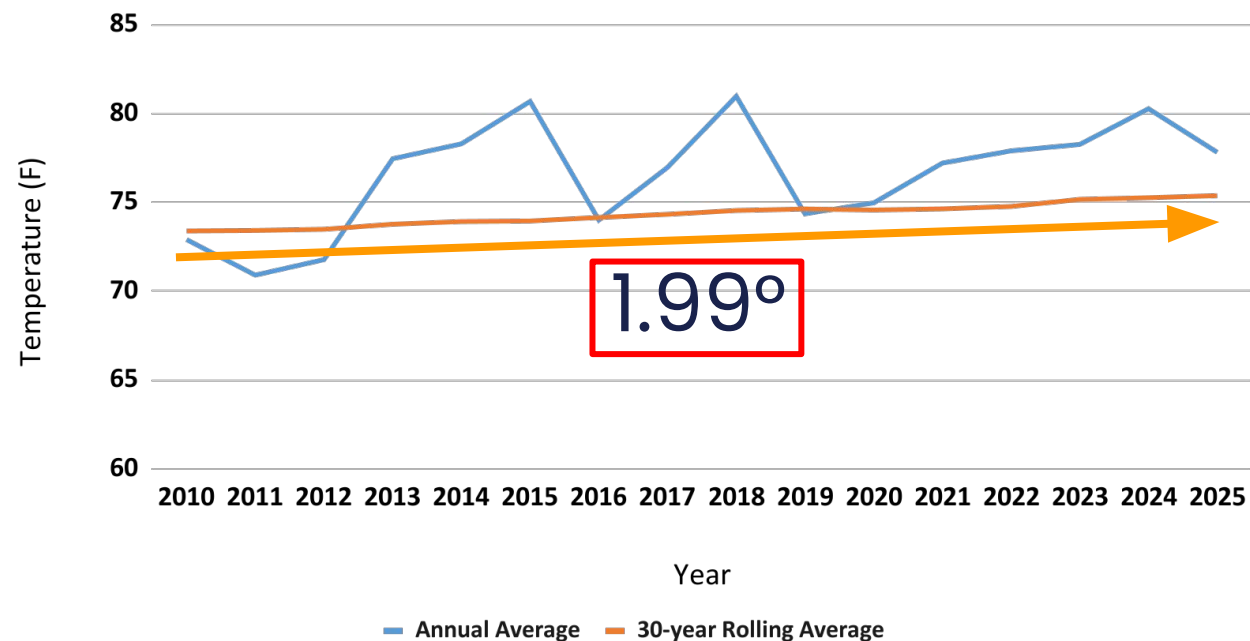
July Peak Temperatures in Seattle, WA



July Temperatures in Seattle, WA

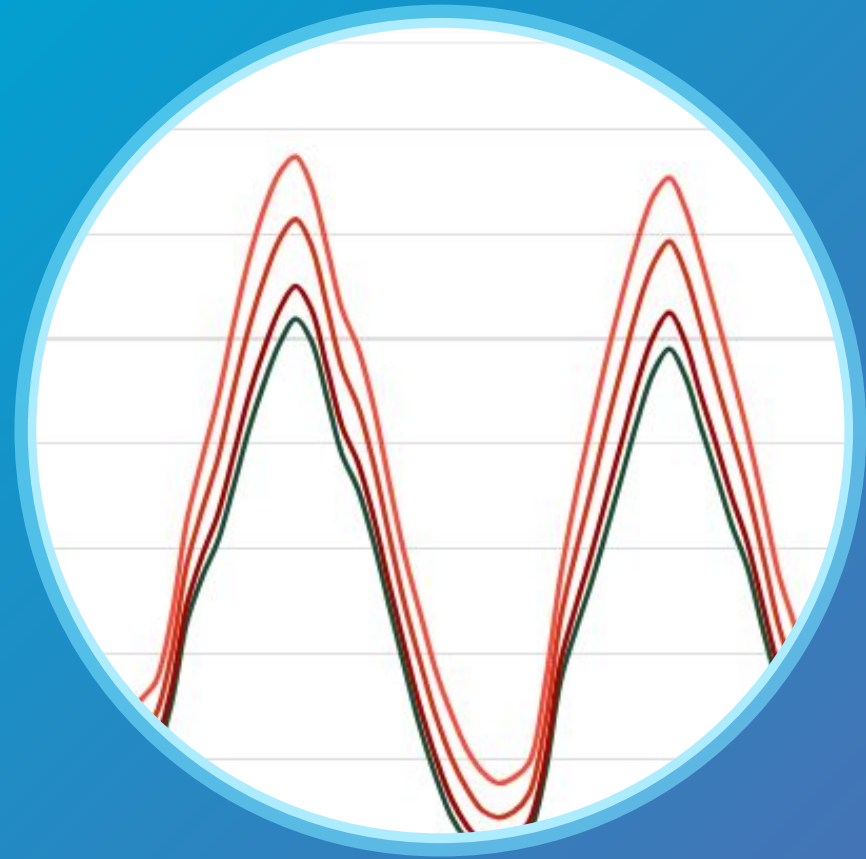


July Peak Temperatures in Seattle, WA

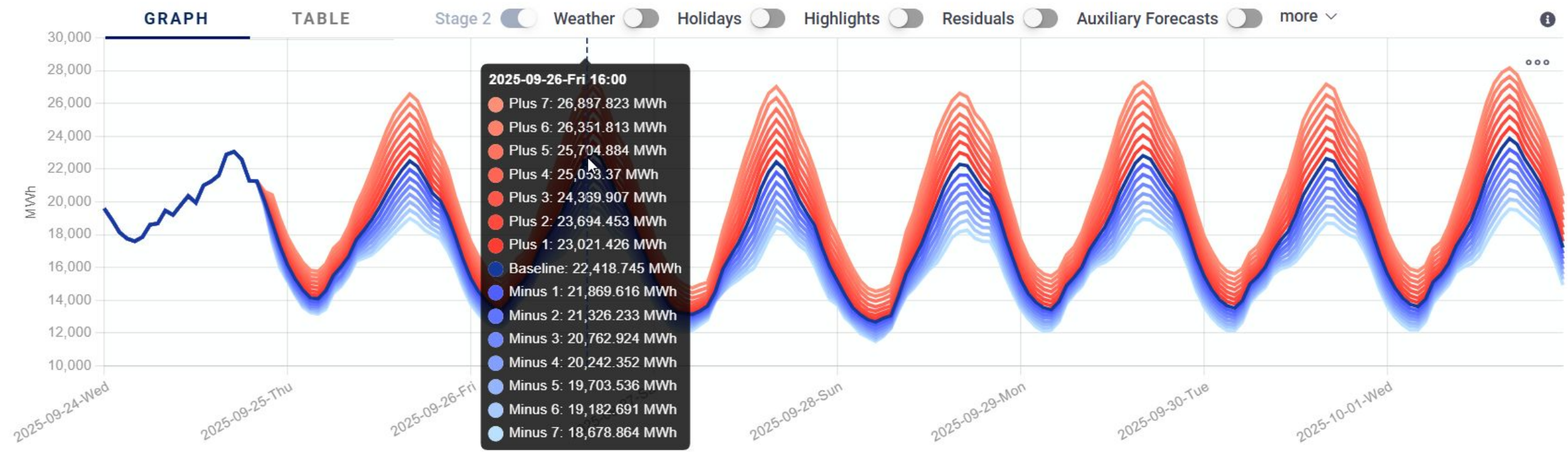


Quantifying Changes in Temperature Sensitivity

How can we
measure changes
in temperature
impact on power
demand over
time?



Temperature Step Load Forecast Solutions



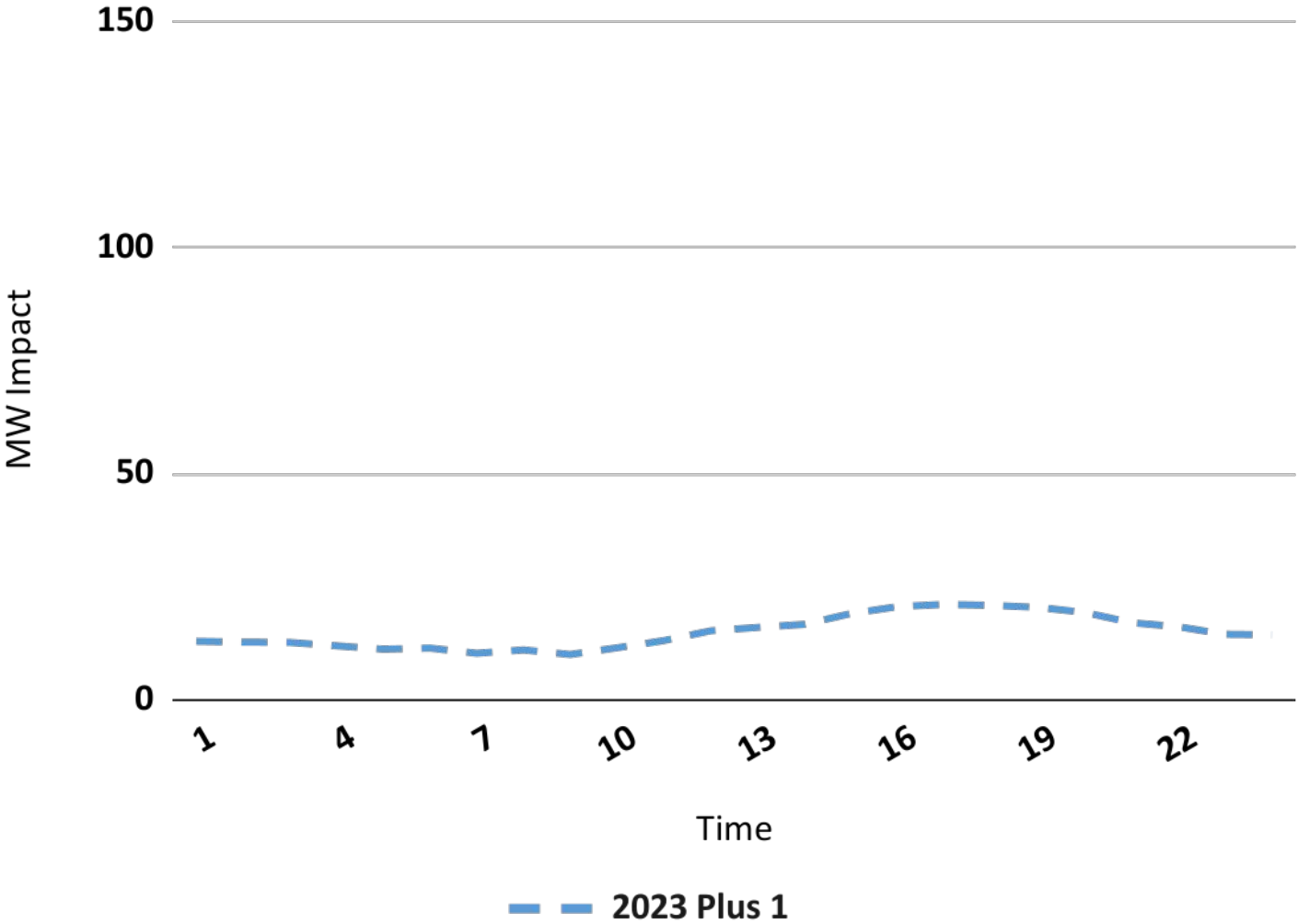
Models estimate
impact of
temperature on load

Run temperature
scenario solutions for
2026 using model
vintages from May
2023 and May 2025

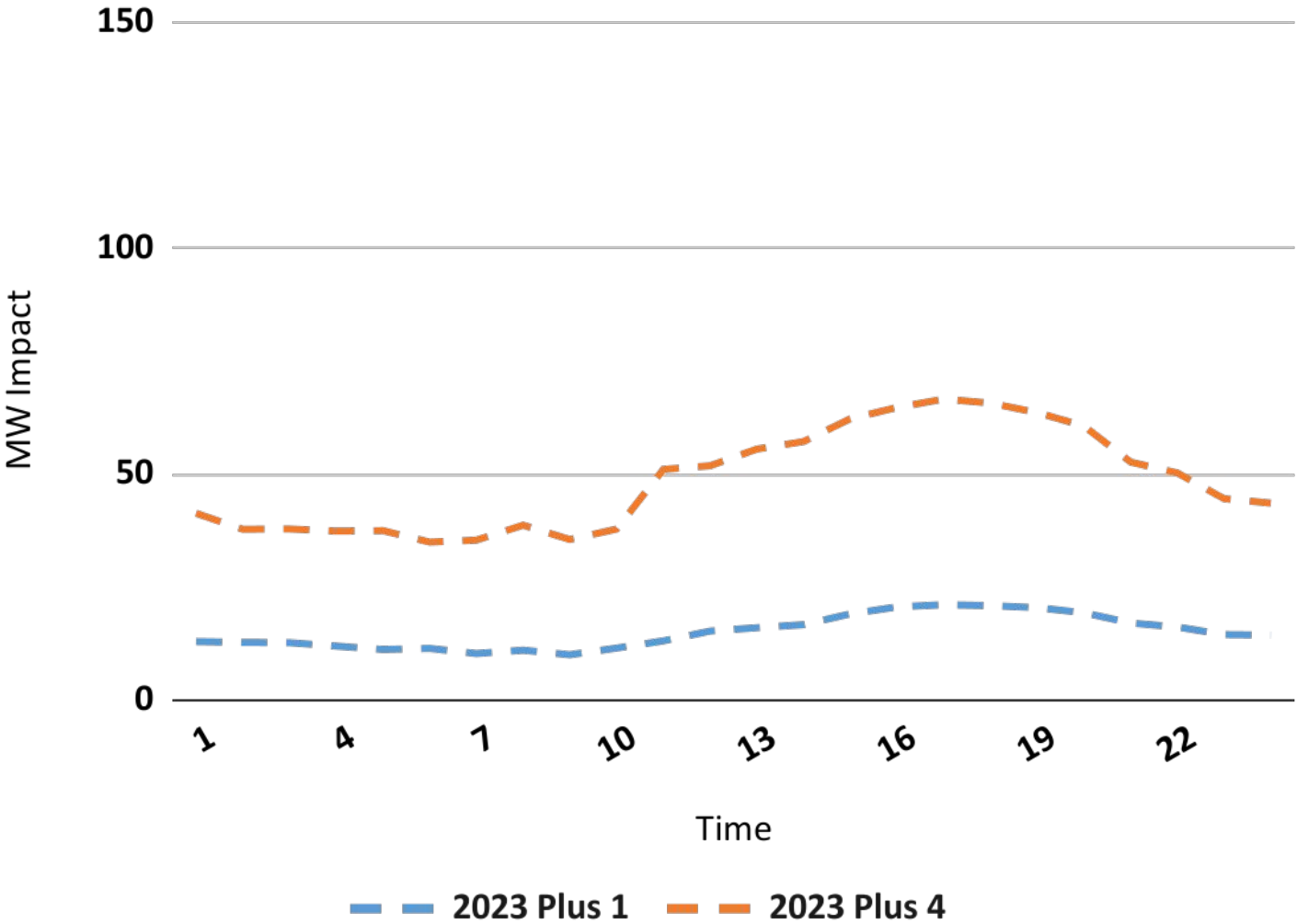
Archive models to
preserve relationship
between
temperature and
demand

Compare solutions

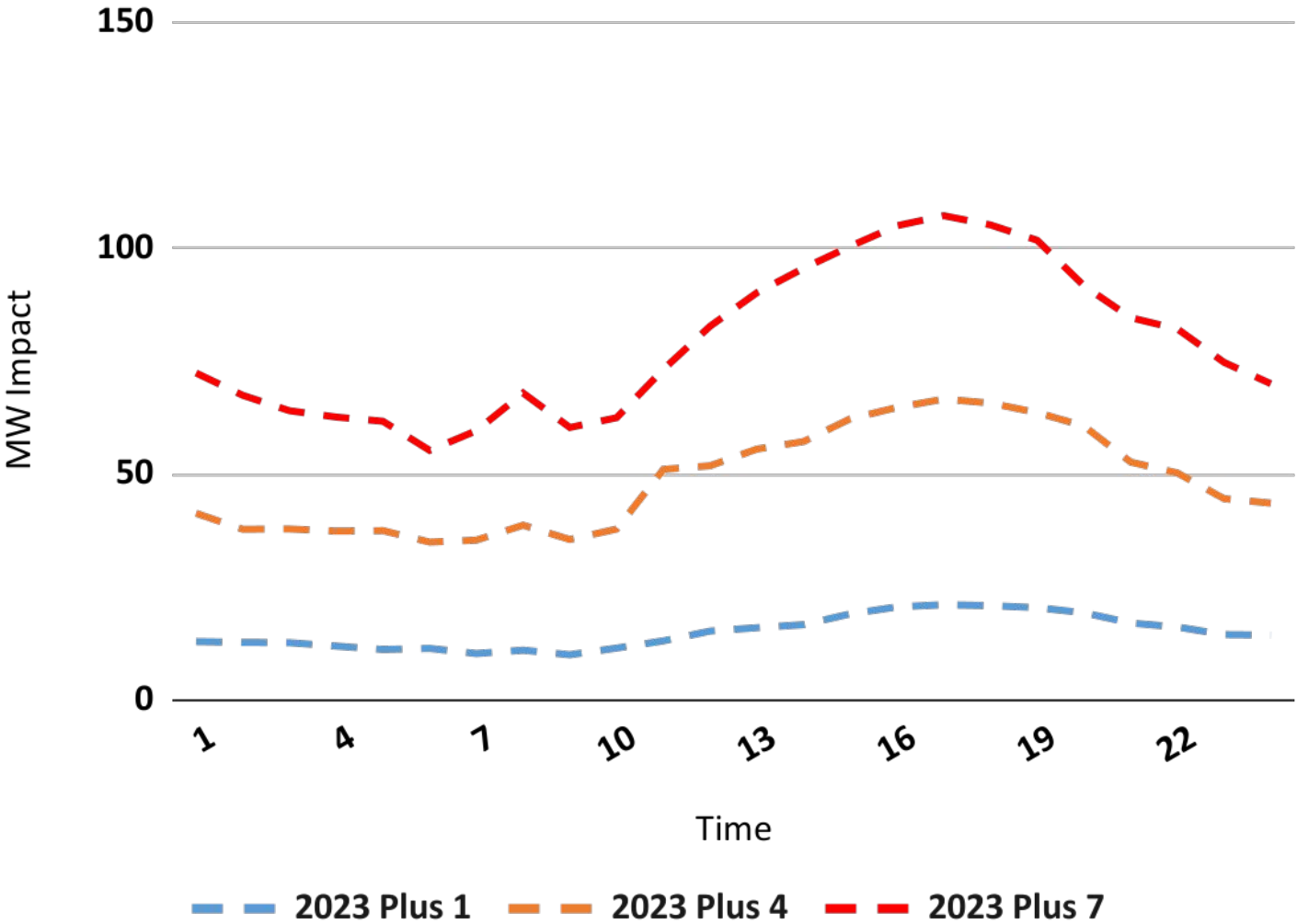
MW Impact of Temperature Increases above Normal in July 2026



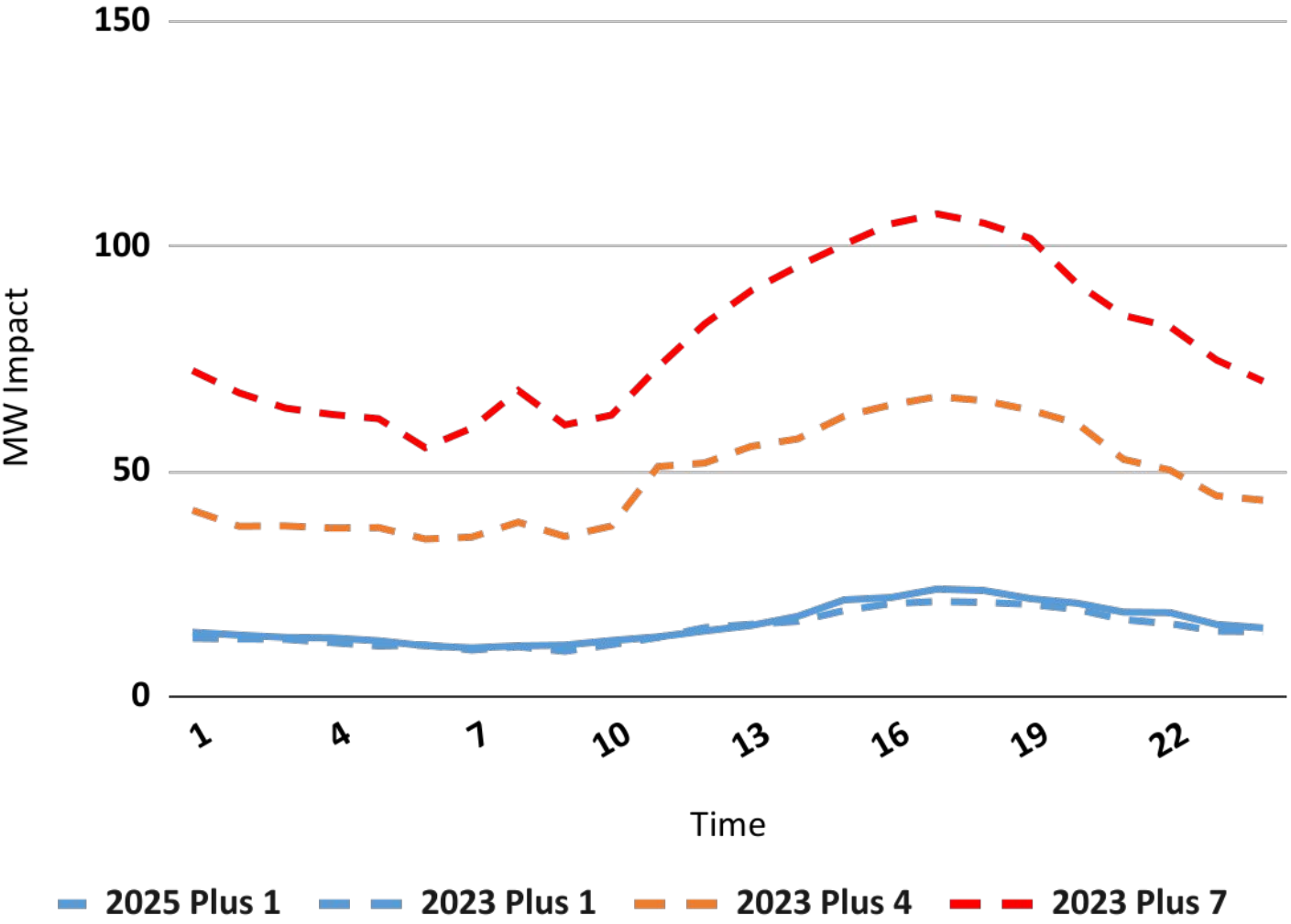
MW Impact of Temperature Increases above Normal in July 2026



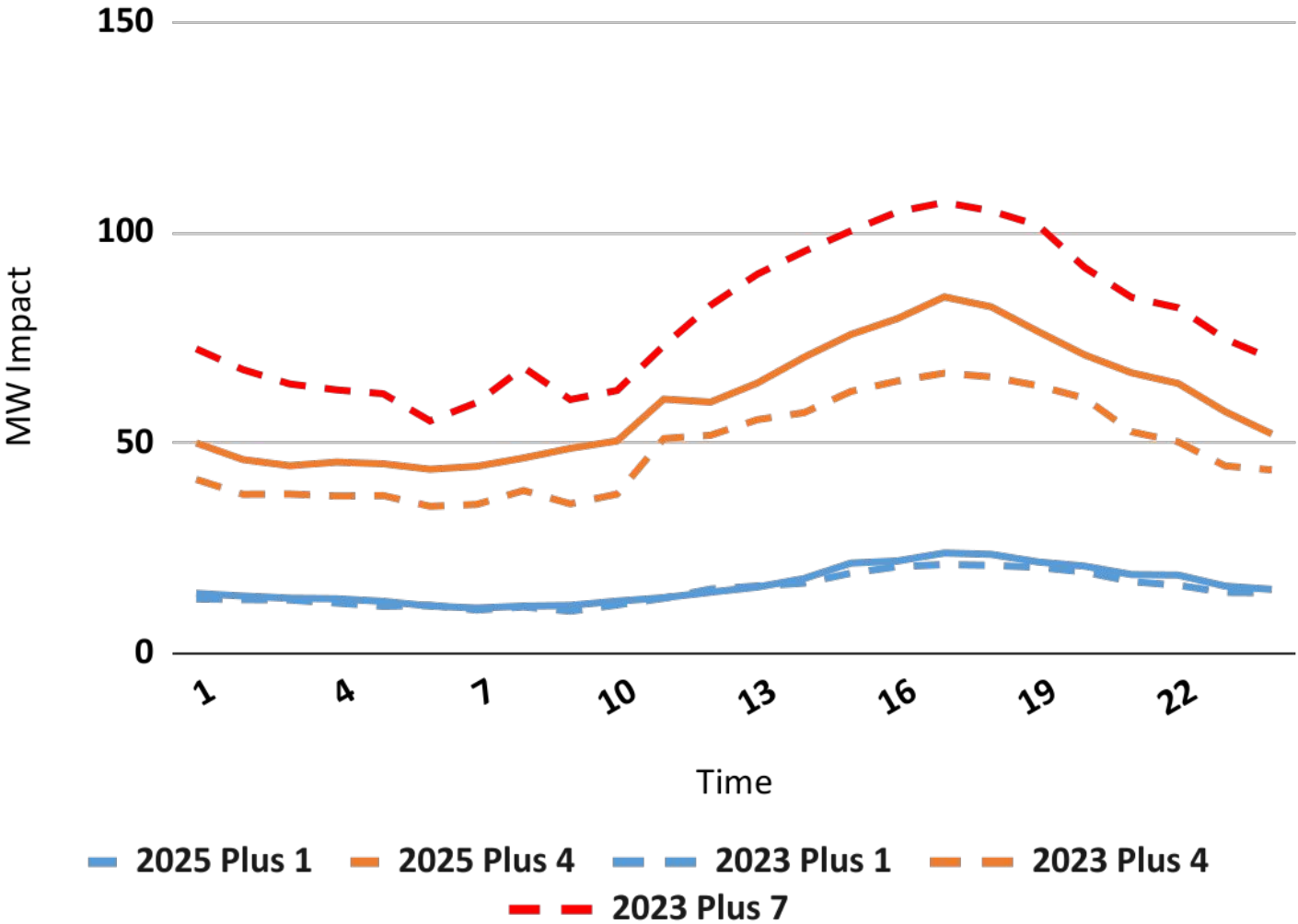
MW Impact of Temperature Increases above Normal in July 2026



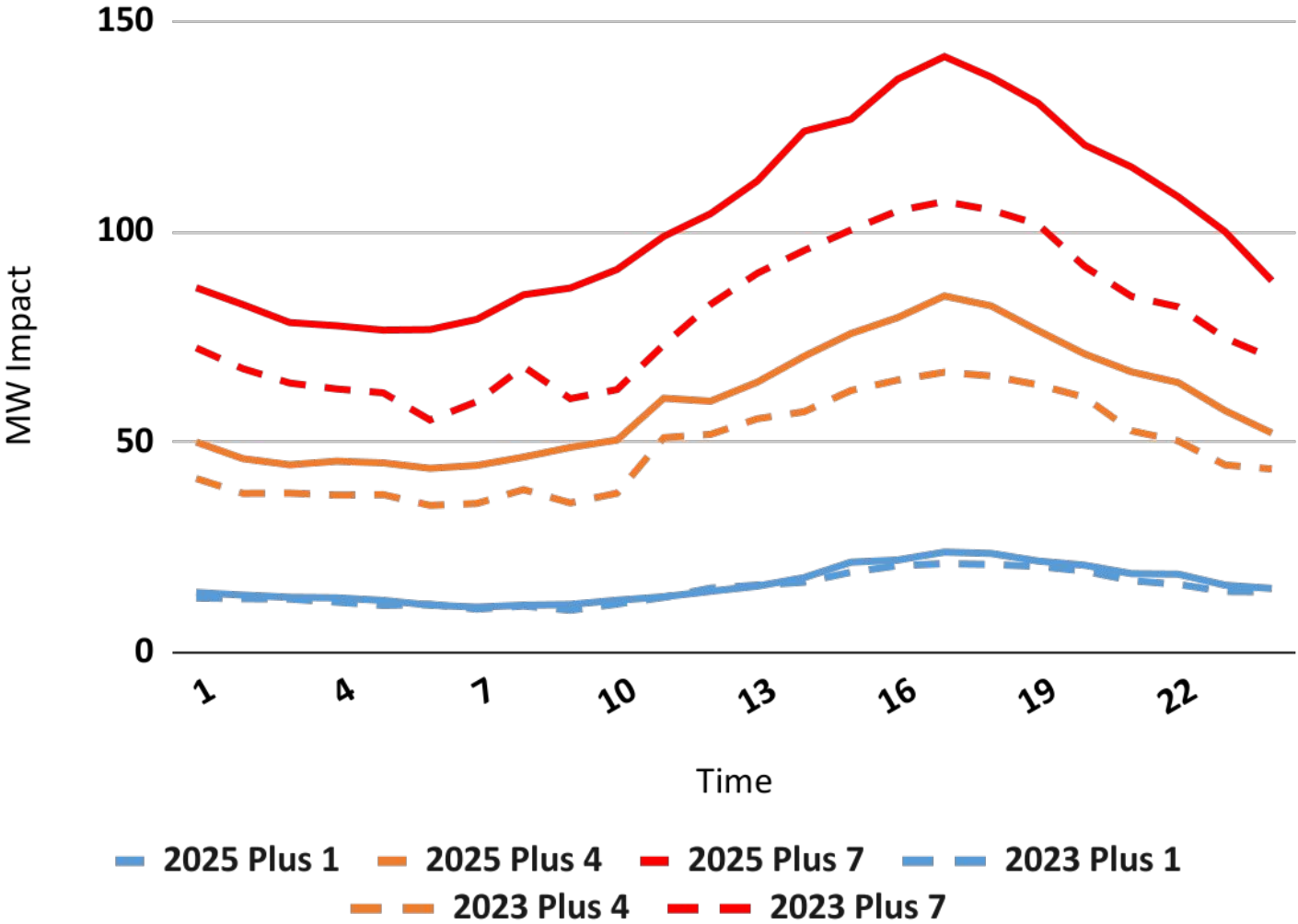
MW Impact of Temperature Increases above Normal in July 2026



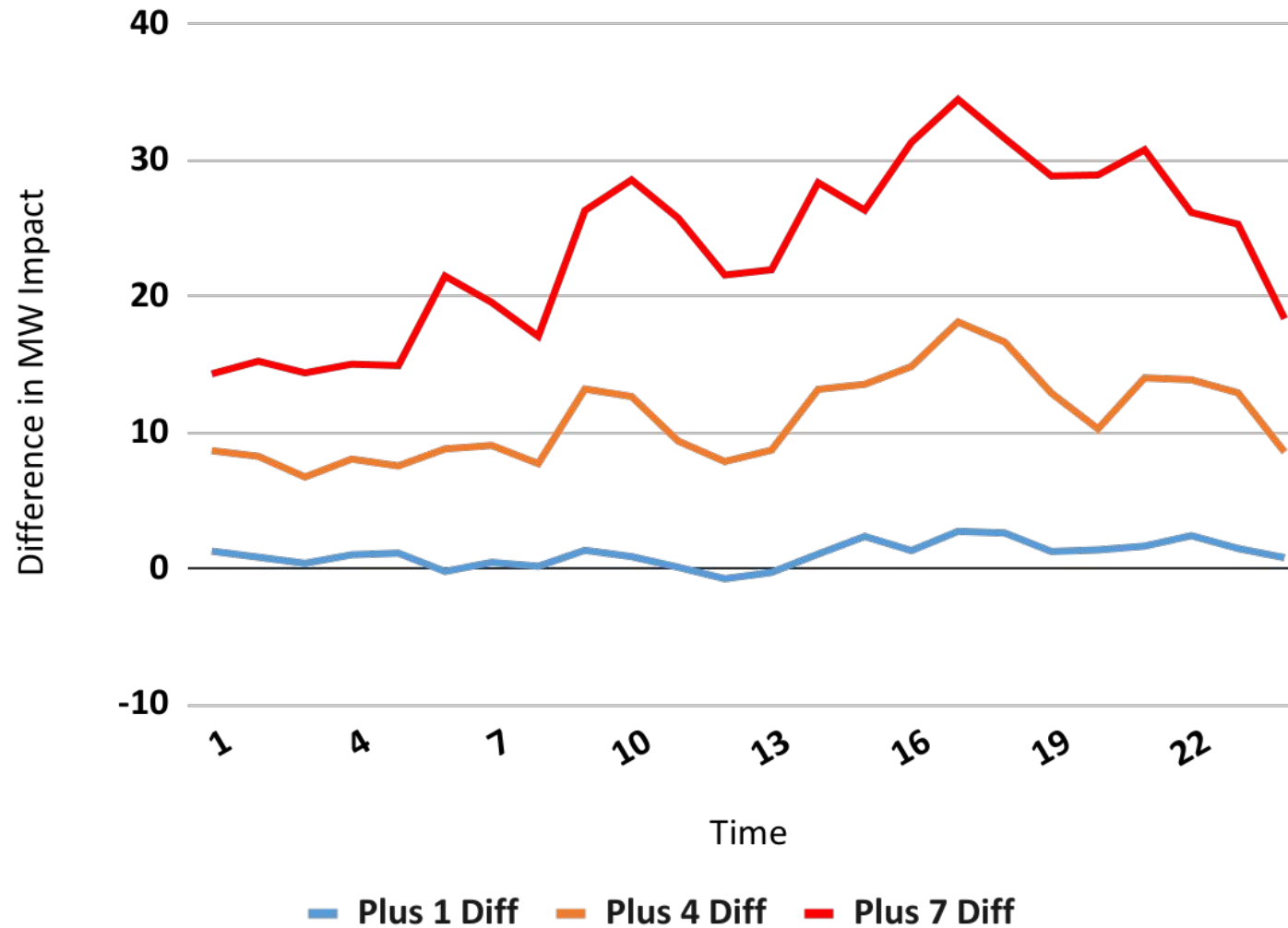
MW Impact of Temperature Increases above Normal in July 2026



MW Impact of Temperature Increases above Normal in July 2026

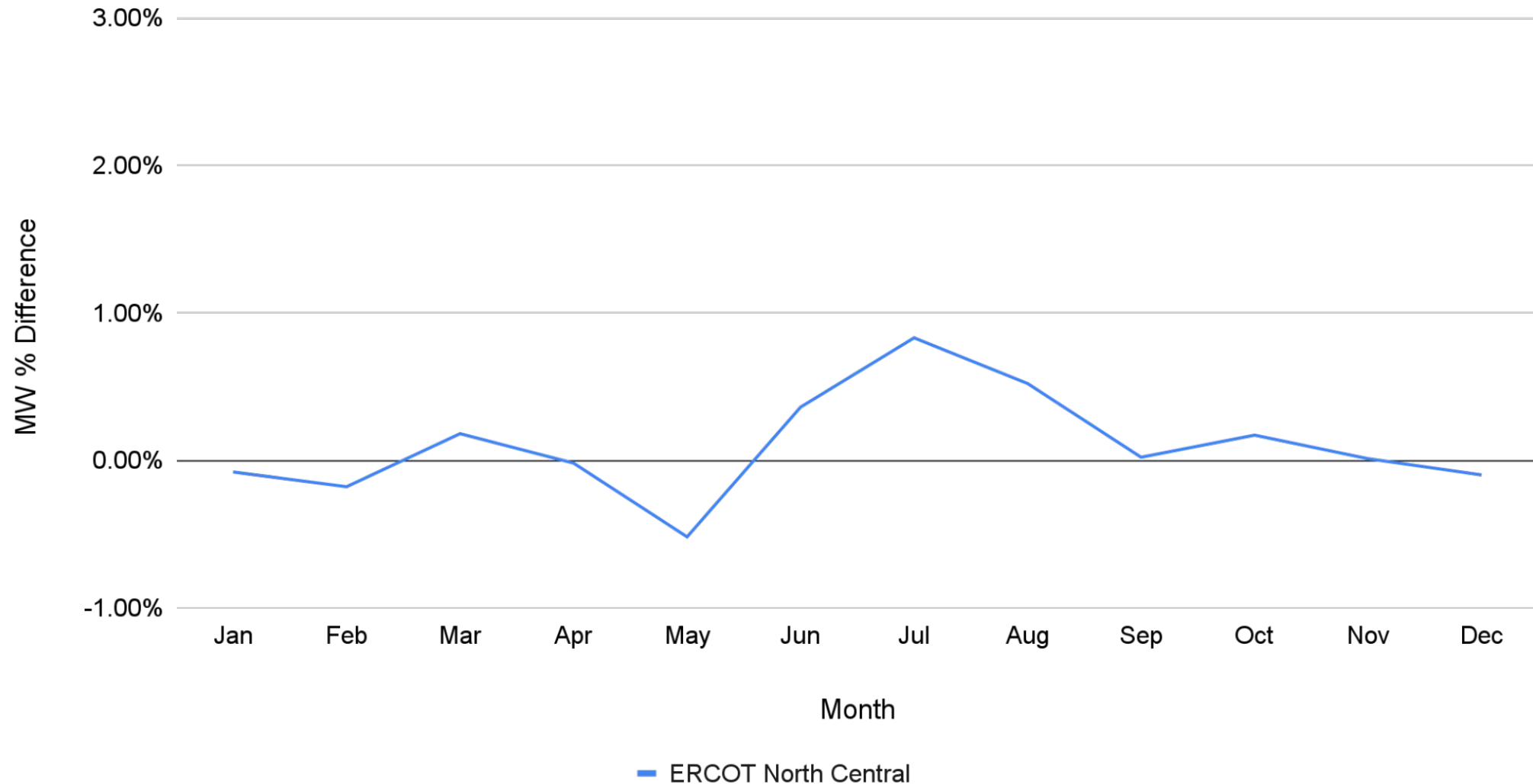


Difference in July Temperature Response Between 2023 and 2025 Models

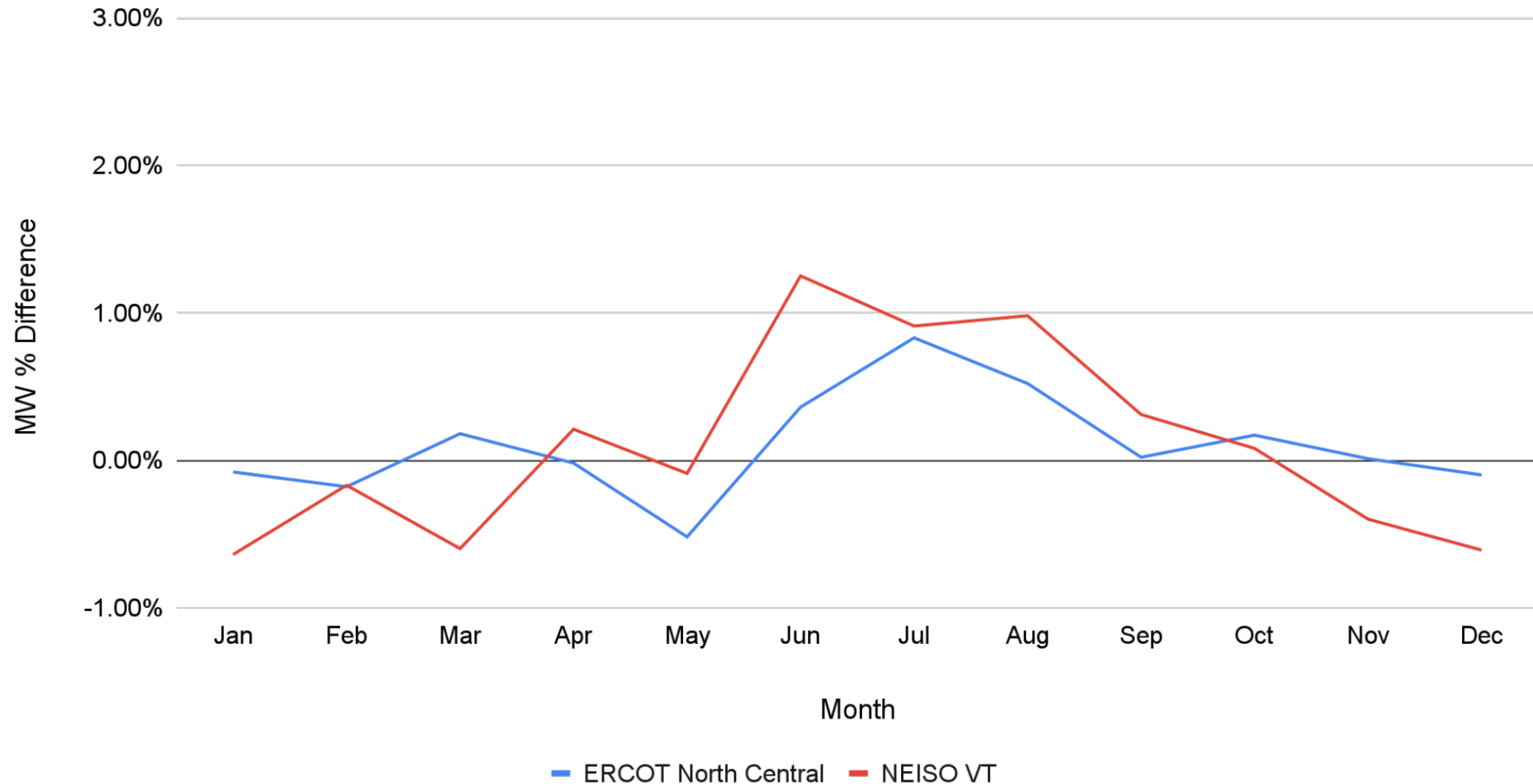


Comparing Regions

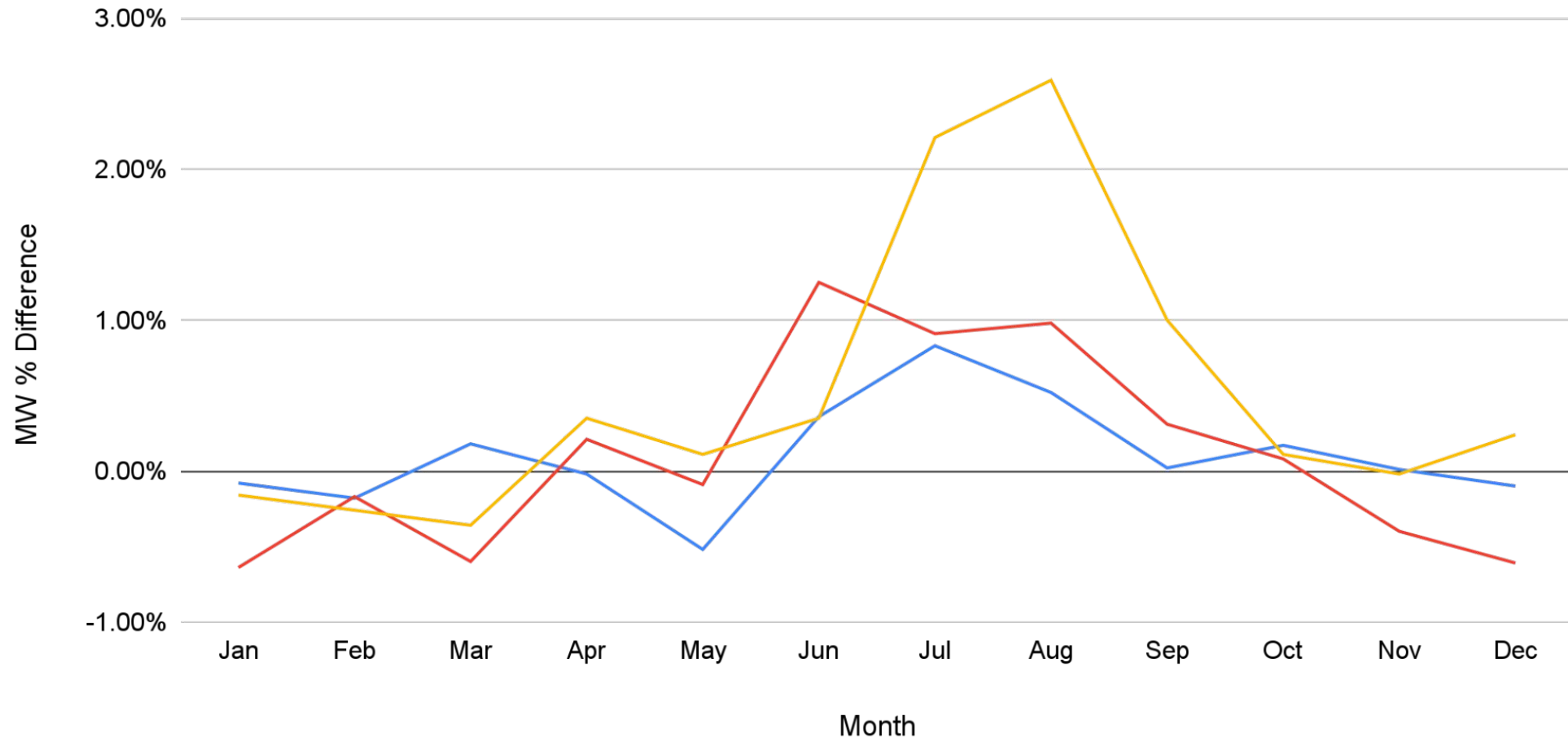
% MW Difference of a 5-degree Above Monthly Average Temperature Between 2023 and 2025 Model



% MW Difference of a 5-degree Above Monthly Average Temperature Between 2023 and 2025 Model

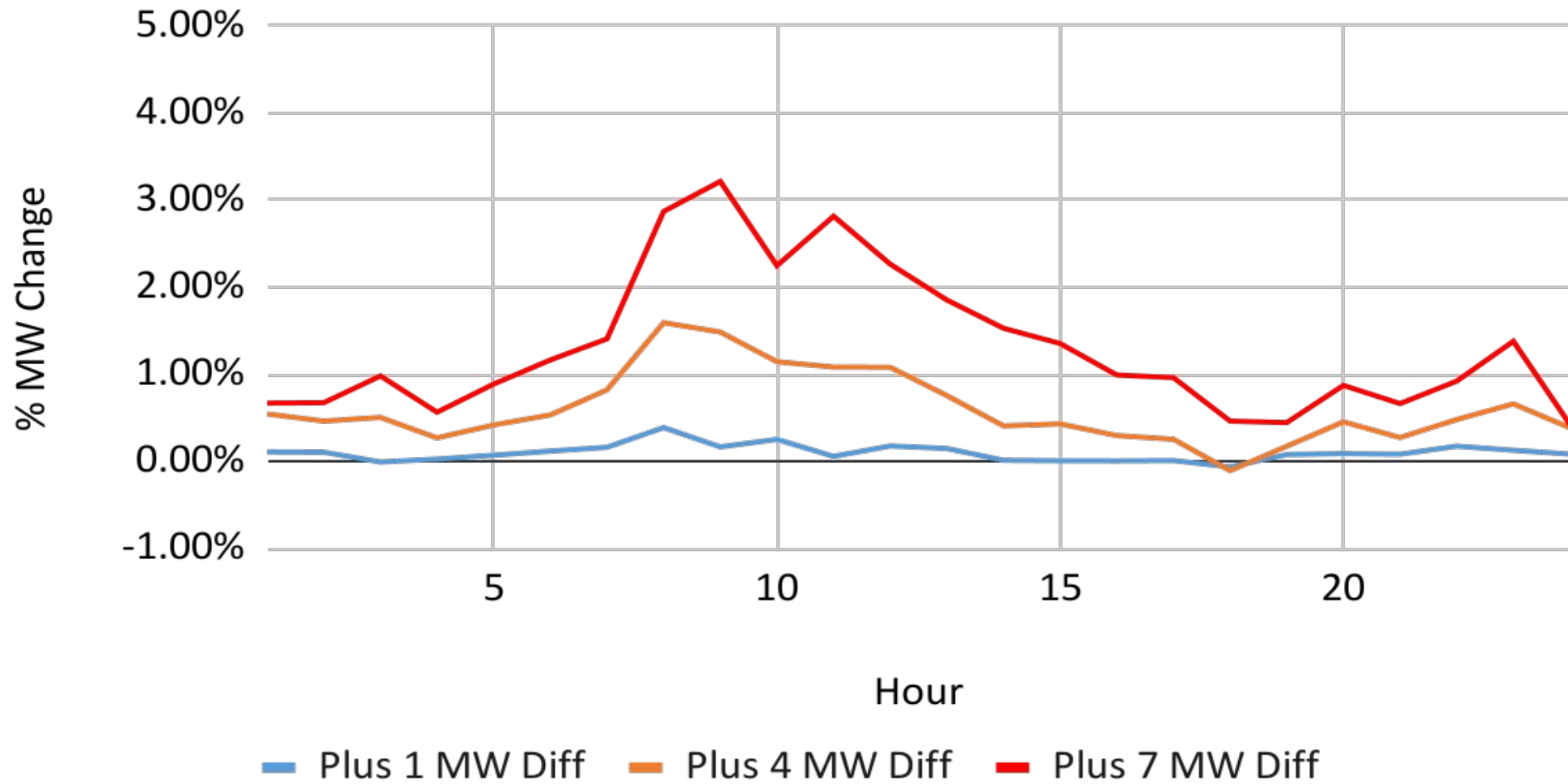


% MW Difference of a 5-degree Above Monthly Average Temperature Between 2023 and 2025 Model



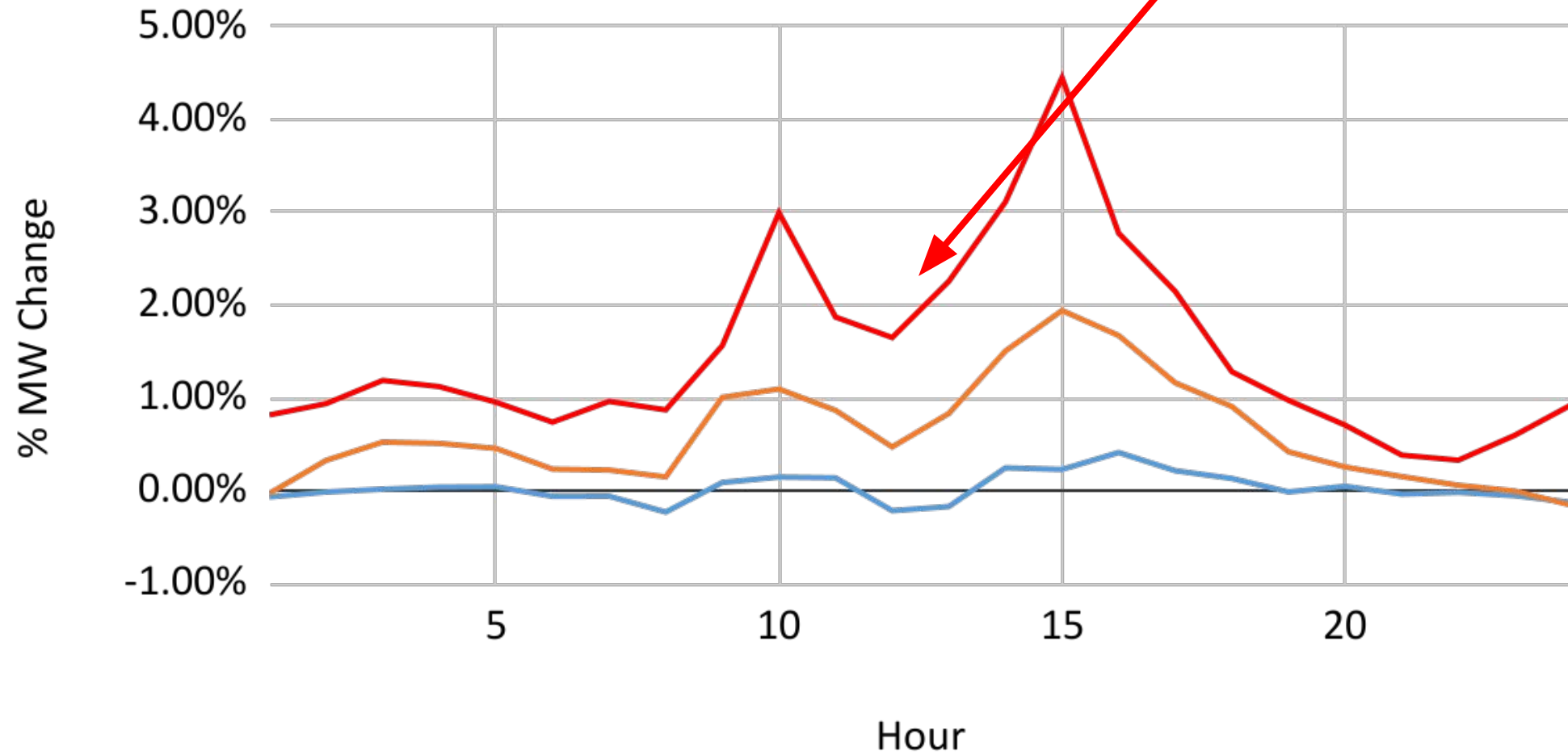
ERCOT North Central NEISO VT Seattle City Light

ERCOT - North Central Weather Zone



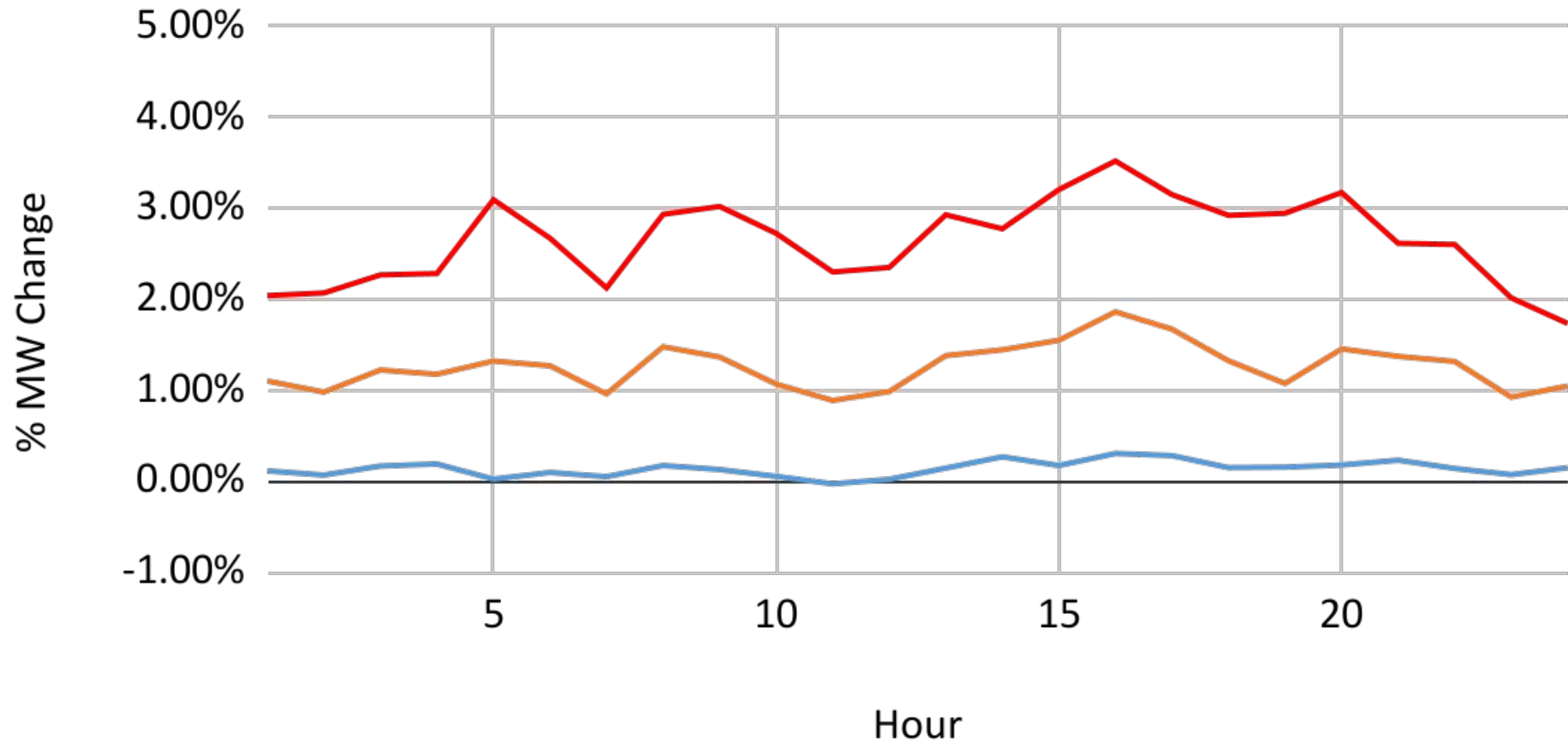
ISO-NE VT

BTM Solar



Plus 1 MW Diff Plus 4 MW Diff Plus 7 MW Diff

Seattle City Light



Plus 1 MW Diff Plus 4 MW Diff Plus 7 MW Diff

Conclusions



Understanding how temperature impacts demand is critical for accurate load forecasting



The relationship between temperature and demand changes over time for various reasons



Tracking where temperature impacts are growing faster than others can reveal new trading opportunities

Thank You!



Ben Perry
SENIOR PRODUCT MANAGER – Forecasting

ben.perry@yesenergy.com

<https://www.linkedin.com/in/benjamin-r-perry/>



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Infrastructure Insights: Your Crystal Ball Into Upcoming Changes To The Grid

Laura Fletcher



Agenda



- Tracking Upcoming Grid Changes
- Upcoming Data Enhancements
- Macro Level Industry Trends
- Leverage in Trading

Infrastructure Insights Tracks Changes to the Electric Power Grid Including:

Generation

- Solar
- Wind
- Energy Storage
- Hydro
- Natural Gas
- Coal
- Biomass
- Nuclear

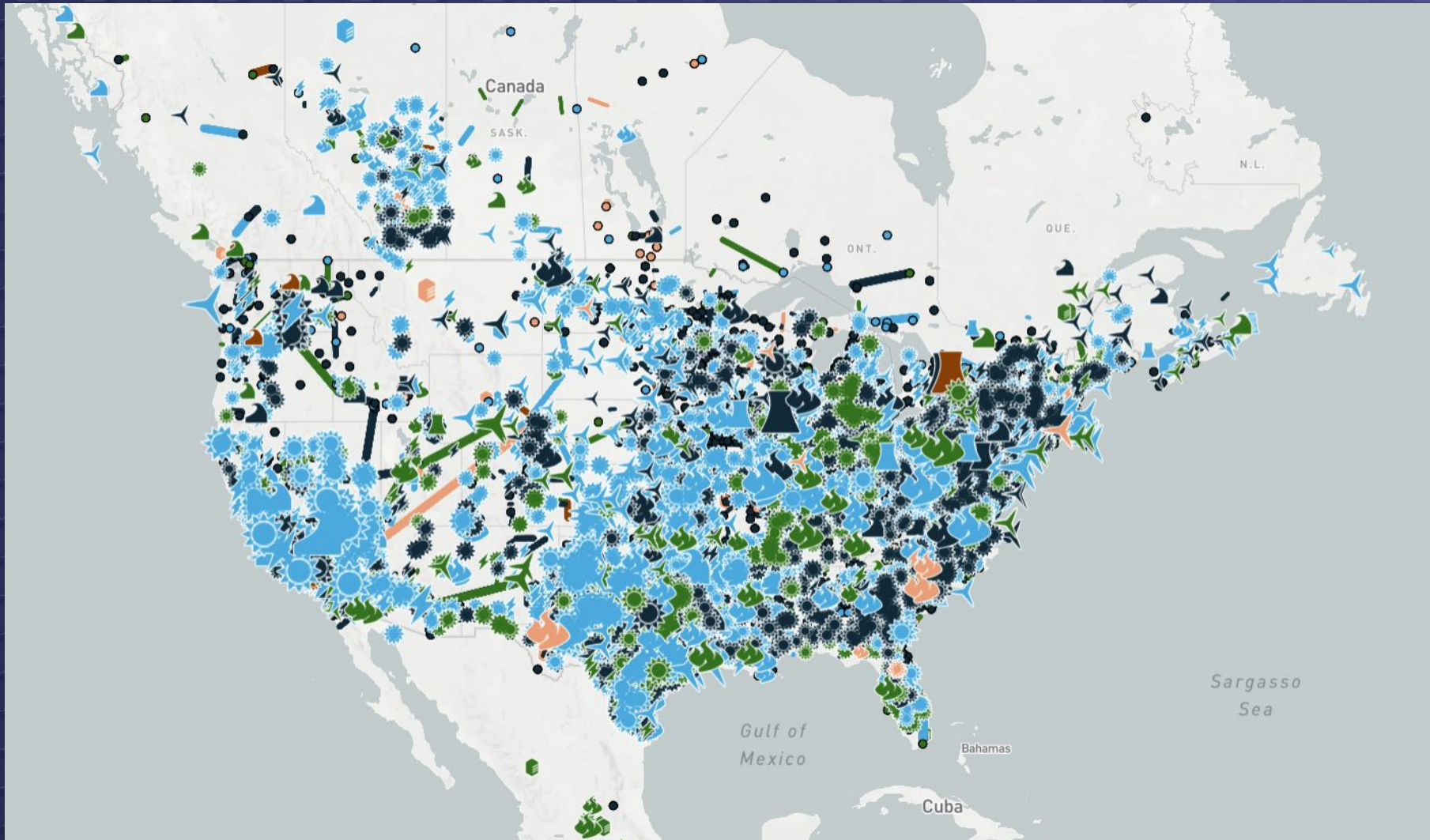
Transmission

- New Lines
- Line Upgrades
- New Substations
- Substation Upgrades

Load Centers

- Data Centers
- Manufacturing
- EV Fleet Charging
- LNG Export Facilities
- Refineries
- Carbon Capture

Where Does All This Data Come From?



Why Is This Useful To Traders?

- Can provide an edge on the market if you have better insights into upcoming infrastructure changes
- Can inform more macro models used to predict hub pricing



Upcoming Data Enhancements

Yes Energy In Service Year

This is the projected online year of the project and is at the *discretion of the analysts* who take into account the full details of the individual project.

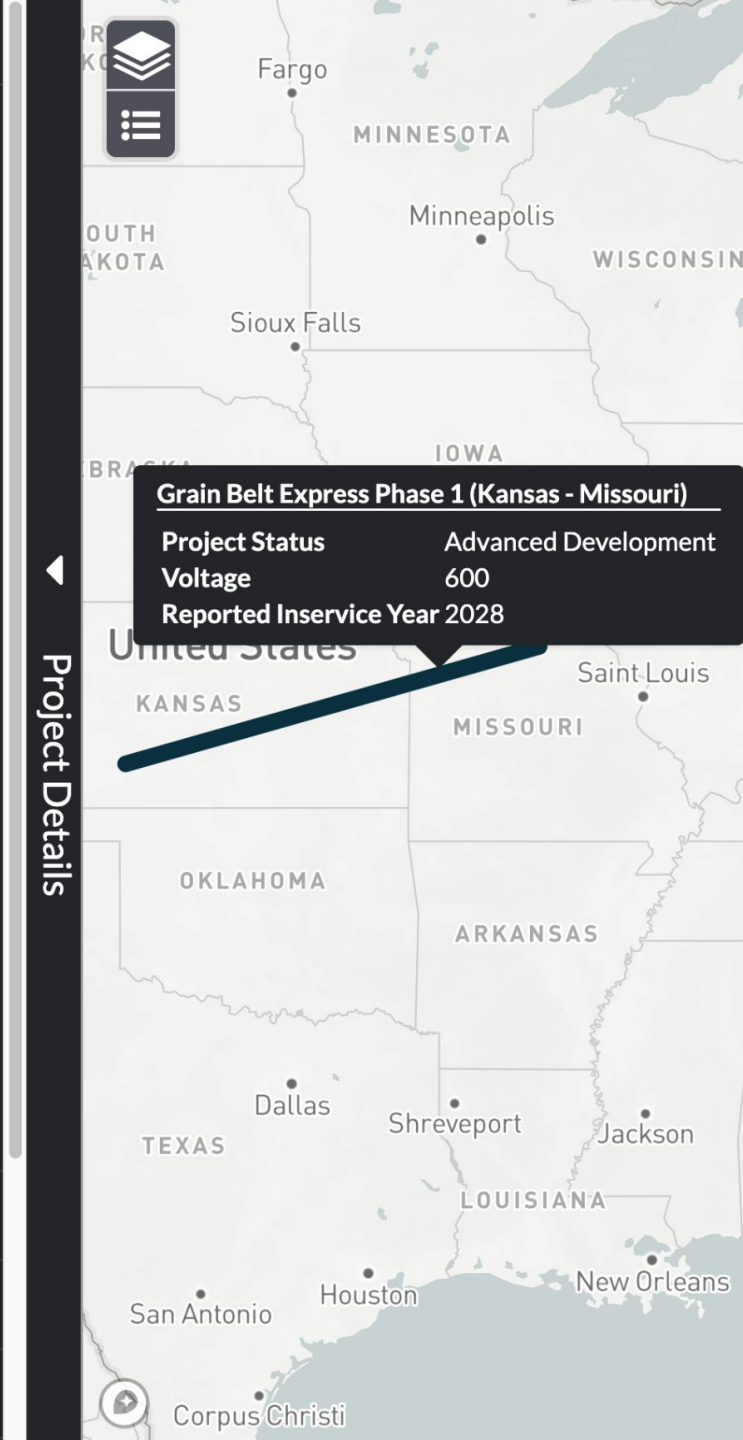
Probability Score

All projects are assigned a percentage on how likely the project is to be completed. The criteria differs between project types as well as ISOs or regions.

POI for Load Centers

This will provide the name of the interconnecting substation whether it is a reported value or an estimate based on location and voltage.

Project Overview	
Project Name	Grain Belt Express Phase 1 (Kansas - Missouri)
Utility	Grain Belt Express
Reported In Service Year	2028
In Service Month	9
Construction Start Date	01/01/2026
Project Status	Advanced Development
Reported Cost or Budget	\$3,500,000,000
As Built Voltage	600
Total Line Miles	500
Project Types	New Line; New Switching Station
Project Elements	HVDC Project; Line: River Crossing/Wetlands; Converter Stations
States or Provinces	KS - MO
Ownership	
Project Description	
Elements or Component Totals	



Grain Belt Express Phase 1 (Kansas - Missouri)

500 mile, 600 kV HVDC line in Advanced Development

- Reported ISD: 2028
- Yes Energy ISD: 2030
- Probability Score: 25%
 - Project crosses RTO/ISO boundaries

and Proprietary Information of Yes Energy, LLC 87

Macro Level Industry Trends

Load Growth

High Voltage Transmission

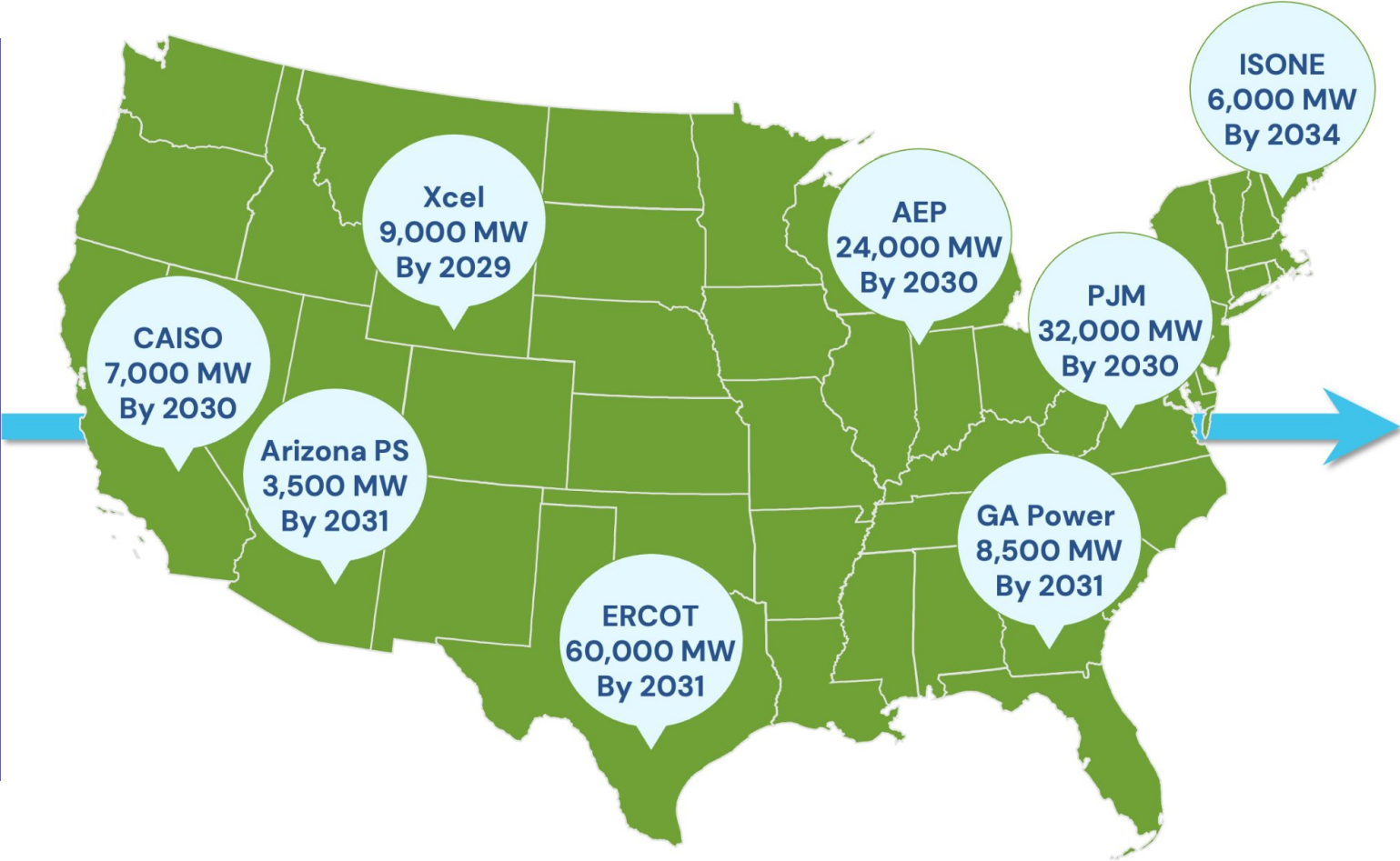
Rise in Baseload Generation
Capacity



Load Growth Additions

Five Years Ago

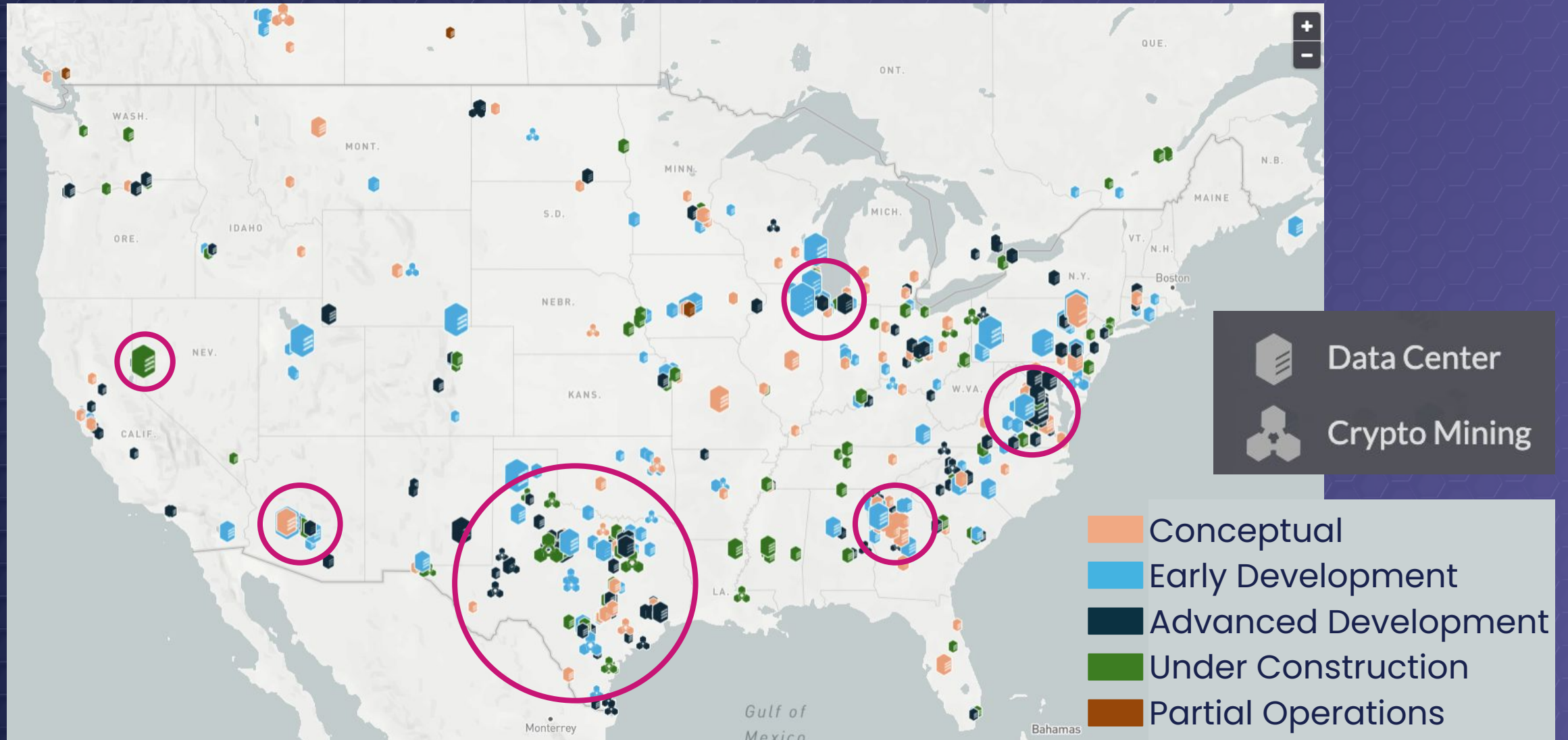
Transportation electrification was the top of mind worry for transmission and distribution planners.



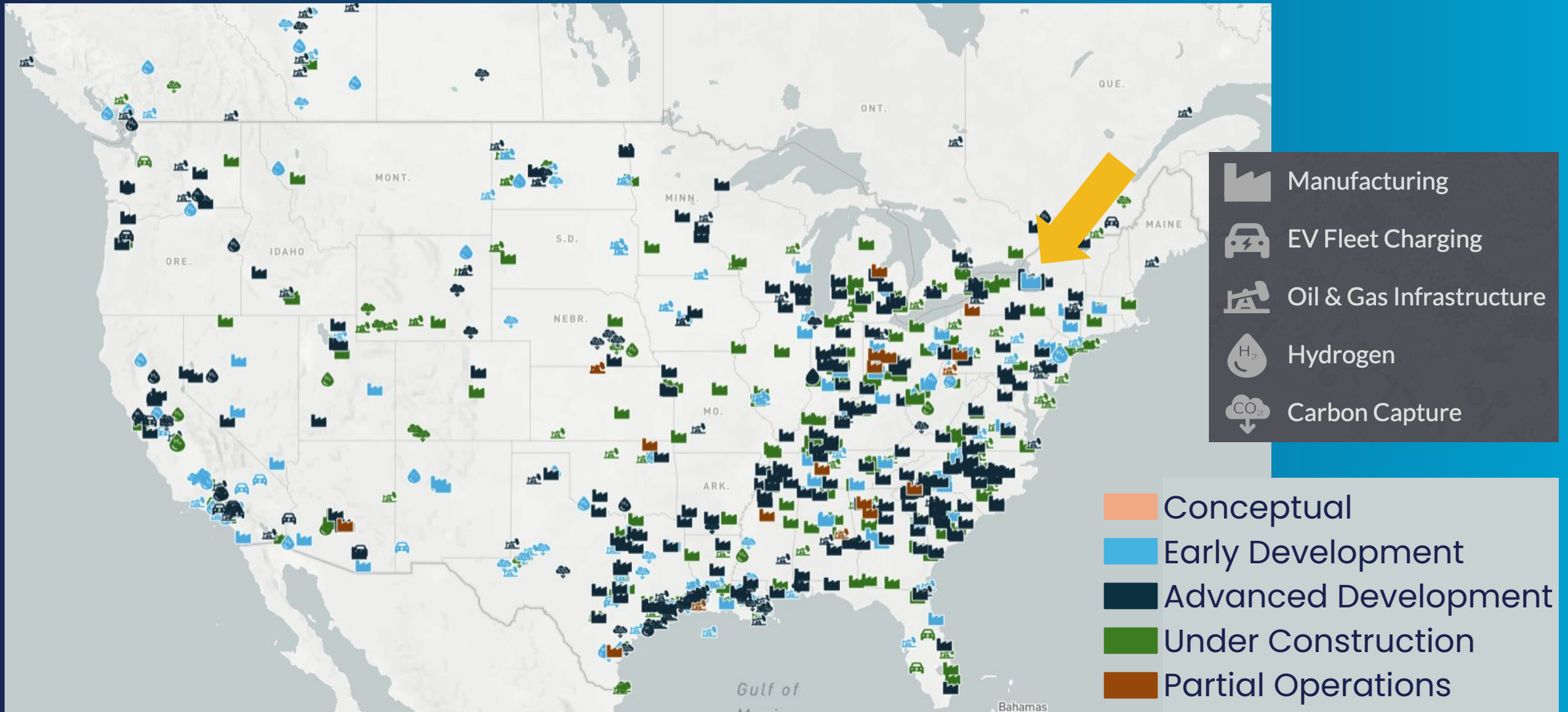
Today

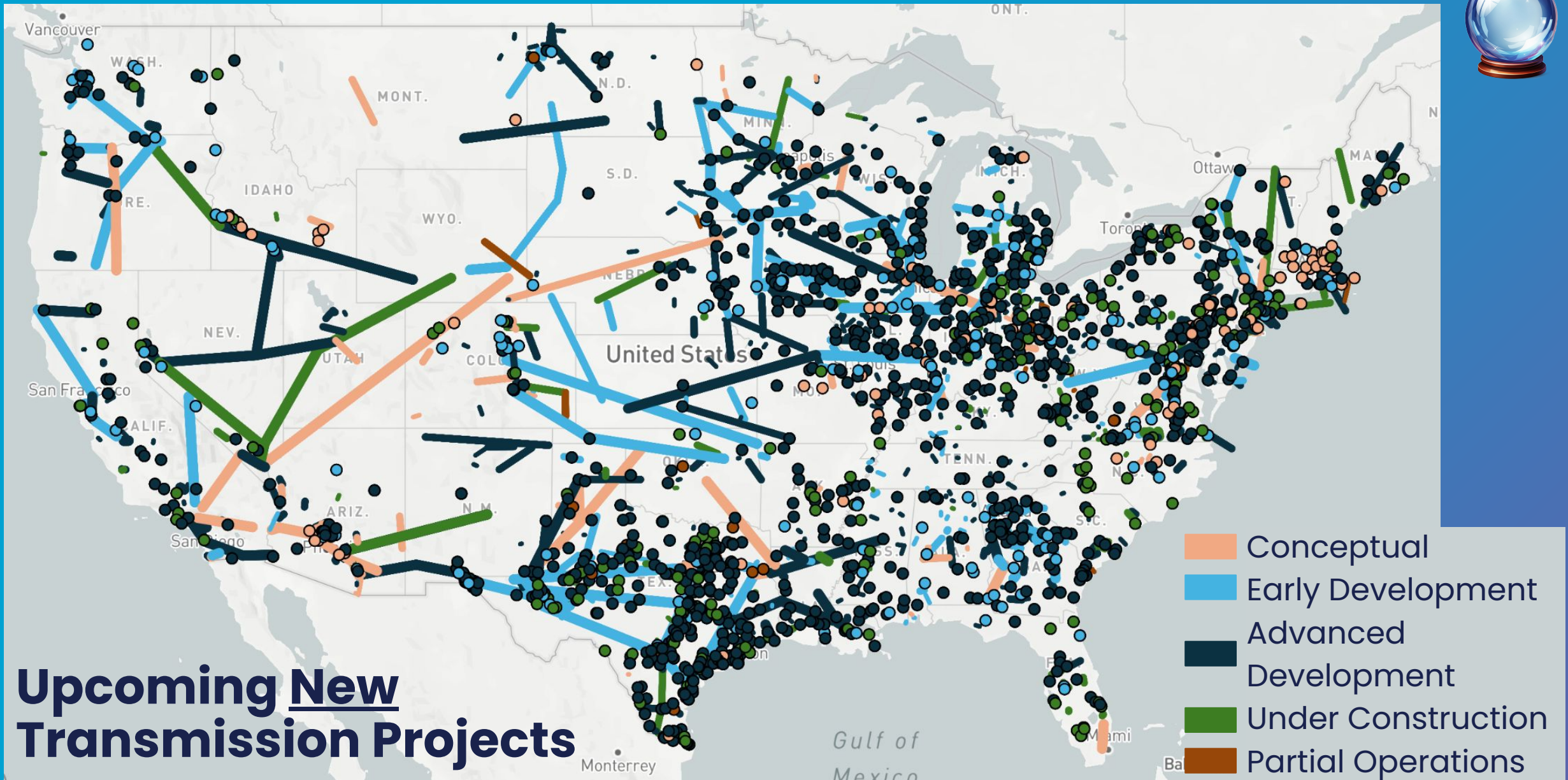
Data centers are the most discussed driver of load growth but are only part of the equation.

Upcoming Data Centers

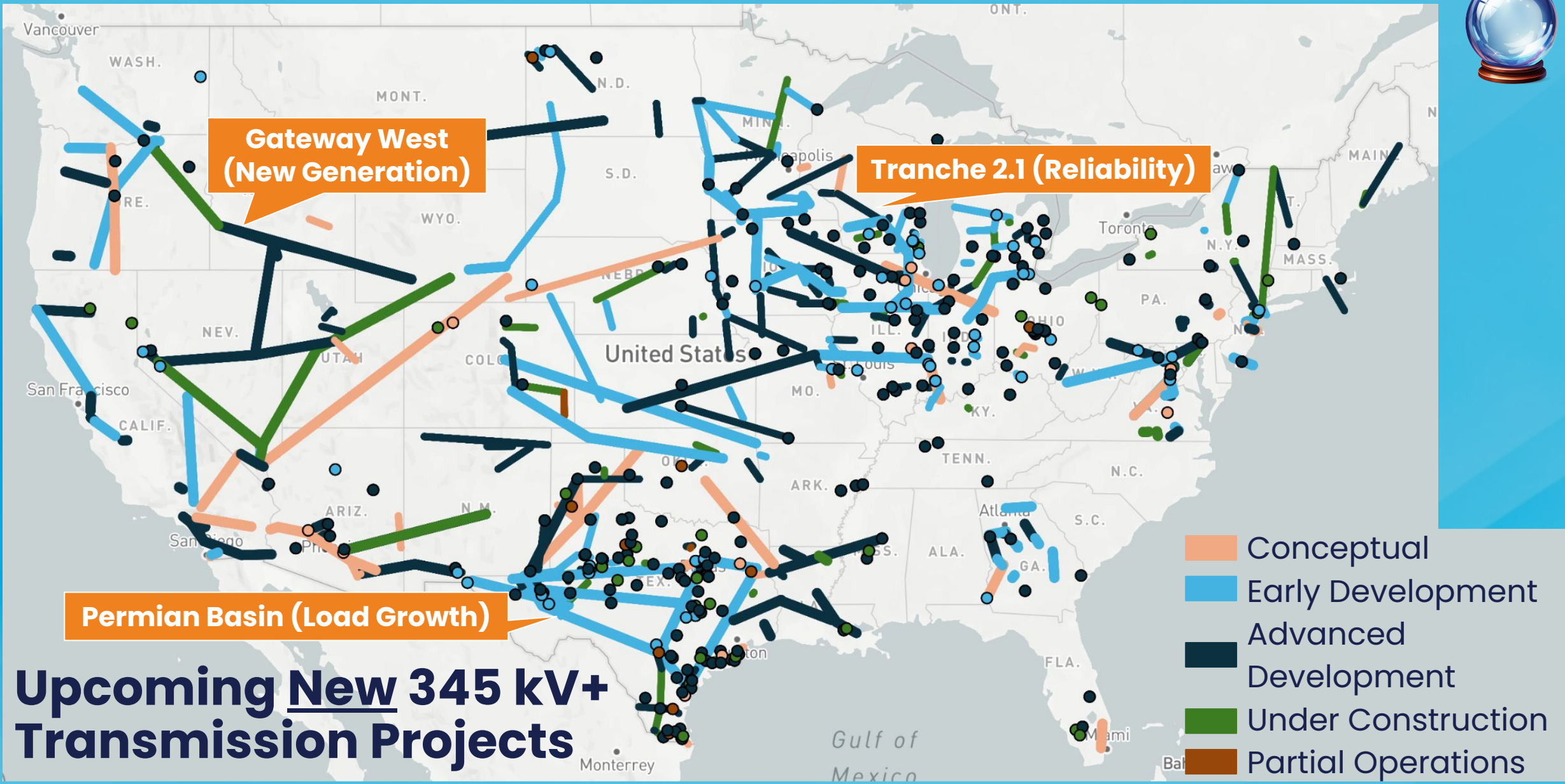


Other Planned Load Centers

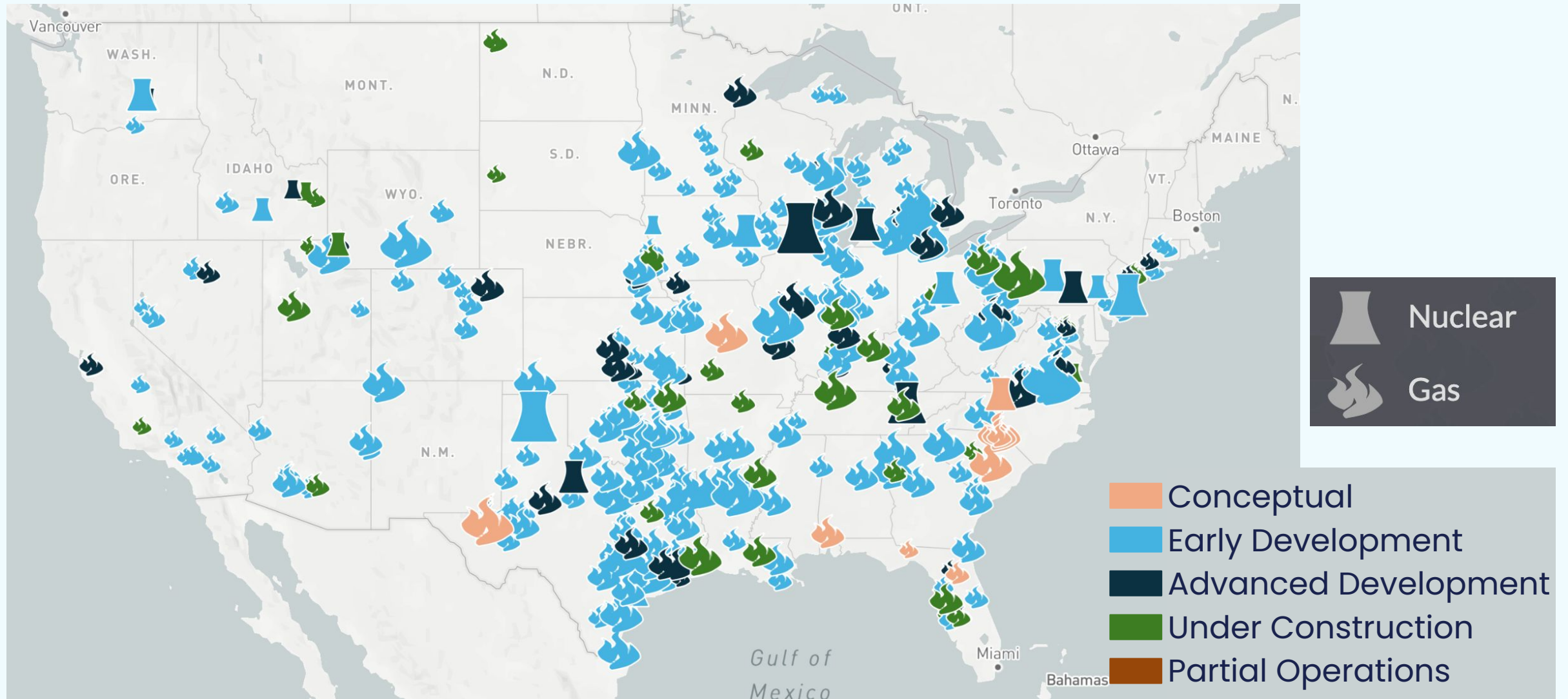




Upcoming New Transmission Projects



Rise in Planned Baseload Generation Capacity



For US Projects With Reported In Service Dates 2025–2035:

Announced or Added in <u>2024</u>		
Fuel	Number of Projects	Planned Capacity
Natural Gas	131	55 GW
Nuclear	4	2 GW
Wind	344	105 GW
Solar	1,855	310 GW
Battery	1,481	289 GW
Total	3,891	760 GW

Announced or Added in <u>2025 (YTD)</u>			
Fuel	Number of Projects	Planned Capacity	
Natural Gas	231	115 GW	↑
Nuclear	18	11 GW	↑
Wind	245	81 GW	↓
Solar	1,544	214 GW	↓
Battery	1,227	230 GW	→
Total	3,266	652 GW	→



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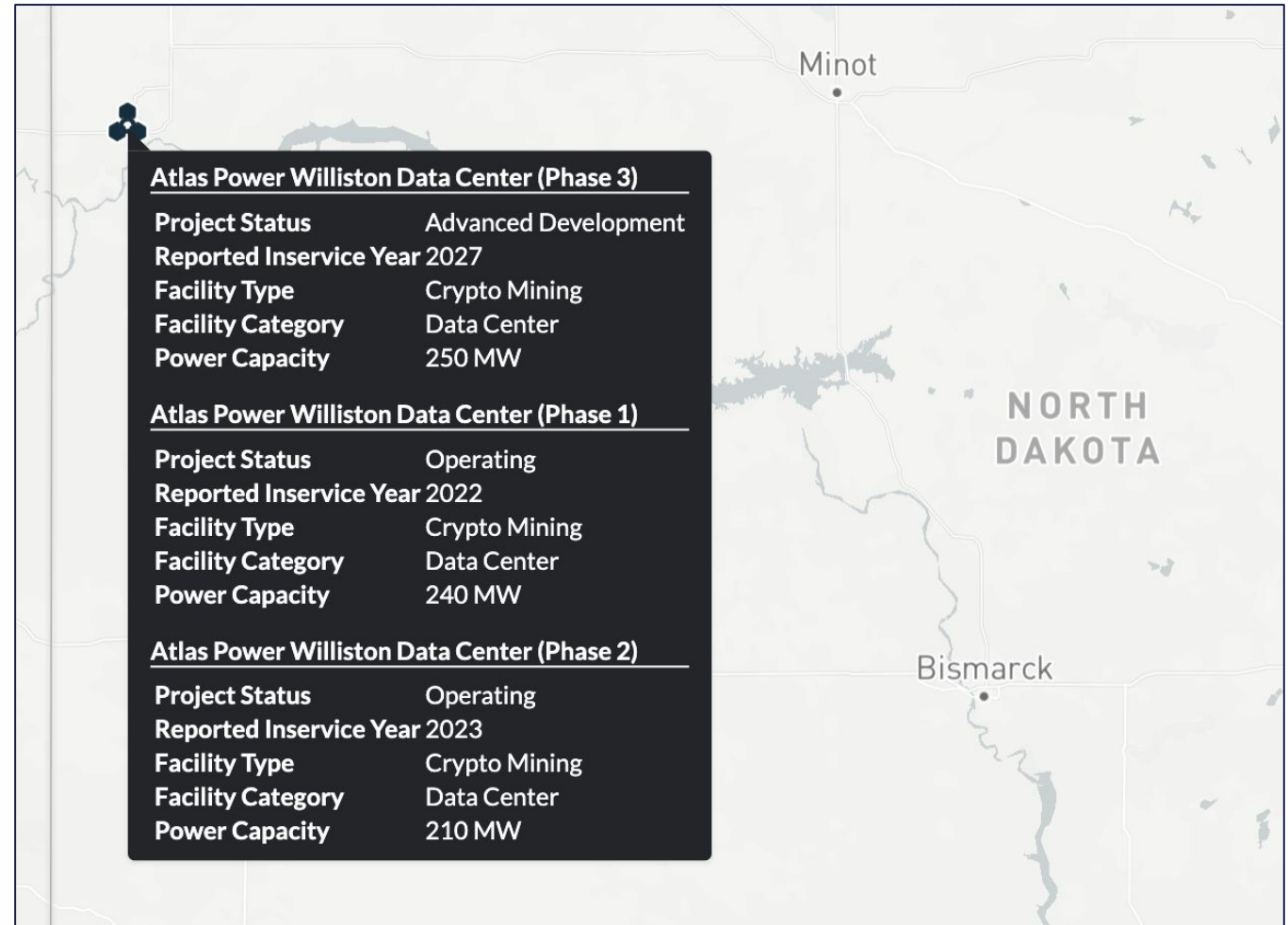
Example: New Load Increasing Congestion

Atlas Power Williston Crypto

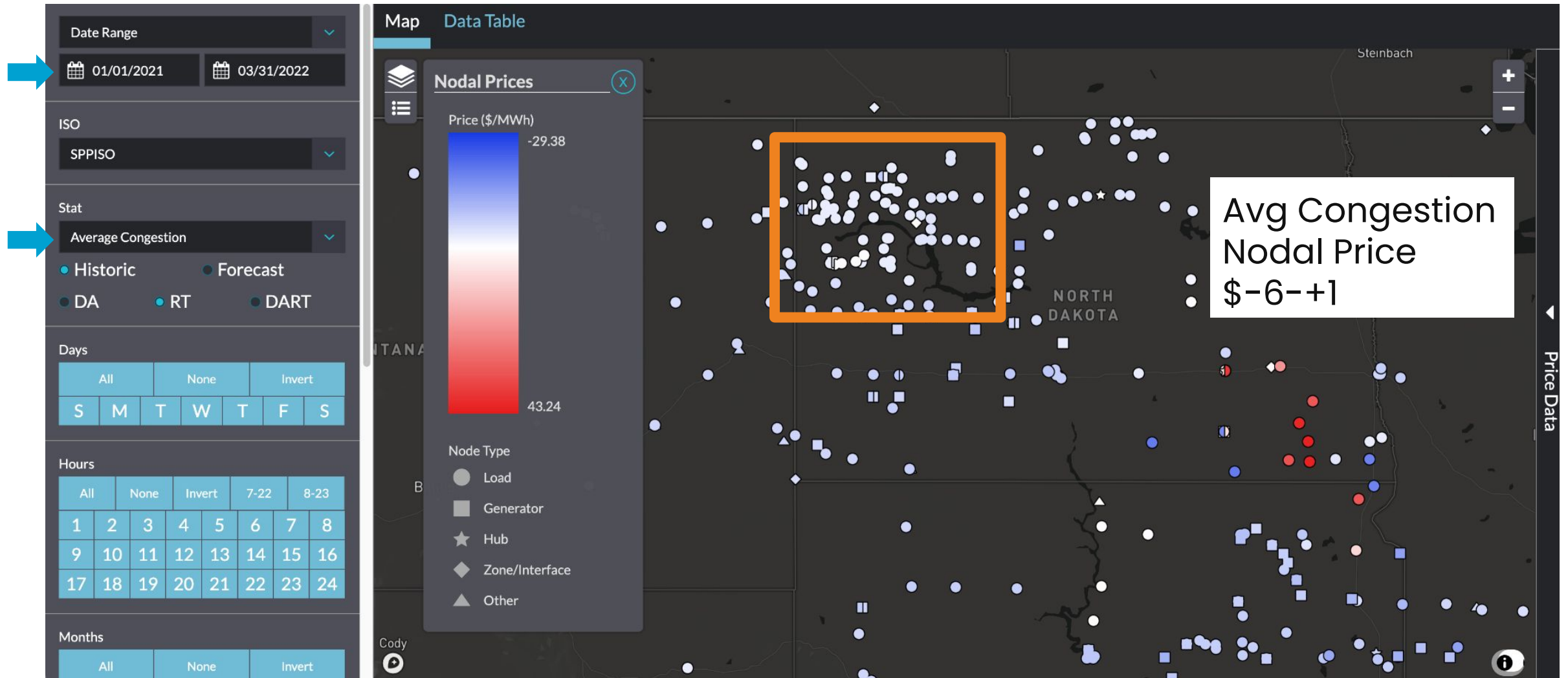


Example: Atlas Power Williston Crypto

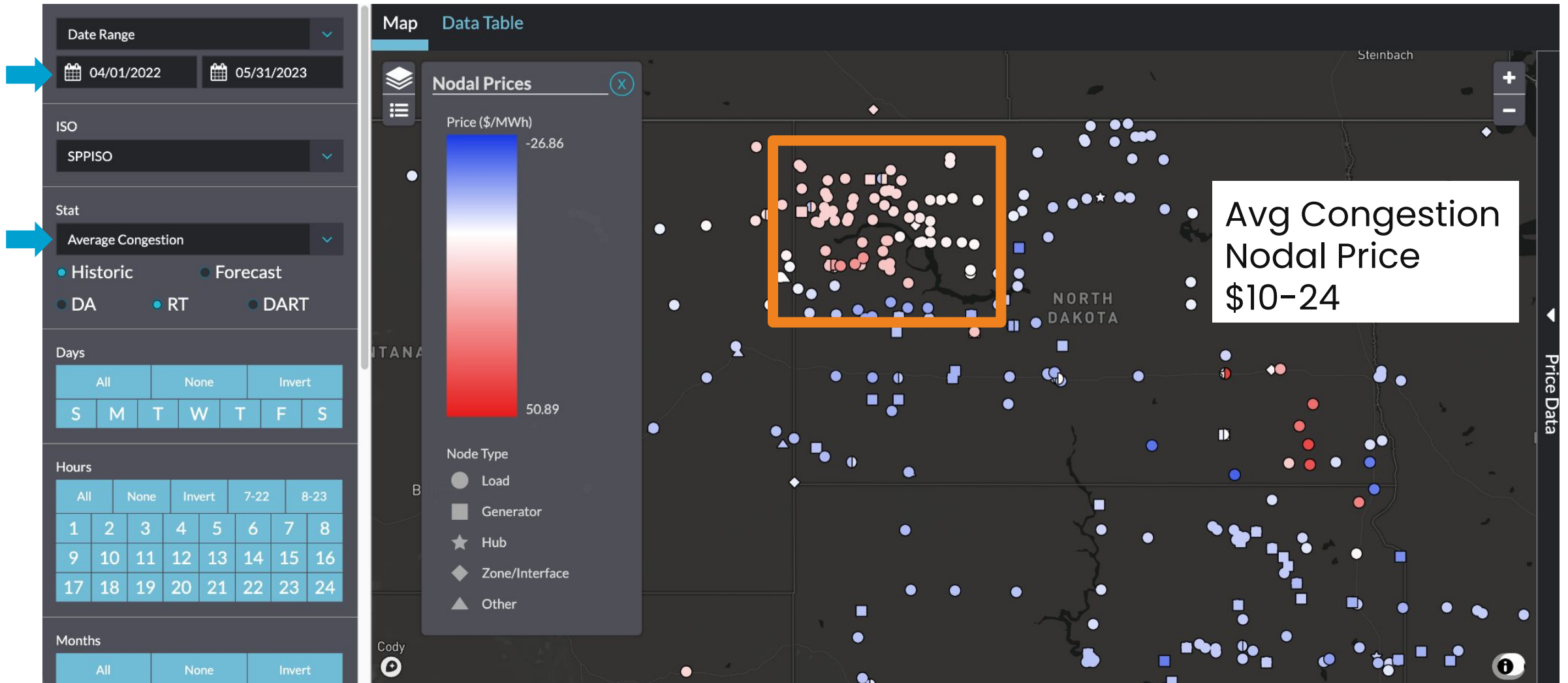
- 700 MW crypto mining facility in North Dakota
- Phase 1 (250 MWs) came online Sept 2022
- Phase 2 (240 MWs) completed June 2023
- Phase 3 (210 MWs) in development



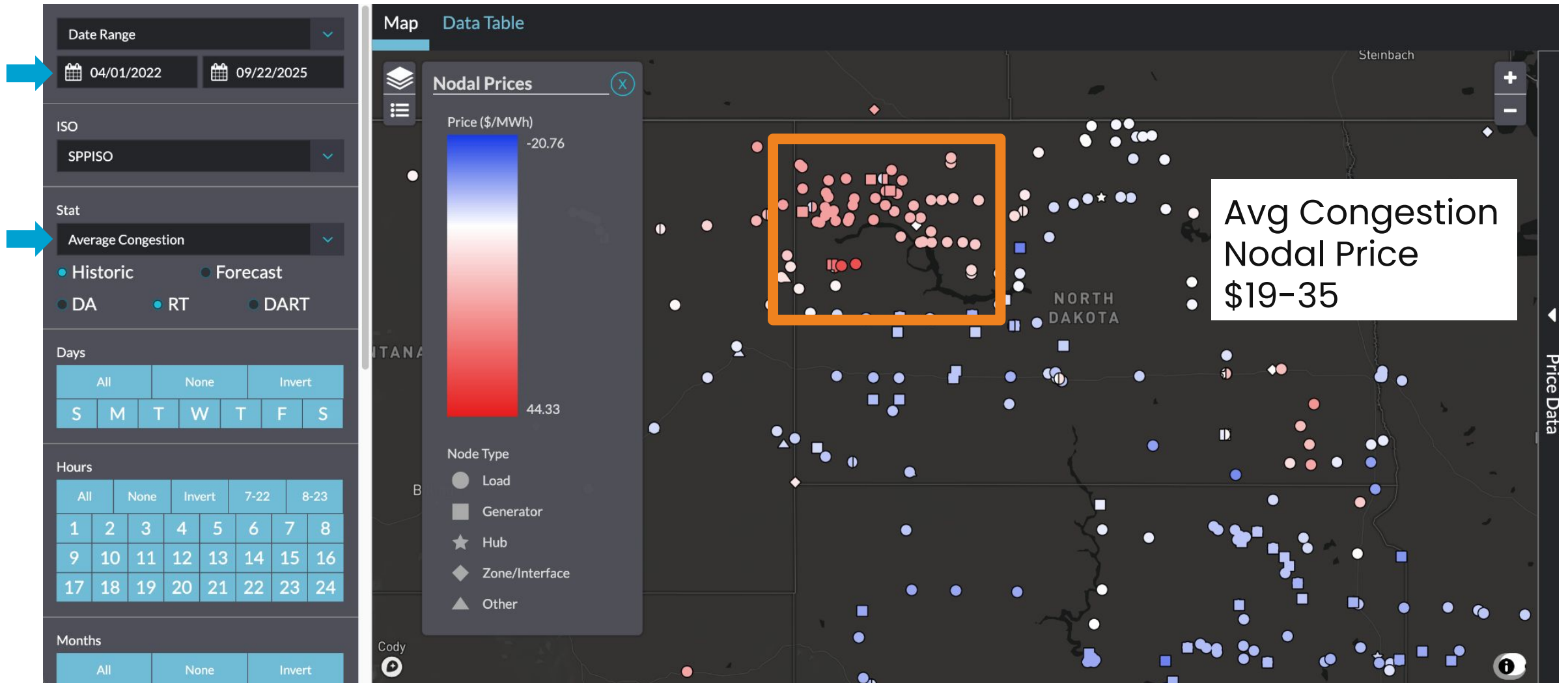
Example: Before Atlas Power Williston Crypto



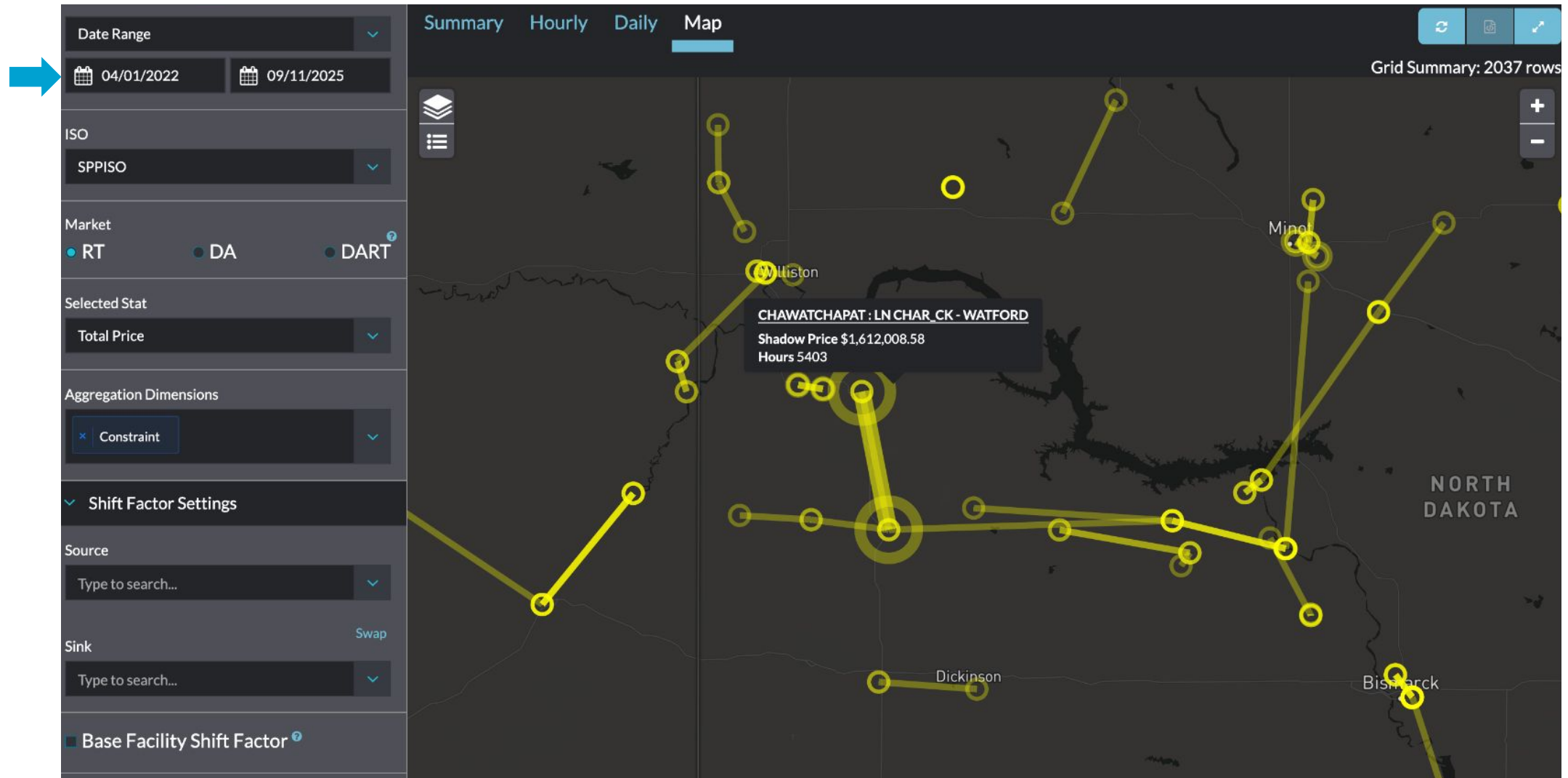
Example: Atlas Power Williston Crypto Phase 1



Example: Atlas Power Williston Crypto Phases 1-2



Example: Atlas Power Williston Crypto Phases 1-2

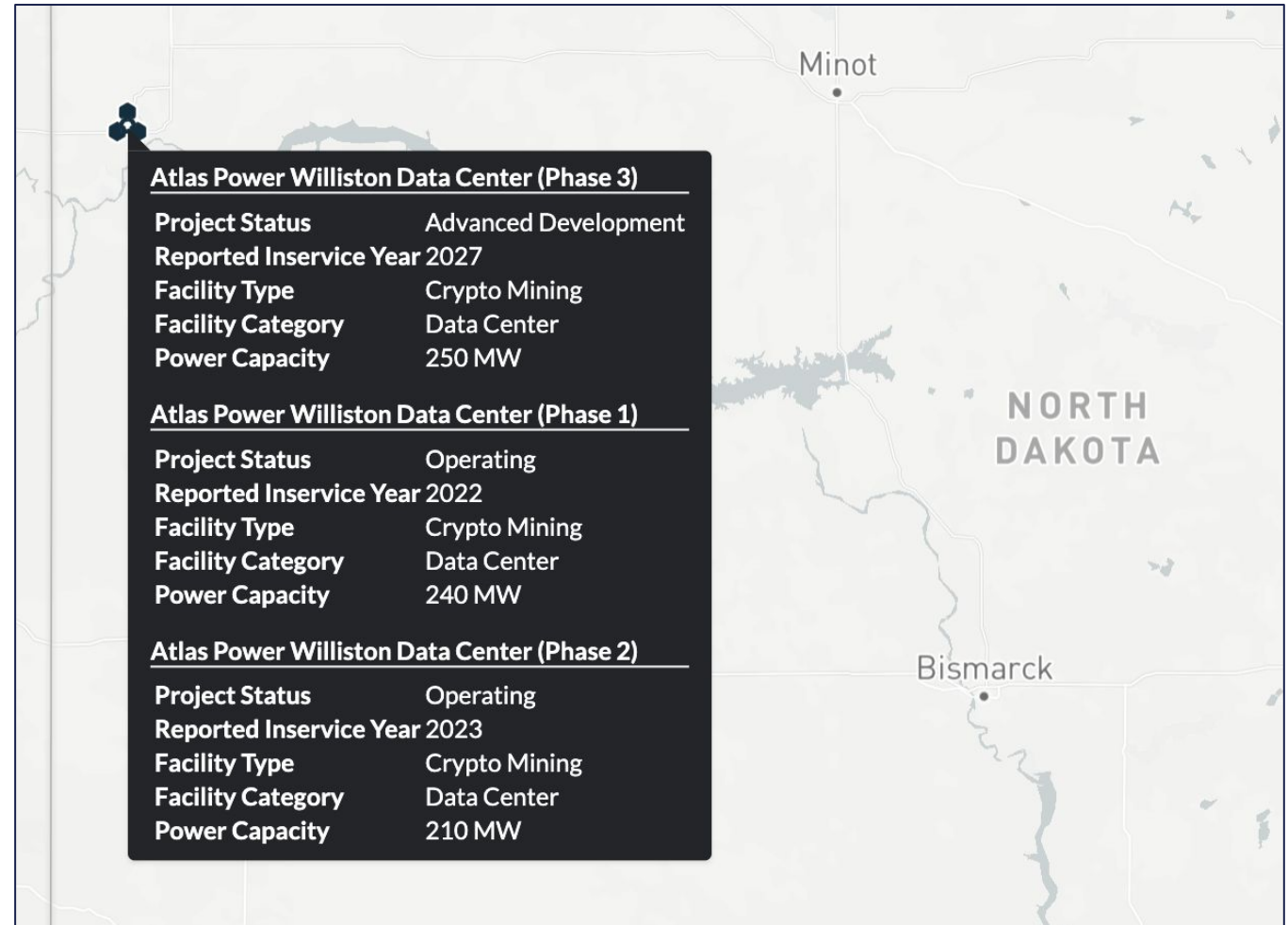


Example: Atlas Power Williston Crypto Phases 1-2

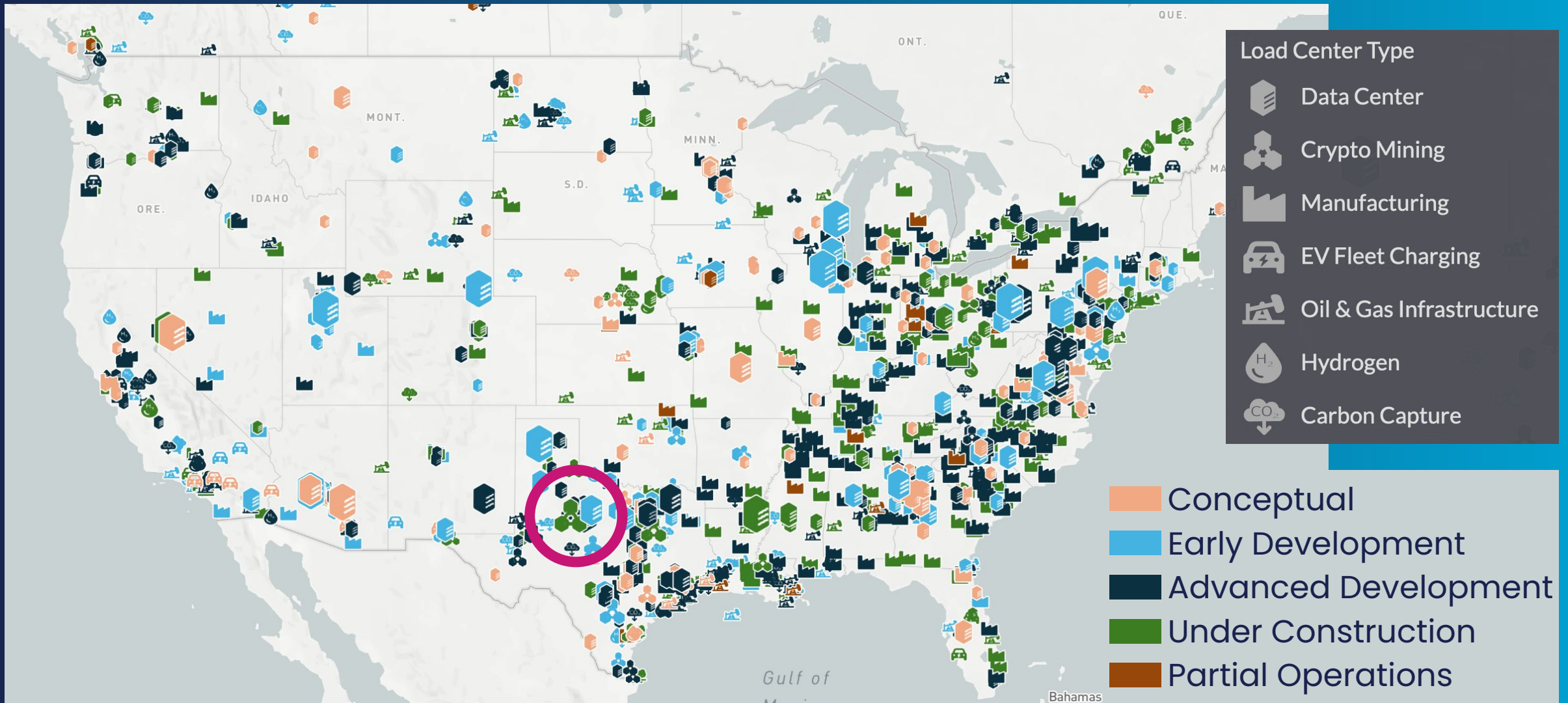


Example: Atlas Power Williston Crypto

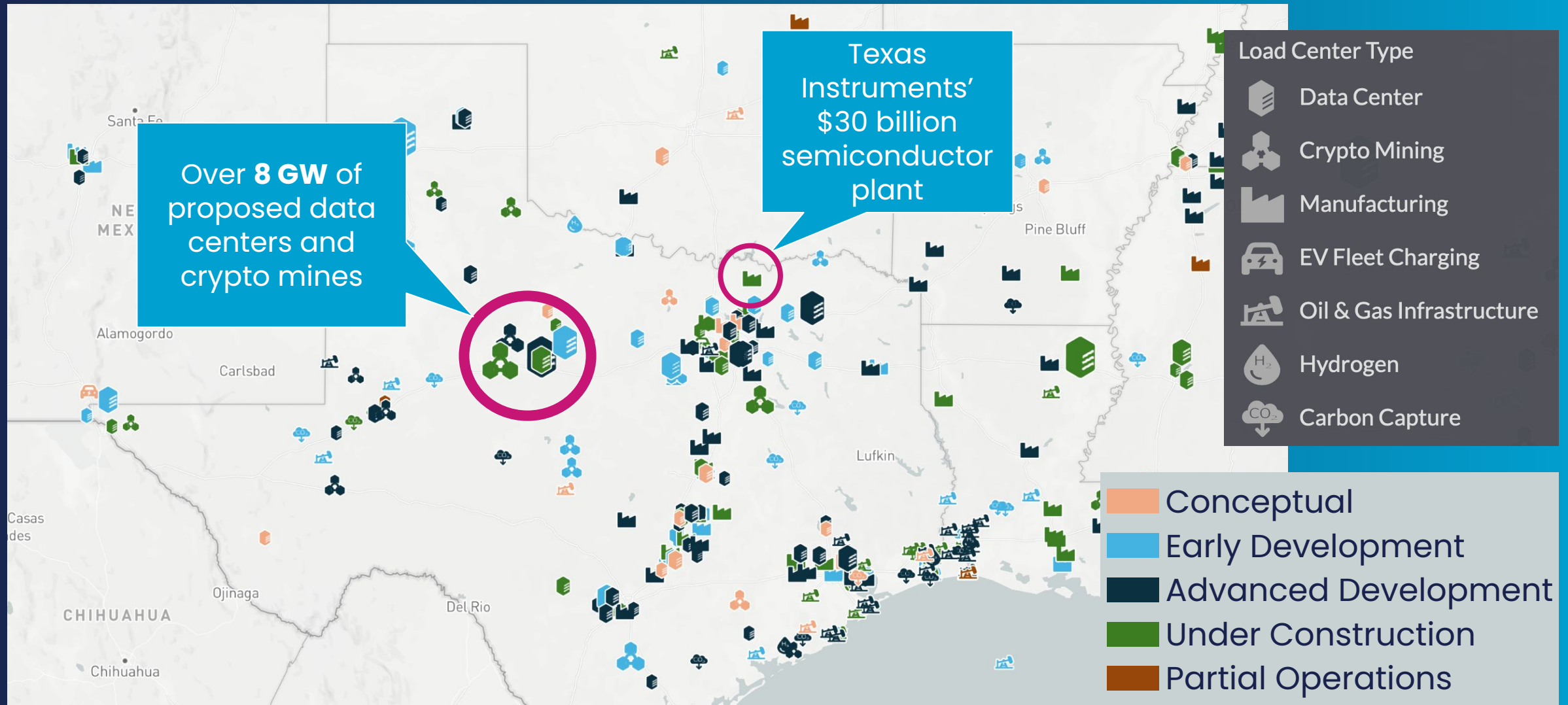
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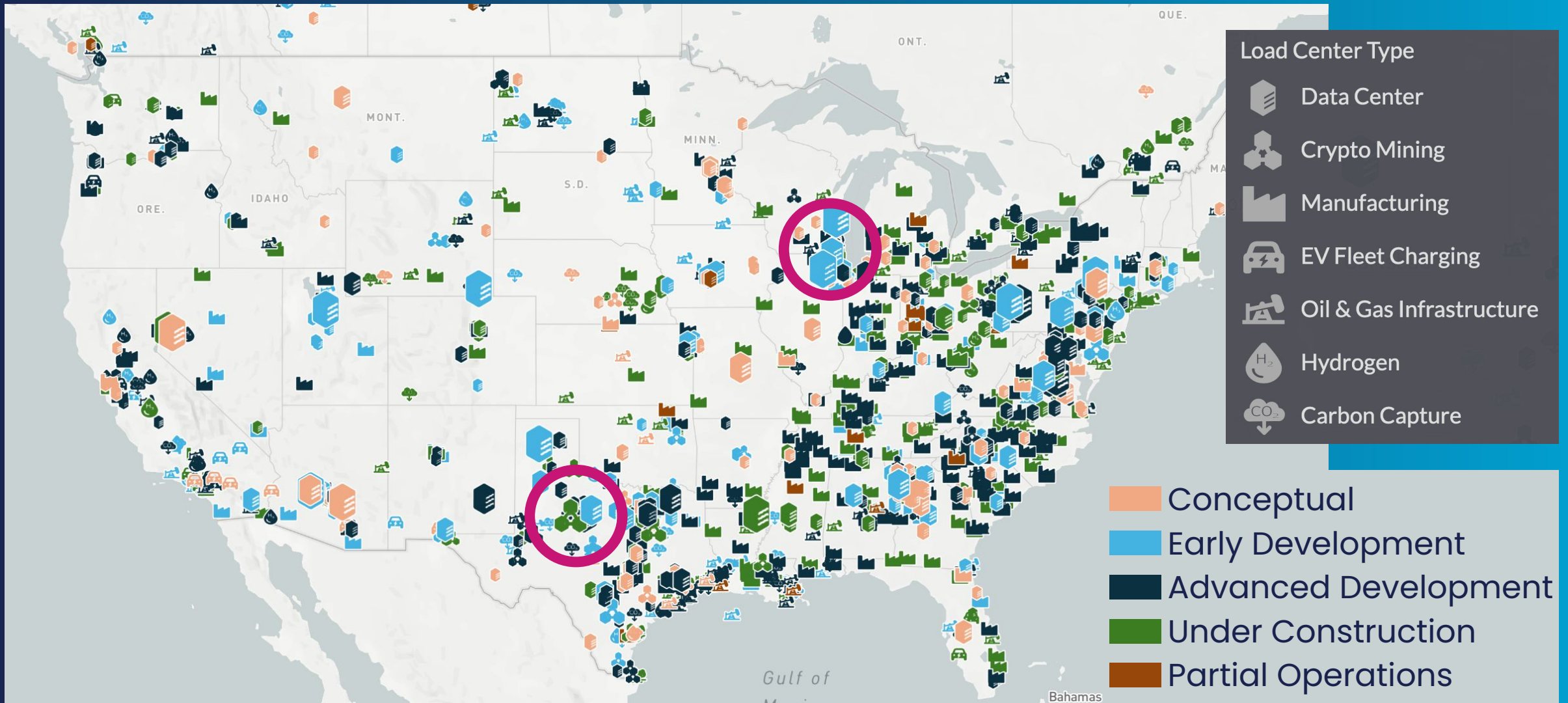
New Load To Watch Out For



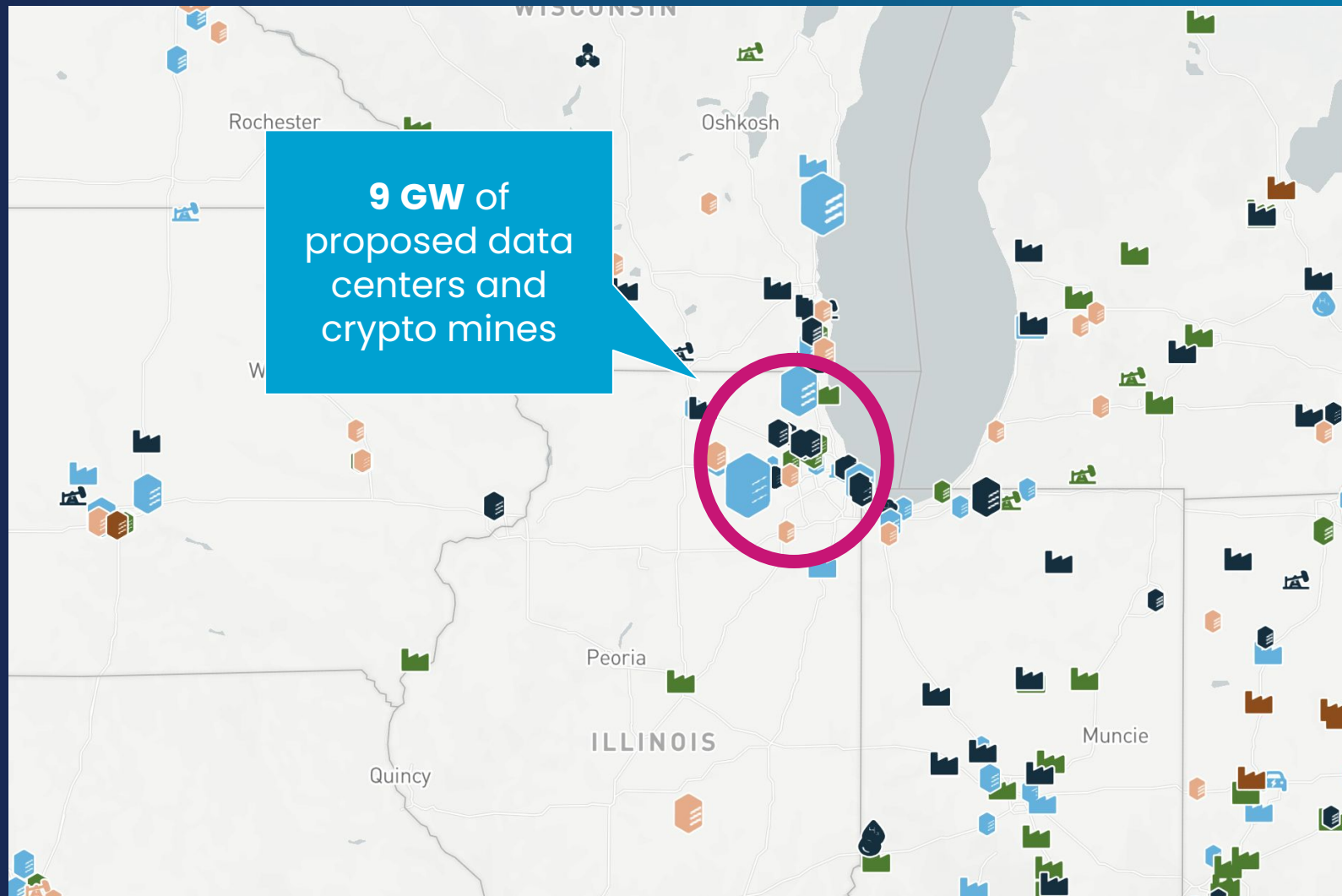
New Load To Watch Out For



New Load To Watch Out For



New Load To Watch Out For

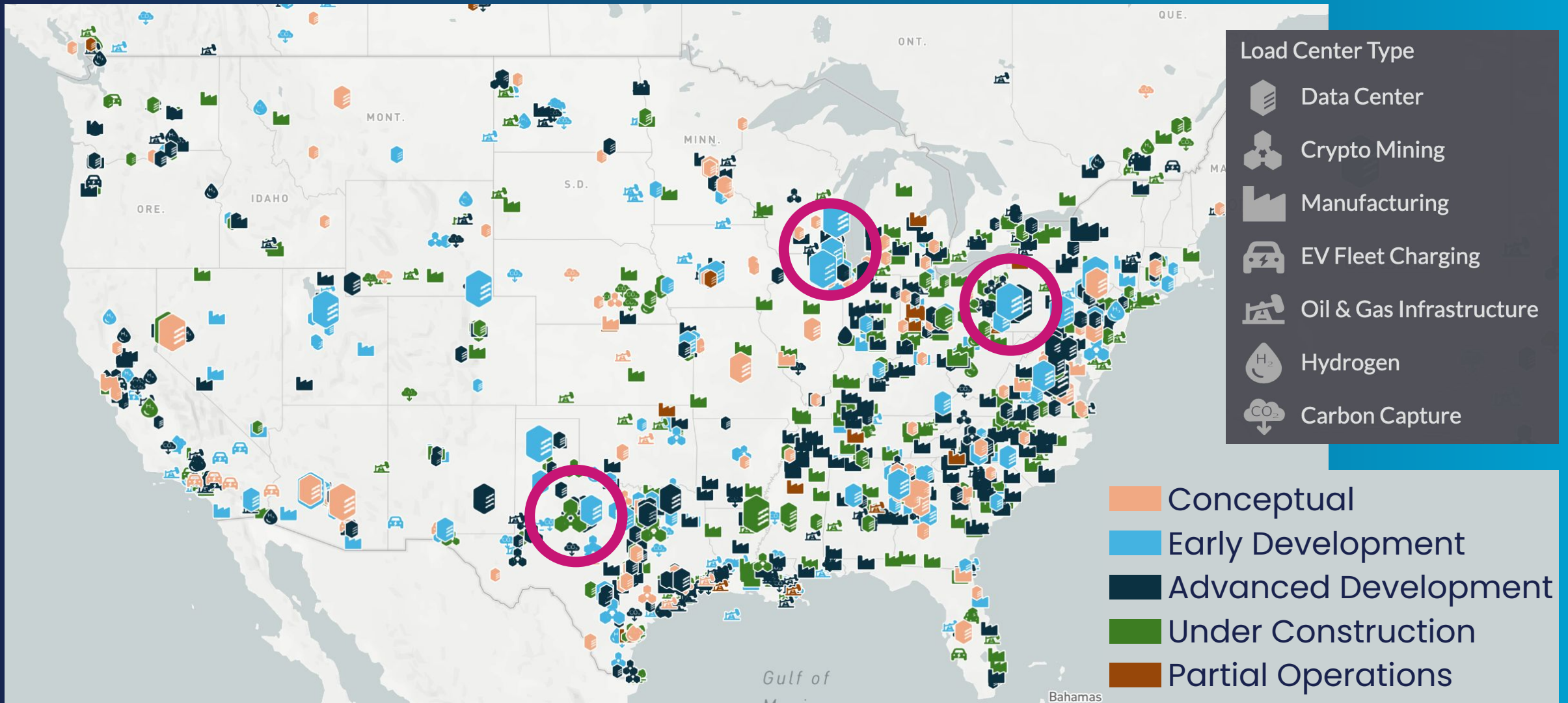


Load Center Type

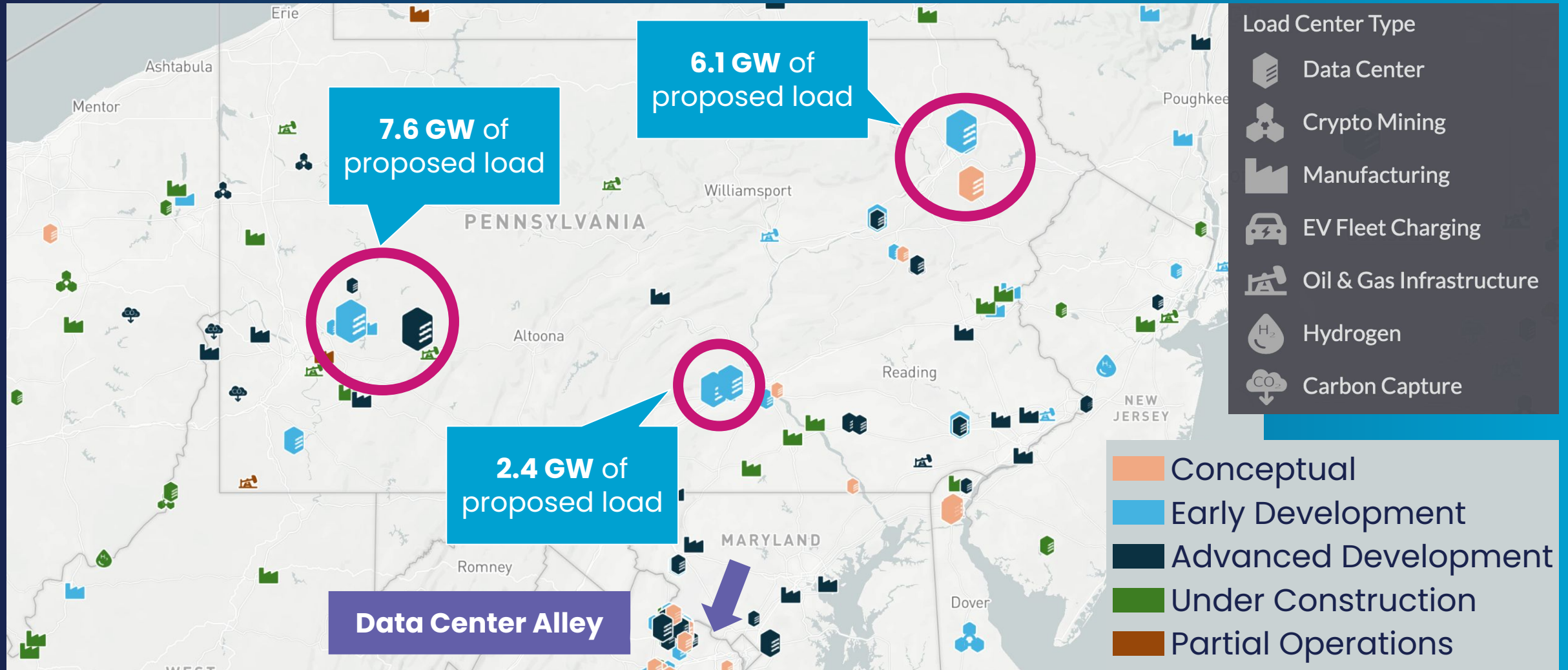
-  Data Center
-  Crypto Mining
-  Manufacturing
-  EV Fleet Charging
-  Oil & Gas Infrastructure
-  Hydrogen
-  Carbon Capture

-  Conceptual
-  Early Development
-  Advanced Development
-  Under Construction
-  Partial Operations

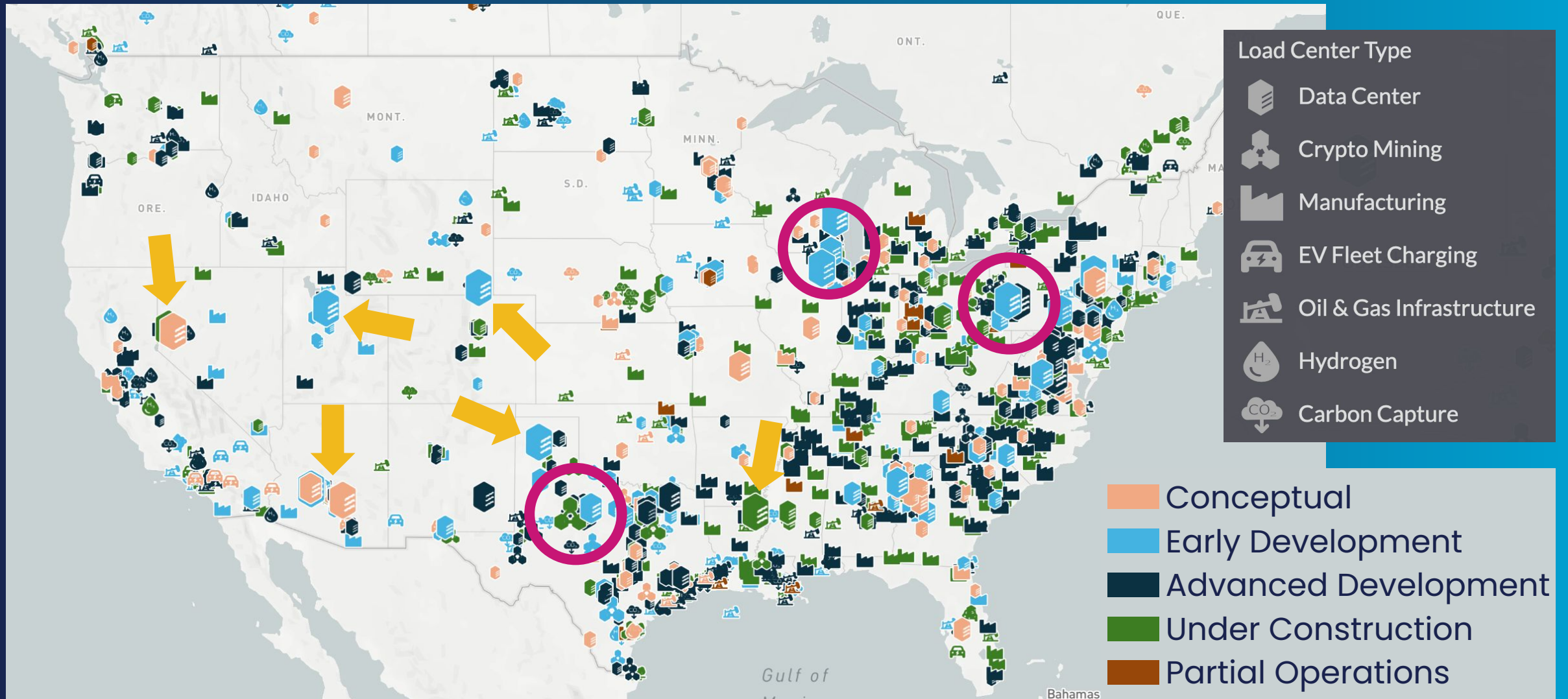
New Load To Watch Out For



New Load To Watch Out For



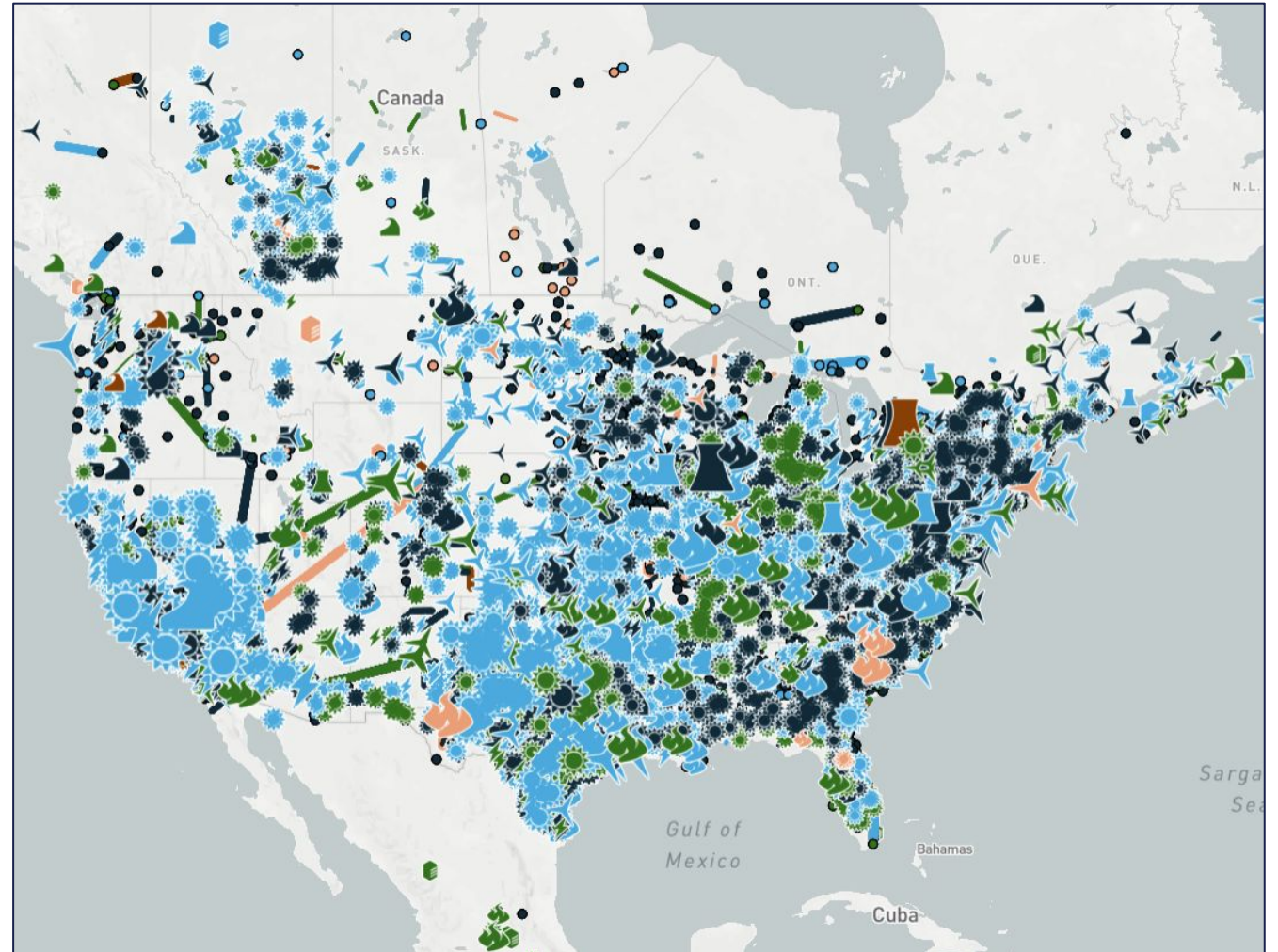
New Load To Watch Out For





In Conclusion

- The electric grid is already rapidly transforming and will continue to do so
- These constant changes will have implications for longer horizon trading
- Data around these upcoming changes is so vast, just need to know what rocks to look under
- We do the research for you and give all the data you need to make informed decisions



Thank you

Laura Fletcher

laura.fletcher@yesenergy.com

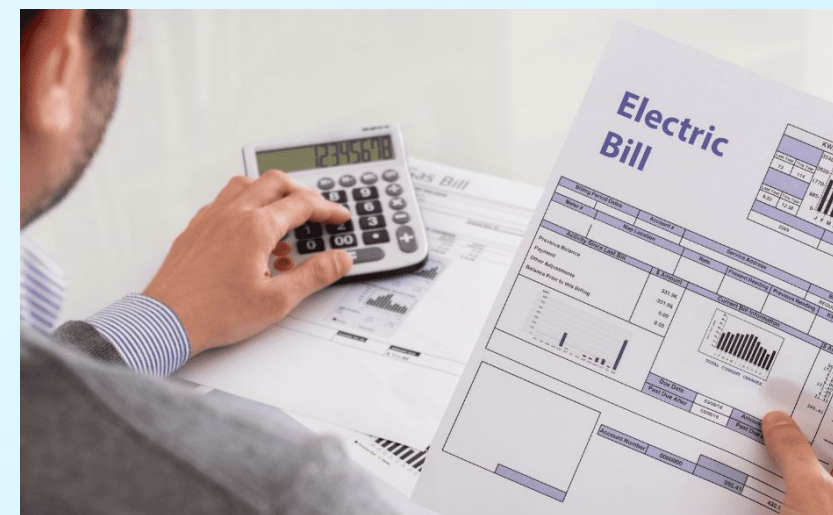


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RTO Insider's Political & Regulatory Briefing: Q3 2025

What Traders Need to Know About:

- Impact of Rising Electric Prices
- Policy Issues from Rising Demand, Data Center Growth
- Is FERC F-----?



RTO Insider LLC



Electric Prices Flat Nationally, Higher in Northeast, West Coast

“Electricity is the new eggs”

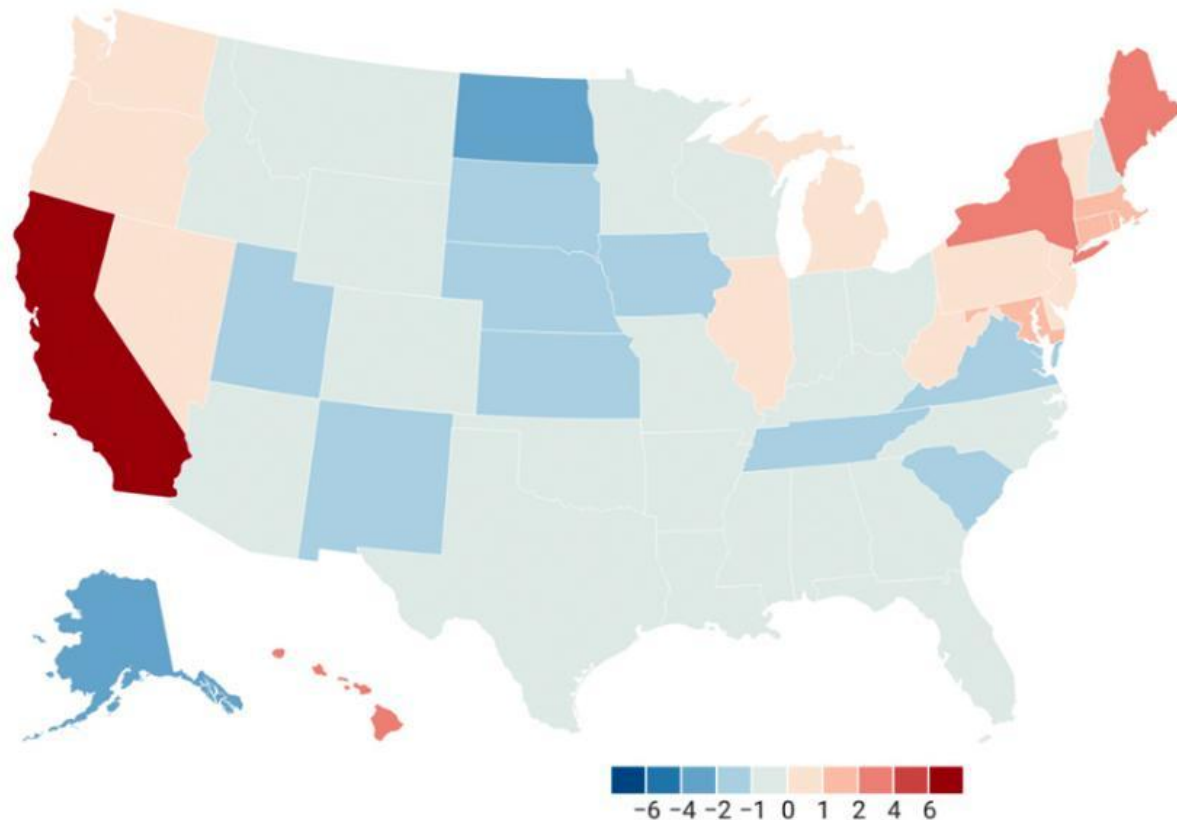
-- David Springe, National Association of
State Utility Consumer Advocates

RTO Insider LLC



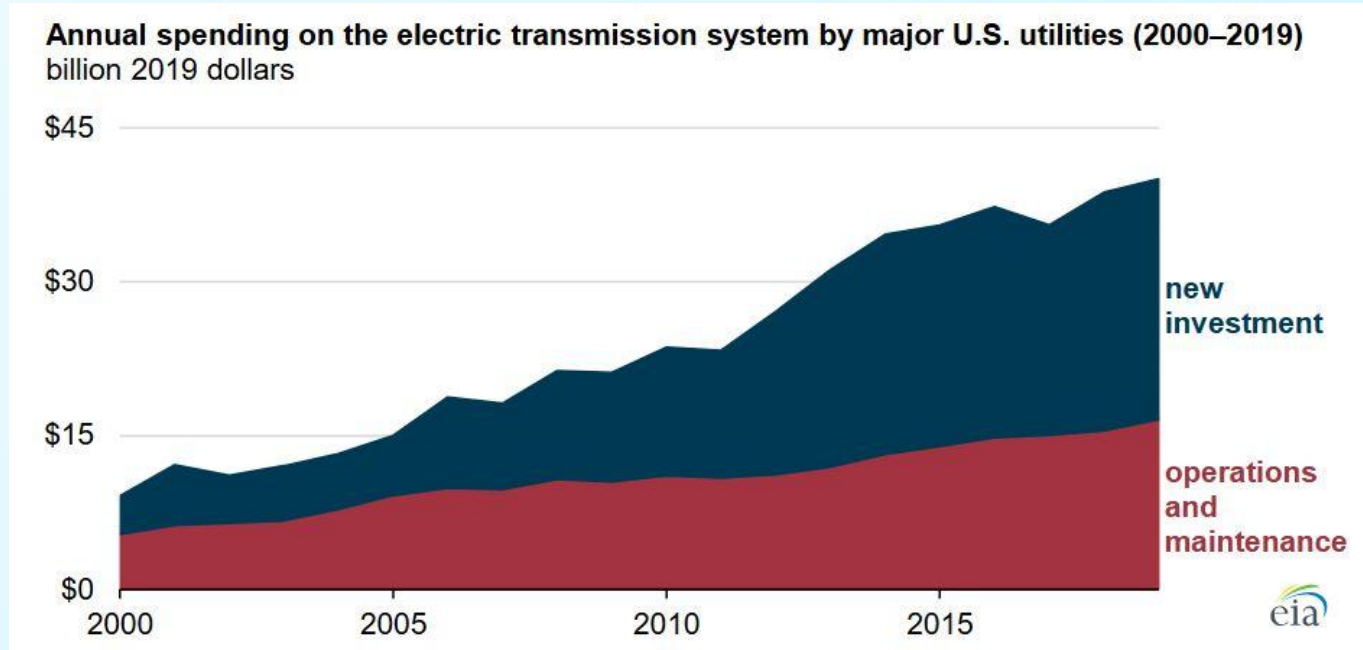
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Real 2024\$ cents/kWh, inflation adjusted



Causes of Rising Electric Prices

- Extreme weather and wildfire (Maine, California)
- State renewable targets
- Replacement of aging transmission & distribution infrastructure
 - Circuit breakers: +140% in two years
 - Transformers: +80% between 2020-024
 - Gas turbines: tripled since 2022.



RTO Insider LLC



High Prices Bring Political Pressure

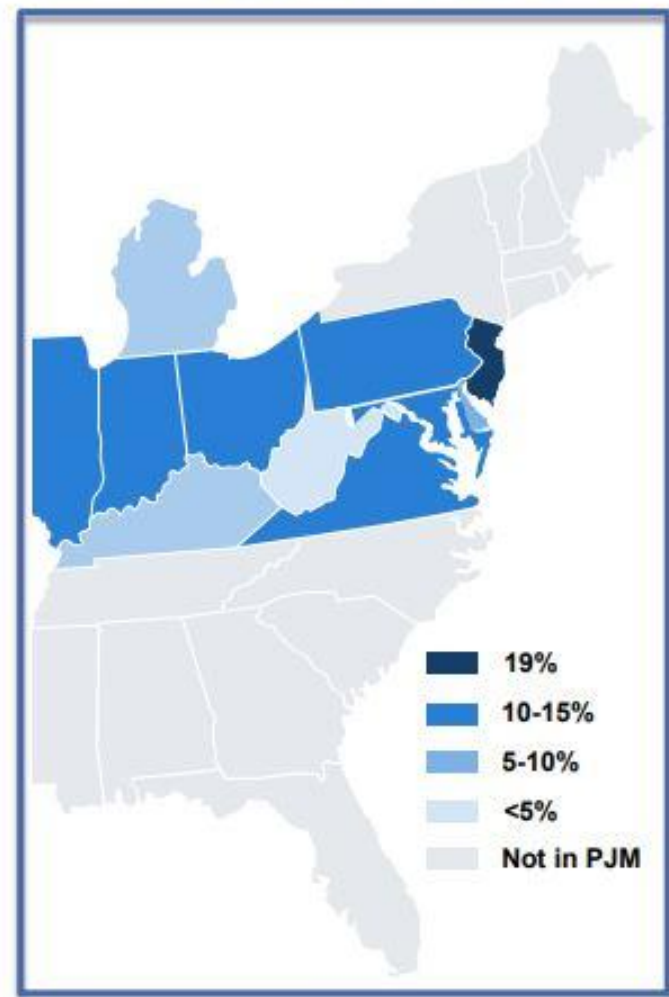
- Impact on gubernatorial races (NJ, VA)
 - Legislative proposals in states, Congress
 - PJM under pressure
- Governors in PJM Want a Bigger Role



RTO Insider LLC



Average Increase in Retail Prices
Between July 2024 & July 2025



Responses to Data Center Impacts

Require data centers to:

- bring their own generation
- sign long-term offtake agreements
- pay for increased grid costs
- flexibility (DR)



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Fallout from FERC's Co-Location Order



RTO Insider LLC



FERC Independence at Risk Retaining the 'Boring Good'

- Supreme Court supports Unitary Executive Theory
- Likely to overturn FDR-era precedent protecting independent agencies



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Why the Worst-Case Scenario Probably Won't Happen

- Historical continuity across administrations
- It's a “boring” (usually non-political) agency
- Industry needs regulatory certainty for long-term investments.
- Data center hyperscalers and LNG exporters need FERC for development



RTO Insider LLC



Questions?

RTO Insider LLC



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ERCOT's RTC+B, Yeah You Know Me

Quinn Gray

Senior Product Manager



Objectives

Understand the upcoming ERCOT market design changes from RTC+B— impacting the real-time / day-ahead markets and battery participation.

Provide you information, context, data, and resources to be ready for Go Live on 12/5/25!

Agenda

ISO Co-Optimization / Benefits

Market Changes:

Real-Time Market (**RTM**)

Day-Ahead Market (**DAM**)

Batteries (**+B**)

Go Live Resources

Market/Trader Impacts



Current State: ISO Co-Optimization

	Day-Ahead	Real-Time	Go-Live
ERCOT	Yes	No	Dec 5, 2025
PJM	Yes	Yes	
CAISO	Yes	Yes	
SPP	Yes	Yes	
MISO	Yes	Yes	
NEISO	Yes	Yes	March 1, 2025
NYISO	Yes	Yes	

Benefits

Savings

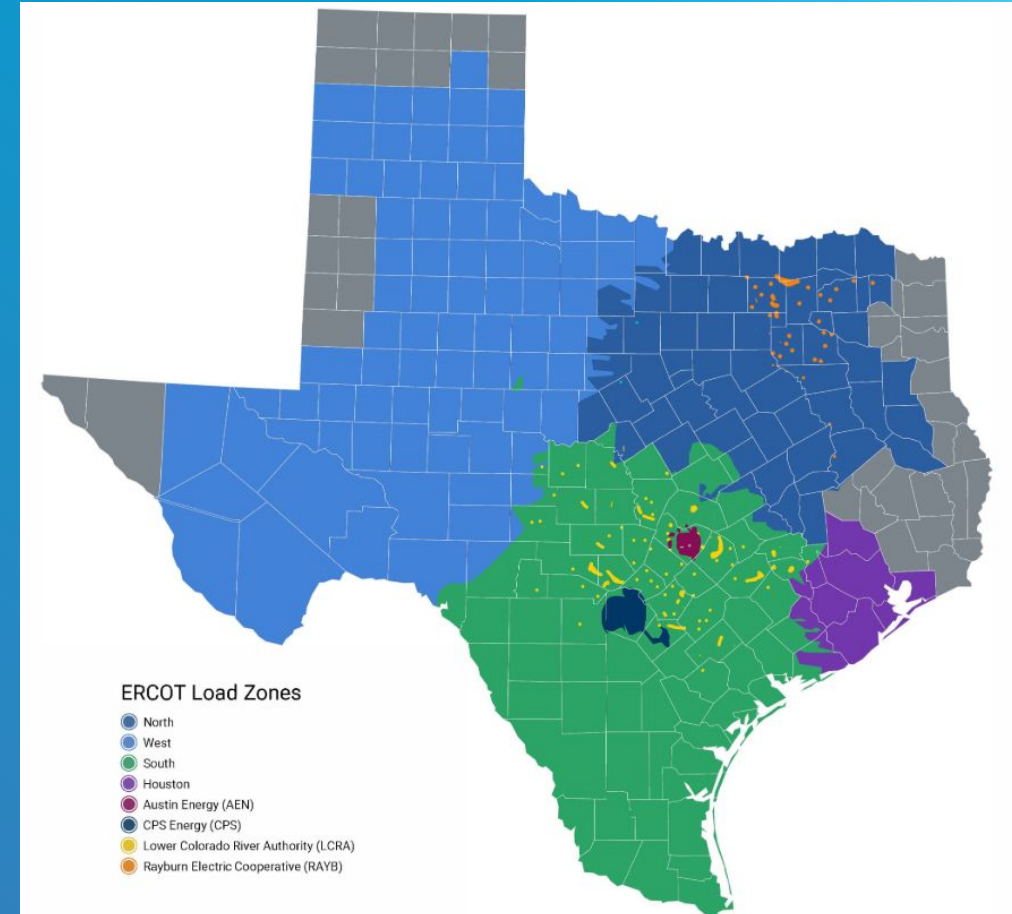
Timing

Congestion

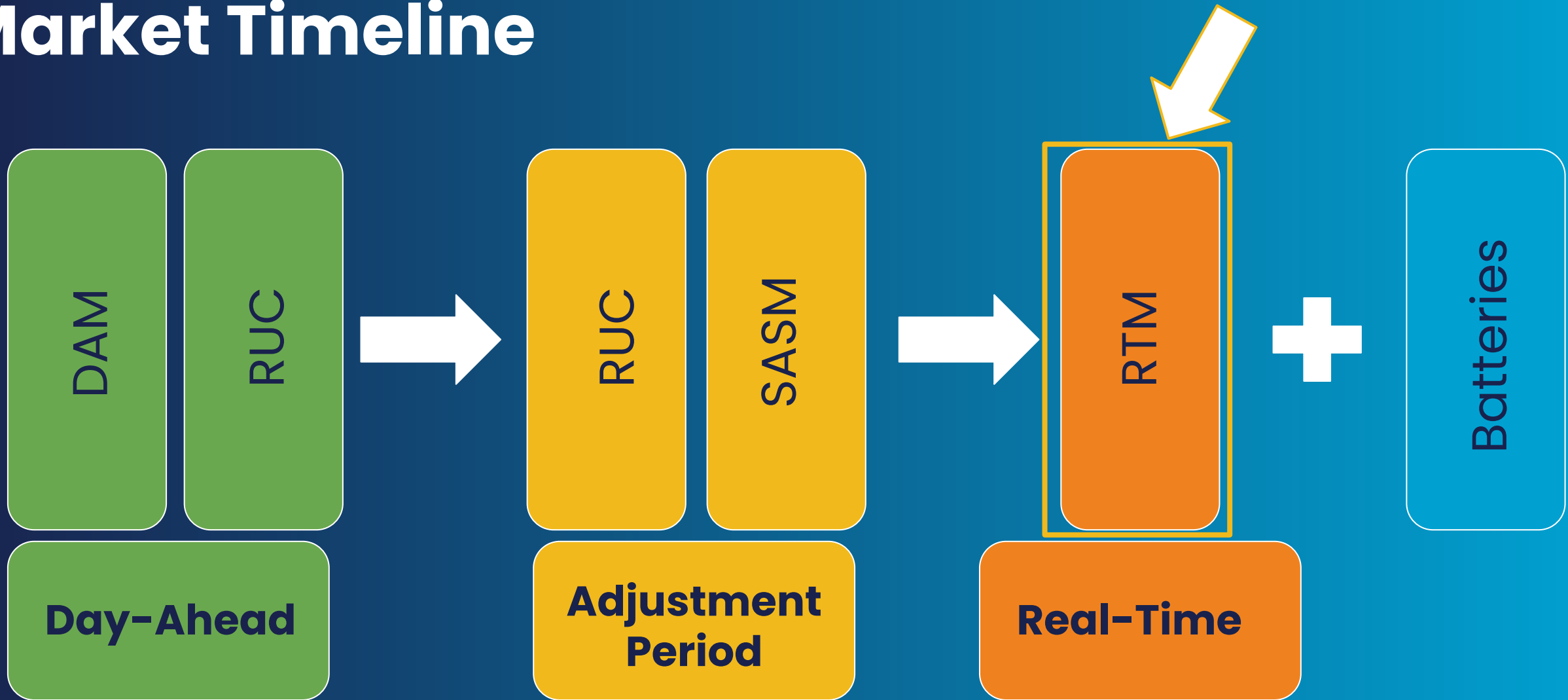
Fewer Manual Operations

Resource Capabilities

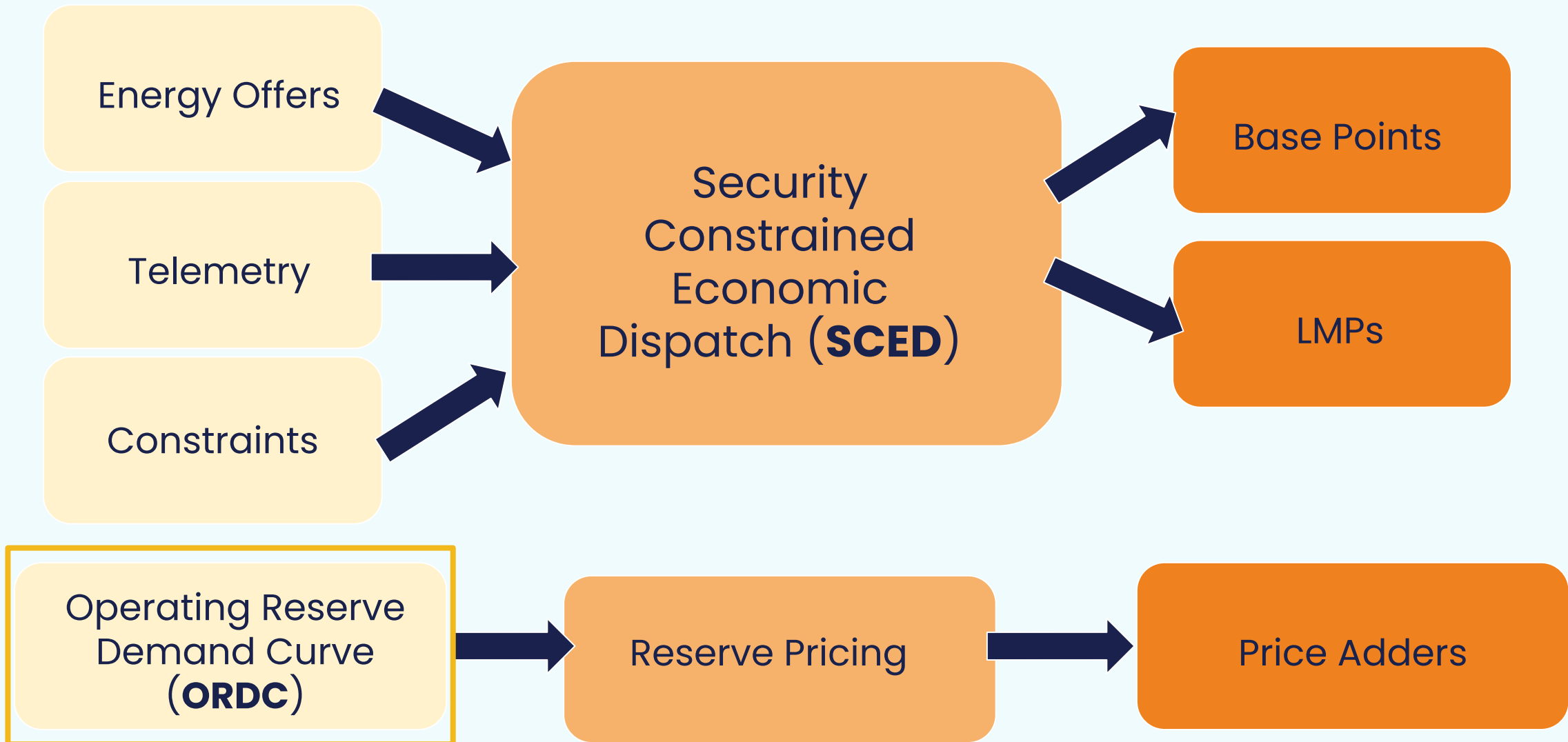
Batteries (+B)



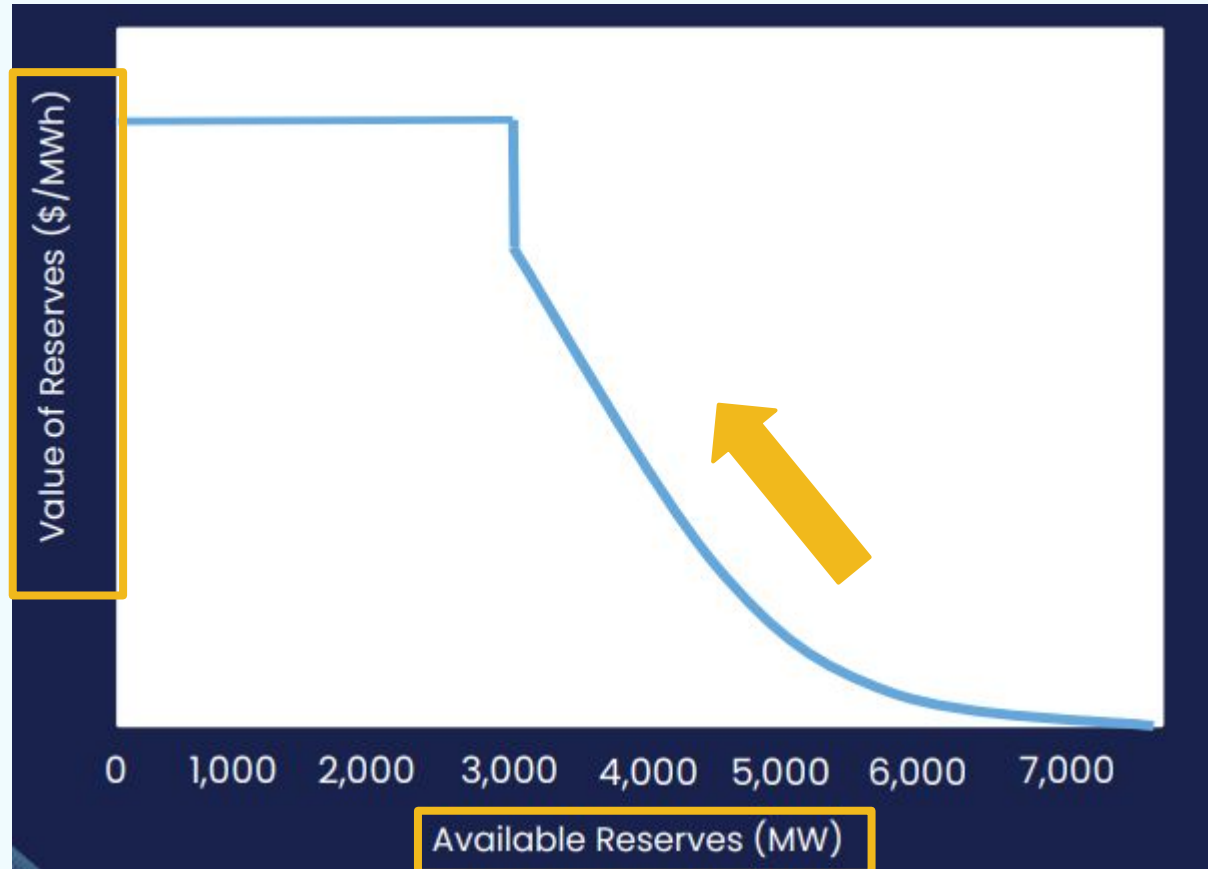
Market Timeline



RTM: Before (*Pre-RTC*)



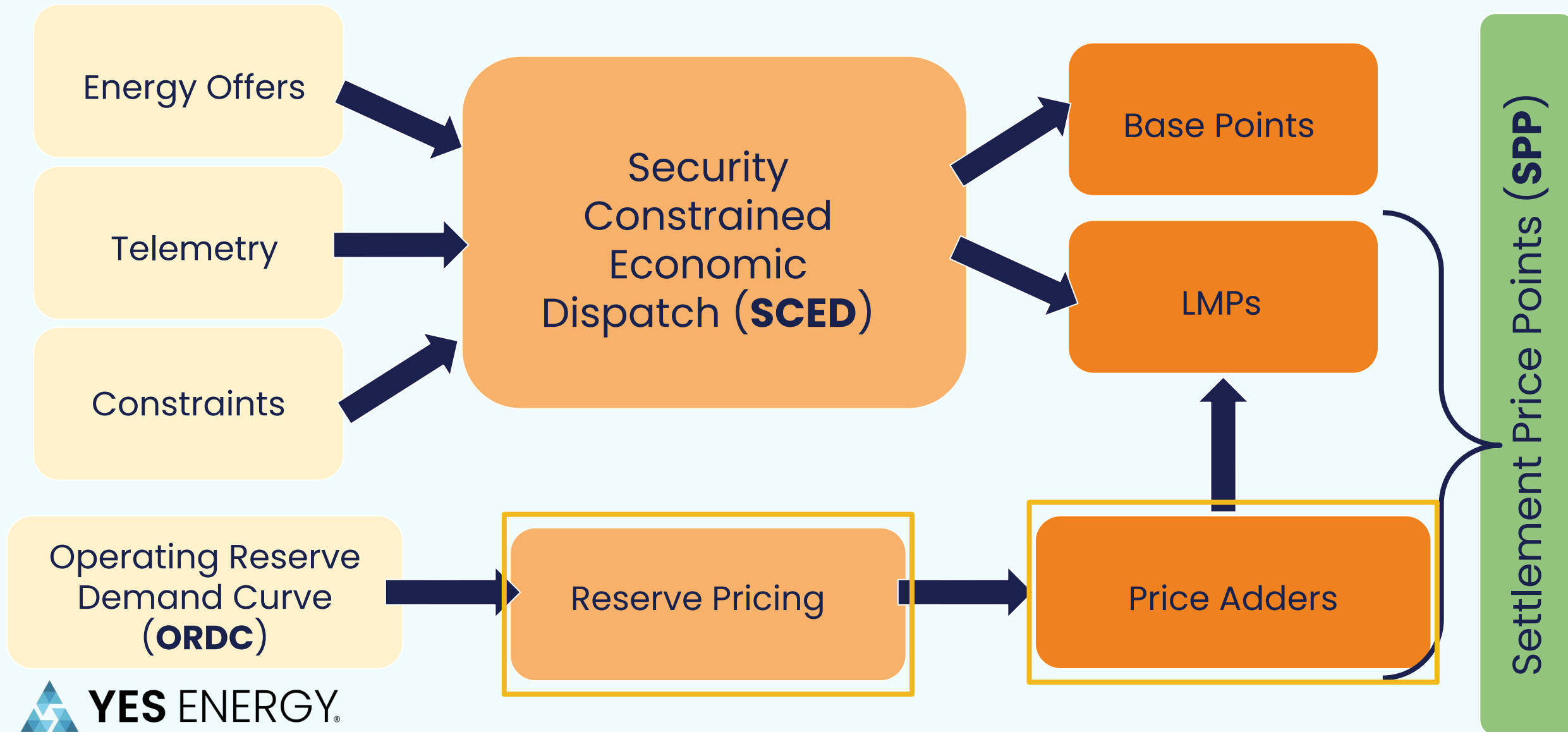
ORDC: Before (*Pre-RTC*)



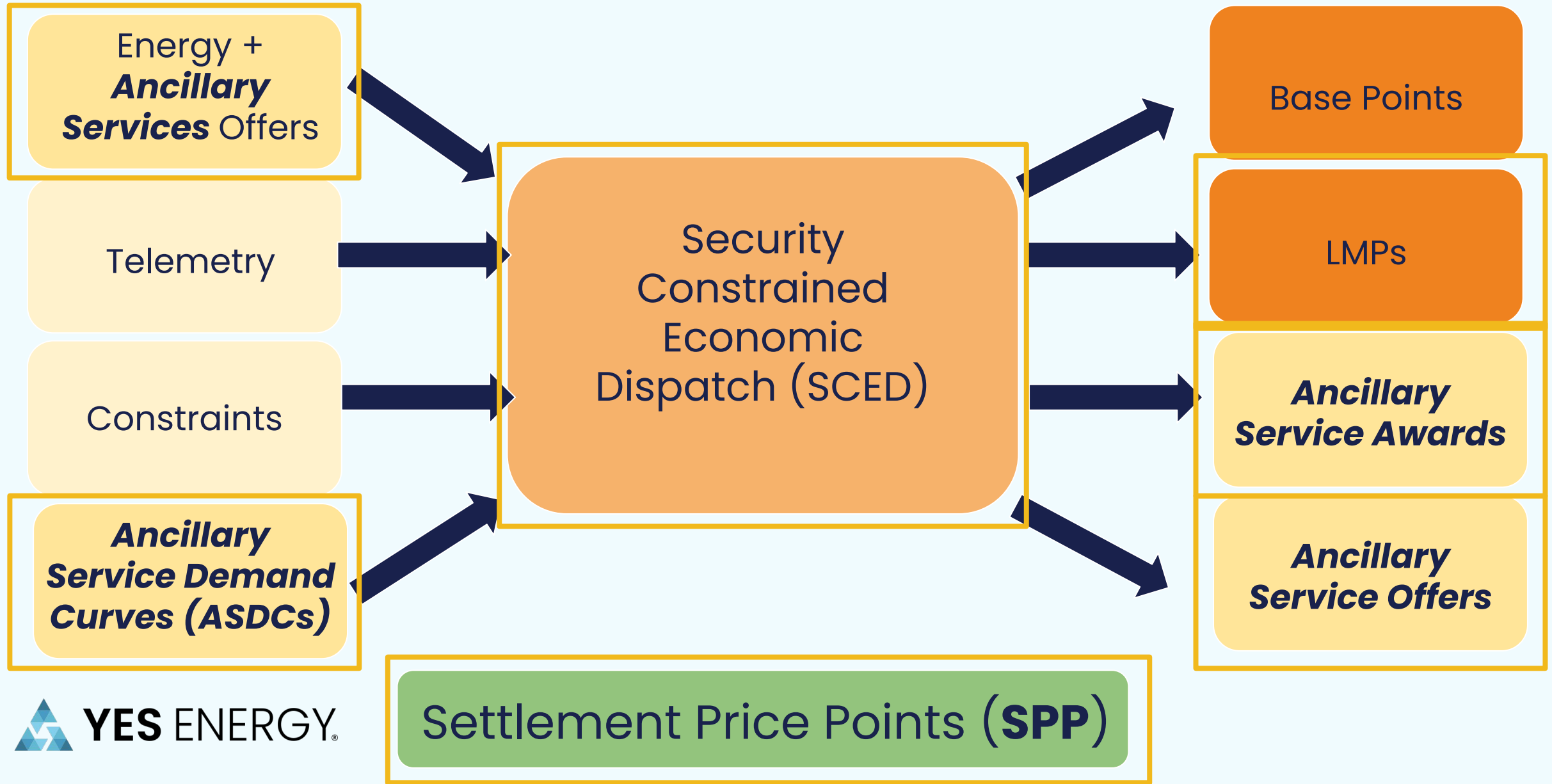
Key Takeaways

- The supply of reserves available to the RTM is an output of SCED
- The ORDC Price Adders are based on the level of reserves

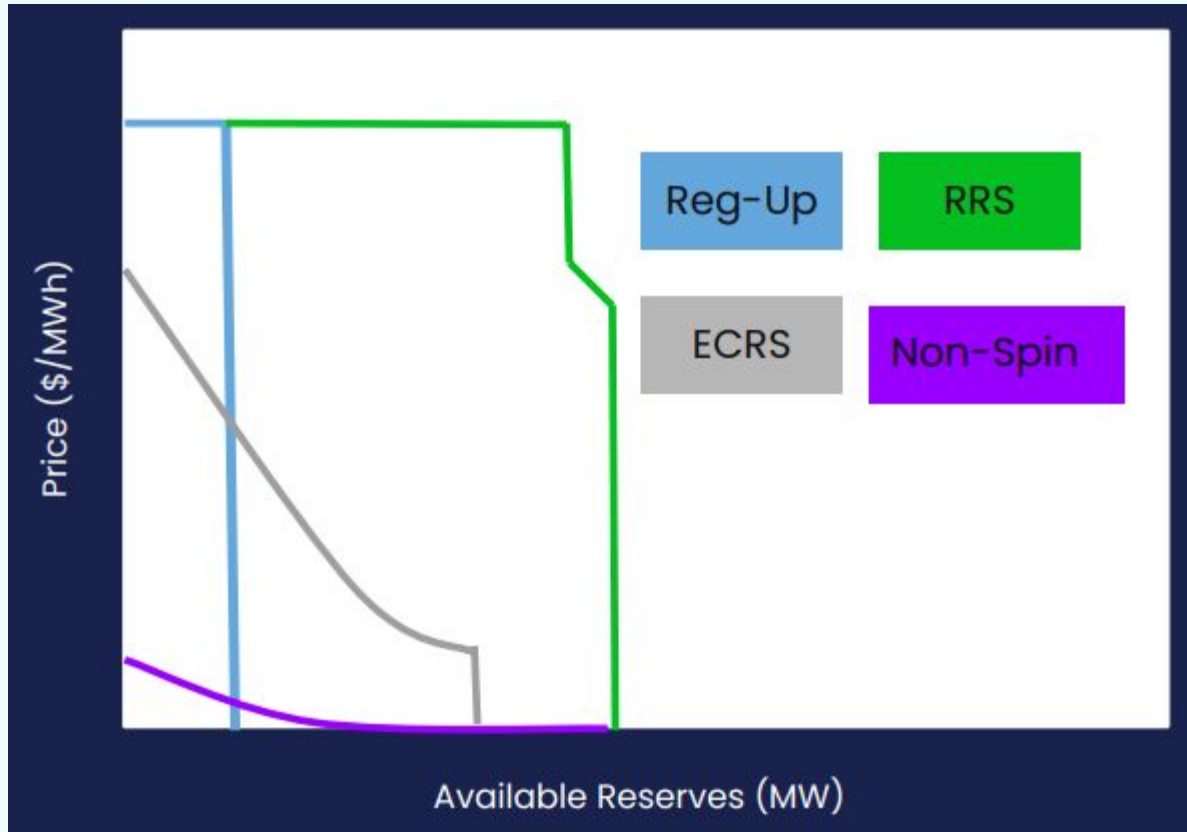
RTM: Before (*Pre-RTC*)



RTM: *After* (Post-RTC)



ASDC: *After* (Post-RTC)



Key Takeaways

- ASDCs allow ERCOT to better distinguish between AS products
- The shape of the curve sets the prioritization
- Designed to exhaust non-spin and ECRS first

RTM: Major Changes



Before *RTC+B*

Energy Offers

No offers for AS in RTM

$LMP + \text{Price Adders} = SPP$

ORDC

After *RTC+B*

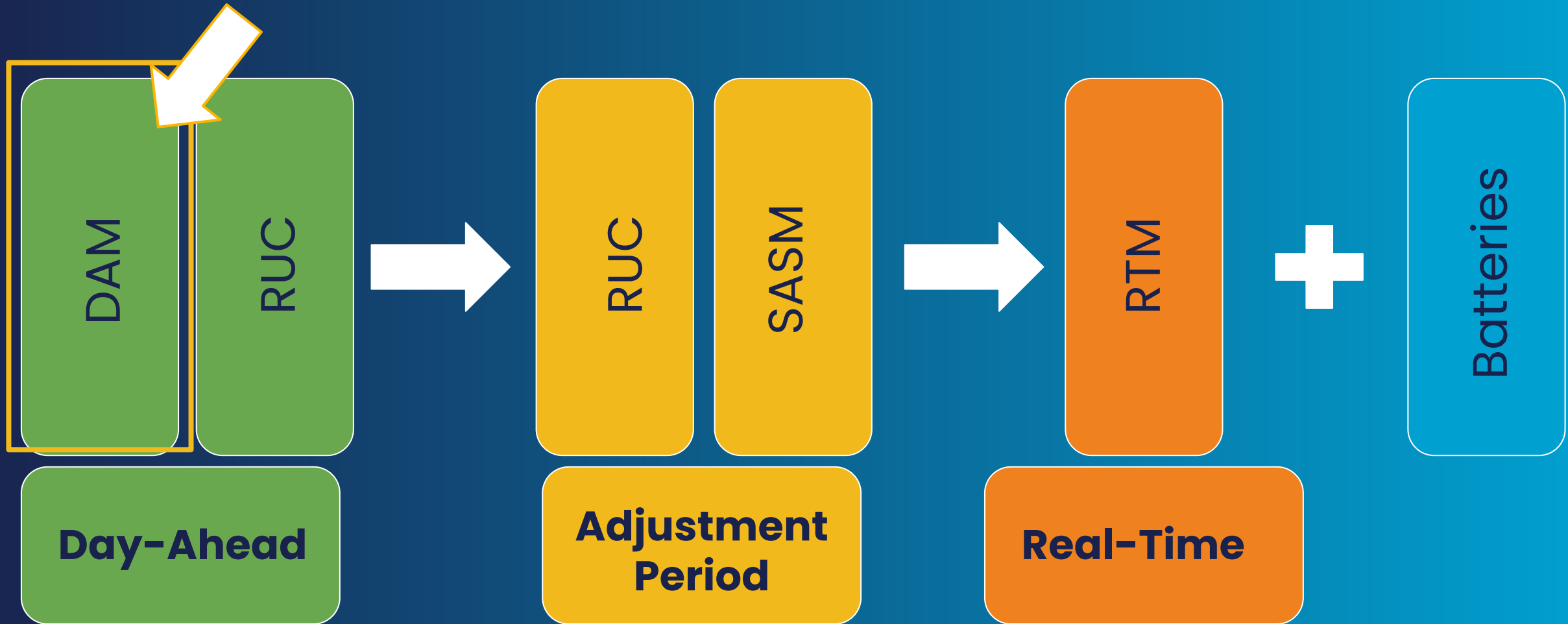
Energy Offers & AS Offers

AS Offers, Awards, and
Prices in RTM

$LMP = SPP$

ASDC

Market Timeline



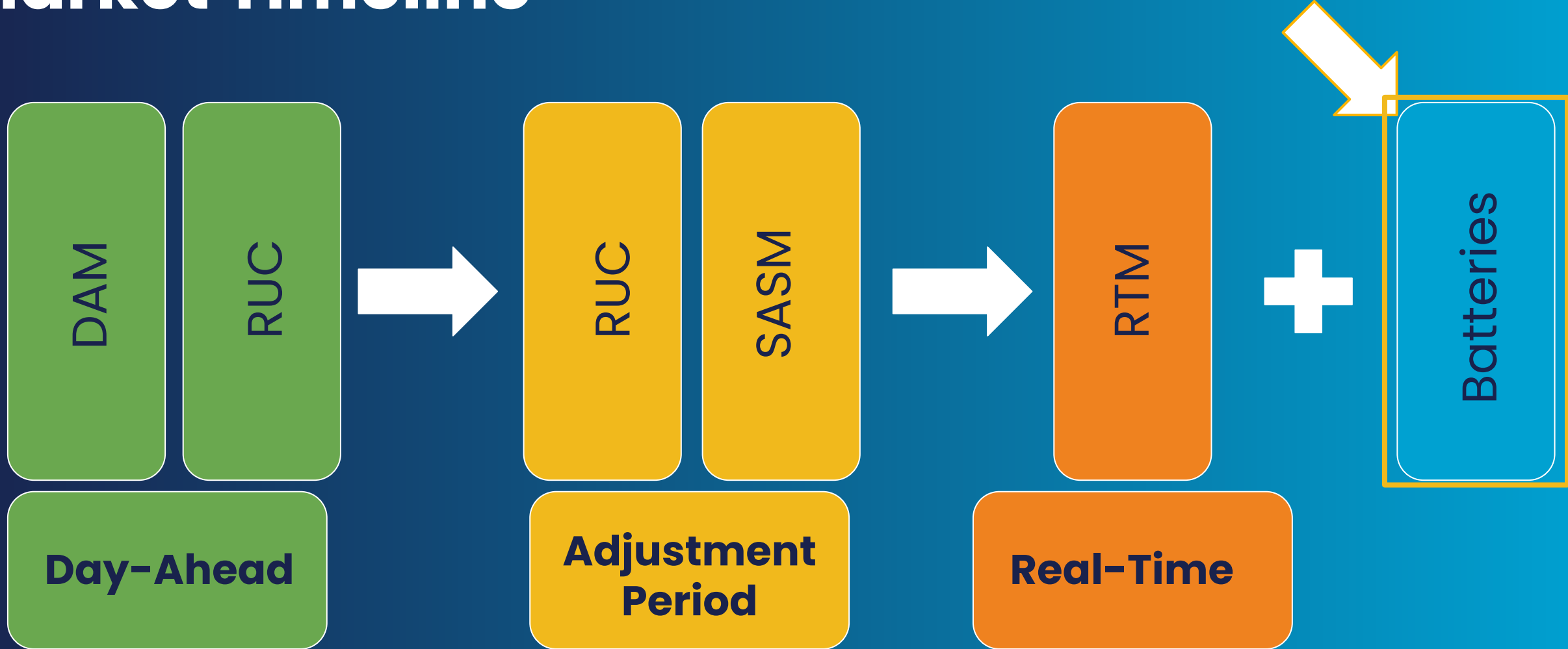
DAM: Major Changes

Before <i>RTC+B</i>		After <i>RTC+B</i>
Physical AS Offers	➡	Physical & Virtual AS Offers
Physical Obligation	➡	Financial Obligation
No ASDC Input	➡	ASDC Input

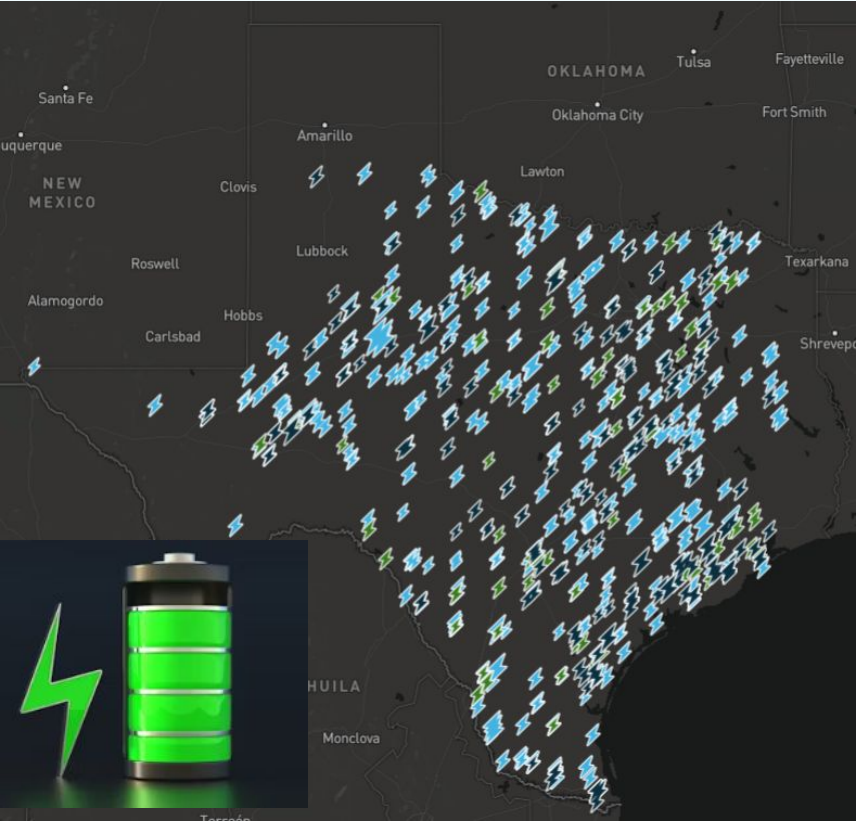
5 offer blocks allowed
for **REGUP**, **REGDN**,
RRSPFR, online **NSPIN**
and online **ECRS**



Market Timeline



Batteries: Major Changes



Before <i>RTC+B</i>	After <i>RTC+B</i>
Combo Model	Single Model
• Generator : Discharging • Controllable Load: Charging	• Both charging and discharging seen as single device • New resource type = Energy Resource Type (ESR)
Energy Bid Curve and Energy Offer Curve	Combined Energy Bid/Offer Curve (EBOC)

Market Trials Data

Group 1 (Open-Loop Testing): *Released July 2025*

- [RTC Market Trials LMPs by Resource Nodes, Load Zones, and Trading Hubs](#)
- [Real-Time Clearing Prices for Capacity by SCED Interval](#)
- [RTC Market Trials Real-Time Price Adders by SCED Interval](#)

Group 2 (Closed-Loop Testing): *Released September 2025*

- [Real-Time Clearing Prices for Capacity by 15-Minute Settlement Interval](#)
- [RTD Indicative Real-Time MCPC](#)
- [RTC Market Trials RTD Indicative LMPs by Resource Nodes, Load Zones and Hubs](#)

Group 3 (Go Live): *December 2025*

- *Full Scope of impacted data and reports TBD*
- *Yes Energy's Market Monitoring Team is working closely with ERCOT*

Market Trials Data



Collections: 34 datatypes across 6 reports. Listed [here](#).

UI: ERCOT RTC+B || Market Trials Data

API:
https://services.yesenergy.com/PS/rest/timeseries/datatypes?iso=ERCOT&description=*BETA*



Prices	Ancillary Services	RTC_RTDCIEEXPORT	(BETA) RTC Market Trials RTDCIEEXPORT Real-Time Deployed DC Tie Export	(BETA) RTC Market Trials RTDCIEEXPORT Real-Time Deployed DC Tie Export
Prices	Ancillary Services	RTC_RTDCIEIMPORT	(BETA) RTC Market Trials RTDCIEIMPORT Real-Time Deployed DC Tie Import	(BETA) RTC Market Trials RTDCIEIMPORT Real-Time Deployed DC Tie Import
Prices	Ancillary Services	RTC_RTDEERS	(BETA) RTC Market Trials RTDEERS Real-Time Reliability Deployment Emergency Response Service	(BETA) RTC Market Trials RTDEERS Real-Time Reliability Deployment Emergency Response Service
Prices	Ancillary Services	RTC_RTDCNCLR	(BETA) RTC Market Trials RTDCNCLR Real-Time Reliability Deployed Non-Controllable Load Resource	(BETA) RTC Market Trials RTDCNCLR Real-Time Reliability Deployed Non-Controllable Load Resource
Prices	Ancillary Services	RTC_RTOLHSL	(BETA) RTC Market Trials RTOLHSL Real-Time Operating Limit High Security Limit	(BETA) RTC Market Trials RTOLHSL Real-Time Operating Limit High Security Limit
Prices	Ancillary Services	RTC_RTOLLSL	(BETA) RTC Market Trials RTOLLSL Real-Time Operating Limit Low Security Limit	(BETA) RTC Market Trials RTOLLSL Real-Time Operating Limit Low Security Limit
Prices	Ancillary Services	RTC_RTRDPA	(BETA) RTC Market Trials RTRDPA Real-Time Reliability Deployment Price Adders	(BETA) RTC Market Trials RTRDPA Real-Time Reliability Deployment Price Adders
Prices	Ancillary Services	RTC_RTRDPAECRS	(BETA) RTC Market Trials RTRDPAECRS Real-Time Reliability Deployment Price Adders for Emergency Contingent Regulation Service	(BETA) RTC Market Trials RTRDPAECRS Real-Time Reliability Deployment Price Adders for Emergency Contingent Regulation Service
Prices	Ancillary Services	RTC_RTRDPANSS	(BETA) RTC Market Trials RTRDPANSS Real-Time Reliability Deployment Price Adders for Non-Spin Supplemental	(BETA) RTC Market Trials RTRDPANSS Real-Time Reliability Deployment Price Adders for Non-Spin Supplemental

More Resources

ERCOT

- [ERCOT Real-Time Co-Optimization](#)
- [ERCOT Battery Energy Storage](#)
- [ERCOT Real-Time Market Participant Testing](#)
- [ERCOT Day-Ahead Market Participant Testing](#)
- [RTC+B Training Videos](#)

Yes Energy (YE)

- [Preparing for ERCOT's RTC+B](#)
- [FAQs](#)
- **YE Team**
 - Market Monitoring (portia@yesenergy.com)
 - Product Managers (allison@yesenergy.com; emily@yesenergy.com)

Frequently Asked Questions (FAQ)

How many current day reports (CDRs) will be changing with RTC+B?

For virtual AS offers post-RTC, will participation be purely financial (similar to today's energy bids/offers), or will it require physical qualification?

With RTC+B allowing SCED to shift AS availability from one generation resource to another in the real time, will this help alleviate some of the current IROLs, GTCs, or congestion across the system?

What impact will ERCOT RTC+B have on DART spreads and price volatility?

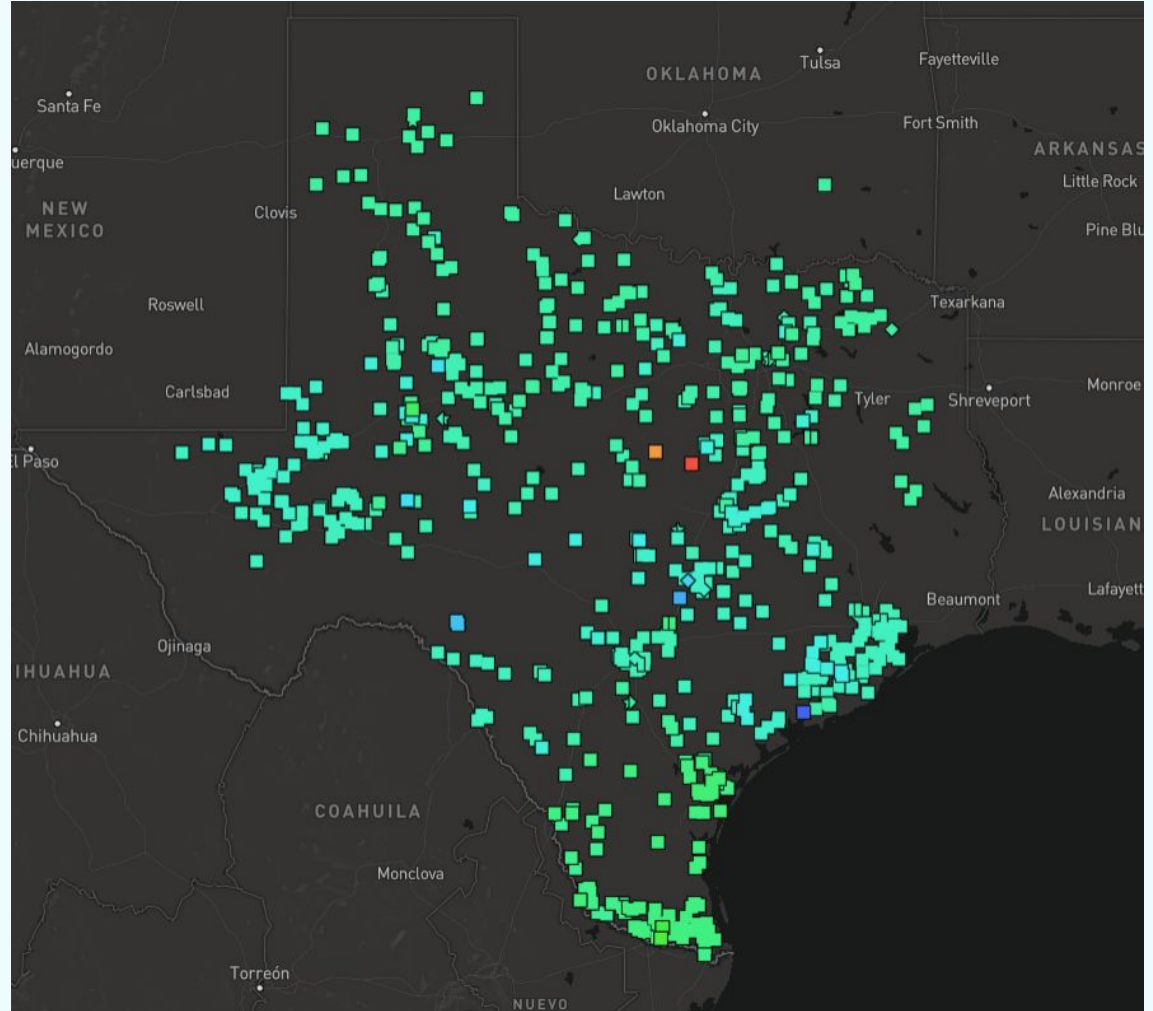
Market/Trader Impacts

Evolving Price Dynamics

Changing Congestion Landscape

New Trading Opportunities

Smarter Bidding Strategies Needed



Summary / Major Takeaways of RTC+B

"A more efficient, flexible and responsive energy ecosystem"

Go live on 12/5/25!

Market Changes

- **RTM:** ORDC → ASDC
- **DAM:** Virtual AS Product
- **Batteries:** ESR + EBOC

New Trading/Hedging Strategies



Thank you



YES ENERGY®



Data and Analytics Best Practices for Power Markets

Session Agenda

Market Context

Data Best Practices

Practical Takeaways



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Market Context

What if you're looking to participate for the first time or enter a new market?

IESO Ontario is a great example.

IESO went nodal May 1, 2025

- One ISO-wide price → ~1,000 price nodes
- Financially-binding day-ahead physical market
- Virtual hourly zonal market
 - nine zones



Source: RTO Insider

Having the right trading strategy is great, but it's only possible with the right data.





Data Best Practices

Data and Analytics Best Practices Checklist

- ❑ Data sourcing
- ❑ Data quality monitoring
- ❑ Changed data management
- ❑ Data normalization
- ❑ Data access and governance
- ❑ Platform reliability



Source: Google stock images

Data Sourcing

- 15+ new reports and 12+ updated reports from IESO
- Data timeliness and freshness

Ontario Nodal Market Nearing ‘Steady State’ After Nearly 4 Months

IESO to Look for Structural Improvements After Correcting Implementation Problems

 [Listen to this story](#)

As the resource fleet was scheduled close to capacity, prices became more sensitive to changes in demand.

Source: RTM

	 ISO	 STATUS	 ERROR	 LOADTABLE	 SOURCE	 FILE_TZ	 FILE_MOD_DATE	 COLLECTDATE
1	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 16:23:00.000	2025-09-30 12:23:36.000
2	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 16:18:00.000	2025-09-30 12:18:36.000
3	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 16:13:00.000	2025-09-30 12:13:37.000
4	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 16:08:00.000	2025-09-30 12:08:34.000
5	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 16:03:00.000	2025-09-30 12:03:37.000
6	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 15:58:00.000	2025-09-30 11:58:36.000
7	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 15:53:00.000	2025-09-30 11:53:36.000
8	IESO	COMPLETE	null	RT_PRICES	https://reports-public.ieso.ca/public/RealtimeOntarioZonalPrice/PU	GMT	2025-09-30 15:48:00.000	2025-09-30 11:48:37.000

Source: Yes Energy Database

Data Quality Monitoring

- Pipeline maintenance, data source changes, feeds breaking
- Data observability, alerting, lineage tracking
- Data outliers and bad data *after* above

	A ISO	A STATUS	A ERROR	A LOADTABLE	A SOURCE	INT FILE_MOD_DATE	INT COLLECTDATE	INT LOADDATE	# LOADCOUNT
1	IESO	COMPLETE	null	DART_PRICES	https://reports-public.ieso.ca/public/DAHourly/	2025-06-23 17:36:00	2025-06-23 13:39:00	2025-06-23 14:40:41	24312.000000
2	IESO	STARTED	null	DART_PRICES	https://reports-public.ieso.ca/public/DAHourly/	2025-06-23 17:36:00	2025-06-23 13:39:00	2025-06-23 13:39:01	0.000000

Source: Yes Energy Database

Bad data exposed
a design flaw

New IESO Day-Ahead virtual
zonal LMP data starting 5/1/2025

Changed Data Management

- Row-level changed data capture
- Storing full change history is best practice

New IESO hourly virtual WEST
zone LMP data ↓

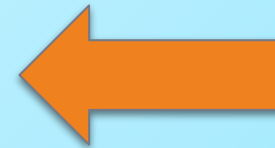
	A METADATA_OPERATION	NT METADATA_TIMESTAMP	# OBJECTID	NT DATETIME	A TIMEZONE	# DALMP	# DACONG	# DALOSS	# RTLMP	# RTCONG	# RTLOSS	A ISO	A SEQUENCE_FLAG
1	UPDATE	2025-07-21 04:57:30.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	24.41	0.00	0.16	O	L
2	UPDATE	2025-07-21 04:49:58.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	25.97	0.00	0.17	O	K
3	UPDATE	2025-07-21 04:47:48.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	26.75	0.00	0.17	O	J
4	UPDATE	2025-07-21 04:41:49.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	26.93	0.00	0.17	O	I
5	UPDATE	2025-07-21 04:37:55.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	27.15	0.00	0.18	O	H
6	UPDATE	2025-07-21 04:29:58.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	27.44	0.00	0.18	O	G
7	UPDATE	2025-07-21 04:27:15.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	27.82	0.00	0.18	O	F
8	UPDATE	2025-07-21 04:23:09.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	28.35	0.00	0.18	O	E
9	UPDATE	2025-07-21 04:17:42.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	29.15	0.00	0.19	O	D
10	UPDATE	2025-07-21 04:10:16.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	30.52	0.00	0.20	O	C
11	UPDATE	2025-07-21 04:07:08.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	30.74	0.00	0.20	O	B
12	UPDATE	2025-07-21 04:00:42.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	31.34	0.00	0.20	O	A
13	INSERT	2025-07-19 17:39:08.00	10018672633	2025-07-21 01:00:00	EDT	39.25	0.00	0.21	null	null	null	O	N

Source: Yes Energy Database

Data Normalization

- Centralized over siloed data
- Reliable timestamp, time zone, daylight savings handling, and intervalization
- For IESO re-launch, consolidating pre- and post-launch objects and datatypes

	<u>A</u> ZONE	<u>NT</u> DATETIME	<u>A</u> TIMEZONE	<u>#</u> RTLMP	<u>#</u> RTLOAD
1	EAST	2025-09-26 01:00:00	EDT	35.997500	860.000000
2	OTTAWA	2025-09-26 01:00:00	EDT	36.647500	802.000000
3	EAST	2025-09-26 02:00:00	EDT	37.865000	834.000000
4	OTTAWA	2025-09-26 02:00:00	EDT	38.563300	758.000000
5	EAST	2025-09-26 03:00:00	EDT	36.849200	806.000000
6	OTTAWA	2025-09-26 03:00:00	EDT	37.537500	741.000000
7	EAST	2025-09-26 04:00:00	EDT	36.937500	826.000000
8	OTTAWA	2025-09-26 04:00:00	EDT	37.647500	729.000000
9	EAST	2025-09-26 05:00:00	EDT	34.221700	804.000000
10	OTTAWA	2025-09-26 05:00:00	EDT	34.913300	729.000000



Time series alignment,
aggregation, and
intervalization example

Source: Yes Energy Database

Data Normalization

- Centralized over siloed data
- Reliable timestamp, time zone, daylight savings handling, and intervalization
- For IESO re-launch, consolidating pre- and post-launch objects and datatypes

	<u>A</u> ZONE	 DATETIME	<u>A</u> TIMEZONE	<u>#</u> RTLMP	<u>#</u> RTLOAD
1	EAST	2025-09-26 01:00:00	EDT	35.997500	860.000000
2	OTTAWA	2025-09-26 01:00:00	EDT	36.647500	802.000000
3	EAST	2025-09-26 02:00:00	EDT	37.865000	834.000000
4	OTTAWA	2025-09-26 02:00:00	EDT	38.563300	758.000000
5	EAST	2025-09-26 03:00:00	EDT	36.849200	806.000000
6	OTTAWA	2025-09-26 03:00:00	EDT	37.537500	741.000000
7	EAST	2025-09-26 04:00:00	EDT	36.937500	826.000000
8	OTTAWA	2025-09-26 04:00:00	EDT	37.647500	729.000000
9	EAST	2025-09-26 05:00:00	EDT	34.221700	804.000000
10	OTTAWA	2025-09-26 05:00:00	EDT	34.913300	729.000000

Source: Yes Energy Database

ONTARIO - IESO

~~ONTARIO - ONZN~~

~~ONTARIO_ZONAL_PRICE~~

~~ONTARIO_ZONAL_PRICE_REF~~

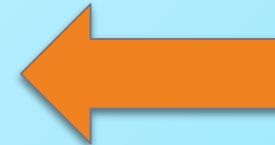


Pre- and post-launch data
remapping and reloading to
single object:
RT 5-min LMPs
Zonal LMPs
Predispatch LMPs

Data Normalization

- Centralized over siloed data
- Reliable timestamp, time zone, daylight savings handling, and intervalization
- For IESO re-launch, consolidating pre- and post-launch objects and datatypes

	<u>A</u> RELATIONSHIP	<u>A</u> SUBSTATION	<u>A</u> PRICENODE	<u>INT</u> CREATEDATE	<u>INT</u> <u>↑</u> LASTUPDATE
1	STATION2PNODE	KASHECHEWAN CTS	KASHECHEWAN-LT.T2_LF	2025-08-05 14:50:55	2025-08-28 16:56:47
2	STATION2PNODE	MIDHURST TS	MIDHURST-LT.BARRIE	2025-05-09 14:53:45	null
3	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.ENERNOC_DRA	2025-05-09 15:04:06	null
4	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.NRGCS_DRA	2025-05-09 15:03:52	null
5	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.GCPROJECT_DRA	2025-05-09 15:03:30	null
6	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.ENPOWINC_DRA	2025-05-09 15:02:47	null
7	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.ENERCORP_DRA	2025-05-09 15:02:28	null
8	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.EDGECOM_DRA	2025-05-09 15:01:43	null
9	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.VOLTUS_DRA	2025-05-09 15:01:15	null
10	STATION2PNODE	MIDDLEPORT TS	MIDDLEPORT-LT.UOG_DRA	2025-05-09 15:00:54	null

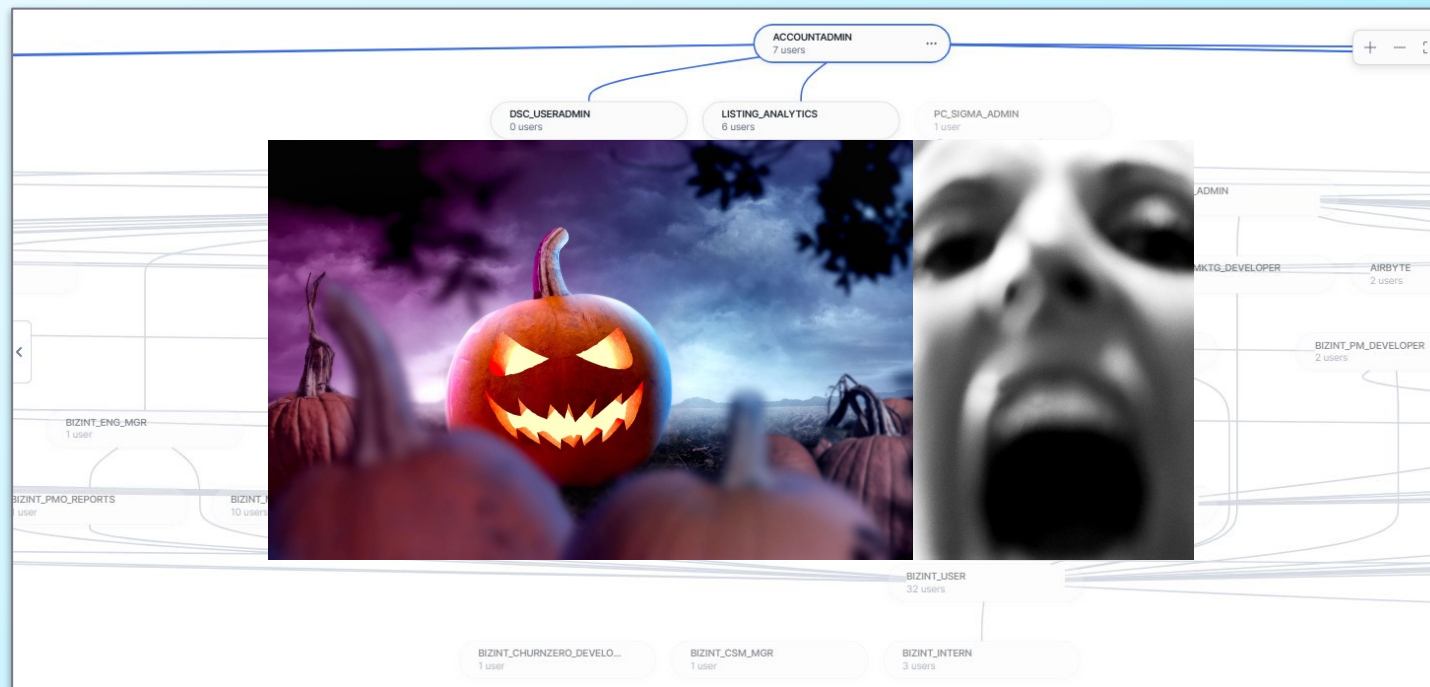


Data relationship
mapping; transmission
equipment and
generating units to
price nodes

Source: Yes Energy Database

Data Access and Governance

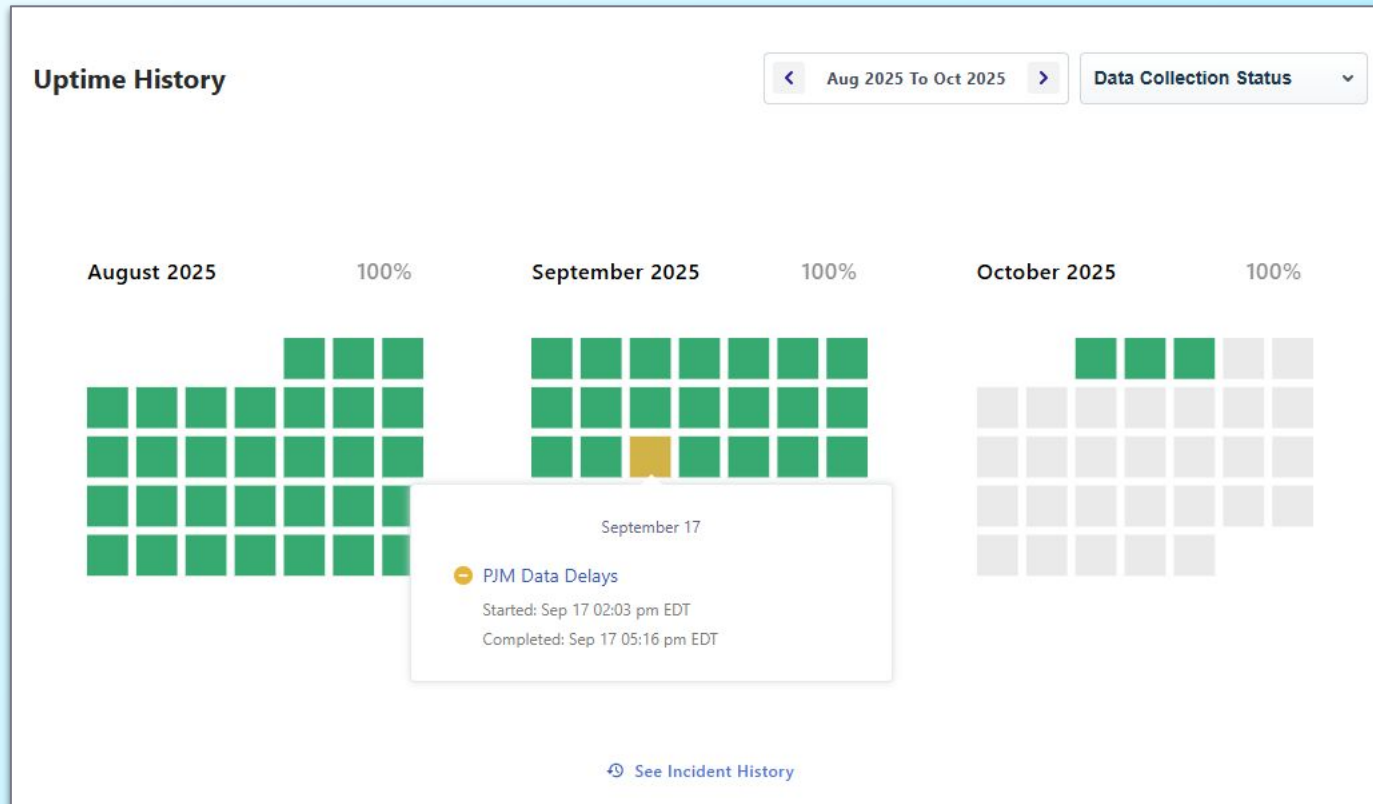
- Understand user needs
- Privileged vs. generally available data, role-based access
- Flexible formats + data normalization = connect to any analytical platforms



The role world can get complex, but it's imperative for having compliant, trustworthy data access.

Platform Reliability

- Disaster recovery, continuity, redundancy
- High availability = no missed \$\$ opportunities



Uptime monitors are critical for visibility into the state of the data and system.



Practical Takeaways

Data and Analytics Best Practices Checklist

- ✓ ☒ Data sourcing
- ✓ ☒ Data quality monitoring
- ✓ ☒ Changed data management
- ✓ ☒ Data normalization
- ✓ ☒ Data access and governance
- ✓ ☒ Platform reliability



Source: Google stock images

Future State Considerations

- Consider your current data and tech stack and identify gaps
- Consider team skills, roles, and responsibilities

In-depth checklist
to review



Market Data & Analytics: Operational Processes

This document is designed to capture how Commercial, Market, or Trading Operations teams source, use, and manage market data and analytics. It can help reduce institutional knowledge gaps, streamline workflows, and surface opportunities for enhanced collaboration between business and IT teams.

Data Sourcing

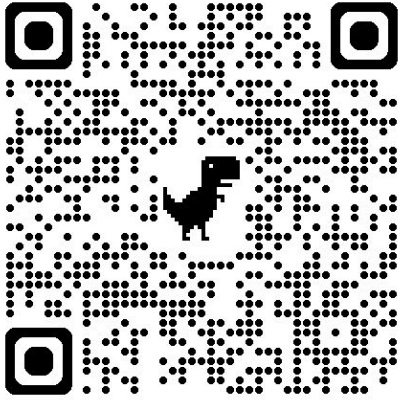
- ☐ **Sources:** List the primary sources your team uses for market data. For each, note the type (e.g., vendor API, internal feed, manual download), its importance, and any known limitations or dependencies.
- ☐ **Systems:** List the key systems and tools your team uses to collect, transform, store, and access market data. Briefly describe each system's role in the data flow from source to end use.
- ☐ **Workflow:** Describe any manual steps in your data workflow (e.g., copy/paste, downloads, email attachments). For each, explain why it's manual, how often it occurs, the effort involved, and any associated risks.

Printouts available or
contact me at
samuel@yesenergy.com

Right data, right
place, right time.



Free Sample Data:



Free Snowflake Trial:



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