



**New Transmission Projects,  
Public Acceptance and New  
Technologies**

## **Progress Report**

---

**HOUSTON, TEXAS  
OCTOBER 01 - 03, 2013**

**Peter Tóth  
Alessandro Moretti**

# SG 3.1 : NEW TRANSMISSION PROJECTS

## ***Scope and Purpose***

Every new transport project is complex and unique because of special characteristics. In some cases, the new project involves laying high pressure gas pipelines along very long distances, across difficult land, densely populated areas. Some projects have a combination of these difficulties.

The purpose of this group is to gather information on new projects related to gas transport (pipeline and compressor plants), to analyze the solution used in each case and propose the Best Construction Practices (BCP) that can be applied by the industry in the future.

## **TRANSMISSION INFRASTRUCTURE:**

- *To report strategic transmission infrastructure projects.*
- *To deal with the challenge of acceptance of technology and technical constructions.*
- *To study the feasibility of new pipelines with small distances to areas of high population density.*
- *To study improvements in the compression process, turbo machineries, performance optimization, emissions.*

## SG 3.3 : PUBLIC ACCEPTANCE and NEW TECHNOLOGIES

### **Scope and Purpose**

*It is convenient to create the best public acceptance of the gas transmission systems for that reason this study group will analyze the growth of the gas industry in two key aspects of the production chain. On the one hand the legal requirements that the provision of new gas supply sources (shale and other indigenous sources of gas) requires, such as: environmental, economic and other aspects. On the other hand new technologies applied to the gas industry to transport larger quantities of gas, and its components, in a safe and reliable way.*

#### **PUBLIC ACCEPTANCE:**

- *To ensure effective communication with the public.*
- *To show that the most convenient means of energy transportation is by pipelines.*
- *To report on different actions that the companies are taking for environmental footprint reduction.*

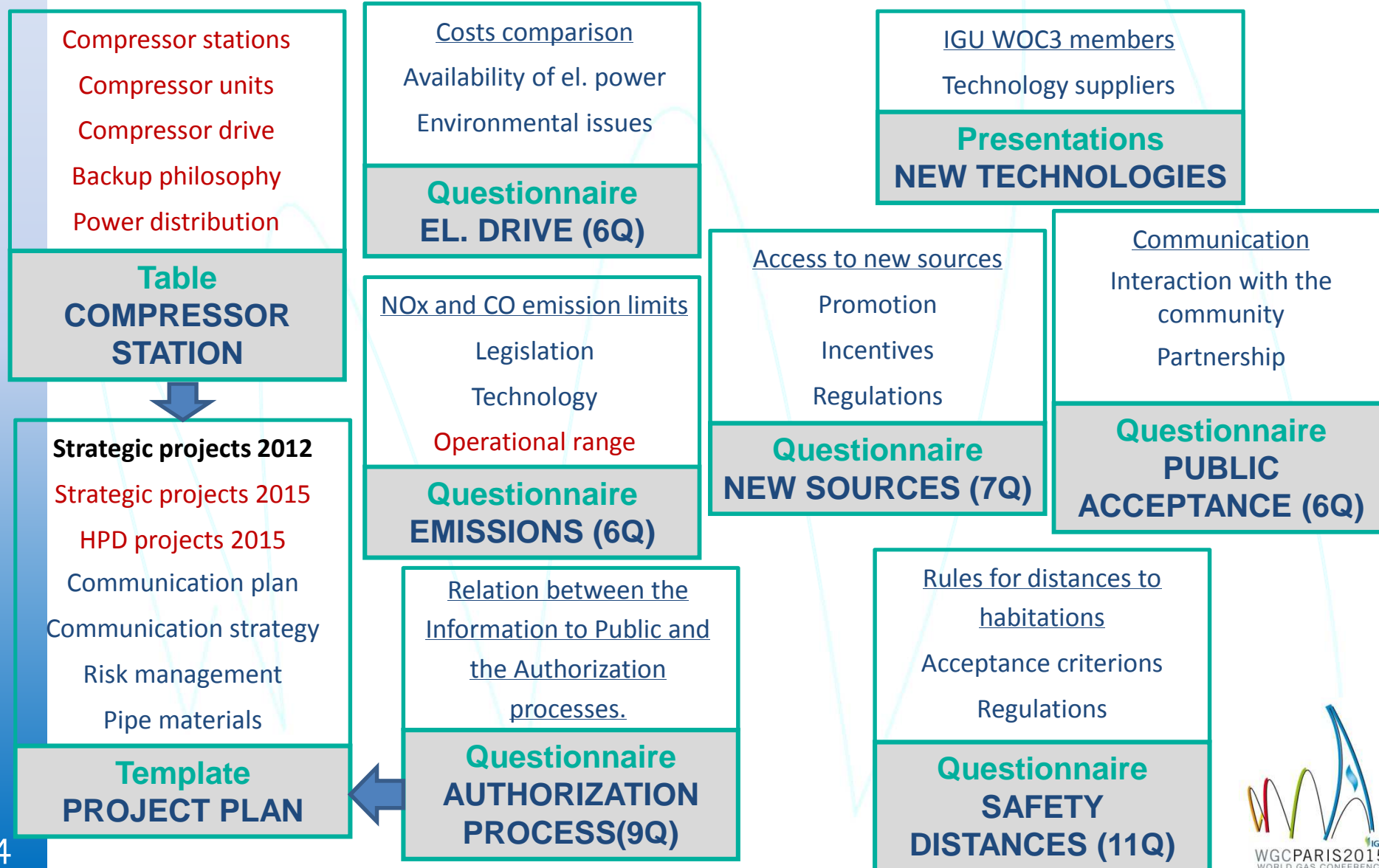
#### **• THE IMPACT OF THE NEW SOURCES ON TRANSMISSION SYSTEMS:**

- *To summarize the new gas sources in the world.*
- *To analyze and present possible topics like: cross country tolls, long haul tariffs, environmental regulations, regulations for open access with free flow of gas and hubs.*

#### **• NEW TECHNOLOGIES APPLIED TO TRANSMISSION SYSTEMS**

- *To discuss new pipe materials.*
- *To propose alternative uses of the pipeline (e.g. CO2).*

# GATHERING INFORMATION FROM THE PRIMARY SOURCES



## OPTIMIZED SUBJECTS - as of 27<sup>th</sup> March 2013

---

<b>A</b>	<b>TRANSMISSION PROJECTS</b> fully covered by SG 3.1	Subject owner:	Ansgar BRAUER
<b>B</b>	<b>COMPRESSION PROCESS</b> fully covered by SG 3.1	Subject owner:	Peter TÓTH
<b>C</b>	<b>IMPACT OF NEW SOURCES</b> fully covered by SG 3.3	Subject owner:	???
<b>D</b>	<b>PUBLIC ACCEPTANCE</b> common task SG 3.1^3	Subject owner:	François CROCOMBETTE
<b>E</b>	<b>NEW TECHNOLOGIES</b> common task SG 3.1^3	Subject owner:	Alessandro MORETTI



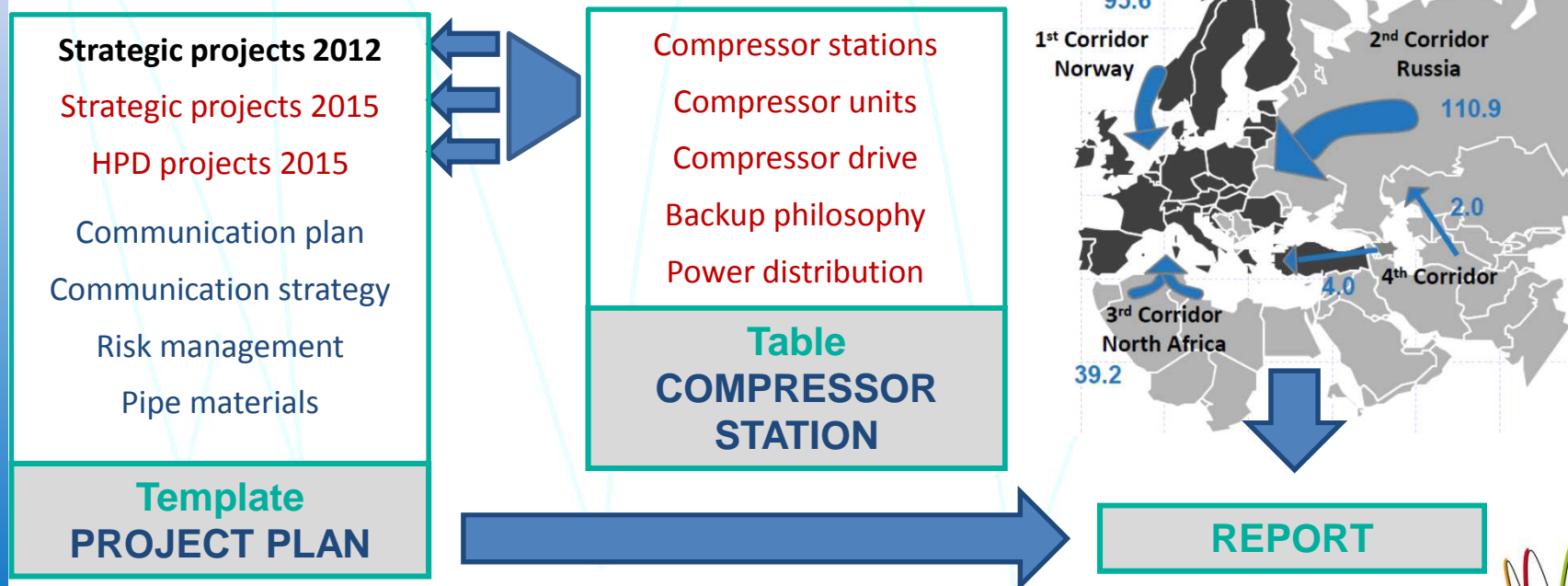
## **The concept of the:**

- **Workflow**
- **Final Report**

# A | TRANSMISSION PROJECTS, Workflow

***Task: To report strategic transmission infrastructure projects.***

- To continue with information gathering which started in the last triennium and to add **detailed information regarding compressor stations** to the projects which were reported during last triennium.
- To add a **description of the main gas corridors** between the main gas sources and consumers.
- To **collect the projects related to each trunk connection** and to provide information about the most important new elements.





# A | TRANSMISSION PROJECTS, Final Report, Ansgar BRAUER

## Chap. 2 Strategic Transmission Infrastructure projects (Ansgar Brauer)

### 2.1 Overview of main gas supply corridors

- Europe (Ansgar Brauer)
- Middle East (Algeria)
- Africa (Vladimir Bychkov)
- Asia (Vladimir Bychkov), China (Takafumi Aoki)
- Australia (Deepank Gupta)
- North America (Mark Rand)
- South America (Carlos Sergio Mazzei, Yenitza Malavé)

Structure:      **Main gas corridors** (to include the impact of new conventional and unconventional sources on gas the transmission infrastructure development)

**Detailed description of the selected projects** (to include the promotion plans and the incentives for specific projects if applicable)

### 2.2 Challenges and chosen solutions (based on Overview)

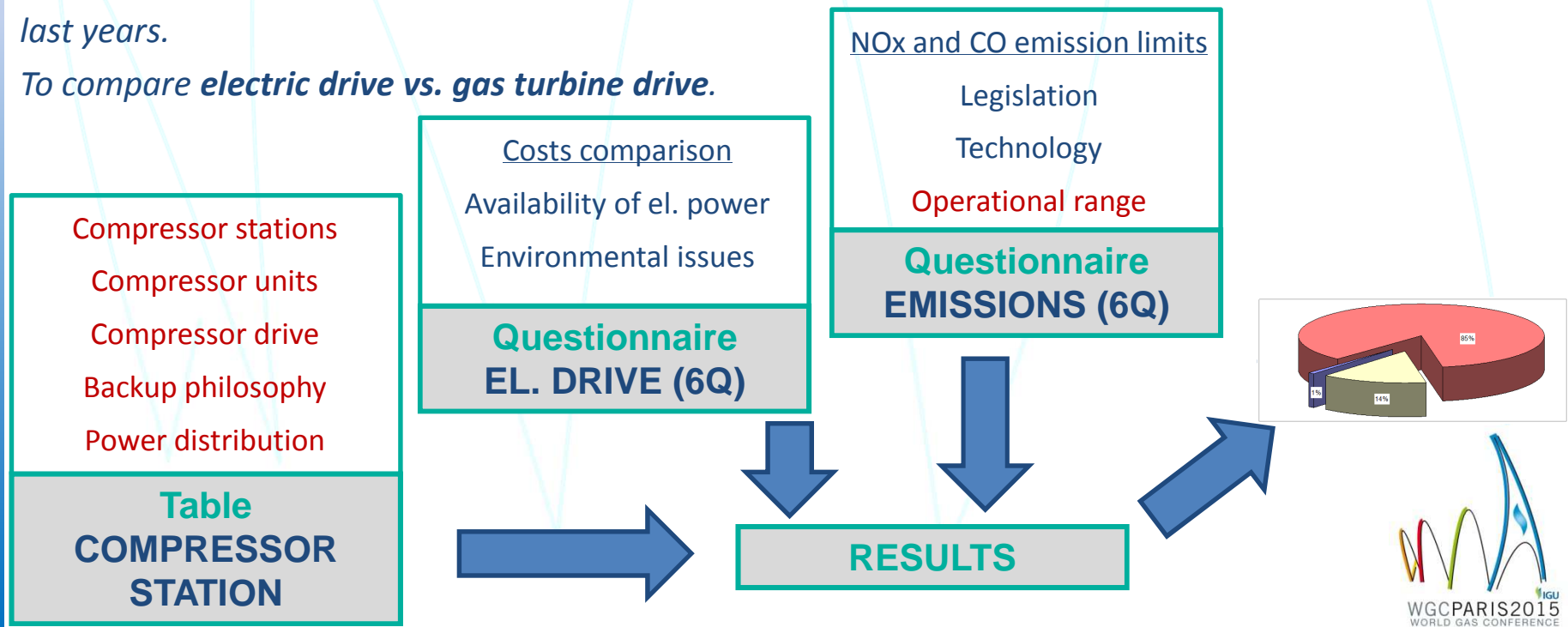
### 2.3 Conclusions and Recommendations (based on Overview)



## B | COMPRESSION PROCESS, Workflow

***Task: To study improvements in the compression process, turbo machineries, performance optimization, emissions.***

- To gather the information regarding emission limits (NOx and CO) in line with the **legislation requirements** for involved countries.
- To assess the **total power distribution** of the compressor station (CS) to the particular units power (sizing) in order to cover the whole operational range of CS including **the backup philosophy**.
- To evaluate the current level of both the compressor and drive **efficiency** of machines installed during last years.
- To compare **electric drive vs. gas turbine drive**.



# B | COMPRESSION PROCESS, Final Report, Peter TÓTH

## Chap. 3 Improvements of the Gas Compression Technology (Peter Toth)

### 3.1 Increasing of the operational flexibility of the compressor units (Peter Toth)

- Tandem compressor (Peter Toth)
- Variable inlet guide vanes (Peter Toth)
- Efficiency of the gas compressors (Peter Toth)

### 3.2 Compressor drives (Peter Toth)

- Gas turbine drive (Peter Toth)
- Legislation requirements (Peter Toth)
- Technologies used to reduce CO and NOx emission (**Technology suppliers**)
- Electric drive (Henrik Rosenberg)
  - Smart Grid conditions / restrictions (Henrik Rosenberg)
- Comparison of the electric drive vs. gas turbine drive (Henrik Rosenberg)
- Efficiency of the gas turbines (Peter Toth)

### 3.3 Distribution of the total power to the particular units in CS (Peter Toth)

### 3.4 Backup philosophy (Peter Toth)

### 3.5 Optimum distance between compressor station (Peter Toth, Ansgar Brauer)

## C | IMPACT OF NEW SOURCES, Workflow, Final Report, ???

**Task: To analyze the impact of new sources on transmission systems.**

- To summarize the new gas sources in the world (**will be included in subject A**)
- Regional infrastructure challenges to take gas to market (**will be included in subject A**).
- To analyze and present possible topics like: cross country tolls, long haul tariffs, environmental regulations, regulations for open access with free flow of gas and hubs.



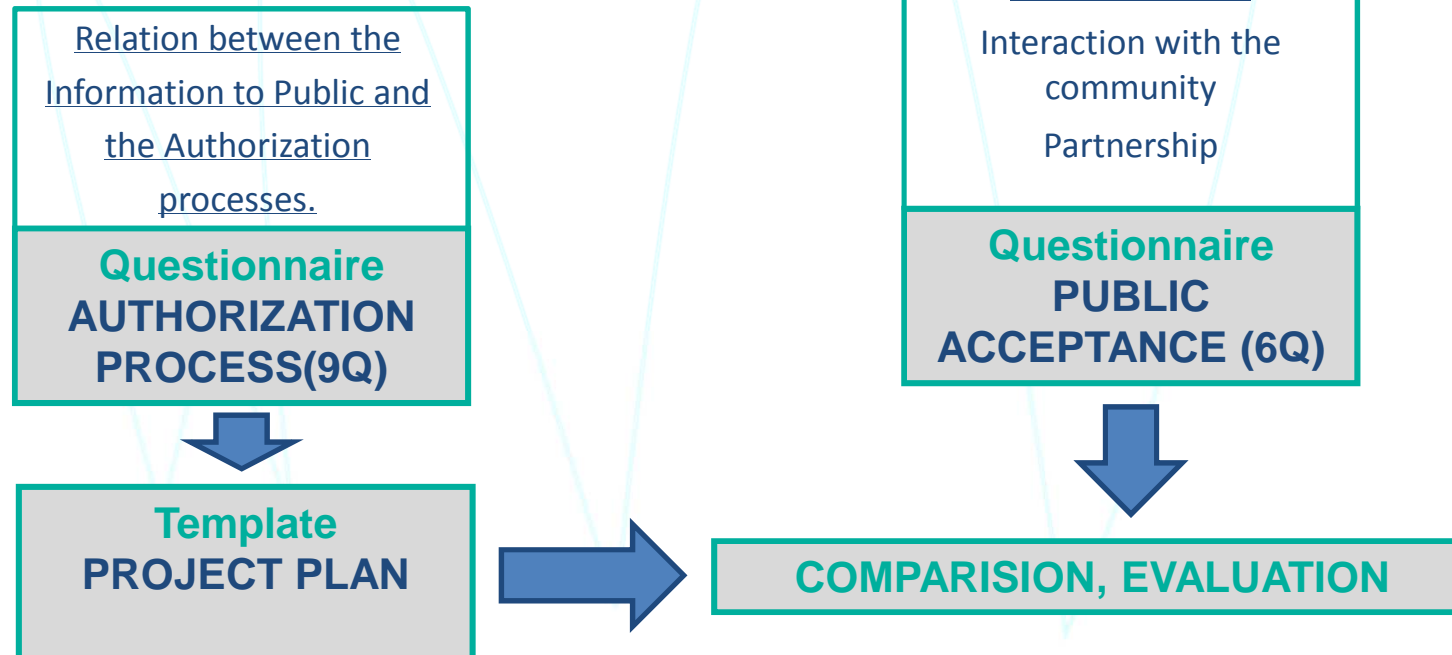
## C | TARIFFS AND REGULATIONS, Final Report, Mark Rand

**Chap. 4 Tariffs and regulations; a comparison & update (Mark Rand)**

## D | PUBLIC ACCEPTANCE, Workflow

***Task: To deal with the challenge of public acceptance of technology and technical constructions.***

- *To ensure effective communication with the public, to enhance the **support of general public** to the technology and the **support of authorities, politicians to the specific projects**. To involve public at the planning stage to use the **advantage of the first impression** and to **engage early and handle well** with the local discussions against particular projects (e.g. at social networks).*
- *To confirm or refute public acceptance as a **central uncertainty** of new gas transmission projects development.*



# D | PUBLIC ACCEPTANCE, Final Report, François CROCOMBETTE

## Chap. 5 Public Acceptance of Technology and Technical Constructions (François CROCOMBETTE)

### 5.1 Introduction: Who are the key public stakeholders? (François CROCOMBETTE )

- Additional 5 questions, first round SG1&3 – quick reaction (François CROCOMBETTE )
- Reference to the stakeholder management (Carlos Sergio Mazzei)

### 5.2 Main impacts of gas transmission infrastructure (François CROCOMBETTE )

- Construction phase (François CROCOMBETTE )
- Operation (François CROCOMBETTE )
- Reduction of the environmental impacts (François CROCOMBETTE )
- Public perception by the different stakeholders (Overview from SG1&3)
- Social impact assessment (François CROCOMBETTE, Ansgar Brauer )

**Source:** Project templates (François CROCOMBETTE )

### 5.3 Effective communication with the public

- Support of general public to the technology
- Support of authorities, politicians to the specific projects
- Advantage or the first impression

**Source:** Project templates / Authorization process (Peter Toth)

### 5.4 Internal processes of companies for the communication with the public

- Regulations on communication with the public
- Interaction with the community around technological facilities

**Source:** Questionnaire / Public Acceptance (Peter Toth)

### 5.5 Mitigation during and after technology construction (Martin Slabý)

### 5.6 Conclusion (based on results)

# E | NEW TECHNOLOGIES, Workflow

***Task: To provide an overview of the new technologies and their application to the transmission systems.***

- *Technologies in the area of Safety and Reliability (TSR)*
- *Technologies in the area of Environmental Footprint Reduction (TEFR)*
- *Technologies in the area of Pipelines / Compression process (TPC)*
- ***Construction of pipelines in areas of high population density (Sinobu Kawaguchi, Sung Baek Hong)***
- ***Alternative use of pipelines – CO2 ( Andrzej Osiadacz) /Hydrogen, etc.***
- ***Technologies used to reduce CO and NOx emission (Technology suppliers)***

IGU WOC3 members

Technology suppliers

**Presentations**  
**NEW TECHNOLOGIES**



**TSR:** *In line inspection; Inspection for long deep-water pipelines; Welding inspection technologies; Quality inspection technologies; Leak detection; Flow meters; Gas treatment plants.*

**TEFR:** *Treatment of exhaust gases; Technologies to reduce CO and NOx emission; Reduction of the methane emissions.*

**TPC:** *Energy efficiency in the compressor stations; Special applications of the compressor stations; Steel pipeline construction analysis; Pipelines material in extreme conditions (jungle/arctic, etc.); Welding technologies; Hot taps; Cold shells, Coatings;*

# E | NEW TECHNOLOGIES, Final Report, Alessandro MORETTI

## Chap. 6 New technologies (Alessandro MORETTI)

### 6.1 Technologies in the area of Safety and Reliability:

- In line inspection (Ol'ga Cherkashina, Jury Dergausov)
- Inspection for long deep-water pipelines (Ol'ga Cherkashina, Jury Dergausov)
- Welding inspection technologies (Ol'ga Cherkashina, Jury Dergausov)
- Leak detection (Ol'ga Cherkashina, Jury Dergausov)
- Flow meters (Takafumi Aoki)
- Gas treatment plants (???)

### 6.2 Technologies in the area of Environmental Footprint Reduction:

- Technologies used to reduce CO and NOx emission (**Technology suppliers**)
- Reduction of the methane emissions (Vladimír Potočný)
- Treatment of exhaust gases (???)

### 6.3 Technologies in the area of Pipelines / Compression process:

- Subsea applications of the compressor stations (Vladimír Bychkov)
- Pipe materials (Sinobu Kawaguchi, **Technology suppliers**)
- Welding technologies (???)
- Hot taps (Ian Fordyce)
- Cold shells (Vladimír Potočný)
- Coatings (Technology suppliers)



## S | Special chapters in the Final Report

## Chap. 7 Construction of Pipelines in Areas of High Population Density (Peter Toth)

## 7.1 Safety distances and guidelines (Peter Hodal)

- Regulations on safety distances
- Rules in rural areas
- Rules in suburban areas
- Rules in highly populated areas

**Source:** Questionnaire / Safety distances

## 7.2 Common practice and special requirements (Peter Hodal)

- Tools used for risk analysis
- Influence of the physical protection
- Guidelines for distances to hazardous industries
- No build zones near pipeline

**Source:** Questionnaire / Safety distances

### 7.3 Technology of construction – Case studies: Japan (*Shinobu Kawaguchi*) Korea (*Sung Baek Hong*)

## Chap. 8 Alternative Utilization of Pipelines (Alessandro MORETTI)

- Hydraulic simulations of the CO<sub>2</sub> transportation (Andrzej Osiadacz)
- Technical challenges of the CO<sub>2</sub> pipeline transportation (Carlo Spinelli / ENI )

## Chap. 9 Conclusion and Recommendations (Subject Owners + Peter Toth)

## Chap. 10 Appendices – Application of the New Technologies ( Authors)

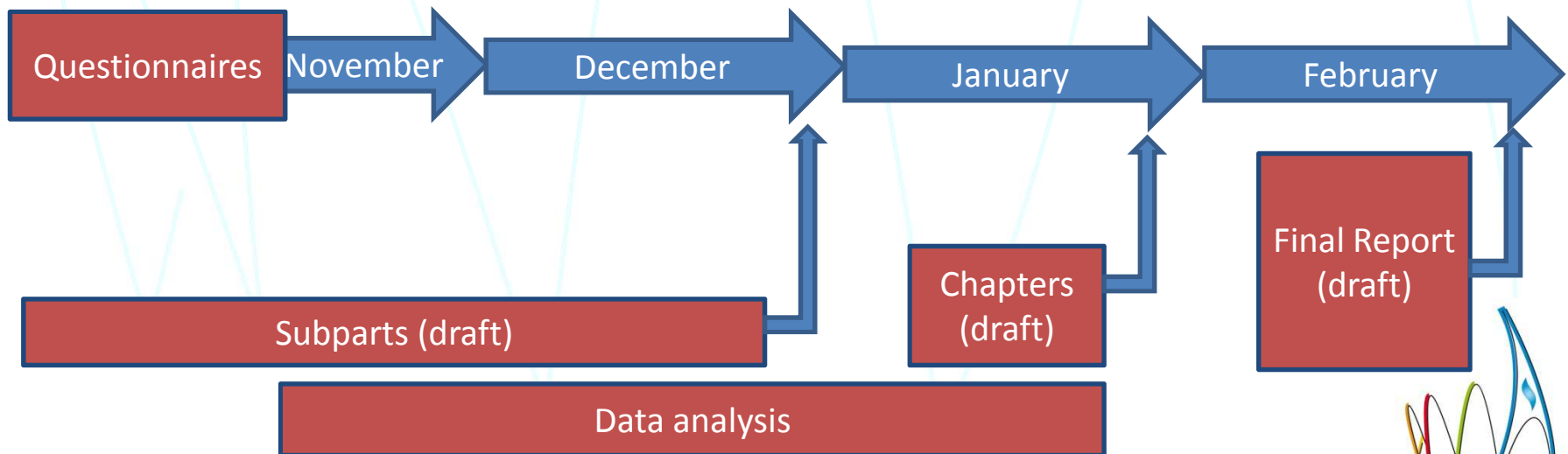
Summary of the technical presentations in the area of new technologies presented during our meetings by our members and technology suppliers.

## Chap. 11 Appendices – Project plans

## List of the Project plans.

## ACTION POINTS

1. The Questionnaires to be **completed by 15<sup>th</sup> November 2013.**
2. Appointed SG1&3 members will prepare draft of their subparts till **end of December 2013.**
3. The **subject owners** will put together particular chapters by the **end of January 2013.**
4. **The first draft of the Final Report will be send to SG1&3 members by the end of February 2014.** (Peter Toth)
5. **On the next meeting in Italy we will discuss the first draft of the Final Report and our progress in details.**



*Thank you for your attention.*

