

Minutes of Meeting

IGU WOC 1



25-28 September 2012

Sapporo Renaissance Hotel

1. Introduction

The first meeting of WOC 1 in the triennium 2012-2015 took place at the Renaissance Hotel in Sapporo, 25-28 September 2012.

A total of 47 IGU delegates attended this meeting, of which 16 from WOC 1 (Table 1).

Table 1. Delegates from WOC 1 in the Sapporo meeting.

Given names	Family names	Affiliation	Country
Abdelouahad	Belmouloud	Sonatrach	Algeria
Mohammed	Kaced	Sonatrach	Algeria
Said	Chelbeb	Sonatrach	Algeria
Denis	Krambeck Dinelli	PETROBRAS	Brazil
Marcos	de Freitas Sugaya	PETROBRAS	Brazil
Shiguo	Lin	CNPC	China
Daojiang	Long	CNPC	China
Guangjun	Wang	CNPC	China
Vincent	Trocme	GDF SUEZ	France
Ik Hyun	Park	Kogas	Korea
Adif	Zulkifli	Petronas	Malaysia
Nazri	Malek	Petronas	Malaysia
Pawel	Jagosiak	PGNiG	Poland
Ekaterina	Litvinova	JSC Gazprom	Russian Federation
Boris	Sharipov	JSC Gazprom	Russian Federation
Olga	Cheprakova	Gazprom expo	Russian Federation

2. Opening

Mr. Satoshi Yoshida, Chairman of PGC A, introduced the invited guests and authorities to all delegates. He presented Hokkaido as a new frontier for economic development in Japan, with significant growth expected in the production of food and in the consumption of natural gas, for example.

All emissions produced by the meeting were calculated and completely compensated with the plantation of trees at the Carbon Legacy Forest developed during the G8 Summit of Hokkaido in 2008 (<http://www.sapporo-convention.net/environment/index.html>). A participant from Rio de Janeiro, on the opposite side of the globe, was estimated to produce nearly 3.9 tons of carbon dioxide.

Mr. Denis Dinelli, Chairman of WOC 1, thanked the participants and desired them a fruitful meeting, with meaningful results for their organisations as well.

3. News from the Coordination Committee

The Chairman of the Coordination Committee, Mr. Georges Liens, presented the theme for the current triennium, "Growing together towards a friendly planet", and the four pillars that support it: (1) Advocacy for the development of natural gas as a foundation fuel for Sustainable Development, (2) promotion of an accurate combination with renewables and electricity, (3) improvement in the availability of natural gas in new areas and developing countries and (4) attraction and retention of human resources (Figure 1).

“Growing together towards a friendly planet”

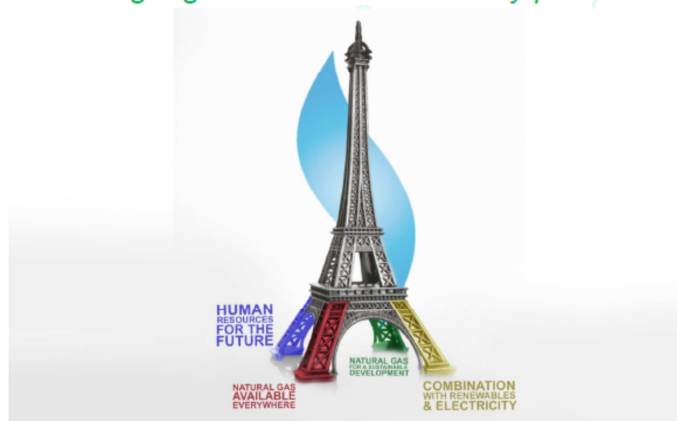


Figure 1. The IGU strategic vision for the 2012-2015 triennium (Liens, 2012).

In the sequence he introduced the IGU Committees and Task Forces for the current triennium, and a list of themes that have been previously arranged for them. As an example, PGC B will continue to coordinate the formulation of perspectives for supply, demand and prices, while PGC C will analyse the use of gas to promote sustainable development in emerging countries, and PGC E will study a “i-gas industry” whose details seem to be still under elaboration.

A number of transversalities or interfaces have been identified between the committees, and **WOC 1 was encouraged to nominate representatives to follow the activities of TF 1 (Human Resources), TF 2 (Gas Advocacy), PGC F (R&D) and PGC A (Sustainability)**. This would be important to secure the development of consistent and congruent messages in all committees.

As of 11 September, 646 nominations to the IGU Committees have been received from 41 countries, of which 50 to WOC 1 (Table 2). Some IGU members are still elaborating their lists to the Coordination Committee, but have already forwarded a few names directly to WOC 1. As a consequence, a total of 57 members can be related today to WOC 1, which is now the 5th largest committee in the IGU.

Table 2. Largest number of nominations.

France	70
Algeria	49
Iran	42
Brazil	39
Poland	35

On top of the regular committee reports, the Coordination Committee has decided to compile a few additional reports, as indicated in Table 3. **Contributions from WOC 1 are expected on best practices and human capital**. All materials must be ready to be submitted to the CC by March 2015, which means that a **complete draft version of the WOC 1 report must be ready by the time of our 5th meeting in September 2014**, two years from now. **First drafts are expected to ready by the time of the 4th meeting of the group in February 2014**.

Table 3. Especial reports to be elaborated in the 2012-2015 triennium.

Title	Responsibility	Date of completion
2050 natural gas prospective	PGC B	March 2015
Natural gas, a key factor for sustainable development in emerging countries	PGC C + TF3	March 2015
e-gas industry	PGC E	March 2015
Global LNG Report	PGC D	Yearly in May
Efficiency and convergence with renewables and electricity	PGC F	March 2015
Best practices	All + compil. by CC	March 2015
Human Capital transversal approach	TF1 + all	March 2015

The call for papers for WGC 2015 is supposed to be opened by 1st February 2014, which means that **WOC 1 will have to consolidate the titles and contents of its WGC panels during the third meeting of the group in Malaysia (September 2013). Selection of the best contributions will take place during the 5th meeting of the group, in September 2014.**

Table 4. Deadlines for contributions to WGC 2015.

Year	Date	Milestone/Venue	Event
2014	1st February	Call for papers	Issuing call for papers
	July	Call for papers	reminder
	1st September	Call for papers	Abstract submission
	1st November	Call for papers	Final selection by Committees
	15 November	Call for papers	Author notification
2015	1st February	Call for papers	Full paper submission
	1-5 June	Paris	26th World Gas Conference

Mr. Yves Tournié, Secretary of the Coordination Committee, urged all committee secretaries to update their IGU websites. A large number of members do not have a budget to travel abroad, relying on the IGU website to follow the progress of the committees as a consequence.

He introduced the attendees to the French WGC website, which is available at www.wgc2015.com. Real time information about the gas industry and the French triennium can be found there, and also a link to the collaborative platform that was recently developed by the French presidency at <http://ccmembers.wgc2015.org> (or <https://wgc-2015.users.dimelo.com>).

This is a space where committee members can share ideas, comments and documents, “tweeting” to each other as in a social network. It contains samples of the work in progress, information about future meetings and other useful information. Presentations and reports of up to 20 MB can be uploaded and downloaded from there.

4. Shale gas

In October 2011, in a joint session with the IEA in Paris, it was decided that the IGU should take a position on shale gas.

This effort was led by the current Vice-Chairman of the Coordination Committee, Mr. Mel Ydreos, and the results achieved were published during the last WGC (Figure 2).



Figure 2. Apparently criticised by the Sierra Club, this document was largely accepted.

In his presentation in Sapporo, Mr. Ydreos criticised the polarised visions prevailing among industry officials and environmentalists. He detected a need to reshape the conversation, calling the attention of the audience to the fact that the focus of the discussion is now moving from the subsurface to above the ground issues such as water usage, methane leakage from natural gas infrastructure and truck traffic.

Media coverage of shale gas issues has intensified, and a number of jurisdictions have imposed restrictions, such as Quebec, Newfoundland, France and South Africa, but some **quality research is now emerging that could produce a strong positive impact, and a similar effect could come from the establishment of best practices by the industry, where WOC 1 could have a key role.** As an example, drilling time has been reduced to half of what it used to be just a few years ago, reuse of water is significantly up, and micro seismic technologies have evolved significantly.

A recent survey conducted the Canadian Gas Association located unconventional gas below nuclear energy in popularity, while conventional gas was considered to be one of the best options, a paradoxal result to a certain extent (Figure 3).

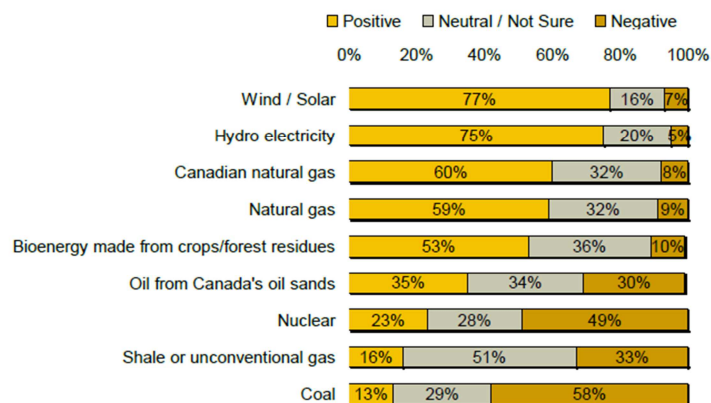


Figure 3. Research conducted by the Canadian Gas Association (Ydreos, 2012).

Rig activity recently moved to wet plays because of the large differences between gas and liquid prices, but now even the latter are suppressed, and rigs are moving again to unconventional oil plays. The industry would need about US\$ 4-5 per MBtu, so a tendency of decline would be expected at the current price levels.

The World Bank is currently performing a full life cycle analysis of the Polish shale gas. Apparently, the additional emissions are entirely offset by the proximity of the production from the market.

5. Gas advocacy

Mr. Georges Liens represented the Chairwoman of TF 2, Ms. Michele Pizzolato. This task force is supposed to advocate in favor of natural gas as a clean, affordable, reliable, efficient and secure fuel.

Clear messages are much needed here, as the development of incentives for partnership with renewables is not a straight forward activity, and significant investments would be needed to promote either international carbon trading or CCS.

6. Gas transmission

Mr. Peter Toth, Study Group Leader in WOC 3, presented the activities of this most important IGU Committee, and explored the transversalities of his group with PGC A. Points of interest include CCS, life cycle assessment and unconventional gas, where **a small interface with WOC 1 could exist (impact of new gas sources in the transmission systems around the world)**.

7. PGC A and the IGU strategic vision

The Chairman of PGC A, Mr. Satoshi Yoshida, described the relationship between the themes developed by his committee and the pillars of the current IGU strategic vision, i.e., sustainable development, combination with renewables and electricity, availability of gas and human resources.

8. WOC 1 and the IGU strategic vision

Mr. Denis Dinelli, Chairman of WOC 1, emphasised the role of WOC 1 in the red pillar of the French strategic vision (natural gas available everywhere). WOC 1 is expected to produce a significant contribution in the green pillar as well (natural gas for a sustainable development), as one of its study groups is supposed to propose best practices for flare reduction.

9. WOC 1 sessions

The Chairman of WOC 1, Mr. Denis Dinelli, introduced the two study groups originally proposed for the current triennium, and also a new proposal formulated by the Secretary of WOC 1, Dr. Marcos Sugaya, for a third group on gas rent and mineral property rights.

WOC 1 currently has 57 members, of which 15 from Eastern Europe, 10 from Southeast Asia, 10 from Africa, 7 from the Middle East, 6 from Western Europe, 6 from South America and 3 from South Asia.

Meetings are scheduled as indicated in Table 5, with an average anticipation of six weeks relatively to the corresponding Executive/Coordination Committee. The second meeting of the group is already confirmed, but the exact venue for the third is still under discussion. It is however certain that it will take place somewhere in Malaysia from the 3rd to the 6th of September 2013.

Table 5. WOC 1 meetings in the 2012-2015 triennium.

	WOC 1 Meeting	Executive Committee Meeting
2012	25-28 September, Sapporo	16-19 October, Ottawa
2013	18-21 February, Rio de Janeiro	9-11 April, Seville
	3-6 September, Melaka	22-25 October, Beijing
2014	4-7 February, tbd	25-27 March, Brisbane
	16-19 September, tbd	14-17 October, Berlin
2015	3-6 February, tbd	24-26 March, Cairo
	30 May, Paris	1-5 June, Paris (WGC)

Deliverables expected include progress reports to the Coordination Committee and IGU Magazine (prepared by the Secretariat of WOC 1 every six months), a triennial report (first complete draft should be ready by September 2014), articles to the IGU Magazine (two per study group during the current triennium), support to the activities of TF 1 (Human Resources), TF 2 (Gas Advocacy), PGC A (Sustainability) and PGC F (Research and Development).

At the WGC 2015, WOC 1 is supposed to organize two or three committee sessions (oral panels with presentations performed mostly by the members of the study groups), one or two expert fora (presentations selected mostly from the call for papers) and one strategic panel, probably about unconventional gas (presentations performed mostly by invited speakers), totaling five oral panels.

In addition to the usual WOC 1 pages in the IGU website, the Secretariat of WOC 1 prepared a “file exchange tool” at <https://quickri.petrobras.com.br/igu>, which members can use to exchange large files between each other. This will be particularly useful for writing up the triennial report, and to exchange large report files and presentations.

Members of WOC 1 can also enjoy the use of a special Google account at <http://www.google.com>, where they will be able to exchange photographs and other materials as well.

A Gantt diagram of the main activities to be performed by WOC 1 in the current IGU triennium is presented in Table 6.

SG 1.1 Technological advances in the exploration and production of natural gas

Led by Mr. Adif Zulkifli, this study group will investigate the most recent advances in the exploration and production of natural gas.

As a first step, a revision of the technologies and standards that have become mandatory in the development of upstream projects will be performed, aiming at the consolidation of best practices for both conventional and unconventional gas.

Building on the list started in the previous triennium, new technologies that have recently emerged via R&D will be highlighted and presented according to the conventional life cycle of E&P projects, i.e., exploration, appraisal, development and production.

Topics of interest include direct hydrocarbon indicators (DHI), amplitude versus offset analysis (AVO), controlled source electromagnetic surveying (CSEM), multi-azimuth seismic, reservoir characterization through the application of amplitude versus angle and azimuth analysis on seismic data (AVAZ), microseismic monitoring, digital rock physics, customized drilling technologies, multi-stage fracturing, processing of gas with high CO₂ content, removal of H₂S, shallow gas development, enhancement of brownfield productivity, water shut-offs, subsea systems and real field applications.

A significant contribution in the formulation of best practices for hydraulic fracturing and production of unconventional gas is expected from this group, which will also handle the transversalities that WOC 1 has with PGC F (Research and Development) and TF 1 (Human Resources).

Mr. Nazri Malek represented WOC 1 in the first meeting of TF 1 in Doha, 19-20 September 2012, and performed a presentation describing the contents of this meeting.

Basically, three important themes have been identified the group, i.e., (1) perception of the industry to the public, (2) attraction of youth into science, technology, engineering and mathematics (STEM) and (3) attraction and retention of women in the oil and gas workforce.

WOC 1 has proposed the use of upstream technology as an instrument to attract young people to the industry, in connection with the second theme above.

SG 1.2 Assessment of global reserves and resources

This study group will perform an assessment of conventional and unconventional gas reserves and resources, and will identify new opportunities and threats to be faced by the upstream segment of the gas industry.

In the middle of the so called unconventional gas revolution, one of the most important challenges to be faced by the industry is the development of reliable estimates for both conventional and unconventional reserves and resources.

While performing this task, this group will identify the most important projects under development and their potential impact in the availability of natural gas from both regional and global standpoints.

Exploratory hotspots and new frontiers will be highlighted, and the most important trends, opportunities, uncertainties and threats to be faced by the upstream segment of the gas industry will be listed and dealt with.

This group will also examine a number of initiatives for the reduction of associated gas flares as a means to enhance the supply of natural gas.

Deliverables include the assessment of reserves and resources of conventional gas, shale gas, tight gas, coal bed methane and natural gas hydrates.

Initiatives and best practices for gas flaring reduction will also be compiled, together with an analysis of new exploratory and discovery trends and new frontiers and exploratory areas for natural gas.

The interface of WOC 1 with PGC A will be administered by this study group.

SG 1.3 Gas rent and mineral property rights

Dr. Marcos Sugaya, Secretary of WOC 1, proposed this new study group to compare the upstream business models adopted by some countries to maximize their gas rent. In the sequence, the best policies and practices would be highlighted, aiming at the development of a win-win situation between governments and investors.

Other topics of interest include the critical analysis of fiscal instruments, the identification of regulatory tendencies and the development of upstream policies for gas rent.

A case study was presented comparing the fiscal regimes adopted in Norway and the UK. Government take and the general attractiveness for new upstream businesses were estimated, and few possible theses were drawn that could be developed during the current IGU triennium.

The group approved the idea, which will be forwarded to the Coordination Committee and IUG Secretariat aiming at the attraction of additional members to the group.

For the next meeting analyses for Brazil, Algeria, Mozambique, Angola and Tanzania are expected to be disclosed.

The interface of WOC 1 with TF 2 (gas advocacy) will be administered by this study group. Dr. Sugaya will attend the first meeting of TF 2 in Milan, 11-12 October 2012, as a representative of WOC 1.

influence in the formation of electricity prices. This is supposed to continue as it seems that coal is supposed to be displaced by new nuclear facilities and wind energy (Figure 4).

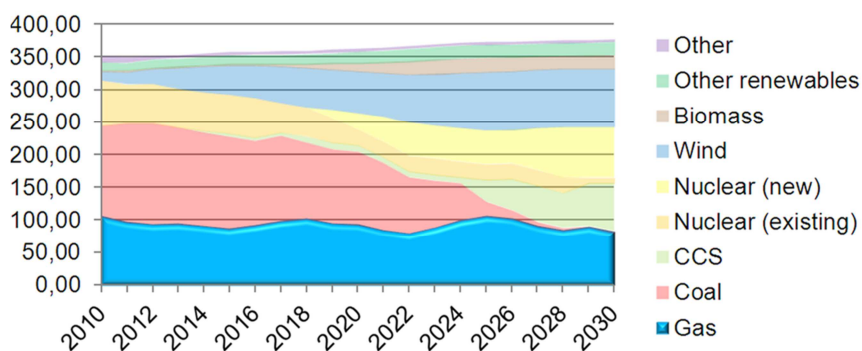


Figure 4. TWh by modal to achieve 100g CO₂/KWh in 2030 (Oppenheim, 2012).

Imports are expected to increase as the indigenous production in the Continental Shelf declines, but international supplies are abundant and gas transportation is considered to be reliable as well.

He called the attention of the audience to the fact that climate change is more of an economic issue than an environmental one, as the potential economic damage caused by inertia is far higher than the cost of action.

11. Ishikari LNG terminal

In the last day of the meeting the delegates of WOC 1 and PGC A had the opportunity to visit this brand new LNG terminal, where they received first hand information from Hokkaido Gas officials and technicians (Figure 5).



Figure 5 Location of the Ishikari LNG terminal in Hokkaido (Yoshida, 2012).

This terminal was developed because the local production in the Yufutsu field has declined. It has only one storage tank, but it is the largest aboveground in the country, with a capacity of 180.000 m³.

The facilities will be commissioned in October, and about 10% of the production will be transported by trucks to large consumers. Coastal shipping is also relevant to the business, but most of the production will be piped to Sapporo after regasification.

12. Second joint meeting of PGC A and WOC 1 in Rio de Janeiro

Dr. Marcos Sugaya, Secretary of WOC 1, presented the agenda for the second meeting of the group, which will take place at the Windsor Atlantica Hotel in Copacabana, 18-21 February 2013.

Delegates will meet with the highest gas authorities in the country, and will have the opportunity to debate on the role of gas in the development of a sustainable energy future in a special workshop organised at the new R&D facilities of Petrobras (Figure 6).



Figure 6. Petrobras' R&D Centre Cenpes was recently revamped.

In addition to that, they will visit the Guanabara Bay LNG Terminal, which was recently nominated as one of the most interesting infrastructure projects by KPMG and the Journal of Infrastructure.