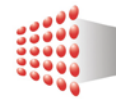




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## Changing global gas markets

### Geopolitical and geo-economic impacts on the Asia-Pacific region and Europe and its contribution to sustainable energy systems

2015/2016

#### Workshop Report

The European Centre for Energy and Resource Security (EUCERS) at King's College London jointly organized a three-day workshop on the topic of 'Changing Global Gas Markets' with, the Konrad Adenauer Stiftung's regional project on energy security and Climate change in the Asia-Pacific region, the Energy Studies institute (ESI) of the National University of Singapore (NUS), and the Atlantic Council of the U.S. from 28<sup>th</sup> of October to 30<sup>th</sup> of October 2015. The workshop was organized to discuss geopolitical and geo-economic impacts on the Asia-Pacific region as well as Europe and its contribution to sustainable energy systems. It was held in William Ballroom of hotel Parkroyal on Pickering, Singapore.

Recently, the Asia-Pacific region has surpassed Europe to become the world's largest gas importing region. As the fastest-growing natural gas market worldwide, the Asian gas market, with 790 billion cubic meters of natural gas demand<sup>1</sup>, is estimated to become the world's second-largest natural gas market by 2015. The demand is expected to surge ahead in the coming years, primarily driven by traditional importers in the region like China, India, Japan and South Korea. The center of gravity of the global natural gas market is shifting eastwards, in line with economic growth and increasing energy demand. As a result, energy geopolitics and energy security issues in the Asia-Pacific region is of greater concern.

#### DAY I: Wednesday, 28<sup>th</sup> October, 2015

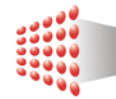
In the afternoon of 28<sup>th</sup> of October 2015, the first welcome address was made by Dr Peter Hefele, Director of the regional project on energy security and climate change at Konrad Adenauer Stiftung (Hong Kong). Then Professor Siaw Kiang Chou, Executive Director of the Energy Studies

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<sup>1</sup> Data Source: IEA (International Energy Agency), Developing a Natural Gas Trading Hub in Asia, [https://www.iea.org/media/freepublications/AsianGasHub\\_WEB.pdf](https://www.iea.org/media/freepublications/AsianGasHub_WEB.pdf)



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Institute (ESI) at National University of Singapore made his welcome address to all the participants. After the introduction, the meeting was chaired by Professor Dr Friedbert Pflüger, Director of EUCERS at King's College London, together with Ms Annie Medaglia, Deputy Director of Global Energy Center at Atlantic Council of the U.S. **The first keynote speech was given by Mr Michael Feist, CEO of Stadtwerke Hannover (municipal utility company in Hanover, Germany) and Executive Vice-President of the German Association of Energy and Water Industries.** Mr Feist reviewed the carbon emission reduction targets in European region and revealed the huge potential of carbon emissions reduction by substituting coal with gas. Other renewables such as wind energy or solar energy can also contribute to the carbon emission reduction. However, they all have their own issues. For example, in some locations from January to March, the insufficient sunlight and wind would probably make renewables difficult to meet the energy needs. As a result, it is important to ensure gas supply. When addressing gas supply security, Mr Feist also introduced the political impact, gas pricing mechanism, and rising LNG imports in EU. **Following the keynote speech was given by Mr Jean Abiteboul, Senior Vice President of Cheniere Marketing Ltd., U.S.** He gave an overview on global gas markets, as well as corresponding forecasts on gas markets in different regions in 2020 and 2025. Mr Abiteboul anticipated that the United States is likely to become one of the lowest cost LNG providers in the future, with a projected LNG capacity of 94 mtpa in 2025 (Australia: 81 mtpa, Qatar: 68 mtpa). In the meantime, Asia will become the main market for LNG growth, with an estimated LNG demand of 314 mtpa in 2025 (in comparison Europe: 89 mtpa, Americas: 19 mtpa). Finally, Mr Abiteboul summarized the benefits of importing LNG from the U.S. to Asia as diversifying the latter's sources of supply and its gas price mechanisms, getting access to cheap and abundant sources of energy and mitigating the uncertainty on demand and lack of storage. After the presentations, many questions were raised. Professor Dr Friedbert Pflüger put forward the thought that whether we have been just too optimistic about the gas market in Asia. Since the Asian economy is slowing down, gas prices in Asia are much higher than in Europe; and also nuclear power is back on the energy development plans for many countries in Asia. After intense discussion closing remarks were made by Ms Medaglia and the seminar was followed by a dinner with participants.

**DAY II: Thursday, 29<sup>th</sup> of October, 2015**

**Part I Geopolitical and Geo-Economic Impacts on the Asia-Pacific Region and Europe and its**



## Contribution to Sustainable Energy Systems

At the beginning of this part, Professor Dr Friedbert Pflüger first made an introductory statement on how to secure our energy supply. Key pillars that can contribute to energy security were identified: supply diversification; energy independence; energy interdependence; and free market competition.

### Session 1: Natural Gas - The Bigger Geopolitical Picture

**This session was chaired by Professor Pflüger and the first presentation was made by Professor Jonathan Stern, Chairman of the Natural Gas Research Programme at Oxford Institute for Energy Studies.** Professor Stern analyzed the emerging gas superpowers and global power shifts. Based on introduction of current gas superpowers of Russia and Qatar, as well as emerging gas superpowers of Australia and the U.S., Professor Stern concluded that the gas world is moving away from pipeline gas to LNG. And for these gas superpowers, the export volumes do not make themselves 'winners' if their projects are not profitable. In terms of geographical reach and profitability of existing projects, Russia and Qatar are clear winners; while in terms of new projects, only Qatar is a clear winner due to the low costs of existing projects and careful approach in expanding its scale of export. **Then Mr Sanjay Jobanputra, Vice President and head of Business Development Asia, Statoil gave the second presentation.** He talked about commercial thinking and geopolitical risk in the global gas industry. Mr Jobanputra first pointed out that long-term forecasts are uncertain. Though some known uncertainties can be handled by constructing scenarios, there are still a large number of other known unknowns such as consumer behavior, climate change impact that cannot be measured accurately, not to mention those unknown unknowns. Still, Asian markets were predicted to drive global LNG demand growth in the future. Pacific Basin LNG demand was expected to rise from 200 mtpa in 2015 to 300 mtpa by 2025, while South East Asian LNG demand was estimated to increase from 10 mtpa in 2015 to more than 45 mtpa by 2025. Demand would be driven by traditional buyers such as China, Japan and India, as well as emerging buyers in South East Asia. **The third speech was made by Dr Tatiana Mitrova, Head of the Oil and Gas Department at the Energy Research Institute of the Russian Academy of Sciences (ERI-RAS).** Dr Mitrova laid emphasis on the changing global energy flows and the corresponding geopolitical implications for the Asia-Pacific region and Europe. Based on the presentations valuable comments were made by Professor Keun Wook Paik, Senior Fellow at the Oxford Institute for Energy Studies,



and Mr Sergey Tulinov, economic affairs officer of United Nations Economics and Social Commission for Asia and the Pacific (UNESCAP).

### **Session 2: Looking into the Geo-Economics of Gas**

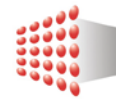
**This section was chaired by Ms Annie Medaglia. The first presentation was made by Mr Laszlo Varro, Head of Gas, Coal, and Electricity Markets Group at the International Energy Agency (IEA).** Mr Varro discussed the role of gas in a carbon constrained energy system. He stated that cheap coal exported by the US is now replacing gas in Europe. Even Germany is building new coal plants to replace its nuclear power. Based on the current situation, Mr Varro led us to a discussion whether we actually need gas as a bridge fuel, or if solar energy and batteries make gas capacity redundant. **The following presentation was made by Dr Chunping Xie, KAS fellow at the European Centre for Energy & Resource Security, King's College London.** Dr Xie first gave an overview of current gas markets in East Asia, followed by a brief introduction on current pricing mechanisms in different gas markets. Further estimations were made on gas consumption based on a heterogeneous panel co-integration model. Estimations were also made on gas production based on a logistic curve model. In addition, according to the construction of gas pipeline, as well as the long-term contracts at present and in the future, natural gas imports were also estimated. **The final presentation in the session was given by Dr Xunpeng Shi, Senior Fellow at ESI, National University of Singapore,** who mainly discussed gas hub initiatives in East Asia. An overview on East Asia's gas market was given, suggesting that Japan, South Korea and China together took up 61% of the world's total LNG imports in 2013, and this number is estimated to be 43% by 2035. However, the proportion of total LNG imports in the Asia-Pacific region will still remain as high as 70% in 2035. Comparisons were made on the world's gas pricing mechanism and emphasis laid on the current situation of Asia premium. Based on the above-mentioned points, Dr Shi concluded the possibilities and benefits of developing gas hubs in East Asia.

### **Session 3: Climate Change and the Future Role of Natural Gas**

**This session was chaired by Professor Hongyuan Yu, Director for Public Policy at the Shanghai Institute of International Study. The first presentation was made by Dr Frank Umbach, Research Director at EUCERS, King's College London.** Dr Umbach talked about the role of natural gas in the future energy mix of Europe and the Asia-Pacific region. He analyzed drivers and deter-



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mining factors for global, European and Asian gas demand by 2040. Forecasts on global gas demand and gas production were also introduced, as well as the projected gas import dependency and LNG import. Conclusions were drawn that the world's gas demand increases are dependent on Asia's demand; however, Asia's gas demand growth might be revised downwards due to the slow-down of economic growth etc. In addition, the switch from coal to gas will take place in the U.S. and in Europe, but not in Asia. Instead, coal will be the fastest growing energy resource in Asia, and may become the most important one around 2030 or 2040. If coal will be replaced by gas in Asia in the future is still of great uncertainty; and at the moment not really realistic based on the current situation. **The next presentation was given by Professor Quentin Grafton from the Australian National University and former Executive Director of the Australian Bureau of Energy Economics.** Professor Grafton presented an analysis of risks, returns and regulation of unconventional gas. Risks included hydraulic fracturing, methane emissions, other risks of seismic events, gas blow-outs, air pollution and non-water well pad issues were also emphasized. When talking about returns, following aspects of annual value-added GDP, employment, annual incremental government revenues in the U.S. unconventional oil & gas industry were taken into account. Regulations in the unconventional gas industry were also discussed.

**DAY III: Friday, 30<sup>th</sup> of October, 2015**

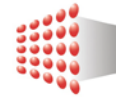
### **Part II Gas/LNG trading hubs and hub pricing in East Asia**

After introductory statements by Professor Siaw Kiang Chou, **Dr Yongping Zhai, Technical Advisor of the Energy Sector Group at Asian Development Bank (ADB), made a keynote speech on 'Natural gas in Asia's energy mix: a development financier's perspective'.** General information about ADB was firstly introduced. Numbers suggested that ADB's clean energy investments are growing rapidly in recent years, most of which are spent on renewable energy projects (59%). ADB's energy policy objectives suggest that natural gas is an important part of the energy mix to improve energy security and to reduce emissions of greenhouse gases etc. A comprehensive ADB study on developing a competitive LNG market in Asia was also introduced, which was mainly about assessing the requirements of fostering a competitive LNG market and examining how an Asian gas trade hub can be created to benefit Asia as a whole.

### **Session 1: Introduction to Gas Hubs and Hub Pricing in East Asia**



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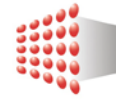


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This section was chaired by Professor Keun Wook Paik, Senior Fellow at Oxford Institute for Energy Studies. The first presentation was made by Ms Yuanyuan Chen, economist at Shanghai Petroleum and Gas Exchange. With a topic of 'China's initiatives in building gas hubs', Ms Chen first introduced the construction of gas pipelines and LNG terminals, and also its market reform in progress, including market liberalization on E&P of shale gas, gas import, interprovincial town gas companies, and price deregulation from governmental guidance to market-based mechanism. In addition, a particular introduction was made to Shanghai Petroleum and Gas Exchange (SHPGX), covering its shareholder structure, value chain and its efforts on the Chinese gas price index. With pipeline natural gas, liquefied natural gas and LNG receiving capacities as its three products, the SHPGX started its trial operation from July 2015. **Professor Tetsuo Morikawa, Senior Researcher at the Institute of Energy Economics (IEEJ) in Japan gave the second presentation.** Professor Morikawa first described the concept of a LNG hub, which is to form an international LNG price instead of domestic wholesale pipeline gas prices (in comparison to the case of the U.S. or European hub like Henry Hub or NBP). A domestic approach to develop Asian benchmark price was described in detail, including gas market liberalization, domestic wholesale price (hub) development, divergence of wholesale and import prices, and also de-oil-indexation of import prices. An international approach was also introduced, covering relaxation of destination clause, spot market development, divergence of oil-indexation and spot prices as well as spot price development. In addition, electricity and gas market liberalization in Japan as well as LNG trading hub initiatives in Japan were also presented. **The third presentation was made by Mr Dave Carlson, Senior Business Development Director of the Singapore Exchange (SGX).** In his speech, Mr Dave Carlson focused on Singapore's initiatives in building a gas-trading hub. Due to the lack of indigenous gas (compared to the Middle East or North America) and the non-liberalized gas market (compared to Europe or North America), wholesale gas prices in Asia are high compared to the rest of the World. And Singaporean gas prices are amongst the highest in the world, only below those countries who fully reliant on LNG. In addition, the LNG market is becoming shorter termed and the spot market share is growing. As a result, the market needs a trusted spot benchmark. Physical LNG participants, together with EMC/SGX of Singapore, are trying to create such a benchmark for Asia. In addition, the Singaporean LNG Index Group of SLInG was also introduced, which is a spot index based on a weekly industry poll for major traders' assessment of a fair mid-price for a Singaporean FOB LNG cargo. Based on their presentations, comments were made by Mr Paramate Hoisungwan,



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Senior Analyst and Upstream & Gas Team Leader of ASEAN Council on Petroleum (ASCOPE) and Mr Michael T. Jones, Senior Analyst of Northeast Asia Gas & Power, Wood Mackenzie.

### Session 2: Moderated Discussion

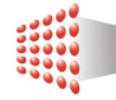
This session was a roundtable discussion, chaired by Dr Xunpeng Shi. Leading panelists discussed stakeholders' views on the East Asian gas hub initiatives.

### Session 3: Lessons learned from European experience

**Dr Frank Umbach chaired the session and the first presentation was made by Mr Henning Gloystein, Energy Editor Asia at Thomson Reuters.** Mr Gloystein discussed the successes and failures of European energy market liberalization. He pointed out that the UK natural gas market (NBP), Dutch natural gas market (TTF), German and Nordic power markets (e.g. EEX and NordPool) have worked well in European energy markets; while French power & gas markets (and southern European markets), German natgas markets, and Carbon markets have not done so well. At last, learning points for Asian natgas and LNG were concluded as: 1) excess supplies need to become liquid; 2) non state-controlled buyers of several sizes are required; 3) should benefit from a large customer base and diverse suppliers; 4) regulator should be trusted and neutral. **The second presentation was made by Mr. Andre Lambine, Senior Advisor of Gas at Platts, on 'critical success factors of European gas hubs'.** Key success factors were concluded as: 1) Transparency. Hub price quotations and indices have been publicly available since the hubs commenced trading; 2) Deregulation. There must be demand to trade; 3) Interconnectivity. Trading between geographical areas must be facilitated; 4) Standardization. Makes it possible to compare prices; 5) Balancing of the Market/Clearing House. That can reduce counterparty risk; 6) Financial trading which will boost liquidity. **The third presentation was made by Dr Xunpeng Shi, on 'Europe's transition from oil indexation to hub pricing: An Asian perspective'.** Dr Shi argued that, oil indexation is no longer justifiable due to many reasons such as oil not being an alternative to gas (coal emerges as an alternative now) and also the low correlation with the U.S. market. Transition from oil-indexed to gas-on-gas (GoG) competitive pricing is underway in Europe as its gas hub development is a dynamic process, which is still in progress. In East Asia, some countries would like to see gas hub trading take off in the near future, too. Lessons from the European experience are valuable for reflecting on successes and failures of gas hub emergence and an East Asian perspective can be derived



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from European experience and adjusted to a new context. Based on their discussions, comments were made by Juan Roberto Lozano Maya, Researcher at Asia Pacific Energy Research Centre (APERC).

#### Session 4: Lessons learned from other commodity markets

**This section was chaired by Professor Quentin Grafton. The first presentation was made by Mr Hari Malamakkavu Padinjare Var, Research Associate at ESI, National University of Singapore.**

His speech was mainly about transition to market based price in crude oil markets and lessons learned for hub pricing in natural gas markets. Both evolution of crude oil pricing and traded natural gas pricing were introduced. Key factors in development of oil benchmark pricing were analyzed and hub market development framework was built for natural gas. **The second presentation was made by Ms Jacqueline TAO, Analyst, ESI, National University of Singapore.** Detailed introduction was given to the coal pricing mechanisms. Lessons for market based pricing of natural gas markets were concluded as: 1) Large volumes of trade, though critical, does not guarantee the evolution of a geographical trading hub; 2) Relevance and reliability must be present, in addition to price discovery; 3) Governance plays an important role. **The third presentation was made by Dr Xunpeng Shi, who focused on Dojima rice exchange.** An overview was given on the Dojima rice exchange, as well as its history and challenges. Implications were summed up for gas market development on following aspects: spot market, futures market, government and policy development. Based on their presentations, comments were made by Dr Yanfei Li, energy economist at Economic Research Institute for ASEAN and East Asia (ERIA).

During the workshops some main conclusions were drawn, including – but not limited to – the following points:

- 1) Natural gas plays a significant role in carbon emission reduction and should therefore be regarded as a bridge fuel;
- 2) World's gas demand increase, especially LNG demand increase are to a large extent dependent on Asia's growing demand, notwithstanding the slowdown of Asian economy at present;
- 3) Gas supply security is a major issue and efforts should be made on following aspects: supply diversification; energy independence; energy interdependence; and free market competition;
- 4) Natural gas pricing mechanisms are vital for gas market development. The European experienc-





es in gas pricing mechanisms are valuable for the transition in Asia;

5) During the transition of gas pricing mechanism, the initiatives in building gas hubs in Asia are of much concern, and some Asian countries such as China and Japan are trying hard to realize plans. Though in the end the workshop did not reach an agreement on whether we should develop a natural gas trading hub in Asia or not, we had intense discussions throughout the three days and important thoughts and insightful comments were made.