

Energy Risk convened representatives from Amphora, Murex, OpenLink, RiskAdvisory and SunGard Kiodex to discuss the the development of ETRM software, the challenges being faced and solutions that are being implemented and deployed by these leaders in the ETRM software market

EVOLUTION AND DEVELOPMENT

Energy trading and risk management (ETRM) software has come a long way since the first issue of *Energy Risk* in 1994. At that time, most energy-specific software systems were in-house and the choice of off-the-shelf packages was limited.

One of the biggest advances over the last decade and a half has been the emergence of specialist energy software providers who – through working closely with energy traders to understand their needs – have come up with pertinent solutions. This has freed up energy traders to concentrate on their own businesses rather than having to spend time and resources creating computer code to support their operations.

Today's sophisticated ETRM software has elevated energy risk management from a mere checks-and-balances function to a decision-support mechanism at the heart of a company's strategic planning.

As deregulation brought more players into the energy markets from

the mid 1990s onwards, liquidity allowed more mature and complex trading to take place and the need for supporting software became vital. One of the most useful functions for traders and risk managers on a day-to-day basis has been the increase in automation. Straight-through processing from trade execution to confirmation and invoicing and accounts has not only freed up a lot of man hours but also eliminated much human error.

Connectivity has also been an important advancement, with ETRM systems now connecting to trading platforms as well as to different internal systems, which makes cross-commodity trading much easier.

In this Q&A feature, five of the leading ETRM software providers talk about the evolution of the market, what challenges need to be addressed next and what they think will be the most exciting developments in ETRM in the next few years.

Stella Farrington

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Amphora has helped transform the ETRM system into an actionable strategic tool for risk management and trading flexibility

What do you consider the most important advancement in energy trading and risk management (ETRM) software in the past 15 years?

Trip Ray, chief operating officer, Amphora: We see two main, related advances in the ETRM world. The first is the ETRM system's evolution into an aggregated hypercube of position, profit and loss (P&L), credit and cashflow indicators. The convergence of advanced mathematical modelling and greater computational horsepower enabled users to analyse this data against 'what if' scenarios involving financial, delivery, operational and legal risks like never before. This has transformed ETRM from an audit or control tool into a decision-support mechanism for tactical and strategic interventions through the trading operations life cycle. The second significant advancement has been the move towards a paperless data world spanning the life cycle of a transaction – from trade initiation and confirmation, to physical scheduling and actualisation, to invoice and payments. This has allowed ETRM to more closely process transactions as they occur, so users can monitor their data more easily.

What is the biggest contribution Amphora has made to ETRM software development?

TR: Amphora's ETRM solutions have been intentionally built to model the complexities of physical oil movement, and give users a flexible structure to simplify and control these processes. We understood very early that the greatest need in physical oil trading is to accurately model the business process and to provide financial integrity, and gave our software tools the sophistication to provide timely, accurate data and the flexibility to allow efficient trading-desk operation. Our ability to get the numbers right and to handle the nuances of logistics and operations helped clients manage both their paper trades and physical

product delivery in a single, efficient platform. As we drive toward industry data-exchange standards, our clients benefit from seamless integration resulting in shorter settlement cycles, as well as from reduced operational risk afforded by automating many processes from execution through to settlement.

What is the biggest challenge the industry now needs to address through the use of software?

TR: The extreme price and supply volatility in global energy markets raises the prospect that traditional risk exposures and static limits inherent in ETRM software can restrict a trading floor's ability to squeeze out margin when opportunity presents itself or to be creative in structuring transactions. Today's industry challenge is to extract actionable intelligence if a trading spike breaches basic trading limits, by combining detailed P&L attribution and splitting out the components of the model used to calculate the measure. A dynamic set of limits, which react to changes in market price levels, changes to volatilities and other factors such as currency rates, interest rates or credit ratings, potentially provides the most acceptable solution. Running the impacts through liquidity, credit, P&L and stressed-scenario filters and their 'at-risk' equivalents in time to beat the market will be the differentiator among trading groups.

What is the greatest challenge the ETRM software industry needs to address and how is Amphora addressing this?

TR: Accurately and rapidly exposing the components of the changes in P&L, credit, cashflow and capital utilisation, and the at-risk numbers for those measures is a daunting challenge for ETRM software systems. Doing it reliably, validly and with the confidence of the trading desks, while maintaining the control



Trip Ray

required by the risk management part and the flexibility sought by the trading part of ETRM users, is the Holy Grail. By engaging technology capabilities that improve the speed of computations – to organising data in its most discrete form, to interfacing in data from partner systems in real time – Amphora addresses the systems side. Using the latest visualisation tools and customised views allows users to map their information to their thought process. Finally, Amphora continuously monitors its implementation processes and testing cycles to expand user adoption and confidence on the numbers reported.

What are the most exciting advancements in ETRM software going to be in the next few years?

TR: The natural and engineering constraints placed on energy production and consumption requires market participants' innovation to discover and protect margins. ETRM systems will release the effort needed to maintain and reconcile data so it can be repurposed to seek margin. Adopting standards such as those proposed by Leadership in Energy Automation Processing will help accelerate the speed and accuracy of data received and converted into actionable intelligence. Being able to run a scenario through various market conditions, as well as through the value-at-risk, credit potential future exposure, liquidity risk, risk adjusted return on capital and other measures will support efficient utilisation of capital and provide increased confidence and control to the users of ETRM systems. Building capabilities that allow a desk to investigate and expose the intelligence in their own data, test hypotheses, recognise patterns and research alternatives will be among the most exciting challenges for Amphora.

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The evolution of ETRM software

“*There is a strong demand for flexible ETRM solutions with a richness of products and functionalities*”

What is the biggest contribution Murex has made to ETRM software development?

Loïc Alexandre, head of energy & commodities, business development/sales, Murex: Murex began providing solutions to the energy industry 16 years ago. We believe that Murex's main contribution to the ETRM landscape relies on the wide coverage of contract management and risk management features across multiple products and commodities (for example, oil and products, natural gas, power, coal and emissions).

Since the 1990s, Murex has been a pioneer software vendor, providing a solution for the management of commodity derivatives, drawing on its experience in forex derivatives and redesigning its system to address the specificities of the then-nascent oil derivatives over-the-counter (OTC) market. We have been innovating, with the management of 'nearby' swaps and options, displaying risk in terms of liquid products, as well as developing quanto products that combine the features of both commodity and forex products. The management of front-to-back functionalities, which was essential to efficiently handle OTC products (including the management of fixings), was also a significant breakthrough.

Nowadays, Murex is again extending its solution by providing real-time management of financial and physical trades and positions, profit and loss, as well as market risk and limit measures.

What is the biggest challenge the industry now needs to address through the use of software?

LA: Energy markets are in constant evolution. As an example, OTC contracts are increasingly being cleared, the trading of emissions and freight derivatives is on a rising curve, inter-dependencies and correlations between markets need to be managed, new products are being launched, and so on.

There is an increasing number of trading players operating in several markets and in multiple regions. And trade volumes and complexity are also growing at a rapid pace.

Business and IT personnel need to ensure that their software platforms are adapted to their (new) activities and can evolve functionally and technically. This is the gateway for achieving the consolidation of global position monitoring and risk management, and to ensure operations efficiency.

What is the greatest challenge the ETRM software industry needs to address and how is Murex addressing this?

LA: There is a strong demand for flexible ETRM solutions with a richness of products and functionalities.

The increasing complexity of contracts and the multi-asset aspects thereof require an ETRM platform to be extensible, and the growing trade volumes impact directly on system performances. At the same time, people are asking for easy and fast-to-deploy solutions. Many companies are launching greenfield ETRM projects and/or find themselves with restricted budgets and IT team capabilities. They need to ensure that implementations, upgrades and the related processes around an ETRM platform are being understood and well-managed.

Murex is addressing these challenges by: (1) investing continuously in functional and technical research and development to address client needs and market evolutions; (2) by proposing its MXPress™ approach (which consists of delivering a pre-packaged system associated with a relevant implementation methodology); and (3) by maintaining a close relationship with its clients and a wide network of consulting firms.



Loïc Alexandre

In addition, the diversity of trading participants (for example, utilities, oil and gas companies, refiners, financial institutions, hedge funds, industrial companies, and so on) must be reflected in the ETRM solutions.

What are the most exciting advancements in ETRM software going to be in the next few years?

LA: First of all, it will be interesting to see who the remaining players are in the next few years. The industry suffered, as did many others, from the global credit and market crunch, which took hold last year.

The software industry requires significant research and development and customer support investments from year to year. Companies that were relying on debts to finance their growth may have had, or continue to have, some tough moments.

With regard to software features, we believe we will see ETRM systems advancing in further supporting the growing need for both contract management and risk management capabilities. This could cover the following:

- The comprehensive management of physical and financial products from one platform, from deal capture to invoicing, coupled with advanced credit and market risk management functionalities. Asset-centric organisations also need to have their ETRM platforms integrated with asset optimisation tools.
- The demand to further integrate short- and long-term trading activities.
- The demand to address multiple energy and geographical markets from a single platform.
- A solution for easy and rapid deployment and integration in the various organisations.

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What do you consider the most important advancement in ETRM software in the past 15 years?

Dr Wolfgang Ferse, executive vice president, Commodities and Energy Solutions, OpenLink: Firstly, increased integration has been a major advancement. If you go back 15 years, software was available for the various parts of an energy company's activities, but it was dedicated to very specialised steps of the process. For instance, there was software for deal capture, risk management or back-office functions. But these distinct systems were not linked and so data could not flow between the front and back office, as it can now.

Secondly, a lot of these applications were Excel based, which increased operational risk and, although they were flexible, they also did not allow data to flow. During the past 15 years, these bespoke Excel solutions have been converted into applications.

There have been similar changes at a content level. Rather than a power trader focusing only on power, or a gas trader only looking at gas, an energy-trading desk can now handle a range of commodities within one system. This has allowed for the development of cross-commodity asset trading over the past 15 years.

Connectivity is the final major advancement that I would highlight. As mentioned earlier, systems used to be separated in terms of both the functions and the commodities they supported. Communication with another system involved exporting or importing information, phone communication or simply re-entering data. Now, there is connectivity at a data level because market information can be transmitted and viewed. There is also connectivity at a trading level because communication is possible between different internal trading systems, or externally with energy exchanges and even with other market participants' systems.

What is the biggest contribution OpenLink has made to ETRM software development?

WF: We support the idea of cross-commodity trading and connecting the entire process from trading via risk management to logistics and connectivity.



Creating one truly integrated solution was OpenLink's guiding principle when we began in 1992, and it continues to be so



Dr Wolfgang Ferse

Similarly minded, many of our competitors have attempted to stitch together different systems to give the impression of a truly integrated approach. OpenLink has differentiated itself from them by making the 'integrated' concept a reality for our clients. Creating one truly integrated solution was our guiding principle when we began in 1992, and it continues to be so.

What is the greatest challenge the industry now needs to address through the use of software?

WF: The energy resource shortage combined with environmental issues will be a big challenge going forward. For instance, how can consumption be influenced or controlled to bring energy efficiency through smart-grid technology, fuel-efficient engines and more efficient building insulation? Alternative energy generation will also require a different approach to modelling in order to be included in a company's trading portfolio.

In addition, globalisation has become an important factor in the energy industry. For example, emissions have become a global issue, with credits and offsets traded between continents.

Another example of the effect of globalisation is the worldwide trade and transportation of gas, based on liquefied natural gas technology. This requires trading and logistics to be linked, as well as the development of risk management processes that can monitor these processes.

How is OpenLink addressing these challenges?

WF: It is essentially our philosophy, as signified by the name OpenLink, to link together all of the components needed to address these issues.

Our worldwide client base has also forced us to think on a global scale. The challenge from Europe is to support emissions trading between

Europe and Asia. We also have challenges from the US to combine infrastructure, investment, optimisation and renewable energy. So, we aim to create solutions to these challenges and bundle them together on our platform.

What developing trends do you foresee for the ETRM software sector over the next few years?

WF: For a company to be successful in addressing all of the challenges detailed above, it will not be enough to have a traditional ETRM system that facilitates deal capture, runs risk reports and supports back-office operations. A 'smart ETRM' will be required – something that OpenLink is in a leading position to provide.

Such a system will provide a trader with two additional features: information about the impact of their trading decisions on logistics and transportation (and vice versa); and decision-support tools. For example, if a gas trader wants to make a smart-ETRM decision, there are multiple ways in which to execute this: purchase contracts; sales contracts; storage; different routes to transport; different costs and capacities; and the spot market. This is where a decision-support system is crucial. Combining an optimisation engine with a flexible trading system creates a more meaningful picture of how a portfolio might perform in different future scenarios and that provides a framework within which more optimal trading decisions and portfolio construction can occur.

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The evolution of ETRM software

What do you consider the most important advancement in ETRM software in the past 15 years?

Louis Caron, executive lead, global energy commodity risk, RiskAdvisory: From a technology-innovation standpoint, we believe there have been few to no real major advancements in ETRM in the last 15 years. Most systems have been fairly stagnant beyond acquisitions and have moved from client-server software to Java or .Net. True architecture advancements that provide benefit to the ETRM user community have been limited.

From a risk manager's perspective, recently we have seen the ability for asset-centric firms – including oil and gas producers, refining, transportation and storage companies, power and gas utilities – to quantify not only current but also potential exposures. At SAS, energy risk solution advancements in the area of analytics can now provide utilities with the ability to quantify an earnings-at-risk (EaR) metric and producers with the ability to simulate risk factors within a cash-flow-at-risk (CFaR) framework.

For an exploration and production market participant, the ability of the ETRM software to quantify a consolidated CFaR estimate provides an important piece of information to the executive team, charged with deciding how and when to deploy the firm's cash for oil and gas exploration purposes.

For utility market participants, the primary objective associated with the heightened activity in the market has been to ensure that utility owners and ratepayers receive the highest possible sales price for excess generation, and incur the lowest possible purchase price on power acquired to satisfy incremental load requirements.

Simply, the energy industry has been grappling with the issue of the substantial impact of commodity price-driven variables on earnings and cashflows resulting from deregulation. The ensuing responsibility to manage the risk profile associated with this multivariable and market-driven business forces management to pursue commodity risk software solutions that can effectively quantify simulation-based metrics.



Louis Caron

“Analytics software needs to provide meaningful insight, not simply static reporting

RiskAdvisory and SAS have addressed this with a solution approach that integrates the advanced analytics, simulation and deal capture into a single architecture. The architecture is unique in that the analytical engine stands outside of the operational datastore that is the ETRM system.

What is the biggest challenge the industry now needs to address through the use of software?

LC: Today's risk manager needs a comprehensive risk management system to monitor the unique set of risk parameters faced by the energy industry. Analytics software needs to provide meaningful insight, not simply static reporting. The ability to quantify consolidated potential exposures, including CFaR and EaR, and the ability to run sensitivity analysis and portfolio stress-testing represents a significant step forward in the advancement of risk management practices in the energy sector.

Today's systems rely on multiple and often manual steps for management to be informed of exposures and changes in exposures. As organisations have grown larger and more complex, subject to persisting market volatility, executive communication requirements have resulted in the development of risk frameworks beyond paper reports and massive spreadsheets in e-mail format. Software advancements at SAS include a framework for risk dashboards to support real-time decision-making regarding the energy firm's current and potential risks.

Many systems have a lot in common, but management is removed from the day-to-day operations and needs to be apprised of key information in a timely manner and in a way that does not add superfluous work to their day. Most ETRM systems today generally fail to do that.

What is the greatest challenge the ETRM software industry needs to address and how is RiskAdvisory addressing it?

LC: The challenge of analysing a multitude of risk factors within a large and complex portfolio of physical and financial contracts and assets, many with unique reliability probability, and selling the product with varying energy requirements associated with it into a highly volatile marketplace requires substantial computing horsepower.

For example, on the utility side, SAS Solutions for Energy Risk offers a multi-tiered Monte Carlo simulation model to allow energy market participants to input customised distributions around load forecasts, generation availability, fuel prices and regional power prices. The end-product is a graphical representation of the distribution around earnings over a chosen fiscal period. Management has access to a simple graphical representation that illustrates the probability and financial impact of both normal-course and extreme events. The EaR metric allows users to determine in a user-friendly fashion the effect that proposed hedge transactions have on the corporate risk profile. Utilities can be in a position to increase their comfort level surrounding the magnitude of coverage required to create their optimal risk position.

The end-result is a comprehensive graphical distribution of the potential variability in utility earnings based on its variable generation, load and contractual profile over the defined fiscal period, whether it is a quarter, a year or longer.

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Kiodex is continuing to transform the ETRM industry by providing a real-time risk management solution

What do you consider the most important advancement in ETRM software in the past 15 years?

Ben Jackson, chief operating officer, SunGard Kiodex: Technology advancements over the past 15 years have enabled ETRM systems to manage an enormous amount of data. This development has reduced operational risk in data management considerably. This development has manifested itself in the vendor's ability to manage dynamic reference data (data that changes, such as forward curves, settlement prices, volatility surface, etc.) more efficiently so that customers can focus on their core business activity rather than data management. Kiodex has taken this a step further by delivering this capability in a Software as a Service (SaaS) framework. An additional significant advancement is the ability to monitor real-time position, profit and loss and risk.

What is the biggest contribution SunGard Kiodex has made to ETRM software development?

BJ: Kiodex was among the pioneers of SaaS delivery in ETRM solutions. Our biggest contribution is that, with our success, we proved that a web service (SaaS) is the most cost-effective way to deliver trading and risk management services to customers. We created our flagship Kiodex Risk Workbench platform as SaaS from day one, and have successfully competed against client server applications.

We also provided the dynamic reference data as a web service to our customers for the first time in the industry. In this regard, Kiodex was a transformational company that provided access to sophisticated risk management and levelled the playing field for small and medium-sized enterprises that previously could only manage risk in spreadsheets.

We were also transformational because we were able to provide an industry-standard risk management service to budding speculators (energy hedge funds) for whom installing a client server application did not make any economic sense. Kiodex is continuing to transform the ETRM industry by providing a real-time risk management solution, allowing energy traders to improve trading performance.

What is the greatest challenge the industry now needs to address through the use of software?

BJ: There are several changes facing the industry. Increased regulation may require that energy companies either trade listed over-the-counter cleared derivatives or disclose their bilateral over-the-counter valuations based on FAS 157 standards.

Both of these developments pose new challenges:

- There will be pressure to monitor risk on a real-time basis because of increased trading on exchanges.
- There will be greater emphasis on the quality of market data and models to value bilateral over-the-counter derivatives to meet FAS 157 standards.
- There may be a more rigorous need to manage margins and collateral due to additional emphasis on credit risk both with an energy company's customers and dealers.

New systems will have to manage these challenges to be successful.

What is the greatest challenge the ETRM software industry needs to address and how is SunGard Kiodex addressing this?

BJ: Kiodex has always been ahead of the curve in these developments. To address the challenges presented by FAS 157, we were the pioneers



Ben Jackson

of integrating independent market data along with our software so that customers can value their bilateral contracts using independent forward marks generated from broker data to get a Level -2 classification.

To address real-time risk management, Kiodex recently acquired ICE RISK (renamed Kiodex Real Time), which is a real-time risk management platform designed to provide risk views to individual traders, department heads and risk managers. The service is offered as SaaS with capabilities to automatically capture trades and prices from different exchanges. Department heads and global risk managers can use this application to view consolidated position, profit and loss and risk (greeks) across all traders on a real-time basis. With the ability to view real-time trade and price data across the entire forward curve, management can quickly take corrective actions intraday rather than wait until the end of the day to find out where their position stands.

What are the most exciting advancements in ETRM software going to be in the next few years?

BJ: ETRM solutions will have to address operational and financial risk (price and credit risk) in real time. We believe that the biggest advancements in the ETRM systems will come in the form of straight-through processing. The ability to view a comprehensive picture of both trade and pricing information in real time will help customers understand, and thereby reduce, their overall operational risk.

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