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Security of Energy Considering its Uncertainty, Risk and Economic implications

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Proceedings of regional Workshop in Bahrain

GRCF

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Proceedings

1.1 First day:

The first day started with the introductions by Dr. Muhammad Abdul Ghaffar and Dr. Abdul-Hussain Bin Ali Mirza who stressed out that the relationships between Europe and the Gulf region needed to be strengthened as this would improve the energy security of both parties.

According to Dr. Abdul-Hussain Bin Ali Mirza “Security is not being better than the others, it is having no enemies at all”. Dr. Abdul-Hussain Bin Ali Mirza also underlined the importance to avoid conflicts with Iran so as to keep the Strait of Hormuz clear at any time.

Dr. Abdulaziz Sager then welcomed all the participants and thanked the Kingdom of Bahrain for hosting the conference and thanked His Highness Shaikh Bin Abdulla Al Khalifa for hosting the event.

Mohammed Y. Al-Qahtany, CEO of Saudi Aramco focused on the evolution of the global energy mix, stressing the future growing weight of renewable energies. He also showed that Saudi Aramco owns 260 billion barrels of oil in reserves or about 20% of the total 7 trillion barrels of conventional and unconventional oil left in the ground.

Pedro de Moraleda then reviewed and explained the main objectives of the SECURE project and detailed the scientific process leading to its successful completion. He highlighted the main themes that could be discussed in the interests of all the participants of the Bahrain meeting:

- Security of supply and of demand cannot be separated
- Which are the current threats to security of demand
- LNG as a tool to foster both security of supply and demand

Manfred Hafner then explained into details the SECURE project’s characteristics, its aims and achievements.

Patrick Criqui presented the POLES model together with the results; then followed by the much awaited presentations by Fawzi Aloulou from the EIA and Trevor Morgan from the IEA. Mr. Aloulou explained that the EIA expects energy consumption to increase by 49% by 2035; the bulk of the growth coming from Asia and the Middle-East. He also pointed out that fossil fuels will remain by far the largest energy source, although renewables will be the fastest growing one. Moreover, CO₂ emissions are expected to rise to 42 billion tonnes in 2035 from 30 billion tonnes in 2007 if actual policies are not changed. The additional demand in liquids could amount to 25.8 million barrels per day by 2035 while the growth in gas consumption reaches 44% and coal 56%, with China and India representing the largest share of coal additional consumption.

Mr. Morgan then presented the new IEA World Energy Outlook (2010) that was presented in Bahrain just after the first presentation to the public held in London. The IEA focused its attention on the future of oil prices, on the impact of renewables and on climate change.

Regarding oil, Mr. Morgan then directed his presentation towards the car market which is supposed to experience a large increase thanks to emerging countries' demand, and in particular China. This is, among other factors, likely to keep the oil demand in non-OECD countries on the rise. This demand will be met increasingly by gas to liquid products and unconventional oil from Canada and Venezuela, while the share of the OPEC in the conventional oil supply is expected to rise from 2009 to 2035.

He also drew the public's attention on the situation prevailing in the gas market and noticed that gas is likely to become an energy increasingly used in the future, experiencing the largest rise in absolute terms among all energy sources (+44% from 2009 to 2030) led by the demand in China and in the Middle East. Expected low gas prices will also favor this situation. He also noticed that unconventional gas profoundly modified the face of the market. The conjunction of the US shale gas exploitation with the economic crisis led to a difference between traded volumes and supply capacities of 130 bcm in 2009 while expected to peak at 200 bcm in 2010-2011 and then decline. He added that this would keep on pressuring gas exporters and would give more ground to the end of the gas prices indexation on oil prices. He concluded by saying that gas was the largest uncertainty in the WEO 2010.

The level of utilization of coal will depend on the climate change imperatives, but it is expected to increase until 2020 and then decrease by 2030. However, the increase of coal-fired power generation capacity in China is likely to reach 600 Gigawatts.

The EU will be the largest user of renewables. The latter is however still uncompetitive if government support ends.

Mr. Morgan then mentioned the important potential represented by resources held in the Caspian region.

The main conclusions of his presentation are that governance expectations relating to climate change mitigation policies are rather dark, in particular after the experience of the Copenhagen conference. The 2 degrees goal is unlikely to be met if no prompt political decision is taken. Secondly renewable sources of energy are entering the mainstream but they must be supported by policy actions in particular ending fossil-fuel subsidies. Finally oil prices are likely to remain high and the growing unresponsiveness of both supply and demand to oil prices will allow larger price swings.

The day continued with the presentation of Mr. Fawzi Aloulou from the Energy Information Agency. Mr. Aloulou explained that CO₂ emissions would grow by 43% from 2007 to 2035 if no policy changes were taken. While emissions in OECD are expected to decline, those from non-OECD countries are expected to rise to 67% of the total emissions from 53% in 2007. Non-OECD countries are also expected to represent 86% of the global energy use. Renewables are the fastest growing energy source, but demand for coal is expanding, led by China and India.

Switching to oil, Mr. Aloulou explained that OPEC countries account for 40% of global liquids production and that the bulk of the growth in OPEC liquids production will come from Saudi Arabia and Iraq between 2007 and 2035 while that in non-OPEC will come from Brazil, Russia, Kazakhstan and the US. Oil prices are expected to be on the rise again after those countries recover from the recession, and should reach a level close to \$133/barrel in 2035.

He then delivered an interesting speech on the gas industry, showing that Asia is likely to become the next big market for this energy. Productions on the other hand, will grow thanks to the Middle Eastern supply. Mr. Aloulou then proposed a very detailed analysis of the exploitation of shale gas in the US, showing that this industry has increased 14 fold in 10 years to reach a total figure close to 5 trillion cubic feet in 2010. Mr. Aloulou

also explained that the EIA was currently producing, showing that tight gas, shale gas, and coalbed methane drive supply growth in China, Canada, and the U.S.

The CEO of Bapco then directed the discussion towards the characteristics of the energy industry in Bahrain, explaining that 90% of the energy of Bahrain came from natural Gas. Mr. Al Mahroos highlighted the great potential of the offshore gas field in Bahrain, providing that the market send the appropriate price signals. In particular he put forward that in the case of Bahrain, new natural gas projects would become profitable at a minimum price of \$5 per Mmbtu. He finally explained how depleted gas fields could be used for Carbon Capture and Sequestration.

End of the first day.

1.2 Second day:

The second day opened with the presentation from Prof. Luciani who started off with the part concerning the physical threats to oil supplies. He addressed the issue of resource nationalism by stating that there is no easy and immediate connection between resource nationalism and/or political instability, and global supply of oil and gas (at the exception of Russia and the FSU) because the influence of political events on the oil and gas industry is highly unpredictable and is generally compensated by the system, thus not leading to acute supply shortfalls. Also he noticed that political instability and armed conflicts rarely have a truly disturbing effect on world oil markets as oil infrastructure is much more resilient to those as generally believed. However, he underlined the fact that asymmetric conflicts involving Non-state actors and civil wars are more disrupting in nature, due to the fact that their occurrence has increased in the past decades (he mentioned the example of Iraq and Nigeria) while that of fully fledged wars has decreased dramatically. The two variables critical for the state of the World market are the situations in Iraq and Iran that are undermined by respectively difficult domestic and international political situations.

Professor Luciani then tackled the issue of chokepoints and sea passages, noticing that the most critical one being the Strait of Hormuz. He explained that, according to his research, it is impossible to fully close Hormuz and that even a situation where Iran was hindering the free passage through it would be short-lived due to the prompt international reaction it would trigger. Moreover, a certain amount of the capacity blocked by such an event could be evacuated by other means, such as via pipeline connecting to the Red Sea. However he sees piracy together with a lack of investment and congestion at chokepoints as a potential risk (even if a non “military” ones).

The panel discussing these security issue consisted of Mr. Russell and Mr. Xu. The former followed Prof. Luciani. He drew three scenarios designed to analyse the resilience of the international oil market as indeed market are sometimes disrupted. At best, he described the only country capable of disrupting a market such as the US, which precisely uses forces to protect the market. Therefore in that scenario the future will be like the past. At worse, he tried to determine at which points customers lose confidence in the market. In fact he explained that a breakdown of political relations, such as when China is trying to build direct relations with producing countries, has such a potential. Finally, in the worst case scenario, States start taking bad decisions resulting

in the collective policing function being undermined and potentially to a contagion on international violence.

Mr. Xu then gave the audience the Chinese vision over the security of supply at the world level.

He highlighted that Qatar is likely to become a very important player in the World gas stage due its LNG capacity. In the Chinese perspective, will the productions of Iran, Iraq and Central Asia be of primary importance for the diversification of the supplies?

He stressed out that if the Gulf countries need to prove reliable suppliers for European customers, they must ensure future exports to Asia, and in particular China. The latter, by and large will become an increasingly large demander of gas. He also gave the example of the Skovorodino-Daqing pipeline that will bring Eastern Siberian gas to China in the future. The Chinese consumption will ensure the shift of gas demand eastwards.

As a future large importer of gas and already a large importer of oil, China is worried by security issues too and calls for setting up new conflict prevention and resolution mechanisms in the Gulf region. In that perspective, the National Defense University of China has created a list of threats including the political use of oil as a weapon, but Mr. Xu underlined that it was consuming countries which had used this weapon more that producing countries (through embargoes in Libya and Iraq for example). That list also contains restriction of investment by national authorities.

Concerning the issue of the Hormuz strait, Mr Xu said that if there was to be a closure for military reasons, the pipelines allowing the oil to be evacuated from the region by the Red Sea would also be threatened, and therefore might not prove an adequate back-up mechanism.

Mr. Xu took the example of the US invasion of Iraq to explain that initiatives to secure one's own supplies (for a single country) are sub-optimally efficient as they threaten all the other countries. Therefore the task of promoting energy security of supply should be devoid to the international community.

Professor Luciani reacted on Mr. Xu's presentation by saying that during the 1973 crisis, there was in fact no shortage of oil, but a drastic reduction of the supply. Concerning Hormuz, he considered that although Mr. Xu is right in proposing that the entire region should be taken into account, the probability of a generalized conflict is close to nil. The strait could therefore be closed for a maximum of 2-3 days he estimated.

Mr. Russel reiterated his statement that the US behaviour, or the perception of other countries of what the American interests are, has the potential to disrupt the markets.

A participant from the centre of strategic studies highlighted that the increased consumption of the big consumers (US, China, Europe, India, Japan) could lead to more conflicts over energy resources.

Mr. Chennoufi from Shell gave his perspective as a trader and said that oil, as a commodity fundamentally obeys to market laws and therefore will go to the main competitive outlet being where the buyers pay more. There is a fundamental flaw in believing that politics drive the oil market.

Mr. Xu pointed out to the fact that oil is not such a weapon anymore while gas can well be.

Prof. Luciani concluded by saying that as long as there is a market, there will not be too much systemic interference. However, a situation of scarcity could trigger the use of military force.

The next topic was also presented by Prof. Luciani and dealt with the volatility of oil prices. He made clear that a financial market is crucial for providing financing to investments and therefore to security. Price in itself is a component of security in the sense that energy should be affordable. The big problem lies more in the unpredictability of the prices than in the volatility of this market. Indeed, the demand and the supply are getting increasingly more rigid.

Major oil streams are not available for trade which increases the vicious circle of volatility and speculation. Consequently, Prof. Luciani suggests to amend the oil market regime by encouraging a freer trade or other oil streams (in particular those from the Gulf), encourage vertical integration, increase reliance on long term pricing, increase oil storage capacity, establish an oil lending window and enforce an internationally agreed price band and create demand security through take-or-pay contracts.

Mr. Aissaoui, member of the discussion panel, reacted to Prof. Luciani's presentation by arguing that oil markets were not able to give proper price signals because pricing oil goes beyond a market mechanism and encompasses technology, economics and politics. He proposed as a pricing system that producing countries budget and draw fiscal revenues from oil. For example if an interest rate of 2.5% is taken, one reaches a long term price around \$70-90 per barrel. This non-market perspective will have the advantage of creating fiscal comfort for producers and support investment.

Mr. Abu Al Soof also reacted and reaffirmed that there would be enough revenues for future demand growth and that there were increasing linkages between physical and financial markets.

The next panel participant to propose his opinion was Mr. Kobayashi. For him, energy security is a matter of diversification both in terms of energy mix and geographically-speaking. He drew the attention of the audience to the following factors:

- The importance of perception (perception affects prices), giving the example of the over-reaction to price change during the first oil crisis
- More spot trading from the Gulf region. There is a need for more price signals coming from the producers as the oil prices are currently more influenced by the US or the currency markets than by inventories or supply/demand (the fundamentals). He added that Gulf oil should be traded on a spot basis. In his view, China is driving the Asian oil demand and must develop its own supplying system, relying increasingly on the Gulf as Russian volumes will not be sufficient.
- The importance of having better information as most Asian countries do not possess or provide reliable demand and imports data, which would be critical for forecasting the future demand. Mr. Kobayashi argued in favour of an inter Asia consumer countries dialogue.
- The need to analyse the psychology of the market. Mr. Kobayashi reminded the audience that it is important to inform the public opinion in consuming countries and to improve the image of Gulf oil industry. He drew the link between this weak recognition by the consuming public and the oil spill in the Gulf of Mexico due to accrued offshore and risky production in that region rather than relying on cheap and easy Gulf oil.

Coming back on the issue of prices, Mr. Aissaoui highlighted a few more points:

- There needs to be a price that producers find incentivising to undertake investments
- Price discovery needs to take place in the Gulf through transparent and efficient trading
- There need to be more links between prices and physical oil
- Need to do more than JODI

Mr Al-Soof also reacted to the discussion by underlining that the crux of the issue is a dialogue between the producers and the consumers as the two have different security concerns but are nonetheless highly inter-dependent. In that regard, initiatives such as JODI must be pushed forward and need to go further.

Participants then quickly reacted before closing the discussion. The noticeable interventions were the following: one needs to rely on the market as it is impossible to forecast the future (Medhi Chennoufi), the market needs to be influenced by the producers who better know the reserves than the consumers who tend to over-react because of the media over-coverage of oil-related events, finally it is important to nonetheless have some volatility (Mr. Kobayashi) as volatility is the basis of a market.

The next presentation concerned gas and was made by Mr. Ovlissen from Ramboll and mainly focused on LNG supplies to Europe. First of all he made it clear that LNG supplies to Europe are increasing and that new infrastructure is being put in place in regions already highly equipped (like the UK or the Netherlands) or regions still lacking such infrastructure (Germany, Sweden, Poland, Lithuania and Finland) . He added that the role of LNG is going to evolve from the traditional base load electricity production to the role of the main purveyor of flexibility.

Even though the benefits of LNG are large, taking into account price and added flexibility, Mr. Ovlissen is of the opinion that the EU will still prefer stable imports from area close to its area over LNG imports. The role of unconventional gas in Europe could also be an alternative to LNG, but in that respect, it is extremely difficult to announce the success of the European shale gas as we have not sufficient information so far and higher environmental regulation than in other countries.

Moreover, LNG suffers from the lack of security it gives to the producer compared to pipeline gas and therefore both imports will remain in parallel, LNG being more dependent on short term market. However, a common spot price is needed to develop the European market.

Finally, Mr. Ovlissen pointed out to the fact that LNG will play a new role in the EU complementarily with wind hydro and solar, giving the flexibility and security to the system when renewables are not available. Therefore, LNG is called on to become an important energy source in a greener Europe. LNG could also be used in the transport industry (in particular in shipping).

Naj Abi Aad from Qatar Petroleum then highlighted that the security of demand question was even more critical in the gas than in the oil industry. He pointed out the fact that other sources of gas to the EU could come from the Middle East by pipeline. He asked the question whether it was important to consider security of supply in the region or from the region as gas consumption domestically is increasing in the Middle East region (Bahrain and Kuwait are importing gas).

Mehdi Chennoufi then developed the idea that Europe is not a homogeneous market and that the participation of suppliers in LNG terminal was in fact just a sunk cost and not a guarantee of supply for the consumer. The only guarantee is a real union like pipeline contracts. Then he underlined that the countries using wind power often need the gas in a very short notice, thus increasing switching costs. He concluded by saying that gas is

indeed a very small share of the total energy consumed, but an essential part of it. LNG will therefore not resolve all the energy problems.

Ms. Rana Samaha's opinion is that although LNG was a way to increase flexibility of supply and therefore security of supply, the EU will increasingly enter in competition with other importing regions, and in particular Asia. At the moment only Qatar has excess LNG capacity and other countries in the Gulf are either importers (including Iran in the short and medium term) or developing gas for themselves (Abu Dhabi and Oman will not increase capacity).

Pedro De Moraleda considered that LNG is not the bridge to renewables, but it is in itself the energy for a sustainable future. LNG indeed represents freedom for both suppliers and customers while long term contracts are slow to react and rigid. He added that an LNG terminal is cheaper to build than a pipeline. As freedom has a price, he explained that Spain has 14 suppliers. On the other hand, LNG also widens customers' horizon for gas producers. The Gulf region is in between Europe and Asia, two large LNG markets; consequently Mr. De Moraleda considers that Middle Eastern LNG has a bright future.

Mr Hafner asked the question whether the over-supply of LNG is to be permanent.

Mr. Chenoufi reacted by saying that it is a fallacy to believe that the gas price decrease is due to unconventional gas in the US as demand from other regions such as Asia and in particular India saw a huge increase in gas demand in the meantime (imports of 80 mcm per day). In that perspective, Europe is insignificant. For Mr. Chenoufi the misunderstanding of the current situation in the gas market comes from a confusion of the causes and consequences. He added that the NBP is not transparent and very small and that there is consequently no LNG forward looking price for the moment.

Finally, Mr. De Moraleda acknowledged that the gas demand in Asia has overcome the effect of the US shale gas.

The second day, and the conference, ended with the discussion on renewables, chaired by Dr. Andrea Bigano (FEEM).

Dr. Rabia Ferroukhi's presentation explained that the potential in RES in the Middle East is real and that the RES-related activity is currently going on. For example, the UAE have a target of 7% RES in power generation in 2020 and several projects in the pipeline both in photovoltaic and wind farms (e.g. Masdar, Noor and Shams). She then described the EU-GCC clean energy network and described its mission.

Mr. Panzer then presented his researches and explained the situation of RES in Europe, showing that the motivation to increase the share of RES in power generation and in total energy consumption is clear. He also clearly detailed the costs of each technology and the support schemes in place. He also explained the tensions on the existing network and the prospects for improving the actual system, in particular by connecting the grids, reducing bottlenecks and establishing cross border markets so as to reduce balancing costs.

Then Mr. Panzer focused on the potential of RES in the Middle East and highlighted the fact that the whole region has very interesting prospects in terms of solar energy that could be used for both domestic power production and exports to Europe. In the case of Saudi Arabia for example, concentrated Solar Power plants could replace gas fired power production which would liberate those volumes for exports to Europe. The success of RES will depend on the implementation of the adequate policies and technology specific tools and appropriately integrate markets, Mr. Panzer said.

The presentation on nuclear energy was done by Mr. Egenhofer. He focused first on the description of the European nuclear industry, which is currently the largest in the World but the cause of much opposition among the EU population and countries. The EU has no specific energy policy and leaves the energy mix at the member states discretion, the latter only having the interdiction to subsidize it. As a matter of fact nuclear energy depends on economic factors but also on political backing (such as in France or in the UK), certain countries being totally opposed to it (Ireland and Austria). As a consequence no major new project is foreseen and nuclear countries prefer to expand the life of existing nuclear plants, which lowers the probability of new nuclear projects being undertaken. He also insisted on the fact that the faith of nuclear very much depends on the future of carbon prices; if those decrease, then nuclear production will decrease too as nuclear is a part of the transition to a decarbonised Europe. He finally highlighted that the potential for EU-GCC cooperation in the nuclear field is promising.

Participants reacted to the presentation by saying that the Gulf countries did not want to lag behind in terms of technology and would like to liberate more oil for exports and are therefore interested in developing nuclear technology.

Another participant asked what could be the potential of cooperation between the EU and the GCC knowing that cooperation could happen with Russia and China too.

Mr. Criqui asked what future energy nuclear would bridge? France always has short term problems which already give a good balance of subsidies to renewables.

A participant asked why is Europe so keen on selling nuclear technology to the Gulf when it is so concerned with nuclear security.

Mr. Egenhofer closed the discussion stating that nuclear policy is right now set up by default and that it is a bridge to a future we don't know yet and left to politicians. In any case the market for nuclear is now outside of Europe, but that is driven by commercial interests, not by an EU policy.

List of Participants

Name	Company/Institute
A. J. Almahroos	Manafer in Aljishi Corp
Abbas Habib	Electricity Authority
Abdoukarim Diouf	Embassy of Senegal
Abdulaziz Sager	The Gulf research center foundation (GRCF)
Abdulla J Al-binali	KAPSARC
Adeeb Al-Aama	Saudi Aramco
Adel Al-Qumish	Electricity Authority
Adel Mahmoud Jalil	
Adnan Almukhareq	National Oil and Gas Authority (NOGA)
Ahmed Ali Yousif Arrad	Ministry of Foreign Affairs
Ahmed Saleh	Electricity Authority
Ali Aissaoui	Arab Petroleum Investment Corporation (APICORP)
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Anissa Aissaoui	APIWRP
Asaad Alsadoon	
Ashraf Al-Bashooti	Electricity Authority
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Christian Panzer	Viennal University of Technology
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Dr. Mohammed Bououdina	University of Bahrain
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Faisal Al-Mahroos	CEO of BAPCO

Farah Ahmed Kheder	Ministry of Education -Directorate of School Building
Fatima Abdulla Aldhaen	Second Secretary in Ministry of Foreign Affairs
Fawzi Aloulou	Energy Information Administration
Frederik Roose Ovlisen	Ramboll
Gawdat Bahgat	Near East South Asia Center
Giacomo Luciani	The Gulf research center foundation (GRCF)
H.E. abdulla Abdul Latif Abdulla	Under_ Secretary - Ministry of Foreign Affairs
Henry Francois Loic	The Gulf research center foundation (GRCF)
Hesham Saoud Salmeen	Commander of Internal security Battalion in Bahrain National Guard
Ibrahim Zayan	
Islam Yasin Qasem	The Hague Centre for Strategic Studies
Jaffar Mattar	Ministry of Health
James A. Russell	Naval Postgraduate School
Jassim Alshirawi	Noga
Jean	French Embassy, Manama
Johannes George Michel Rademaker	The Hague Centre for shatepic studies
Kawther Abbas Al Rubaie	University of Baghdad
Khalil Algossab	Ernst and Young
Larry Jaeger	Bapco
Lucia Bottecchia	Universita Cattolica del sacro cuore
Luigi Narbone	AMB. EU Commission
Maha AlSabbagh	Arabian Gulf University
Mahmood Alwardi	BANAGAS
Manfred Hafner	Fondazione Eni Enrico Mattei (FEEM)
Mansour N. Al-Lahiani	King Abdullah Petroleum Studies & Research Center
Mark Allworthy	IISS
Mehdi Chennoufi	Shell Trading (LNG)
Meriaux Vincent	French Embassy
Michael Bauer	Center for Applied Policy Research (C.A.P.)
Mirza Salman Khalaf	Environmental Affairs
Mohammed Abdullah Almutawa	Communications Officer in Bahrain National Guard
Mohammed AlAnsari	Ministry of Foreign Affaris
Mohammed Al-Qahtani	Saudi ARAMCO
Mohammed H. Al-Mahmeed	GCC
Mohammed N. Galal	Ministry of Foreign Affairs
Morgan Trevor	International Energy Agency
Mr. Yasser A.Rahim Mohamed	Safty, Health and Environment Manegar

	in Gulf Petrochemical Industries Co.
Muneera Isa Alkhalifa	Ministry of Foreign Affairs
Naji Abi Add	Qatar Petroleum
Namat AlSoof	International Energy Forum
Nasser Khalifa Almoosalli	Bapco
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Nezar Radhi	Ministry of Affairs
Othman Abdulghaffar	NOGA
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