

Commodity Trading & Risk Management

Quantitative Advisory Services



EY

Building a better
working world

Our CTRM services

Risk modelling	04
Valuation	08
Business process optimization and internal controls	10
Applications support and data management	12
Compliance and regulation	14

CTRM Advisory

Jean-Noël Ardouin

Senior Manager
CTRM Services Leader
Tel. +41 58 286 55 63
jean-noel.ardouin@ch.ey.com

Vuk Stancic

Manager
CTRM Specialist
Tel. +41 58 286 59 89
vuk.stancic@ch.ey.com

Risk Advisory

Marc Ryser

Partner
FS Risk Leader
Tel. +41 58 286 49 03
marc.ryser@ch.ey.com

Oliver Kaufmann

Executive Director
FS Risk Quant Leader
Tel. +41 58 286 38 84
oliver.kaufmann@ch.ey.com

Roger Disch

Executive Director
Financial Services for
Corporates Sector Leader
Tel. +41 58 286 41 59
roger.disch@ch.ey.com

Assurance

Scott Duncan

Partner
Commodity Trading Sector Leader
Tel. +41 58 286 56 46
scott.duncan@ch.ey.com

IT Advisory

Andreas Toggwyler

Partner
IT Advisory Leader
Tel. +41 58 286 59 62
andreas.toggwyler@ch.ey.com



EY Commodity Trading & Risk Management services

A dedicated team of professionals you can rely on

EY's Commodity Trading & Risk Management team is dedicated to servicing commodity and energy trading organizations in Switzerland and to supporting other EY teams with commodity trading clients across the globe.

Our team includes professionals from industry and professional services, many of whom have worked in the front, middle and back offices of leading energy and commodity trading organizations. Our team's aim is to provide support to our clients in confronting their challenges in the areas of modelling, valuation, business process optimization, internal controls, data analytics and compliance.

A valued CTRM team

We serve the world's leading commodity and energy traders as well as other organizations involved in the sector from a variety of backgrounds, from oil and gas majors to large utilities, industrial end users of commodities and global investment banks.

Measurable impact

We can deliver a measurable impact across a range of fields:

- ▶ Help you identify, quantify and manage your key risks, including market, credit and operational risks
- ▶ Enhance your business processes and internal controls
- ▶ Help you harness the latest advances in data analytics
- ▶ Assist you with your initiatives to develop a robust governance framework that responds to today's regulatory and compliance requirements





Identifying leading practices in a volatile world

Commodities and energy markets have witnessed some of their most turbulent moments over the past decade. Market uncertainty due to price volatility, political turmoil and external shocks have added dimensions of complexity to commodity trading activities. Bowing to this growing complexity and tightening regulation, traders have sought to identify and establish leading practices in the way they tackle risk assessment.

Risk modelling

Confronting market risk

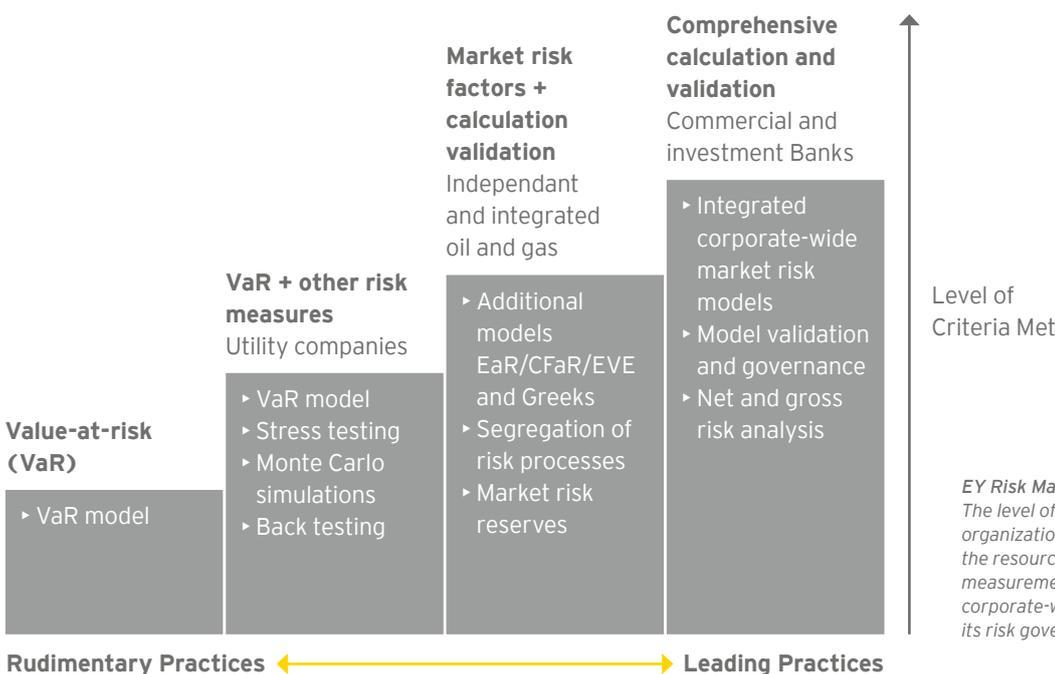
At the forefront of any commodity trader's concerns is that of price volatility and the adverse effects it can have on P&L. A variety of metrics are now available to estimate and mitigate these purely market risks. To identify and hence act on these risks, your organization will need to reach a certain level of risk management maturity.

The right strategy mix for your risk exposure

Beyond the emphasis put on market price risk, commodity trading companies are compelled to deal with a far broader spectrum of risks, spanning:

- ▶ Liquidity risk - wide spreads and illiquid markets will limit your execution and unwinding potential
- ▶ Funding risk - a lack of access to cash can seriously impair your most rational business and transactional decisions
- ▶ Credit risk - your bottom line depends on your counterparty's ability to execute on its contract
- ▶ Operational risks - logistic or environmental risks are routinely difficult to anticipate, quantify or cover

VaR
EaR
CFaR



EY Risk Management Maturity Model
The level of risk management maturity an organization has ultimately depends on both the resources dedicated to building risk measurement models as well as the level of corporate-wide risk model integration and its risk governance framework.



Our dedicated teams can help you identify and confront your various underlying risks, build hedging strategies and implement leading practices in your organization's workflows.

Cutting-edge techniques for a tough environment

Backed by our experience and in-depth knowledge gained serving clients in a broad range of markets (grains, oil/petrochemicals, metals, to name but a few), we are able to develop risk assessment tools, such as value-at-risk (VaR) and cash flow-at-risk (CFaR) models, to help you stay on track with your risk exposure and ensure transparency in front of boards, regulators and in response to disclosure requirements. Our Quantitative Advisory Services team is experienced in modelling and quantifying different types of risks across multiple asset classes and spanning the full product spectrum, from futures and spreads to contracts for difference and forward freight agreements.

Stress testing

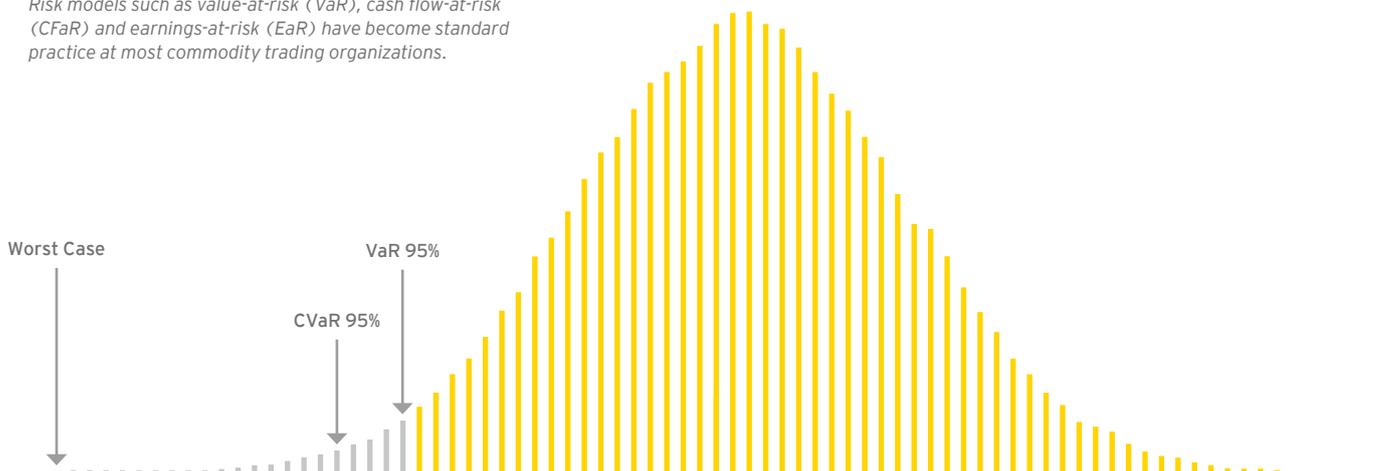
Empowered by better tools for diagnosing market risk exposure, commodity trading companies are increasingly feeling obliged to go a step further and test the limits of how bad things can really get. Stress testing, or what is commonly referred to as "what if" scenarios, have increasingly become a must-have complement to VaR and CFaR models. Taking into account historical and hypothetical shocks and factoring in unforeseen external events allows your business to be a step ahead of the market and better prepared to confront severe financial incidents when they do occur.

EY's CTRM team can assist you with the following:

- ▶ Design and develop models that fit your organization's needs, including VaR, CFaR and EaR
- ▶ Perform back-testing activities required for model validation
- ▶ Validate and review existing in-house risk assessment models
- ▶ Execute stress test scenarios that respond to the needs of both market operators and c-level management
- ▶ Benchmark your types and sources of funding against industry practice
- ▶ Develop appropriate credit evaluations (rating methods) for different asset classes and according to counterparty geography
- ▶ Implement more formal credit processes; revise credit limits based on quantitative and qualitative attributes of your counterparties
- ▶ Provide insight on how to mitigate against operational and logistic risks
- ▶ Implement internal compliance approaches for uninsurable risk

Statistical risk measurement

Risk models such as value-at-risk (VaR), cash flow-at-risk (CFaR) and earnings-at-risk (EaR) have become standard practice at most commodity trading organizations.





Gaining a competitive edge with analytics

Vying to gain a competitive edge in today's marketplace, commodity trading houses are diverting vast resources to quantitative analysis and, more specifically, to the pricing of options, derivatives and structured products. On top of having dedicated in-house valuation models, commodity firms are focusing their efforts on building overarching hedging strategies and establishing dedicated business processes to monitor and analyze market movements and trends. Dedicated teams of market and fundamentals analysts are working side by side with quants to grasp the full picture portrayed by market trends and forecasts.

Valuation

The pitfalls are many and treacherous

Based on our experience on the ground, irregularities can have a substantial and detrimental impact if they go unnoticed:

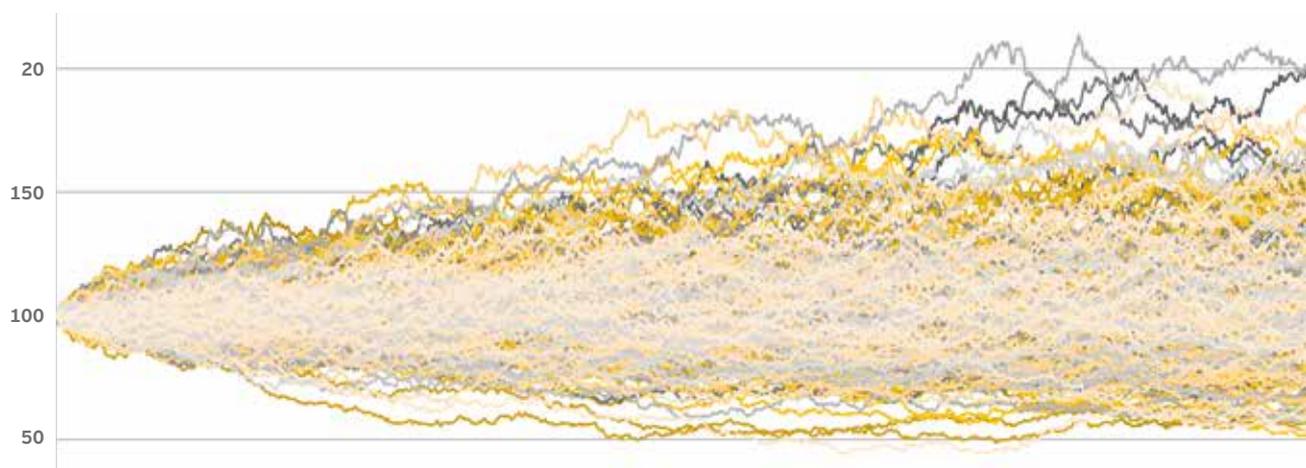
- ▶ Physical and paper positions are frequently valued incorrectly or inconsistently.
- ▶ We often find that not all features of physical contracts are accounted for, or detect liquidity and credit issues.
- ▶ At times, excessive focus is placed on quantitative analysis, and too little on economic research or more fundamental approaches.
- ▶ Disclosures often fall short of market standards with regard to risk-related accounting requirements.

Retooling for today's challenges

Despite the investments made into quantitative valuation and risk management activities, keeping abreast of ongoing developments can be a challenging task. Our dedicated team of commodities and commodity derivatives valuation professionals draws on extensive experience gained supporting major trading houses and utilities. We can support your programs to develop customized pricing models commensurate with your company's activities and

risk profile. We model, quantify and value various types of derivatives, both directly for clients and to support our audit teams, using both standard software and internally developed applications (e.g., binomial models, Monte Carlo simulations). Our CTRM team offers a range of services to support you with the following tasks:

- ▶ Value commodity and energy derivatives (options, swaps, structured hedging products)
- ▶ Construct fair value curves and forward term structure models
- ▶ Design and develop fit-for-purpose calculators for physical commodities (allowing companies to value inherent logistics costs, physical and local premiums and taxes)
- ▶ Develop fundamental forecasting models (e.g., "stack models") that afford operative staff an additional pricing insight
- ▶ Calculate a variety of energy spreads (spark/dark spreads, crack and frac spreads)
- ▶ Review and validate your existing pricing models and calculators, and benchmark them against current standards



Monte Carlo Simulation

Our experts can help you choose which valuation method is best suited for your specific trading strategies.



Fine-tuning operations

Spurred by initiatives to connect front-, middle- and back-office operations, commodity traders have long sought faster, more seamless and efficient solutions. Toughening competition and tighter regulation are driving traders to dedicate more and more budget and resources to enhancing their business processes at all levels. Business process improvement initiatives add value by making better use of limited resources, with direct and measurable impact on your company's performance.

Business process optimization and internal controls

Finding the appropriate formula for your business process solutions

There are numerous and varied business management solutions out there to support your company in its simplest and most complex activities. Before venturing into outsourcing projects or investing into onerous vendor solutions, an internal check-up is often the best starting point. High-performing companies routinely partner with external professionals who help them think out of the box. Our domain professionals can support you with your initiatives:

- ▶ Provide objective diagnostics of your existing business processes and help you identify potential gaps to industry benchmarks (e.g., front-to-back tools and procedures)
- ▶ Recommend proven methods of business process improvement that your company has the latitude to accept and implement
- ▶ Help you optimize your procurement process to ensure that you are not paying more for less (e.g., support you with your energy procurement contracts, calls for tender)
- ▶ Assess the pros and cons of outsourcing business processes and assist you with vendor selection
- ▶ Support you in the business process application selection as well as its implementation

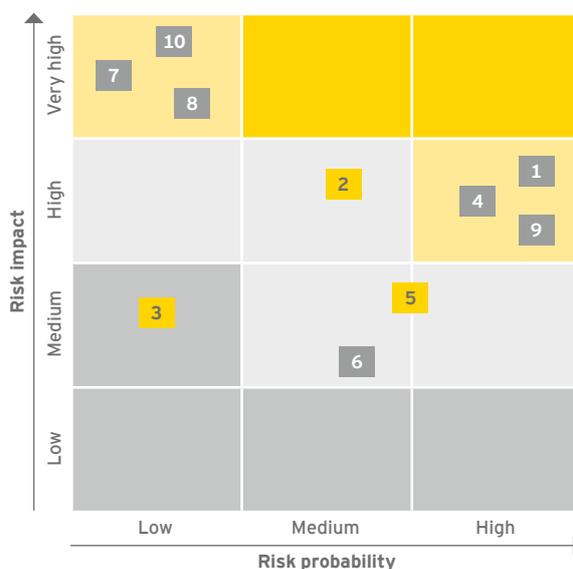
Uncompromising internal controls

Disruptions or inefficiencies in workflows or business processes can quickly spiral, running up painful financial and legal costs. Consequently, there is no room for compromise when it comes to the robustness of a company's system of internal risk controls in today's commodity trading environment.

EY's internal controls toolbox

EY's risk management professionals can support you in this mission-critical field and:

- ▶ Assist you in identifying business risks and assess their potential impact
- ▶ Recommend preventative measures to ensure that risks are mitigated
- ▶ Help you construct your risk control matrix by mapping identified controls to risks
- ▶ Document your internal control system
- ▶ Benchmark design effectiveness and overall soundness of your internal control system based on practices observed at peer companies (gap analysis)



Risk Map
Mapping risks is a fundamental starting block to an organization's internal risk control framework.



Exponential growth in market data

Keeping pace with the latest market news and data is a key success factor for your trading operation's profitability. Being there first and acting on the latest information can make the difference between boom and bust. With this in mind, commodity trading companies have invested heavily into market data, transactional and risk management applications.

Applications support and data management

Compiling the data you need

Your choice of data and system vendors will ultimately impact your front-, middle- and back-office performance on the one hand and yearly IT budgets on the other. At EY, we have CTRM system and market data professionals who will assist you with your choice and help you with the following operations:

- ▶ Assess your market data requirements and assist you in optimizing the scale and type of market data required for your operations
- ▶ Rationalize the scope of your current market data coverage with regards to your actual requirements and deal with duplicate or redundant data
- ▶ Help you choose the market data vendor(s) that best fit your workflow needs
- ▶ Configure your existing financial data applications to render them more seamless and user-friendly
- ▶ Prepare RfPs for new market data requirements and support you throughout the proposal process

Grasping big data and data analytics

Leading commodity and energy trading players are only beginning to grasp the power of big data and the implications for operations. By harnessing big data, organizations can identify the patterns and extract the information that truly matters when making sensitive business decisions.

We understand the challenges that come with big data analytics and the inherent investment of material and human resources needed to glean meaningful information out of petabytes of raw data. Our Quantitative Advisory team can provide you with insight and support on a range of topics, including:

- ▶ Data mining (e.g., cluster analysis, anomaly detection, association rule mining)
- ▶ Predictive analytics (scoring data with predictive models)
- ▶ Forecasting and optimization

Reliable trading and risk management tools

Operating in volatile market conditions, your company must ensure reliable and compliant transactional and risk management systems. Your exposure to market risks both in physical and financial commodity assets requires you to have systems and processes in place that will allow you to perform your operations with peace of mind.

Building an appropriate IT landscape

Whether you need systems for trading operations, calculating risk exposures, physical scheduling nominations, or financial reporting, EY's CTRM applications professionals can provide you with the sound guidance you need:

- ▶ Help you assess your CTRM requirements based on your specific workflow of commercial and financial operations and the inherent risks that need to be monitored and managed
- ▶ Provide implementation and configuration assistance for your selected CTRM applications provider
- ▶ Help you validate implemented modules through case testing and recommend potential enhancements and adjustments
- ▶ Accompany you in the management of data migration projects for vendor changes or version upgrades

Big Data
CTRM system
Data Analytics



Regulation on the horizon

Trading in European commodity and energy markets is more regulated than ever before. Effective internal monitoring is essential, not only for organizations to meet regulatory obligations, but also to manage their reputational risk, mitigate against possible fraud and ensure that trading strategies are effectively executed.

Compliance and regulation

Managing regulation

Over the years, regulators have introduced a raft of new rules to ensure market transparency and combat market abuse and manipulation, whether real or perceived. In Switzerland, the Financial Markets Infrastructure Act, also known as FinfraG, which is expected to come into effect towards the end of 2015, is deemed to regulate derivatives trading much like its equivalent acts in the EU (EMIR) and the United States (Dodd-Frank). Other EU-based directives such as MiFID2, MAD2 and MAR have also been on the table for commodity traders. Organizations that trade in derivatives are not always accustomed to dealing with the complex regulatory frameworks that are emerging, and often seek external professionals to help them confront new regulation and compliance requirements.

Financial Instruments Regulation

In the area of financial instruments regulation, a new financial services act, also known as FIDLEG, has been the Swiss initiative in response to the EU's MiFID2, and is expected to come into effect in 2017. Passed into law in April 2014, the EU's revised Markets in Financial Instruments Directive (MiFID2) represents a fundamental change for energy and commodities firms that deal in financial instruments and that have, until recently (under MiFID), largely escaped regulation as a result of broad exemptions. Aside from limiting available exemptions, the changes in MiFID2 also broaden the scope of instruments for both physically and financially settled derivatives under the wider classification of "financial instruments".

The new set of measures aimed at regulating commodity market participants can be summarized within the following categories:

- ▶ Market infrastructure - e.g. an extension of the regulated platforms to incorporate OTFs
- ▶ Position limits/controls - derivatives traded on regulated venues will be subject to position limits and position controls, while venue operators will also need to report on these positions
- ▶ Trade transparency reporting - pre- and post-trade disclosure requirements will increase market participants' reporting burden
- ▶ Domestic regulatory frameworks - governance and controls, as well as business conduct rules will need to be employed to ensure appropriate risk measurement, management and integrity

Commodity trading firms are advised to conduct assessments in order to determine, at a minimum, the applicable scope boundaries, legal entity and business model impacts, as well as to establish a roadmap to implement the necessary organizational response.

At the forefront of compliance and regulation

EY is in continuous dialog with authorities and regulators the world over. Backed by this unique interdisciplinary knowledge network, our team of experienced commodity professionals will work with you to understand new requirements as they concern you, formulate an appropriate response for your market and activities, and assist you in implementing it.

EY's CTRM team can help you:

- ▶ Identify required enhancements for regulatory compliance through gap assessment
- ▶ Define appropriate risk measurement tools and metrics designed to support your market monitoring framework
- ▶ Implement transaction reporting processes and governance requirements
- ▶ Provide assurance on compliance with key elements of regulation
- ▶ Develop a "defense file" to demonstrate compliance in case of investigations



Do you want to find out more?
Consult our thought leadership on
MiFID2/MiFIR for Commodities Markets.

About the global EY organization

The global EY organization is a leader in assurance, tax, transaction and advisory services. We leverage our experience, knowledge and services to help build trust and confidence in the capital markets and in economies all over the world. We are ideally equipped for this task – with well trained employees, strong teams, excellent services and outstanding client relations. Our global purpose is to drive progress and make a difference by building a better working world – for our people, for our clients and for our communities.

The global EY organization refers to all member firms of Ernst & Young Global Limited (EYG). Each EYG member firm is a separate legal entity and has no liability for another such entity's acts or omissions. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information, please visit www.ey.com.

EY's organization is represented in Switzerland by Ernst & Young Ltd, Basel, with ten offices across Switzerland, and in Liechtenstein by Ernst & Young AG, Vaduz. In this publication, "EY" and "we" refer to Ernst & Young Ltd, Basel, a member firm of Ernst & Young Global Limited.

© 2015
Ernst & Young Ltd
All Rights Reserved.

SRE 1505-420
ED None