

ENERGY AND COMMODITIES

# ALIGN FOR NATURAL GAS AND POWER MARKETS

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**ALIGNE  
FOR NATURAL  
GAS AND POWER  
MARKETS**

# Transforming Natural Gas and Power Markets

**The Energy Information Agency (EIA) recently reported that natural gas has exceeded coal in power generation for the first time in 2015 in the United States.<sup>1</sup>**

Even though natural gas prices have begun to recover, utilities and retailers are facing a new reality in trading, operations and risk management.

With the incorporation of new gas fired assets, flexible energy trading and risk management solutions are required that can address the complexities of the natural gas markets and infrastructure, including the ability to capture and manage complex natural gas purchase and sales agreements, create and manage nominations across multiple pipelines, manage natural gas storage agreements and perform risk management.

Even for companies that had previously operated a handful of gas generators, the increased adoption across a wider geographical area will increase operational complexities, taxing current systems and increasing both operational and financial risks. One area of particular operational concern is the forecasting and nominating of fuel supplies well in advance of power delivery. This includes managing optionality in fuel supply agreements that provide surety of delivery to meet reliability requirements, yet also allow for alternate delivery, turn back, or resale should the fuel not be required for power generation.

As new gas fired assets are brought on-board, the importance of capturing and maintaining a complete portfolio view increases in importance, as natural gas systems for fuels management cannot live in isolation — these systems must be closely incorporated into the larger utility IT infrastructure, an infrastructure that will also include systems for managing power sales and purchases, plant operating systems, production cost models and ISO/RTO bidding, settlement and market communications systems

Integrating these new operations and new markets can be challenging, as fuels management systems that were adequate for coal plants operating as base load facilities will not meet the needs of a utility operating a fleet of gas fired generators, and rapid expansion of the pipeline grid and new gas processing facilities bring increase complexity for gas management systems.

Given the dynamic interaction between natural gas and power markets, market events, such as power peak days or natural gas pipeline upsets can inflict rapid and potentially extreme damage to near-term portfolio values. FIS is well positioned to help natural gas and power market players optimize assets, reduce operational risk and costs and drive margin growth.

**“FIS helped us automate key processes, improve overall productivity and quality, and better manage risks associated with our natural gas supply chain.”**

**ENRIQUE MORFÍN,**  
MANAGER OF NATURAL  
GAS AT CFE.

<sup>1</sup><http://www.publicpower.org/media/daily/ArticleDetail.cfm?ItemNumber=45599>

# Natural Gas Operations

## Improve margins with tighter gas operations

Cheap and abundant natural gas has made gas the leading choice for new power generation in the US, and the EIA reports that natural gas has exceeded coal in power generation in the U.S. for the first time in 2015 with plans to further reduce coal-fired generation to one-third by 2030 as mandated by the Clean Power Plan.<sup>2</sup>

### Reduce operational risk

Gas market participants face increasing pressure to adjust to changing gas supply patterns and market regulation that place greater demands for real-time information flows that help streamline processes and avoid penalties.

FIS' Aligne for natural gas operations helps drive efficiencies by managing cross-pipeline contracts, scheduling, nominations, balancing, allocation, actualization and valuation activities in a single platform, delivering real-time capabilities to achieve competitive advantage in utilization of available capacity, scheduling efficiency, position management, penalty avoidance and market response. Our solution helps users make the timely decisions needed to maximize capacity while avoiding imbalance penalties.

"From aging infrastructure to the movement towards aggregating and communicating big data to the many different regulatory concerns, utilities are at a cross roads and it's clear they will need to increasingly leverage technology in order to meet and stay abreast of these emerging challenges in the coming years."

**PATRICK REAMES**, MANAGING  
DIRECTOR, COMMODITY  
TECHNOLOGY ADVISORY.

### Improve internal coordination

When it comes to managing gas operations, doing so in real-time has become a necessity as pipelines and service operators expand globally, enact more stringent balancing requirements, and survive with leaner internal resources.

Aligne helps streamline gas operations by automating workflows, aggregating data and providing a smooth integration of physical risk and accounting systems.

### Key features and benefits include the following:

- Minimize data entry costs with a single repository.
- Improve trader/scheduler coordination with configurable workflow automation.
- Traders enter deals at trading locations, allowing schedulers to specify the specific pipeline meters for the nominations on a day-to-day basis.
- Automatically creates and balances complex nominations as deals are executed.
- Provides open integration between enterprise information systems to eliminate duplicate data entry and costly reconciliation.
- Helps improve operational visibility and responsiveness.
- Provides immediate feedback on positions, inventories, pricing and costs that facilitates reporting and streamlines invoicing.
- Drill down capabilities offer managers a detailed picture of cross-pipeline movements.
- Facilitates decision making with a consolidated view of cross-market positions and balances within and between markets.
- Provides ability to track and validate volumetric constraints on long-term swing contracts, transport positions and storage capacities for assessment of long-term contract performance and penalty avoidance.
- Tracks detail on physical locations down to the meter level, with aggregation to trading location for risk and accounting.
- Helps to ensure timely delivery and avoid penalties.
- Real-time balancing helps minimize reconciliation time and imbalances.
- Hourly nominations, scheduling, allocations, and automatic imbalance tracking.

<sup>2</sup><http://www.eia.gov/forecasts/ieo/electricity.cfm>

### Automated scheduling

Aligne's extensive automation supports timely reaction to changes in forecasts, automatically adjusting for changes in consumption or production forecasts, or physical deal volumes. Automated scheduling helps protect against the potential errors or time delays that may occur from manually scheduling in spreadsheets and delivers rapid response to changing market conditions. For Aligne users, automation supports both simple title transfers at a trading location or hub, as well as the more complex scheduling across multiple pipelines, contracts, and nomination models. In addition, these automation schemes are particularly beneficial in high-volume scenarios such as upstream production or downstream retail businesses.

### Support for all industry-standard nomination types

Aligne supports pathed, non-pathed, and pathed nonthreaded NAESB nomination models among other variations. With increased adoption of NAESB's pathed non-threaded nomination model where the scheduler simply enters the total amount purchased and sold by each counterparty at each meter point and the total amount moving along each pathed segment, Aligne users are well positioned to take full advantage of this model. Aligne allows these nominations to be aggregated at a counterparty level per path to meet the requirements of these pipelines, while simultaneously maintaining the deal level detail for the marketer's balancing and settlement requirements, delivering operational efficiency for schedulers as well as accountants.

### Track inventory, contracts, balances in one place

Aligne deploys a sophisticated real-time inventory model to track balances for pools, storage, park and loan, and interconnects as well as contract imbalances by location or across locations, reflecting the real complexities of the physical gas business. Users have complete control over the hierarchy and the depth of detail that they wish to see, enabling tight management of hourly imbalance penalties and other complex tracking and valuation challenges.

### Gain control of invoicing and settlements

Aligne's real-time charge processes eliminate the once common batch processing of price calculations and settlement transactions. Real-time inventory tracking facilitates accurate information flows between departments, facilitates timely reporting and supports real-time charge calculations. Price and quantity formula capabilities allow users to track complex, long-term physical gas deals and contracts.

Over/under delivery penalties, buybacks, transport, storage, park and loan, price tiers, overrun charges, taxes and complex asset management scenarios are modeled with ease. Actuals can be entered at an aggregate, monthly level and allocated to daily transactions. Charges are generated automatically and grouped into statements according to rules defined upstream.

## A FOCUS ON AGILE GROWTH

### Differentiating in a competitive marketplace: Converging natural gas and power markets

With the incorporation of new natural gas fired assets, new energy trading and risk management solutions are required that can address the complexities of the natural gas markets and infrastructure, including the ability to capture and manage complex natural gas purchase and sales agreements, create and manage nominations across multiple pipelines, manage natural gas storage agreements and perform risk management.

Even for companies that had previously operated a handful of gas generators, the increased adoption across a wider geographical area will increase operational complexities, taxing current systems and increasing both operational and financial risks. One area of particular operational concern is the forecasting and nominating of fuel supplies well in advance of power delivery. This includes managing optionality in fuel supply agreements that provide surety of delivery to meet reliability requirements, yet also allow for alternate delivery, turn back, or resale should the fuel not be required for power generation.

### Powerful physical generation solutions tailored to your assets

A significant trend in energy trading is the movement from a financial world back to a physical world and power is no exception. With this trend is a growing need in the power world for physical operations solutions that exceed the typical CTRM solutions. Driving that need are very complex contracting rules that come along with being a physical power player. The difference between a physical power market participant versus a vendor who may provide retail power with no generation assets is significant.

Physical power market participants need the ability to capture complex contracting characteristics that may have:

- Settlement based on interval-level data (hourly or sub-hourly).
- Fixed and variable (e.g. based on price index) price components.
- Payment adjustments based on operational events, CAISO prices, and/or CAISO payments/charges.
- Monitoring of energy delivery targets over a time period (month, season, year).
- Comparison of forecasted vs. scheduled vs. delivered volume.
- Tolerance bands for energy delivery (e.g. scheduled vs. actual).
- Tiered pricing based on volume within the same time period (month, season, year).
- Requires complex formulas to calculate payment including conditional logic (if-then-else) and nested formulas.
- The ability to go beyond the typical parameters to add custom and non-standard attributes to a contract.
- The ability in pricing to leverage Excel™-like functions to create pricing with conditional logic statements.
- Support for complex contracting work flow.
- The ability to handle complex settlement routines and track evolution of settlement and invoices as underlying data is changed.

### Competitive tools for the constantly evolving power markets

The North American power sector faces a number of complex challenges that include: meeting the power needs of a growing economy; a shift towards cleaner energy sources; the impact of emerging technologies; the continuous drive towards reducing costs; and a resurgence in mergers and acquisitions.

As power generation continues to be fueled by natural gas globally, market participants are facing increasing operational complexities, taxing current systems and increasing both operational and financial risks. With the incorporation of new gas-fired assets, market participants are looking to expand their capabilities to capture and manage complex natural gas purchase and sales agreements and perform risk management, while searching for ways to take costs out of their businesses.

As a result, opportunities to deploy better procurement practices, develop better operational practices, maximize use of risk and hedging systems, attain better finance, and adopt better practices to streamline operations and lower costs are all areas of interest to US power and utility companies.



“Seattle City Light upgraded to FIS to increase our operational efficiency and give us greater transparency into our position and risk.”

STEVE KERN, POWER SUPPLY AND ENVIRONMENTAL AFFAIRS OFFICER, SEATTLE CITY LIGHT.

# Power Operations

## Support for front, middle and back office

Utilities must manage front, middle and back offices along with access to multiple energy sources, some that fluctuate minute by minute. Accurate, real-time commodity scheduling is essential for success in today's competitive and complex utility markets.

Aligne for power operations provides all the integrated information energy marketers, generation owners and load providers need for scheduling, along with superior tools for everything from contract compliance to settlement calculations, billing to invoicing, real-time generation dispatch with the ability to model the precise physical characteristics of each asset for full real-time curtailment management. This state-of-the-art energy transaction delivery management system is designed with the ability to model the precise physical characteristics of each asset for full support of critical business processes of asset owners, traders, schedulers, suppliers and other key players in the interconnected electricity grid. With Aligne, schedulers and traders are free to focus on their real job: getting the best transactions available.

### Staying competitive

Aligne provides energy companies with the power to stay competitive in an increasingly complex environment by unifying all the crucial elements affecting electricity trading decisions so that access is just a click away. This flexible solution is ideal for any energy operator who must compile, analyze, and manage high volumes of transactions and distribution information.

### Improve your margins

Aligne makes it easier than ever to perform long-term, day-ahead, hour-ahead, and real-time scheduling for load generation, transmission, energy purchases and sales, ancillary services, and other commodities. It is model-driven and supports user-definable business practices and optimization of physical trading and operations. Once set up to reflect these practices, the system ensures that its operation matches business specific goals and requirements, while complying with local and national regulatory agencies that govern the grid and transmission of power.

## HIGHLIGHTED POWER OPERATIONS FEATURES:

- Capture and manage all parameters of your power generation asset including capacity, while scheduling generation, track forecasted and actual emissions outputs, track forecasted and actual fuel consumption, and bid your units into global power markets.
- Distill massive volumes of information with flexible BI tools and reporting views.
- Integrate information with existing energy management and corporate information systems, without re-entering data.
- Connect front, middle and back office processes and share information fluidly with the ability to restrict access, set limits, validate information and provide audit trails.
- Manage positions and position limits with position limit parameters.
- Access and track contracts, schedules, price, inter-utility invoicing and revenue reports online.
- Enforce business rules and generate alerts to drive real-time decisions.
- Capture and store marketing information including forward market view, pricing of and methodology of load following contract pricing with little or no intrusive interface.
- Manage and track hydro system events like pond levels and up/down stream impacts of water flow through chained hydro systems, while scheduling generation, pump/storage units, and irrigation.

# Trade and Risk Management

## Effectively trade and manage energy transactions and associated risks

Aligne for trade and risk management (TRM) helps energy market participants to effectively manage the complexities of trading power, natural gas, oil, emissions and weather for both physical and financial instruments. By integrating all the data from front-to-back office trading operations, energy companies are able to efficiently and confidently identify and manage risk.

### Capture and report multi-commodity financial and physical deals

Aligne TRM supports natural gas, power, oil, coal, emissions, biomass, metals, foreign exchange and weather for both physical and financial transactions where applicable. It also supports a variety of instrument types, including spot, forwards, listed futures and options, swaps, swaptions, transmission capacity, nominated/actual volumes, and a variety of complex or structured contracts. You can manage the price and operational risks associated with environmental trading, with support for a variety of schemes such as the US ARP and EU ETS, and in renewables schemes involving GOOs, ROCs, LECs, CERs, RECs, REGOs and carbon futures.

### Manage multiple option types and pricing models

Aligne TRM enables capture, price, analysis and report functionality on Standard American and European options including exotic options such as Chooser, Asian, Basket Spread, Barrier, Rainbow and Swing. In addition to returning the option value, these models return a variety of Greeks to help you determine how much to hedge your portfolio and measure option sensitivities.

### Measure market risks and define trading strategies

You can separate different risk exposures embedded in portfolios for an intuitive representation of potential hedging/ netting and analysis for your positions allowing short-term and long-term hedging strategies to be put in place. Aligne TRM helps measure and assess both performance and accuracy of VaR. The VaR Toolkit helps determine the incremental effect on VaR by adding a new asset or trade to a portfolio. Credit related metrics including current and potential future exposure, expected and unexpected losses and credit VaR can be calculated and reported. It assists your trading decisions and assesses the impact of counterparty risk. Monte-Carlo or historic models help evaluate strategies.

## ADVANCED TECHNOLOGY PLATFORM TO SUPPORT A CHANGING MARKET

- Robust N-tier architecture
- Information model (EPRI CIM Power System Model).
- Integrated callouts to external models and calculations.
- Configurable object model
- Planning functionality, including interfaces to production cost models, joint asset ownership models and integrated risk management.
- Manages complex schedules and applies changes across all reports as applicable
- Flexible pre-scheduling functions for managing day-ahead processes for multiple legal entities
- Comprehensive scheduling, including generation, transmission, ancillary services, market bids and load
- Real-time scheduling by increments ranging from minutes to years
- Extensive experience providing inter- and intra-state and/or national regulatory agency interface worldwide, including
  - Austria (APCS, APG, TIRAG)
  - Belgium
  - Czech Republic
  - Denmark
  - Germany (RWE, EON, ENBW, VATENFALL)
  - Finland
  - France
  - Hungary
  - India
  - Ireland
  - Italy
  - Netherlands
  - Norway
  - Philippines
  - Poland
  - Portugal
  - Romania
  - Slovakia
  - Spain
  - Switzerland
  - United Kingdom (NETA)
  - United States (NAESB ETagging and OASIS Reservations)

**Trading and risk overview**

Aligne trade and risk management ensures your success with a full range of features

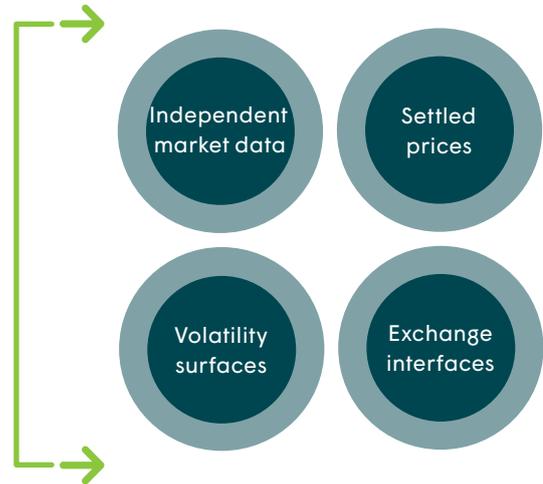
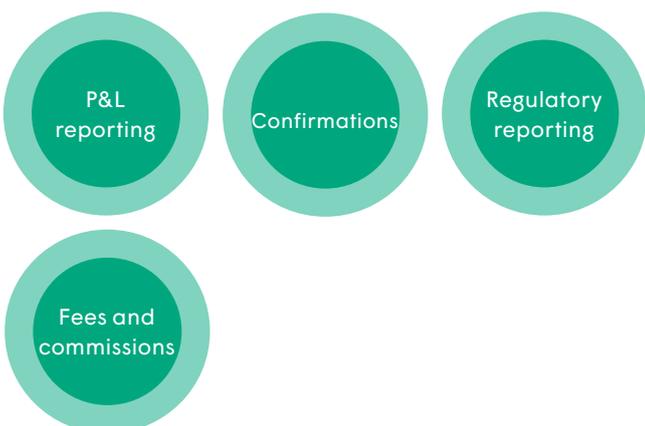
**Trading**



**Risk and compliance**



**Middle office**



### Valuation, forecasting and optimization

Aligne enables you to value, optimize, report and efficiently manage the embedded optionality in non-standard and long-term structured contracts and physical assets including swing contracts, spread options, gas storage, power generation, hydro assets and rainbow options. Plus, it also provides the flexibility to incorporate proprietary in-house valuation and optimization models. Additionally, Aligne can help you optimally manage multiple physical assets, matching supply, storage, transport, transmission and demand reducing imbalances and gaining efficiencies through automation. Finally, leveraging advanced analytics, the load forecast tool can generate a forecast surface used to forecast loads with user defined factors. The load forecast can then be fed back into various processes within Aligne.

### Trade and manage logistics

A major challenge for companies involved in power generation today is to capture risks and costs associated with coal fuel stocks. Aligne allows capture of physical and financial fixed, index and complex formula coal trading deals, quality specifications, contractual penalty and fees associated with the delivered coal product. It also helps you track and report on all scheduled and unscheduled volumes. Working together with Aligne Fuels Management, it can offer a full coal logistics solution, covering inventory management, delivery, and quality assurance.

### Market connectivity

FIS offers seamless integration between its energy solutions and third party systems to enable true end-to-end business processes and Straight-Through Processing (STP). This results in a more efficient front office, a more accurate trade capture process, and a more complete view of trading activity. FIS Energy provides specific interfaces from the front office to the following:

- Exchanges – APX, NordPool, ICE, NYMEX, EEX and Nodal Exchange.
- Confirmations – eConfirm, eFETNET, Brokers: Trayport (e.g. Spectron, ICAP, Prebon, GFI).
- Physical Operators: Gemini (UK Gas), ESS (German/Austrian power), Producer/Shipper.
- Requests and Offtakes via email, EDI Gas.

The interfaces are designed to allow executed deals to electronically flow into the front office application for full reporting, valuation, and risk analysis. Additional interfaces to similar organizations can easily be created using Aligne Integration.reconciliation.



# Designed for Usability

## Dynamic and auditable spreadsheet control

Aligne5 (Aligne + HTML5 web and mobile technology) provides users with an ergonomic and truly user definable experience. Users are able to leverage our out of the box capabilities, as well as create their own workbenches with drag and drop components. Customers will benefit from a true web application that lowers the cost of deployment to the desktop.

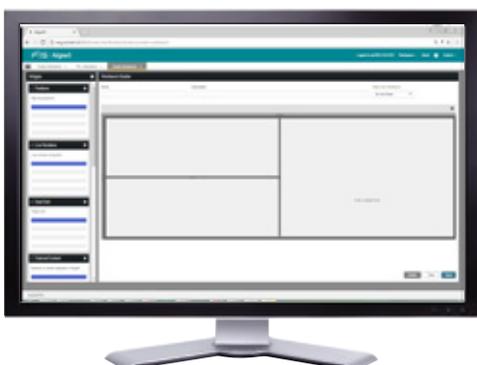
### Aligne5 Trader Workbench



## Flexible user-defined workbench

A flexible framework allows users to create custom workbenches to refine their interaction with Aligne. Users can drag and drop a wide variety of components into the workbench such as real-time charting, customized maps, and feeds from external systems or websites.

### Aligne5 Workbench Builder



## ALSO AVAILABLE IN SAAS

50 percent of energy market participants are considering hosted and cloud-based ETRM solutions in order to reduce application-associated IT costs and keep up with market changes, according to a recent FIS market study.<sup>3</sup>

Here's how FIS Aligne SaaS | Retail Express benefits natural gas retail companies:

- **Core Aligne ETRM capabilities** that are used by some of the world's largest energy trading firms, producers, utilities and large retailers
- **Lower cost** due to reduced up-front capital costs, a higher level of flexibility to keep up with market change, and reduced or non-existent need for IT staff
- **Security** as FIS maintains close relationships with domestic security and intelligence communities to ensure that hosted systems and data are secure at all times
- **Rapid implementation** of a standardized set of integrated, end-to-end capabilities – in as few as 60 to 90 days
- **Automatic software upgrades**, so you're always up-to-date with functionality, market and regulatory changes
- **Scalability** to turn the usage up and down, depending on business requirements

**Aligne SaaS | Retail Express** is generally available to the North American markets.

<sup>3</sup><http://empower.fisglobal.com/rs/134-VDF-014/images/ETRM%20in%20a%20Low%20Commodity%20Price%20Environment.pdf>

### About FIS Solutions for Energy and Commodities

FIS solutions for energy and commodities help utilities and retailers, pipeline and storage operators, marketers and traders as well as integrated energy companies compete efficiently in global markets by streamlining and integrating the trading, risk management and operations of physical commodities and their associated financial instruments. Through real-time data, connectivity and analysis, FIS solutions help you achieve transparency and regulatory compliance, optimize end-to-end transaction and operational lifecycles and meet time-to-market needs with flexible deployment options. As your technology partner, we can help take advantage of the latest innovation and explore new opportunities. For more information, email us at [getinfo@fisglobal.com](mailto:getinfo@fisglobal.com).

### About FIS

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Florida, FIS employs more than 55,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit [www.fisglobal.com](http://www.fisglobal.com)



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