Emissions management strategies and emission trading and potential barrier: The faster way to satisfy EU ETS compliance requirements

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1. Abstract

**Emissions Management Strategies**

Emissions management for single plant is dependent on the complexity of the CO₂ calculations and the emissions caps imposed by the governmental or the local state regulator. Different European countries have imposed contrasting data quality constraints. E.g. In the Netherlands spreadsheet cannot be used for data processing but for most other countries verifiers and regulations have been less stringent.

Multi-site emitters have a more complex scenario to manage. The ideal approach is to have a common enterprise wide solution to capture emissions for monitoring and reporting purposes and combines allocations and forecasts for the plants in a central system where a net position can be managed and a trading strategy implemented.

**Emissions trading and potential barriers.**

Emissions trading strategy should utilize financial market best practice and spread market exposure over the year (in keeping with the annual NAP allocation) for trading a net long or net short position. This will expose the firm to an average price traded value over the year and not a single one off price. The larger the short or long exposure the closer the position should be actively managed by financially experienced personnel. Options, floating price forwards and swaps can also be used to ensure an average annual price exposure and minimize transaction costs. An effective and active trading strategy will help ensure market trends are tracked and market timing of transactions are effective. This will result in lowering environmental costs to the firm.

There are few barriers to cap and trade emissions trading so long as markets evolve across Europe at the same pace. Liquidity has improved and one common market across Europe has evolved for emissions which is more akin to financial markets like foreign exchange than flow based commodity markets where there are still massive barriers to the creation of an effective pan European traded market.
1. Introduction

In order to implement successful business strategies a complete end-to-end, top-to-bottom solution for EU ETS and beyond is necessary. To link up people across your business, from production facility to front office trading desk within one software solution will give the right benefit - monitoring fuel usage and emissions on the one hand, to a full end-to-end, front, middle and back office trading capability on the other. With such a detailed and complete view available instantly across the corporate structure, every part of your business will be able to make informed decisions with the information on demand.

Think beyond the single production facility, beyond single trader, an overall software solution has to model any corporate structure, handling the ownership and operation of your entire fleet. All relevant data produced at one level in the corporate structure, like emissions data from the production facility, should be aggregated and projected to all levels in the corporate structure above it. Such an approach enables full fleet management; linking everyone working in the enterprise; site and energy managers to front office traders, back office to middle office and let you get a single unified picture. For EU ETS, this means that actual and forecast emissions data should be instantly available to the traders who need to know the company’s accurate carbon position to make market decisions. With this approach there are no discrepancies, no delays while spreadsheets work their way through the mailing system.

The software solution EMISSIONS MANAGEMENT within the Siemens Power Plant Automation Energy Management Suite SPPA-M3000 supports the complete workflow with a monitoring and compliance solution combined with a modern, fast carbon trading system. Everything is web-based and it’s available from Siemens as a subscription service - zero rollout costs, no costly implementation project, no hassle with upgrades nor updates.

2. Emissions Management Strategies

No one can predict accurately the price of CO₂ allowances at the end of 2007. (There is a forward curve for the price of emissions allowances but we do not know if this accurately demonstrates the spot price in December 2007). All that is known is that on average CO₂ emissions will reduce across Europe and that 11,400 sites will have to monitor their emissions and ensure there is no imbalance between their allocation, net purchases or sales at the end of the compliance period. With CO₂ emissions prices ranging between 12 €/ton and 28 €/ton the timing of purchases and sales through the market is imperative. Some typical emissions management strategies include the following. These are designed to reduce exposure to a one-off transaction:

- Centralize emissions allocation across multiple operator sites across Europe (this reduces external transaction fees and enables the firm to have bargaining power and central control).
- Manage net emissions purchases and sales passively over the year on a monthly/weekly basis depending on the size of exposure. This follows financial best practice which would take place for foreign exchange currency hedging or commodity hedging. Consequently the value of transactions will tend towards the average.
- Manage emissions net purchases and sales proactively and on a daily basis through regular market transactions or monitoring closely a structured deal with a counterparty which either exchanges fixed price exposure to floating price exposure or separates exposure into a series of options.
Through analysis of market exposure, emissions conservation strategies can be evaluated with full knowledge of their financial impact. Consequently emissions reduction projects can be justified since there is a clear financial impact of not undertaking an emissions reduction strategy and investing in the relevant equipment.

Firms who do not manage their exposure to the market are liable to scrutiny from the investor market just as they would be with respect to energy purchases and foreign exchange exposure.

3. Emissions trading and potential barriers

There are a number of barriers to emissions trading and liquidity.

- A small number of larger emitters could control the price of CO₂ emissions.
- A number of local exchanges have emerged with the same product which results in market segregation and a lack of price transparency. One Europe wide exchange would be more favorable.
- The government registries and markets support a forward and futures market but not a spot market for emissions transactions. Most participants would prefer to realize emissions sales in cash when the transactions are executed and not at the end of the year.
- Countries have taken a contrasting stance to EU legislation. United Kingdom, Netherlands and Sweden have embraced the legislation with rigor, other countries are slow adopters of EU directives and legislation. This prevents a level playing field. E.g. Greece, Italy and Poland could be classified as slow adopters.
- Market information regarding supply/demand imbalances and CO₂ usage on a month by month basis are not visible so markets are more volatile and open to distortion than they should or could be.
- Emissions trading is still not understood by all potential participants.
- The cost of serve regarding EU ETS compliance is proportionally larger the smaller the participant leading to competitive disadvantage for smaller firms.

These barriers will disappear as the market matures and participants' demands are met. The result will be a less volatile CO₂ price and market transparency creating a model for cap and trade which can be replicated worldwide.

4. Legal (and corporate) Obligation

Over and above EU ETS legislature which financially penalizes firms for non-compliance there is also a corporate duty for the firm to do their bit to conserve the environment. In France and the Netherlands "environmental corporate statements" must be disclosed to the public by law and should these statements prove untrue or misleading there are sanctions which can be imposed to the executive board. Corporate responsibility of the executive will be a large potential driver for firms who participate in EU ETS and in Phase II of Kyoto (2008-2012) and as a consequence Europe wide disclosure is a distinct possibility, just as financial reports and statements must be disclosed at regular intervals.

5. Recommended Business Practice

The recommended business practice for the firm is to:

- Monitor emissions using an auditable system.
- Manage the CO₂ emissions and position using a simple trading system.
- Provide management reports on the status of the emissions output.
Integrate these three activities on one system to eliminate operational risk, corporate financial liability and trading exposure.

Train all key stakeholders on the system to ensure data is reliably maintained.

As a result the corporation will be able to position itself as environmentally friendly and efficient with the appropriate processes in place for EU ETS compliance.

6. The Solution

EMISSIONS MANAGEMENT with the features Contract Management, Deal capture, Front, Middle- and BackOffice Workflow, Risk Management, Interfaces / Registries, Monitoring & Reporting, Verification, Decision Support / Compliance Chart.

6.1. Contract Management

The software was built from first principles with a contract management framework that supports all current and future contract types (from IETA Master Agreement to EFET). The innovative web technology actually generates PDF confirmation slips from the system, each formatted according to the type of contract being traded on. These can be printed and faxed or emailed to the counterparty directly.

6.2. Fast Deal Capture

From the front office web portal, the trader is one mouse click away from the deal capture screen - making this a fast and easy solution. Once the deal is recorded it moves into the back office workflow.

Fig. 1 The Trade Portal - All alerts and “to do” items appear in the event list. A simple click on the Counter Party to access deal capture screen.
6.3. Back Office Workflow

Once a deal has been recorded and a ticket number assigned it moves into the back office workflow system. Accessed from a separate web portal, the back office user has visibility of all active deals. From this one portal page, the back office user can manage the full trade life-cycle, third party companies and contracts with these third parties as well as the full trade book structure.

6.4. Risk Management

From the risk management web portal, a risk manager can monitor and report on the company’s exposure, both in terms of payment and delivery. With this information at their disposal, companies can then control access to counterparties, enabling or disabling them for trading with, instantly. As you’d expect the risk manager can maintain multi-market, multi-commodity price curves, data used for marked to market reporting.

Trade activity can be downloaded as an Excel spreadsheet for detailed analysis outside the product or for inclusion in cross-commodity exposure reports. All activity is fully audited, every action - successful or not. The risk manager has immediate access to this detailed auditing.

![Image of Risk Portal]

Fig. 2 The Risk Portal - Monitor & Report on exposure. Easily enabling or disabling Counterparties.

6.5. The Registry

As of April 2006, there is no electronic registry. The specification has not been released for the interface. However, on availability, Siemens is interested in delivering automated integration between the solution EMISSIONS MANAGEMENT and the national registries. For our customers, the subscriber to our ASP solution, there is no extra cost and no extra implementation required to get this important technology integration piece. In the mean time,
EMISSIONS MANAGEMENT is the perfect tool for recording and managing your registry transactions, giving you the capability to report and reconcile your registry account position in a world of manual transaction creation.

6.6. Monitor Your Emissions

With the capability to visually model any process, combustion or chemical, fossil fuels to biomass, this product is equipped to deal with any industry or sector. Underpinning this modeling tool is the EMISSIONS MANAGEMENT Calculation Engine, a mathematically powerful but intuitive tool for designing and implementing fuel or material calculations. All emissions data, not just CO₂, can be calculated, recorded and reported on with this product.

![Fig. 3](image)

*Fig. 3* The dynamic process diagram provides easy to edit calculation process for an installation.

6.7. Are you Ready for Verification?

Fuel and material usage is fully recorded and audited just like any other data in the product. Every modification to historical fuel or material usage creates an audited historical record. This is vital for successful verification of your facilities.

EMISSIONS MANAGEMENT actually generates all the regulatory reports within EU ETS that are needed for verification, automatically. This is a huge timesaving on performing this task manually.

6.8. Decision Support Tools

EMISSIONS MANAGEMENT offers a number of visual decision support tools to aid compliance planning and strategy. Two of particular note are the compliance chart and the monthly position report. The former shows the overall compliance position of a company or aggregation of companies in terms of their allowance position against their CO₂ liability.
includes forecast positions as well to let companies plan ahead across the years and compliance periods of EU ETS and beyond. The monthly position report shows the aggregated position each month in the current year, of actual and forecast emissions data against allowance positions for the year. Recalculating the position for each month in the year, the report makes suggestions of buys or sells for each of the remaining months in the year to minimize price exposure and risk.

Fig. 4  The compliance chart provides quick visual feedback of current position, at either installation or company level.

7. Conclusion

SPPA-M3000 EMISSIONS MANAGEMENT is a full EU ETS compliance solution. It combines detailed monitoring and reporting of production sites with allowance transfer and trading capability. More than that, it is a strategic planning solution, one that offers the end user the confidence to formulate a mature compliance strategy. With detailed tracking of the CO₂ position of individual sites, the capability to forecast CO₂ emissions across the compliance period and detailed tracking of all allowance movements, EMISSIONS MANAGEMENT is a genuinely end-to-end solution.

In a wider corporate context EMISSIONS MANAGEMENT provides even more business benefits. Allowing the end user to model corporate structures of ownership and operation, EMISSIONS MANAGEMENT provides a compliance view across multiple production sites - aggregating the CO₂ obligation and EU allowances to include all production sites belonging to any given company in the corporate structure. Therefore the solution supports multi-national and international operating companies by national language support.
8. Glossary

ASP  Application Service Provider
IETA  International Emissions Trading Association
EFET  European Federation of Energy Traders
EU  European Union
EU ETS  European Union Emissions Trading Scheme
NAP  National Allocation Plan
PDF  Portable Document Format
SPPA  Siemens Power Plant Automation

9. Reference List

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3. Dr. M. Elspas / Prof. Dr. P. Salje / Dr. C. Stewing (Hrsg.), Emissionshandel, Carl Heymanns Verlag, ISBN 3-452-25905-6

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