



Verksamhetsberättelse 2010

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Förord

Nätverket Olja & Gas har sedan starten 2001 arrangerat ett antal seminarium per år i syfte att skapa en plattform för utbyte och diskussioner kring frågor relaterade till de fossila bränslena. Seminarierna har varit uppskattade med många intressanta talare och givande diskussioner. Nätverket har under året fått ett sjuttiofem nya medlemmar. Det är glädjande att se att nya medlemmar kontinuerligt ansluter sig till nätverket.

NOG har under 2010 arrangerat sex stycken seminarier. Dessutom har en partnerträff anordnats i samband med seminariet i september "Irak on the threshold of a new era as oil producer".

På NOG:s hemsida finns referat och presentationer från de seminarier och studieresor som nätverket anordnat. Kalendarier uppdateras kontinuerligt med datum för och information om kommande seminarier och det finns dessutom information och nyheter realiterade till olja, gas, kol och andra energirelaterade ämnen.

NOG fortsätter sitt arbete med kunskapsspridning om försörjningstrygghet, olja och gas under 2011, och nätverket har nu funnits i hela tio år.

Nätverkets huvudfinansiär är:

Energimyndigheten

Partners under 2010 var:

Preem Petroleum
Nynas
Statoil Sverige
Svenska Shell
Fortum Värme Sverige
Göteborg Energi
Vattenfall
Eon Gas Sverige

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Nätverkets inriktning och syfte

Bakgrund

De fossila bränslena, särskilt oljan, har en avgörande betydelse för landets energiförsörjning trots de satsningar på alternativ för att minska importberoende och värna miljön som skett under de senaste decennierna. Oljans funktion i samhället är flerfaldig; dels som råmaterial till petroleum- och plastindustrierna, och dels till drivmedel. Alternativ i form av t.ex. förnybar el i plug-in-hybrider eller biodrivmedel finns, men ännu inte i någon större utsträckning i volym och utbyggd infrastruktur. Inom överskådlig tid kommer de fossila bränslena fortsätta att vara nödvändiga för Sveriges energiförsörjning.

Nätverkets övergripande syften

Vårt samhälle och välfärd är starkt beroende av tillgång på energi i olika former. Kunskap om alla tillgängliga energiförsörjningsalternativ är således i högsta grad en riksangelägenhet. Nätverket Olja & Gas har två övergripande syften.

Syfte 1: Underlag för en bred energipolitisk debatt

Nätverket skall bidra till att ta fram objektivt underlag för en bred energipolitisk debatt. Det är nödvändigt att oljans och gasens betydelse för viktiga samhällsfunktioner är känd och att värdefull kunskap om olja, gas och kol bevaras och utvecklas. Det gäller även i rådande situation då samhällets fokus sedan många år varit helt inriktad på förnyelsebara energikällor. De olika energislagen låter sig olika lätt substitueras. Det handlar om såväl betydande kostnader som det faktum att vissa förändringar tar betydligt längre tid än andra. De tillgängliga alternativens tekniska möjligheter och de kostnader som förknippas med dem måste bli kända. Detta gäller även hushållnings- och besparingsalternativens praktiska och ekonomiska konsekvenser. Förändringarna i teknik och infrastruktur måste bevakas.

Syfte 2: Försörjningstrygghet och beredskap

Sårbarheten hos det moderna samhället diskuteras normalt endast sporadiskt. Störningar i elförsörjning och telekommunikationer blir varje vinter ett flitigt diskuterat ämne i samband med snöfall främst i landets sydligare delar. Däremot tas den underliggande tillgången på energi för given. Internationella kriser kan dock rubba energisystemet i grunden. Trender i energiefterfrågan liksom såväl förutsebara och oförutsebara förändringar i utbudet kan påverka oss på ett avgörande sätt. Riskerna att vi skall få uppleva allvarliga störningar i energisystemet kan inte uteslutas. Nätverket skall således verka för att beredskapsfrågorna inom energiområdet lyfts fram och diskuteras. Framsynthet är viktigt och kräver att en aktiv omvärldsbevakning och analys bedrivs och kommuniceras. Riskerna för energikriser bör belysas på ett ickealarmistiskt sätt så att det skapas en förståelse för behovet av beredskapsåtgärder. Energiberoendet och sårbarheten liksom även lösningarna på problemen delar vi med övriga EU-länder varför det är nödvändigt att diskutera beredskapsfrågorna ur ett EU-perspektiv.

Stockholm, januari 2011

Seminarier under 2010

Under 2010 har sammanlagt sex stycken seminarier anordnats.

Teman har valts efter de frågor som har varit aktuella under året. Frågor som präglade 2010 i medier och debatter var bland annat den olycka som ägde rum på oljeplattformen Deep Water Horizon i Mexikanska golfen och de efterspel som följt denna händelse. NOG har också tittat närmare på det teknikgenombrott som skett inom gasmarknaden där skiffergasen förändrat förutsättningarna framförallt på den amerikanska energimarknaden och vidare har nätverket undersökt förutsättningarna för energiförsörjning i vårt europeiska grannland Storbritannien.

Titlarna för årets seminarier har varit:

- The challenge of secure energy supply in Britain – Implications for Europe
- Coal as a raw material in a sustainable energy system – how do we make it possible?
- Energiförsörjning och säkerhetspolitik: samband och utmaningar
- Iraq on the threshold of a new era as oil producer
- Gas Markets in Transition – Shale Gas Impact
- Jakten på framtidens fossila energi. Utvinning av olja från svårtillgängliga källor, både kommersiellt och kontroversiellt

Seminarierna "Energiförsörjning och säkerhetspolitik: samband och utmaningar" och "Jakten på framtidens fossila energi. Utvinning av olja från svårtillgängliga källor, både kommersiellt och kontroversiellt" var samarbeten med andra nätverk, Folk och Försvar respektive Näringslivets miljöchefer, NMC.

Nedan följer korta sammanfattningar av seminarier. För seminarierens referat i fullängd, se Appendix A – G.

The challenge of secure energy supply in Britain – Implications for Europe

2010-03-02

Great Britain, once a major exporter of both oil and gas, has recently become a net importer and the gap between consumption and production is increasing. The electricity generating system is aging, and commentators argue that a lack of political decisions is delaying necessary investments.

The British dilemma is also Europe's:

- Growing dependence on energy imports, concerns for security of supply
- Need for policies to stimulate future energy investments
- The challenge of developing cost effective technologies for decarbonization

The NOG seminar addressed this dilemma and highlighted the following issues:

- The British energy balance; consumption and supply trends; perspectives for the oil and gas production
- When modernizing the energy system, which options will Britain opt for: coal, nuclear, renewable energy or more imported gas?
- Investment needs and political challenges
- Consequences regarding the security of supply for Britain and Europe
- What can Sweden learn?

Coal as a raw material in a sustainable energy system – how do we make it possible?

2010-04-14

The electricity in Europe today is to a large extent produced from coal and natural gas. In order to meet the current climate goals, new solutions are required to reduce emissions from these sources.

Extensive research is being carried out to develop methods to use coal and other fossil fuels in a sustainable way in order to minimize the release of emissions into the atmosphere.

Clean Coal Technologies, such as Carbon Capture and Storage are one of the interesting solutions that could be used to meet the environmental targets.

The NOG seminar addressed the problem of how coal can be used as fuel in a sustainable energy system in the future. Some of the aspects that the seminar highlighted were:

- Present coal resources and utilization, how large are the resources and where are they located?
- New technologies, identification of Clean Coal Technologies in Sweden, Europe and the world
- The role of coal in the future energy system

Energiförsörjning och säkerhetspolitik: samband och utmaningar

2010-05-18

Världens energiresurser är koncentrerade till vissa regioner medan en stor del av förbrukningen sker i andra länder. Sveriges självförsörjningsgrad är inte mer än cirka 30 procent, vilket gör oss beroende av energitillförsel från internationella marknader. Även om vi vill öka andelen inhemsk och förnyelsebar energi kommer vårt beroende att vara fortsatt stort; särskilt av olja. Utmaningen att utforma en energiförsörjning som är både säker och hållbar är också en viktig fråga för Europeiska unionen.

Obalans i energiresurser och beroendet mellan stater och regioner reser brännande säkerhetspolitiska och energimässiga frågor. Hur möter vi riskerna? Hur påverkar beroendet säkerhetspolitiken? Vilka slutsatser drar våra politiker? Folk och Försvar och Nätverket Olja & Gas inbjöd till diskussion kring risker och utmaningar i framtidens energiförsörjning.

Iraq on the threshold of a new era as oil producer

2010-09-14

Iraq stands at a crossroad. On the one hand there is the prospect of political collaboration and stability. This scenario could allow Iraq to develop its large petroleum resources and take a place among the world's leading oil exporters. On the other hand there is the risk of further sectarian conflict and more violence in the wake of the US withdrawal.

With the help of international and Swedish expertise the seminar examined the opportunities and

risks that Iraq is facing, politically and economically. The following questions were discussed at the seminar:

- Will the political fractions in Iraq be able to bridge the mistrust and create an effective government?
- The US presence and influence are waning; what are the consequences.
- The international oil companies are back in Iraq and the government has set objectives to produce more than 10 million barrels/day. Can this be done?
- What would the consequences be, within OPEC and for the oil market? How could the regional power balance be affected by the different development scenarios for Iraq?
- What are the ambitions of the influential neighbors; Iran, Saudi Arabia, Syria?

Gas Markets in Transition – Shale Gas Impact

2010-10-27

Shale gas is defined as natural gas trapped in shale formations. Shale gas has in only a few years time become an important energy source in the U.S., viewed to have the potential of radically reduce the need of imported natural gas. For example, the forecast of imported natural gas of the Energy Information Administration (EIA) has been modified from 28 down to 9 percent of the overall natural gas supply. And the changes in US gas import have factored in the fact that the construction of a number of LNG terminals approved years ago is now on hold.

Shale gas findings in the US have already affected the pricing of gas and the world's LNG market by increasing the available supply to the global market by re-directing supplies intended for the US to other parts of the world. Turning to Europe, the full potential of its shale gas resources has yet to be explored, in terms of deposit geological conditions and cost structure, etc. However, market players have expectations of a rather large potential. Physical exploration is currently under way in Poland, Austria, Hungary, Great Britain and in Skåne, Sweden, Shell is drilling in the shale deposits.

In order to discuss the potential and the role of Shale gas in the global energy mix, international and Swedish experts were invited to the Network Oil and Gas seminar on October 27th. The seminar highlighted issues such as:

- The “factual” aspects of shale gas, e.g. geographical location; availability, technology and geological challenges.
- The local environmental impact of mining for shale gas.
- The effect of current and future exploration of shale gas on gas markets in the US and Europe as well as global gas market.

Jakten på framtidens fossila energi. Utvinning av olja från svårtillgängliga källor, både kommersiellt och kontroversiellt

2010-12-01

Fossila bränslen kommer med all sannolikhet att fortsätta efterfrågas inom överskådlig framtid, framför allt är en ökad efterfrågan att förvänta i nya tillväxtekonomier. Var ska denna energi komma

ifrån? Energibolagen ger sig ut på nya marker i jakten på framtidens fossila energi, som finns i områden som är tekniskt alltmer komplicerade och mer kostsamma att exploatera. Den 21:e april 2010 exploderade oljeplattformen Deepwater Horizon i Mexikanska golfen. Nästan två månader senare lyckades BP stänga oljeläckan, då hade stora mängder olja läckt ut i havet utanför den amerikanska kusten. Under seminariet gavs en utblick mot framtidens exploateringsprojekt och de utmaningar som energibolagen står inför inom teknikutveckling, ekonomi, riskhantering och miljö samt de frågor som aktualiserats efter olyckan med DeepWater Horizon. Några av de frågor som belystes var:

- Nya fossila energikällor; var finns de och hur tillgängliga är de?
- Inom tekniskt komplicerade exploateringsprojekt, hur arbetar energibolagen med riskhantering, teknologikutveckling och miljöhänsyn?
- Vilka konsekvenser får ett större oljeutsläpp för miljön och vad finns det för teknikutveckling inom området?
- Vilka konsekvenser för energibranschen får ökade krav på riskhantering?
- Hur kan myndigheter, företag och organisationer agera preventivt för att minimera risken för svåra olyckor?

Medlemsantal

Nätverket har under 2010 fått cirka 70 stycken nya medlemmar; det totala antalet medlemmar sedan starten är nu uppe i nästan 800 personer. Det har inte skett någon aktiv medlemsrekrytering under året utan nya medlemmar har ansökt om medlemskap via formuläret på nätverkets hemsida. De nya medlemmarna representerar, liksom tidigare, stora delar av energisektorn, både myndigheter, akademi och företag.



Figur 1. Utveckling av medlemsantal i NOG.

Hemsidan: www.nog.se

Nätverket Olja & Gas hemsida under adressen www.nog.se innehåller information om:

- NOG – hur NOG kom till.
- Seminarier – inbjudan till seminarier och referat från alla seminarier.
- Svensk beredskap – hur gör Sverige?
- Bli medlem i NOG – direktanmälan via Internet
- Medlemmar – organisationer som är representerade i NOG
- Studieresor – information om NOG:s studieresor
- Kalendarium för NOG:s aktiviteter under året
- Fakta om olja, gas och kol – fakta, analyser, rapporter med mera.
- Nyhetsarkiv – dagsfärska nyheter från världens alla hörn.
- Länkar – länkar till myndigheter, företag, organisationer, nyhetsservice och övrigt.

Hemsidan fungerar som en informationspunkt för nätverkets medlemmar, både för kommande seminarium och andra aktiviteter samt för nyttig allmän information, nyheter och länkar. Hemsidan har uppdaterats kontinuerligt med fakta, nyheter och länkar etc. Sidan har under 2010 haft ett relativt stadigt antal besök, med undantag för semestermånaderna, på cirka 30 till 70 besök per dag.

Partners

Nätverket Olja & Gas har ett par industriella partners som anser det viktigt att nätverket lever kvar och vidareutvecklas. Dessa partners har under 2010 varit E.ON, Fortum, Göteborg Energi, Nynas, Preem, Shell, Statoil och Vattenfall. Under 2010 anordnades en partnerträff i samband med seminariet i september, "Iraq on the threshold of a new era as oil producer".

I samband med seminariet i december, "Jakten på framtidens fossila energi. Utvinning av svårtillgängliga källor, både kommersiellt och kontroversiellt" anordnades ett mingel med ost och vin och fortsatta diskussioner för alla seminariedeltagare.

Appendix A: The challenge of secure energy supply in Britain – Implications for Europe

2010-03-02

Skrivet av:

Staffan Riben
Johan Viksten

Foreword

Great Britain, once a major exporter of both oil and gas, has recently become a net importer and the gap between consumption and production is increasing. The electricity generating system is aging, and commentators argue that a lack of political decisions is delaying necessary investments.

The British dilemma is also Europe's:

- Growing dependence on energy imports, concerns for security of supply
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The NOG seminar will address this dilemma and highlight the following issues:

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- Investment needs and political challenges
- Consequences regarding the security of supply for Britain and Europe
- What can Sweden learn?

Talare var:

Alex Kemp

Professor of Petroleum Economics,
Director, Aberdeen Centre for Research in Energy Economics and Finance (ACREEF)
University of Aberdeen Business School

Dieter Helm

Professor of Energy Policy at the University of Oxford and a Fellow of New College, Oxford

Moderator:

Staffan Riben

Consultant, former Statoil executive, and chairman of NOG's Program Committee

Alex Kemp

Alex Kemp pointed out that the UK relies on indigenous production of oil and gas and increasingly on imports. Imports are not necessarily more risky per se. Diversity of supply gives higher security, while dependence on few supply sources or elements of infrastructure can entail risks.

Gas production grew steadily from the late sixties until about 2000. In the first decades production and market introduction were managed under state domination. Gas was directed to the domestic market to replace coal and fuel oil and prices were controlled. To ensure security of supply, long term import contracts were entered with Norway. The price controls and imports held back exploration and development activities on the UKCS.

From the mid 1980s development of production increased and the state monopoly (British Gas Corporation) was privatized. As the market fundamentals moved towards abundance of supply this liberalization entailed very low risk. Increased interest in security of supply for oil grew following the Suez crisis in 1967 and the oil crises of 1973-1974. Production from the UKCS grew rapidly from 1975. A state oil company (BNOC; later Britoil, privatized in the second half of the 1980s) was formed to increase control, but had limited influence. The government promoted domestic refining of UKCS crude oil to enhance supply security. Product imports and exports have grown, because of a mismatch between the domestic refinery configuration and the product structure of UK demand.

The UK reached self sufficiency in 1980 and became a net exporter of oil. Since 1999 production has fallen steadily, and the country is now again a net importer. Falling production from larger fields has to be replaced by a growing number of smaller fields, with shorter depletion times. Alex Kemp summarized modelling of the prospects for the future oil and gas production on the UKCS made at the university. Exploration and discovery trends, technical, economic and industrial capacity factors were used to generate different scenarios until 2040. In a “high” scenario, production is substantially maintained during the next 10 years and then declines more sharply, while a “low” scenario shows continued, steady decline. In both scenarios, total hydrocarbon production will have fallen to between 1 and 0,5 million boe per day at 2040 (from approx. 2,5 million boe per day in 2009).

Professor Kemp pointed out that the UKCS infrastructure is complex and some key facilities are very old. On the other hand oil and gas are produced at some 300 fields, none of them accounting for a major share of the total production.

For *gas* it appears that domestic production and import capacity (but not necessarily molecules of gas) will be able to rather comfortably meet demand until 2020 or so. The capacity should also be able to meet the normal winter demand, but it is much less clear whether the market could provide for disruptions to gas supplies. There may be a need for extended gas storage capacity; a discussion that is ongoing in the EU.

Successful implementation of the UK low carbon transition plan will reduce demand for both gas and oil, but nevertheless substantial import needs will remain.

Professor Kemp ended by reviewing the compulsory storage requirements for *oil*. Because of falling oil production the UK will have growing stocking obligations under EU and IEA rules (which are being harmonized to require stocks corresponding to 90 days of net imports).

Dieter Helm

Dieter Helm began by emphasizing that the energy contexts in the UK and in Sweden are substantially different. UK depends on coal and gas in power production, while hydropower and other renewables play a much more important role in Sweden. UK has relied to a large extent on market forces, “but, we are joining your world”; the world of nuclear and renewables and of government policies to bring about change. A massive technical change will be required. In power production – the main focus of Dieter Helm’s remarks – the most striking feature is how little technical change has occurred in past 100 years!

Until 2000 UK had a comfortable excess of supply. The focus was to “sweat the assets”, rather than new investments. The results are seen now, an ageing infrastructure. Dieter Helm underlined that the UK will have to live with the consequences of previous decisions – for a long time!

Policy cannot be made without objectives. Climate change is a new context, which politics now is trying to address by new targets and policies. So far UK has been doing well in reducing carbon emissions; this is however a result mainly of switching from coal to gas and of British deindustrialization. In fact, the carbon emissions from production have moved to other countries, while Britain’s consumption of goods that caused the emissions in the first place has grown. Now UK’s policies are driven by EU’s 2020-20-20 framework. 2020 as a target year is not sensible. Until that time a number of the main options cannot be realized: new nuclear capacity and CCS in particular. That leaves the UK with wind power as the main option, delivering limited effect at very high cost.

In addition to the 20 percent reduction in carbon emissions, the UK has also adopted a target of a 15 percent share of renewables by 2020. This implies that offshore wind power would have to grow from 5 percent to around 30 percent in 10 years. The target is not credible and will probably have to be abandoned. An intellectual experiment: the transition to renewables, primarily wind power, will cost 100 billion £, perhaps more. Roughly the same reduction in carbon emissions could be achieved in a couple of years, at a fraction of the cost, by replacing about 4GW of coal fired power plant with two or three combined cycle gas turbine plants which would cost around £6 billion.

Security of supply has not been a big concern, but Britain is now moving from self sufficiency to growing need of imports. There are massive investment needs in infrastructure and storage. A big question is how this will be achieved.

The regulatory body Office of Gas and Electricity Markets nowadays acknowledges that “liberalization will not keep the lights on”. Politicians talk about more state intervention, while industry states that the current market won’t deliver. There are no credible targets, and the result is maximum uncertainty.

Energy policy has been marked by lots of ad hoc policy interventions and policies tailored for specific technologies. A lesson to learn is that there is a cost to trying to politically pick the winners.

Dieter Helm went on to summarize the options to address the challenges.

He underlined that climate change must be taken seriously. A general price on carbon emissions is not sufficient, but it is necessary. To maintain a capacity margin is a public good; the market will not provide that on its own. Capacity auctions tied to carbon emission budgets would be a method to achieve sufficient capacity. Increased focus on R&D is essential. Smart electricity grids and smart meters would make electricity use more efficient and curb demand. The development of hybrid and electric cars will mean that electricity can be stored on a larger scale.

The unrealistic renewables target should be abandoned and be replaced by a low carbon obligation. There is potential for quick carbon reduction in the next decade through coal to gas substitution, taking advantage of the change in demand/supply balance brought on by the economic depression,

and the rapidly increasing supply of gas. “Potentially, we will be awash with gas for a long time to come.” Large scale non-conventional gas (shale gas) in the US frees up large volumes of LNG. In Europe there is good potential for non-conventional gas in Poland and elsewhere.

In Europe gas competition should be kept open. Gazprom should not be allowed to integrate downstream in Europe. In this context Dieter Helm commented on the Nord Stream project, which serves primarily German security of supply interests at the expense of Poland and the Baltic states. This is an illustration of the lack of unified European policy.

Finally Dieter Helm referred to further information in various publications and papers (listed in his presentation), particularly the 2009 book, edited by him and Cameron Hepburn, *The Economics and Politics of Climate Change* (see <http://ukcatalogue.oup.com/product/9780199573288.do?keyword=helm+and+hepburn&sortby=bestMatches>).

Appendix B: Coal as a raw material in a sustainable energy system – how do we make it possible?

2010-04-14

Skrivet av:

Johan Söderblom

Foreword

The Electricity in Europe today is to a large extent produced from Coal and Natural gas. In order to meet the current climate goals, new solutions are required to reduce emissions from these sources. Extensive research is being carried out to develop methods to use coal and other fossil fuels in a sustainable way in order to minimize the release of emissions into the atmosphere.

Clean Coal Technologies, such as Carbon Capture and Storage are one of the interesting solutions that could be used to meet the environmental targets.

The NOG seminar addressed the problem of how coal can be used as fuel in a sustainable energy system in the future. Some of the aspects that the seminar highlighted were:

- Present coal resources and utilization, how large are the resources and where are they located?
- New technologies, identification of Clean Coal Technologies in Sweden, Europe and the world
- The role of Coal in the future energy system

Talare var:

Torbjörn Wahlborg

Head of Vattenfall Nordic

John Topper

Managing Director, IEA Clean Coal Centre

Kalliopi Kalesi

Programme Manager, CCS, European Commission

Moderator:

Tomas Bruce

Managing Director of the Swedish Coal Institute

Tomas Bruce

Tomas Bruce is CEO of the Swedish Coal Institute and special adviser to the Swedish Government on Energy Efficiency. He has worked for many years within the Swedish energy sector, and has been CEO at Skellefteå Kraft, Stockhom Energi and Birka Energi. He has also been a board member at Capital Cooling Europe, Euroheat & Power and Svenska Kraftnät.

Tomas Bruce was the moderator of the seminar, and he held an opening speech titled Supply and use of coal in an international perspective.

The speech started with a presentation of the Swedish Coal Institute, which is an interest group for the use of coal in Sweden. Their aim is to work for a use of coal that is responsible from an environmental perspective, and to inform about the role of coal in the Swedish as well as the global energy consumption. The organization has members from energy companies, industries, fuel traders as well as research institutions.

Tomas Bruce showed statistics of the use of coal on different regional levels. Coal constitutes 26 percent of all energy being used in the world, and 40 percent of the energy being used for electricity. For Europe the numbers are somewhat smaller, with 18 percent of the total energy being used and 30 percent of the energy used for electricity. This situation has been stable during the last decades. Sweden differs from most of the world, having only 0.3 percent of the electricity originating from coal. Of total energy being used in Sweden coal constitute about 5 percent, mostly because of the coal being used within larger industries.

China is the biggest coal supplier, followed by USA, which has a supply that is only one third of Chinas. India is the third biggest supplier. Only 15 percent of the coal is exported from the country where it is mined. China, USA and India were therefore also the three largest coal users in 2008. Australia, followed by Indonesia and Russia, were the biggest coal exporters in 2008. Most important coal importers are Japan, South Korea and Taiwan. However, China has an increasing import of coal and according to Tomas Bruce it is likely that China is second to Australia at this moment. A review of the current reserves of coal and lignite shows that coal is likely to last for more than hundred years, assuming that the technology and consumption does not change. The resources however are even bigger. Tomas Bruce concludes that coal is today used more than ever in a global perspective, and he therefore believes that it will be an important energy source for the coming centuries. Sweden is however thought to stay as a low-coal economy.

John Topper

John Topper is a chemical engineer who started working in the coal industry in 1975. He is currently the Managing Director of the IEA Clean Coal Centre, located in London. Earlier in his career John Topper was executive director of a private energy and environment consulting company, and he has also worked for the British Coal Corporation, the UN Industrial Development Organisation and the IEA Environmental Projects Ltd.

John Topper held a presentation titled Coal Use World-Wide; why it will continue and the Challenges it must meet. The focus of the presentation was to describe the usage of coal in a global perspective and to present forecasts of the future development, as well as presenting the progress of burning technologies and decarbonization of fossil fuels.

The IEA Clean Coal Centre aims at providing information about the sustainable use of coal world-wide. The organization has member countries as well as private sponsors from all over the world. Forecasts made by the IEA predict that the energy demand will increase with 45 percent from now until 2030. According to the IEA this scenario is far from sustainable since fossil fuels are expected to account for most of the increase. More than one third of the overall rise in energy use would be coming from coal, which is also the energy source for which the demand is increasing most rapidly. It is mainly the non OECD-countries with China and India in the front that are suspected to increase their demand, of energy in general and coal in particular. The OECD-countries are believed to stay at a stable level.

IEA has also made a forecast of the division of different energy sources if the share of carbon dioxide is to be halted at 450 ppm by year 2030. This would require about 40 percent renewable sources for the electricity generation. Coal would however still be used in substantial amounts. John Topper points out that 1.5 billion people are lacking electricity today, and that mitigating carbon dioxide is not the only important task on the agenda.

John Topper continued by presenting the state-of-the-art and the current development within coal fired power plants, based on a recent global investigation. Nordjylland 3 in Denmark is given as an example of a highly efficient coal-fired plant, operating at a net efficiency of 47 percent. For lignite the German plant Niederaussem K operates with a net efficiency of 43.2 percent. E.ON is building a new plant in Wilhelmshaven that is hoped to be the first coal fired plant ever to reach a net efficiency of 50 percent. John Topper also mentions a Japanese plant, the Isogo New Unit 1, which has managed to get their emissions of nitrogen oxides and sulphur oxides to be lower than what can be found in the European countries. This has been achieved by using the latest techniques.

According to John Topper there is a great potential to reduce the carbon dioxide emissions by upgrading old coal fired power plants. However, it is his opinion that Carbon Capture and Storage (CCS) is necessary to make the emission reductions that are needed for the future. This is the only possibility if we are to continue using fossil fuels. John Topper finished his presentation by giving a review of the current situation and future challenges for Carbon Capture and Storage. The Vattenfall pilot plant at Schwarze Pumpe was mentioned as the leading example of capturing carbon, having been running for about one year. A lot of research is done within the field of CCS but there are still many question marks to address. China is developing capture technologies with some assistance and co-operation from western organisations and aims to own its own Intellectual Property and supply its own market in due course. John Topper believes that the efficiency of power plants have the potential to increase until the year 2030 so that when adding systems for CCS the total efficiency will be about the same as the current standards. To have an effect however CSS must be installed in all parts of the world and both within power production and industries. A big challenge is also for CCS to get accepted by the public opinion, which so far has been rather difficult.

Torbjörn Wahlborg

Torbjörn Wahlborg is head of the Vattenfall Business Group Nordic and Senior Executive Vice President of Vattenfall. Torbjörn holds an engineering degree from Chalmers University of Technology and has worked at Vattenfall for about fifteen years. During these years Torbjörn has worked at a number of the company's facilities, and he has until lately been Country Manager for Vattenfall in Poland.

Torbjörn Wahlborg held a presentation titled *Clean coal from a Vattenfall perspective*, with the objective to explain how Vattenfall look at coal and the role that it will have in the future. Torbjörn Wahlborg started his presentation by giving a brief presentation of Vattenfall. Vattenfall is the fifth largest generator of electricity in Europe and the largest producer of heat. The company is operating in seven countries and has a total of six million costumers. In total Vattenfall have more than 40,000 employees, whereof less than one forth are located in Sweden.

Vattenfall owns coal fired power plants in Denmark, Netherlands, Germany and Poland. Their total annual consumption of hard coal is 11.5 million tons. The company does not own any coal mines. According to Torbjörn Wahlborg there have been several offers to invest in coal mines, but due to lack of knowledge within mining they have always turned down those offers.

The long time goal of Vattenfall is to be climate neutral by year 2050. In the Nordic countries the goal is to be so by year 2030. One of the strategies to reach this goal is to invest in renewable energy sources, and Torbjörn Wahlborg mentions that wave-power is one of the areas where they are very active. Other activities that they are planning are to replace fossil fuel with electricity where this is possible, upgrade nuclear power plants and install carbon capture and storage.

Torbjörn Wahlborg believes that there is a big potential in CCS. However, there must be a functioning global trading system for greenhouse gases for CCS to be carried out in full scale. With the current development it is likely that a fully developed commercial concept for CCS will be in place by year 2025. Before the COP 15 meeting in Copenhagen it was estimated that a commercial concept would be in place by 2020, but according to Torbjörn Wahlborg the failure in Copenhagen it likely to delayed the progress with a few years. Currently there are pilot plants running, though the next step to develop a demonstration plant is still a few years ahead. Torbjörn Wahlborg believes that this will be realized at the earliest in year 2015.

There are three different methods for capturing carbon dioxide in power plants. Vattenfall has focused on oxyfuel combustion, but are hoping for all technologies to be developed. Their main project at the moment is the oxyfuel pilot plant in Schwarze Pumpe, Germany, which has been running for little more than one year. For the next step in the development Vattenfall is planning a demonstration plant for CCS in Jämschwalde, Germany. The plant is believed to be ready about year 2015, but there are still some critical issues that must be solved. Getting public acceptance for storing carbon dioxide below ground is one of the biggest challenges.

According to Torbjörn Wahlborg CCS is a necessary step if Vattenfall is to succeed with the goal of being carbon dioxide neutral in the Nordic countries by year 2030. If combining CCS with combustion of biofuels there is even a possibility to create a carbon dioxide sink. Torbjörn Wahlborg concludes his presentation by saying that "there is a future for coal in Europe, but not for carbon dioxide".

Kallopi Kalesi

Kalliopi Kalesi currently works in the Coal and Oil Unit of the European Union's Directorate General for Energy. Prior to joining the DG for Energy, she was policy officer in the European Commission's Directorate- General for Research, where she was responsible for policy development on the financing of strategic energy technologies, including CCS. Earlier, in her role as European parliamentary assistant, she helped draft and negotiate the European Parliament's report on the EU's CCS Directive. She has previously worked as a public affairs consultant in climate and energy, and has experience in international relations in energy, multilateral negotiations in the UN system, and the liberalization of energy markets.

Kalliopi Kalesi, Programme Manager for CCS at the European Commission, held a presentation titled *European perspective on clean coal technologies-CCS policy*. The presentation focused on policy making, finance and deployment.

As a background to the work that the EU commission is doing within the field of CCS, Kalliopi Kalesi mentioned the EU climate strategy 20-20-20. The aim of this directive is to reduce greenhouse gas emissions by 20 percent (compared with 1990 emission levels), reduce energy consumption with 20 percent, and increase usage of renewable energy with 20 percent until year 2020. CCS is included in this package, even though the CCS is not likely to be commercially available before 2020.

The EU adopted in April 2009 a directive for CCS and safe storage of carbon dioxide. The member states who wish to pursue CCS in their territory have until June 2011 to transpose this directive into their national law. This will make it possible for companies to apply for constructing a CCS facility, provided that it can be shown that there are sufficient storage sites for the carbon dioxide and that the CO₂ can be safely stored. The EU supports this development and has a program with a budget of 1.05 billion EUR for demonstration projects of CCS.

Kalliopi Kalesi presented a forecast, based on Eurostat data, implying that the share of coal in Europe's energy supply will still be substantial in year 2030. On a global scale the usage is even assumed to be rising. Based on these forecasts Kalliopi Kalesi states that to stabilize the share of carbon dioxide in the atmosphere at 450 ppm 19 percent of the emission reductions must be coming from CCS.

However, CCS still has a long way to go before being commercially available. Kalliopi Kalesi presented a list of the major challenges, not including the technical aspects. The economic aspect of CCS is an important issue, since the technique is expensive and requires a functioning emissions trading system. Since there are no economic advantages for performing CCS today there is also a challenge to finance large scale industrial CCS demonstration projects. The public awareness is also mentioned as one of the most important factors. CCS is still a new phenomenon for most people and if not properly communicated public support may be hard to ensure.

Kalliopi Kalesi points out that the price of carbon dioxide in the EU-ETS is today too low for CCS to be profitable. In combination with rising prices, and the costs of CCS going down, there are good possibilities for CCS to be profitable in the future. This will however require an international cooperation, both regarding knowledge and financing.

Appendix C: Energiförsörjning och säkerhetspolitik – samband och utmaningar



NOG Seminarium, 18 maj 2010 *Energiförsörjning och säkerhetspolitik: samband och utmaningar*

Världens energiresurser är koncentrerade till vissa regioner medan en stor del av förbrukningen sker i andra länder. Sveriges självförsörjningsgrad är inte mer än ca 30 %, vilket gör oss beroende av energitillförsel från internationella marknader. Även om vi vill öka andelen i inhemsk och förnyelsebar energi kommer vårt beroende att vara fortsatt stort, särskilt av olja. Utmaningen att utforma en energiförsörjning som är både säker och hållbar är också en viktig fråga för Europeiska unionen.

Obalans i energiresurser och beroendet mellan stater och regioner reser brännande säkerhetspolitiska och energimässiga frågor. Hur möter vi riskerna? Hur påverkar beroendet säkerhetspolitiken? Vilka slutsatser drar våra politiker?

18 Maj 2010 bjöd Folk och Försvar och Nätverket Olja & Gas tillsammans in till diskussion kring risker och utmaningar i framtidens energiförsörjning.

Moderatorer var Folk och Försvars Lena Bartholdsson, bitr. generalsekreterare och Ambassadör Mikael Eriksson, energisamordnare UD från NOG.

Seminariet bestod av ett antal korta anföranden följt av en frågestund och avslutades med en diskussion.



Medverkande talare

Det globala energiberoendet och konkurrensen om resurserna

- Niklas Granholm, forskare, FOI
- Staffan Ribben, Ordförande i programrådet, Nätverket Olja & Gas

Energiförsörjning och säkerhet i Sverige och vår närmiljö

- Ann-Marie Pålsson (M), ledamot Utrikesutskottet
- Urban Bergström, Energimyndigheten, enheten för trygg energiförsörjning

Utmaningar för framtiden

- Vladislav Savic, Journalist och författare, Sveriges Radio

Avelutande Debatt

- Samtliga ovanstående talare
- Anders Karlsson (S), ordförande Försvarsutskottet





Det globala energiberoendet och konkurrensen om resurserna

Niklas Granholm, forskare, FOI

Niklas Granholm pratade om de strategiska förändringar på global nivå, konkurrensen om resurser och dess implikationer.

De geostrategiska förändringar som togs upp som speciellt viktiga var:

- Globalisering – virtuell och fysisk
- Kärnvapenföregång – förändra spridning till icke-statliga aktörer i fokus
- Terrorism och pirateri – två "effektmodeller" som blir kvar
- FN-systemet – försvagas och kompletteras med olika tillfälliga konstellationer av stater för vissa frågor
- Klimatförändringarna påverkar bl.a. konflikter, jordbruk, migration och sjukdomsspridning
- EU – Europa – För EU ihop det?
- USA – Relativ Maktförlust
- Ryssland – Missad modernisering
- Kina, Indien och Sydostasien – Större ekonomisk och politisk betydelse globalt
- Mellanöstern – Fortsatt konfrontation. Öppen krigsrisk
- Auktis – Mer tillgänglighet, inkoppling i nya sammanhang
- Sydamerika – Ökad global betydelse på väg
- Afrika – Konflikthärd och råvaruleverantör



3



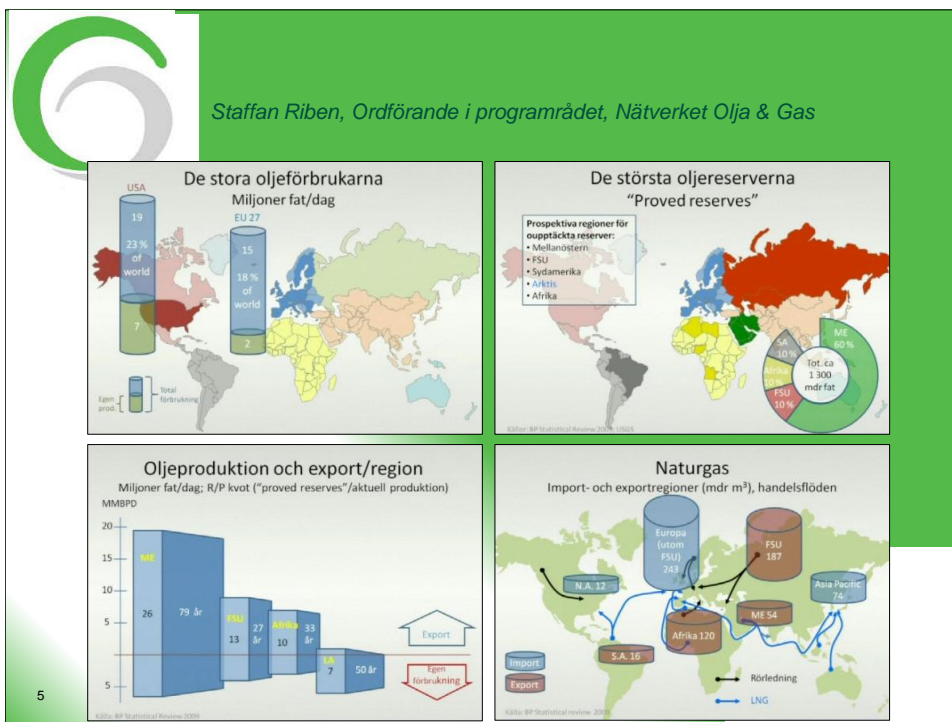
Det globala energiberoendet och konkurrensen om resurserna

Staffan Riben, Ordförande i programrådet, Nätverket Olja & Gas

- Olja, gas och kol fortsätter att vara de dominerande energikällorna i decennier
- Växlande efterfrågan drivs av ekonomier under utveckling, främst Kina och Indien
- USA, Europa, Kina och Japan är beroende av ett fåtal regioner för sin oljeförsörjning, särskilt Mellanöstern. Exportörerna är i sin tur beroende av olje- och gasintäkterna
- Gasresurserna är mer spridda, men Mellanöstern och Ryssland har en särställning. Skiffergas gör USA oberoende
- OPEC-länderna, Ryssland och deras nationella oljebolag får allt större inflytande på marknaden



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Energiförsörjning och säkerhet i Sverige och vår närmiljö

Anne-Marie Pålsson (M), ledamot Utrikesutskottet

- Den totala energianvändningen har ökat med ca 7000 TWh i Europa, av dessa är 4000 TWh ökning av användning av gas och 3000 TWh ökning av användning av kärnkraftsenergi
- EU's vilja inom energiområdet kan sammanfattas till; Solidaritet, Gemensam marknad, Klimatvänligt
- Lissabonfördraget har ett antal betydelsefulla solidaritetsklausuler som även rör energi:
 - Art 170 punkt 1 ... ska unionen bidra till att upprätthålla och utveckla transeuropeiska nät [...] energisektorerna, Art 192 punkt 1 ... garanterar energiförsörjningen i unionen.
- På kort sikt handlar det dock om att ersätta gasen från de sinande fälten i Nordsjön med annan energi
 - Främst från Ryssland och norra Afrika
 - Detta ökar beroendet av osäkra stater, ökar beroendet av ett energislag som kräver långsiktiga relationer, och ökar säkerhetspolitiska spänningar
 - Detta utan att utsläppen av CO2 minskar annat än marginellt!**



Utmaningar för framtiden

Vladislav Savic, *journalist och författare, Sveriges Radio*

- Rysslands framtida bundsförvant – väst eller öst?
 - Östersjön är huvudsakligen ett NATO-dominerat havsområde idag
 - Politiska kartan har ändrats och ser annorlunda ut än vad den gjorde för 20 år sedan
- Den muslimska världens framtida bundsförvanter:
 - Irak, Afghanistan
 - Mellanöstern – Turkiets nya roll är ett exempel
 - Burkadebatter – karikatyrdebatter (och tilltagande "islamofobi") i väst
 - Utvecklingen i till exempel Pakistan

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Appendix D: Iraq on the threshold of a new era as oil producer

2010-09-14

Skrivet av:

Johan Viksten

Foreword

Iraq stands at a crossroad. On the one hand there is the prospect of political collaboration and stability. This scenario could allow Iraq to develop its large petroleum resources and take a place among the world's leading oil exporters. On the other hand there is the risk of further sectarian conflict and more violence in the wake of the US withdrawal.

The seminar on September 14th examined the opportunities and risks that Iraq is facing, politically and economically, with the help of international and Swedish expertise. Some of the questions that were discussed at the seminar where:

- *Will the political fractions in Iraq be able to bridge the mistrust and create an effective government?*
- *The US presence and influence are waning; what are the consequences?*
- *The international oil companies are back in Iraq and the government has set objectives to produce more than 10 million barrels/day. Can this be done?*
- *What would the consequences be, within OPEC and for the oil market? How could the regional power balance be affected by the different development scenarios for Iraq?*
- *What are the ambitions of the influential neighbors; Iran, Saudi Arabia, Syria?*

Talare var:

Niclas Trouvé

Sweden's Ambassador to Iraq during the past four years

Dr Manouchehr Takin

Senior Petroleum Upstream Analyst at Centre for Global Energy Studies in London

Dr Robert Egnell

Assistant Professor at the Swedish National Defense College

Ingolf Kiesow

Former ambassador in Kuwait

Moderator at the seminar will be Staffan Riben, Chairman of NOG's Program Council

Niclas Trouvé

Niclas Trouvé began his presentation by talking a bit about Sweden's history of presence in Iraq, which started already in 1925 by Einar af Wirsén. So being in Iraq is nothing new and that is why Sweden during the four last years has been building and reestablished a new embassy for the purpose of a long Swedish engagement in Iraq.

In 2007 which was a turbulent time in Iraq Carl Bildt and Andreas Billström were among the first ministers to visit Iraq since Saddam's regime fell. This opened up the door for reestablishing Sweden's long standing contacts with the Iraqi people, and thereby strengthens the Swedish business in Iraq. Currently the Swedish export to Iraq is rapidly growing and there is a great market potential in the region. Niclas continued telling more about the market opportunities in Iraq and the importance of being there which could give Sweden a pioneer premium.

Moreover, Trouvé gave a brief reflection about Iraq's oil infrastructure and the challenges that lies within the future prospects of Iraq becoming an important oil producer. Iraq has substantial amounts of oil resources both discovered and not yet discovered and the country is highly dependent on the resources of oil and gas which stands for approx. 90 percent of the governmental revenues.

Therefore it's crucial that the oil sector starts working again both from a economical point of view but also from a political point of view, where money helps to reach security and stability in the region. There is quite a long list of market challenges to solve to keep up the trend of a growing GDP in Iraq. These challenges include security risks, undeveloped financial system, bureaucracy and lack of transparency, and corruption just to list a few. This makes it very important that the democracy process that is been undertaken will keep on developing.

Niclas continued by given his point of view of how to succeed in establishing business in Iraq where a good market strategy would be to work directly with the Iraqis and not with agents in neighboring countries and to use Swedish goodwill. This in combination of a long engagement and a "seize the opportunity" mindset would be the proper way to go.

Thereafter Niclas gave the audience an overview of the political climate in Iraq today where we have the Sunnu- Shia and Kurdish population to unit. Today Iraq's ongoing conflict between the Sunni and Shia population isn't as violent as it was a couple of years ago. Further, tribes still play an important role, especially in the country side and where successful efforts have been made to minimize Al-Qaida's influence. One worrying thing though, is that Iraq has not yet been able to form a functional government based on the result of the last election that took place earlier in 2010.

Niclas concluded by giving his view on what Iraq needs by saying "the Iraqis talk a lot of the past when they should talk about the future – Iraq needs a common vision for the future".

Dr Manouchehr Takin

Dr Manouchehr Takin gave a speech about the future prospects of Iraq becoming a major oil producing nation. There is evidence that Iraq within the second half of this decade could produce 13-14 million barrels a day. Manouchehr elaborated around this and gave his reflections on if the world would need all that oil from Iraq?

Manouchehr began his speech by talking about the world's oil reserves and where they could be found. There are substantial reserves known in the Middel East from which about 15 percent lies within Iraqi border.

He then talked a little about Iraq's history as a oil producing nation, which in its heydays in the early eighties peaked around 3,8 mbpd. Since then the production has gone down due to the first Gulf War and the years of sanctions together with the Military occupation of Iraq and is now reaching 2,5 mbpd. Today's known reserves counts for 148 mbpd and in addition to this there are undiscovered resources expecting around 200 mbpd.

This gives a scenario where Iraq might reach a total amount of 13-14 mbpd in the second half of this decade. Such a scenario is only expected to last approx. 5- 10 years, and then rapidly decline. Manouchehr view is that such a scenario wouldn't be realistic due to heavy investments for installing high production capacity that will only be utilized for a few years. There will also be substantial operational constraints to overcome if such a scenario could be reached. A more moderate scenario would give 8 mbpd and would be more realistic in terms of investment and so forth.

In addition to the above, one should also account for the fact that OPEC has closed down 6 mbpd of their oil production in defense of price. Further on, IEA has done downwards revisions on their World Oil forecasts by – 20 mbpd to 2020. According to Manouchehr's presentation the world's oil supply will increase in the coming years, in addition to an increase in demand at a slower pace. Consequently, OPEC has to curtail its future oil production and Iraq should do the same.

Manouchehr concluded his presentation by talking a bit about the legacy of the former concessionaires, whom in general transferred to little revenues to the producing countries and are therefore viewed by the general public in Iraq and the Middle East with a suspicious eye. This is something that foreign oil companies should be aware of.

Dr Robert Egnell

Dr Robert Egnell gave a presentation about the US withdrawal, the Iraqi development and the Persian Gulf region. Robert talked briefly about the Persian Gulf today, which he describes as a region in flux surrounded with Arab disagreement where no one really knows which direction the development of the political landscape is going to take.

Dr Egnell continued by listing these key factors for reaching security in the region.

The future of Iraq, Iran

The Arab-Israeli Conflict

Regional tensions,

The role of external actors

(Asymmetric threats-Al Qaeda)

When it comes to the future of Iraq and the ability of reaching stability and security in the country, it is very important that the ongoing political and economical development continues. This would lead to a strengthen region, both regionally and globally. He then discussed Iran and its impact on the security issue where his conclusions where that Iran with its nuclear ambitions, close ties to Syria and a source of instability in the Arab-Israeli conflict would prefer status quo in Iraq. However, peace in Iraq certainly would be beneficial for stability regarding the ongoing the Arab-Israeli conflict.

Then there is the question where Iraq is going to position itself concerning the regional tensions (Sunni-Shi'a, Pro Western vs. Iran, Syria and others and Iran-Israel)? In addition, the external actors (USA, Russia, China, India, Europe, and Turkey) influence and have interests in Iraq, which may have a big impact on the future development in the country.

Robert concluded by stating that the war in Iraq has already had a huge impact on the region and this will spill over to the future Iraq regardless it's political and economical development. There is three likely scenarios for the future Iraq, the first is; continued political and economical development and a new strong Iraq (stabilizer or a threat?), the second one is; status quo- political turmoil and limited improvements (this is currently happen and is likely to continue) and the last one is; backlash into sectarian strife and civil war.

Ingolf Kiesow

Ingolf Kiesow made a short post on his personally view of the first Gulf war and the importance of this war in addition to the present situation in Iraq. Ingolf began by talking a bit about the common history of Iraq and Kuwait and the aspects that eventually led to the Iraqi invasion of Kuwait in July 1990.

In 1990 the war between Iran and Iraq had ended with circa 1 million people killed in the conflict. Iraq was in a bad economical shape and therefore needed all the oil income they could get to rebuild the economy. The Iraqi oil equipment was in bad shape and therefore could not pump oil as fast as needed, whereas Kuwait and Saudi Arabia had good equipment and therefore wanted high quotas in OPEC. Iraq called for low quotas in OPEC but wasn't getting heard and in the meantime Kuwait pumped oil faster from the Rumeila field than Iraq could keep up to.

Furthermore, in 1961 Iraq tried to incorporate Kuwait from UK but failed. This was, however, something that the Iraqi government had not given up. So, in July 1990 Iraq made a vicious attack on Kuwait's oil policy at OPEC's meeting and on July 17th Iraqi troops went southwards and the occupying of Kuwait was a fact. Saddam then tried to prepare other Arab nations to take his side in the attack on Saudi Arabia in August, but failed to do so. The reactions of the other Arab nations were not in favor for Saddam as they teamed up with Russia and the US in UN demanding a counter-attack on Iraq.

This counter-attack was led by the US and financed in large by oil money from Kuwait and Saudi Arabia. Kuwait was liberated in February 1991 and southern Iraq occupied by allied forces. Then the allied forces planned a march to Bagdad, but the march didn't come true, which led to the re-opening of the old Sunni-Shia rift.

Ingolf concluded with some exiting reflections on what would have happened if Iraq would not have attacked Kuwait, would the US then have attacked Iraq and Afghanistan a few years later? Pointing out that the Iraq attack on Kuwait changed the international playground.

Appendix E: Gas markets in transition - Shale gas impact

2010-10-27

Skrivet av:

Johan Viksten

Foreword

Shale gas is defined as natural gas trapped in shale formations. Shale gas has in only a few years time become an important energy source in the U.S., viewed to have the potential of radically reduce the need of imported natural gas. For example, the forecast of imported natural gas of the Energy Information Administration (EIA) has been modified from 28 down to 9 percent of the overall natural gas supply. And the changes in US gas import have factored in the fact that the construction of a number of LNG terminals approved years ago is now on hold.

Shale gas findings in the US have already affected the pricing of gas and the world's LNG market by increasing the available supply to the global market by re- directing supplies intended for the US to other parts of the world. Turning to Europe, the full potential of its shale gas resources has yet to be explored, in terms of deposit geological conditions and cost structure, etc. However, market players have expectations of a rather large potential. Physical exploration is currently under way in Poland, Austria, Hungary, Great Britain, and in Skåne, Sweden, Shell is drilling in the shale deposits.

In order to discuss the potential and the role of Shale gas in the global energy mix, international and Swedish experts have been invited to the next Network of Oil and Gas seminar. This seminar will highlight issues such as:

- The "factual" aspects of shale gas, e.g. geographical location; availability, technology and geological challenges.
- The local environmental impact of mining for shale gas
- The effect of current and future exploration of shale gas on gas markets in the US and Europe as well as global gas market

Talare var:

Carl Michael Smith

Executive Director, Interstate Oil and Gas Compact Commission, USA

Alan Riley

Professor, City University, London, Great Britain

Johan Mörnstam

Director, Market Analysis, E.ON, Germany

Janneke Abels

Exploration Manager New Ventures, Unconventionals, Shell International Exploration and Production

Carl Michael Smith

In U.S. Shale gas has only been successfully and commercial profitable to drill for during the last ten years. The technical development continues to increase the production rate of Shale gas in the US where it estimates to last for + 100 years. The total resources are unknown but are considered huge. The debate of natural gas has changed in US as a result of Shale gas extraction and now there is a strong favor of starting to use gas for producing electricity instead of coal and nuclear power. There are also some plans for development gas stations for use as fuel in cars.

The Shale gas is extracted by horizontal drilling which is about 2,5 times more expensive than conventional drilling, but has the advantage of providing a wider zone under neat the surface for extracting gas.

New shale gas resources have short well drilling times and very high initial production rate. In the long term, new wells being calculated to produce for 40-50 years or more, providing for supply stability.

During the drilling process there is a part that's called hydraulic fracturing that involves water being pumped in to the drilling hole under very strong pressure causing the shale to crack and the gas molecules flowing out.

But there is also some environmental issues surrounding the Shale gas boom in US. There are some concerns about the extreme amounts of water needed which also contains chemicals used to crack the rock and the fear of these chemicals leaking out and contemning the local water supply. In US Shale gas plays an important role providing a greater energy and economic security with more predictable and stable prices.

Alan Riley

In reference to the rapid and successful development of Shale gas in US, where US now has replaced Russia as the largest gas producer, is there going to be a similar gas hype in Europe?

One important question is how fast and easy there is to develop the resources in Europe? One can predict that unconventional gas development in Europe has a potential but is not going to be there tomorrow. There is a time lag to significant development between 5-10 years away if substantial resources are discovered.

The great success of Shale gas in US has already had an undeniable impact on the European market via the LNG displacement.

The development of unconventional gas has some positive incentives for the European market such as: Energy security issues and opportunity for price arbitrage within the EU gas market.

But on the other hand we have the EU climate Change policy which seeks to restrict the role of gas which could help to suppress the demand for gas and therefore it could be argued that the European market is limited.

A conservative projection for the medium term would be that the production of domestic unconventional gas in EU would be small for the next 10 years due to the major factors of LNG dumping and climate change suppression on the market.

The impact of unconventional gas production in Europe could lead to greater liberalization of the EU gas market where fundamental "bottlenecks" are removed and more spot markets are developed. It could also lead to a break between oil and gas prices in a more clear way than earlier. Then we have the prospects of the impact on the climate change policy in EU where on question is if EU climate change is survivable due to recessional budget crunches?

Alan's conclusions summed up: More competition in the EU single market, LNG diversification from US to EU will lead to a modest development of unconventional gas in the next 10 years. It will lead to a more liberalized EU gas market, where neighboring countries such as Russia and Ukraine are compelled to respond. Also will a future development of unconventional gas in Europe trigger a reshaping of EU climate change policy?

Johan Mörnstam

Johan talked about unconventional gas as a game changer in global gas markets and how the market has developed in the recent years.

Prior 2009 the global gas market was split in three regions, the Henry Hub (US), Brent (UK) and JCC (Asia), where LNG flows in recent years were mainly divided between the Atlantic and the Pacific basin.

Due to the global economic crisis the demand for gas in Europe has decreased during 2009 and for 2010 first half now increasing again. At the same time the excess of LNG have found a liquid market in Europe.

In Europe the unconventional gas resources doubles the existing recoverable reserves and holds a diverse inventory of Shale gas, coalbed methane and tight gas with major basins in Poland, northern Germany and southern North Sea. In Europe all projects are in a development/pilot stage with first wells being drilled.

Johan then continued talking about the challenges for unconventional gas in Europe which is believed to have a sustained impact in the mid-term.

The major challenges concerns geological, environmental and service aspects. In Europe the geology of unconventional gas is not well understood. The population density in Europe is also generally higher compared with US. Also, in Europe the environmental standards are high.

Lack of pipeline infrastructure and skilled labour means significantly higher costs for projects, something that also contributes to uncertainty regarding future investment in Shale gas projects in Europe.

Johans conclusions summed up:

- Global developments (LNG, US shale, recession?) have had a huge impact on European gas market-and will continue to do so. Europe will produce unconventional gas, but no “drag and drop” of US approach.
- Trading at European hubs has continued to develop and the overall liquidity trend in European energy markets is very positive.
- More can and should be done to connect regions
- This dynamic market creates opportunities for Traders –and competition between them. And ultimately increased integration and competition is good for consumers

Janneke Abels

Janneke talked about Shells ongoing project in exploring unconventional gas in Skåne. Shells vision is to produce natural gas in Skåne in an economical, environmental and social viable way. This could be done by applying the most modern technique and minimization of visual footprints. Shell will create a blueprint for the industry.

In May 2008, Shell was given permits by the Swedish mining authority for the project of determine whether there is natural gas in Skåne. The two permits that were given to Shell compromise to one quarter of the area of Skåne. Though, this being only in the exploration stage Shell needs to look at the full life cycle spectra.

The project is currently in a phase of uncertainty, when they are investigating whether there is sufficient amounts of gas in the Shale to extract, so that the project can be economical viable. Shell is going to drill in three different sites where the geological, environmental and social aspect is the best. In one location they drilled 950 meter down in the ground and managed to collect 200 meter of good quality of core sample.

The results from the different samples will be delivered in the end of 2010 or early 2011. Based on these results, decisions regarding further testing could be taken. The process is challenging and Shell is working constantly with local community to inform of their project and status. If there is sufficient amounts of gas found there, it is expected to take several years before an eventually extraction could take place.

Appendix F: Jakten på framtidens fossila energi. Utvinning av svårtillgängliga källor, både kommersiellt och kontroversiellt

2010-12-01

Skrivet av:

Johan Viksten
Hanna Paradis

Förord

Fossila bränslen kommer med all sannolikhet att fortsätta efterfrågas inom överskådlig framtid, framför allt är en ökad efterfrågan att förvänta i nya tillväxtekonomier. Var ska denna energi komma ifrån? Energibolagen ger sig ut på nya marker i jakten på framtidens fossila energi, som finns i områden som är tekniskt alltmer komplicerade och mer kostsamma att exploatera. Den 21:e april 2010 exploderade oljeplattformen Deepwater Horizon i Mexikanska golfen. Nästan två månader senare lyckades BP stänga oljeläckan, då hade stora mängder olja läckt ut i havet utanför den amerikanska kusten. Vi vill under detta seminarium ge en utblick mot framtidens exploateringsprojekt och de utmaningar som energibolagen står inför inom teknikutveckling, ekonomi, riskhantering och miljö och belysa de frågor som aktualiserats efter olyckan med DeepWater Horizon.

- Nya fossila energikällor; var finns de och hur tillgängliga är de?
- Inom tekniskt komplicerade exploateringsprojekt, hur arbetar energibolagen med riskhantering, teknologikutveckling och miljöhänsyn?
- Vilka konsekvenser får ett större oljeutsläpp för miljön och vad finns det för teknikutveckling inom området?
- Vilka konsekvenser för energibranschen får ökade krav på riskhantering?
- Hur kan myndigheter, företag och organisationer agera preventivt för att minimera risken för svåra olyckor?

Talare var:

Peter Mellbye

Executive Vice President, Statoil International Exploration and Production

Sasja Beslik

Chef, Ansvarsfulla investeringar, Nordea Fonder

Svante Axelsson

Generalsekreterare, Naturskyddsföreningen

Jonas Fejes

Chef, Oljeskadegruppen, IVL

Sasja Beslik

Sasja Beslik är chef på Nordea för Ansvarsfulla investeringar.

Macondo-olyckan har på ett radikalt sätt förändrat finansvärldens sätt att se på oljeindustrin. Tydligare och mer omfattande information och transparens på en helt ny nivå efterlyses vid värdering av risker avseende investeringar i oljebranschen.

Nordea har tagit fram en analys efter händelserna i Mexikanska Golfen, där man tittat på konsekvenserna för industrin om något likande skulle inträffa igen. 25 stycken företag som borrar olja på djupt vatten har utvärderats. Resultatet är att 6 företag bedömts som högriskföretag att investera i på grund av bristande hantering av olyckstillbud och antal miljö- och hälsoincidenter.

De företag som agerar på oljemarknaden är medvetna om riskerna men de är sent ute och det går sakta. Det som krävs är att företagsledningarna i dessa bolag strävar efter ökat fokus på planer och åtgärder för att minimera risker genom att ta ett tydligare ansvar vad gäller hälso- och säkerhetsaspekterna i och med att tidigare riskbild nu ändrats.

Efter Macondo ligger BP:s aktie stilla i väntan på den utredning Obamas administration gör som fastställer skadeståndsnivåerna för olyckan. Förväntningarna från finanssektorn är att denna utredning kommer innebära strängare restriktioner och krav på ökat risktänkande från oljeindustrins sida. Olyckan är ett slag för BP men kan även fungera som en vändpunkt i likhet med Exxon som visade att de lärt sig sin läxa och idag står i framkant vad gäller risk- och sårbarhetsarbete.

Avslutningsvis ställer sig Sasja frågan hur länge vi kommer att komma ihåg denna olycka? Om vi avgränsar frågan till att omfatta finansvärlden, så tror han att de inte kommer att glömma eftersom det handlar om stora mängder kapital.

Peter Mellbye

Statoil arbetar för att utvinna energiresurser på ett miljömässigt hållbart sätt. Statoils övergripande strategi bygger på tre ben:

- Maximera värdet inom Norsk kontinentalsockel
- Ökad global tillväxt
- Förnybar energi

Statoils globala oljetillgångar uppgår till 2 miljarder fat, varav 600 000 fat olje- och gasekvivalenter per dag produceras utanför norsk kontinentalsockel. Utvecklingen från att fokusera på ett område till att bredda sig både geografiskt och till andra källor, som oljesand och djuphavsborrning, är strategisk och har skett inom Statoil de senaste decennierna.

Statoil bedömer att de efterföljande konsekvenserna från olyckan i Mexikanska Golfen kommer att påverka följande områden:

- Finansiella
 - Större ekonomisk ansvars exponering
 - Ökade avgifter, skatter och royalty
 - Ökade anläggningskostnader
- Politiska
 - Inga större fundamentala förändringar
- Operativa
 - Striktare säkerhets standards
 - Fokus på säkra operationer
 - Planer på förebyggande- och saneringsåtgärder viktigt
- Möjligheter
 - Mindre konkurrenter
 - Operatörer som skött sina hygienfaktorer kommer att premieras
 - Tonvikt på teknologi och HSE

Peter avslutade med att konstatera att det är viktigt att oljeindustrin tar samma ansvar över hela världen när det gäller miljö och säkerhetsaspekter.

Svante Axelsson

Svante inledde med att konstatera att dagens diskussioner hållit sig kring skadeverkningarna av oljeutsläppet och de miljömässiga konsekvenser som följde men att ingen har talat om de fossila bränslenas roll och klimatförändringarnas effekter.

Han menar att vi måste vidga vårt synsätt och se även atmosfären som en resurs. En resurs som det idag råder en knapphet på.

Om vi ser atmosfären som om den har ett tak, så har vi 1600 miljarder ton CO₂ kvar att släppa ut fram till 2050 innan taket är nått. Med nuvarande utsläppsnivåer når vi detta tak redan om 20 – 25 år. Till denna nivå kan vi till 70 procents sannolikhet komma under 2-graders höjning av den globala atmosfärstemperaturen.

Naturskyddsföreningen förordar därför nollutsläpp från industrin till år 2030. Det finns även stora möjligheter att kombinera fattigdomsbekämpning och klimatåtgärder via exempelvis regnskogsskyddet för att minimera utsläppen av koldioxid till atmosfären.

Den mest effektiva kombinationen för att lyckas ställa om energisystemet är via lågt pris på energi (ger lågt initiativ till investeringar) samt en hög skatt (ger minskad konsumtion). Det finns en affärsidé i att skapa lönsamhet för företag genom hållbara investeringar.

Idag finns det tyvärr en debatt kring fossilgasens förträfflighet och dess framgångar har enligt vissa bedömare lett till att investeringar i förnybart uteblivit. Naturskyddsföreningens ståndpunkt är att Sverige ska bort från en infrastruktur och beroende av naturgas och hoppas att via opinionsbildning även påverka investeringsbeslut i denna riktning.

För att vända inriktningen mot ett hållbart samhälle bör man sätta fart på investeringarna i Afrika och i förnybar elproduktion. I Afrika saknar cirka 1,5 miljarder människor tillgång till elektricitet och här finns ett stort behov av nya investeringar.

För Sveriges del så behöver vi satsa mer på energieffektivisering och dess stora potential. Detta är något som känns mycket angeläget och samtidigt skapar ökad sysselsättning.

Jonas Fejes

Jonas inleder med att berätta att en precis likadan olycka som Macondo inträffade i Mexikanska Golfen 1979. Då läckte olja ut under 8 månaders tid. Dessa fakta var i stort sett helt okända hos media och frågan är varför?

Enligt Jonas är svaret enkelt: internet fanns inte, d.v.s. begränsad tillgång till digitaliserad information. Han menar att vi måste bli bättre på att lära oss av tidigare erfarenheter trots att det är svårt och människan funkar så att man glömmer fort.

Jonas fortsatte därefter med att resonera kring varför riskerna med oljeborring tycks glömmas bort och där han menar att bidragande orsaker är:

- Mängden borrhål.
- *Under årens lopp har det borrats cirka 49 000 hål runt om i Mexikanska Golfen och antalet olyckor har varit relativt få.*
- I USA anses oljeborring som en "Cowboy bransch".
- *En tuff bransch där man inte är rädd för lite smuts och hårt arbete.*

Vid olyckan i Macondo användes en rad olika bekämpningsmetoder för att minimera skadorna av oljeutsläppet, dessa var:

Till sjöss

- Dispergering
 - naturlig
 - kemisk
- Bränna
- Upptagning
 - pumpning från botten
 - skimmers
 - absorption

Vid land

- Styrning
- Spolning
- Upptagning
 - maskinell
 - manuell
 - absorption
- Nedbrytning
- Bränna

I efterhand har det visat sig att 17 procent av oljeläckaget togs upp vid botten, 5 procent brann upp, 3 procent lyckades tas upp med hjälp av skimmers, 25 procent har upplösts eller avdunstat, 8 procent har dispergerats kemiskt, 16 procent har dispergerats naturligt medan hela 26 procent fortfarande är kvar i miljön

När det gäller skador på miljö och samhälle så sammanfattas dessa konsekvenser i punkterna nedan:

- skador på vilda djur
- förgiftade miljöer
- stopp för yrkesfiske
- stopp för turism/rekreation
- utmattade organisationer
- negativ PR

Kostnaderna för oljeutsläppet i Mexikanska golfen är idag okända men väntas bli omfattande. Tidigare oljeutsläpp har kostat samhället:

- Exxon Valdez, Alaska, 1989: 15 miljarder kr
- Prestige, Spanien, 2002: 90 miljarder kr

Jonas menar att nuvarande och planerade åtgärder för att skydda samhället och miljön inte är tillräckliga utan behöver skärpas ytterligare. Det behöver bli dyrare att släppa ut olja och man behöver förstärka skyddet för de mest känsliga områdena. Dessutom bör man tänka utanför boxen på vad som skulle kunna hända och öva för det riktigt stora utsläppet.