REPORT part of SG4.3 : draft summary

1 Introduction: Why a sub Group on SGG? - (1 page)

2 Definition of smart Gas grids - *Daniel HEC* **(1 page)**
Connexion with smart metering, with eletricity smart grids etc…

3 Main challenges (5 pages + 10 pages of technological blocks)
- accept new gases
- improve the performance of the DNO for safety, maintenance, operation
a) Remote monitoring : safety & continuity of supply - customer information - information management
- support other energy systems for a more efficient and less expensive energy,

According to the contributions brought by the different countries

4 Feed back – case studies – case for green and efficient networks (10 pages)
5 Summary matrix (2 pages)
5 Perspectives and keys for success (2 pages)

Working program of Madrid meeting

- Presentation of the information collected after Paris meeting
- Drafting the SG 4.3 report

The WOC 4 Committee Report: specimen structure

0 Abstract (1/2 page)

1 Introduction (1 page)

2 Committee members (2 – 3 pages)

3 Committee Meetings (list, 1 page)

4 Topics of the Committee Report (brief introduction od study group topics, max. 3 pages)

5 Report of Study Group 4.1 “Regulation on Third Party Access to Gas Distribution Networks – A Standard Approach” (1 page header)

5.1 Introduction (1 – 2 pages)
5.2 Background and Purpose (1 – 2 pages)
5.3 …5.x Report text (30 – 40 pages)
5.y Conclusion (1 – 2 pages)
5.z Literature (2 – 4 pages)

The WOC 4 Committee Report: specimen structure

6 Report of Study Group 4.2: "Diversification of Gas Quality and Non-conventional Sources in a Carbon-free Future "
6.1 Introduction (1 – 2 pages) …
6.z Literature (2 – 4 pages)

7 Report of Study Group 4.3: “Smart Grids in Gas Distribution"
7.1 Introduction
7.1.1 Background
7.1.2 Purpose
7.1.3 Definitions and Summary
7.3 Gas distribution systems
7.3.1 Inlets
7.3.2 Outlets
7.3.3 Metering and regulating station
7.3.4 Dispatching …
7.6 Best practices for smart grids
7.7 Conclusions
7.8 References

The WOC 4 Committee Report: specimen structure

8 Conclusion and Perspectives

8.1 Conclusion (1 – 2 pages, by Committee Chairman)

8.2 Outlook (1 page, by Committee Vice-Chairman/Incoming Chairman)

9 Gratitude (1/2 page, by Committee Chairman)

Natural Gas Facts & Figures

Presentation by *Emmanuelle Wicquart*, IGU-WGC 2015

Paris 2015 – La Conference!

- Presentation by *Georges Liens,* Chairman IGU-CC

Information on the fifth meeting

Information about the meeting in Austria by Christian Schicketmüller

IGU WOC 4 – Any Other Business

- Last meeting: Organization
- Next steps
  - 26th WGC: technical program
    - 3 Sessions, 1 Special panel „Smart Grids for sustainable energy systems“ (jointly with PGC F; Contact to J. Lewnard required), 1 Poster session
  - Paper & Poster selection
    - Abstracts after 15 September 2014
    - First viewing, separation into SG subjects: Chairman & Secretary
    - Preselection: SG-Leaders and members (5 – 6 presentations per SG, 2 – 3 Posters / Videos per SG)
    - Selection at Vienna meeting
  - Report preparation: Final draft by end January 2015, delivery before 13 March 2015

IGU WOC 4 – Any Other Business

Preparation 26 WGC

- Panel parties: Chair SG-Leader, support by WOC 4-chairman or secretary
- Special panel: high-ranking panelist required

Natural gas – Facts & Figures

- Questionnaire developed by SGs
- Dissemination and evaluation by whom?
- Accompanying letter required explaining why and what will happen with the data

IGU WOC 4 – Today's results of the study groups

- SG 4.1:
- SG 4.2:
- SG 4.3:

WOC 4 Study Group 1 (SG 4.1)

Regulation on Third Party Access to gas Distribution Networks – A Standard Approach

- ***Leader :*** *Jose Carlos Broisler Oliver, COMGÁS, Brazil*
- ***Vice Leader****: Gabriel de Sousa, GALP Energia, Portugal*

March 2014, Madrid

IGU WOC 4 – Reminder of Work Programme

Gas distribution companies in many countries are subject to a changing economical environment. After the unbundling of the large gas companies into transport service operators and gas sales companies, the distribution companies are targeted now by the regulation authorities. In addition to that, third party access is becoming an growing issue, with the number of suppliers increasing, and not only with natural gas to enter. Biomethane and hydrogen are ecological sound entries, but to manage a stable gas quality also for sensible clients does not become easier. One solution could be smart grids and their possibilities in dispatching and quick response. Which in turn needs operating staff just as smart, and up-to-date with the fast development of electronic aides.

WOC 4 Study Groups in the 2012 – 2015 Triennium

1. Regulation on Third Party Access to Gas Distribution Networks – A Standard Approach
2. Diversification of Gas Quality and Non-conventional Sources in a Carbon-free Future
3. Smart Grids in Gas Distribution

WOC 4 Study Group 1: Regulation on Third Party Access to Gas Distribution Networks – A Standard Approach

- Examination of the development of regulation over the last decade in different countries
  - Access of gases other than natural gas
  - Development of marketing/charging areas
  - Change of energy balancing and transfer options for costs
  - Unbundling of distribution companies
  - Training and qualification of personnel
  - …
- Preparation of an “IGU Network Code”

SG 4.1 work progress

- **Leader: Jose Carlos Broisler Oliver, COMGÁS, Brazil**
- **Vice Leader: Gabriel de Souza, Galp Energia, Portugal**
- **Study Group Members:**
  1. José Carlos B Oliver, COMGÁS, Brasil
  2. Gabriel de Souza, Galp Energia, Portugal
  3. Walter Piazza, GasBrasiliano, Brasil
  4. Rosemary Mcall, GL Group, UK
  5. Peter Demec, SPP Distribucia, Slovakia
  6. Seong-Kyeong Hong, Kogas, South Korea
  7. Makoto Hiranuma, Osakagas, Japan
  8. Benoit Chaintreuil, GrDF, France
  9. Wijuck Krisnakri, PTT, Thailand
  10. Anna Zhur, Gazprom, Russia
  11. Anna Dyuzheva, Gazprom, Russia
  12. Igor Tverskoy, Gazprom Promgaz, Russia
  13. Tatiana Kopina, Gazprom, Russia
  14. Nick Biederman, Gas Operations Alliance, US
  15. Manfred Pachernegg, Gasnetz Steiermark, Austria
  16. Thiranan Kraitongsook, PTT, Thailand
  17. Torpong Suphadul, PTT, Thailand

SG 4.1 work progress

- **Final Objectives & What We Need to Do:**
  - Present different experiences around the world regarding TPA legislations and regulation, stage of implementation and evolution,
    - Benefits
    - Problems
  - Identify trends of TPA around the world
  - Prepare a “World Map” of TPA
  - *Contribution to the IGU magazine, by the second semester 2014*

SG 4.1 work progress

- **Key Inputs until now:**
  - TPA is clearly associated with:
    - Privatization and liberalization
    - Vertical Integration x Unbundling
    - Open access
    - Intent to increase competition, secure supply and cost & price reduction
    - Requires a very rigorous & comprehensive regulatory framework
    - It takes time to be implemented
    - Not always the intended objectives are achieved
    - Huge variation amongst regions and countries
    - Different stages of implementation
    - Different sources of gas (competition on production) impacts TPA on transmission and distribution
    - There are cases of success and some of them are not so successful
      - Competition & Cost reduction & secure supply & transparency
      - North America vs EU
  - Examples for all above items
  - Future of TPA
    - Inevitable?
    - Requires modifications?

SG 4.1 work progress

- **Proposal for the SG Paper Structure:**
  - **Introduction:** terminology, definition, subject of the study, purpose of the report, overview about TPA models,
  - **"TPA World Map"** according to the following regions & countries (basically considering the relevance of each one in terms of volumes of gas consumption, strategic position and market maturity):
    - European Union (UE): France, Germany, UK, Italy, Netherland and others
    - Russia
    - North America: mainly US
    - South America
    - East Asia: Japan and South Korea
    - Asia Pacific: Australia, Indonesia, Malaysia, Thailand
    - South Asia: India, Pakistan
    - North Africa: Algeria, Morocco, Tunisia, Egypt
    - Middle East: Saudi Arabia, Oman, Qatar, Emirates
    - Iran, Turkey
  - **TPA on Distribution** (for each of the above regions included in the TPA World Map)
    - Model adopted – regulation and legislation
    - Objectives – explicit and implicit
    - What was done
    - Implementation timescale
    - Maturity level
    - Future tendencies
    - What was successful and unsuccessful x critical evaluation (quantitative and qualitative)
    - Political regime x networks infra structure x regulatory framework
  - **Description about the different models**
  - **Conclusions**

SG 4.1 work progress

Sequence of the contents within the SG Paper

- **Subject of Study**
  - Terms & definitions
  - Historical aspects
  - Aims & tasks of TPA
- **Country & Region**
  - Brief figures
    - Gas distributed volumes
    - Number of costumers
    - Scope of distribution network, lengths, pressure regimes, ages, etc.
    - Number of operators (distribution companies)
    - Etc.
  - Principles of gas price calculation
  - Unbundling characteristics for distribution
  - TPA regulation
  - Tendencies, Problems, transparency

SG 4.1 work progress

- **Progress of the SG 4.1 Paper (item 5 of the WOC 4 Committee Report):**
  - **5.1 Introduction** (1-2 pages): drafted, discussions during the 4th meeting
  - **5.2 Background and Purpose** (1-2 pages): drafted, discussions during the 4th meeting
  - **5.3 - 5.n Report Text** (30-40 pages):
    - lots of material already written, about 100 pages,
    - the “basic” can be considered done,
    - it needs refinement and some alignments between parts of the text to make it a complete body, that makes sense.
    - It will be necessary more time (2 months – a good guess!).
    - Agreed format to be presented by each country and or region
  - **5.m Conclusion** (1-2 pages): drafted, discussions during the 4th meeting, captured some additional insights for the conclusions
  - **5.o Literature** (2-4 pages): done

SG 4.1 work progress

What we did during these 2 days

- **WGC dates of the sessions for WOC 4 including the Special Panel**
- **Discussion of the "Call for Papers" presented – compromise of the members of the SG to submit papers**
- **Discussion of the content of the slides for the CC in Sydney**
- **Very rich and insightful presentations**
  - **Nick**
    - Canada
    - India
    - Indonesia
    - Pakistan
  - **Benoit**
    - France – real benefits of TPA
    - Turkey
- **SG paper draft discussions**

SG 4.1 work progress

Summary of the SG 4.1 "Call for Papers"

Title

- Third Party Access to Distribution Networks: could it bring benefits to the parties involved in the gas chain**?**

Objectives: Discuss the following issues

- TPA to Distribution Networks experiences around the world
- The application for distribution often does not occur as effectively as in transmission
- Regulation for distribution is many times a copy of the rules for transmission, not considering differences that could be applicable to distribution.
- TPA a wide variety of concepts and stages of development
- The level of implementation is directly related to the maturity of the gas industry . U.S. and the European Community presents the greatest experiences on TPA
- Increasing the supply of gas and reducing the costs to consumers are the pillars that usually justify the TPA, but not always these objectives are effectively achieved
- The session is addressing a discussion on TPA to distribution, the benefits that can be achieved, the problems and difficulties that may arise, the main regulatory frameworks, and technical issues that can be associated with its implementation.

Examples of Topics and Key Words

SG 4.1 work progress (slide for the CC)

- **Third Party Access on Distribution**
  - Identified key experiences around the world regarding TPA legislations and regulation, stage of implementation and its evolution, specially for
    - United States & Canada
    - European Union, detailed evaluation of France, Italy, Portugal, and UK
    - Russia
    - Asia
    - Latin America
  - Identified trends of TPA & unbundling around the world
  - A "World Map" of TPA & unbundling is being prepared
  - Benefits and Problems are identified and being discussed within the study group
  - Final Report is already drafted and it is under discussion within the group
    - Focus on the key regions (North America, EU, Russia)
    - Reference for the ones who want to know about TPA experiences
    - Goal: conclude it by June 2014
  - *Contribution to the IGU magazine, by the second semester 2014 (november) is being prepared*

SG 4.1 facts and data

- Number of distribution companies
- Number of customers
  - Residential
  - Commercial
  - Industrial
  - Power
  - CHP
  - Etc.
- Volume distributed
  - Residential
  - Commercial
  - Industrial
  - Power
  - Etc
- Length of the pipelines
  - Material
  - Pressure
  - Age
  - Range of diameters
- Satellite distribution networks
  - Number
  - Volumes distributed
  - % market attended
- Penetration rates
- Number of meters
  - Manual
  - AMR
- Number of suppliers
- TPA Yes or No
- Utilization
  - Water heating
  - Space heating
  - Cooking
- Expansion & Renewal
  - Km constructed / year
  - Number of customers connected / year
  - Km of replacement / year
  - % of replacement / year
- Number of employees
  - Direct
  - Contractors
- LUAG

WOC 4 Study Group 2 (SG 4.2)
The Team in Madrid

Many thanks to my team!!!

Chairman:
Peter Flosbach, Westnetz GmbH (RWE), Germany

Vice Chairman:
Rory Somers, Bord Gais Networks, Ireland

Study Group Members:

- Jose Maria Almacellas Gonzalez, Gas Natural Fenosa, SDG, S.A., Spain
- Maciej Chaczykowski, Warsaw University of Technology, Poland
- Flemming Jensen, DONG Energy, Denmark
- Tohru Takahashi, TOKYO Gas CO., LTD., Japan
- Uwe Klaas, DVGW, Germany
- Christian Schicketmüller, OÖ. Ferngas Netz GmbH, Austria
- Paul D. Wehnert, Heath Consultants, USA - Texas

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Study Group 4.2 Work progress

IGU INTERNATIONAL GAS UNION UNION INTERNATIONALE DU GAZ

Progress detail at 6th of march 2014:

- The integration of renewable production does heavily impact gas markets (reduction of CCGT, gas quality fluctuation, etc.)
- Gas quality tracking in gas transmission and distribution networks (example of polish system - Maciej Chaczykowski)
  - software tool development for nominations, tracking and billing
  - simulation of the impact of renewable gas injection is highly challenging
  - good opportunity as tool to manage future shale gas, LNG and hydrogen and bio-methane injection into the NG grid, but needs to be further developed as industry standard in future
  - could be a “game changer” on billing standards
- PROPOSAL FOR CALL FOR PAPERS SG 4.2 “Evolution into a Carbon-free gas future” concluded
- Analysis of the initial status of the diversification of Gas Quality in selected countries incl. determination of acceptable concentrations of renewable gases for the injection in distribution grids
- Decision on structure, responsibilities and timeline for the preparation of the “Report of Study Group 4.2” for the WGC

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The Study Group 4.2 Report for the WGC :
"Diversification of Gas Quality and Non-conventional Sources into a Carbon-free Future "

0 Abstract (1/2 page)
1 Introduction (1 page)
2 Committee members (2 – 3 pages)
3 Committee Meetings (list, 1 page)
4 Topics of the Committee Report (brief introduction od study group topics, max. 3 pages)
5 Report of Study Group 4.2 (1 page header)
5.1 Introduction (1 – 2 pages)
5.2 Background and Purpose (1 – 2 pages)
(1) Christian: Bio-methane to grid in Austria (4)
(2) Uwe: Bio-methane to grid in Germany (4)
(3) Peter: Biomethane incl. compressing & deodorization; survey on hydrogen tolerance in gas infrastructures in Germany, experiences in Germany in "power to gas" und further R&D projects (4)
(4) Tohru: Experience on bio-methane introduction in Japan (2)
(5) Jose Maria: Long term LNG experiences in Spain on gas composition (3-4)
(6) French case Change between pipeline based and LNG-based supplies
(7) Vladimir: LNG plans and future solutions in Russia (3)
(8) Paul: Effects of shale gas on distribution markets in the US and management of liquids (4)
(9) Flemming: Variation of gas qualities in Denmark (5)
(10) Rory: ISO/ CEN standards framework on gas quality (2)
(11) Maciej: Gas quality tracking (3)
6 Conclusion & Perspectives (1 – 2 pages)
7 Literature (2 – 4 pages)

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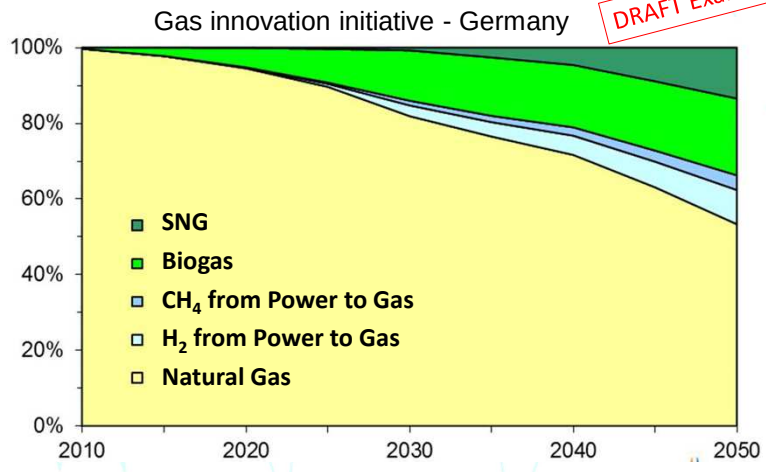
Renewable gases will strongly contribute to reduce the CO_2 emissions in Germany

DRAFT Example



Source: gas innovation initiative of the DVGW

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Scenario assessment & evaluation as a global approach - Country:

Country: Total market volume …….. BCM

	Today	2020	2025	2040
NG	99.5 %	98 %	95 %	90 %
Biogas/ Bio-Methane	0.5 %	2 %	3 %	5 %
Hydrogen	-	-	1 %	2 %
SNG	-	-	1 %	3 %

DRAFT Example to be filled

Estimation of the introduction of renewable gases
ToDo for all members of WOC 4 to do an evaluation for his/ her home country!

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WOC 4 Study Group 3 (SG 4.3)

Smart Grids in Gas Distribution

March 2013, Madrid

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WOC 4 Study Group 3 (SG 4.3)
The Team

- ***Leader :*** *Pascal VERCAMER (Fra)*
- ***Vice chair****: Steven VALLENDER (UK)*
- ***Members:*** *Akiharu ASADA (Jap); Libor CAGALA (CZE); Ahmedzine HASSANINE (Alg); Mohammed HAKKOUM (Alg); Roch DROZDOWSKI (Fra); Birgitte HERSKIND (DK); Ben LAMBREGTS (NL); Kees PULLES (NL); Ryoichi TORIUMI (Jap); Peter VERBEEK (NL); Kim VRANCKEN (Bel), Catherine THAUVIN (Fra) Shoiab WARSI (Pak), Daniel HEC (Bel) …*

Objectives of SG4.3 report

- Help DNO managers to build a road map for the network of the future
- Give arguments to face and convince public authorities about the design of future gas networks
- Show that gas can be as smart as electricity and can be in sinergy with the other energies
- Smart is not the target- the target is to identify the best ways for the network of the future using new technologies
- Highlight some cases where smart gas grids are useful and efficient

Apply Sao Paulo's motto: *Non ducor, duco*
(I am not behind a leader, I am the leader)

Work done in mAdrid

- Presentation of the information collected after Paris meeting
- Preparation of the round table with PGCF
- Drafting the SG 4.3 report

Draft report summary

1 Introduction: Why a sub Group on SGG?

2 Definition of smart Gas grids (See iGU newsletter)

3 Smart gas grids: 20 Use cases

4 "To do or not to do a smart grid That is the question " -Keys for success for future smart grids

5 Summary matrix (2 pages)

6 What's next ? (2 pages): INNOVATION ROAD MAP (Kim)

ANNEXES: **Feed back – case studies – case for green and efficient networks**

20 Uses cases

Remote gas grid monitoring and management
- Earthquake risk prevention (JP)
- Pressure monitoring – optimization of network by feedback(Kim)
- Smart pressure regulating station (CZ - Libor)
- Dynamic pressure management: leakage reduction, green gas integration, pressure at delivery points guarantee (Steve through Pascal)
- Maintenance monitoring & tracebility & Localization, Reliability Centralized Maintenance (RFID) (Pascal)
- Workforce monitoring (Shoiab through Pascal)
- Cathodic protection monitoring , damage alert (Libor)
- Leakage and losses and accident monitoring (Pascal)
- Third party interference sensors (Ben & Peter & Kees)

Advanced external surveillance of gas networks (Drones, satellites) (Roch)

Advanced internal surveillance of gas networks (robots…) (Kees)

Injection of gases
- Biomethane injection management (Roch)
- 2nd and 3rd generation injection management (Roch)
- Power to gas (H2, Syngas,…) including storage conditions (Libor)

Gas quality monitoring
- Odorization control (Pascal with Peter F)
- Gas composition and GCV monitoring (Pascal with Peter F)

Smartmetering and remote measurements data management (for internal uses or external information) (Pascal)

Development of new uses of Gas
- CNG stations, peak shaving storage, local storage (Mohamed + Shoiab)
- individual compressors monitoring (Kim)
- Gas Heat Pumps, Micro CHP and Fuel cells (interaction between electricity and gas uses, problem of non sulfur gas) (Asada & Toriumi)

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Focus on each use case

- Description
- Drivers / Context
- Potential technological solutions
- Maturity of technology (existing usage, under development, examples, pilots, …)
- Technological and economical challenges and obstacles (regulation, law,…)
- Benefits: safety, environment, development of gas, optimization of the use of gas networks, efficiency, reactivity , possibility of sinergy with another use case
- Link with other energies

Example : earthquake prevention

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Example : smart earthquake risk prevention (JP)

Description	Gas grid including automatic shut off in case of big earthquake
Drivers / Context	Immediate Safety of the persons Shut off of consumers and of network mains Prevent additional damage due to explosions or fire
Technological solutions Incl potential)	Meters equipped with shut off valves operated in case of seismic movements Network Valves linked with seismic sensors Possibility of shutting off network valves from the control center
Maturity of technology	Operates in Japan (Tokyo gas, Osaka gas, Toho gas) since 1996 (after Kobe earthquake) for earthquakes higher than a given intensity (acceleration over 200 gals) Linked with a adapted structure of the distribution network (independent blocks)
Technological and economical challenges and obstacles (regulation, law,…)	Risk based decision taken by the companies (not by regulation) Costs have to be supported by the tariff and are justified by the level of risk Development of particular shut off valves and small seismic sensors Fukushima: a few local valves shut off and no leak and no breakage occurred
Additional benefits	A well structured network easier to operate and to manage with the different blocks High reactivity in case of incident on the network thanks to remote controlled valves Gas shut off in case of excessive flow of gas Alarm in case of continuous flow of small volumes of gas during 30 days Shut off in case of abnormal pressure drop Possibility of an option in case of gas leak alarm in the house -Optional round the clock security service (charged to the customer) Radio infrastructure easying the installation of remote meters (communication adaptor) (regular phone or internet lines can be also used)
Link with other energies	No link

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Articles for the IGU Newsletter/Magazine

Delivery date:

- June 2013*: Flosbach/Klaas* on SG 4.2 issues ✔
- June 2014: *Vercamer/Vallender* on SG 4.3 issues
- December 2014*: Broisler Oliver* on SG 4.1 issues
- Anyone else who wants to contribute?

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Tonight

- 20:00 Departure from the hotel lobby

Friday‘s program

- 9:30 Departure from hotel lobby

IGU WOC 4 – End of Meeting

Thank you for your attention!

Grüß Gott in Vienna

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