



WGCPARIS2015
WORLD GAS CONFERENCE



IGU
INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ


**WOC 2: « STORAGE
Kick off - Wrap up»**

**Bratislava, Slovakia
October 23-26, 2012**



Topics

1. **WOC2**
 - ↳ **Introduction**
 - ↳ **Meetings organizations**
 - ↳ **Collaboration**
 - ↳ **Transversal Pillars issues**
 - ↳ **Contribution to the IGU papers**
2. **Study groups TWP**
 - ↳ **SG 2.1 UGS Database**
 - ↳ **SG 2.2 Techniques and new opportunities**
 - ↳ **SG 2.3 Attracting students/young professionals to storage activities**



WGCPARIS2015
WORLD GAS CONFERENCE

WOC2 Introduction



- Chairman: **Ladislav Goryl**  **(Slovakia)**
- Vice-Chairman: **Nikita Barsuk**  **(Russia)**
- Secretary: **Mária Poláková**  **(Slovakia)**

SG 2.1

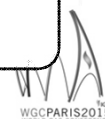
- «UGS Database»
- SG leader: Ladislav Goryl

SG 2.2

- «Techniques and new opportunities»
- SG leader: Fabien Favret

SG 2.3

- «Attracting students/young professionals to storage activities»
- SG leader: Nikita Barsuk



Meetings organizations



Date and location of the 6 meetings

Meeting	Date	Venue	WOC 2 Workshop's topic
Kick off	24 - 26 October 2012	Bratislava, Slovakia	Introduction & Latest development in your companies
2nd	On May 2013	St Petersburg, Russia TBC	Energy efficient operation gas storage leading to reduce environmental impact
3rd	09 - 11 October 2013		
4th	Spring 2014		
5th	17 - 19 September 2014		
6th	Spring 2015		

- Note: Formal invitation for hosting WOC 2 meeting from Iran, informal from Austria and France



Transversal Pillars issues



- ❖ **Yellow Pillar (renewables and electricity combination)**
 - ❖ **SG 2.2 Techniques and new opportunities - Energy Storage**
- ❖ **Purple Pillar (Human Resources)**
 - ❖ **SG 2.3 Attracting students to storage activities**
- ❖ **Green Pillar (Sustainable Development)**
 - ❖ **SG 2.2 Techniques and new opportunities - Energy efficient operation gas storage leading to reduce environmental impact**



Collaboration



- ❖ **IGU Transversalities with WOC/PGC/TFs**
- ❖ **Correspondent members:**

<ul style="list-style-type: none"> ❖ PGC A Sustainability ❖ PGC F RD&I ❖ TF 1 Human Capital ❖ TF 2 Gas Advocacy 	<ul style="list-style-type: none"> Stanislav Bilik Kangwon Lee Helene Giouse Siegfried Kiss (TBC)
---	---



Assumed IGU magazine papers



- Autumn 2013 *Energy efficient operation gas storage leading to reduce environmental*
- Autumn 2014 *Energy Storage*



SG 2.1: « UGS database » Wrap up

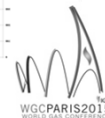
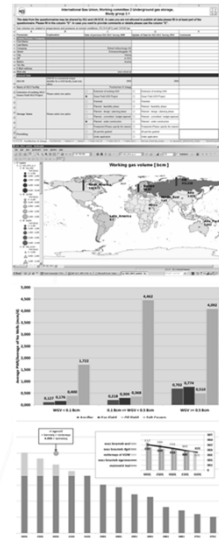


Bratislava, Slovakia
October 23-26, 2012

SG 2.1: « UGS database »



- ❖ **Leader: TBD**
- ❖ **Goal:**
 - ❖ Update of storage database and trends
 - ❖ New developments (Asia, Middle East)
 - ❖ Highlighting roles of storage (balancing, SoS, trading liquidity)
 - ❖ Positioning storage's role
- ❖ **Deliverables:**
 - ❖ Database
 - ❖ Report
 - ❖ Geo-referenced visualization
 - ❖ Cooperation with
 - ❖ WOC 3 Transmission
 - ❖ PGC A sustainability
 - ❖ PGC B Strategy
 - ❖ PGC D LNG, etc.



SG 2.1: « UGS database »

- ❖ **Discussed**
 - ❖ **Data structure**
 - ❖ existing, abandoned, projects,
 - ❖ Level of details vs probability of data collection
 - ❖ **Data collection**
 - ❖ **cooperation with others (to avoid duplicity)**
 - ❖ Outside IGU => GSE, UN ECE, AGA, etc.
 - ❖ Inside IGU =>
 - ❖ WOC1(CO2...)
 - ❖ WOC 3 (pipelines visualisation)
 - ❖ PGC D (LNG regas terminals visualisation)
 - ❖ PGC B (qualitative & quantitative study)
 - ❖ **Online version of the database**



SG 2.1: « UGS database »

Tasks

- T1: **Send existing questionnaire with level of response for each storage parameter to SG2.1 members to analyse scope of data**

Responsible (R): Lorenc Deadline (D): 11/2012

- T2: **Analysis impact of LNG and Transmission pipelines to UGS**

R: all SG2.1 members D: spring 2013 WOC2 meeting

- T3: **Ask feedback of SG2.1/WOC2 members for using UGS database**

R: Lorenc D:12/2012

- T4: **Elaboration principles for online database**

R:Goryl & Lorenc D:01/2013



SG 2.1: « UGS database »

Moving Milestones

Spring 2013

- To be agreed data structure, on line vs off line database, accessing database (public, IGU members, data contributors, ...)
- Way of data collection
- Position on transmission and LNG interactions

Autumn 2013

- Start data collection
- Decision on CO2 CCS projects database & visual
- Scope of studies & analysis

Spring 2014

- Main Data collection closure
- Samples of studies & analysis

Autumn 2014

- Draft version database & visualisation, analysis, report

Spring 2015

- Final version database & visualisation, analysis, report,





WGCPARIS2015
WORLD GAS CONFERENCE


**SG 2.2: « Techniques and new opportunities »
Wrap up**



IGU
INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ

**Bratislava, Slovakia
October 23-26, 2012**

SG 2.2: « Techniques and new opportunities »




Leader: Fabien Favret

Goal: promote and share techniques „best practices“ within storage community

- ❖ **1. Regulatory framework for UGS (around the world)
(Leader: Fabien Favret & ???)**
- ❖ **2. Energy efficient operation gas storage leading to reduce environmental impact
(Leader: James Bradley)**
- ❖ **3. New opportunities**
- ❖ **Energy storage (Leader: Jacques Grappe)**

❖ **Coordinator with PGC A Sustainability (Stanislav Bilik)**



WGCPARIS2015
WORLD GAS CONFERENCE

SG 2.2: « Techniques and new opportunities - Best Practices »



1. Regulatory framework for UGS (around the world)

- Goal:
 - Information/comparison of the regulatory framework for UGS development and operation in various countries
 - Impact of regulation on projects
- Way:
 - Agree the level of detail required – to balance presentations from various countries
 - Leader: Fabien Favret & ???
 - Timing of the workshop: Spring 2014



SG 2.2: « Techniques and new opportunities - Best Practices »



2. Energy efficient operation gas storage leading to reduce environmental impact

- Goal:
 - Reduction of the environmental footprint within the UGS operation in synergy with increased efficiency of operations
- Way:
 - Follow the injection/withdrawal/standby cycle and identify the points of energy consumption/environmental impact.
 - Adjust the scope of presentations for SG members
 - Propose efficiency increase measures – mix of technologies, new technologies
- Leader: James Bradley
- Timing of the workshop: March 2013



SG 2.2: « Techniques and new opportunities - Energy storage »



3. Energy storage

Goal:

- ✦ Identification of the synergy between UGS and energy storage – new opportunities for the UGS
- ✦ Recommendations/added value for the energy storage from the point of view of the UGS operators
- ✦ Raise our voice for promoting UGS existing solution for energy storage: vision – contribution of the UGS to green energy deployment

Way:

- ✦ Energy storage techniques, energy storage demand, adjustment, identification of technological gaps and constraints in the chain/system
- ✦ Synergy between UGS and energy storage
- ✦ Implementation of the energy storage (also from legislative, regulation point of view)

✦ Leader: Jacques Grappe

✦ Timing of the workshop: Autumn 2013

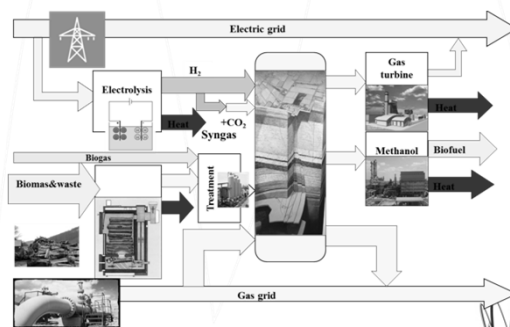



SG 2.2: « Techniques and new opportunities - Energy storage »



Energy storage

- ✦ Study/comprehensive overview of energy storage (hydrogen, mixture of hydrogen and gas, biomethane, syngas, CAES, etc.)
- ✦ Balancing of electrical grid with storage and gas plants interactions
- ✦ Cooperation with PGC F RD&I






WGCPARIS2015
WORLD GAS CONFERENCE


**SG 2.3: « Attracting students to storage activities »
Wrap up**

**1st WOC 2 meeting
Bratislava, Slovakia
October 2012, 23 -26**



IGU
INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ

SG 2.3: « Attracting students to storage activities – Scope and purposes»




Leader: Nikita Barsuk

Target groups: *students ready for graduation (last years of education), women.*

We have to keep under consideration:

- New updated statistic information across IGU's members to understand the demographic of the industry and gender characteristics and what are the commonalities and specificities across regions and companies;*
- Understanding of which skills and resources and in which quantity are necessary to deliver the UGS business of today and develop the UGS sector of the future;*
- Availability of best educational practices and most efficient educational programs across countries and companies;*
- Strong points of gas industry: innovative character of gas industry, international character of gas industry (trans world and trans continental features), gas industry environmentally focused (supports of renewables), UGS in energy supply process (energy storage, market opportunities).*



WGCPARIS2015
WORLD GAS CONFERENCE

SG 2.3: « Attracting students to storage activities»



We have to keep under consideration:

Weak points of gas industry:

- Gas industry is exploiting natural resources; it is linked to oil industry and this is not making the gas industry attractive to talent; the gas industry has suffered from lack of publicity and promotion; ageing issues.



SG 2.3: « Attracting students to storage activities»



Our approaches should be:

- Multi-cultural;
- Attracting young people from within technically universities;
- Targeting a recruitment strategy toward the female talent pool;
- Promote the image of gas rather than individual companies;
- Creation of innovative and environmental friendly image of gas industry.



SG 2.3: « Attracting students to storage activities»



The following tasks were agreed as a key elements of further program of SG 2.3:

- ✦ *Gathering of statistic information across IGU's members to understand the demographic of the industry and gender characteristics, which skills and resources and in which quantity are necessary to deliver the UGS business of today and develop the UGS sector of the future;*
 - ✦ *Development of appropriate questionnaire*
 - ✦ *Analysis of gathered information*
 - ✦ *Updating of final report and proposals*



SG 2.3: « Attracting students to storage activities»

- ✦ *Program of competition among student's theses about UGS;*
- ✦ *Development of appropriate questionnaire for students and sponsoring companies*
- ✦ *Meeting of students to present their thesis*
- ✦ *Evaluation of students reports about UGS*
- ✦ *Opportunity to visit UGS on-site*
- ✦ *Selection of the best attendees to be recommended to participate at the WGC in Paris.*
- ✦ **Feasibility to be confirmed:**
 - ✦ *Availability of support from universities and companies*
 - ✦ *Financing of event and award has to be defined*
 - ✦ *Decision regarding student exchange programme could be approved after this competition program (optional).*



SG 2.3: « Attracting students to storage activities »



The following tasks were agreed as a key elements of further program of SG 2.3:

- ✦ *To develop proposals for creation of promotion tools (move, cartoon). To improve image of gas industry and UGS sector particularly.*

Development of proposals for creation of PC based educational tools in the field of UGS:

- ✦ *trainer-simulators in the field of UGS operation with the application of multimedia facilities and virtual reality technology intended for training, fixing and checking practical skills and abilities.*
- ✦ *Development of **automated training systems** that constitute a software package ensuring the possibility of mastering the theoretical learning material on one's own.*
- ✦ *Development of **professional games** with the application of computer technologies, that allow to train practical skills in taking managerial decisions on economic and personnel management issues.*



SG 2.3: « Attracting students to storage activities »



SCIENTIFIC-RESEARCH TRAINING SIMULATOR CENTER OF GAZPROM

The collage displays six different training simulator interfaces:

- Derrick erection while drilling rig assembling. Automated training system**: Shows a 3D model of a drilling rig derrick being assembled.
- Well completion. Trainer simulator**: Shows a 3D model of a well completion process.
- Reservoir gas recovery increasing. Trainer simulator**: Shows a 3D model of a reservoir with gas recovery equipment.
- Offshore oil-gas production infrastructure. Automated training system**: Shows a 3D model of an offshore oil and gas production platform.
- Adsorption gas treatment at UGS. Interactive training system**: Shows a 3D model of a gas treatment facility.
- Offshore oil-gas production infrastructure. Automated training system**: Shows a 3D model of an offshore oil and gas production platform.

Links 2012-2015

Looking forward to your active participation 😊

- ✦ [*ladislav.goryl@nafta.sk*](mailto:ladislav.goryl@nafta.sk)
- ✦ [*N.Barsuk@adm.gazprom.ru*](mailto:N.Barsuk@adm.gazprom.ru)
- ✦ [*maria.polakova@nafta.sk*](mailto:maria.polakova@nafta.sk)

www.igu.org:

Login : Gas4ever

Password : 2015FR

<http://ccmembers.wgc2015.org/>

mgarcia@wgc2015.org

