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1 June 2016

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Presentation and Background Paper – Plenary 4:

“Energy Prices, Climate Change and Geopolitics: What Next?”

at the Asia-Pacific Roundtable – APR @ 30: *‘Cooperation and Contestation in a Changing Regional Landscape’*

Introduction

The dramatic 70% fall of oil prices between the summer of 2014 and January 2016 has reminded the world of the geopolitical impacts of rapidly declining oil prices. The interplay and nexus of oil prices and geopolitics, resulting in falling energy export revenues for state budgets and companies, was once the beginning of the end of the Soviet Union and its socialist empire, when the oil prices dropped 3.5 times and Saudi Arabia's production increased fourfold since 1986. As long as the fossil fuels will dominate the world's energy mix for at least in the mid-term perspective by 2040/2050, oil supply and prices will remain critical for geopolitical shifts and the sustainable stability of the world economy.

Energy supply security is still not guaranteed without political stability in oil and gas producing countries. Despite drilling in ever more deeper offshore and onshore areas, even the remarkable technological progress and production efficiency of the U.S. shale oil and gas exploration during the last decade are still dependent on geopolitical risk factors. For Europe, Russia's annexation of Crimea and its policies to destabilize eastern Ukraine and turn it into a lasting “frozen conflict” with its often overlooked energy dimensions have reinforced a new sense of instability around its supply security. Despite the fact that Russia has been the most important energy supplier to Europe, the EU-28 - together with the US - has imposed wide-ranging sectoral sanctions on Russia by freezing its access to foreign technology and banning Western companies from cooperating in Arctic, shale oil and deep water drilling projects. These sanctions have been designed to curtail Russia's future oil production, which presently guarantees 80% of Russia's energy export revenues and 40% of the state budget.

At the same time, the recent Paris global summit on climate change and related mitigation efforts have strengthened the international efforts for a decarbonization of the world energy supply and a faster transition to a new global energy system based on renewable energy resources. Ahead of the December 2015 global climate summit in Paris, international fossil fuel (i.e. coal) policies have become an increasingly controversial and polarizing issue. While the U.S. and Europe are significantly reducing their coal consumption in order to meet their announced or agreed upon climate targets, a global divestment movement away from fossil fuels has surged in popularity since 2014. In fact, new research on 1,400 international funds during a two-year timeframe until 2014 even concluded that green funds have outperformed so-called “black funds” by more than 14 per cent. But any decarbonization scenario is complicated by ongoing state subsidies to fossil fuels – some US\$550 billion in 2013 (i.e. petroleum products). The Paris summit itself witnessed fundamental disagreements on how to share out carbon emission cuts between rich nations and fossil fuel-reliant giants such as China and India. The much celebrated outcome notwithstanding, it is important to understand what has been and has not been achieved, the uncertainties of the implementation process

and the differences of opinion regarding the implementation of the mostly unbinding final accord.

COP21 Global Summit Agreement and its Uncertainties of Implementation

Instead of relying on multilaterally negotiated provisions for emissions reductions, the new Paris Agreement is dependent on the will of the 175 countries, having signed the agreement, to implement their own developed “nationally determined contributions (NDCs)”. It may include not just mitigation targets, but also information about adaptation needs keeping global warming in the range of 1.5-2.0° of Celsius. In addition, the Paris accord agreed on a far more challenging goal, namely to zero emissions in the second half of this century. For the first half by 2050, the hope is based on newly established and still establishing transparent rules as well as unified standards for ensuring a mutual exchange of information in order to create a stronger climate policy cooperation.

But to some extent, the COP21 agreement has further widened the gap between global environmental policies and the present worldwide energy megatrends. Already before the Paris summit, those megatrends indicated a global warming leading to a 3.6°C increase in 2100. As a new MIT study, having investigated the likely effects of commitments made under the Paris Agreement, concludes with a 95% predictability: the likely warming will be still in the range between 2.7-3.6°C. Thus the Paris Agreement promised NDCs can only be considered as the step in the right direction for a complete transition towards a decarbonized energy supply. Ultimately, it demands far more drastic changes in the forthcoming years and decades before 2050 not just for the coal, but as well as oil and gas markets worldwide.

Furthermore, the conclusions of the MIT study are still based on the best-case scenario that all promised targets and obligations will be fully implemented. However, the worldwide implementation is still uncertain due to numerous political, economic and energy developments. In the U.S., Republican contender Donald Trump and his party have already argued against the Paris Agreement as they doubt in man-made climate change. In February, the Supreme Court temporarily blocked the implementation of Obama’s Clean Power Plan, which is the main strategy instrument to meet the country’s targets under the Paris accord.

Despite the US having agreed to a joint plan with China reducing their emissions, accounting for about 40% of global ones, Beijing’s commitments are essentially dependent on its future social-economic development. China’s state-owned enterprises of its energy intensive industries appear to transfer its investments and overcapacities more than ever in neighbouring countries as part of its silk-road strategy of “One Belt, One Road”. While its helps to reduce national emissions, it may contribute to even higher emissions on a global scale. China, for instance, is already the world’s largest investor in coal-mining and coal power projects. Beijing’s overseas coal investments serve its domestic energy policies and economic growth concept as well as its strategic and foreign policy objectives. Despite China’s new initiatives for reducing its domestic coal consumption and air pollution, its present industrial overcapacities and economic transformation as well as reduction of its domestic coal consumption increase the pressure for China’s coal industry to further expand its overseas investments in coal power plant and coal mining projects. It ultimately remains questionable whether it will sacrifice economic growth for its overall political stability to meet international climate obligations. In the case of mounting economic problems and China’s transformation of the energy sector becoming too expensive to implement, the government may return to ‘cheap’ coal and won’t restrict any overseas coal investments.

Many other oil producing countries, including Brazil, are in a political and economic turmoil and may face their countries falling behind on implementing its Paris commitments. Even in the EU, the ratification process could take longer to ratify the agreement because of its complex national procedures. The EU’s target for 2030 is still not compatible with the 2°C target. Any further more ambitious climate policies have been blocked by some member states up to now.

Explaining the Dramatic Decline of Oil Prices – Structural Changes, New Energy Megatrends and the Death of the Old World Oil Order

The dramatic falling oil prices from US\$115 in June 2014 to less than US\$30 per barrel in January 2015 have surprised oil producing and consuming countries equally at a time when many producer states in the Middle East, North Africa and Africa have faced rising unrest and political instabilities, which forced them to decrease their oil production. A logical conclusion would be hitherto that a shrinking global oil output would lead to rising oil prices.

Conspiracy theories have tried to explain the falling of oil prices as another new collusion between Saudi Arabia and the U.S. by targeting their most major enemies Russia and Iran at a time, when four major producers (Libya, Iraq, Syria and Nigeria) are in major turmoil. But a more reasonable explanation is that Saudi Arabia - like everyone else - has underestimated the rapidly changing world oil market due to a combination and interplay of several rapidly changing market conditions, accompanied by unrealistic expectations on the world's oil market and the appreciation of the US-Dollar.

The new developments on the global oil market may have a longer lasting impact beyond the present situation of the world economy, highlighting the shifting geo-economics and geopolitics as the result of the technological innovation linked with the horizontal drilling, hydraulic fracturing (also known as 'fracking') as well as seismic surveying. That technology revolution has spurred the U.S. shale oil and gas revolution. It has made the country increasingly self-sufficient (at least in the North American framework by the 2030s) and turning it from the once world's largest energy importer into a projected net exporter of energy by 2025. Since 2008, US crude oil output increased by 80% (+4 mb/d) – far more than the combined production increases by all other oil producers in the world. Thanks to the U.S. shale oil production, its oil imports have constantly declined to less than 3 mb/d in comparison with its 2006 peak of 10 mb/d. The U.S. had originally been forecasted to overtake Saudi Arabia becoming the globally largest producer of liquefied petroleum even by excluding its impressive biofuel production of more than 1.1mb/d. During the last four years, productivity and efficiency have increased by 25% with longer laterals, targeted fracturing stages as well as reducing maintenance and repairs, which are slicing costs and boosting output. The profitability of US\$100 per barrel three years ago has been the same like the US\$75 in 2014/15.

The Saudi unwillingness to stop the price fall has been determined by its interest in maintaining its market share particularly in Asia-Pacific as the world's the most rapidly rising oil consumption region. Having US\$750 bn in reserves, it also wanted to test the robustness and break-even price for U.S. and Canadian shale as well as tight oil production and to undermine its rising market shares in North America and beyond. While Saudi Arabia officially insisted that its new oil policy is not intended to be a "war on shale", it stressed in March 2015 that it was not the role of Middle East countries and OPEC to "subsidise higher-cost producers by ceding market share". Over the last year, however, the geo-economic and geopolitical rivalry with Iran has considerably increased and even led to proxy wars in Yemen and Syria. Iran has the worldwide fourth largest oil (9.3%) and largest proven conventional gas reserves (18% of the world's total) – even ahead those of Russia. But any substantial increase of Iran's oil and gas production is only realistic after 2020.

The declining global oil and gas prices are even more impressive by taking into account that the spreading political instabilities as the result of the Arab Spring has led to production cuts and supply disruptions in addition to those in Nigeria and some other producer states. It has affected the global oil and gas markets by reducing the gross oil production across the region to around 3.5 million barrels per day (mb/d). During the last years, it was not so much Saudi Arabia as the world's traditional "swing producer", which balanced the market by its spare capacity (in the U.S. viewed as the "nuclear weapon of the global oil market") but rather the U.S. becoming the indispensable non-OPEC producer for balancing the oil market.

But despite that many oil production disruptions, the oil price has further sunk to less than US\$30 per barrel last January as the US oil production still increased until the autumn of 2015 and only then declined – but gradually rather than dramatically. Thus any previous

analyses on the fracking's death have been clearly overstated and exaggerated. The fracking of unconventional energy resources has not just added new oil and gas to the market, but has entirely overturned the economics of the worldwide oil markets. As resources and technology will remain, *Daniel Yergin has warned the Saudi government* at the last Davos summit: „*You can conduct a price war, and you can drive companies in a specific industry or sector into bankruptcy, but you cannot do that to a technology. ... groups with deep pockets such as Blackstone and Carlyle will take over the infrastructure when the distressed assets are cheap enough, and bide their time until the oil cycle turns.*” Indeed, hedge funds and private equity groups already wait with US\$60bn to overtake bankrupt US shale drillers and will re-start the production when oil prices will increase to US\$60 per barrel alongside the potential expansion of production in Iran, Iraq and other producing countries (i.e. beyond 2020), all contributing to an oversupply on the global market for the years to come.

In comparison with traditional US and most other conventional oil producers in the world, US shale oil producers are able to adopt to rapidly changing market situations. It allows the U.S. to function as a “massive storage depot” with an ability to respond with unprecedented speed to volatile global commodity markets. But in contrast to much more capital-intensive Canadian oil sands projects, for instance, at present only 4% of U.S. shale oil output need prices above US\$80 per barrel. In order to cause larger trouble for the US oil production and having a market impact, Saudi Arabia has been forced to bring down oil prices over a longer period to below US\$50 - in contrast to many OPEC officials, who initially believed that larger investment would leave the U.S. market at a higher oil price of US\$85-70 per barrel. In this view, the U.S. break-even price for its shale oil projects has become rather a “moving target” instead of a fixed one. If the oil prices will further grow again to a level of US\$50-60 in the forthcoming months and years, then the U.S. shale oil production may just re-start its oil production and having larger impacts again on the global oil market.

Moreover, gas has become a direct competitor to oil in the U.S., China and some other countries (Middle East, Latin America) as an alternative in the transport sector (as CNG and LNG). It is already slowing the oil demand growth. If these energy trends in the global transport sector continue in the future, it will further constrain the worldwide oil demand and may stabilize the oil prices on lower levels around US\$50-60 per barrel also beyond 2020.

Geopolitical Implications of the Dramatically Falling Oil Prices

At least, four geopolitical implications of the new world oil order can presently be identified:

1. ***Technology Innovation Changes Geopolitical Landscapes:*** Following the new widespread instabilities and political unrest in North Africa, the Russian-Ukraine conflict and the rising threat of Islamic State of Iraq and Syria (ISIS) threat to both states, geopolitics has returned on Europe's and Asia's energy agenda. Falling oil production prices as the result of the technological revolution of the fracking drilling advances have fueled the shale gas and oil revolution in the U.S. with its wider impacts on global oil and gas markets. As the present example of falling oil prices is highlighting again, oil and gas prices are still determining factors for the rapidly changing geopolitical landscape. In the 1960s and 1970s, the rise of OPEC spurred the diversification efforts of the OECD countries to reduce their dependence on oil in general and oil imports from the Middle East and the Persian Gulf region in particular. But at the same time, the EU's efforts and progress on establishing a common energy policy and a united internal energy market since 2007 would be unthinkable without the geopolitical impacts of the previous three Russian-Ukrainian gas conflicts in 2006, 2009 and 2014.
2. ***Decreased Energy Dependence on the Greater Middle East:*** On a more positive side, Europe and Asia have decreased their dependence on oil and oil supplies from the 'Greater Middle East' and Gulf region, which still contain the greatest concentration of giant and super-giant oil fields in the world. The oil production dominance and strategic importance of the region is enhanced by the most attractive oil and gas geology for

prices of oil and gas production. The diversification away from this dominant oil production region - which a decade ago was forecasted to become ever more strategically important for the world's oil supply stability as the oil field production in the Atlantic basin is much more rapidly declining - has helped to stabilize the world's oil prices despite all regional instabilities since 0911. New conventional oil field production started in Alaska, the Gulf of Mexico, the North Sea, the former Soviet Union and mostly recently also in Africa, South America and the Arctic. Since 2006, the U.S. and Canadian shale oil and gas revolution has added much more oil and gas volumes to their markets. It has decreased their import demand, which has become available for other markets. Oil and gas companies are now exploring similar shale oil and gas fields for future production. It will increase the numbers of oil and gas producing as well as exporting countries and the worldwide diversification options – and, therewith, reduce the overall geopolitical risks on relying primarily on the Gulf region and the Middle East, whose political instabilities has bedeviled the global oil market since the oil crisis in 1973/74.

Share of the Gulf and Middle East Countries of Global Oil and Gas Production in 2013:

- Oil Production: 33% (peaked in 1975 with 37%)
- Gas Production: 17%;

Global Share of Proven Oil Reserves of Gulf and Middle East Countries:

- 2013: 48%;
- 2005: 56%;
- 1993: 64%

3. **Impacts of the Perceived U.S. Disengagement from the Gulf Region:** Despite the significant decrease of U.S. oil import dependence on the Gulf region and the Middle East from 22-24% during 0911 to just 10-12% today, it has led to a perceived major U.S. disengagement from the Middle East by reducing its regional military commitments. To some extent, China has already replaced the U.S. as the world's largest net oil importer and has strengthened its military relationships with Middle East countries and its presence in this region. But the reduction of U.S. engagement in the Persian Gulf Region has left a security and power vacuum. It has been filled with Saudi and Iranian ambitions to control both the region and oil prices, which has led to an escalating bilateral strategic rivalry. Even more: the Gulf-region stands at historical crossroads as the Saudi-Iranian geopolitical conflict is fueled by a generational change of governmental decision-makers (i.e. the rising influence of Deputy Crown Prince Mohammed bin Salman) with their own policy ambitions (i.e. Saudi vision of 2030) and efforts to control rapid social changes in their societies and technological revolutions in the wider regional landscape.
4. **Winners and Losers – the Demise of OPEC:** In contrast to the past when OPEC (i.e. Saudi Arabia with its spare capacity of at least 1.5 mb/d) often played a swing producer, the oil cartel appears no longer willing or able to adjust production to the market demand as the last Doha summit highlighted. As the U.S. shale oil revolution has transformed the national oil market with wider implications as a 'disruptive force' for the world oil market, other oil producers with their higher production costs are pressured to cut their production - i.e. extracting from deep water offshore oil fields, oil sands (Canada) and in Arctic regions (Russia). Arabian OPEC producers, by contrast, see their often light tight oil (LTO) supplies remaining most profitable – albeit above US\$50-60 b/d. The rapidly falling oil prices will affect many state budgets, which are heavily dependent on high oil and gas revenues, to cut their production output significantly. It includes several OPEC-member (i.e. Venezuela) and non-members (i.e. Russia) alike in the mid-term perspective. In the longer run, these oil and gas producers are still not prepared at all for a worldwide decarbonized energy supply as their economies have not been diversified in times when huge revenue flows - based on high oil and gas prices - were available.