



Minutes of meeting

4th Meeting of WOC 1, Triennium 2012-2015

Renaissance Hotel, Seoul, 10-13 March 2014

1. Attendance

A total of 77 IGU authorities, delegates, guests and accompanying persons from 20 countries attended this meeting, which was held in conjunction with PGC A and PGC C, including Mr. Georges Liens, Chairman of the Coordination Committee of the IGU, Mr. Seok-Hyo Jang, Kogas CEO and candidate to the Presidency of the IGU for the 2018-2021 triennium, Mr. Mr. Jae-Seob Kim, Secretary General of the KGU, Mr. Bong-Suh Lee, former Minister of Trade and Industry, Mr. Youn-Hoo Lee, former Minister of Knowledge Economy, Mr. Kang-Soo Choo, former CEO of Kogas, 19 delegates from WOC 1, 21 from PGC A and 12 from PGC C (Table 1).

Table 1. Attendees from WOC 1.

Country	Given names	Family names	Organization	Group
Algeria	Abdelouahad	BELMOULOU	Sonatrach	1.2
Algeria	Mohammed	KACED	Sonatrach	1.2
Brazil	Marcos	SUGAYA	Petrobras	1.3
China	Ping	SUN	PetroChina (CNPC)	1.1
China	Shi guo	LIN	PetroChina (CNPC)	1.1
France	Bernard	SEILLER	Total SA	1.2
Korea	Kyungsick	PARK	KOGAS	1.3
Korea	Seungho	LEE	KOGAS	1.1
Korea	Taehyeong	LEE	KOGAS	1.3
Malaysia	Im Xaxanuhani	ZULKIFLI	PETRONAS	1.1
Malaysia	Nazri Idzlan	ABDUL MALEK	PETRONAS	1.1
Malaysia	Rashidah	ABDUL KARIM	PETRONAS	1.1
Malaysia	Zainal Abindin	ZAINUDIN	Petronas	1.3
Poland	Pawel	JAGOSIAK	PGNiG SA	1.3
Russia	Alexey	SEMENOV	Gazprom	1.3
Russia	Andrey	KNYAZEV	Gazprom	1.1
Russia	Boris	SHARIPOV	Gazprom	1.1
Spain	Guadalupe	VARGAS GIRALDO	Repsol	1.3
Thailand	Naruepon	LECKSIWILAI	PTTEP	1.2



2. Joint plenary session

After brief welcome words from the chairman of PGC C, **Dr. Gi-Chul Jung**, from the chairman of PGC A, **Mr. Satoshi Yoshida**, and from the acting chairman of WOC 1, **Dr. Marcos de Freitas Sugaya**, the meeting started with a congratulatory speech from **Mr. Seok-Hyo Jang**, current President and CEO of Kogas, and candidate to the presidency of the IGU for the triennium 2018-2021.

In the sequence, **Mr. Kun-Ho Lee** (Kogas) lectured the delegates on the current status of the Korean gas industry. The country imported nearly 41 M tons of LNG in 2013, and Kogas continues to be the single largest buyer of LNG in the world. The supply has been procured from 10 countries by means of 16 long term and 3 medium term contracts, including Sabine Pass, but 21 new projects are currently under investigation. There are three regasification terminals in the country, a fourth in construction and a fifth under study. Most of the future capacity will continue to come from nuclear power, in spite of a recent change in the National Energy Basic Plan, but the share of gas in the primary mix is also expected to increase. In addition to that, the country will expand its transmission system from about 4.000 km to nearly 5.000 km by 2017.

Mrs. Karen Sund (Sund Energy) kindly forwarded her presentation, which was shared with the attendance. She thinks oil and gas companies often see gas as a somewhat precious fuel, mainly for its cleanliness and flexibility, but the perception is different among power producers and environmentalists. It is necessary to rethink all assumptions in a much broader perspective, in which competition from other sources such as nuclear and even coal should be included. In addition to that, other options for gas should be investigated, as higher margins are likely to be obtained in transportation (replacing oil) and in remote power production (replacing diesel), just to mention a few.

Mr. Sanjeev Gupta (E&Y) described some of the most important statistics on the oil and gas transactions registered in 2013. The overall activity slowed down significantly after a record high of US\$ 423 billion in 2012, registered along approximately 1800 transactions. Asset deals continued to dominate the market, driven by the acquisitions performed by NOCs and changes in North America due to the production of unconventionals. In the upstream segment a decline was observed mostly in Australia, Canada and the USA, while significant growth was registered in Africa, Latin America and the CIS. The most significant decline was observed in the downstream segment, while the midstream registered a 17% increase in value, the top four of them being gas related. In the near future Africa could be a game changer, driven by the gas discoveries in Mozambique and Tanzania.

Mr. Ross McVey (Gazprom M&T) examined the European gas to power demand, which is very sensitive to fuel pricing. Four consecutive years of decline has been registered now, with a total drop of nearly 50 bcm, mainly because of coal. Forecasting is more complex now, and the growth of renewables is adding significant to the equation, as in the vast majority of the cases their supply is intermittent, unpredictable in nature and mandatory. As a



consequence, increasing amounts of system flexibility have been required, which are likely to be obtained from gas.

Mr. Jaishankar Krishnamurthy (E&Y) presented on the pricing implications of the new supply and demand scenario for global LNG operations. These are expected to increase at a 4% yearly rate, but uncertainties in the medium term demand, which are notable in China, are causing a delay in new projects. In addition to that, the restart of nuclear power in Japan could cause a significant drop in LNG prices, and additional uncertainties subsist in the US exportation projects, Australia, Canada, East Africa and Russia, as indicated in his presentation. Buyers will seek for additional equity in LNG plants, geographic diversification and contractual flexibility.

Ms. Leslie Palti-Guzman (Eurasia Group) listed some key challenges that gas buyers will eventually face in Asia. The first one is a supply risk caused mostly by domestic difficulties in established producing countries such as Qatar, Russia, Nigeria, Indonesia and Egypt, which have been aggravated by the competition from the US shale gas exportation projects. Moving away from oil indexed prices will not be fast, but imports from the US based on the Henry hub may assist buyers towards that purpose. In that sense, a higher usage of spot indexation has been registered in numerous contracts.

Mr. Georges Liens, Chairman of the Coordination Committee, described the key elements to be settled by the working groups in the next couple of weeks, aiming at the publication of the preliminary programme for WGC 2015. At the moment, the rooms indicated in Table 2 have been allocated to the sessions of WOC 1. The arrangement differs slightly from the original request formulated by the committee, but a revision will be performed after the call for papers, when a better idea of the potential attendance for each of these sessions will be available.



Table 2. WOC 1 sessions at the WGC 2015.

Day (time)	Session name (number)	Venue (capacity)	Chairmen
Tue 2 nd June (15:15-16:45)	Gas flaring and venting reduction (strategic panel)	Notre Dame Amphitheater (550)	Bjorn Hamso (World Bank) and Denis Krambeck Dinelli (Petrobras)
Wed 3 rd June (8:30-10:00)	Gas on gas competition and upstream investment (thematic session WOC 1.5)	Tour Eiffel (500)	Marcos de Freitas Sugaya (Petrobras)
Wed 3 rd June (17:00-18:30)	Fiscal regimes for the production of conventional and unconventional gas (thematic session WOC 1.3)	Sacre Coeur (150)	Daniel Johnston (consultant) Marcos de Freitas Sugaya (Petrobras)
Thu 4 th June (8:30-10:00)	Natural gas available everywhere: an assessment of global resources (thematic session WOC 1.2)	Tour Eiffel (500)	Denis Krambeck Dinelli (Petrobras) Fernando Bado (Tenaris)
Thu 4 th June (15:15-16:45)	Unconventional gas (strategic panel)	Notre Dame Amphitheater (550)	Denis Krambeck Dinelli (Petrobras) and Maria Gabriela Rosello (Total)
Thu 4 th June (17:00-18:30)	Technological advances in gas exploration and production (thematic session WOC 1.1)	Invalides (300)	Adif Zulkifli (Petronas)
Fri 5 th June (8:30-10:00)	Technologies for the monetization of gas reserves (thematic session WOC 1.4)	Louvre (170)	Rashida Karim (Petronas)

As the sessions are only 90 min long, the number of speakers will have to be limited to about five, which will be enough for presentations of 15 min followed by 3 min of Q&A.

WOC 1 has also requested the Coordination Committee to include the strategic panels in the call for papers, as this will increase author competition and the overall quality of the conference. On top of that, the administration of unconfirmed speakers will be facilitated.

3. WOC 1 sessions

Mr. Denis Krambeck Dinelli, Chairman of WOC 1, was held in Brazil at the last minute due to urgent company matters. **Dr. Marcos de Freitas Sugaya**, acting chairman, reminded the most important discussions that took place in Kota Kinabalu, and called attention to the products expected in Seoul, mainly a first draft of the triennial report of the committee.

Ideally, it would contain the most important actions and best practices to be adopted by the upstream segment of the gas industry. The introduction should be captivating enough to encourage the reader to proceed, but reasoning must be properly developed to support the conclusions. Figures, texts and tables taken from other sources should not be reproduced without written consent, and their authors must be properly quoted.



The call for papers for the next World Gas Conference is now open at <http://www.wgc2015.org>. All WOC 1 members are encouraged to submit and/or procure submissions to enhance the competition and the overall quality of the conference. The best will be selected during the next committee meeting, in September 2014, but the contributions from WOC 1 members will not be exposed there.

All WGC strategic panels, committee sessions and expert fora organised by WOC 1 are now completely defined, with titles, chairmen and contents. They will be available in the conference programme that will be released by the French presidency within a few weeks.

3.1 SG 1.1 E&P Technology

This study group was asked to focus on the technologies that are most relevant for the production of unconventional, such as horizontal drilling, multi-stage stimulation and microseismic monitoring. On top of that, the group is expected to establish best practices aiming at the exploration and production of hydrocarbons in a safe, efficient and environmentally sound manner. These could integrate the new edition of the shale gas brochure that is being produced by the IGU under the leadership of the Vice-chairman of the Coordination Committee, Mr. Mel Ydreos.

The group was also asked to deliver on the technologies that are relevant to the reduction of gas flaring and venting, including FLNG and FGTL. At strategic panel on gas flaring and venting will be chaired at the WGC by the new manager of the Global Gas Flaring Reduction programme of the World Bank (GGFR), Mr. Bjorn Hamson, who has asked the committee to emphasise the role of technology in that purpose.

Dr. Marcos de Freitas Sugaya (Petrobras) reprocessed some flaring data published by the GGFR, suggesting that technology should be particularly important for developing countries where significant amounts of gas are still being flared. New upstream facilities in these countries should be properly designed to minimise flaring and venting, and the group could write down a few best practices on that.

The report draft produced by the group contains an introductory section and a good review of some important reservoir and drilling technologies. Although well structured, a section on the most important production systems is still under development. The gas monetization section and the case study presented will also require some work, with more focus on technological innovation. The current content of the gas to power subsection seems to be more related to the scope of activities WOC 5, a different approach will be required there as well.

3.1. SG 1.2 Assessment of Reserves and Resources

Dr. Marcos de Freitas Sugaya (Petrobras) tried to negotiate the use of figures and data on drilling for conventional gas with IHS CERA, but permission was granted for only one figure, in which gas discoveries are shown to have recently fallen to their lowest level in many decades, in spite of a considerable increase in the exploratory activity. As the success ratio decreases and a severe inflation is observed in the upstream activity, it is hard to believe that



prices could be reduced, as the unconventional gas revolution remains confined in North America.

The report draft produced by the group contains a section for unconventional gas whose definitions will be consolidated in the next few months. This is a theme of relevance, as the English word “shale” is often confused with “schist” in Spanish, French, Portuguese and other languages, while the differentiation between shale and tight gas in the literature is often grey.

The other sections of the report deliver on how hub pricing is affecting upstream investment, and on the growing role of the independent producers of oil and gas, but much remains to be done in the next few months, as the group is expected to complete its report by September 2014.

3.2. SG 1.3 Gas rent and Mineral Property Rights

Dr. Marcos de Freitas Sugaya (Petrobras) presented on the most important results obtained by the group, whose best practices recommend government authorities to focus on progressive instruments based on profits in lieu of signature bonuses, flat royalty rates and other regressive instruments based on production. Among all case studies investigated by the group, the USA was one of the most interesting, as government take there is the smallest, and additional efforts have been recently undertaken to further reduce the upstream taxation. However, a growing discussion is taking place there in the opposite direction, and this could severely hit the independent producers, which were ultimately responsible for the revolution of unconvensionals. According to a recent report delivered by WoodMackenzie, a reduction of 3.8 million bpd could be observed in 10 years if the current tax treatment of intangible drilling and development costs was ended in the USA.

Mr. Pawel Jagosiak (PGNiG) analysed the tax regime in place at the Norwegian continental shelf (NCS). Activities are relatively expensive there, and the tax system is also complex, but at the same time there are many built in incentives and many upstream companies have been attracted to this region as a consequence. In the vast majority of the cases a minimal working commitment is required, the most common one being a drill or drop obligation. As seen in Sapporo, the marginal tax rate is 78% but the allowance for capital expenditure is also large (93%), with a 30% uplift, and the authorities refund 78% of the exploratory cost, minimizing the impact of dry holes and cost overruns.

Mr. Pawel Jagosiak (PGNiG) has also described some of the upstream activity in Poland, where significant amounts of unconventional gas have been announced in the press. Only 12 wells have been drilled so far by PGNiG, but 9 more are planned for 2014 in Baltic, Central Poland and Lublin Basins.

Zainal Abidin Zainudin (Petronas) presented some of the experience gathered in Canada by Progress Canada Energy Ltd., which is drilling in North Montney (BC) and Deep Basin (AB). Typical drilling costs for shale gas have been around US\$ 5 million per well there, and some logistical challenges still subsist, but these have been confronted by means of a



modular design of facilities and the use of a progress pod concept. In BC a deep drilling credit is available for up to three years (3% royalty).

Taeh-Yeong Lee (Kogas) wrote down on the Mozambique and Tanzania case studies developed in the previous meetings.

The report draft of the group analyses the most important fiscal instruments usually applied to the upstream industry. It follows with a description of a number of case studies, including the USA, where a number of fiscal benefits have been applied to incentivise the production of oil and gas by independent companies. It then explains why gas should not be treated as oil, and finishes with some best practices aiming at government authorities.

4. Technical visit

After a final joint plenary session, in which the study group leaders presented on the status of their groups, delegates reconvened in the next morning for a visit to the Incheon LNG terminal, one of the largest in the world.

5. Next meeting

Mrs. Guadalupe Vargas Giraldo (Repsol) described the preparatives for the next meeting of WOC 1 in Madrid, 23-26 September 2014. Delegates will select the best contributions for WGC 2015 using the rating system described in her presentation, where quality, originality, objectivity and relevance of the subject are the most important items. In the last day WOC 1 delegates will visit Repsol's Technological Centre in the outskirts of Madrid.