PLEXOS

2021

GAS

Leverage Every Opportunity
as the World Transitions to a
Lower Carbon Future

PLEXOS is the only simulation software that has ultra-high definition modeling 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.

Customers are mastering the transition to gas or the use of gas as a primary fuel, by making the most accurate decisions possible for tomorrow's requirements.

Power and Gas Co-Optimization

Today PLEXOS customers are able to make the most accurate predictions and take the most profitable actions, to fully realize benefits with natural gas.

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

The move to abundant, inexpensive and clean natural gas has already put pressure on the entire gas system - pipeline capacity, gas storage facilities, LNG transportation, and gas supplies; and we need to be prepared to manage the strain of increasing future energy demand, all while we continue to reliably supply home heating for our customers.

What is your confidence level, with these critical planning questions, to bring power and gas together?

? Can the legacy planning methods properly account for the competition between demand sources for gas?

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

? Can gas units generate while injecting gas into storage?

? If there is excess capacity, can that capacity be sold off while accounting for power generation requirements?

? Will there be excess gas to sell to the market? Is it more profitable to sell the fuel or the power?

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

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 either physical constraints or contractual constraints, and include 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 optimization given both power and gas demand

- Capacity expansion studies

- Policy analysis setting CO_2 targets.

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

Specifically, these modeling features 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.

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

PLEXOS Gas provides the most robust modeling available in the market that is unmatched by any other solution.

No longer should you be settling for workarounds, inaccurate gas dispatch, or spreadsheet models. It's time to move into the future of gas modeling, you owe it to your rate payers.

Questions that can be answered by running studies 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?

LNG

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.

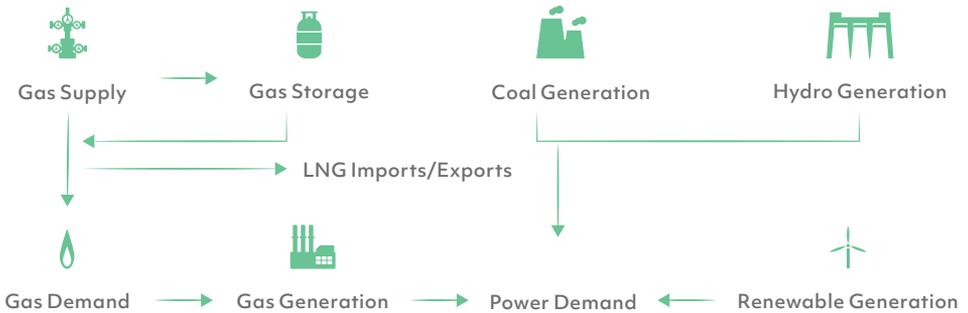## HOW CAN PLEXOS HELP YOU THROUGH THIS LNG EXPANSION?

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 optimization
- 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 including:
  - Voyage time
  - Loading time
  - Discharge time
  - Shipping charges
  - Boil off

Ensure that all costs and constraints are met for both power and gas across the system. Each decision you action, you will earn millions of dollars in reducing costs or capturing opportunities.

Gas Supply → Gas Storage   Coal Generation   Hydro Generation

LNG Imports/Exports

Gas Demand → Gas Generation → Power Demand ← Renewable Generation

Energy Exemplar

Energy Exemplar is the industry leader in energy market simulation software. Our software suite, headlined by PLEXOS®, is trusted by more than 1,500 users across every region of 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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