

**DONG**  
energy

**ENERGINET/DK**

**5<sup>th</sup> WOC 2 meeting**

**Copenhagen, Denmark**

**15<sup>th</sup> -17<sup>th</sup> of September 2014**



# Topics

- 1. Main meeting's goals**
- 2. Study group progress**
  - **SG2.1**
  - **SG2.2**
  - **SG2.3**
- 3. WGC 2015/WOC 2 sessions**
  - **Topics**
  - **Deadlines**
- 4. Next meetings schedule**

# Agenda

- ❖ **Monday, 15<sup>th</sup> September 2014, Copenhagen Island Hotel, Meeting room Modelokale 1+2**
- ❖
- ❖ **13:30–14:00** Registration
- ❖ **14:00–14:30** Opening
- ❖ Opening/Ladislav Goryl
- ❖ Opening/ DONG Energy
- ❖ Opening/ENERGINET/DK
- ❖
- ❖ **14:30–15:00** Message from CC 2012–2015 /G. Liens, Y. Tournié)/CC IGU
- ❖
- ❖ **15:00–15:30** Coffee break
- ❖
- ❖ **15:30–17:00** WOC 2 Sub-group meetings (SG 2.1, SG 2.2, SG 2.3)
- ❖
- ❖ **17:00–18:00** WOC 2 Sub-group meetings (SG 2.1, SG 2.2, SG 2.3)
- ❖
- ❖ **18:30–20:30** Dinner at the hotel restaurant “The Harbour”
- ❖

# Main WOC2 meeting's goals

## 1. To verify:

- ✧ ***SG's status & progress***
- ✧ ***Program of competition among student's and young specialist's evaluation***

## 2. To agree upon:

### ***a) WOC2 deliverables & WGC 2015:***

- ✧ ***WOC2 report & database (report structure)***
- ✧ ***WOC2 Session (papers selection & reviewing process)***
- ✧ ***UGS brochure (popular and attractive explanation of UGS)***

### ***b) Others:***

- ✧ ***WOC2 spring 2015 venue***

## SG 2.1 progress «UGS Database»

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### ***What was done on UGS on line web application of the database***

- ✧ *Created*
- ✧ *Uploaded on ugs.igu.org*
- ✧ *Extended by new features (export, map, Arc Reader, analysis)*

### ***What we are doing now***

- ✧ *Updating the storage information*
- ✧ *Updating scope of data analysis*

### ***What is the main target***

- ✧ *To complete data collection (USA)*
- ✧ *To agree scope of analysis*
- ✧ *To agree proposal of visualisation*

# SG 2.1 progress «UGS Database»

Data View > Show 10 entries

Data Update > List of UGS > Add new UGS

	Name	Nation	Type	Status	Actuality of data (year)	Working Gas Volume (mill. m3(Vn))
2165	banzhongnan	China	Oil Field	In Operation	2010	470.0
2166	banzhongbei	China	Gas Field	In Operation	2010	755.0
2167	dazhangtuo	China	Gas Field	In Operation	2010	600.0
2168	bannan	China	Gas Field	In Operation	2010	501.0
2169	ban876	China	Gas Field	In Operation	2010	217.0
2170	ban828	China	Gas Field	In Operation	2010	257.0
2171	ban	China	Gas Field	In Operation	2010	417.0
2174	Brugherio	Italy	Gas Field	In Operation	2010	694.0
2175	Cellino	Italy	Gas Field	In Operation	2010	180.0

Showing 1 to 10 of 708 entries

# SG 2.2 progress: « Techniques and new opportunities »

## ***Status of papers to IGU magazine***

- ✦ *Energy efficient operation (gas storage leading to reduced environmental footprint)* delivered to Spring/2014
- ✦ *Energy storage* delivered to Autumn/2014

## ***Definition of best practices***

- ✦ *to be elaborated/presented in a WOC2 report and WGC*
- ✦ *Source:*
  - ✦ *IGU magazine articles,*
  - ✦ *workshop's presentations,*
  - ✦ *work of SG2.2 during 2012-2015 triennium*



# SG 2.2 «IGU magazine issue»



April – September 2014

## Improving UGS Operations

By Dr Fabien Pasquet

The need for underground gas storage (UGS) facilities has in recent years been changing. Market demands for gas while raising safety standards and reducing environmental impacts. IGU's Working Committee 2 (WOC 2) is studying the latest developments as part of its remit and this article focuses on recent findings. The first part looks at subsurface integrity management and the second at the reduction of the environmental footprint of UGS operations and the enhancement of their energy efficiency. I would like to thank all the members of WOC 2 and other contributors for their input.

**Subsurface integrity management**  
Integrity management involves taking a risk-based rather than a uniform approach to safety and was pioneered by pipeline operators. Asset integrity is the ability of an asset to perform its required function effectively and efficiently while safeguarding life and the environment. It involves that the people, systems, processes and

resources which deliver integrity are in place, in use and fit for purpose over the whole life-cycle of the asset. As regards the subsurface integrity of UGS, there have been some interesting developments.

### Well integrity management

Wells are key assets for storage operators and their integrity has to be controlled not only during their ageing phase but starting from their drilling or building phase (some UGS wells have been in operation for more than 50 years!).

Well integrity management (WIM) involves a six-stage process:

- An initial collection and review of all the data sets available, such as geological, drilling and completion data, to create an "identity card" or database entry for each well;
- Regular monitoring should be carried out during normal operation or maintenance. The parameters (such as tubingwellhead pressure, annulus pressure, production) to be measured (every day, or every week or every year, according to the expected evolution of the parameters) depend on many factors: operator's needs, national regulations and availability of those data;
- There, every change or abnormal evolution of the parameters should be analysed. These factors could be more or less negative in their consequences according to the specific environment (on surface and/or subsurface) of the well. The assessment of the criticality of the risk has to be adapted according to



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## Drawing on UGS Experience to Store Renewable Energy

By Jacques Grappe

Governments around the world are setting ambitious targets for the share of renewables in the energy mix but today's main renewable energy sources – wind and solar – are intermittent and their electricity production is difficult to predict. Gas-fired power generation is already providing reliable back-up when the wind isn't blowing or the sun isn't shining; now the gas storage sector is looking at ways to help when favourable weather conditions mean surplus electricity is generated.

With current technology there is no way to store large quantities of electricity so it has to be converted into another energy vector for storage. The gas industry has nearly a century of experience of underground gas storage (UGS) in porous reservoirs, salt and rock

caverns, which contributes to security of supply by allowing supply and demand to be balanced over a wide range of timescales. UGS facilities store large volumes of natural gas at reasonable cost, with very strong safety and reliability records, high flexibility, a low environmental footprint and emissions, minimal land occupation and good public acceptance. Working Committee 2 is looking at the extent to which UGS techniques can be used to store surplus energy generated from irregular renewable sources.

Most studies of future storage needs linked to renewable energy agree that capacity of an order of magnitude of at least tens if not hundreds of terawatt hours (TWh) is needed. To put this into perspective, the global UGS

► The gas industry has nearly a century of UGS experience – surface equipment at the Epe salt cavern facility in Germany.



October 2014 – March 2015

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Many thanks to Jacques and Fabien



## SG 2.2 « Transversal Pillars issues

### ***Meeting on PGC A in Helsinki***

**09/2014**

- *Presentation of online UGS database and conversion to CCS database*
- *Feedback from PGC A representatives*

### ***Implementation of changes from PGC A meeting, establish the parameters***

**10/2014**

### ***Launching of online database***

**01/2015**

# SG 2.3 progress: « Attracting students to storage activities»

## ***What was done***

### ***Analysis of UGS sector gender characteristics***

- ✦ Questionnaires submitted

### ***Program of competition***

- ✦ 8 full papers submitted

## ***What is the main target***

### ***Analysis of UGS sector gender characteristics***

- ✦ To process of information to the Final Report

### ***Program of competition***

- ✦ To evaluate papers
- ✦ To get a sponsors
- ✦ To arrange awarding process with WGC2015

# WGC 2015 sessions / WOC 2

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## **Submission deadline:**

**Abstract**

**11 September 2015**

**Reviewing process**

**9 November 2015**

**Full paper**

**13 March 2015**

**SG2.1 „What is ahead of us: General trends & perspectives“**

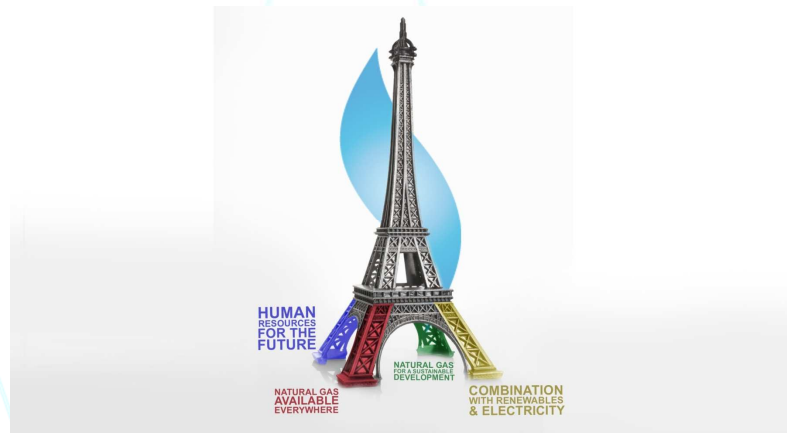
**SG2.2 „Innovations & new technologies: can UGS industry take/do more?“**

**SG2.3 „Increasing attractiveness of Gas industry: what shall be done?“**

# Next meeting schedule

Meeting	Date	Venue	WOC 2 Workshop's topic
Kick off	23-26 October, 2012	Bratislava, Slovakia	Introduction & Latest development in your companies
2nd	28-31 May, 2013	St Petersburg, Russia	Enhancing of performance and efficiency of storage facilities
3rd	1-4 October, 2013	Teheran, Iran	UGS Techniques & Opportunities
4th	19-21 March, 2014	Pau, France	Energy efficient operation gas storage leading to reduced environmental footprint
5th	15-17 September, 2014	Copenhagen, Denmark	<b>Energy Storage, IGRC</b>
6th	11-13 February, 2015 *preliminary or 16-20 March, 2015	Vienna, Austria or China	TBD

# *Thank you for your attention*



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

[www.igu.org](http://www.igu.org):

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