

The Future of Gas: System Flexibility is Vital

How to stay agile as markets transform





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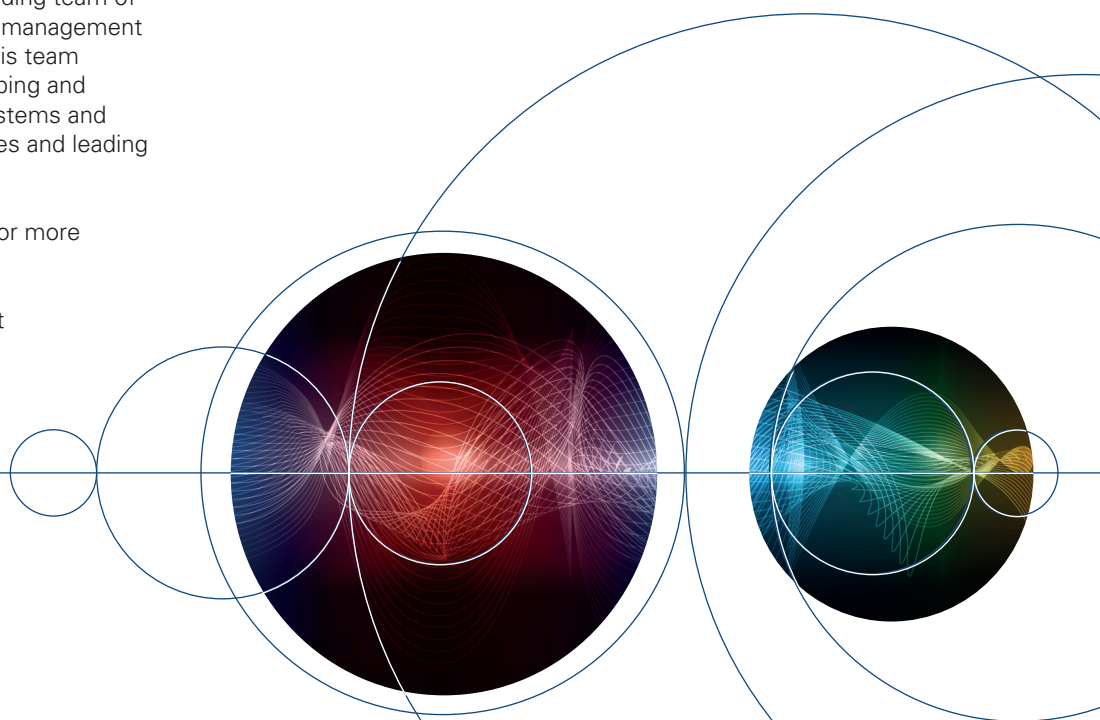
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Enuit¹ was founded in 2008 with a single goal in mind: to bring to the market an affordable and fully functional trading and risk management solution. Enuit's energy trading risk management (ETRM) solution, ENTRADE®, helps clients to have uncensored visibility over their transactions through the entire deal lifecycle, from done-deal through to sent-bill.

ENTRADE is a flexible, robust, open-data risk management solution that supports every commodity, feature and end user in one place, ensuring that users can trade what they want when they want without limitations.

With ENTRADE firms have all the functions they need to run their commodity trading business, including:

- Deal capture and risk reporting.
- Valuation and attribution.
- Scheduling physical commodity movements.
- Tracking primary and secondary costs.
- Monitoring inventory levels and costs.
- Actualizing volumes and settling deals.
- Tracking credit exposure.
- Generating accounting entries.
- Monitoring operational and market-related risks.
- Providing useful reports and a data warehouse.

ENTRADE also has the functions and features to help manage trading and logistics, from producing gas wells, through processing and natural gas production, downstream to points of consumption. Helping natural gas retailers to aggregate and manage forecast demand behind traditional city gates.

Some of the features of this comprehensive natural gas application include:

- Captures counterparty data and agreement terms.
- Stores all sorts of physical and financial types of deals.
- Calculates position risk and exposure to price movement.
- Evaluates counterparty credit risk.
- Calculates physical and financial deal settlements.
- Generates counterparty invoices.
- Tracks costs associated with pipeline transport and storage.
- Creates profit/loss drill-down and attribution reports.
- Creates price risk report that allows users to disaggregate risk for hedging.
- Creates option price ladders that facilitate options risk management.
- Allows users to see the value of firm transportation on a pipeline contract.
- Provides extended functions to support retail operations.
- Aggregates retail load.
- Allocates demand to supply pools.
- Applies various load-shaping factors, such as attrition and fuel loss.
- Allocates physical supply to markets to close monthly business.

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¹ Text provided by Enuit.

A host of geopolitical and other forces are reshaping demand for gas, creating more fragmented and complex markets. As gas producers and consumers reevaluate their long-term strategies, they will require greater flexibility in their technology tools, especially data, analytics, workflow and pricing engines – placing a premium on flexible software solutions.

Introduction: a market in flux

The global market for natural gas is undergoing a period of profound change. Geopolitical forces, including Russia's invasion of Ukraine, are transforming the structure of the market and reshaping relationships between producers, consumers and traders. The drive toward net zero is equally or even more transformational. Many of the consequences of the drive toward net zero are second-order effects, and anticipating them is proving a challenge.

These changes bring volatility, not just in spot and future prices but across the entire energy ecosystem, which includes a broad range of energy-intensive industries, as well those which use gas (or oil) as feedstock. To navigate this volatility, natural gas consumers are having to build up more sophisticated risk management systems that can handle multiple commodities, and develop increasingly complex contracts and logistics. They are also experiencing a growing need for systems that are flexible enough to keep up with the rapid changes transforming the market.

This report explores the changes affecting the global natural gas market and their impact on natural gas consumers and traders. It also considers how market participants will have to alter their practices and employ more nimble risk management strategies to stay ahead of shifting trends.

A new demand paradigm – switching to LNG

While the overarching drive toward net zero is creating shifts in market structure and generating volatility in markets, the strongest proximate trigger for the change has been the war in Ukraine. Indeed, while many elements of the market imbalance predated the conflict, the war has highlighted gaps in market structure and triggered liquidity risks (margin dynamics in futures markets) that were relatively unanticipated. Overall, the situation has raised significant questions about the stability and structure of energy markets worldwide and energy market design in Europe.

Indeed, the war in Ukraine has catalyzed a shift in the supply and demand balance for natural gas

globally – but most notably in Europe. Flows from Russian gas pipelines into the European Union (EU) have fallen sharply since the February 2022 invasion. Last year, **Russia supplied the EU with 40% of its natural gas**. As of September 2022, Russian gas accounted for only 9% of EU natural gas imports, and **EU policymakers have pledged to cease all imports of Russian gas by 2027**.

To replace this supply, Europe has turned increasingly to liquefied natural gas (LNG), predominantly from the US and Qatar. From January to May this year, LNG imports into the EU and the UK averaged 422 million cubic meters per day, 66% more than the annual average in 2021, according to the **US Energy Information Administration**.

Elevated demand for LNG demand is likely to persist over the long term. The **American Petroleum Institute projects** that the EU's LNG demand will increase by 150% between 2021 and 2040; by 2030, the commodity is expected to account for half of the EU's natural gas demand. Last year, the commodity made up just 20% of imports from outside the EU.

Europe's appetite for LNG has placed the continent in heightened competition with Asian countries, including China, Japan and South Korea. It has also prompted a frantic effort by European states to build out LNG import capacity and connect underserved areas to regional gas hubs. **Today, the EU's import capacity** is around 157 billion cubic meters (bcm), enough to satisfy 40% of current gas demand. Together, European countries plan to increase this capacity by 42% by 2026.

LNG suppliers in the US, the Middle East and Australia are struggling to meet the increased demand, since many have already maxed out existing terminal capacity. In addition, a shortage of tankers is making it difficult for LNG carriers to contend with the surge in demand. These factors have helped to create a tighter global LNG market.

Other natural gas markets are having to adjust. North Sea natural gas production, for example, has jumped this year as Russian supplies have tailed off. **Norway is projected** to produce 122 bcm of natural gas this year, up 8% over 2021 levels, making the country the single largest supplier of pipeline gas to the EU. In September,

in the boldest manifestation yet of the market's transformation, the **new Baltic Pipe opened**, linking Poland to Norway's natural gas fields.

Other demand drivers

Forces besides the Russia-Ukraine war are also strong drivers of demand patterns. In the US, record demand for natural gas this year has been fueled in part by constraints on the generating capacity of coal-fired power plants – a product of ongoing retirements of coal plants and low inventories. Natural gas demand in the US is expected to climb even higher over the coming years if the country's high-voltage transmission system is not expanded rapidly. The system is needed to convey new renewable energy into the grid at scale.

Meanwhile, in Southeast Asia, shifting away from coal-fired electricity has become a key component of countries' energy-transition strategies. To replace this capacity and meet still-growing energy demands, these countries will have to turn to a mix of renewables and natural gas. This heralds strong growth in natural gas demand throughout this region over the coming decade.

A more fragmented and complex market

This new demand paradigm has given rise to a more fragmented and complex natural gas market, with myriad types of contracts and derivatives across commodities, geographies and time horizons.

Market participants that operated predominantly in highly liquid, highly reliable spot markets for pipeline gas are increasingly having to contend with short- and long-term contract markets for LNG. Some entities may not be accustomed to dealing with such varied and complicated markets and will likely require more sophisticated pricing, scheduling and risk management capabilities to navigate them.

European consumers, in particular, are having to increase their expertise in long-term LNG contracts, since most LNG supply is long-dated. The global pool of LNG production that is forecast to be made available through long-term contracts may amount to more than 7,800 bcm between 2022 and 2040, much more than the roughly 1,500 bcm available in the spot and free-on-board imports today, **according to Rystad**. European utilities will have to tap this long-term market to replace gas supplies from Russian pipelines.

Complex contracts and regulations

However, these long-term contracts are far removed from the simple, standardized spot deals with which European consumers are familiar, and instead are distinguished by their idiosyncrasies. Contract provisions that allow for termination or price changes in transit are not uncommon, and destination clauses, which prevent buyers from reselling LNG to other users, can complicate deal negotiations. They also make pricing long-term contracts – which is already difficult, given they can run from 10 to 25 years – even harder for consumers.

Regulations and sanctions are also contributing to the more complicated market environment. EU policymakers are working on reforms to rein in high prices and limit volatility. In September, EU leaders proposed a series of emergency measures to address high energy prices, which would compel a reduction in energy consumption across the bloc, impose revenue caps for marginal power products like renewables, and introduce a windfall tax on energy firms. Certain EU countries are also pushing for a cap on wholesale gas prices as part of the broader campaign of sanctions against Moscow. These initiatives could further skew the market, not just for European consumers but for importers around the world. Where there are price controls and demand imbalances there will also be opportunities for arbitrage between gas commodities that traders may exploit.

Potential changes to rules covering energy derivatives – which are intended to address recent pressures – could also wrong-foot market participants. For example, in September the European Securities and Markets Authority (ESMA) proposed introducing circuit breakers that would halt trading in energy derivatives at times of excessive volatility. European policymakers are also pondering how to ameliorate the impact of huge margin calls on energy trading firms. Companies are scrambling to source the cash and liquid collateral needed to guarantee trades, and some governments have already extended liquidity support to ease their burdens. These and similar developments prompted the European Commission to call on ESMA to produce recommendations for tackling high margin requirements, which could result in more stringent supervision and new trading regulations down the line. Increased policing of gas market participants' risk management practices and policies is also likely.

Fragmentation of the natural gas market, coupled with ongoing geopolitical strains, has disrupted pricing and altered trading dynamics. The squeeze

on LNG has **raised the average price** for the Asian benchmark spot by 140% compared with 2021, while front-month gas futures have smashed records across geographies all year. The divergence between spot and long-term LNG prices has also incentivized suppliers with destination flexibility in their contracts to redirect shipments, to the benefit of high-bidding consumers and the detriment of less mighty entities.

All this highlights the importance of deal management and risk control for natural gas consumers. Market participants must keep a close eye on each delivery and each counterparty to ensure their orders are being filled as agreed. The need to juggle multiple commodities, destinations and charters also places a premium on consumers' logistical capabilities.

More flexible technology

All of the market structure shifts and fragmentation outlined above are driving the need for a more flexible set of technologies and analytics – namely **data**, **analytics** and **flexible workflow**.

Gas producers and consumers are changing how they trade and undertake risk management in response to the market's rapid transformation. This in turn is driving demand for better data, analytics and software resources among participants.

In this volatile environment, companies need up-to-the-minute information about their market risk, a clear view of their exposure to price swings, and clarity on the effectiveness of different hedging strategies.

When it comes to trading LNG, they also require **sophisticated pricing engines** that can construct forward curves for the major hubs and handle the commodity's fickle relationship with natural gas and oil benchmarks. For both pipeline gas and LNG, front-office staff at gas consumers also need to keep a tight grip on their counterparty risk – especially given the vulnerability of some producers and traders to continued price shocks. Credit risk management **systems that aggregate data and forecasts** from global sources would be helpful here.

Middle- and back-office professionals have a need for more sophisticated capabilities, too. LNG contracts are complex, nuanced agreements, so firms would benefit from solutions that **expedite the document review process** and **automate the production** of confirmation letters, invoices and reports.

Shipping and storage are other crucial parts of the LNG lifecycle, and they have grown more difficult for firms to navigate because of the multiplicity of distributors and carriers, not to mention the challenge of coordinating different contracts' scheduling provisions. Against this backdrop, investments in software that can streamline the scheduling process and align deal volumes with storage capacity, enabling consumers to balance their inventories, are likely to pick up.

In addition, market volatility has forced companies to **set risk limits** in order to contain potential financial losses and navigate physical capacity constraints. Increased regulatory scrutiny of market participants' financial and operational robustness is also driving risk management to the top of the agenda. Companies therefore have a growing appetite for technologies that can help them surveil their risks on a position and portfolio level and conduct 'what if?' analyses to determine how they could be affected under various scenarios.

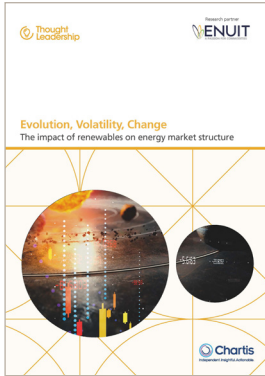
Conclusion: flexibility is key

The global natural gas market is undergoing a wide-ranging transformation. Traditional supply-demand dynamics have been upended by the war in Ukraine, forcing participants to diversify and navigate increasingly volatile spot and forward markets. Moreover, shifts in energy markets – predominantly growth in the use of renewables – have accelerated, forcing companies to reevaluate their long-term strategies.

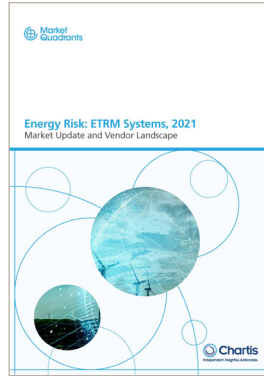
Amid this market restructure, agility is key. Producers, consumers and traders must respond quickly and with confidence to rapidly changing conditions in order to take advantage of fleeting opportunities and avoid being saddled with expensive risks. This puts a premium on flexible software solutions that can support multiple commodities and keep up with shifting pricing dynamics.

Elevated market volatility, together with the heightened scrutiny placed on the functioning of the gas market by concerned policymakers, has made improving risk management processes a priority for firms. However, companies must be flexible as they build out their risk management capabilities. Firms that have access to tools that can adapt to market conditions as they evolve, and which adapt to incoming rules and regulations, are likely to have an edge over those that do not.

Further reading



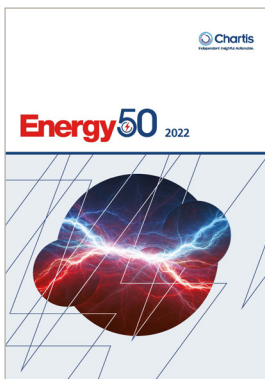
Evolution, Volatility, Change:
The impact of renewables on
energy market structure



Energy Risk: ETRM Systems,
2021; Market Update and
Vendor Landscape



Energy Risk: Pricing and Data
Management 2021; Market
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