PLEXOS Technical Conference - NYISO

Energy Exemplar | 11.10.2025

Agenda

1 Energy Exemplar Overview

2 PLEXOS – ISO and Customer Stories

3 PLEXOS Overview

4 Nodal Capabilities

5 Advanced Platform

6 Datasets

Energy Exemplar

Energy Exemplar Overview

Energy Exemplar

Energy Exemplar

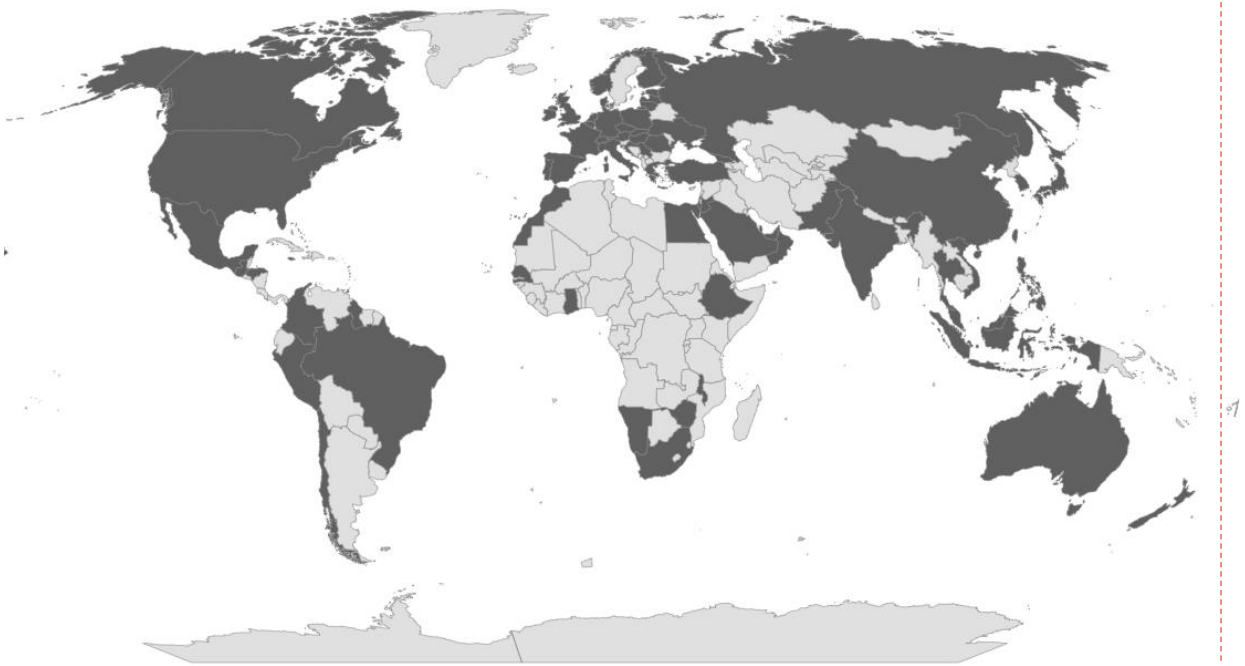
We are a **fundamental** simulation and optimization **software** and **data** solutions provider supporting the **evolving** challenges of the global **energy** industry.

PLEXOS

AURORA

Adapt2 SOLUTIONS by Energy Exemplar

EE at a Glance– Growing at 30% Annually



700+
Team

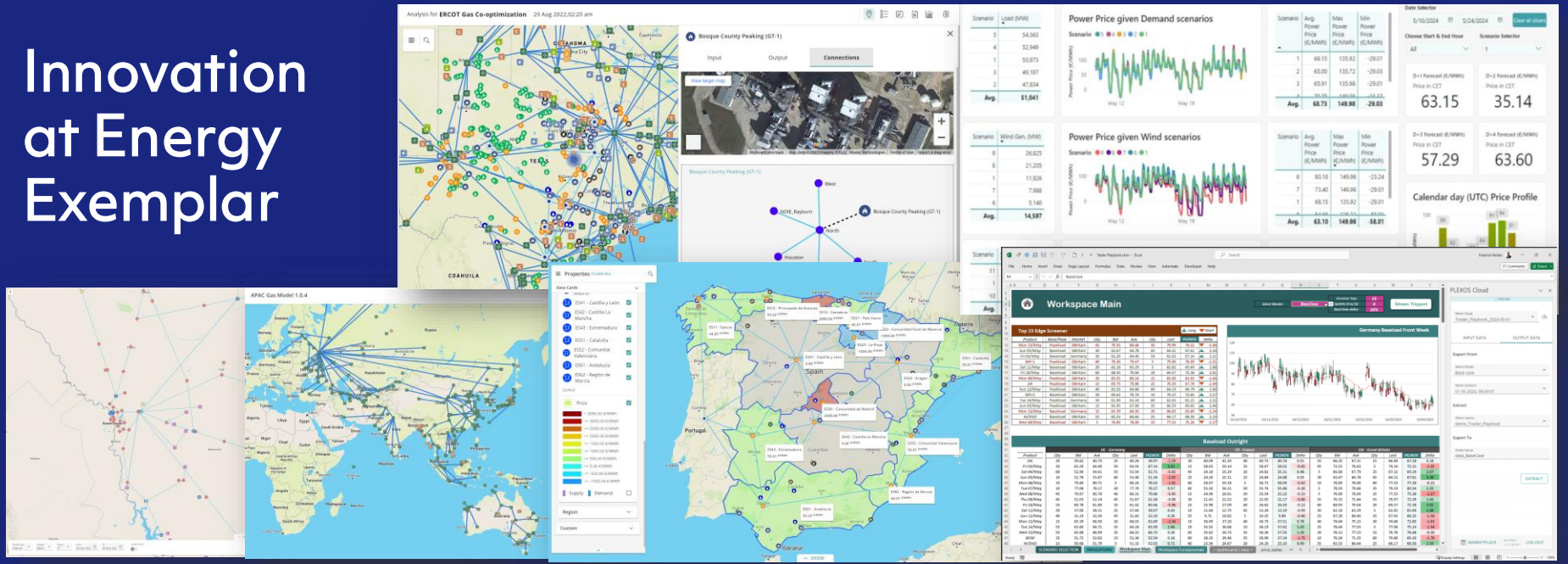
600+
Customers

80+
Countries

200+
Cloud

1 - Conservative as only where we have a paying customer rather than where they are doing analysis

Innovation at Energy Exemplar



300+ Dedicated staff on Product

Significant Expansion of Engine Capabilities

Cloud Simulation and Analytics Expansion

Playbook solutions for specific use cases

PLEXOS Intelligence

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Serving over 50 Transmission and System Operators Globally

Eastern Interconnect

MISO

pjm

New York ISO
Independent System Operator

ISO new england

ieso
Connecting Today.
Powering Tomorrow.

WECC

aeso

CAISO

WECC

ERCOT

ERCOT ISO

GLOBAL SYSTEM OPERATORS

PLEXOS – ISO and Customer Stories Detail

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PLEXOS Use Cases

- Energy Exemplar Website. https://www.energyexemplar.com/
- PLEXOS Website. https://www.energyexemplar.com/plexos
- Energy Exemplar Power and Gas Datasets. https://www.energyexemplar.com/datasets
- Energy Exemplar Use Cases. https://www.energyexemplar.com/blog?tags=Case+Studies
- PLEXOS Publications to Support the Energy Transition around the world. https://www.energyexemplar.com/resources?type=publications

- MISO Nodal Reliability Study (2016).
- MISO/PJM Clean Power Plan Joint Study
- RIIA. Renewable Integration Impact Assessment (2021).
- RASC. Resource Adequacy Subcommittee (2021).
- Non-Thermal Accreditation Reform - Resource Adequacy Presentation
- Evaluating expanding Capacity between Manitoba Hydro and MISO - Case Study and Report
- Regional Resource Assessment (2024): Evaluating how resource mix might change

- PJM Fuel Security Study (2018).
- Energy Transition in PJM (2023).
- Energy Transition in PJM Decarbonizing Grid (2023).
- Clean Attribute Procurement Senior Task Force: Market Scenarios (2023).
- Clean Energy Procurement – Presentation

PLEXOS Use Cases

- Pathways to Decarbonization (2022): Evaluate moratorium on natural gas generation and pathway to zero emissions.
- Reliability Outlook: Energy Adequacy portion of their quarterly reliability outlook

- CAISO TEAM nodal economic transmission evaluation (2004).
- PLEXOS Production Cost Models of the Integrated Resource Planning: 38 million Metric Ton Core Portfolio Models (2022).
- 2024 Summer Loads and Resources Assessment (2024)

- 2021-2040 Outlook: Identifies potential generation mixes to achieve public policy mandates. Highlight opportunities for transmission investment in New York.
- 2023-2042 Outlook:

- EPCET. Economic Planning for the Clean Energy Transition (2022): As a leader in industry trends DER buildout, large scale renewables (offshore wind), HVDC imports, etc., so prepare models/tools/processes so informative and actionable results can be more readily produced for future studies.
- Economic Studies Technical Guide

PLEXOS Overview

Energy Exemplar

What PLEXOS Solves For

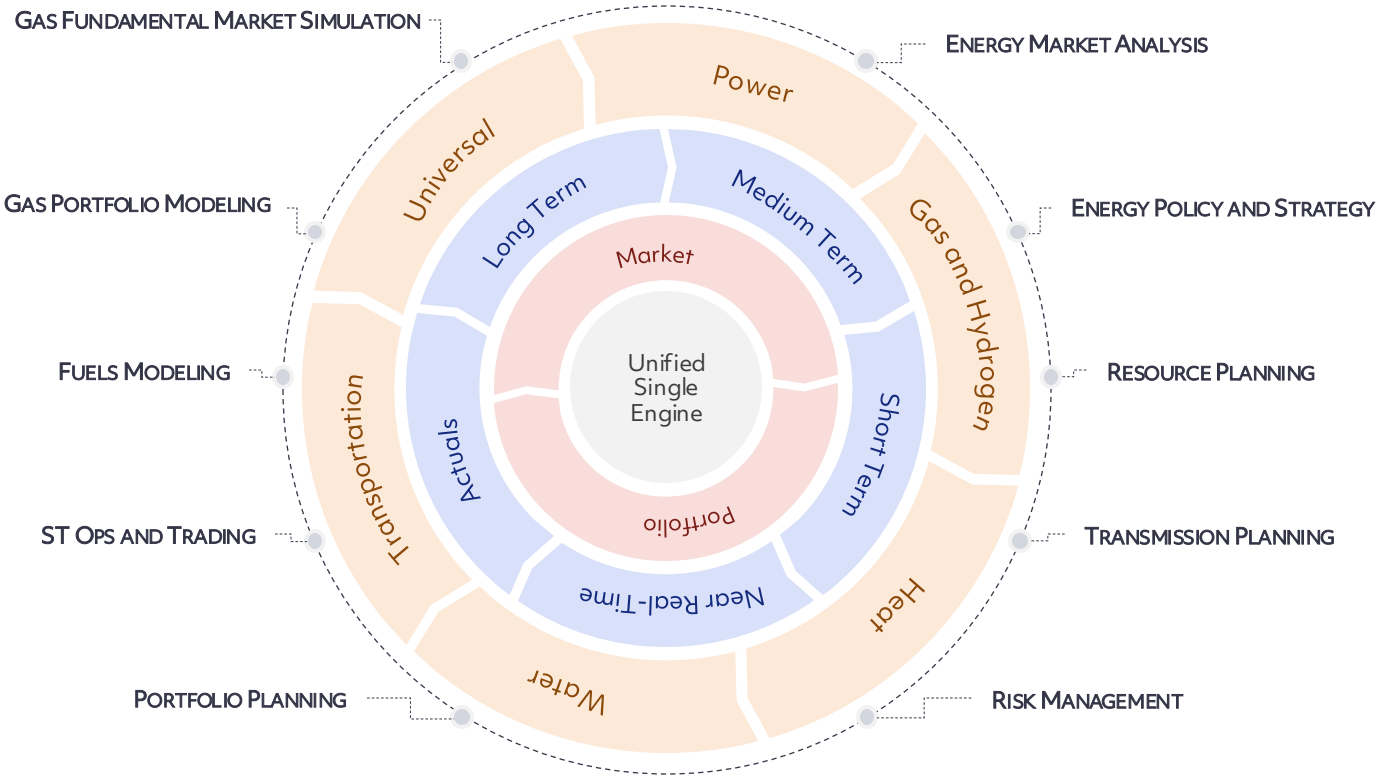
*Our customers are faced with **unprecedented**, complex **challenges** that demand **action**.*

- **Decarbonization.** By transforming data into knowledge, we empower those advancing the energy transition to understand the optimal pathway forward.
- **Energy Security.** Understanding supply scenarios, changes to demand and pricing has never been more critical to energy operations.
- **Digital Transformation.** As technology advances and organizations continue moving into the cloud, they need a powerful and secure way to continue model and simulate.

Energy Exemplar

PLEXOS® Overview

One platform solution for all your energy modeling needs across all commodities and all planning horizons.



Across all Time Horizons

PLEXOS is utilized for minute-by-minute asset level operations to long term planning and budgeting

Distinct Uncertainty Modeling

Deterministic Scenarios
- One optimal solution for each deterministic scenario
- Scenario comparison for decision support

Monte-Carlo Simulations
- One optimal solution for each Monte Carlo sample
- Statistical analysis required for decision support

Stochastic Optimization
- One optimal solution for entire stochastic sample test

Operations
1 Sec › 1Min › 5Mln

- Detailed start-up profile
- Multi-band ramp rate
- CCGT operational constraints
- Group constraints
- Intra-hour portfolio optimization

Day ahead market forecast and portfolio management
30 min › 1 Hour › 1 Day

- Optimized day-a head
- Trading optimization
- Outage modeling
- Technical constraints

Planning and budgeting
1 Week › 1 Mo › 1 Year

- Hydro storage Management
- Optimized fuel planning
- Operational plan for LNG/Gas operation
- Emission accounting and optimization
- 1 M to 2Y optimal operational plan

Capacity expansion and long-term studies
10 Years › 50 Years

- Policy analysis
- Long-term price forecast
- Emerging technologies
- Reliability analysis
- Optimized Investment plan

PLEXOS is a unified multi commodity solution across all timeframes

Energy Exemplar

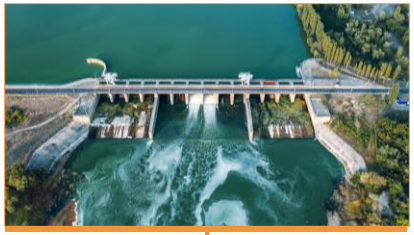
Integration of All Planning Horizons

LT Capacity Expansion

- Capital investments
- Integrated energy model (gas, generation, transmission, storage, hydrogen, etc.)
- IRP
- Optimal expansion build and retirement plan
- Resource adequacy

Reliability

- Projected Assessment of System Adequacy
- Optimal reserve share
- System maintenance and outage scheduling
- FOR Monte-Carlo modeling
- Reliability metrics: LOLE, LOLP, EENS, etc.



MT Planning

- Constraint decomposition
  - Emissions allowances
  - Fuel limits
  - Hydro storage levels
  - Energy storage targets
  - Take of pay contracts
- Resource allocation
- Budgeting
- Risk Management

ST Operations

- Detailed operational optimization
- Unit commitment and economic dispatch
- SCUC and SCED
- Sub-hourly and sub-minute intervals
- Optimal bidding

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Advanced Analytics. Visualization, insights, business intelligence, analytics as a service

Energy Enterprise. Security, workflow coordination, collaboration, PLEXOS Intelligence

LT Strategy & Analysis

Market Analysis & Insights
Price forecasting.
Decarbonization and emissions analysis.

Policy & Regulatory Analysis
Impending policy impacts.
Net zero target, RPS and reliability.

LT Portfolio Expansion
Multi-commodity integrated system and portfolio planning. Energy security.

Investment Analysis
Infrastructure investments, impact of high VER, new technologies, etc.

MT Planning & Govern

Origination & Contracting
MT Analysis and forecasting.
PPA and contract formation.

System Impact Analysis
Transmission modeling and analysis.
Market fundamentals.

Position & Risk Analysis
Sensitivity and stochastic analysis.
Extreme weather events.

Portfolio Planning
Portfolio budgeting, fuel forecasting, maintenance plan, and trading analysis.

ST Tactics & Operations

Short Term Market Analysis
Weather and sector coupling correlation.
Reserve margins.

Portfolio Optimization
Operational plan, updated unit conditions and DERs.

Trading Support
Multi-commodity pricing. Avoided and incurred costs.

Post Analysis
After-the-fact analysis, performance analysis, continuous feedback.

Scenarios. Imagining Multiple Futures

Data. Single Version of the Truth

Electricity | Hydrogen | Gas | Heat | Transport | Water

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What Makes PLEXOS Unique

Delivering value ahead of the industry transformation curve

Unified Energy Model

Wide Range of Use Cases
Horizon integration
Multi commodities
Sector coupling

Advanced Enterprise Platform

Collaboration
SaaS and Hybrid
Cloud Scalability
PLEXOS Intelligence
Robust Modern Integration

Advanced Modeling

Custom constraints
Detailed unit types
P2X, EV, CCGT, Battery,
Cascade Hydro, LDES

Capacity Expansion

Detail Chronology
Large Scale Performance
Transmission expansion
Dynamic ELCC

PCM

Transmission
Congestion analysis
Contingency screener
Kron reduction
Performance

Ecosystem

Training
24/6 Support
Xchange
User Groups

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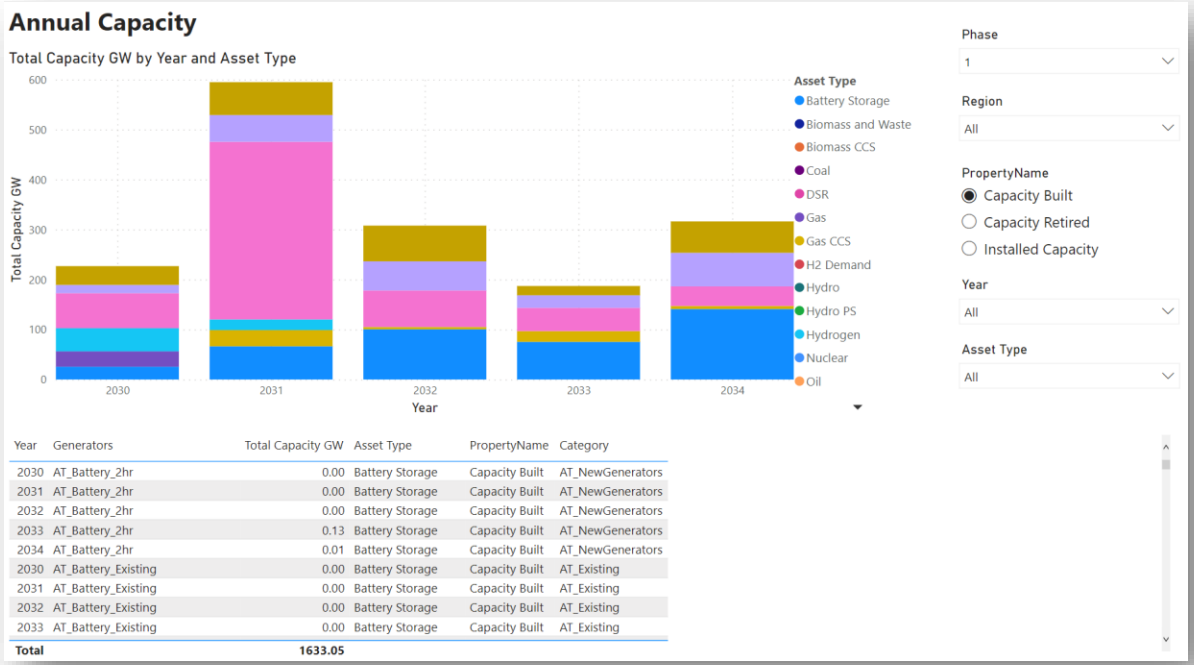
Capacity Expansion

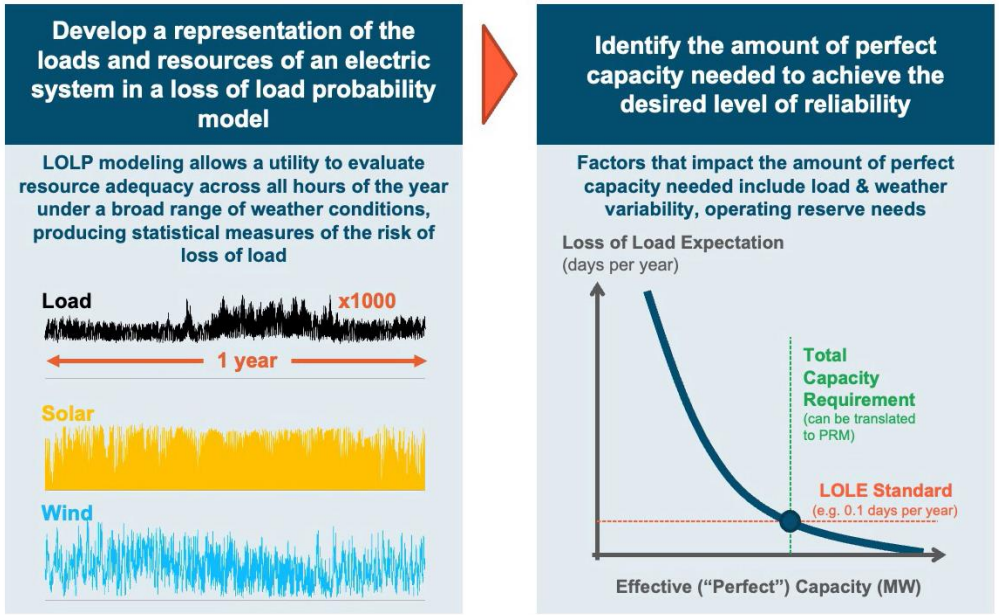
- Generation, Ancillary Services, Transmission, and fuel infrastructure
- Emerging technologies, hybrid resources, nodal transmission
- Flexible modelling constraints, such as RPS targets, regional constraints, asset specific constraint, etc
- Scenario Analysis and uncertainty modeling



Year	Generators	Total Capacity GW	Asset Type	PropertyName	Category
2030	AT_Battery_2hr	0.00	Battery Storage	Capacity Built	AT_NewGenerators
2031	AT_Battery_2hr	0.00	Battery Storage	Capacity Built	AT_NewGenerators
2032	AT_Battery_2hr	0.00	Battery Storage	Capacity Built	AT_NewGenerators
2033	AT_Battery_2hr	0.13	Battery Storage	Capacity Built	AT_NewGenerators
2034	AT_Battery_2hr	0.01	Battery Storage	Capacity Built	AT_NewGenerators
2030	AT_Battery_Existing	0.00	Battery Storage	Capacity Built	AT_Existing
2031	AT_Battery_Existing	0.00	Battery Storage	Capacity Built	AT_Existing
2032	AT_Battery_Existing	0.00	Battery Storage	Capacity Built	AT_Existing
2033	AT_Battery_Existing	0.00	Battery Storage	Capacity Built	AT_Existing
Total		**1633.05**			

Resource Adequacy

- Within Capacity Expansion
  - Appropriate Chronology to handle "energy adequacy"
  - Reserve Margins
- LOLE runs – PASA & ST
  - Resource Adequacy
  - Monte Carlo
  - Multiple risk metrics – LOLP, LOLE, EUE, EUE Hours
- Stress testing – extreme events



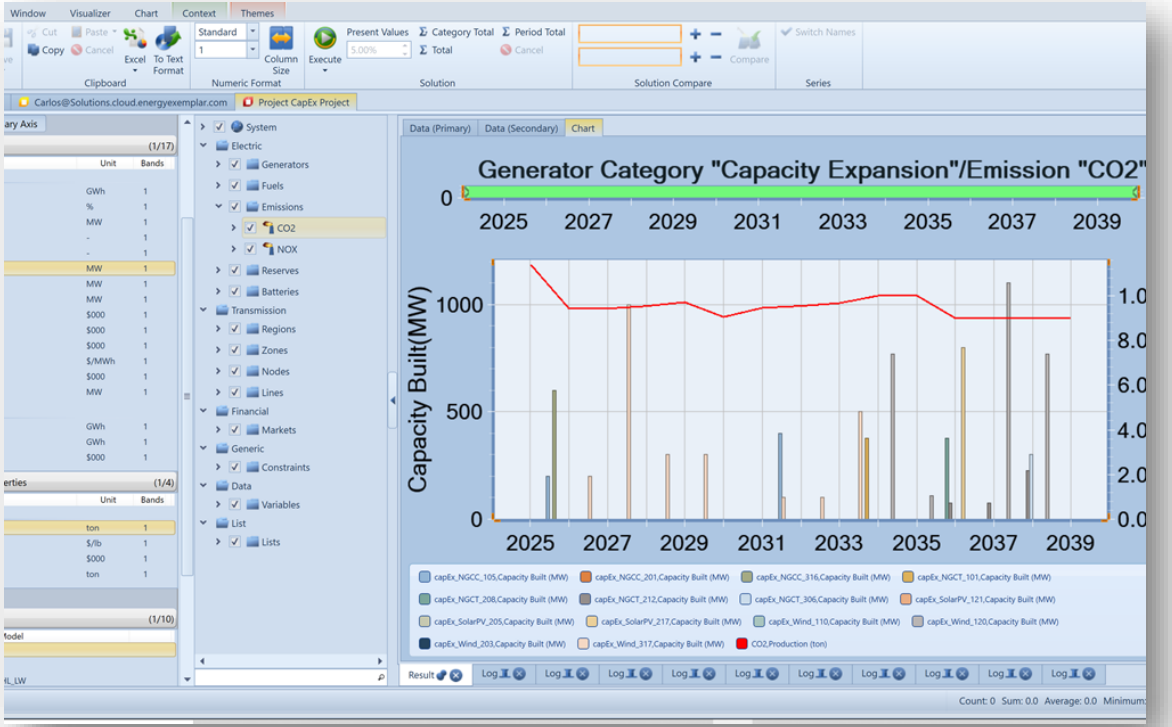
Decarbonization and Energy System Transition

Scenario Based Analysis
- Impact of Policy Decisions
  - Decarbonization targets
  - Subsidy schemes
  - Technology retirement impact

Key Outcomes
- New technology build schedules
- Existing asset retirement schedules
- Total installed capacity by technology
- Total generation by capacity

Examples of market behaviors
- Electrification / gasification of new sectors
- Market responses to geopolitical situations (e.g. Russian gas off)

PLEXOS provides visibility into every outcome of the market



Nodal Capabilities

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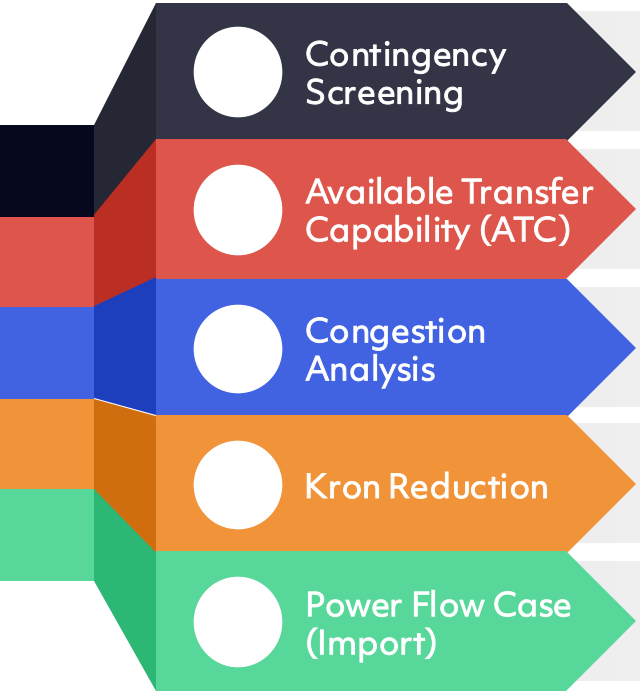
PLEXOS Nodal Modeling Strengths



Contingency Screening	Due to the energy transition, today's constraints may not be suitable for the future power flow years. Contingency screening enables users to filter out non-applicable contingencies and identify new mon-con pairs for the future power flow years.
Available Transfer Capability (ATC)	ATC allows the user to help identify specific nodes' injection and withdrawal capacity. This helps load centers (like data centers, and bitcoin mining) and developers looking to site resources pick out suitable nodes for their assets.
Congestion Analysis	In-house tool offering helps the client identify and understand what is contributing to congestion cost, what is alleviating congestion, and what are the binding constraints.
Kron Reduction	A unique modeling capability enables users to scale down the system to a specific region of interest to run detailed PCM while keeping the external market transactions (generation, load, flow transfer) capabilities.
Power Flow Case (Import)	PLEXOS can successfully import updated power flow cases (.raw files) and map the transmission topology (i.e. buses, transmission lines, transformers) to the existing database.

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Kron Reduction

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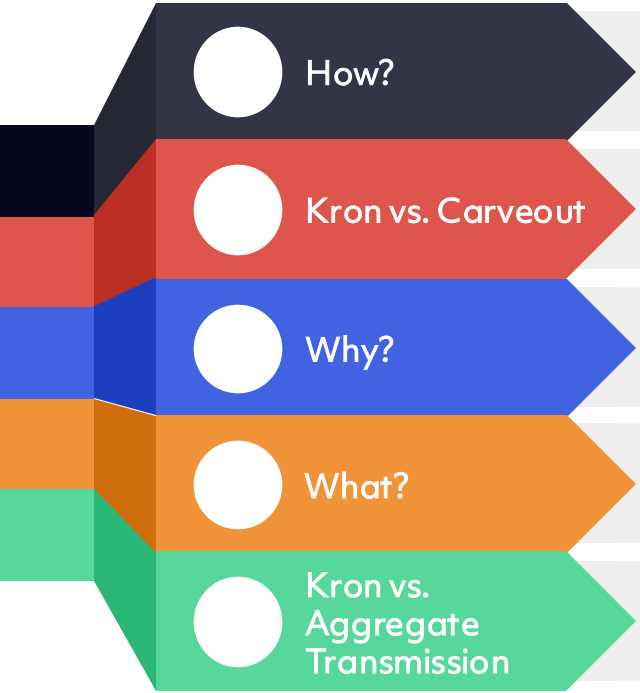
Kron Reduction



How?

Enabled in the **Region Class**

Kron vs. Carveout

Kron accounts for the effect of **the transmission lines removed** at the boundaries of **the area of focus:** Virtual **lines,** Virtual **markets**

Why?

Flexibility and **Performance**

What?

A unique modeling capability enables users to **scale down** the system to a specific **region of interest** to run detailed PCM while keeping the **external market transactions** (generation, load, flow transfer) capabilities.

Kron vs. Aggregate Transmission

While aggregate transmission is considered to be equivalent to a **transportation model**, Kron Reduction ensures the **network physics** are kept **intact**.

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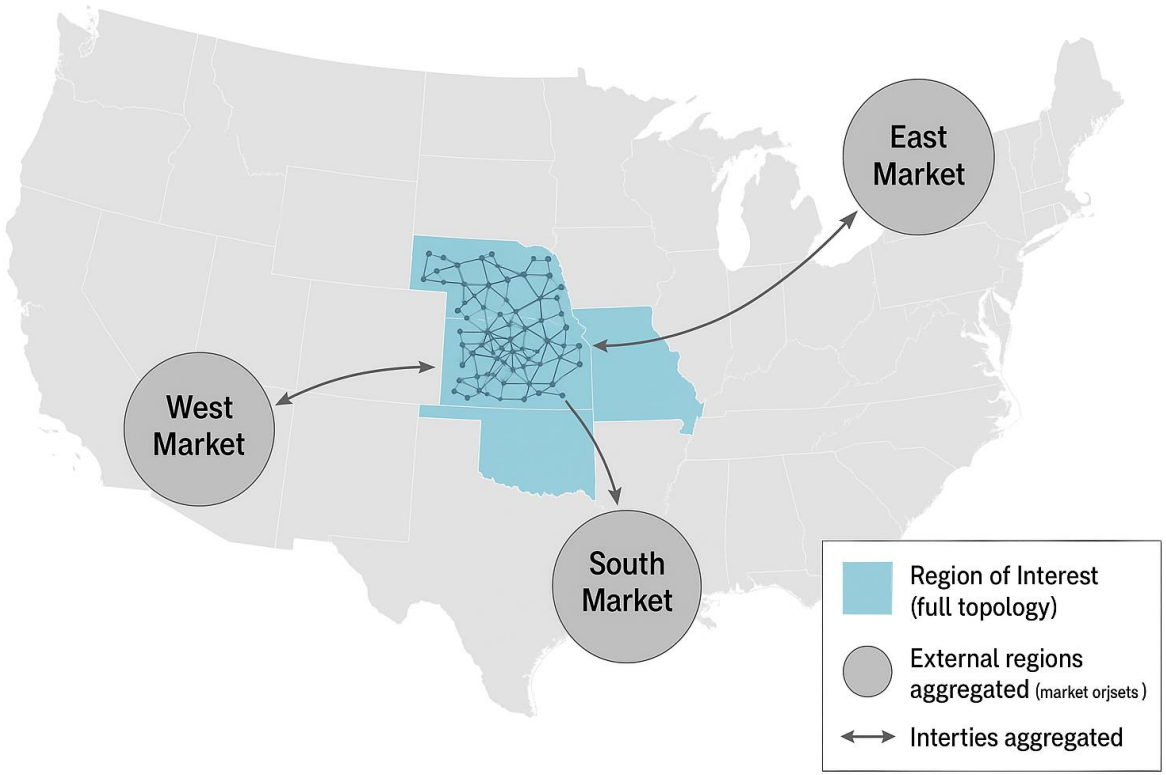
Kron Reduction Highlights

- Network reduction with physics retention
- Scalability, Performance and Flexibility
- Preservation of boundary conditions



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Congestion Analysis

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Congestion Analysis with PLEXOS®

What the platform provides

A comprehensive planning solution that translates grid physics into clear, actionable business insights.

Full coverage of all nodes and interconnection points across the system, capturing both injections and withdrawals.

Support for both interval level and long-term summary views for a complete picture of congestion.

Detailed, defensible reports including system congestion, nodal cost breakdowns, and contributors to constraints, that withstand regulatory and investor scrutiny.

Scalable performance that can handle complex power systems while remaining exportable for reporting purposes.

A single platform that serves planners, developers, operators and traders with output tailored to each decision maker's needs.

PLEXOS® provides **one unified platform to understand congestion risk** and turn it into opportunity

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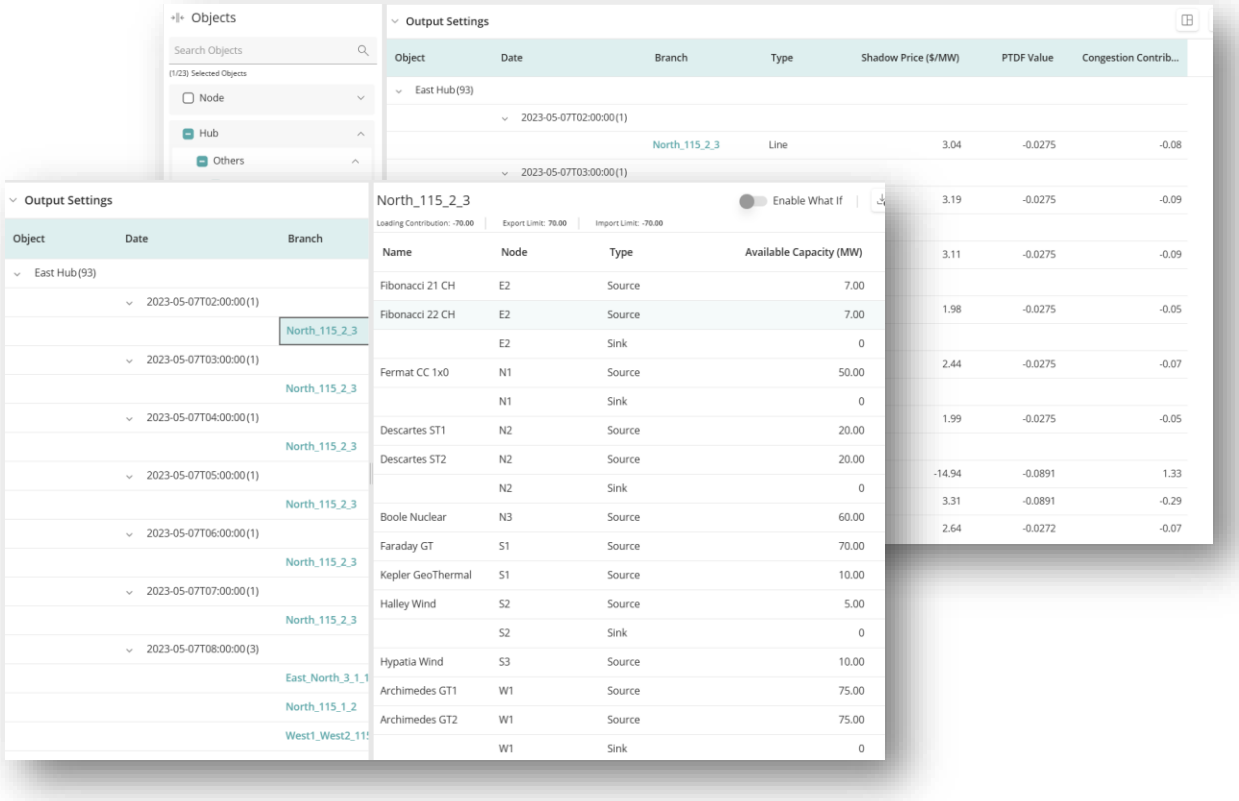
PLEXOS® Congestion Analysis: 8760h Node-level Insights

- **See congestion drivers instantly,** track contributors and alleviators at any node or hub, hourly and across the year (8760h).
- **Spot top helpers and harmers,** pinpoint assets most impacting congestion on lines or transformers.
- **Compare congestion across models,** analyze node and hub congestion side by side.
- **Run "what-if" scenarios,** test how generator dispatch changes affect congestion.
- **Get started quickly,** with the included Xpert primer.



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Available Transfer Capability

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Available Transfer Capability (ATC)

By definition, ATC is the **amount of power** that can be **reliably transferred** through a transmission **network** or a **substation without the need of any upgrades**.

The results of this calculation help us understand what the **injection** and **withdrawal** capacity is with respect to substation.

Business use cases for ATC include **site selection** for generation, batteries, datacenter loads and other flexible loads (i.e., bitcoin mining). Additionally, ATC helps understand potential **cost-savings** to avoid network upgrades.

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Components Required to get to ATC

Factors Influencing ATC

Network Constraints:

The physical limitations of transmission lines, transformers, and other grid components can impact ATC.

Contingencies:

ATC calculations often consider the ability of the grid to withstand equipment failures or unexpected events (contingencies) without violating reliability criteria.

Generic Transmission Constraints:

GTCs can often refer to interfaces containing multiple transmission elements and having an overall limit value on the whole interface instead of individual circuits.

Grid Conditions:

Weather Patterns
Load Forecast
Generation Dispatch

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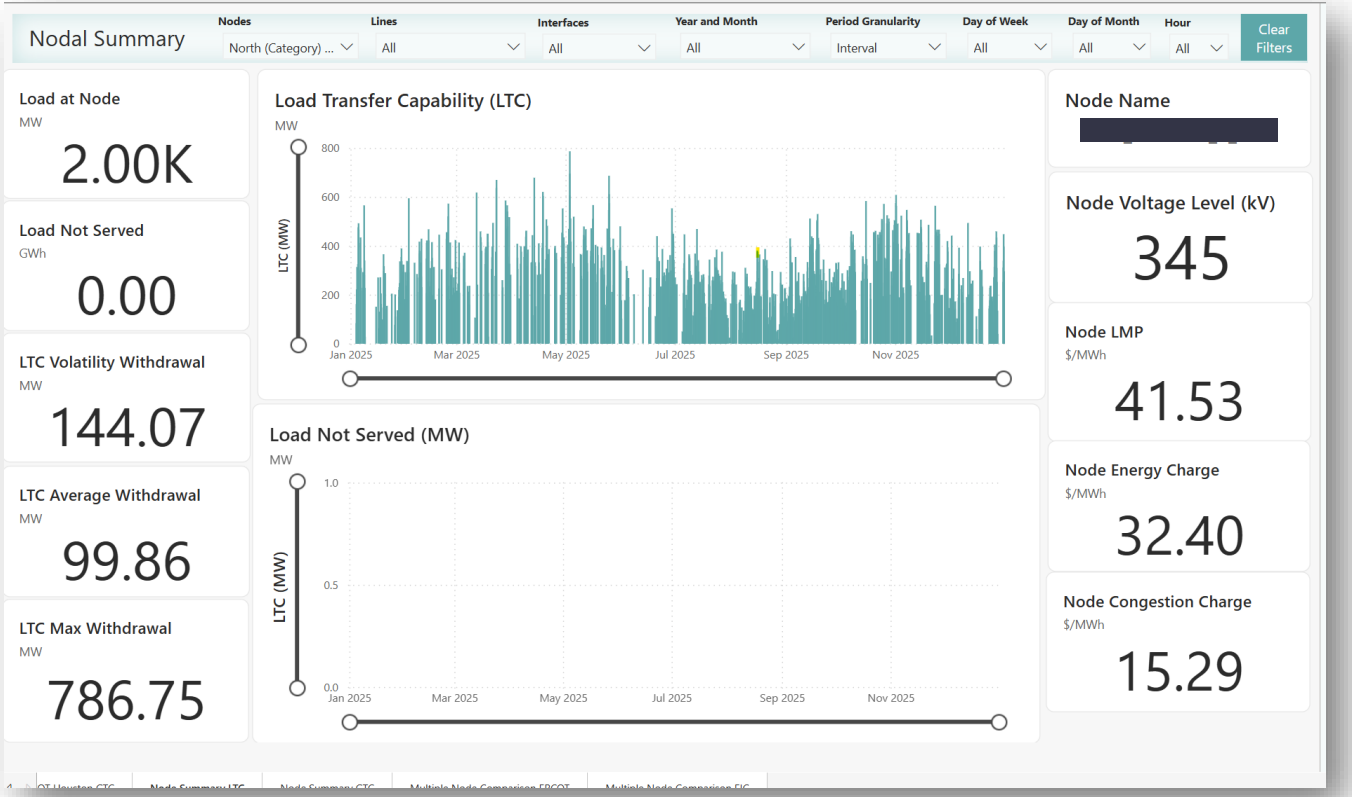
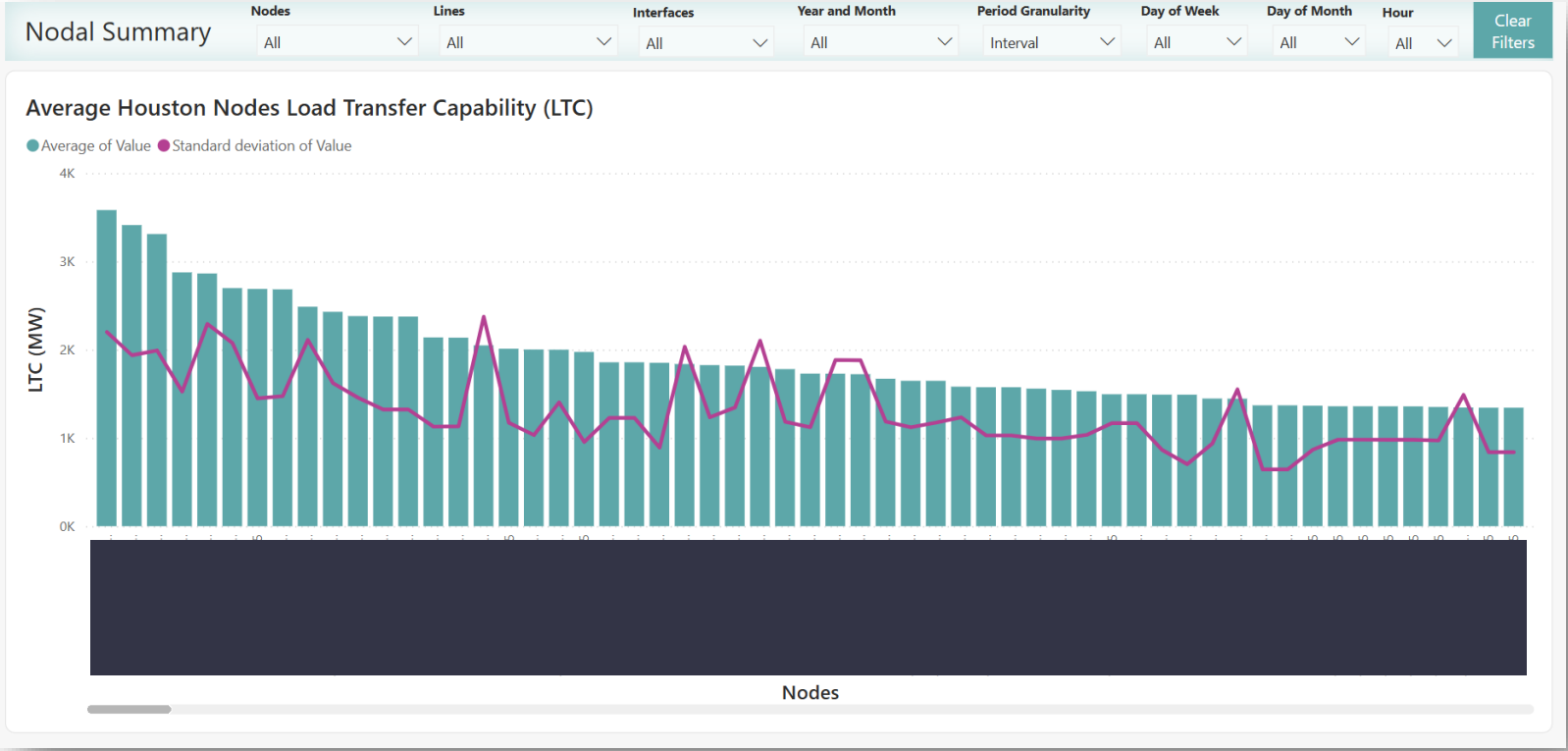
Load Transfer Capability Example



Load Transfer Capability Example



Contingency Screening

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Contingency Screening

Why is contingency screening needed?

Monitored-contingent elements drive up simulation time

Current contingencies are not applicable for future year transmission planning

Screening contingencies requires other software tools

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Advanced Platform

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PLEXOS Cloud – Advanced Platform

Optimized Simulation Monitoring

Configure your optimal simulation settings, easy monitoring of long-running simulations and cancel anytime

AI Support Assistant for Analysts

Generative AI tool that provides product support

Easy Editing and Model Management

Edit and analyze output directly in Excel. Improved editing and model management capabilities on cloud. Foundation for Playbook configurable interface

Extended Automation & Integration Tools

Python and C# SDKs

Improved Documentation

Flexible Reporting & Analytics

Integrated capabilities to visualize data in charts, maps and grid. Aggregate your key output tools on a single Dashboard

Most Affordable Entry Point

Lower entry point for Cloud vs on-premise

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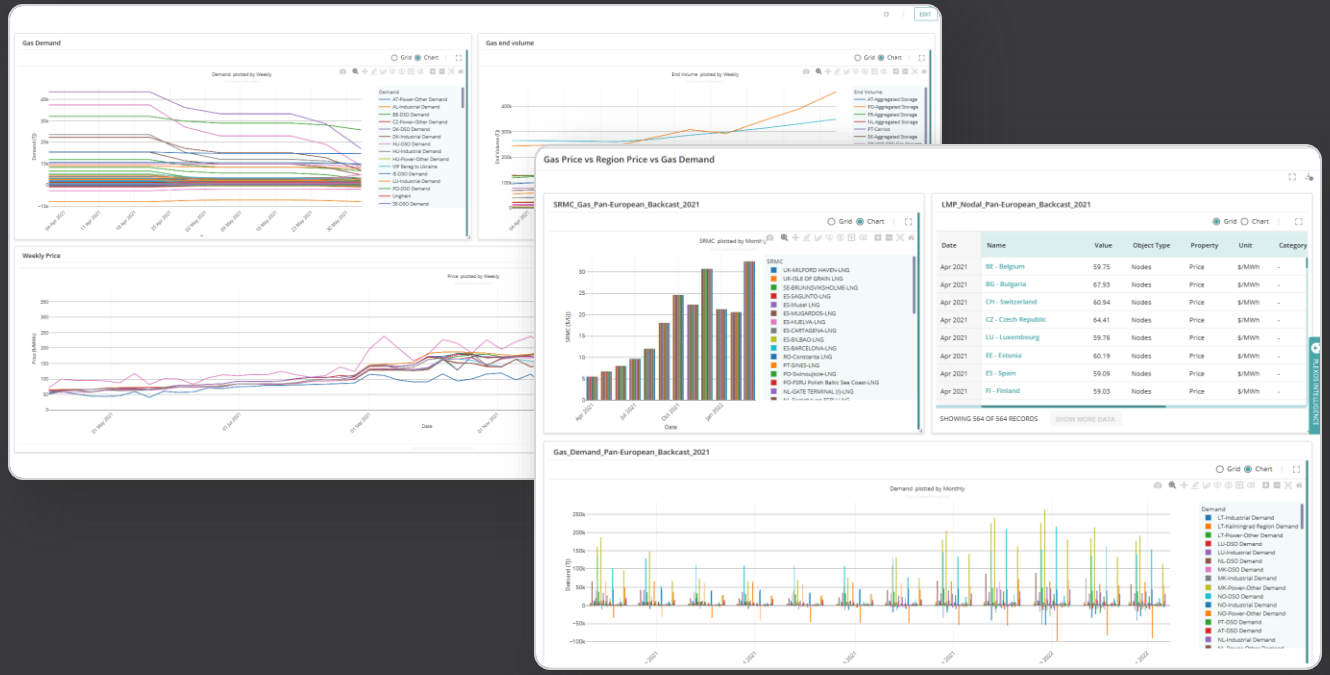
Aggregate all your Key Output Analysis Tools in a Dashboard



Publish to stakeholders and executives

- Add charts, grids, and BI Reports to a single Dashboard
- Create and reuse across Models and Studies
- Rerun your Model and see all your metrics in one place
- No Coding Required
  No need to export data to separate tool

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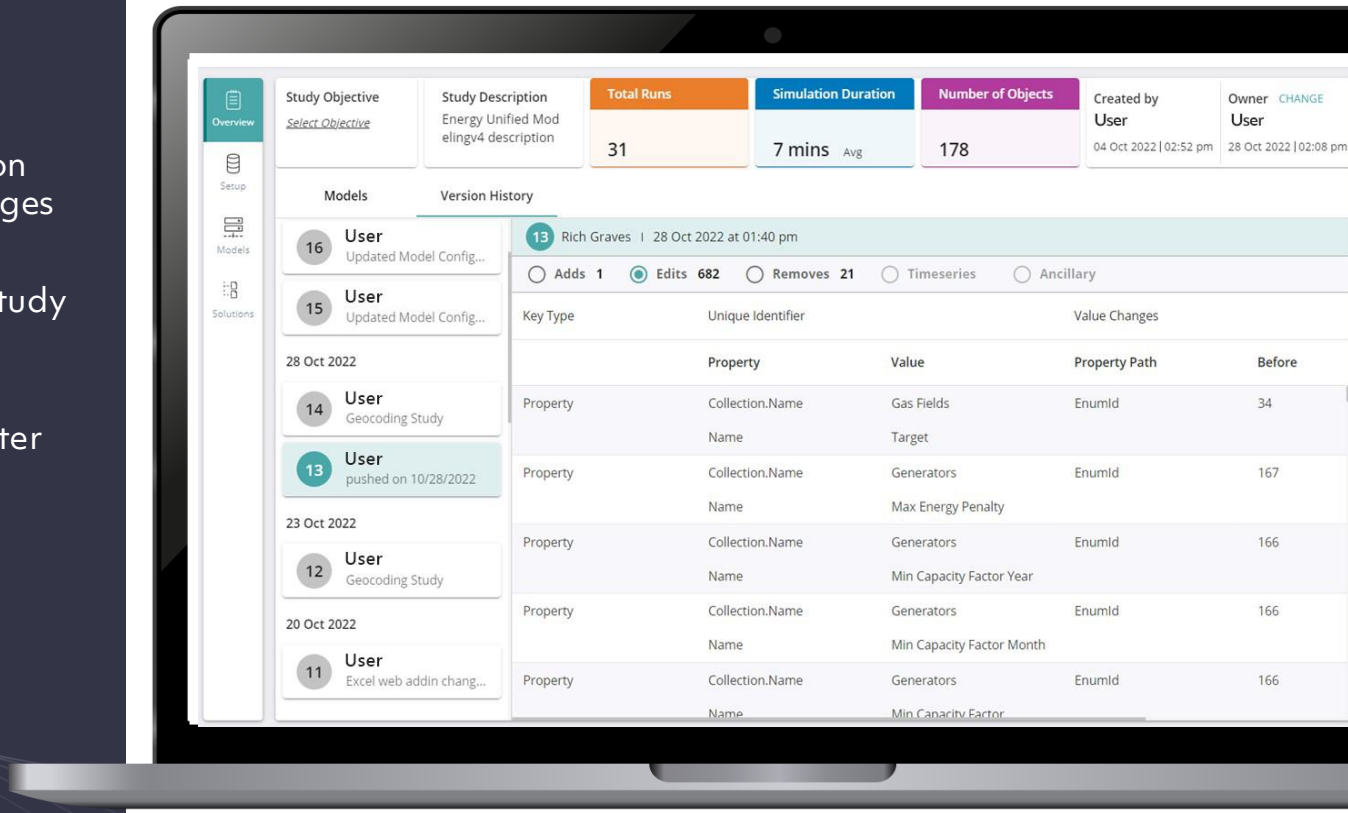
Version Control

- Simultaneously collaborate on the latest run and track changes made by others
- Easily trace the history of a study and roll back to a previous version, when needed
- Automatic backup and disaster recovery



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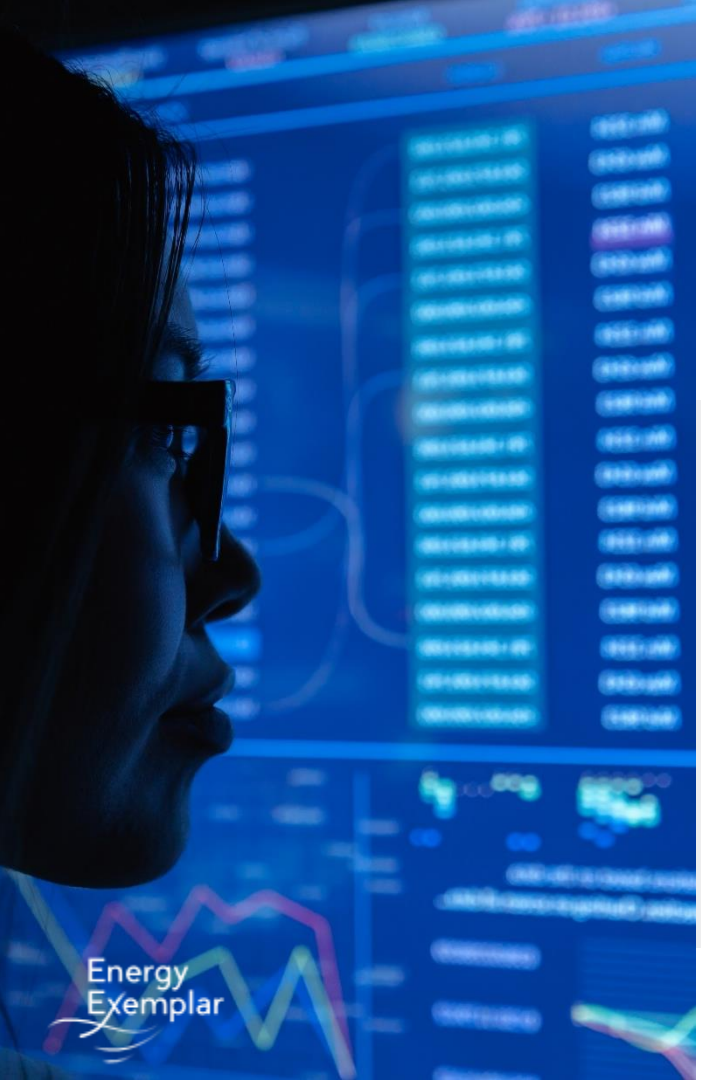

Safe & Secure

End-to-end security has never been more important, and PLEXOS Cloud provides world-class security. With PLEXOS Cloud, data is secure, backed-up, and totally recoverable. In other words, it's disaster proof

Here's how PLEXOS Cloud protects your data:

- Hosted on Microsoft Azure
- Recurring security scans, penetration testing, and vulnerability testing performed by a 3rd party
- Single Sign-On (SSO) authentication to integrate with existing organization access
- 24x7 Application Monitoring, Security Monitoring and Support
- **SOC 2 Type II Certification**
- Multi-region fault-tolerant redundancy
- Business Continuity SLA– **RPO**-4Hr **RTO**-24Hr
- Status page to view real time status, incidents, and notifications on planned maintenance
- Recurring backups and disaster recovery
- Each customer has their own tenant, no other customer can access that tenant
- Enterprise Grade security- Data encryption in transit and at rest Additional tenant level data encryption
- ISO 27001 Certification

PLEXOS® Intelligence Overview

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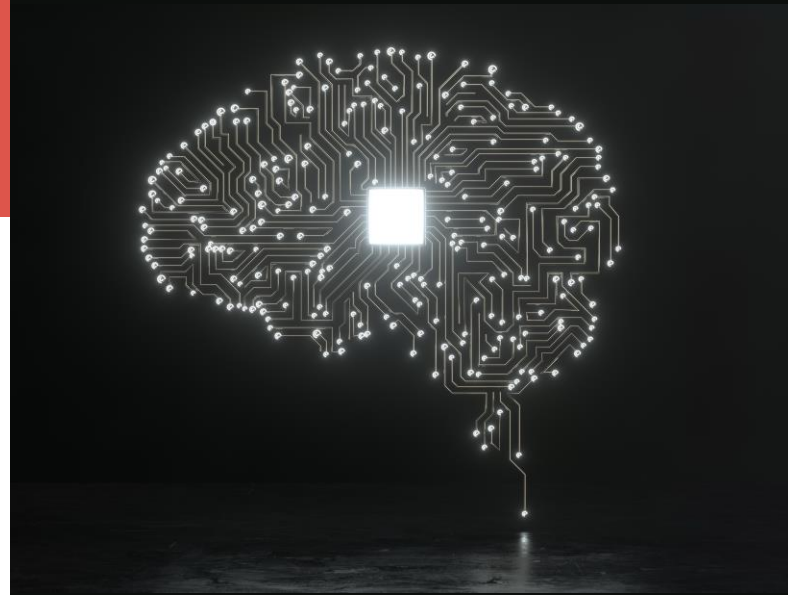
PLEXOS® Intelligence: AI built for energy optimization

PLEXOS Intelligence is an integrated suite of AI agents designed to accelerate decision making.

The agents assist, analyze, and automate modeling workflows within the PLEXOS platform.

- Simplifies complex modeling for faster understanding and decision making
- Automates workflows, saving time and manual effort
- Expands access for non-modelers
- Delivers regional market intelligence tailored to specific users



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Meet PLEXOS® Intelligence

A suite of AI agents that assist, analyze, and automate across the modeling lifecycle

1

Support Assistant
Ready to Use

- Instant solutions for simple and complex PLEXOS® queries
- **Delivers faster support, freeing up experts to focus on high-impact issues**

2

Digital Analyst
Ready to Use

- Partners with real-life analyst to automate time-consuming tasks
- **Accelerates modeling workflows and maximizes analyst productivity**

3

Automation Agent
Launches in November

- **Builds Python scripts to automate key workflow steps**
- **Simplifies building automation for the platform**

4

Market Expert
In Early Access

- Designed and trained for a specific use-case or market
- **Empowers users with deeper analysis grounded in real-world market logic**

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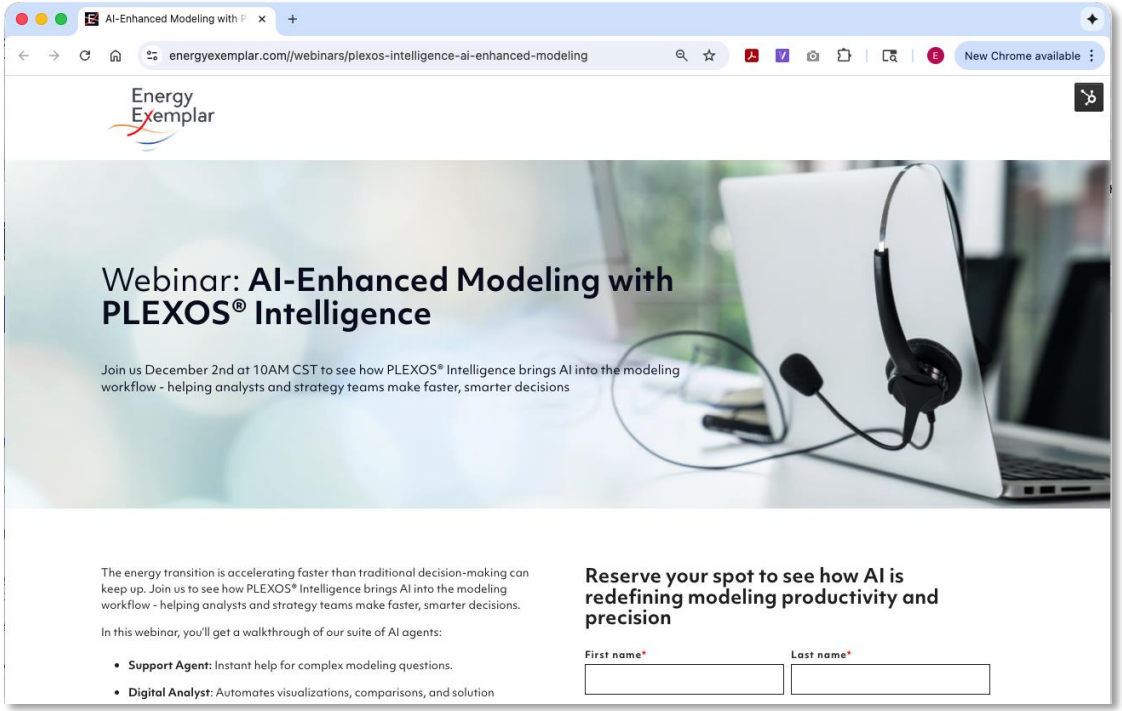
PLEXOS ®Intelligence Webinar

Helping analysts and strategy teams make faster, smarter decisions



December 2nd @10am CT

For clients & prospects

Hosted by EE Product / Rich Graves

Key Learnings:

- Save hours with AI-driven support, modeling, and analysis
- Create visualizations and summaries instantly with Digital Analyst
- Script faster in Python using Automation Agent
- Get real-world insights with Market Expert

Register on energyexemplar.com/events

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PLEXOS® Simulation-Ready Datasets

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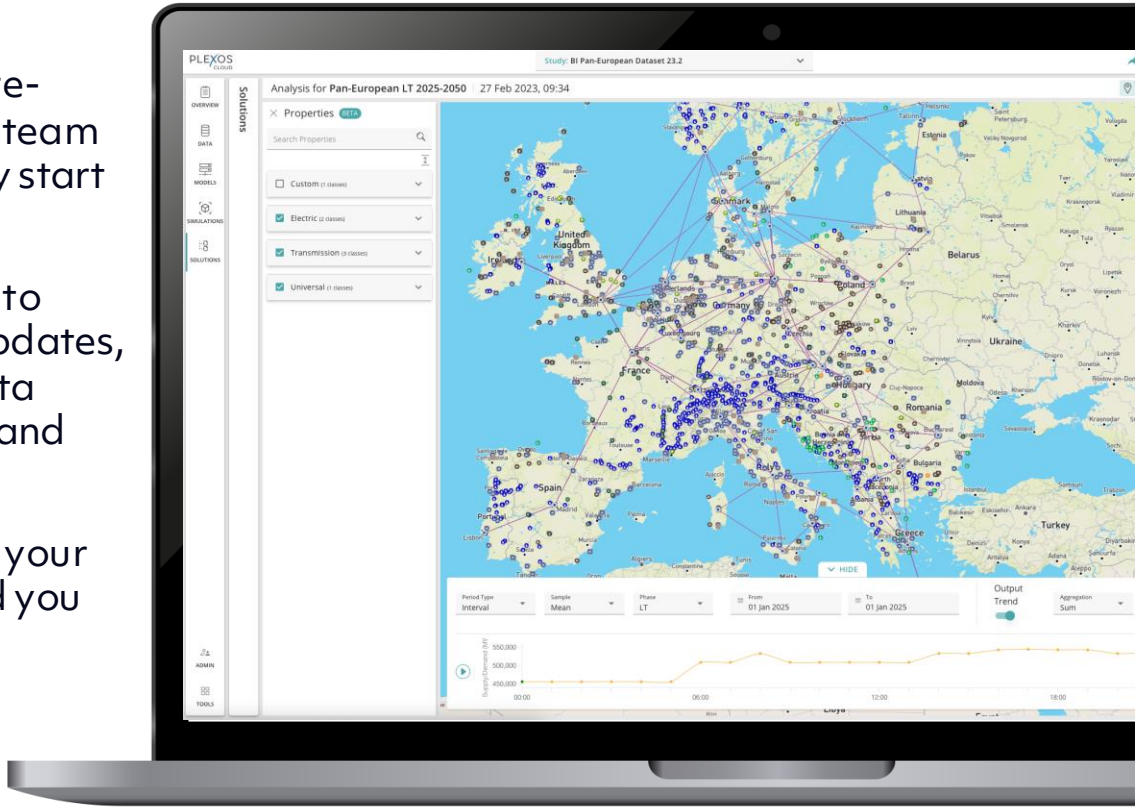
Energy Exemplar Simulation Ready Data

Our Simulation Ready Datasets are pre-made for you by our dedicated global team of experts so that you can immediately start modeling with confidence in PLEXOS.

Energy Exemplar's datasets are made to easily overlay, maintain proprietary updates, and incorporate the latest industry data from public sources, regional entities, and government agencies.

By using our datasets, the accuracy of your simulations will never be an issue – and you won't have to devote precious time and money to building your own.

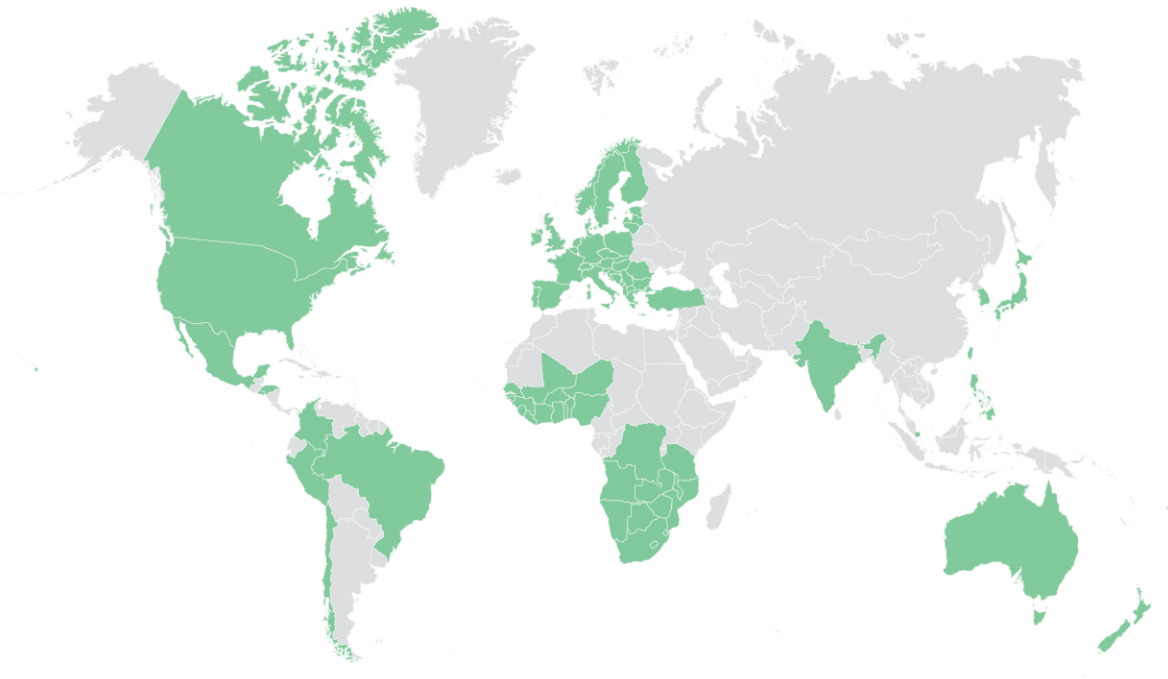


Dataset Coverage

Currently
36 Power and Gas Datasets are available

Covering over
50 countries

Approximately
64% of total electricity demand*



*BP World Statistics book; excludes China

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North America PLEXOS Datasets

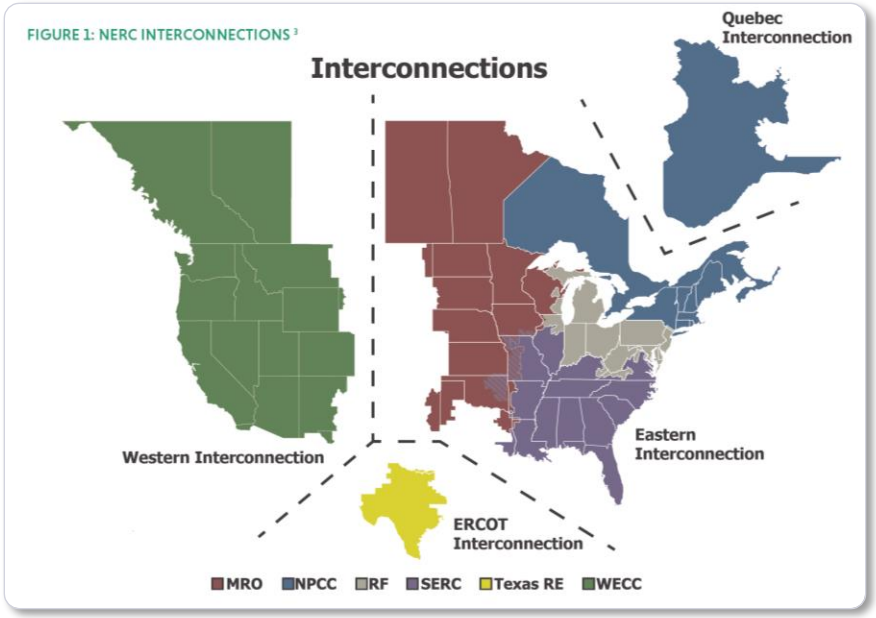
Exclusively Use Public Data Sources
- Convert data sources to model-ready format

Extensive Validation Process
- Backcasting
- Long-term Capacity Expansion
- Forecast validation

Dataset Includes:
- Data supporting forecast simulations through 2054
- Preconfigured use cases (Backcast, LTCE, Forecast)
- Historical data used for Backcasting
- Complete documentation

Nodal Dataset
- EIC Release v25.7: MMWG 2026, 2027, 2029, and 2034 (Summer Cases)
- ERCOT v25.7: SSWG 2025-2031 (Summer cases)
- WECC v25.4 – ADS Cases 2025,2030,2035 (Summer Cases)
- Evaluated with PSSE/Powerworld for power flow consistency

Heavily value client feedback and requests



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Q & A

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Thank You!

Sri Harika Kuppa

Sri.harika.kuppa@energyexemplar.com

Mark Doolin

Mark.doolin@energyexemplar.com