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SECURE
Security of Energy Considering its Uncertainty, Risk and Economic implications

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 Small or medium-scale focused research project

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“Stakeholders Meeting on Oil, Gas and Coal”

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Stakeholders Meeting on Oil, Gas and Coal

Agenda

26 November 2009

Venue: OME, Meeting Room
105 rue des Trois Fontanot – 92000 Nanterre; Tel. +33 1 70 16 91 20

09:00 Registration and coffee

09:30- 9:50 INTRODUCTION

The SECURE project, started in 2008, aims at building a comprehensive framework for measuring energy security of supply in the EU. Assessing the risks related to geopolitics, price formation and the economic and technical design of energy markets inside and outside the EU, the project focuses on both qualitative and quantitative analyses, adopting a global as well as a sectoral approach. The tools, the models and the policy recommendations provided by this project will serve policy-makers to formulate energy security policies taking into account the related costs, benefits and risks.

- Welcome by **Pedro Moraleda**, OME, General Director
- Introduction to the SECURE project by **Roberto Vigotti**, OME, SECURE Coordinator
- Scientific aspects of the SECURE project by **Manfred Hafner**, FEEM

9:50- 11:30 SESSION I – “Threats to the Security of Oil Supplies – A Critical Analysis”

This session aims at overcoming the stereotypes which dominate the oil supply security issue. Studies presented in the session are implementing threat identification and assessment based on realistic scenarios of possible developments in producing regions and estimating the potential impact on global oil supplies. The relations between the different elements of the oil chain from production to consumption will be also addressed both for geopolitical, technical, economic and regulatory dimensions in order to establish efficient mitigating strategies.

- Presentation by **Giacomo Luciani**, Gulf Research Center Foundation, Switzerland
- Discussant: **Said Nachet**, International Energy Forum, Saudi Arabia
- *Open discussion*

11:30- 11:50 Coffee break

11:50- 13:00 SESSION II – “SECURE global scenarios 2020-2030-2050: Security of supply and climate change nexus”

The aim of this section is to present some framing scenarios up to 2050 developed in the SECURE project in order to explore the climate change and security of supply nexus for Europe by taking also in account impacts of climate change on the world energy system. It is upon these scenarios (Base Line, Muddling Through, Europe Alone and Global Regime) that the SECURE sectoral analysis will be based upon.

- Presentation by **Patrick Criqui**, University of Grenoble/LEPI-CNRS, France
- Discussant: **Francois Cattier**, EDF, France
- *Open discussion*

13:00- 14:00 LUNCH BUFFET

14:00- 16:00 SESSION III – “Potential Threats for EU Gas Security”

The studies presented in this session will focus on the vulnerability of the EU to natural gas supply risks, impacts of supply disruption as well as mitigation possibilities and options, particularly in the lights of the recent gas crisis. The uncertainties on how much gas the EU will need in the future will be discussed in the framework of security of supply versus security of demand issues. Also, natural gas availability to Europe from supply sources and their transport routes will be discussed. While doing that an overview of reserves, evolution of production and supplier countries’ export potential to the EU will be given as well.

- Presentation by **Stefan Schaar Kruse**, RAMBOLL, Denmark
- Discussant: **Miharu Kanai**, Energy Charter Secretariat, Belgium
- *Open discussion*

16:00- 16:15 Coffee break

16:15- 17:15 SESSION IV – “Between international supplies and domestic clean-coal: risks for coal markets in Europe”

From a supply perspective coal does not present a security threat to the European Union as it is available in sufficient quantities world-wide and the supplies to Europe are diversified. However, in the long term, it poses questions because of the institutional danger of coal being excluded from further development in Europe due to its environment impact. All scenarios aiming at addressing climate change assume a strong penetration of CCS after 2020. The timely availability of CCS poses a serious risk to coal and thus overall energy security of supply for Europe. This session will discuss those points.

- Presentation by **Christian von Hirschhausen** and **Franziska Holz**, Technical University of Dresden, Germany
- Discussant: **Brian Ricketts**, International Energy Agency, France
- *Open discussion*

17:15- 17:30 CONCLUSIONS

- Wrap-up by **Roberto Vigotti**, OME & **Manfred Hafner**, FEEM

INTRODUCTION

Pedro Moraleda, General Director, OME

Welcome address to participants in the SECURE stakeholders meeting.

Roberto Vigotti, SECURE Coordinator, OME

As SECURE Coordinator, introduced the concept of security of energy supply for the EU and highlighted the importance of this ambitious project.

Manfred Hafner, FEEM

Introduction to the scientific aspects of the SECURE project. Study should propose policy recommendations to the European Commission.

SESSION I – “Threats to the Security of Oil Supplies – A Critical Analysis”

Giacomo Luciani, GRCF, Switzerland

Giacomo Luciani presented several deliverables of work package 5.1 that are in the process of finalization. The main points in his presentation were the followings: There is no easy and immediate connection between resource nationalism or political instability and global supply of oil and gas. They have rarely been associated to acute supply crises or shortfalls. Their effect is rather gradual and normally compensated by action in other parts of the system. Oil and gas installations appear to be much more resilient to armed conflict than is normally acknowledged. Interstate wars are a low-probability event. A government’s inability to overcome or reabsorb violent opposition discourages international oil company investment even if the violence does not affect the vicinity of oil and gas installations.

Maritime logistics are unlikely to generate major crises, but require constant attention. Therefore patrolling and surveillance of maritime traffic is essential. Investment to reduce pressure on key choke points (Bosphorus, Danish Straits) is essential. In addition, investment to reduce traffic in enclosed seas is highly advisable. Energy security is primarily a function of investment, which in turn is a function of prices. A well-functioning market is therefore a key component of security. The main obstacle to oil and gas security of supply is the growing volatility of prices and their fundamental unpredictability. Security itself is also dependent on prices. Encouraging the freer trading of major crude oil streams, increasing reliance on long term pricing, offer demand security through take or pay contracts are some of the options.

Said Nachet, Energy Director, International Energy Forum (IEF)

Discussant of session I, **Said Nachet** commented on GRCF’s presentation giving the following suggestions:

- Access to resource terminology should be preferred to resource nationalism. Some of resources are kept outside of the International Oil Corporations but restrictions to access to resources (such as the Outer Continental Shelf in the US) are also important. Political environment is also very important.
- Midstream issues are gaining importance. Shipping industry is in the hands of private companies.
- Although threats to oil from terrorism, banditry are manageable and can be contained, it has an impact on cost of production, transportation that should be taken into account.
- Role of emerging countries with “country-to-country” deals which affect the well functioning of the market.
- Importance of limiting oil price volatility to secure long-term investment.
- Role of governments in security of supply is less clear than before. Security implications in consumer, regional and global level are different. Who is in charge of security of supply in domestic level?

- Role of emerging countries/economies should be tackled.

Open discussion

From the floor, **Maurizio Maugeri** (ENI) suggested the study to address further mid-stream issues as the risk of diesel shortage in the EU, pressure on refining margin and/or environmental issues that could entail closure of refineries in the future. The EU should concentrate on industry needs as well. **Anil Markandya** (FEEM) encouraged SECURE partners to have more forward looking approach and discuss what would be the consequence of a war on the oil price volatility. How much of the price volatility come from market fundamentals and how much from non market fundamentals? **John Corben** (IEA) stated that time frame is important for security of supply threats.

Giacomo Luciani welcomed the comments and clarified the following points:

- Impossible to define what is influenced by fundamentals and non fundamentals in oil price. However, there is a need to stabilize oil prices and send clear price signals for investment. Market sentiment, people's expectations and beliefs are important in price forming. It is a game of expectations and hence difficult to forecast. Use of long term take or pay contracts like in the gas market to some extent perhaps would play a stabilizing role in the market.
- No objection to envisage long-term contracts between countries.
- Stability in producing countries is important but we cannot say anything what may happen 15 years later. We can envisage a military action as a possibility. But this to happen is not highly probable. Strategic stocks would cover lost oil from Iran.
- Agreed that it is becoming increasingly difficult to answer demand of middle distillates in Europe without increasing surplus of light distillates.

SESSION II – “SECURE Global Scenarios 2020-2030-2050: Security of Supply and Climate Change Nexus”

Patrick Criqui, University of Grenoble/LEPI-CNRS, France

Presentation of four scenarios explored with the POLES model on Europe's energy future up to 2050:

1. The BaseLine case is a counter-factual, no climate policy scenario, used mostly for benchmarking;
2. The Muddling Through scenario describes the consequences of non-coordinated, low profile climate policies;
3. The Europe Alone case represents the outcome of a scenario in which every country is free-riding;
4. The Global Regime explores a new world energy system, under strong emission constraint (EU-type).

The results show that climate policies are strongly structuring the energy security problem, whether in a cooperative or non-cooperative world

Francois Cattier, EDF Research and Development, France

Commenting on LEPI-CNRS' presentation, **Francois Cattier** made the following remarks:

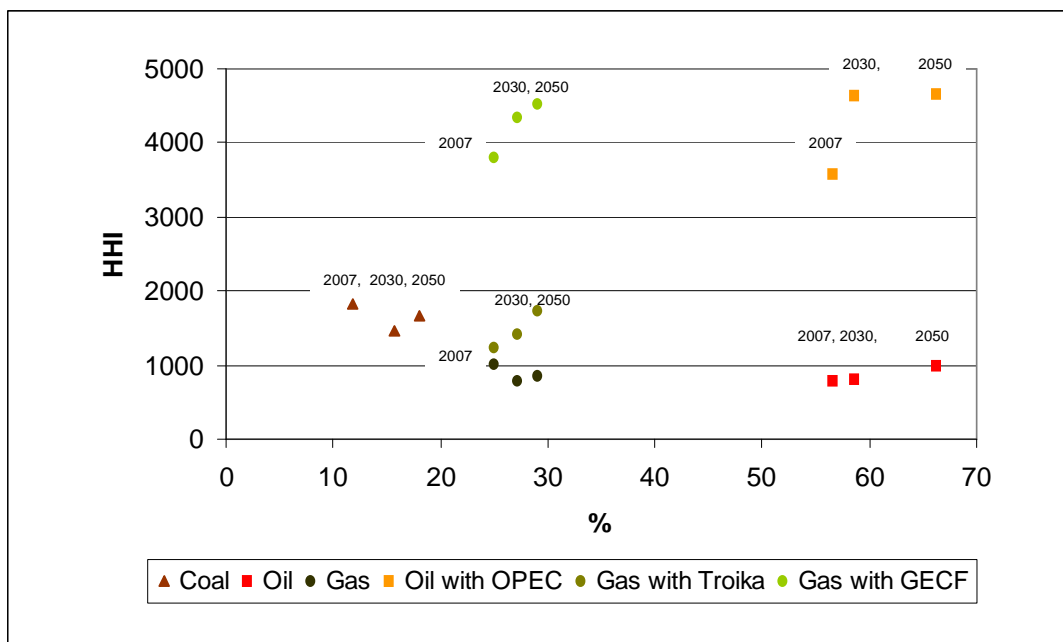
The reference scenario highlights the unsustainability of Business As Usual trends. The alternative scenarios stress a possible future based on different policies. Three keys points may have a significant impact on the energy landscape and therefore on energy security :

Mobilising Resources: Resources base used in these projections are in the upper range of resources estimates. However, the ability to mobilise these resources in a timely manner may be challenging. If investments are not made in a timely manner, the risk of a supply crunch happening may increase much earlier than expected.

Recent trends: Even under a strong economic recovery, energy consumption may not come back to previous trends. Many of the measures, such as the European Climate and Energy Package or Renewables energy programs all over the World which were passed during the crisis, will definitely affect long term energy trends.

Energy Market concentration: The Secure Scenarios highlight the growing role of OPEC countries in global oil supply. Even climate oriented scenarios show a reduction in imported volumes. They all project a concentration of production in small number of countries. This result is clearly a risk for security of supply and it concerns not only oil but also gas and coal. The figure below illustrates how the concentration (measured by the Herfindahl-Hirschman Index applied on a country basis) on fossil fuels markets could increase in coming years. The concentration will be particularly important if major producers coordinate their policies. For example, the concentration index for the oil market in 2007 is 780. If we consider that OPEC countries act as a single player, the concentration index jumps to 3600 in 2030 and reach 4700 in 2050. Similarly for the gas market, if the Gas troika (Russia, Iran, Qatar) or the Gas Exporting Countries Forum (GECF) succeed in coordinating their export policies, the concentration could rise to critical levels.

Market Concentration vs Market Size



Note : the concentration is becoming problematic above 1800. Market size is measured as the volume of total net exports on global consumption.; Source : 2007 : BP(2009) ; Projections : EDF R&D

Open discussion

From the floor, **Said Nacet** (IEF) emphasized on the importance of natural gas as a possible fuel of choice in the future due to new resources potential (non-conventional gas) and its “clean” characteristics. Natural gas could be fuel of choice and a backup for renewable. He evoked the illusion to believe on energy independence and suggested to rather discuss about interdependency between producers and consumers. He argued that if the EU energy package does not work out the EU will be even more dependent on fossil fuel supplies from outside. **Christian von Hirschhausen** (TUD) suggested in developing sub-scenarios to the BaseLine one focusing on the role of biomass in the future. He questioned the timing of CCS start in scenarios in 2020.

Patrick Criqui concluded the session by evoking the risk of technology failure: in the scenario of a strong carbon reduction policy which would entail less investment in the oil and gas sector, what would be the consequences if polices fail? The problem is not investment scarcity. Real problem is how to adjust investment while taking into account of climate. Capability of implementing large scale CCS is a major issue. We should address it. POLES model assumes a V shape recovery from crisis. If the shape of recovery changes the results may be different.

Market power scenarios require more assumptions to be added. Reducing uncertainty both for energy importers and exporters while taking into account of climate issues is a major challenge.

SESSION III – “Potential Threats for EU Gas Security”

Stefan Schaar Kruse, RAMBOLL, Denmark

Presentation focused on several deliverables of work package 5.2 that are already finalized or in the process of finalization. EU imports more than 60% of its gas needs but most rely more than 90% on gas imports. However share of gas in energy mix vary a lot between countries and dependency does not always entail vulnerability. Largest importers have less concentrated import sources. Options for mitigating gas supply disruptions in the light of the lessons from January 2009 gas crisis include flexibility of supply and demand, presence and degree of interruptible customers and fuel switch, national emergency measures, infrastructure, gas storage, diversifications of supply sources and routes, internal EU gas networks as well as importance of dialogue and cooperation. It has been stated that European gas security faces serious challenges due to decreasing domestic production in parallel to increasing demand. And that demand side and internal factors are at least as important as diversification of supply sources and routes. There is no single response to supply disruption. Instead the solution is in the implementation of a set of forward looking policies and measures.

There is enough gas around Europe to secure the EU gas supply to 2030. Question relates to investment in upstream sector and infrastructure development in supplier countries to achieve the desired production, particularly after 2030. The main question is whether the EU will be prepared for a post gas peak in most of its current suppliers, and how. This brings us to the conclusion that gas security has to be addressed in a global perspective, and throughout the gas chain. As far as market imperfections in relation to SoS are concerned it is mentioned that markets do not know the true costs and risks adhered to SoS. And that investments decisions need clear market signals and rules.

Miharu Kanai, Energy Charter Secretariat, Belgium

Miharu Kanai commented RAMBOLL’s presentation giving, among others, the following suggestions:

- Is natural gas demand decrease a temporary phenomenon or not?
- Cooperation and dialogue is as important as diversification of energy sources: example of January 2009 crisis between Ukraine and Russia. But countries could improve their security by other means as well, such as increasing storage capacity,
- Security of supply and market doesn’t conflict with each other but if a country (like some eastern European countries) is supplied by one source and by one company we cannot talk about a competitive market.
- Quoting CERA, he underlined the importance of unconventional gas being perhaps “the greatest technological achievement of this decade”.

Open discussion

Many suggestions, comments and requests for clarification came from the floor:

- **Christian von Hirschhausen** (TUD) commented that there is a common misunderstanding of energy security as a public good that market cannot provide. He referred to a study which questioned whether there is an LNG action plan. The answer was no because LNG markets work well. Cost of reversing pipeline flows is not high but would be a major contributor to security of supply.
- **Pedro Moraleda** (OME) stressed the proximity of 2030 for the gas industry and that the real challenge would be after 2030.
- **John Corben** (IEA) asked the speaker for three policy suggestions.
- **Patrick Criqui** (LEPI-CNRS) emphasized on the reciprocity between producers and consumers that need each other.
- **Tatiana Mitrova** (ERI RAS) evoked the situation of Russia and the uncertainty about long-term demand perspective in Europe and its effect on investment. She raised the question how much Russia should invest

now to satisfy uncertain demand in the future. She emphasized the importance of long term commitments. Today, Russia only invests to secure its long-term contracts. There is a risk that due to postponed investments, gas demand in the future could not be met. Russia understands that sound international energy relationship is needed but she doesn't see how to make it work inside the Energy Charter Treaty. Russia has given off take-or-pay obligations to Ukraine to avoid any crisis. Miharu Kanai replied that Member Countries try to solve problems in political level.

- **Anil Markandya** asked whether there is cost estimate to mitigate the cost since security of supply could be increased by doing something such as storage building.

Stefan Schaar Kruse welcomed the vivid discussions during the session and concluded with a few remarks:

- Dramatic fall in gas demand in Europe and the radical change in the gas market with the development of unconventional gas, which entails rerouting of LNG to Europe, should be taken into consideration.
- If you don't coordinate markets with security of supply you may miss opportunities. They don't conflict but don't work always together either. You may regulate and legislate but you may need to change physics to support these issues.
- The amount of mitigation cost would depend on the level of security. In Denmark \$40-50 million is spent on emergency supplies even though the country is not dependent on imports.
- January 2009 gas crisis between Ukraine and Russia highlighted the lack of infrastructure in Europe rather than the lack of available resources. The recent four billion euros EU programme should help mitigating this problem.
- Three policy suggestions could be: investment, uncertainty of demand; the need to integrate supply security with demand, and to look at beyond 2030.

SESSION IV – “Between International Supplies and Domestic Clean-Coal: Risks for Coal Markets in Europe”

Christian von Hirschhausen, and **Franziska Holz**, Technical University of Dresden

Presentation of the preliminary results of WP5.3 following the 6 step methodology of SECURE: threat identification and assessment; impact assessment; assessment of EU vulnerability; cost assessment of the threat impacts; remedies assessment; and financing of remedies.

Coal supplies in the last years have expanded considerably but little (geo-) political risk on coal market. Diversification indices show that European countries are in a good situation. There is an increasing globalization of the steam coal market. COALMOD finds no evidence of oligopolistic behavior that is a threat to a “reasonable price level” on the import market. The results tend to indicate that the international steam coal market is competitive. The real issue in European supply security regarding coal is the absence of an economically and politically sustainable use of the coal. Current long-term energy scenarios seem to underestimate the institutional obstacles of implementing CCTS (transportation and storage); the „sustainable infrastructure“ paradigm is limited by the „NIMBY infrastructure“ paradigm associated with CCS. Because considerable asset-specific investments are required along the value-added chain of CCS, vertical integration, is not necessarily the first-best option . The conditions for CCS to become a success story for a sustainable, energy-secure future of Europe are not very promising.

Brian Ricketts, International Energy Agency, France

Brian Ricketts commented on the presentation by providing an overview of the coal market situation.

- Coal (demand) is growing at 5% per year, twice natural gas growth rate. Coal now accounts for more than 40% of electricity generation.
- Global financial crisis upset all our projections. Beginning of 2009, due to the financial crisis, investment was forecasted to be down by 40%. In fact, Chinese recovery plan boosted the coal industry and prices

remained steady. World coal market was saved by China. China is not yet a coal importer which has a big implication for coal security of supply for the rest of the world. China is absorbing all LNG available in the world. Imagine they do the same for coal. How the world would look like if China didn't produce any more coal. Demand side of China is as important as the supply side. China is moving in and out with an influence of 100 million ton in a year in the global market which makes outside market completely unpredictable. A few years ago coal to liquid was discussed in China but now it is cheaper to get it from outside.

- There are pros and cons regarding CCS. If you are investing in coal you have to consider CCS. CCS is not the silver bullet, there are other options but CCS is an option that needs to be developed and investigated. Without a portfolio of options costs will rise. Public perception is important and incentives play a role.
- In coking coal export market we see market dominance but we cannot say the same for steam coal market.
- Although a leadership, at the country level, is missing for the moment to further develop CCS, IEA is slightly more optimistic than TUD about the future of this technology. He asked TUD that policy makers want to see justified statements.

Open discussion

From the floor, **Patrick Criqui** (LEPI-CNRS) reminded that all scenarios that aim to reduce CO₂ emissions are ambitious. To use all options to reach a more secure future may not be possible but energy efficiency is an important tool. Strong emission constraint is hardly feasible. We are stuck in a situation between unacceptable and unfeasible. Innovation side could be a solution. Answering a question about concentration in the coal market, **Brian Ricketts** indicated that it could happen in the coking coal market, although with a low probability because of new countries in a position to enter this market, but not in the steam coal market. **Miharu Kanai** stressed that for CCS the will important.

Christian von Hirschhausen ended the session by stressing the relevance of a “China import” scenario. Such a scenario would not distort current results but certainly prices. Coal prices are driven by transportation issues contrary to other markets. Thus transportation bottlenecks are the reason for increase in coal prices. Coal is moved by tankers that use oil. Therefore oil price has some influence as well. He reiterated that the work package is not optimistic for CCS.

CONCLUSIONS

Manfred Hafner (FEEM) stressed the importance of the time frame for all the scenarios: do we have time to implement them? SECURE partners should look at what scenario is the most probable; certainly between Muddling Through and Global Regime scenarios. Muddling Through scenario is maybe too modest. **Roberto Vigotti** (OME) thanked all participants and declared the workshop closed.

Stakeholders Meeting on Oil, Gas and Coal 26 November 2009

List of participants

First Name	Surname	Affiliation	Country
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François	Cattier	EDF	France
Chiara	Piardi	Edison	Italy
Hamed	Korkor	EGAS	Egypt
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Maurizio	Maugeri	ENI	Italy
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