

# EWRM for Energy Firms:

## Enterprise-Wide Risk Management with Risk Literacy

The practice of managing risk often previously fragmented by risk category into different departments is quickly becoming an enterprise wide activity in companies trading in the international energy markets. Here, **CARLOS BLANCO & ROBERT MARK** introduce the best practices in risk governance, linking risk management with corporate governance, and explore the building blocks and key benefits of implementing an EWRM framework.

**TRADITIONALLY, MANY ENERGY** trading firms have managed their various risks in geographical or functional silos. However, the traditional approach is no longer adequate due to the need to take into account the linkages between risk types (e.g. between market and credit risk), as well as to standardise and integrate various risks and business results across different activities (eg between oil and gas trading.) The goal is to also ensure that the corporate-wide risk profile is within the range mandated by the board of directors as well as to measure performance on a risk-adjusted basis. Another key benefit of the integrated approach is the identification of natural hedges arising from diversification across the firm's portfolio of business and assets, therefore avoiding sub-optimal micro-hedging policies. Another benefit of EWRM is to minimise the probability of financial distress for the firm as a whole.

In response to the increasing complexity and new regulatory pressures, oil, natural gas, electricity and multi-commodity energy trading firms are implementing EWRM programmes. These EWRM programmes serve to achieve a unified view and management of traditional risk types (such market, credit, operational, legal and regulatory risks) as well as other insurable and non-insurable risks faced by energy market participants (such as geopolitical, terrorism, shipping, environmental, reputation, and contractual risks).

In this article, we introduce a framework to proactively manage enterprise corporate risks with particular emphasis on recent developments in the regulatory area and the state-of-the-art in major energy trading firms worldwide. In a forthcoming article, we will evaluate in more depth the potential impact of the existing and proposed regulations

affecting corporate governance and the internal control framework, as well as those covering minimum capital requirements for energy and commodity trading firms.

### 1. Sarbanes-Oxley (SOX) Act of 2002 & the COSO Risk Governance Framework

In response to the series of accounting and management scandals that surfaced soon after the millennium, the US Congress passed the SOX Act of 2002.

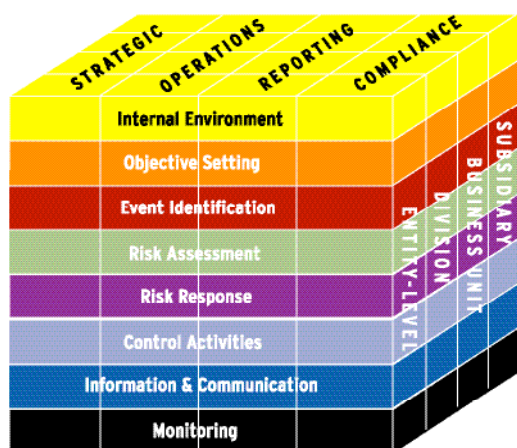
SOX places primary responsibility on the CEO and CFO of a publicly traded corporation for ensuring the accuracy of company reports filed with the Securities and Exchange Commission (SEC). SOX requires that these senior corporate officers report on the completeness and accuracy of information contained in the reports, as well as on the effectiveness of the underlying controls. Senior officers must certify that the financial statements fairly present (in all material respects) the results of the corporations operations and cash flows. They also must take responsibility for designing, establishing and maintaining disclosure controls and procedures. The CEO and CFO must also disclose to the audit committee and to the company's external auditors any deficiencies and material weaknesses in internal controls as well as any fraud (material or not) involving anyone with a significant role in internal control. The Act creates a more rigorous legal environment for the board, the management committee, internal and external auditors, as well the Chief Risk Officer (CRO).

The Act also seeks to make sure that the board of the company includes some members who are experts in understanding financial reports and have experience with internal and accounting controls as well as an understanding of audit committee functions.

The SEC also requires that each firm has "a suitable, recognised control framework." The framework that is emerging as the standard is the one developed by the Committee of Sponsoring Organisations of the Treadway Commission (COSO), a private industry initiative organised in 1985 by five of the key finance professional organisations in the US to sponsor a national commission on fraudulent financial reporting. COSO's emphasis on internal control has emerged as an important element of the overall risk governance exercise, particularly with the advent of SOX.

COSO defines Enterprise Risk Management as "... a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."

**Figure 1. Essential Components of an Effective Internal Control Environment**



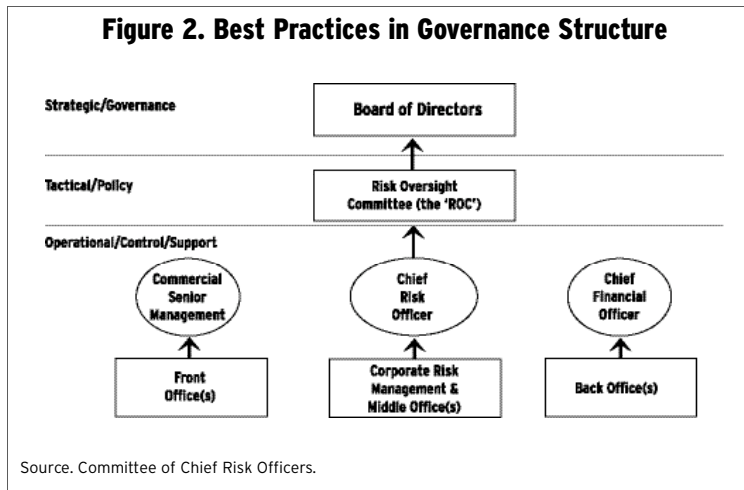
Source: COSO. Enterprise Risk Management Framework. Draft. Summer 2004.

In the COSO framework, internal controls are defined as those that assure the effectiveness and efficiency of the firm's strategy, operations, the reliability of financial reporting and compliance with laws and regulations. Recently, COSO widened its remit to produce a report that moved beyond internal controls to produce ... "a broadly accepted framework for enterprise risk management" (see Figure 1). COSO's various reports are an important industry attempt to define the board's relationship to management. For example, COSO emphasised that management is accountable to the board of directors and that the board should be providing the appropriate governance, guidance and oversight. COSO has also helped establish the critical oversight role of the board - and especially the audit committee.

#### *The Rise of the Chief Risk Office in Energy Trading Firms*

The role of the CRO is to design, coordinate the implementation of an EWRM programme and oversee risk management activities across the entire organisation. An essential element of an EWRM programme is to have a higher ranked individual or committee reporting directly to the board. For example, in the structure presented in Figure 2, the CRO would be part of a risk oversight committee reporting to the board. The CRO would be in charge of the firm-wide risk assessment and management efforts.

**Figure 2. Best Practices in Governance Structure**



## 2. Establishing an Effective EWRM Programme for Energy trading Firms

An effective corporate governance and risk management framework relies on an independent and proactive first-class management of the risks. A EWRM programme is usually built around three building blocks: **Policies**, **Methodologies** and **Infrastructure**.

#### *Policies*

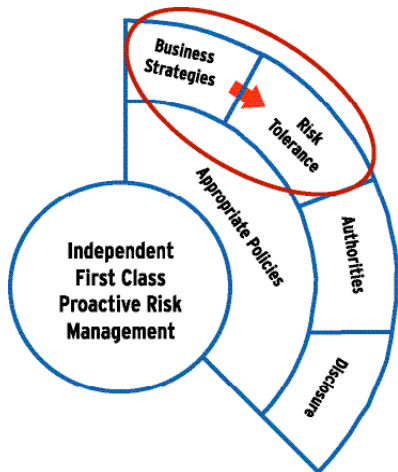
The first building block rests on the policies linking **business strategy** with the **tolerance** for risk (as circled in Figure 2). The core business strategies and the material risks from each of the main firm's activities and business units as well as the

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**Figure 3. The First Building Block is the Policies**



firm-wide risks and objectives should be clearly articulated and communicated.

An effective corporate governance structure, clear lines of authority and appropriate disclosure are integral parts of the best practices framework.

A thorough disclosure which makes the risk transparent to internal and external stakeholders is critical to a strong risk management process. Risk disclosures can provide assurances that the risk levels are within the parameters authorised by management and the board.

For example, trading margin

disclosures by location and product line have become standard disclosures by US energy trading firms. Some leading firms are also providing information related to the distribu-

tion of daily Trading Revenues as risk proxy. The SEC and other regulatory bodies have strengthened the Market Risk Disclosure requirements for energy and commodity trading firms. Royal Dutch/Shell is still struggling to regain market confidence after their announcement earlier this year that they had overstated their oil reserves by four billion barrels.

common metric to communicate and control market risk. Similar metrics are being applied to credit and operational risk. Similar measures such as Earnings-at-Risk and Cash-Flow-at-Risk is also used by several energy trading firms to measure and manage risk.

Stress testing and scenario analysis are playing an increasing role in measuring and controlling risk under extreme market conditions, particularly in the current environment of historically high oil prices and extreme volatility due to heightened risks in the marketplace. For example, Reliant made the decision to exit proprietary trading after experiencing a loss of US\$80 million in a spread position after a weekend price increase of US\$2.53/mmbtu for Natural Gas in February 2003. Even though the position was within VaR limits, the VaR did not indicate much about what could happen beyond VaR and the nature of the 'tail risk' for those positions.

**Credit risk** measurement and management systems are also a key component of a best practices methodological framework. A key characteristic of superior trading credit risk exposure methodologies is to develop a robust capability to appropriately calculate potential credit exposure by counterparty, and to arrive at reasonable paranoia credit risk stress tests.

**Operational risk** measurement is rapidly becoming standardised across the financial industry and will become the same for Energy Trading Firms. In Figure 5, we can see the seven operational risk categories which are embedded in the Basel Accord.

A key principle in operational risk measurement is to "make the important measurable, not the measurable important". Energy trading firms can use a simple matrix diagram (see Figure 5) to plot the material risks that they should focus on vs. the existing availability of data related to those risks.

As part of the spectrum of risks, it is particularly important to include catastrophic risks, which are both insurable and non-insurable. It is also important to understand the potential exposure to devastating events that could wipe out a substantial percentage of the firm's capital or even lead it to bankruptcy. The environmental disaster caused by the Exxon Valdez in Alaska in 1989 and the reputation and financial damage to Exxon shareholders should be kept in mind when evaluating extreme operational risks for energy trading firms.

Another of the objectives of EWRM is to provide an integrated view of liquidity and capital adequacy in order to satisfy information requirements by credit rating agencies and external stakeholders. MG Refining and Marketing Inc. lost over US\$1.5bn due to a poorly devised hedging strategy that underestimated the impact of liquidity risk.

Best practices should also address the validity of the valuation techniques used by the firm as well as the potential amount of model risk. Disclosure on sources of fair market value should be provided by energy trading firms in order to provide insights into the amount of model risk. For example, best practice disclosure calls for isolating marked-to-mar-

**Figure 4. The Second Cornerstone is the Methodologies Used**

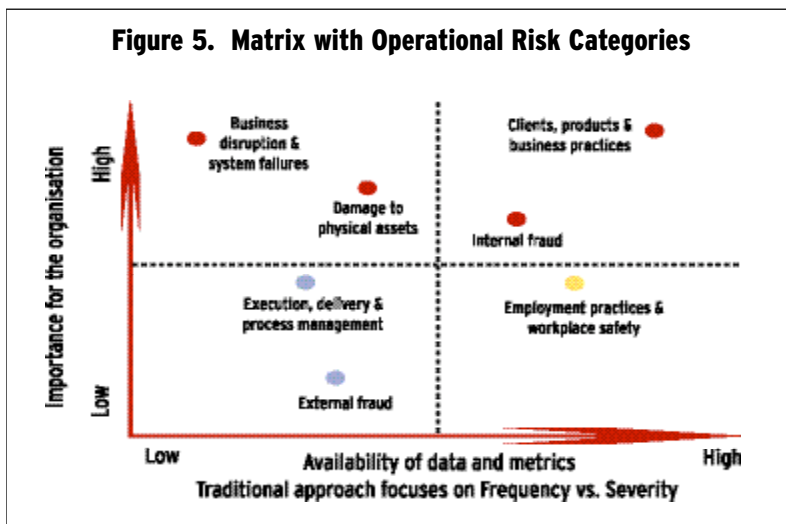


**Methodologies**

The methodologies to measure and manage Market, Credit and Operational Risk are the cornerstone of a sound risk management framework (see figure 4).

Over the last few years Value at Risk (VaR) has become the

**Figure 5. Matrix with Operational Risk Categories**



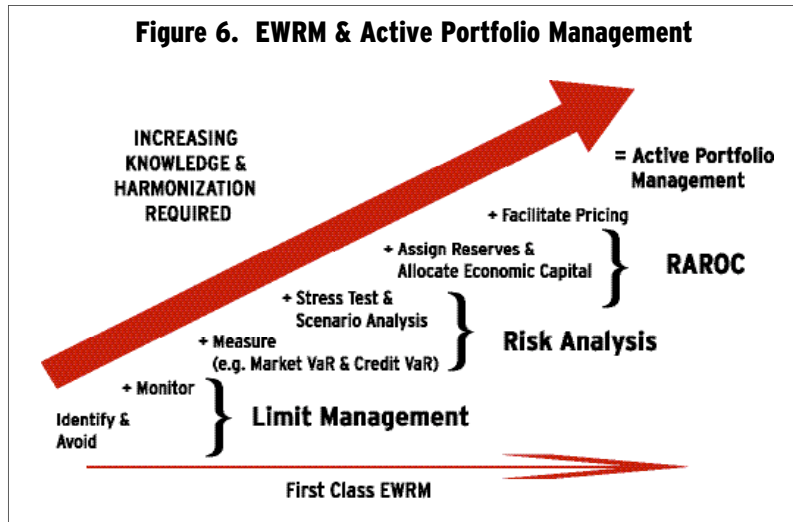
ket vs. marked-to-model profits and losses to prevent tactics to manipulate earnings by 'fudging' forward curves and model parameters.

**Active portfolio management is a key component of first class proactive Risk Management.**

The allocation of risk capital amongst different units is one of the key activities performed by senior management of energy trading firms, and also one of the main benefits of implementing an integrated risk management framework. Economic capital is defined as the risk capital a company is required to hold to support the risk of unexpected loss in the value of its physical and financial portfolio. For most energy trading firms, the primary sources of risk covered by economic capital are market risk, credit risk, and operational risk. There are different ways to obtain an aggregate capital measure. These range from a simple sum of the capital required to cover each of those risks, to an integrated simulation framework adding multiple sources of risk. The simple sum overstates the risk and distorts a firm's ability to accurately assess the risk-return profile of a business. One of the ultimate objectives of implementing a EWRM system is to facilitate active portfolio management at the firm-wide level (Figure 6).

Determining the economic capital allocated to each activity or business unit provides senior management with a mechanism to link risk and return, and therefore provide a risk/reward signal that can be used at different levels of the firm. An investment evaluation process based on economic capital considerations (such as where decisions are based on a risk-adjusted return basis) encourages corporate managers to take risk into consideration explicitly at the time of allocating resources internally as well as to make investment and divestment decisions.

Risk Adjusted Return on Capital (RAROC) ratios relate the return on capital provided by a risk-taking unit to the risk of



the investment required to generate that return. RAROC enables management to answer such questions as: How can managers determine who are the most efficient generators of revenue on a risk-adjusted basis? What type of returns should be expected given the risk assumed to generate them?

We can produce ex-ante RAROC estimates to allocate capital once we have an estimate of both the expected returns (net of expenses and expected losses) as well as the capital required to sustain each activity. We can use the actual profits or losses achieved by each risk-taking unit to determine the ex-post risk-adjusted returns for performance measurement once the actual results are known.

In table 1, we can see the use of RAROC for a global energy trading firm. RAROC is calculated by dividing the P&L (net of expenses and expected losses) by the Economic Capital Used. For example, the RAROC for NY is \$340,000/\$2,925,000 or 12%. We can evaluate the actual capital utilised by each risk-taking unit vs. the capital allocated by looking at the utilisation rate at the end of the period. We can also use RAROC to decide on where we want to invest additional capital as well as set compensation levels. For example, we can invest in those business units that exceed hurdle rates such as Houston, and divest from those business units that fail to meet hurdle rates such as Singapore or New York.

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**Table 1. RAROC Analysis for Various Energy Trading Desks**

Energy Trading Desks	P&L (net)	Economic Capital Allocated	Economic Capital Used	Utilisation Rate	RAROC	Excess/Deficit Over Hurdle Rate
New York	\$340,000	\$3,000,000	\$2,925,000	98%	12%	-3%
Houston	\$257,000	\$350,000	\$335,000	96%	77%	62%
Los Angeles	\$87,000	\$400,000	\$340,000	85%	26%	9%
London	\$85,000	\$250,000	\$210,000	84%	40%	25%
Singapore	\$120,000	\$2,500,000	\$2,400,000	96%	5%	-10%
Firm-Wide	\$889,500	\$5,000,000	\$4,657,500	93%	19%	4%

### Infrastructure

Besides having the right policies and using the right methodologies, it is essential that the firm has the right people in the right place, with accurate data to make informed decisions (see Figure 7).

A common language can be used to describe the multiple dimensions of risk, as well as accommodate the complexity inherent in restructuring and repackaging risk.

EWRM starts with Enterprise-Wide Risk Literacy and Awareness. Training plays a crucial role, and firms that engage in EWRM programs should not underestimate the importance of having people with the right skills to make the process work. The firm also needs to deploy the systems to make sure that the accurate data goes to the right people at the right time. Based on our experience the objectives of the EWRM program should be set very

clearly from the beginning, and make sure that the IT systems support management to accomplish the main objectives. In many cases, simple technology solutions developed to solve specific issues in the context of the firm's operations are considerably more effective than implementing and deploying large systems that require massive resources to implement and deploy and have very limited use for the firm.

### Conclusion

EWRM involves significantly more goals than simply reduc-

ing or limiting risk taking, or engaging the firm's resources into a fancy and expensive statistical exercise. The main goal of a EWRM is create a framework to assist decision makers understanding and managing a set of interrelated material risks arising from a complex business environment such as the one faced by energy trading firms. Once the degree of interaction between the various material risks is understood, the firm can identify the risks that should be eliminated. The firm can also identify those risks that should be taken, as well as manage them in a consistent and comprehensive fashion.

EWRM through a well designed RAROC process can provide the bridge to tie risk/reward relationships with the different activities and business units of the firm, and therefore serve as a common analysis and communication tool.

Energy Trading Firms that successfully adopt and implement economic capital and RAROC models throughout the firm will have a competitive advantage by being able to run their businesses with a more efficient use of capital. These firms will also be able to provide greater transparency and thereby demonstrate their ability to manage risk to credit rating agencies, shareholders, regulators and creditors.

It is ultimately the board's fiduciary responsibility to ensure that the company has an appropriate EWRM program in place. The EWRM should facilitate the board's understanding of the key exposures of the firm as well as the interrelations amongst the material risks that the firm is taking.

Our article has hopefully served to provide you with a window into the benefits of implementing a well defined EWRM program. Nevertheless, there are clear difficulties and hurdles towards implementing a EWRM programme. For example, many companies are organised into silos, which may be reluctant to move towards a more centralised risk control structure. Risk managers have a significant responsibility to clearly articulate the benefits and added value of EWRM to the board.

Based on our experience, we believe that firms envisioning or engaged in EWRM greatly benefit from workshops for senior managers and Board members since it facilitates aligning the business strategies of the firm with the current risk management practices in the firm. These workshops can serve to define the common language used to measure and report risk as well as set the vision and objectives of the EWRM programme. A key outcome of these workshops is also to make sure that the EWRM program is goal congruent with the business strategy and the risk tolerance of the firm. The workshop can also open the dialogue between senior managers of different units to identify and set mitigation strategies for any potential hurdles in its efficient and effective deployment ■

**Figure 7. The Third Cornerstone is Infrastructure**



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*The authors welcome your feedback and would like to thank Dr. Kevin Dowd and Chris Mammarelli from Black Swan Risk Advisors, and Dr. Ian Holdaway and Robin Burley from the College of Petroleum and Energy Studies for helpful comments and valuable insights.*