The energy trading industry took a beating between 2001 and 2004, but those that survived this period of commercial Darwinism have generally emerged much wiser and more capable. The deregulated Natural Gas trading business is now a decade old: we’ve learned a lot of lessons, we have good regulations in place to protect investors and the industry is now experiencing a comeback.

On the technology front we’ve gone from an immature industry that was based upon outdated pipeline management systems, to finally arriving at the point where we have purpose-built products, supported by companies with staying power, strong financials and professional management.

The resurgence in the energy trading business is attracting organizations of all sorts hoping to take advantage of volatility, prices and liquidity. In order to capitalize on this resurgence, trading organizations need tools to manage the growth, and this time around, mature tools that have stood the test of time are available.

The challenge is to know exactly what you should expect a system to deliver, what a good solution looks like, and get a glimpse under the covers of one of the industry leaders. This white paper addresses these issues.
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Introduction

At first glance it would appear that a system for managing the wholesale energy trading business should be fairly uniform and simple. It should not be much different than a system built to trade equities or pork bellies. After all, energy marketing companies simply buy and sell energy commodities. However, a closer look reveals an entirely different picture. The main source of complexity in this space is that the systems must take into account the physical attributes and delivery requirements of energy commodities in addition to the financial aspects of the trade. This physical aspect of the business is often overlooked as a wrinkle in the overall picture of energy trading, however it should not simply be written off as an afterthought. Consider some hard facts facing natural gas traders: in the United States, there are more than 100 interstate pipelines operating more than 200,000 miles of pipe. Each of these of pipelines has hundreds to thousands of injection, withdrawal, and interconnect points. Companies doing business with these pipelines will hold multiple contracts, each with different service levels, commodity rates, and options for receipt or delivery. The intrastate system, while smaller in mileage, can be an even more complex environment in which to conduct business as the operators of these systems are free to set their own business rules. Unless your business is purely financial in nature, you must be able to analyze, manage, and account for your physical business: identifying long and short positions, covering those positions through trading or storage transactions, scheduling gas on multiple pipelines via multiple contracts, dealing with pipeline or market constraints, and potentially rescheduling through multiple cycles; all before the gas even flows. Adding to this complexity is the need to optimize each transaction, ensuring that not only does the gas flow the next day, but it flows in the most profitable way while minimizing operational risk.

In addition to the operational risks associated with physical gas, companies must also take into account all the other various risks inherent to trading, such as price exposure, counterparty credit exposure, balance sheet implications, and of course Sarbanes Oxley and all that implies.

Trading organizations must choose between managing all of this complexity in one system from a single vendor, or following a best of breed approach using the best system for the job to solve each piece of the puzzle. It is easy to understand that, before you know it, you have the very complicated
problem of sorting out multiple pieces of different information, and the ETRM vendors in the space are left trying to provide a solution that enables a trading company to manage their business as efficiently and profitably as possible.

This white paper discusses the benefits that are realized by having an advanced ETRM solution, the factors that contribute to the complexities inherent in the natural gas marketing business and the requirements for a system designed to enable a gas marketing organization to manage their book of business as profitably as possible. In particular this whitepaper focuses on the physical scheduling of gas, which is a problem that solutions have historically struggled to solve. It then discusses Triple Point Technology’s Commodity XL™ product which is an example of an advanced system that can be used to manage your gas business in order to provide a look under the hood at one of today’s leading ETRM solutions.

The **bottom line** for Energy Trading and Risk Management (ETRM) systems is that:

**The company that has the best information wins.**

**A good ETRM System can be more than a computer system;**

**it can be a competitive advantage.**
Why Utilize an ETRM Solution?

The quick and easy answer to this is that you will simply outgrow Excel. There are other reasons such as real time decision support, streamlining operations, auditing, communication and management of operational risk to mention a few. This section explores some of the major reasons that your organization must consider an ETRM solution.

**Benefits derived from a next generation ETRM Solution**

**I. One Version of the Truth**

If your company maintains trading, risk management, scheduling and reference information in multiple systems, often including Excel, it is an impossible task to keep all the information synchronized and reconciled. In addition, it is extremely inefficient in terms of use of resources to have multiple points of entry for different pieces of data, and then having multiple reports to reconcile. This simply increases operational risk, potential business losses, and auditability questions.

**II. Real-time Visibility and Enhanced Decision Making with Sophisticated Business Intelligence models**

The “holy grail” of many trading organizations has been a real time whiteboard. This would remove the physical whiteboards updated manually during the trade day, and the inevitable spreadsheets maintained on the side by trade floor personnel for their private use. Physical whiteboards are inadequate for representing all but the most simple of transactions, such purchases or sales at pools. Transportation contract optionality, fuel loss, and transport across multiple pipeline interconnects require information, communication, and calculations that are not available on a physical whiteboard. Manual updates for these factors are slow and prone to errors. Private spreadsheets are not synchronized with the rest of the trading floor and the information they contain cannot be shared with the remainder of the floor. A good ETRM system centralizes all the information from the organization, making it available for up to the moment analysis of...
opportunities and threats, facilitating optimization, and speeding up the decision making process.

III. Fewer Missed Deals From Not Immediately Knowing Position Across Commodities and More Optimally Sized Deals for Hedging

Many organizations today trade multiple commodities. It is not enough to view your portfolio from an isolated point of view. You must be able to see the big picture and understand the ramifications, opportunities and risks occurring during the day. This will, for example, provide greater transparency of spread positions enabling the capture of additional trade opportunities that were previously difficult to ascertain.

IV. Centralized Control and Decentralized Execution

The merits of agile organizations have been well documented. The question has often been posed; how do we make large corporations act in an agile fashion like a small company? By enabling individual trader autonomy through the use of efficient trading tools that also enable central control and review from a management perspective, a company can get the best of both worlds.

V. Minimize Disputed Settlements

Disputes don’t make money for anyone; they simply cost money while companies figure out what should have been done correctly the first time. For a company using a next generation ETRM solution, incorrect invoices, nominations, confirmations, etc. are a thing of the past. In the case of a dispute, the company can efficiently make their case, without having to reconcile multiple views of the issue in order to present their argument.

VI. Improved Hedging

Better information across commodities means that there are fewer missed, directionally wrong or non-optimally sized hedges. In addition it enables an organization to hedge further out along the curve and with complete visibility into correlated cross commodity “natural offset” positions, reduces the need for capital expenditures for hedges on both sides of each offset.
VII. Operational Excellence

As mentioned above, multiple entries of similar information into multiple systems result in operational risks, mistakes, auditability questions and unnecessary added costs. Information should only need to be entered once to help eliminate re-keying errors. A company striving for operational excellence utilizes an advanced ETRM solution to enable clear views into mid-office and back-office position recording which provides greater value to the front-office trading process and accurate exposure information eliminating breaches of control limits.

Current Industry Situation

I. External Environment

A. Volatility

The price of natural gas is affected by many factors including not such extraordinary events as hurricanes, business scandal, new business models of new market entrants, etc. This is in addition to the understood issues of seasonal weather patterns, availability of supply and delivery issues. The highs seen during last winter, and the volatility of natural gas over the past six years have given companies that trade gas real food for thought. Volatility and liquidity provide opportunity in a market, but this must be carefully managed since it can cut both ways.

B. Complex Deal Structures

There is a seemingly never ending stream of new ways to trade natural gas including every flavor of swaps, options, futures and swaptions with wonderful terms such as “multi-factor forward curve evolutions model” being used to describe the business. Some of these instruments are designed and utilized by speculators in a volatile market, however many of them are designed to even out the price risk for consumers of natural gas including large commercial and industrial users and utilities.
With complexity comes the opportunity for human error. A leading ETRM solution will enable your business to keep up with the latest trends and opportunities, and account for the business your organization conducts using whatever instrument the trade floor comes up with next.

C. Unique Requirements For Each Pipeline
NAESB, and before that GISB, went to great lengths to try to standardize the nominations of gas to each pipe in the interstate system, however these efforts have largely amounted to guidelines that the pipelines pay lip service to. There are so many exceptions to the rules that each of the more than one hundred interstate pipes end up having unique requirements, business rules and technical specifications. And you’d better pay attention, because it can all change with every new tariff filing. Your organization should be in the business of trading, not trying to figure out the peculiarities of each pipelines’ nomination requirements.

D. Part Unregulated, Interstate FERC Regulated, and PUCs Regulating Part of the Industry
Who regulates what? Where do they overlap? When will it change again? As if the complexity and volatility of trading natural gas was not enough, marketers and vendors alike must stay on top of, and react to, the latest regulatory changes and be aware of the implications to their respective businesses.

II. Internal Systems
Since Natural Gas was the first energy commodity to be deregulated, most companies that have been in the business for any time already have a ‘solution’ in place to manage their business. In fact, in the June 2006 UtiliPoint market sizing study and in the 2005 UtiliPoint ETRM Benchmarking Studies of Gas Marketing System usage, it was found that many Merchant and Producer Marketer companies are now in a replacement phase for their systems, having out grown their existing systems.
Many trade floors have a patch-work of systems supporting each job function and spreadsheets are used throughout trading and scheduling functions.

UtiliPoint research has determined that the typical trade floor has 8-12 different computer systems for managing their business. More than 50 percent of these systems are not integrated together. This lack of integration leads to massive problems as outlined below:

A. Delayed or Bad Decisions Because Data Not Available or Incorrect

Every asset, contract and commercial transaction has information associated with it that must be available to the decision makers on the trading floor during the trading cycle. Commercially optimizing your physical position requires a myriad of information: transport fuel and commodity charges, cost of injection or withdrawal from storage, pipeline balances, price curves, basis numbers, and up to the moment deal and other volume commitments are but a few of the hundreds of factors and variables that will determine whether that trading day turns a profit or not. If all this information must be continually compiled from multiple systems or spreadsheets, or is coming from sources that conflict, the trading cycle can spiral out of control as decisions are made based on bad information.

B. Increased Resources Used to Collect and Analyze Data

There is a common phrase at several marketing companies, which is “we have checkers checking the checkers.” In other words, companies must reconcile all the reports from all the different systems to ensure that they all tie out, and then in an attempt to wring all the errors out of the numbers, they have more people checking that these numbers are correct. If Wal*Mart operated with similar efficiency, they wouldn’t dominate the American landscape.

C. Compliance and Control of Risk

With the advent of Sarbanes-Oxley, knowing who changed what information in which systems and having strict security and audit control on information has become imperative. However, when similar information is entered into different systems by
different people, this can become a nightmare of complexity. It makes reporting of key financial controls a manual process, which is once again extremely inefficient and prone to error.

What to Look for in an ETRM Solution

What Business Functionality Constitutes an ETRM Solution?

Before getting into the specifics of business requirements it’s instructive to review the systems likely to be in place for a gas and/or power trading organization, and to delineate which systems we are considering as part of an ETRM solution. In the Diagram 1 below, the components (related to the business processes for trading) considered as part of an ETRM solution are bolded.

Diagram 1

For the purposes of this White Paper, we have provided a checklist of required functionality for an ETRM solution broken down into the major business functions on a trade floor (see Appendix A).
You can use these as a “must have” template of what you should expect an ETRM solution to provide.

**Business and Architectural Expectations of an ETRM solution**

There are “must-have” business and architectural requirements that should be expected from a leading commercially available ETRM solution. These are outlined below:

- Integrated front to back office – real-time, straight through processing – one version of the truth for each function and no re-keying of data which is an error prone process
- Include physical and financial position/exposure – view of entire portfolio
- Support global business – offices, foreign exchange, local and global profit and loss reporting, prices & settlements in multiple currencies
- Multi-commodity – aggregate risk and gain efficiencies across back office functions
- Standards based component architecture
  - Plug and play – add system functionality as required
  - Integrate easily with the existing IT environment
  - Platform independence
  - Unlimited scalability
  - Enable use of best-of-breed functionality
- Business Intelligence models – reporting and analysis models for better decision making
- Workflow to ensure flexible, efficient, controlled business processes
- Flexible and dynamic reporting
  - Slice and dice information to analyze different perspectives
  - Filters with real-time updated views
  - Instantaneous access to all data
  - Drill down and roll-up
- Import/export with Excel for additional analysis – spreadsheets will never go away but they need to be limited to a personal productivity tool, not an enterprise system
- Compliance and control
- Information transparency, accuracy, and communication
- Control limits and sign offs
- Audit trails – every change in the system tracked
- Maintenance of historical data
- Security
- SOX compliance, FAS 133 & IAS 39 models

A Look Under the Hood

We promised a look under the hood at one of the industry’s leading ETRM solutions, and since we started out by stressing the implications of the complexities brought about by physical delivery of gas, it is only appropriate that we focus in on this aspect in our “look under the hood.”

It is imperative to understand your physical position in the gas trading business since all business processes are down stream from this. You must understand whether you are long or short at the beginning of the trading day. You must understand where you stand during trading and you must know where you plan to end up, and whether you have achieved that objective. All risk management, and hedging strategies are planned based upon a thorough understanding of your physical business. The problem is that this is very difficult to describe in spreadsheets and screens full of forms. In fact, if you go to any trade floor, and ask them to describe their business, one the first things they will do is draw something very similar to this…

… on a whiteboard in order to describe the flow of their products from source to sink. It is easier to visualize than it is to describe in a spreadsheet format with columns and rows.
**Triple Point’s Commodity XL for Gas™**

Triple Point Technology, Inc has been a leader in the natural gas trading and risk management software business for several years and with the announcement of Gas Scheduling "Visual Cockpit™" in June 2005, Triple Point has gained the reputation as one of the companies to beat on any deal. This is in part because "Visual Cockpit" provides such a comprehensive view of the physical business, and as can be seen from the screenshot below, it enables a company to conduct business visually just like the diagram above.

![Visual Cockpit screenshot](image)

It might be easy to write this off as a gimmick. I’m sure several people have seen products such as this work in “demo” mode, but the stats of an early customer listed below speak for themselves, this is not a toy.
Statistics of an Early "Visual Cockpit" Trading Customer

- 13 BCF
- 190+ users
- 4000+ trading locations
- 175+ pipelines
- 15+ real-time interfaces to other corporate systems
- 12,000+ trades per month
- $2.5B notional trading value per month

"Visual Cockpit" was designed and built in two of the world’s top marketing organizations, and has subsequently been continually enhanced to incorporate the best practices of global leaders in gas scheduling organizations. "Visual Cockpit" was designed from inception to provide real time support to a trading organization and, provides a compelling and incomparable solution to a traditionally thorny problem.

"Visual Cockpit" is based on an advanced graphical scheduling model that presents all data in an intuitive, visual format. The module is a central control point that gives schedulers all the information required to perform complex scheduling - including balance, capacity, transportation cost and other critical decision-making data - displayed in real-time on a single screen.

In addition, Triple Point's Gas Scheduling "Visual Cockpit" offers the ability to interface electronically with pipelines - all natively woven into the system. For example, it offers pre-written, pre-tested features for building NAESB EDI-compliant connections to North American interstate pipeline systems.

With Triple Point's Gas Scheduling "Visual Cockpit," both traders and schedulers can now maximize their productivity on a single platform. "The common flaw in most trading and scheduling systems is that they are either tailored to traders or schedulers, but not both," said Doug Daugherty, director of product management for Triple Point. "With Triple Point's new "Visual Cockpit," schedulers get the real-time data they need the way they like to work with it, without affecting the way traders view and use the same critical data."
"By streamlining the scheduling process, our product expands the daily trading window, enabling clients to make and schedule more trades at peak trading time - the most profitable time of the day," Daugherty added "The ROI has been proven in customer tested situations."

Commodity XL, including "Visual Cockpit," is a single system of record providing complete transaction audit trails, which vastly improves an organization's regulatory compliance capabilities. "Many schedulers still use spreadsheets and then manually key data into the system of record at some point during the month," Daugherty noted. "With an increasing focus on corporate governance and regulatory controls, most executives understand they run an audit risk by using spreadsheets and siloed applications. With our system, they can eliminate that risk very quickly."

Conclusion

Today's business, regulatory and risk environment demands that a company trading energy commodities use increasingly sophisticated and capable systems to manage their business. Trading energy commodities is fundamentally rooted in the physical aspects of the business, and dealing with the physical nature of the business on top of all the other aspects adds a level of complexity that is easy to underestimate. Triple Point's solutions provide an excellent example that will be the top of most buyers' lists.

For additional information on Triple Point solutions go to www.tpt.com.
Appendix A

Functionality Template for an Advanced ETRM Solution

I) Trading (Deal Capture)
   A. Quick and easy deal entry
   B. Complex price models – fixed, formula, index, schedule
   C. Automated complex derived price curves
   D. What-if analysis

II) Risk Management
   A. Sensitivity analysis and stress testing
   B. Manage real-time position and mark-to-market exposure
   C. Measure portfolio at any level
   D. Full Value at Risk support
   E. Monitor counter-party credit status in real-time – including locations, accounts receivable, accounts payable, unbilled contracts, mark to market forward contracts, prepayments, etc.
   F. Full curve support – foreign exchange, volatility, price, interest rate
   G. Checks and balances between functions controlled by system workflow

III) Position Keeping
   A. Real time display of position by region, pipeline, pool, point, etc.
   B. Drill down capability from the highest level to the lowest
   C. Updates “pushed” to everyone’s screen, ensuring that everyone is operating from the same information
IV) Scheduling

A. Visual representation of scheduled transactions
B. Automatic calculation of fuel
C. Electronic pipeline interfaces – unified business model, meet specifications of each pipe
D. EDI
E. Volume management
   1. Pipeline settlement
   2. Deal matching intricacies
   3. Capacity management
   4. Pool balancing
   5. Parking, lending
   6. Pipeline imbalances
   7. Cash outs
   8. Nominations and confirmations
   9. Multi-leg path structure
   10. Back-to-backs
   11. Storage valuation
   12. Transportation and storage capacity management
   13. Pipeline cuts
   14. Complex unit of measure conversions
   15. Volume/Energy heat factor conversions

V) Accounting

A. Update information based on pricing and delivery
B. Track secondary costs
C. Automate confirmations
D. Produce provisional and final invoicing
E. Manage Accounts Receivable and Accounts Payable
F. Manage Cash-flow