

Creating the Grid of the Future

Opportunities for Storage



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PRESENTER

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Interconnection Queue Predictions



Long-Term Load Forecast



LMP Volatility



Energy Storage Strategies

Interconnection Queue Predictions

Long-Term Load Forecast

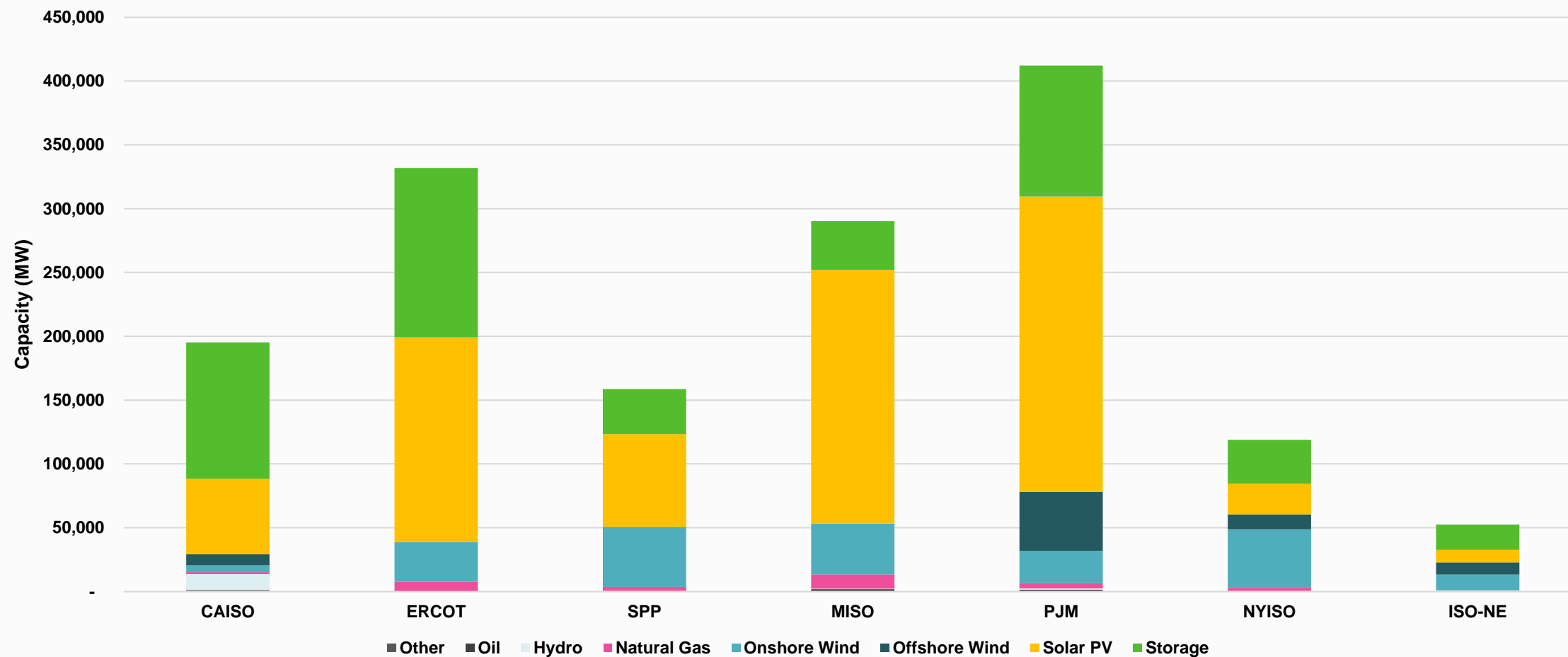
LMP Volatility

Energy Storage Strategies

Solar and Storage Dominate the Queue

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Total Queued Capacity by ISO

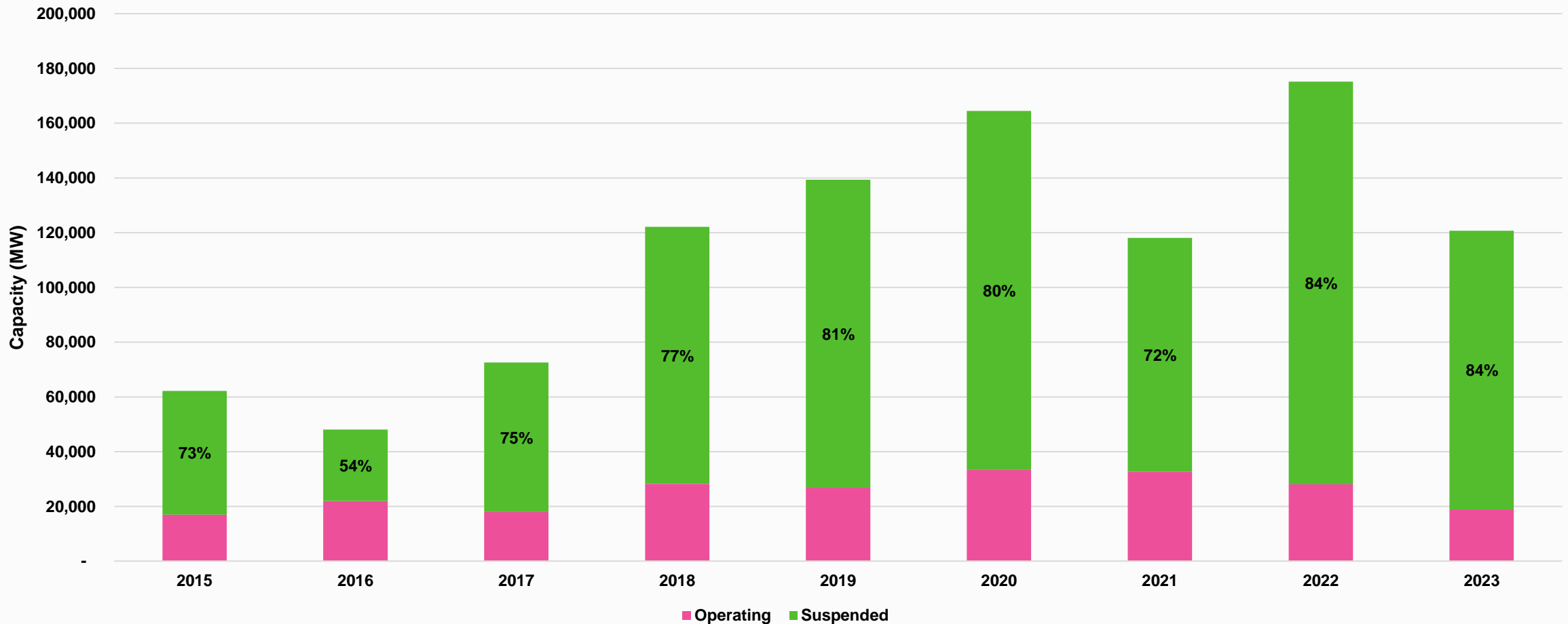


Source | Enverus Intelligence® Research

~80% of the Queue Is Suspended Each Year

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Historical Project Completions and Suspensions

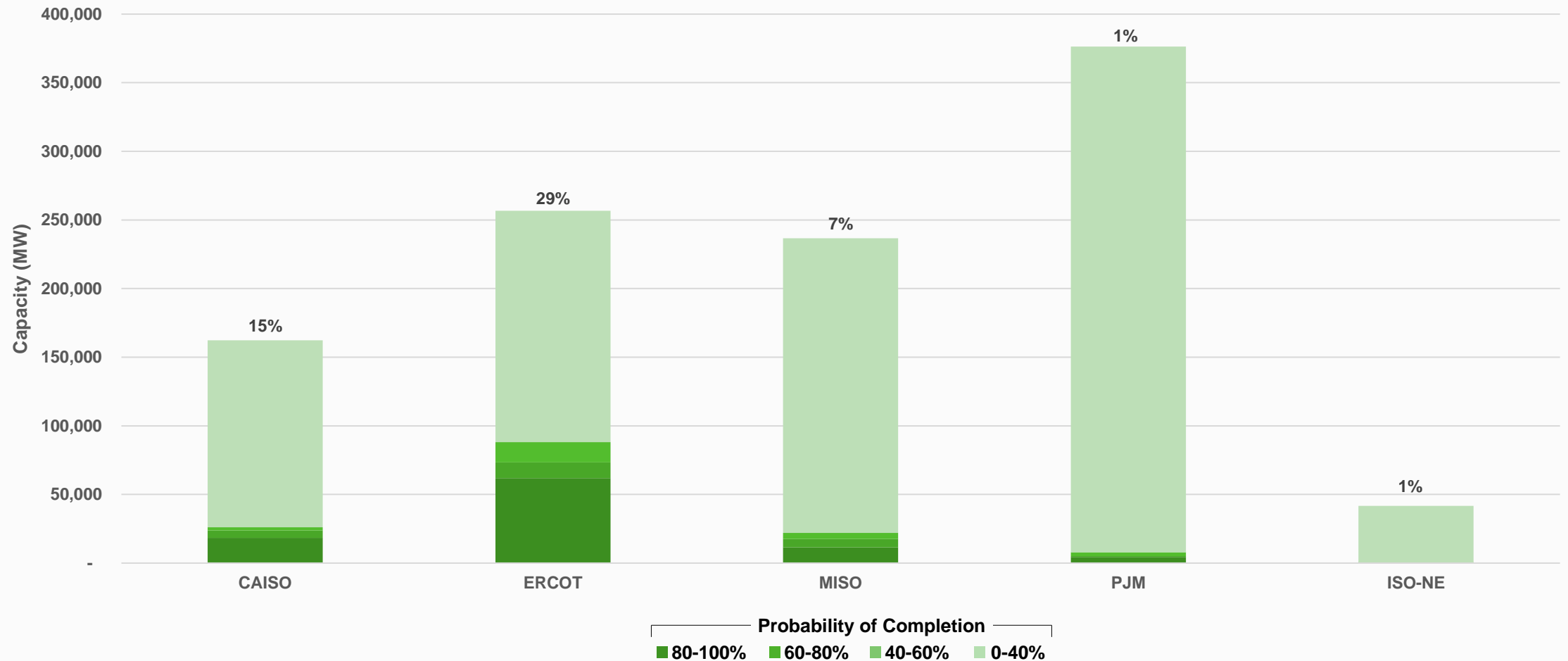


Source | Enverus Intelligence® Research

Most Planned Capacity Unlikely to Happen

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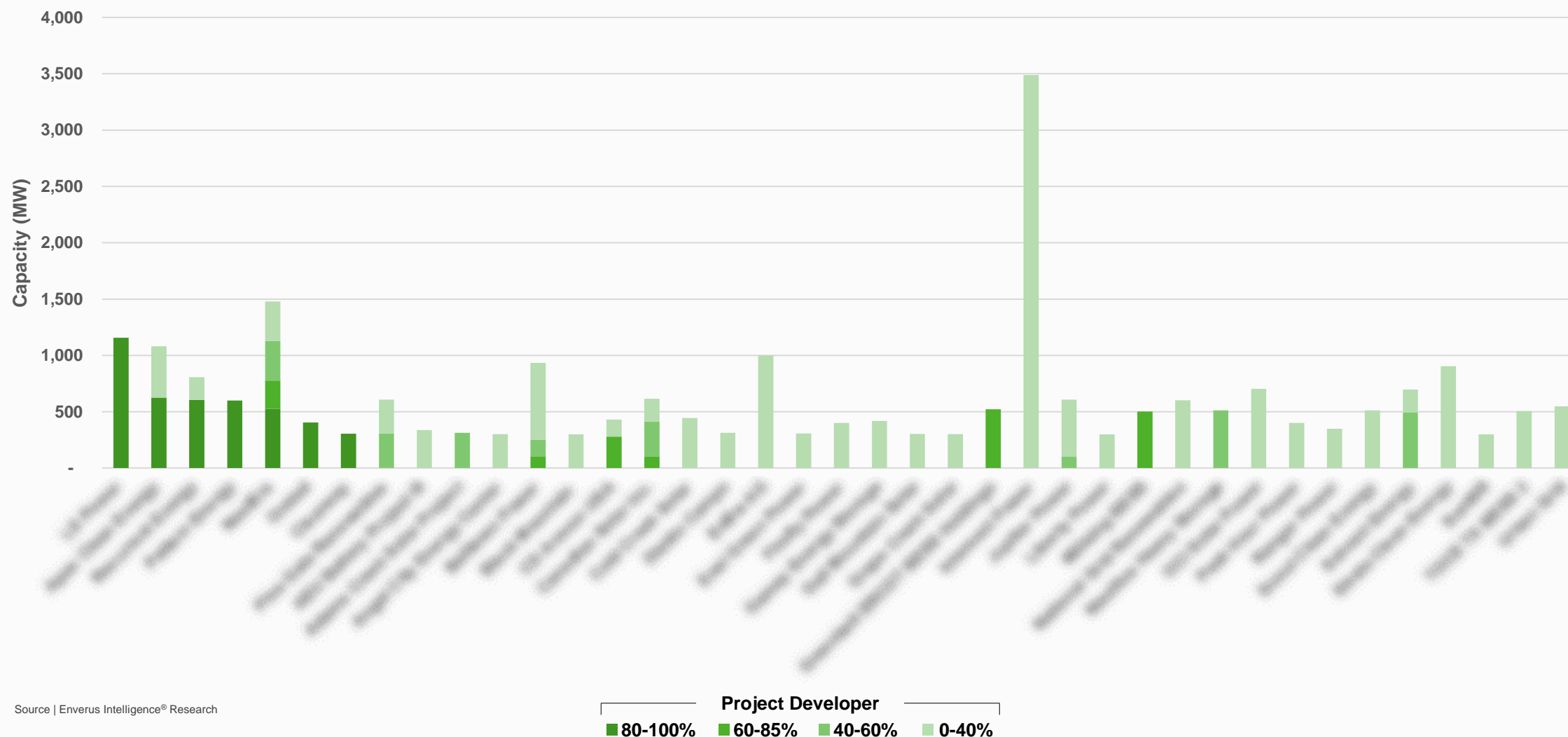
Enverus Intelligence® Research (EIR) View on Project Viability



Source | Enverus Intelligence® Research

Not All Developers Are Equal

Developer Queue Capacity Grouped by Probability of Success

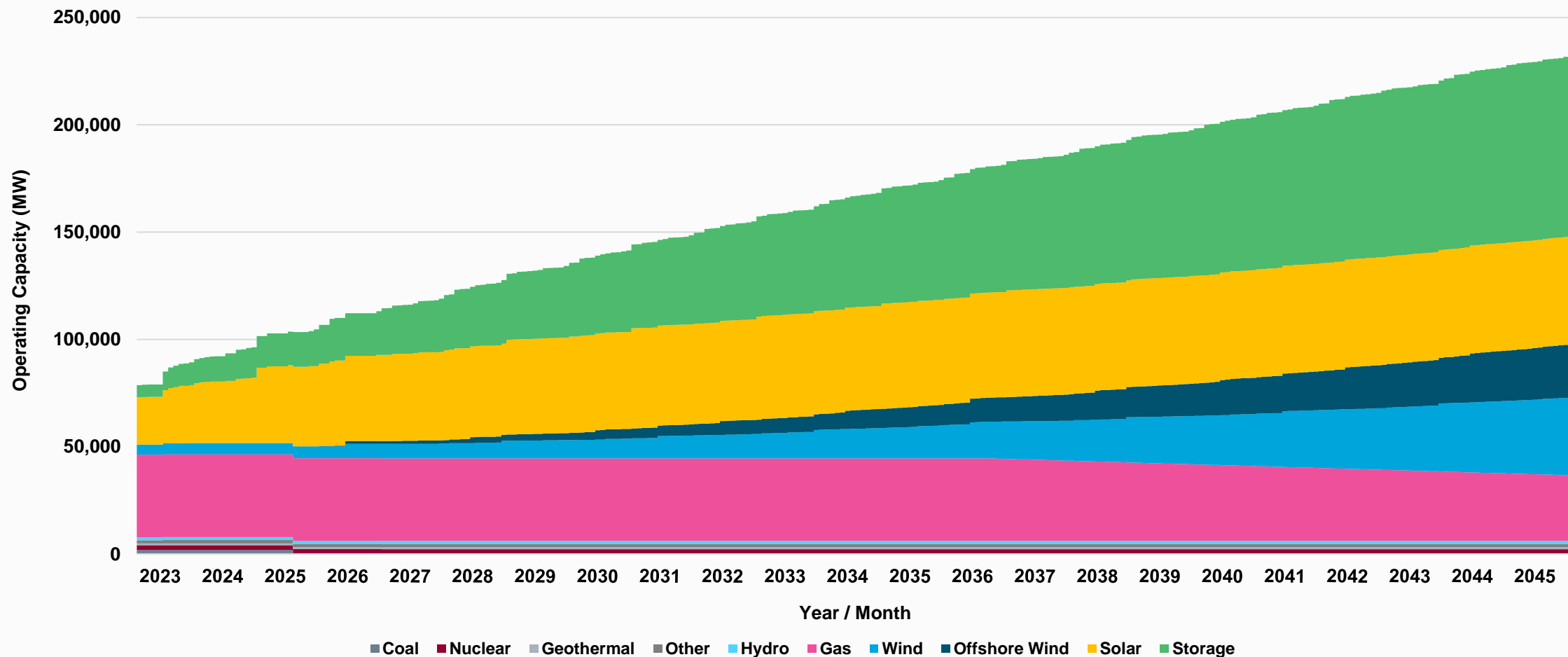


Source | Enverus Intelligence® Research

CAISO Storage Capacity to Grow 13x by 2045

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EIR Forecast Capacity Mix



Source | Enverus Intelligence® Research, EIA

Interconnection Queue Predictions



Long-Term Load Forecast

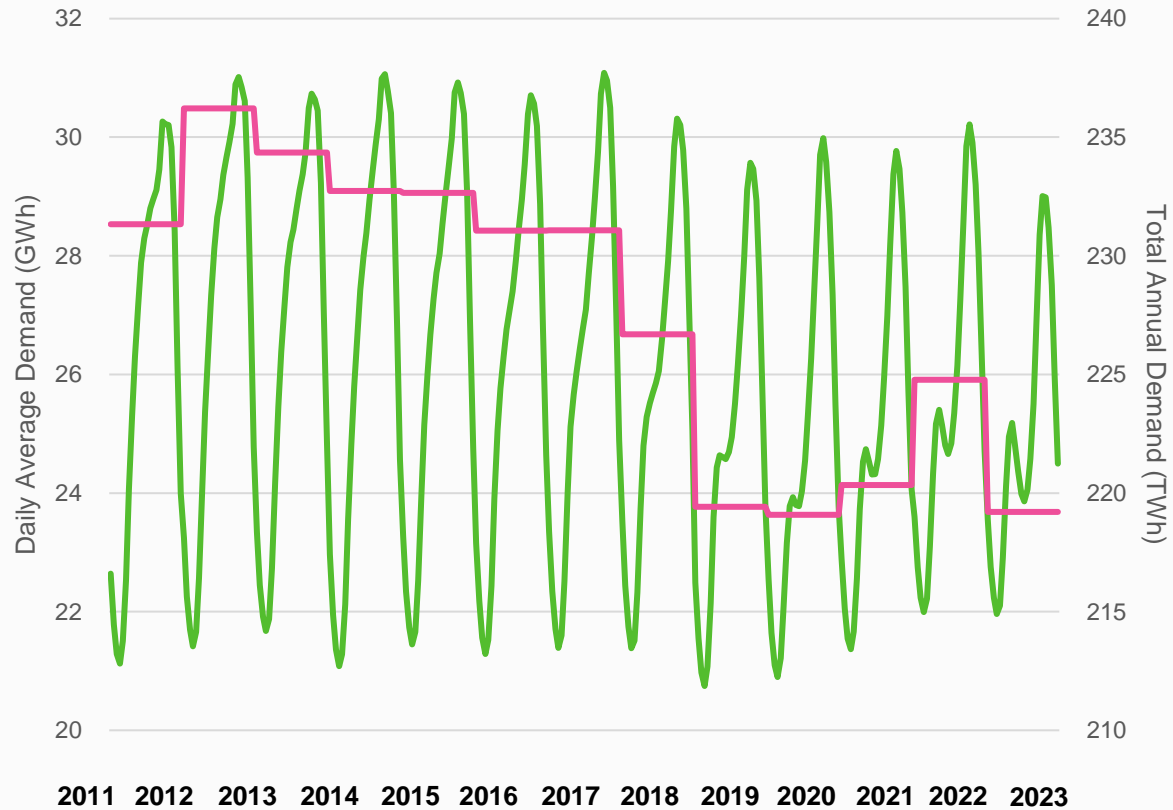
LMP Volatility

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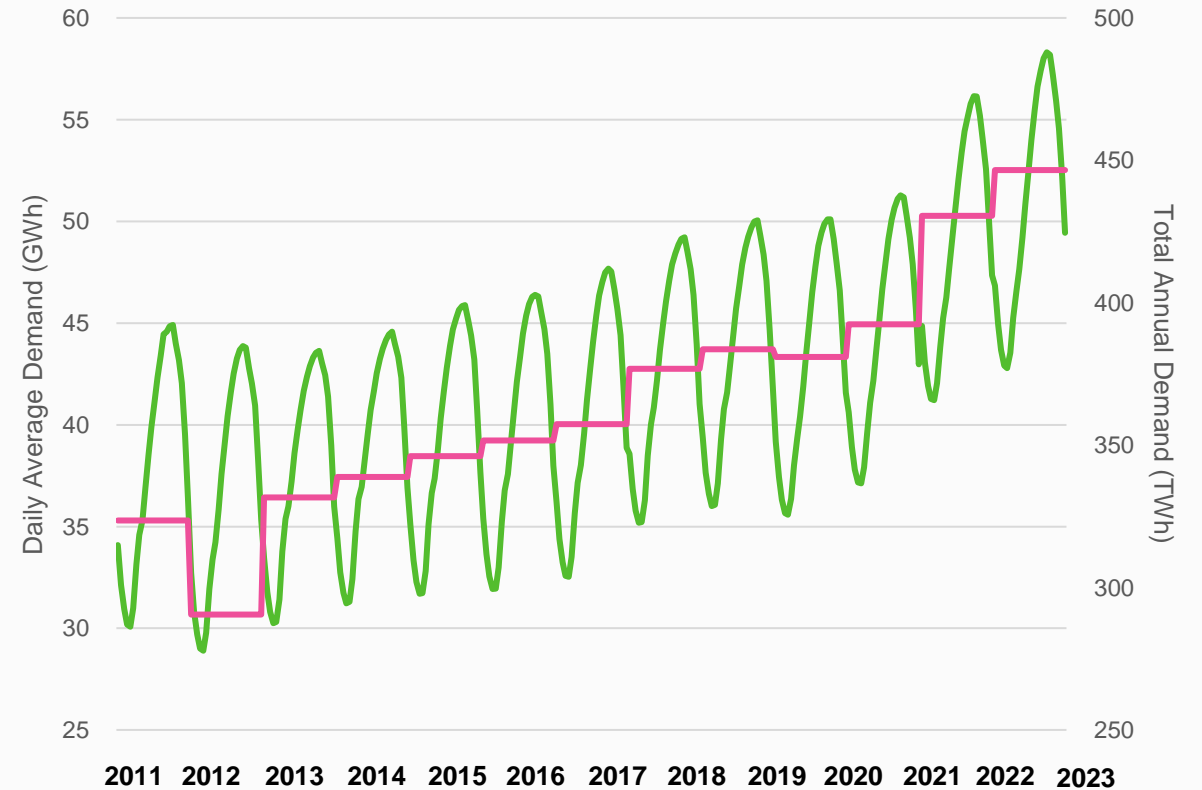
Daily Shape and Total Load Change

Historical Load Trends

CAISO



ERCOT



Source | Enverus Intelligence® Research, CAISO

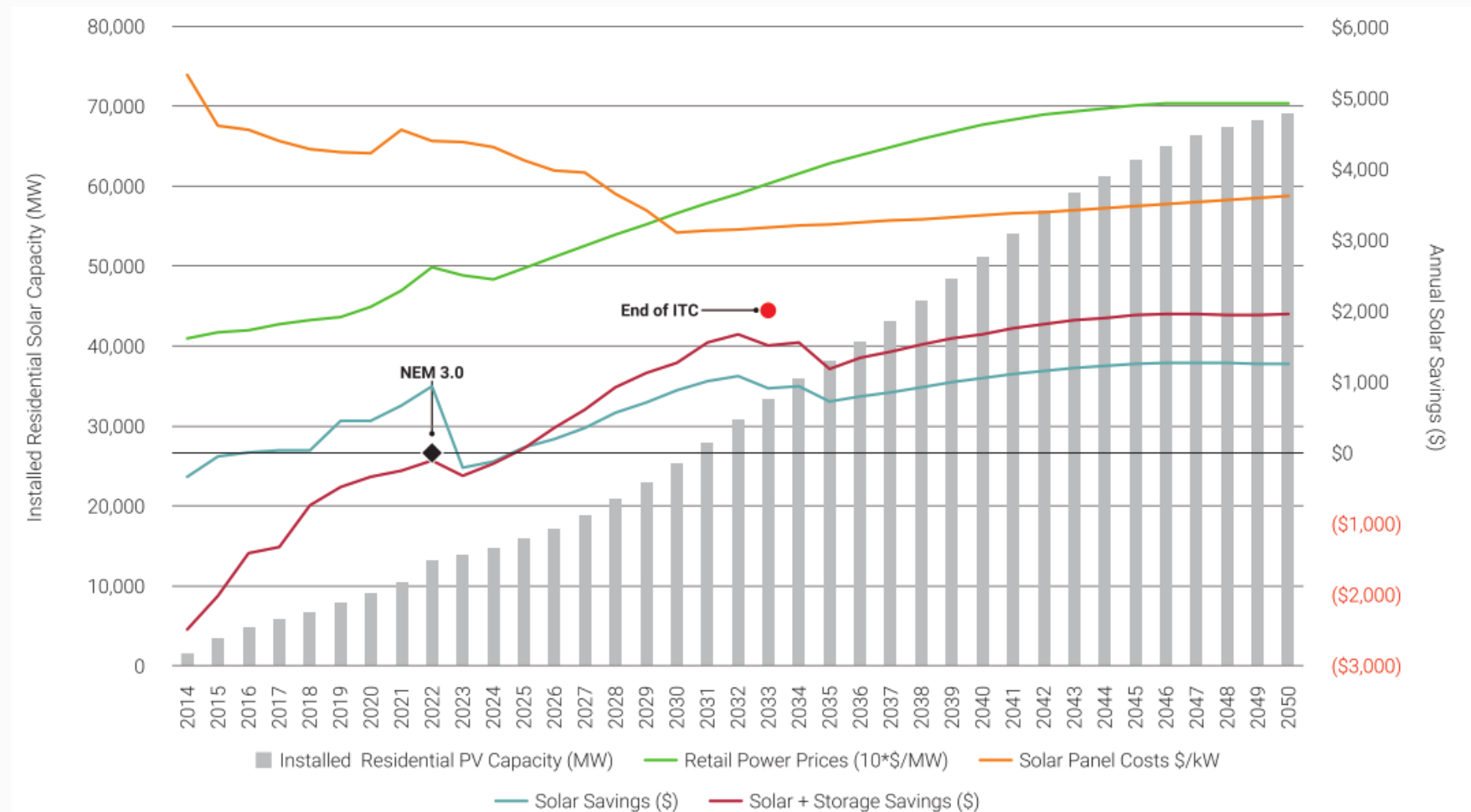
Demand
— Daily Average — Annual

CAISO Drivers of Future Load Change

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Four Types of Drivers Based on Their Impact on Load

- **Increase in Demand**
 - Electrification
 - Climate Change
- **Decrease in Demand**
 - BTM Solar
- **Demand Time Shift**
 - Time of Use
 - BTM Storage
- **Increase and Time Shift**
 - EV Adoption

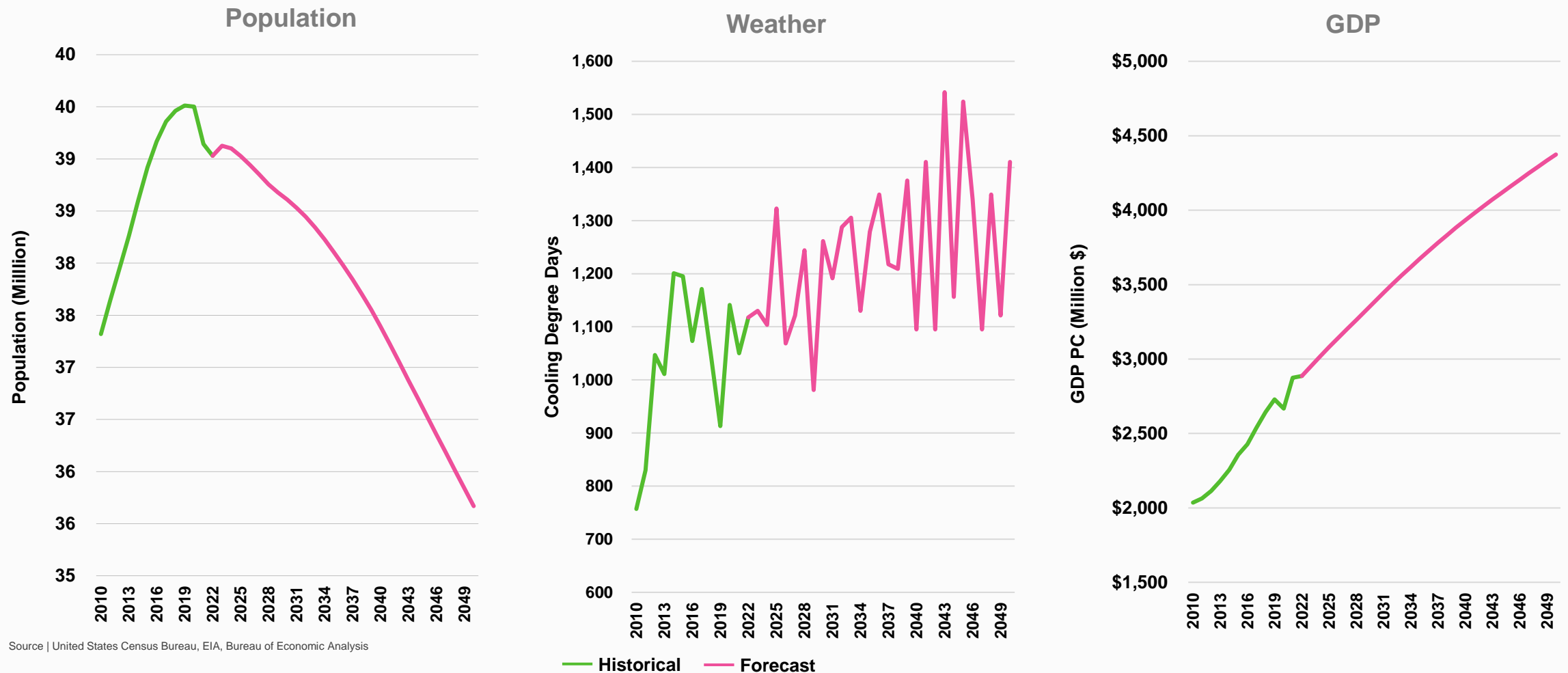


Source | Enverus Intelligence® Research

92% of Current Load Explained by Three Factors

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Historical and Forecast for Current Load Factors

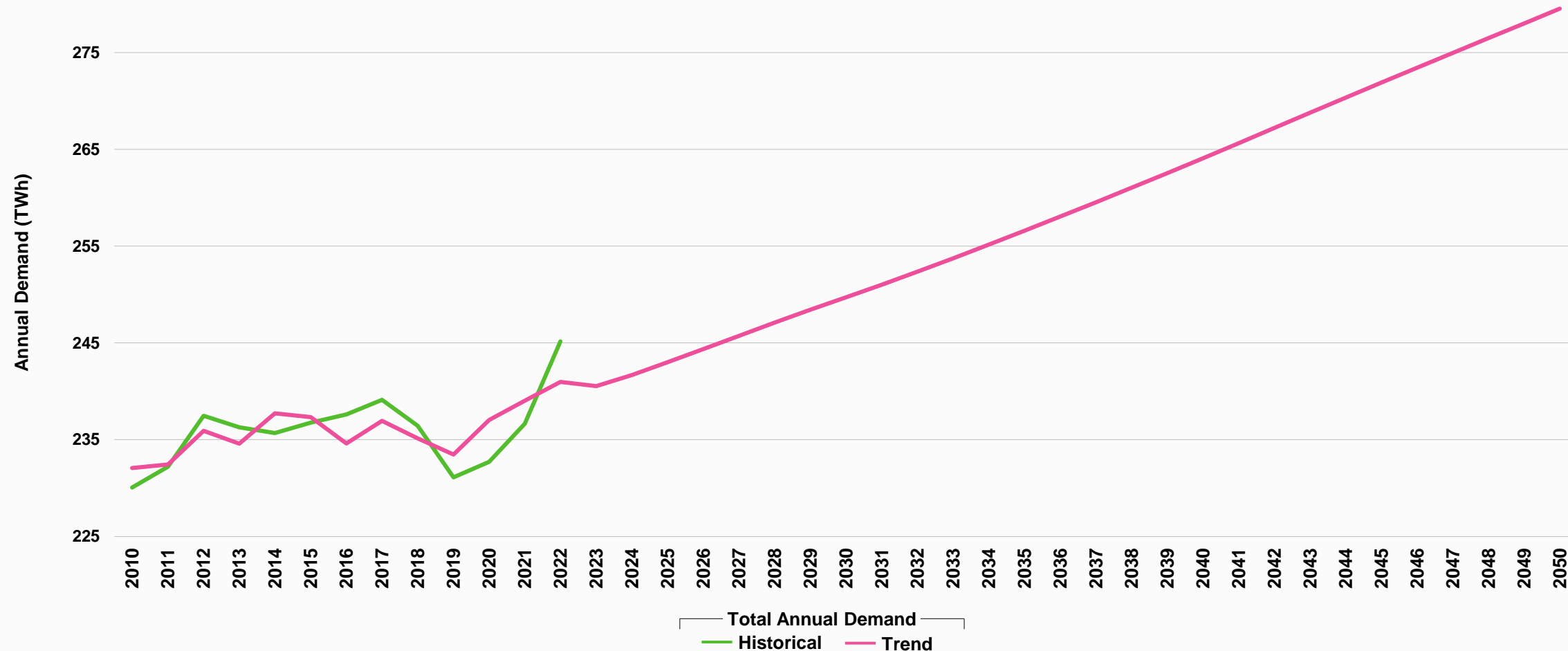


Source | United States Census Bureau, EIA, Bureau of Economic Analysis

Without Modifications Load Would Increase

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Historical and Forecast Unconstrained Demand



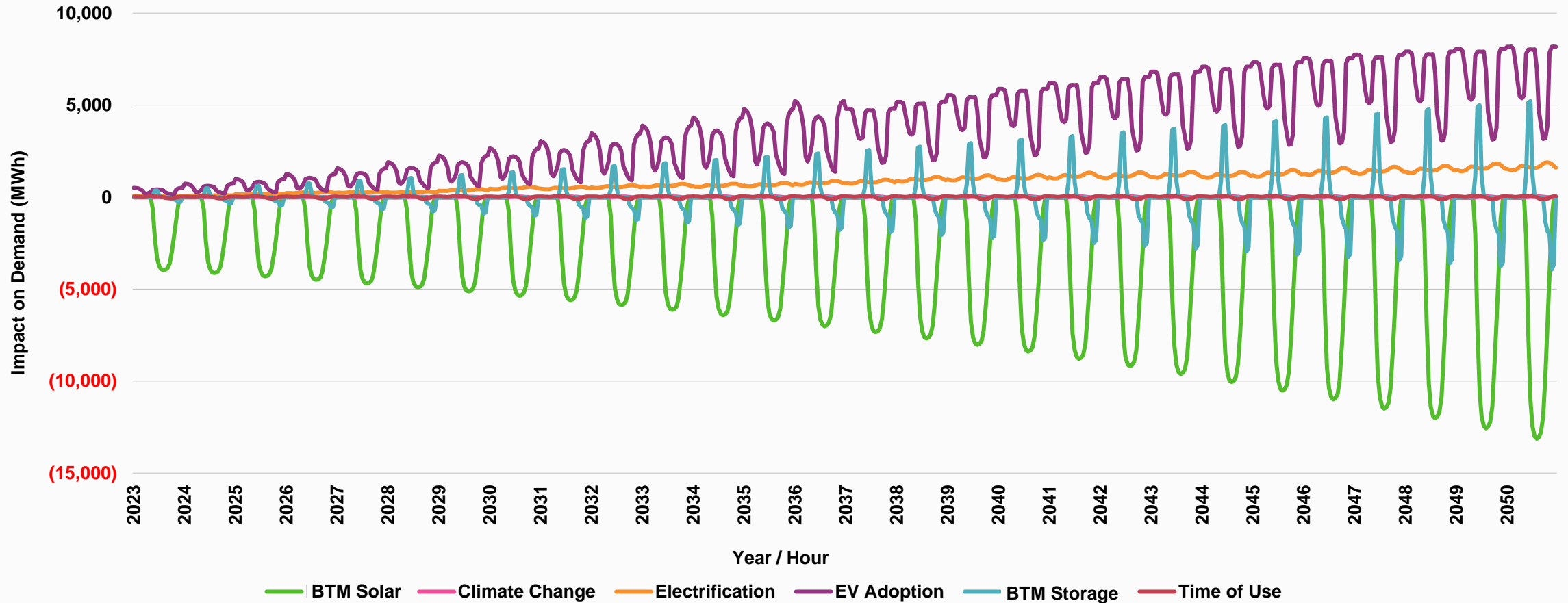
Source | Enverus Intelligence® Research

BTM Solar, EV Adoption and Electrification

Major Drivers of New Load

Long-Term Load Impact by Driver

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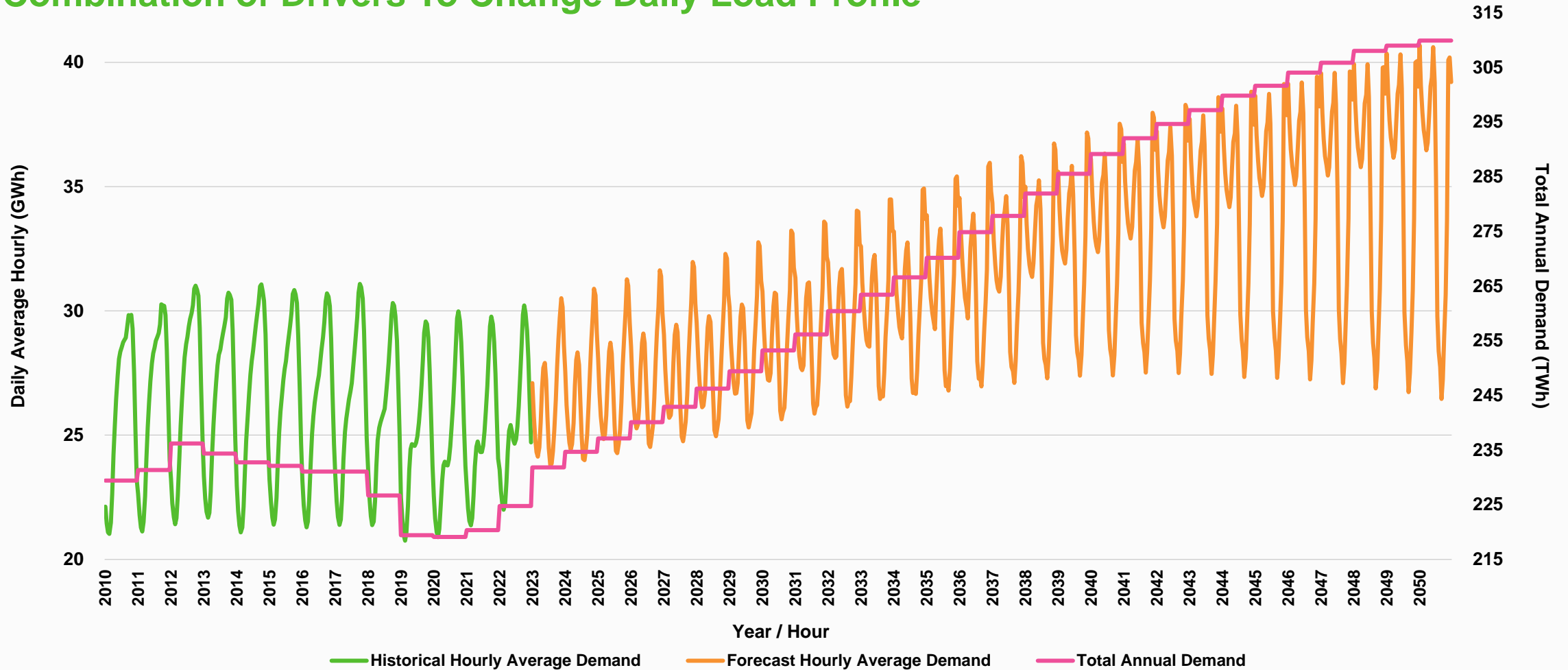


Source | Enverus Intelligence® Research


General Electrification To Outpace BTM Installs

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Combination of Drivers To Change Daily Load Profile



Source | Enverus Intelligence® Research, CAISO



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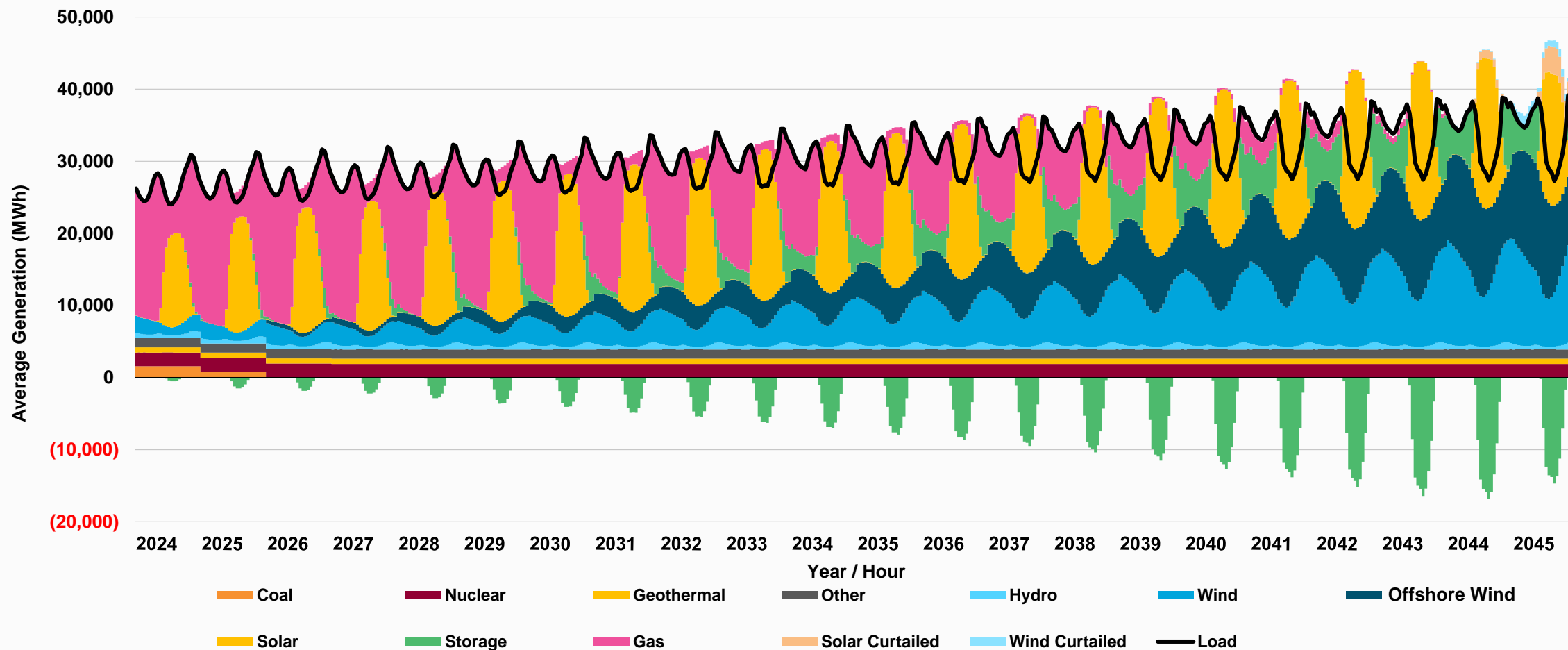
LMP Volatility

Energy Storage Strategies

Storage and Wind Displacing Gas Generation

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Generation Forecast



Source | Enverus Intelligence® Research

Gas Still Needed to Maintain Balance

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Monthly Gas and Storage Generation

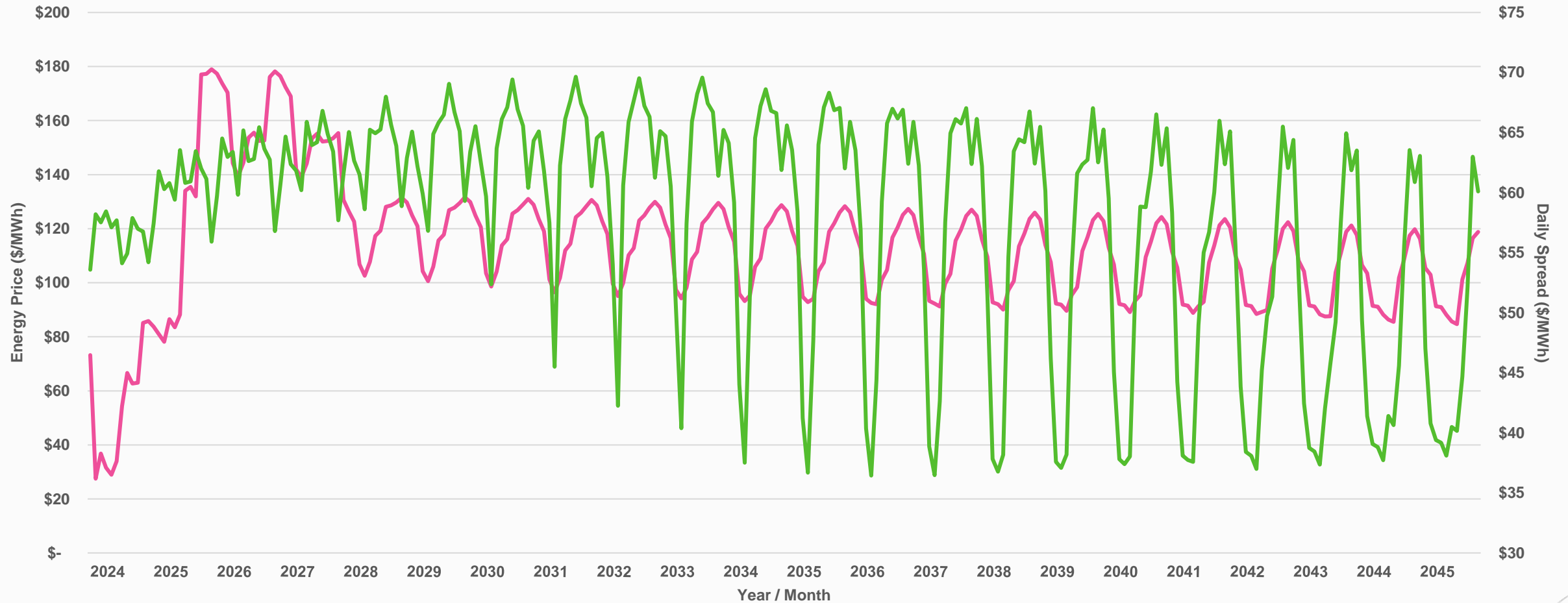


Source | Enverus Intelligence® Research

Increased Seasonality on Spreads

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Average Monthly Price and Daily Spread



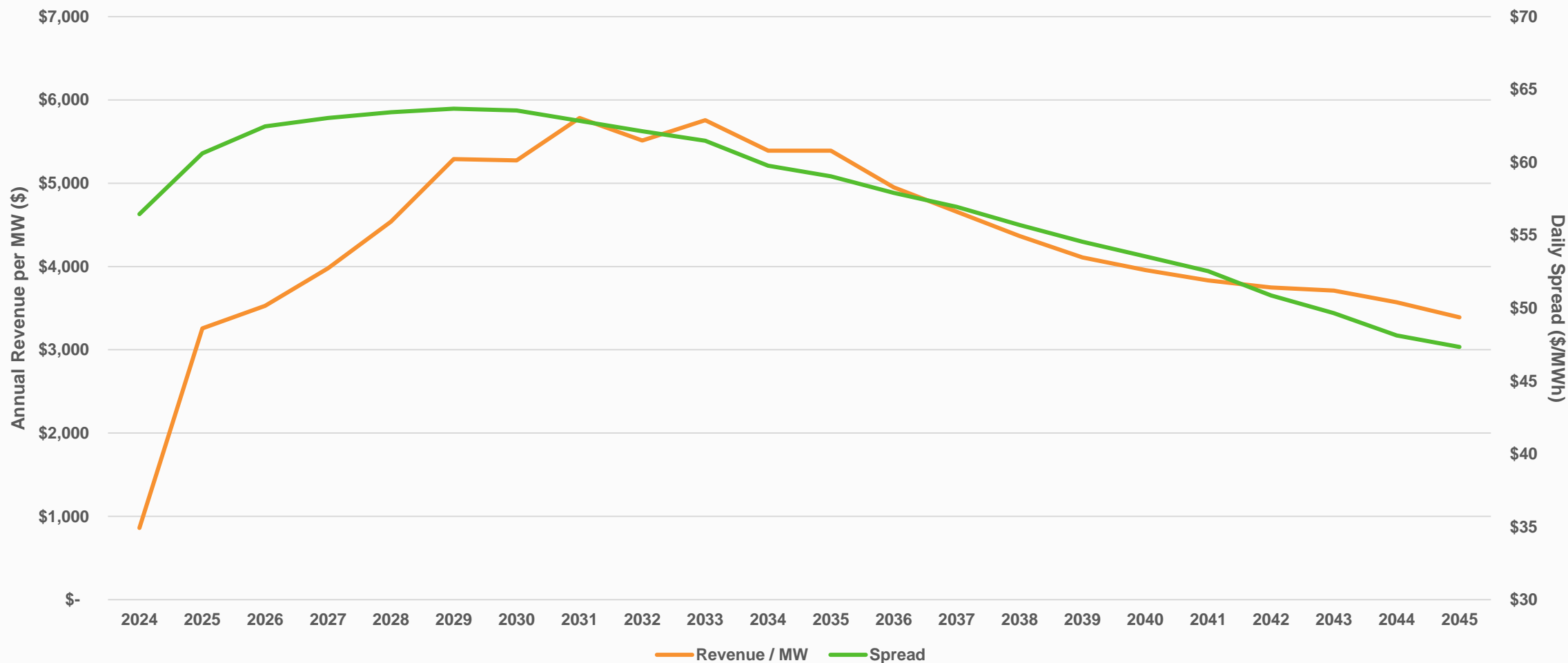
Source | Enverus Intelligence® Research

Energy Price Spread

Storage Arbitrage Revenue to Peak in 2031

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Annual Spreads and Storage Arbitrage Revenues



Source | Enverus Intelligence® Research



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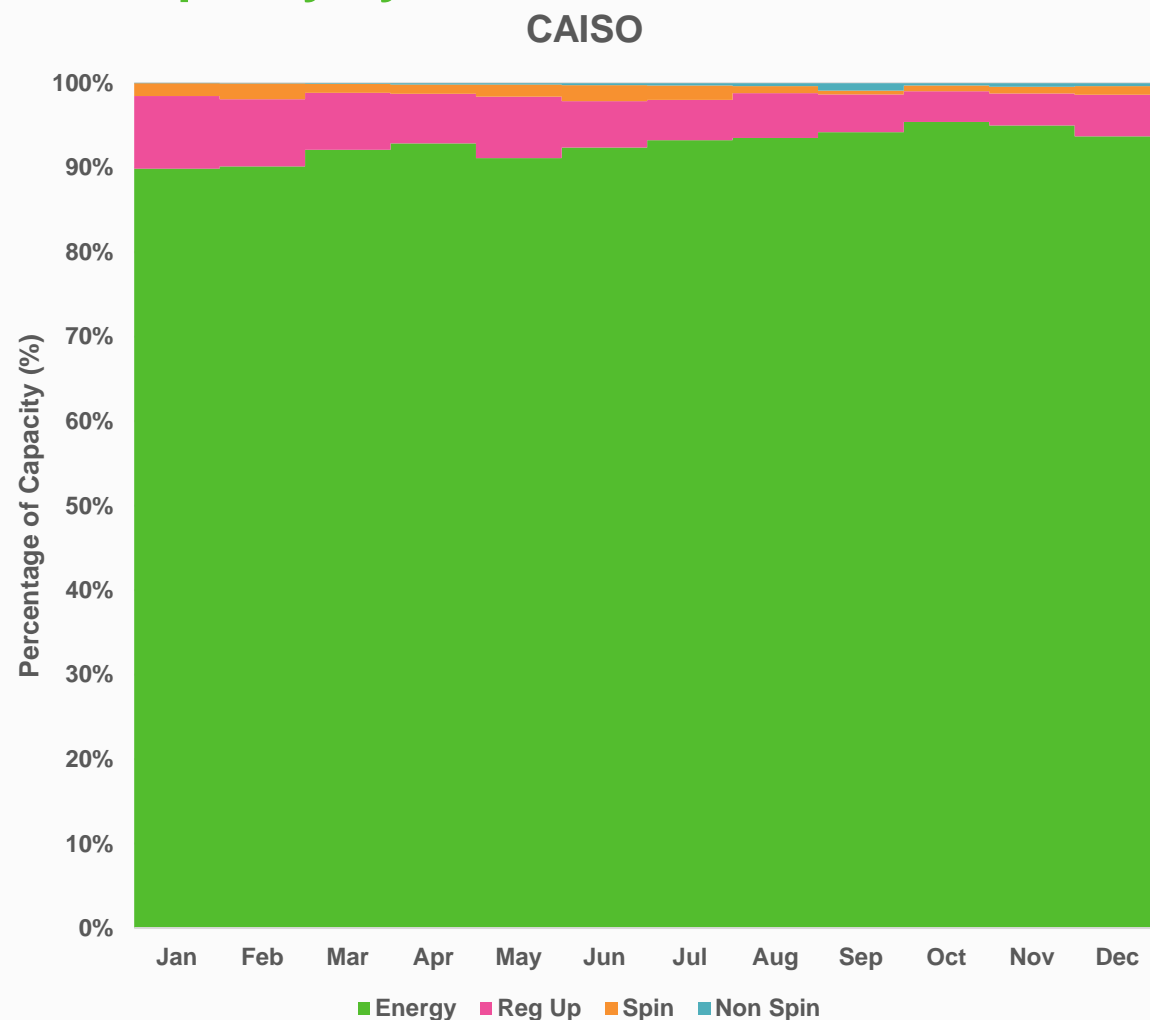


Energy Storage Strategies

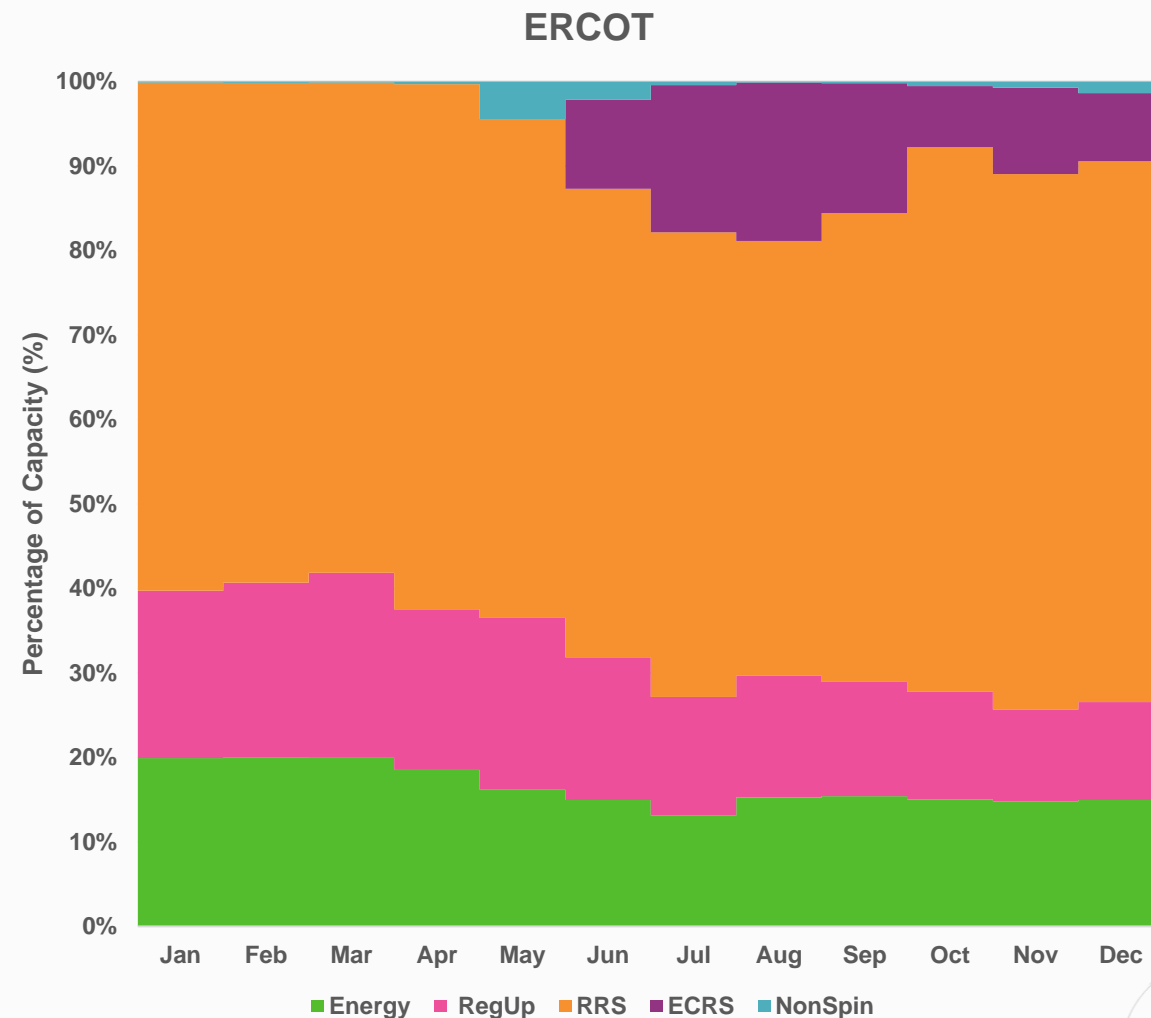
Energy in CAISO Ancillary Services in ERCOT

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% Capacity by Service



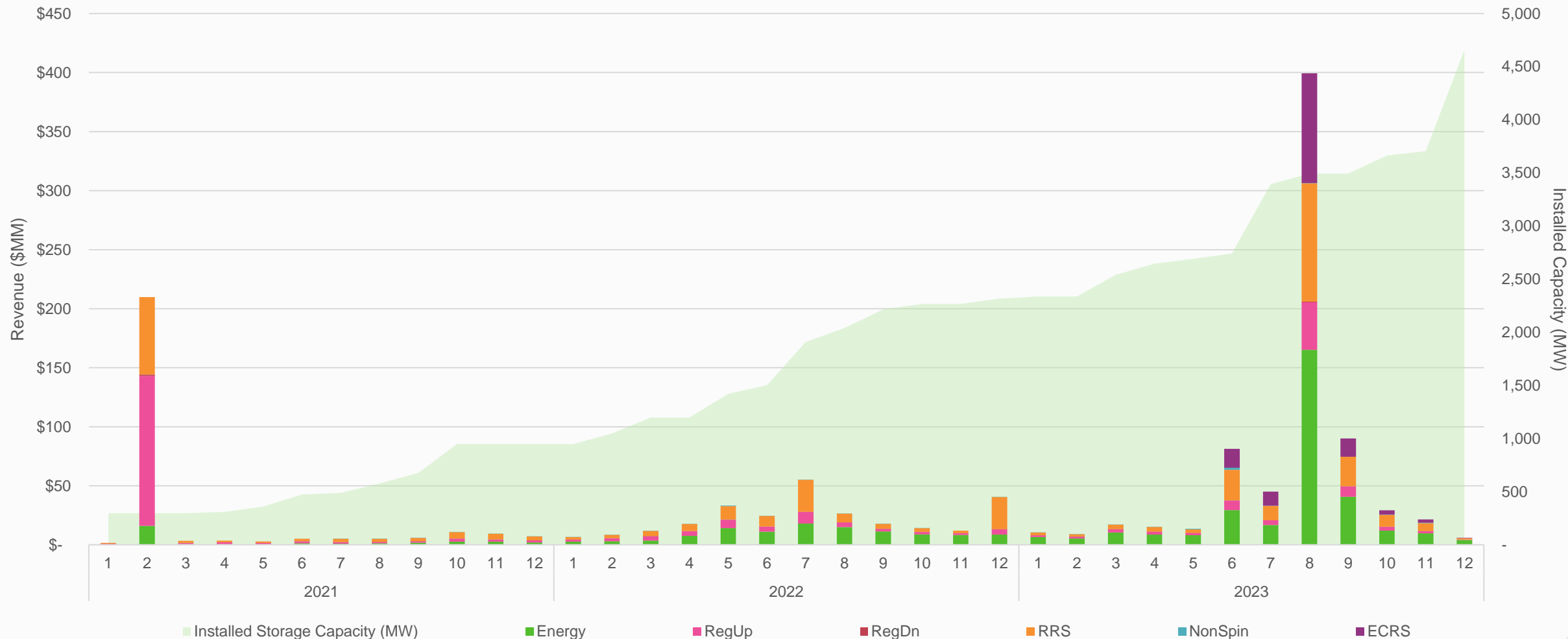
Source | Enverus Intelligence® Research



Weather Events Increasing Storage Profits

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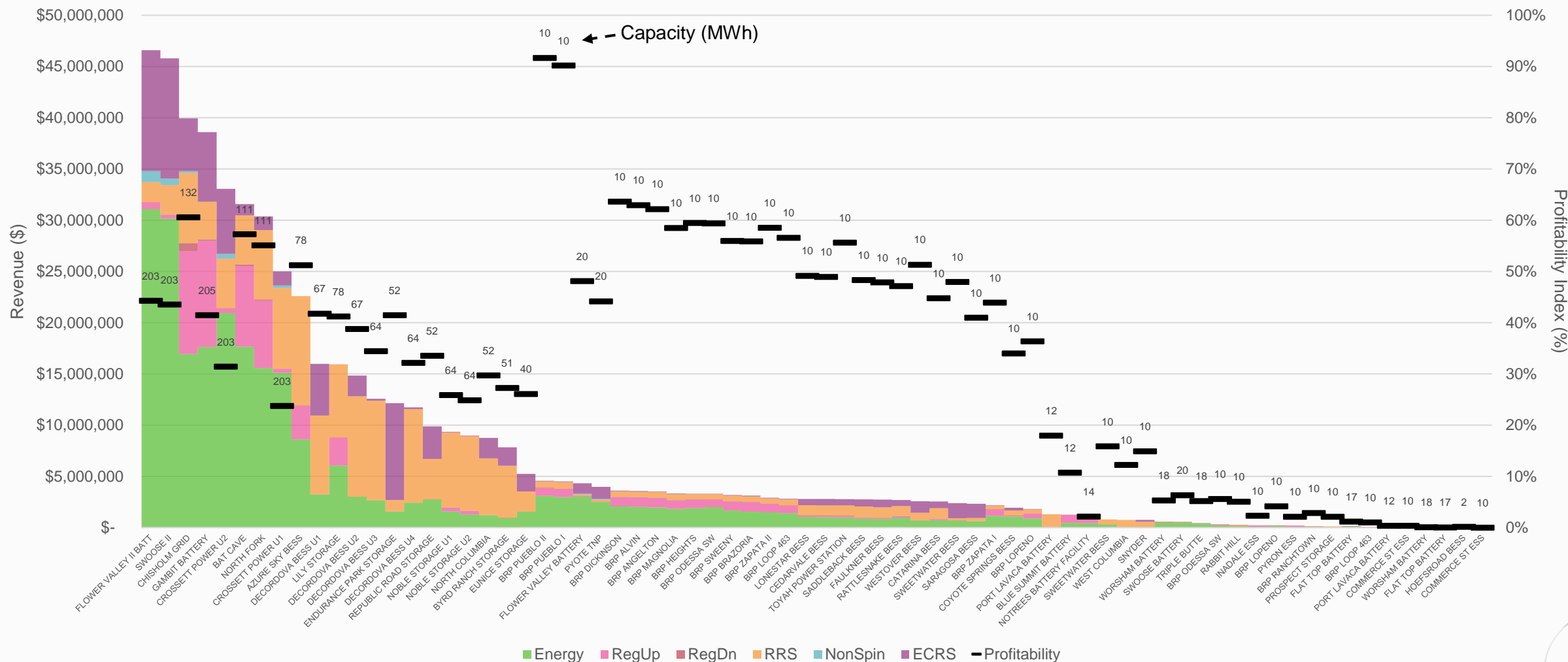
Storage Capacity and Revenue Timeline



Source | Enverus Intelligence® Research

Bigger not Always Better

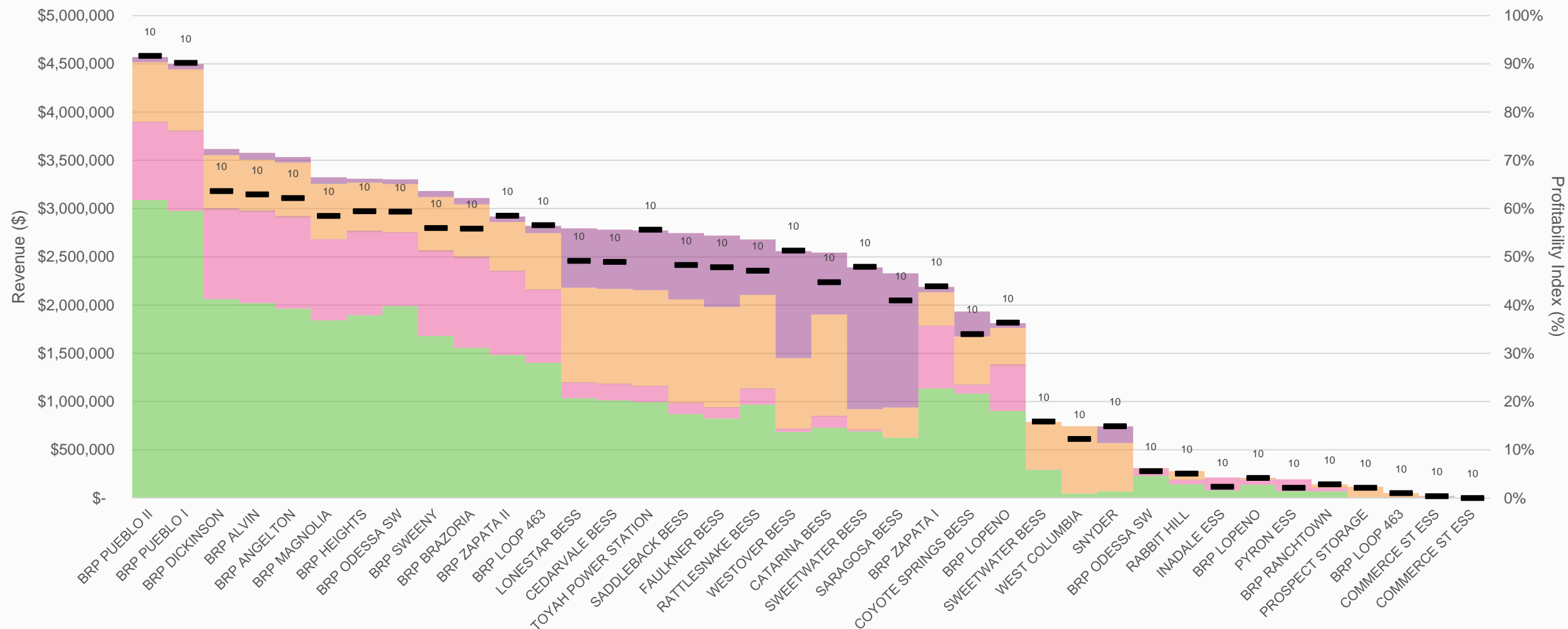
2023 Revenue by Service and Profitability



Source | Enverus Intelligence® Research

Operating Strategy Matters

2023 Revenue by Service and Profitability for 10 MWh Assets

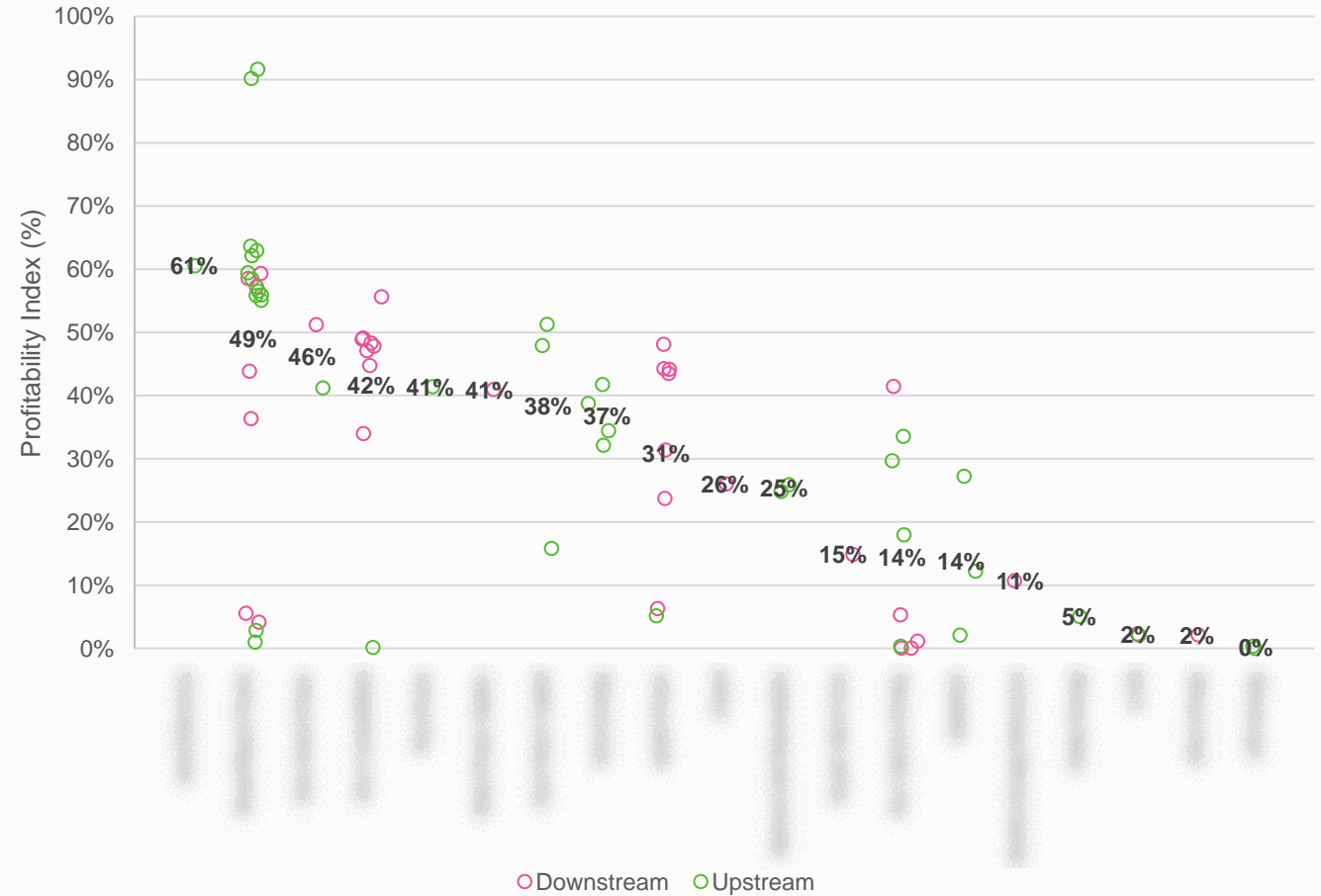
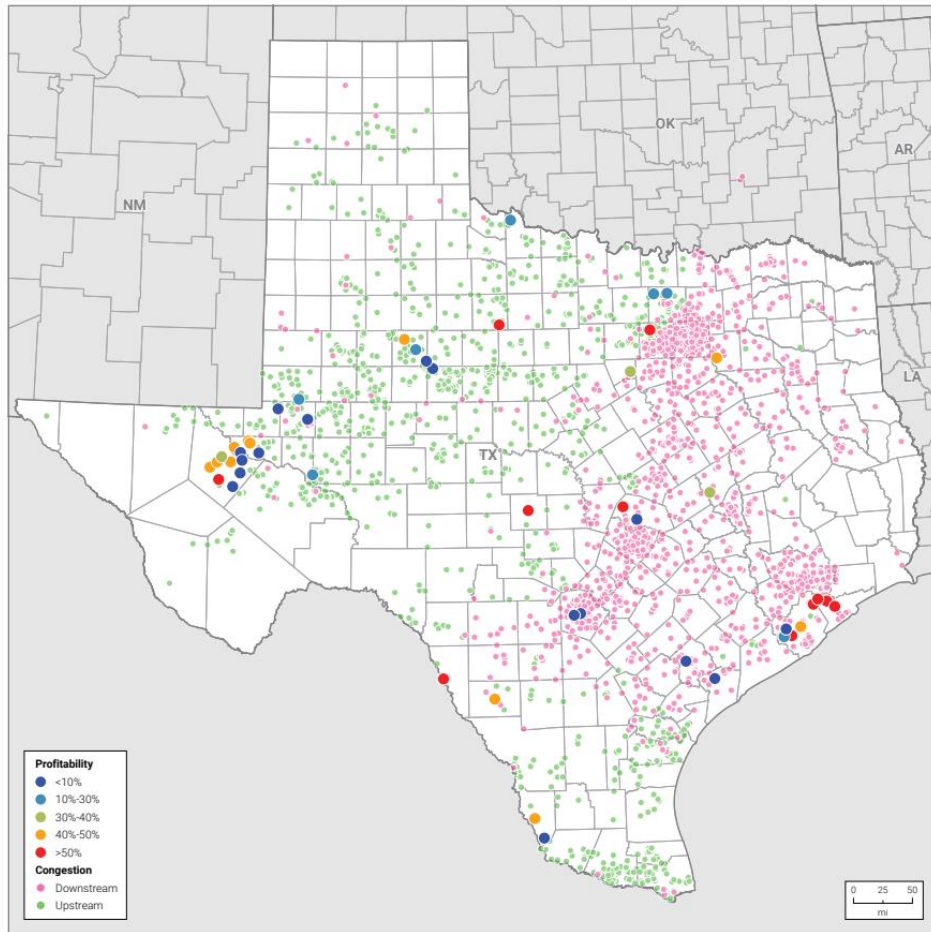


Source | Enverus Intelligence® Research

Energy RegUp RegDn RRS NonSpin ECRS Profitability

Strategy Still More Important than Location

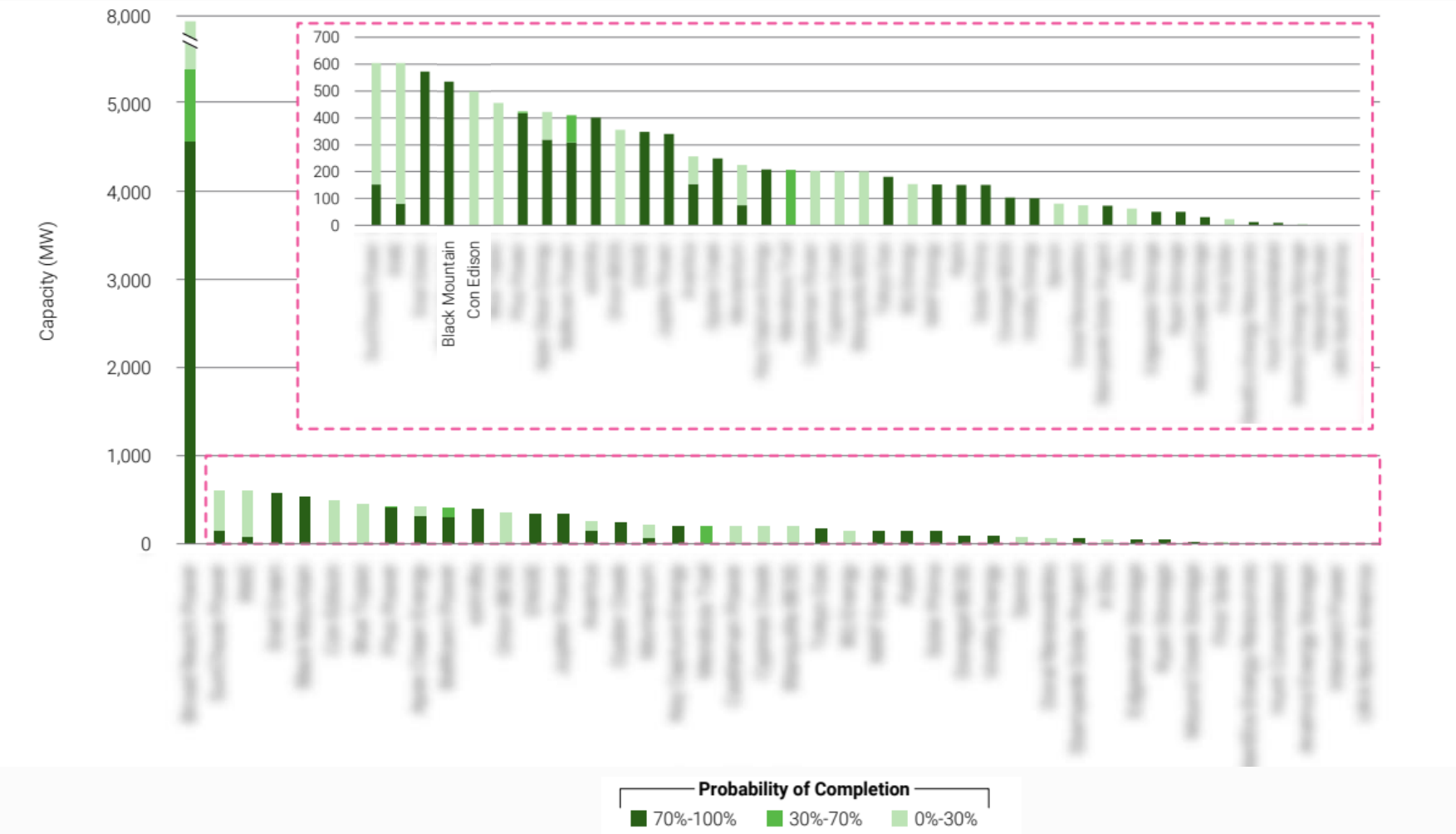
Location of Storage and Portfolio Profitability



Source | Enverus Intelligence® Research

Additional 9.7 GW of Storage in 2024

2024 Expected Storage Capacity by Owner



Source | Enverus Intelligence® Research

QUESTIONS



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