PLEXOS

by **Energy Exemplar**

GAS

Model Every Opportunity as
the World Transitions to a
Low Carbon Future

PLEXOS® is a powerful simulation engine that provides analytics and decision-support to modellers, generators, and market analysts—offering flexible and precise simulations across electric, water, gas and renewable energy markets.

What Does PLEXOS® Do?

It's easy to be overwhelmed with the volume of data available and rate of change the energy industry is currently experiencing.

That's why Energy Exemplar built the most powerful energy modelling engine on the market to provide analytics and decision-support to modelers, generators, and market analysts.

PLEXOS® gives you the power to unify all your data streams – in any granularity – into a single, unified energy modelling and forecasting platform. Its powerful simulation engine analyses zonal and nodal energy models ranging from long-term investment planning to medium-term operational planning and down to short-term, hourly, and intra-hourly market simulations.

While other simulation software only models energy markets separately, PLEXOS allows you to understand the market variations across the entire energy landscape. The result: a co-optimised, interdependent energy market simulation that enables you to uncover hidden value.

Who Uses PLEXOS®?

PLEXOS is built to serve the entire energy industry ecosystem.

Trusted globally by governments, regulators, system operators, researchers, utilities, power producers, developers, retailers and traders, PLEXOS provides our customers greater ROI through deeper insights than any other platform on the market.

- IoT Data Analysts
- Energy Market Analysts
- Mid office Planning Analysts

- Fuel Procurement
- Operators
- Risk Managers

- Generation Planners
- Transmission Planners
- Researchers
- Gas Planners

- Marketers
- Traders
- Consultants

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PLEXOS® is the only simulation software that has ultra-high definition modelling capabilities encompassing electric, gas, and water systems.

Globally, Gas Planners, Analysts and Operators use PLEXOS to account for hundreds of variables to reflect real-life constraints and uncertainties.

ONLY PLEXOS HAS THE PROVEN TRACK-RECORD TO OPTIMISE YOUR GAS AND POWER TOPOLOGY.

The transition to a lower-carbon economy is driving the evolution of gas supply planning and power planning needs. Taking a whole system view to optimise both gas and electricity creates new insights and opportunities compared to the legacy approach. You can now master the management of fuel types, capacity, and planning across your organisation and eliminate the frustration of silos.

Today, PLEXOS users make the most accurate simulations and take the most profitable actions to fully realize the benefits of natural gas.

PLEXOS Gas models deliver co-optimization across multiple commodities. You can use PLEXOS to either combine disassociated planning groups or eliminate the iterative planning approaches of the past.

With PLEXOS, you can configure the complete electric topology, zonal or nodal, as well as the complete gas topology from the wellhead to the city gate. This holistic approach to topology

and constraints ensures that gas generation is run only when economical while maintaining the reliability requirements of the gas distribution system, including storage targets.

Model your system with physical constraints or contractual constraints, while including external markets for both power and gas. Conduct studies such as:

- Reliability requirements for delivering gas

- Right-sizing for supply, storage, and transportation contracts given gas and power demand

- Profit maximization of excess fuel and capacity

- Renewable generation impact studies to serve both power and gas demand

- Storage injection and withdrawal target optimisation given both power and gas demand

- Capacity expansion studies

- Policy analysis setting CO_2 targets.

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Gas Planning

Gas planning ensures that the right supply of gas is available to meet an ever-changing demand.

Your stakeholders, regulators, and customers need to rely on gas supply from wellhead to burner tip – encompassing gas contracts, transportation contracts, storage fields, LNG gasification, and liquefaction plants.

The complexity of capacity planning means you need a robust solution that can model the short-term, hourly decisions through multi-decade expansion plans.

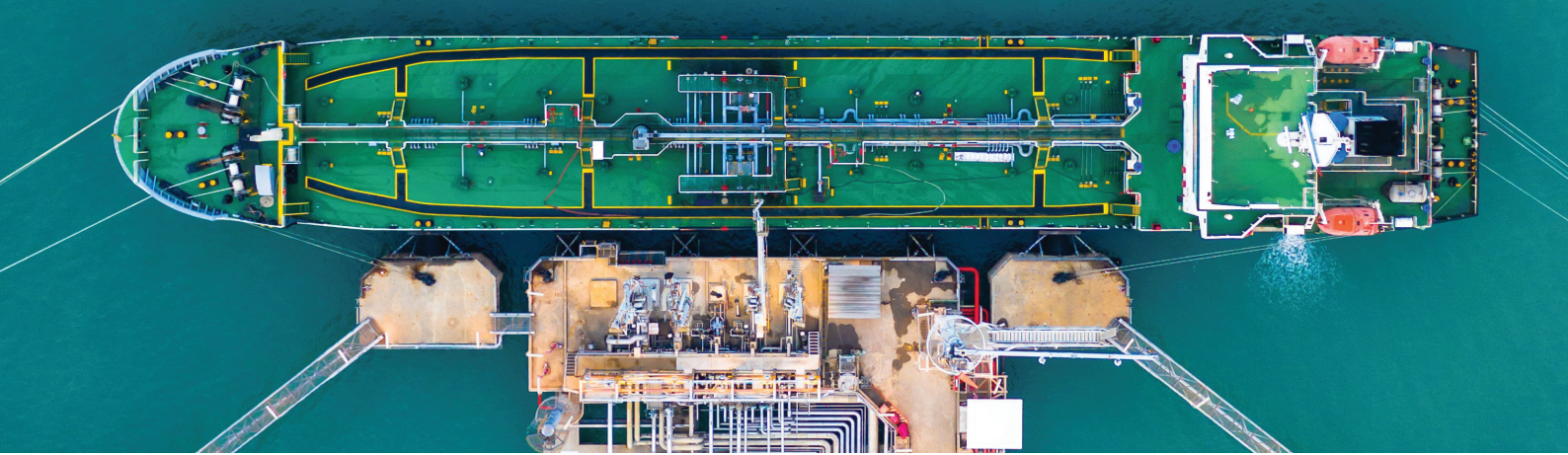## HOW CAN PLEXOS HELP YOU MAKE SHORT-TERM AND LONG-TERM DECISIONS?

PLEXOS Gas runs complex expansion studies from monthly interval data down to short-term remainder-of- month gas dispatch in hourly or sub-hourly resolution.

- Design year, peak day, or mild year scenario analysis
- Optimal storage dispatch
- Right sizing storage, transportation, and supply contracts

- Long-term capacity expansion studies
- Rate adjustments
- Off-system sales and capacity release
- Capacity hedging strategies

PLEXOS modelling features that will help drive your decision-making insights:

- Gas supply contracts
- Gas transportation contracts
- Gas storage contracts including storage ratchets
- Gas demand
- LNG terminals and shipping
- Physical wellheads, pipelines, and storages

- Gas markets
- Monthly, weekly, daily, and hourly intervals
- Scenario analysis
- MILP, relaxed MILP, and LP
- Stochastic analysis
- Distributed processing
- Built-in reporting

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LIQUIFIED NATURAL GAS

LNG is the present and future of global power and heat.

Natural gas price fluctuations, greater supply options, and off-system market sales are already impacting every power and gas utility. Ensuring reliability of LNG supplies and transportation is a recent challenge that comes with reduction in 30-year take or pay contracts, which increases the risk when siting new ports, gasification and liquefaction plants.

With the shale boom in the US, decommissioning of nuclear facilities in Japan, and energy growth in southeast Asia, LNG has become the global fuel. It is actively replacing legacy generation.

HOW PLEXOS HELPS YOUR LNG EXPANSION PLANNING

PLEXOS Gas gives you a suite of simulation tools to model contractual risk, review cargo diversion options, and conduct siting studies to ensure market conditions support capacity, location, and timing.

- Supply chain optimisation
- Cargo diversion
- LNG price forecasting
- Siting
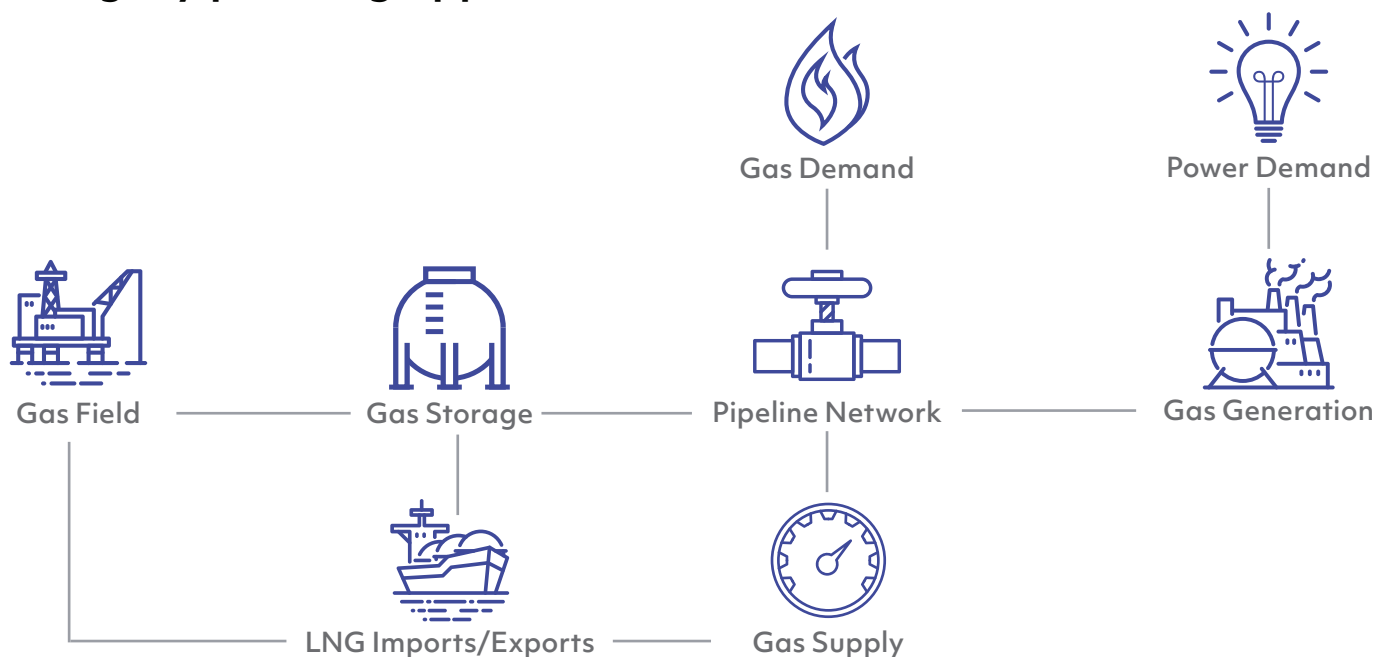- Expansion planning
- Policy impact

PLEXOS Gas supports all the aspects you need to model LNG including:

- Gas contracts
- Gas storages
- Gas plants
- Gas transports:
  - Voyage time
  - Loading time
  - Discharge time
  - Shipping charges
  - Boil off

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PLEXOS Gas provides the most robust modelling available in the market, unmatched by any other solution.

Ensure that all costs and constraints are met for both power and gas across your system.

PLEXOS Gas is the next-level planning tool that moves you from spreadsheet models, load duration curves, home grown models, or legacy planning applications.

Gas Demand

Power Demand

Gas Field — Gas Storage — Pipeline Network — Gas Generation

LNG Imports/Exports — Gas Supply

Questions that can be answered with PLEXOS Gas:

- ✓ What is the most economical plan to meet all my demand requirements and storage targets accounting for transportation and supply constraints?

- ✓ What contracts should I expand to meet future demand growth assumptions?

- ✓ Should I evaluate hourly storage contracts?

- ✓ When should I be injecting and withdrawing gas from my storages?

- ✓ Can I sell excess capacity or gas to a market?

- ✓ What happens in spring with a cold snap? Is there enough gas in storage to generate power and serve heating demand?

Ready to get started with PLEXOS Gas?
Schedule a meeting with one of our experts.

https://www.energyexemplar.com/talk-with-expert

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Energy Exemplar is the industry leader in energy market simulation software. Our software suite, headlined by PLEXOS®, is trusted by thousands users around the world for a wide range of applications, from short-term analysis to long-term planning studies. Integrated across electricity, gas, and water systems, the PLEXOS® platform provides exceptional decision insights to our customers.

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