

In this edition of our newsletter...

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Recent developments in the Dutch Energy Market

I am pleased to present the fifth edition of our newsletter, delivered each quarter. This time, we changed the format and it is in English. I have made a selection of the interesting developments within the Dutch energy-market over the past months.

RWE, Vattenfall and E.ON will continue with the development and exploitation of coal-fired power plants.

There have been quite some reactions on the remarks of CEO Peter Boerma from Delta related to the second nuclear power plant at Borssele. Crucial decision point will be at the release of this edition of the newsletter when the shareholders in Delta will decide whether to pursue or not. It has now been agreed that the process for obtaining the license for construction has been postponed by 6 months.

On nuclear there was more news over the past month; Electrabel will shut down its old nuclear plants by 2015 and in general Belgium and Switzerland have decided to turn away from investments in nuclear power generation. Also EDF plan to build nuclear power plants in the UK has been cancelled.

The green deal has been received as positive by most of the stakeholders. Intention for the government is to provide support, but without subsidizing. Some sub-projects are eligible for subsidy in the SDE+ subsidy scheme. Co-firing of bio-mass in a coal-fired power plant has also been subject to Green deal discussion. Green deal agreements have been reached with Energie Nederland, required due to the absence of MEP subsidy in near future for energy companies.

On November 7th the official opening has been of Nordstream; the gas pipeline that will bring Russian gas to Northern Europe. A next project will be the connection to the Netherlands via NEL. It is planned to have this by next year.

NMa Energiekamer merges with OPTA and Zorg autoriteit in '*Consumer and Market Authority*'.

Sia Partners started this month a new consulting assignment in Zeeland at Delta related to the application for the license for a new nuclear power plant KCB-2.

Also we held a small working session with energy trading companies and EFET on the topic of REMIT. We will focus in our first article on REMIT, secondly because of the challenges with Delta and KCB-2, we dedicated an article to nuclear and lastly inspired by the Nordstream opening in November, we dedicated an article on gas sourcing. On the last page I introduce with pride our team Netherlands.

If you wish more information about our activities, please visit our website www.sia-partners.nl, have a look at our Energy blog energy.sia-conseil.com or contact us directly via email or phone.

On behalf of the team, I wish you a Merry Christmas and a happy New Year!

Robert Jan van Vliet

Sia Partners

Director Netherlands

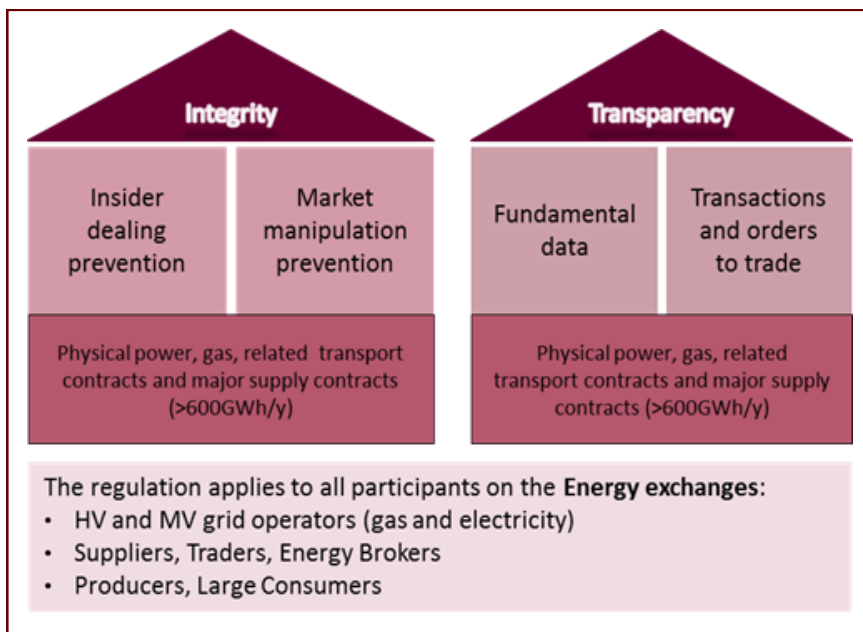


European Financial Regulation for Energy Trading Companies

First round REMIT

The Financial crisis drives the European Commission to improve the regulation, functioning, and transparency of financial and commodity markets to address excessive commodity price volatility. As a direct reaction to the crisis there are proposals to regulate the over-the-counter (OTC) derivatives market through enhanced market oversight (EMIR), the forthcoming review of the Market Abuse Directive (MAD) and the ongoing revision of Mifid. The existing financial regulation like MAD and Mifid only applies to financial instruments such as Energy derivatives traded at Energy Exchanges. Within the electricity market, they only account for less than 20% of the total volumes traded. Hence, the new REMIT and EMIR regulation and reviews of the existing regulations MAD and Mifid shall close the

gap. The European Council approved the Regulation of Energy Market Integrity and Transparency (**REMIT**) on the 10th of October 2011. REMIT intends to prevent Market Manipulation and trading on Inside Information in the European Gas and Power markets and is just the first step in Energy trading regulation. With REMIT Energy market participants will be subject to additional transparency requirements. They need to publish fundamental data before trading on the market and regulators will get a strong mandate to monitor, investigate and intervene in Europe's energy markets.



REMIT implementation

How is REMIT practically implemented? REMIT will prohibit 1) the use of inside information when selling or buying at wholesale energy markets, 2) transactions that give false or misleading signals about the supply, demand or on prices of wholesale energy market products and 3) distributing false news or rumours that give misleading signals related to wholesale energy market products. Exclusive and price sensitive information should be disclosed before trades can take place.

The Regulation will come into force the 28th of December 2011 (20 days after publication by the EC), but leaves some areas of interpretation. While ACER publishes guidance to the definitions and defines the rules of reporting, most of the Trading companies are translating the regulation into operational risk areas, assessing the impact on existing processes and reporting, and implementing measures to prevent cases of investigation. Individual traders can be accused of Market Manipulation based on monitoring signals by the European regulator, ACER, but do they encounter all the insights of the European Energy Market? This leaves the companies in an uncertain situation with quite some risks ahead in the coming years.

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The definitions of the Insider Trading and Market Manipulation are not very precise. ACER states that it's up to the Market participants to know what should be marked as 'Bad Behavior'. ACER will not publish pages of detailed definitions on this subject, but will provide guidance to the National Regulatory Authorities (NRA's) to be able to implement the Directive on National Level. To prevent differences in the National implementation by NRA's the Dutch National Regulator Energiekamer will be responsible for the National implementation of REMIT and takes a coordinating role. A first session with market participants, Sia Partners and Energiekamer has been recently held and a sector-wide meeting will be initiated by Energiekamer early February of 2012. Energiekamer aim is to provide



market participants more insights in how they will monitor and analyze the Energy Markets as of the beginning of 2012. For example how the publication should take place of the Insider Information applying to the different Trading companies. At this moment there is no platform selected to publish and no International standard to comply with. In a later stage the transactions reporting towards ACER will be shown on the agenda. The detailed requirements should be clear in the summer of 2012 and first reports to ACER need to be delivered by end of 2013. Quite some work to be done by the National Regulators as well as the Market Participants.

REMIT will be followed by EMIR and MiFID

Besides REMIT, Energy trading companies are investigating the impact of the proposal to regulate the over-the-counter (OTC) derivatives market (EMIR) and the revision of MiFID which is already approved for financial institutions.

"The detailed requirements should be clear in the summer of 2012 and first reports to ACER need to be delivered by end of 2013"

The impact on an Energy trading company can be extensive. If energy companies were to be classified as financial institutions under MiFID, they would be subject to strict operational and capital requirements and they would also be obliged to clear all their derivatives transactions under EMIR.

Clearing of all OTC transactions will impact the price of each of these OTC trades. Additional margin will be expected by the Clearing institution and will result in higher prices. Due to these higher prices the number of transactions could reduce and new participants (smaller companies) will focus to a limited amount of markets, which will impact the liquidity of the Energy markets. Besides that sourcing of additional capital under MiFID will increase costs and make Energy companies more dependent on the Financial Markets.

REMIT final remarks

The market participants all agree that REMIT will improve the transparency in the market and the trust towards Energy trading companies. For now there is no way back as the directive is approved by the European Committee and it doesn't directly increase the business costs for an Energy trading company.

The Economics of a Nuclear Power Plant

to invest or not to invest....

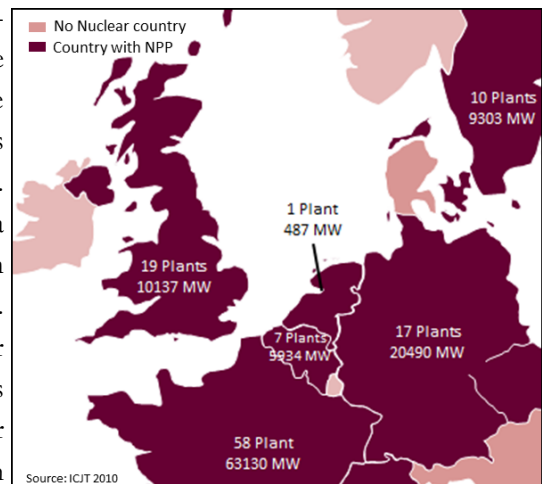
“Nuclear energy is a mature, safe and reliable technology capable of supplying electricity and heat on a large scale, at an affordable price, and without pollution or greenhouse gases”. Nuclear opponents argue that “Nuclear wastes are an unresolved problem and nuclear power enjoys massive government subsidies”. As this two opposite opinions reveal, there is currently a lively debate going on around this type of energy. Despite this discussion it has to be noted that nuclear energy is and will remain an important source of electricity around the world in the coming decades. At

“More than 40 countries globally intend to implement a nuclear program within the next two decades”

the moment there are more than 400 Nuclear Power Plants (NPP) active. The share of nuclear energy production in world’s energy consumption is significant. While the political debate continues in several countries regarding the benefits and risks of nuclear power, more than 40 countries globally intend to implement a nuclear program within the next two decades (World Nuclear Association). This article has a financial perspective on the implementations of these NPP’s. Prior to elaborating on the financial side, a snapshot will be shown of the current European situation.

European context

Nuclear power in Europe accounted approximately for 27% according to IEA of total electricity consumption in 2010. Nevertheless the share per country varies a lot. France and Finland for example are distinct proponents and are developing the latest EPR reactors (France derives more than 75% of its electricity from nuclear power). Germany recently decided in the aftermath of Japan's Fukushima nuclear disaster to close all of its 17 nuclear power plants between 2015 and 2022. Eight plants were closed directly after the disaster. Sweden is considering reversing its strategy to abandon nuclear power. The United Kingdom is building new EPR’s. The previous examples show that the national energy policies regarding NPP’s per EU member differ significantly. The figure to the right shows which countries currently have nuclear reactors.



Dutch situation

At the moment the Netherlands has one active nuclear reactor generating 4% of its electricity, which is operated by Delta. In 2008 this same company announced a proposal for a new nuclear unit at Borssele. This second plant should be operational in 2018 and will have a capacity of 1600-2500 MWe. Currently Delta is in the process of obtaining all the necessary permits and to attract investors/partners. The total investment sum for “Borssele 2” is estimated around €4,5 billion. In November 2011 Delta CEO Peter Boerma was in the media expressing his concerns regarding low electricity prices. The CEO pleads for a tax on CO2. By this Delta wants to make the business for additional NPP in the Netherlands feasible.

Economics of a NPP

The economics of a NPP is complex and it’s hard to quantify the costs and benefits. Furthermore, the cost to build and run a NPP strongly depends on the type of plant and the construction time. The average overnight capital cost (cost to build a NPP, without taken interest into account during the construction period)

The Economics of a Nuclear Power Plant

to invest or not to invest....

is \$3500/kW for a AP1000 (Generation III+ pressurized water reactor) and for an EPR it is \$3400/kW (World Nuclear Association). The construction time however differs strongly: an AP1000 plant is constructed in 36 months whereas the an EPR takes more than 60 months with the necessary consequences on capital costs. Nevertheless the costs of generating power via nuclear energy can be separated into the following components (Nuclear Economy):

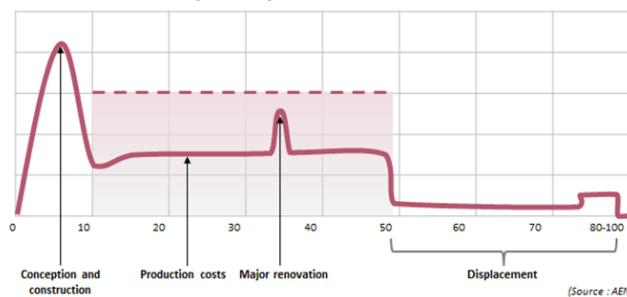
- ◆ Capital costs related to the construction
- ◆ Operating cost and waste disposal
- ◆ Decommissioning costs



Basically, the investment challenge initial high upfront capital investment. The majority of nuclear energy's cost is the extensive capital investment required to construct the plant (65% - 75%) in the first phase. The lion share are financing costs and will depend on the rate of interest on debt. Once the NPP is constructed the plant operates at reasonably low costs and is considered by some as a “cash machines”.

This is graphically shown in the graph to the right. In addition, nuclear energy production results in volume of radioactive waste that needs to be disposed. Disposal costs account for approximately 2% - 3%. Costs for future decommissioning of a power plant is often budgeted into the priced charged for electricity to the consumer. European experts estimate that decommissioning costs to be around 10% - 15%.

Cash flow over the nuclear plant life cycle



Levelized costs of generated electricity

As stated earlier some consider NPP's as a “cash machine”. Others state that “Nuclear power is cost competitive with other forms of electricity generation, except where there is direct access to low-cost fossil fuels”. Currently studies investigate the cost competitiveness of a NPP with regards to the price for CO₂. Hence the influence of a political decision on introducing a carbon tax or carbon emission trading strongly influences the investing climate.

“An AP1000 plant is constructed in 36 months whereas an EPR takes more than 60 months with the necessary impact on capital costs”

Investing climate is changing

As with any big investment decision a thorough analysis must take into account who bears the risks of future uncertainties. A few decades ago the involved risks of NPP's were taken by state-owned or regulated utility monopolies. Now after the liberalization of the market more often private companies are taking the risk in a highly competitive environment. This leads to a different way of addressing and evaluating the economics of new NPP's. In addition with the 2011 Fukushima disaster it is likely that the operating costs will increase as a result of stricter safety regulations. Then is question how electricity market prices will evolve. For now, this changing and uncertain environment results in a reserved attitude of investors. The future will tell if this attitude will be permanent or temporary.

Gas sourcing in Europe

Still room for long-term gas contracts?



“Zolotoi vek za gaz” as would the Russians say (the Golden Age of Gas). Is that truly the case or are the long-term high value contracts getting redundant in this liberalized and increasingly volatile market? According to the International Energy Agency (IEA), the place of natural gas in the global energy mix will be of significant relevance for the upcoming decades. The IEA Gas Scenario assumes that the gas usage will rise by more than 50% and will account for 25% of the world energy demand in 2035.

In line with the European energy deregulation, the gas market is slowly shaping towards a more mature and liberalized market. The pipelines originating from Norway, Russia, Africa and Asia are feeding Southern and Northern Europe assuring the supply of the local gas demand. The

gas capacity flowing into Europe will be even increasing the coming years due to the new gas pipelines with delivery points at hubs in Europe. The recently established Nordstream project ensures additional delivery capacity from Russia towards the European continent where the Southstream and Nabucco project are entering in South/Central Europe. Next to these physical interconnections between the gas hubs and local gas receipt stations, the LNG industry is a growing source for gas supply with delivery at the largest ports in Europe (mainly ARA - Amsterdam Rotterdam - Antwerp). The available regasification terminals at these ports process the liquid gas back to its original condition.

For each actor operating on the natural gas market, the determination of the right sourcing strategy depends on three basic elements: 1) gas demand forecasting, 2) gas price assessment and 3) sourcing channel selection.

Forecasting the gas demand

The gas demand forecast depends on weather conditions, contractual obliged volumes, number of gas-fired power plants and their capacity (if applicable), etc. The forecast can be broken down in the following way (generalization)

- ◆ **Base load (per month, quarter or year) requirement for the different segments:** demand forecast for the domestic sector, small/medium enterprise and industrial consumer, power generation and exports.
- ◆ **Peak demand and Load Duration Curves (LDC):** once establishing the base load forecast, the peak demand and load duration curve can be determined based on either historical data (looking back), models to generate what if scenarios (looking forward) or a combination of both.

Next to identifying the seasonality patterns within the gas demand forecast curve (winter/summer movements), the long-term planning investments and strategic objectives need to be taken into account in order to forecast the spikes/disruptions compared to the regular seasonality curves. Besides these intrinsic drivers, the (geo-)political and economical drivers will also affect the demand on local scale but even more so for cross-border activities.

Gas sourcing in Europe

Still room for long-term gas contracts?

Assessing the gas price - short overview of the pricing mechanisms

When the market for gas was just being established - in the Netherlands around 1960 - the question raised: how to value/price gas? The most straightforward way in that time - and in the many years that followed - was to couple the gas price to the oil price (the so-called oil indexation benchmarked against Brent oil). This approach for gas pricing is getting less applied due to a.o. the direct exposure to the oil price. Following the price development of oil and gas over the past ten years, it can be noticed that the correlation between the gas and oil price is getting smaller. This reduced correlation implies indirectly that there are other methods/mechanisms for the pricing of gas. Variations to this oil-index method are price indexes based on a time lag (of multiple months: 3, 6, 9), prices based on an oil to gas ratio and gas-to-gas indexation methods. According to the International Energy Agency, three-quarters of the gas consumed is sourced with wholesale long-term contracts with oil-price indexation. For the main North-West European countries this ratio is lower. Spot gas price indexation or hub-based pricing is becoming more and more the preferred method of pricing (reducing the indirect oil price exposure).

“According to the International Energy Agency, three-quarters of the gas consumed is bought with wholesale long-term contracts with oil-price indexation.”

Select the sourcing channel

Securing the gas supply obligations can be done in multiple ways. Generically seen, the gas procurement can be done either by means of long-term gas contracts from gas wholesalers originated in Russia, Algeria or locally in Europe via the Netherlands, Norway, etc. or by taking positions on the spot markets via the gas Exchanges like ICE, NYMEX, APX-Endex (TTF), etc.

The long-term contracts are typically gas indexed and span a period of at least 5 years. These contracts often provide the seller, buyer or both volume flexibilities by having options within the contract like a Take-or-Pay option, min/max volume flexibility and/or a carry forward option. Even though these long-term contracts provide the opportunity to tweak (optimize) the constraints, the oil price exposure is seen as a strong drawback to these contracts. Seen the fact that the gas price has dropped and is not following the upward oil price trend, having a long-term obligation can result in a loss at delivery. For this reason, new contracts are more often based on a gas-to-gas index or buyers decide to source a part of the required volume on a gas exchange. This hybrid form spreads the risk exposure from the buyers side. From a seller/wholesaler perspective, this will imply that they will have to act on the spot market and change their commercialization approach regarding the gas sales activities.



Conclusion - still room for long-term contracts?

The era of long-term gas contracts based on bilateral terms seems to be over. The evolution of the gas market towards a healthy, transparent and mature state is steering the actors towards standardized short-term products. However, security of supply will always remain a strategic objective. Driven by the risk appetite of especially the buyer, the need for mid- and even long-term contracts will decrease but not completely disappear if gas wholesalers can maintain the contractual flexibilities and adapt their price indexation method.

Get to know the Sia Partners Amsterdam team

A mixed team with a unique set of experience and expertise

As an independent management consulting firm, Sia Partners has expanded its activities and presence on a global scale. We started doing business abroad in 2005. With this expansion we are aiming to foster our culture which is strongly result driven through experience and expertise.

The Amsterdam office has been established in October 2009. Meet here a few of our consultants working on interesting energy related topics. A short introduction to them.

Ceyla Tokbay - Consultant

Ceyla works for Sia Partners since January 2010. In the energy sector, Ceyla has contributed as PMO for NMa in a project aiming to monitor the customers complaint handling of Dutch suppliers. She also follows closely the developments of financial regulation for energy trading companies, like REMIT, EMIR, MAD. Ceyla worked previously on a large assignment in the insurance industry – Solvency II.



Khalid el Bachraoui - Consultant

Working for Sia Partners since October 2010, Khalid has been involved in the start up phase of the Amsterdam office. Expertise areas for Khalid are Smart Energy and Trading & Portfolio Management. Khalid has assisted in the development of models related to the impact of the electrical vehicle on the Dutch distribution grid and has developed the Smart Pricing business case model. Currently he is on a mission at Vattenfall Energy Trading doing analysis on the Oil Trading business processes.



Robert-Jan de Boer - Consultant



In April 2011 Robert Jan de Boer started at Sia Partners as an energy consultant. Prior to Sia Partners he worked at APX-ENDEX, the Anglo-Dutch power exchange. Areas of expertise are energy trading (gas, electricity & carbon emissions) and Pricing. Robert Jan is currently on a mission at EDF Luminus as an analyst within the Retail department focusing on Pricing. In addition he is involved in a price regulation project and in the redesign of business processes.

Marcelino Cancela Vallespin - Consultant

After his graduation at TU Delft with a specialization in Energy Technologies, Marcelino started working for Sia Partners in June 2011. Marcelino has developed expertise in Energy generation, Energy markets and project management. He is currently a member of the project team of EPEX Spot (French-German Power Exchange) where he is involved in the international project for the Price Coupling of Regions.



Jeroen de Laat - Consultant



As of September 2011 Jeroen joined Sia Partners in Amsterdam. He has contributed to large scale (IT) delivery projects for clients within the Utility sector. He was team lead within various projects through all phases of the delivery cycle. Furthermore, Jeroen has developed extensive experience within the domain of Trading & Portfolio Management. Current focus is on three topics European Financial regulation (REMIT, EMIR, etc.), back delivery project cases and Vendor implementations.

We would be glad to get your feedback on our newsletter or any other inquiry you might have
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