



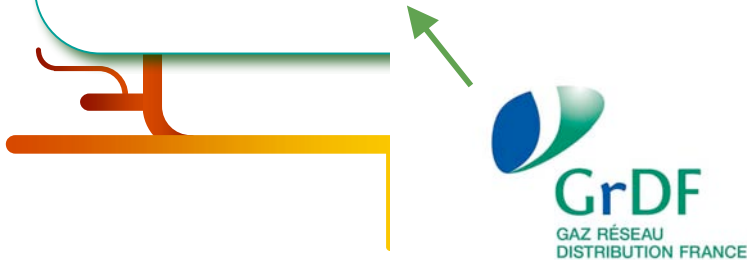
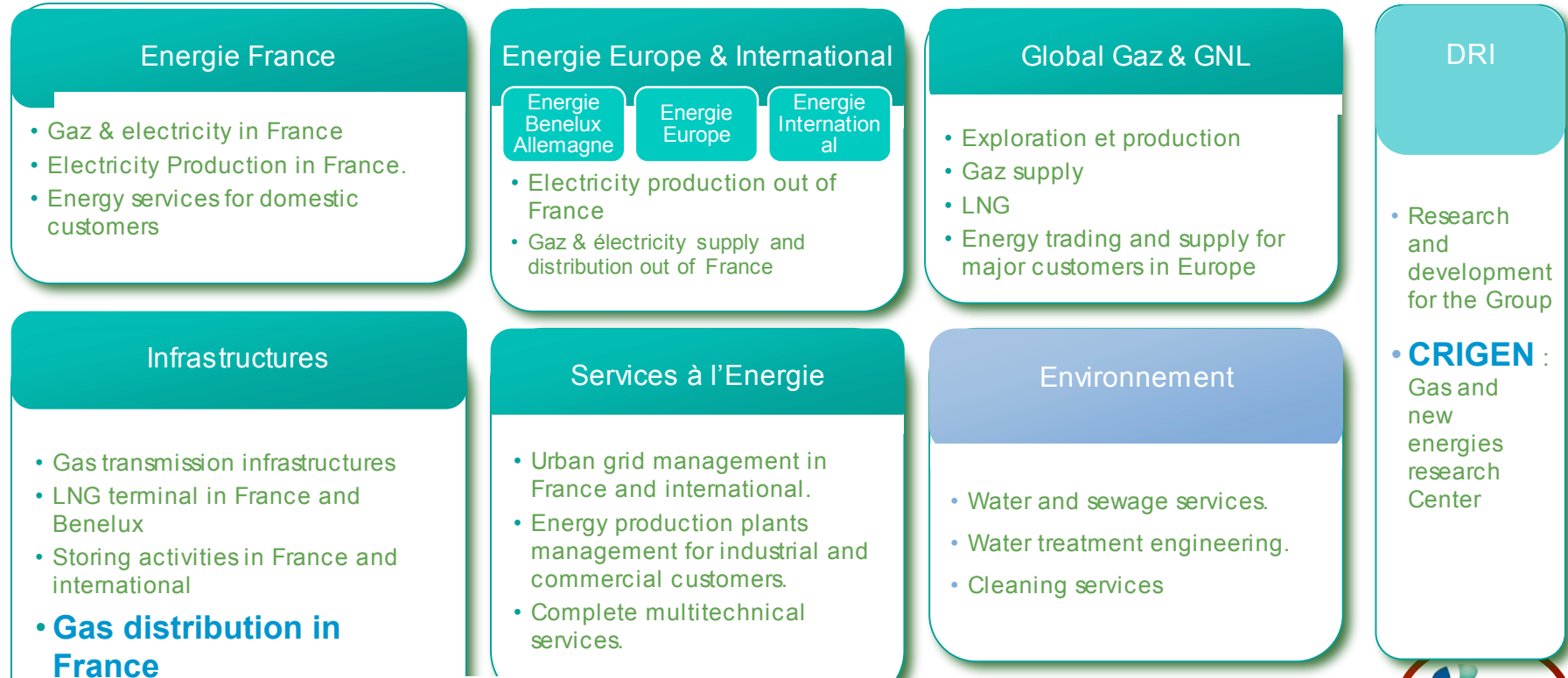
Biogas injection into gas distribution grids in France : focus on the technical constraints

Claire BRECCQ
Biogasmax Conference

2009, Septembre 8th

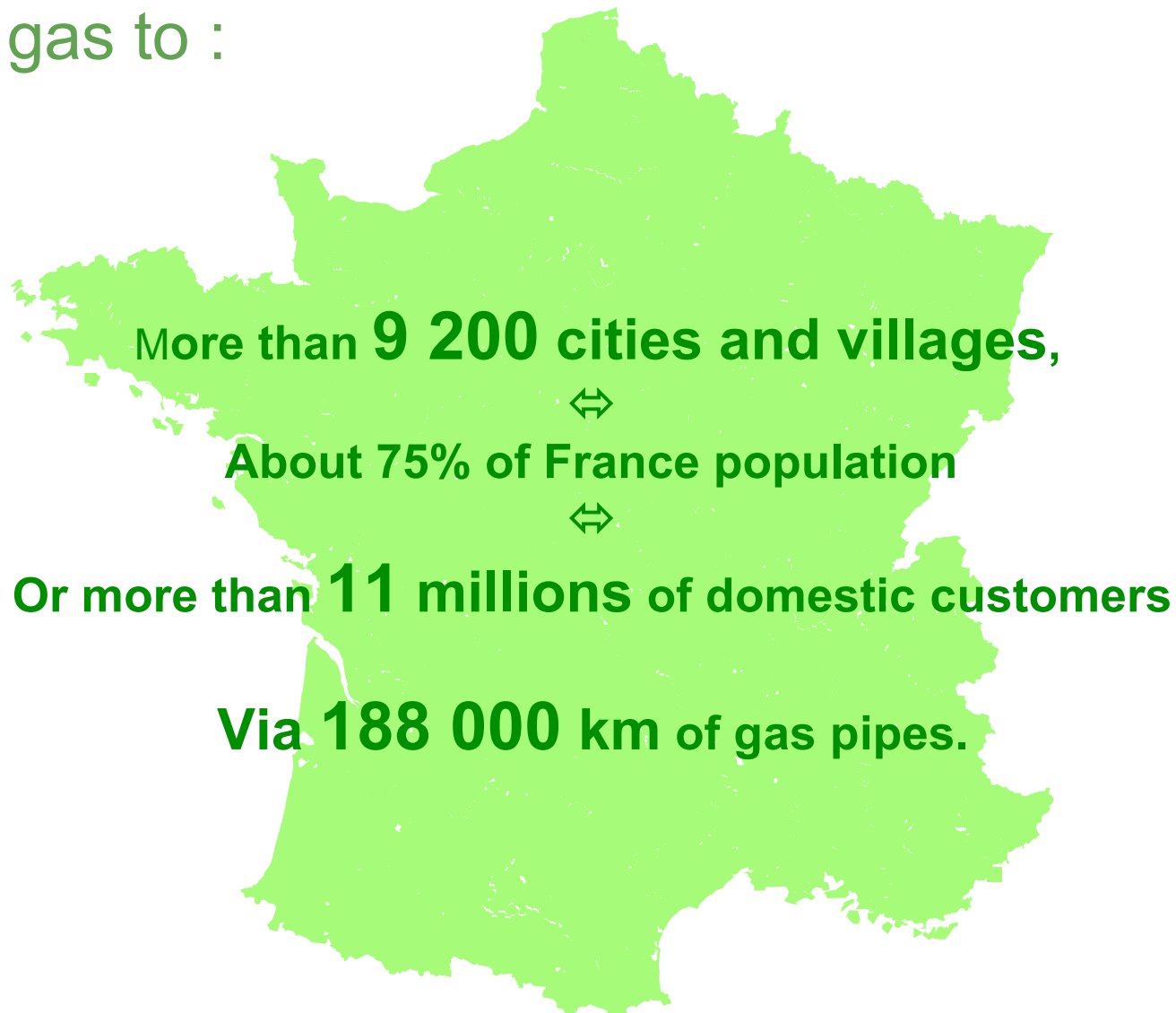
GrDF is a GDF SUEZ subsidiary

GDF SUEZ activities are structured in 6 branches, 5 in Energy and 1 in Environment



Gaz Réseau Distribution France, distributes natural gas to :

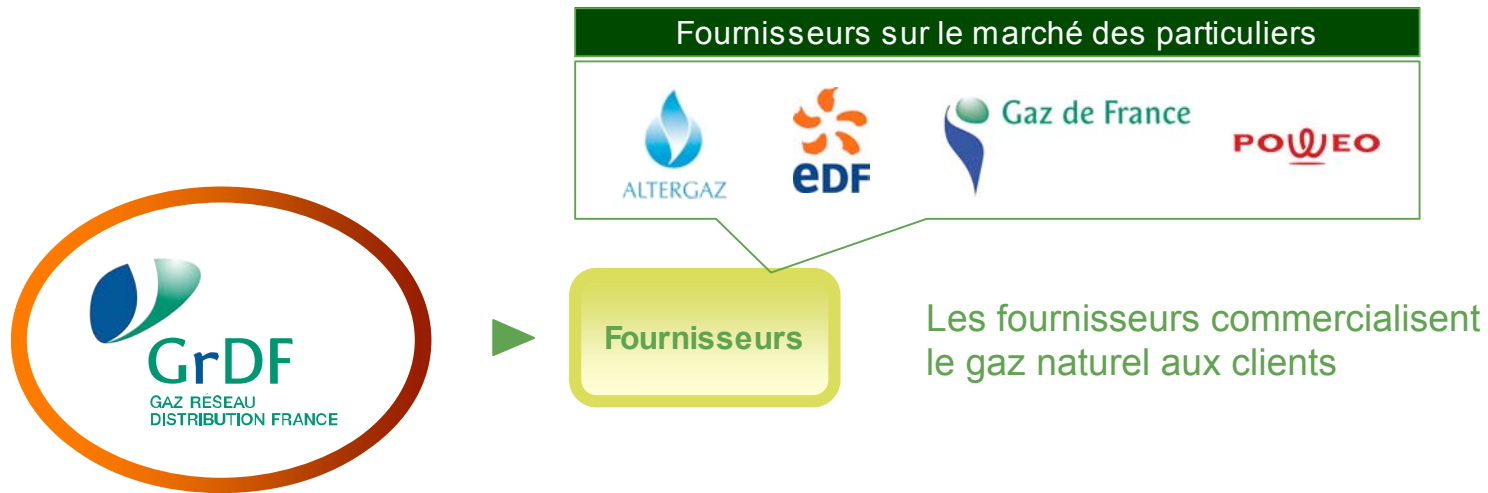
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GrDF distributes natural gas for several suppliers

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= > Indépendance, no discrimination

= > Grid extension - > gas usages développement



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Grid injection in France : Context has changed

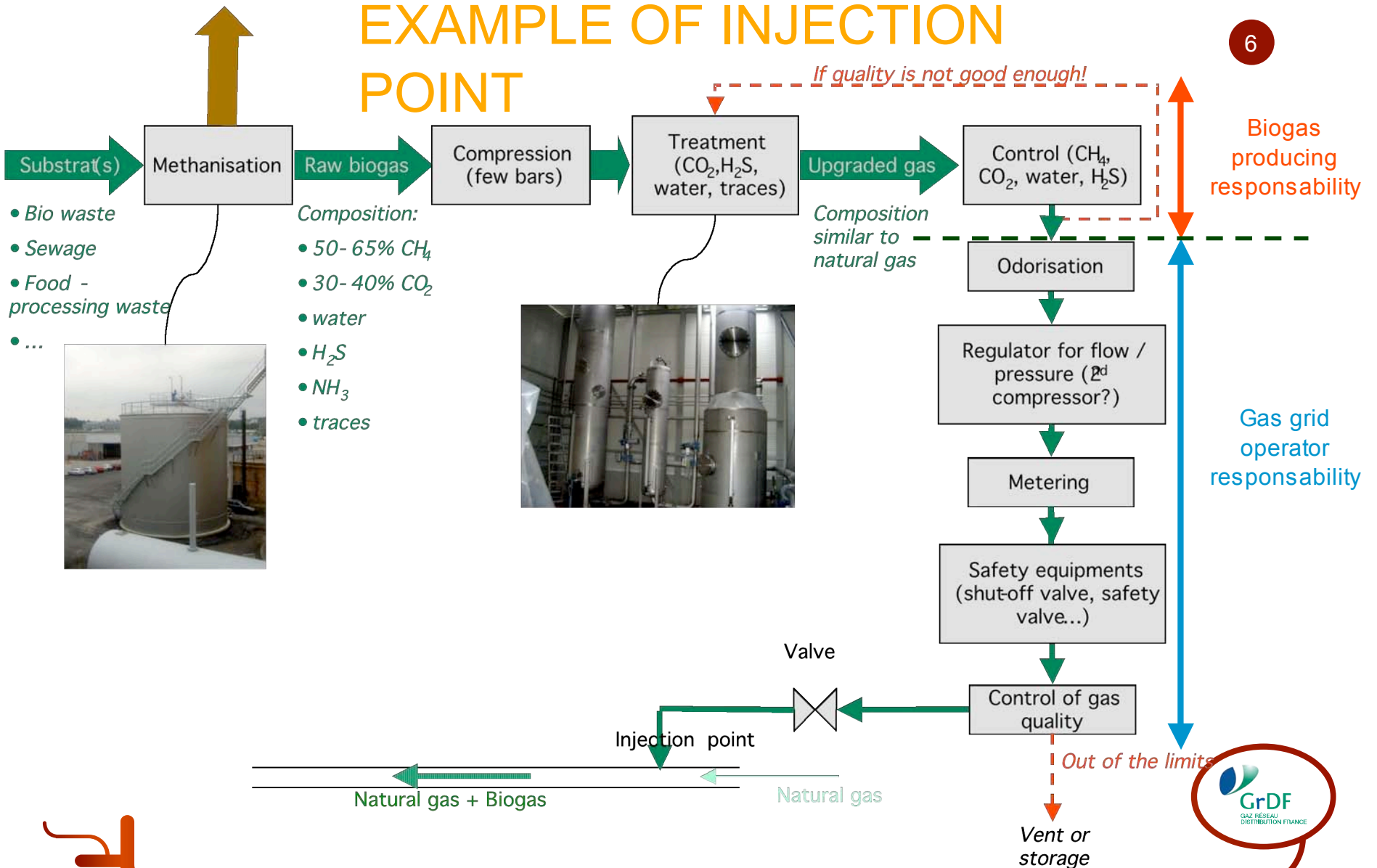
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- At European level : Gas Directive & NRE Directive
- At French level :
 - 2003, january 3rd **law** : biogas injection is authorized if :
 - technically possible
 - safety is guaranteed
 - 2004, june 15th **Decree** n°2004-555 : publication of technical prescriptions is required
 - **october 2008** : AFSSET (French Agency in charge of Sanitary Safety of Environment and Labour) report states on sanitary risk of biogas injection into national gas grid
 - Since **December 2008**, the French Ministry of Ecology, Energy, Sustainable Development and Sea coordinates a working group in charge of technical and economical injection conditions definition.



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EXAMPLE OF INJECTION POINT



Bio-methane quality

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- Sanitary aspects :

Gas grid operators wish that for each project the local competent authority takes the responsibility to authorize or not injection, guaranting that the bio-methane does not present any risks for safety for public health, environment and safety. (autorisation préfectorale par ex)

- Technical prescriptions (published on GrDF website) : www.grdf.fr

biomethane must comply with technical prescriptions in order to :

- preserve **infrastructures integrity** of the gas distribution operator
- guarantee that the gas injected into the grid has the **proper quality for combustion and complies with regulation**

→ The biogas producing is responsible in treating the gas, regarding these specifications



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Technical constraints regarding gas distribution grids operating and structure

- Injection point

→ cost of connection depends on the distance to the grid

- Pressure of injection

- Injection pressure for must be a few bar higher than the pipe pressure.

- Each project will be scanned and decision to proceed to injection will be taken regarding the dynamic parameters (pressure, pressure drop, flowrate)

- Grid capacity to absorb produced bio-methane quantity :

- Biomethane flowrate is continuous, 24h/24 and all year long

- Consumptions depend on the season and the temperature : The flow rates in the grid may vary of a factor 1 up to 10 between winter and summer

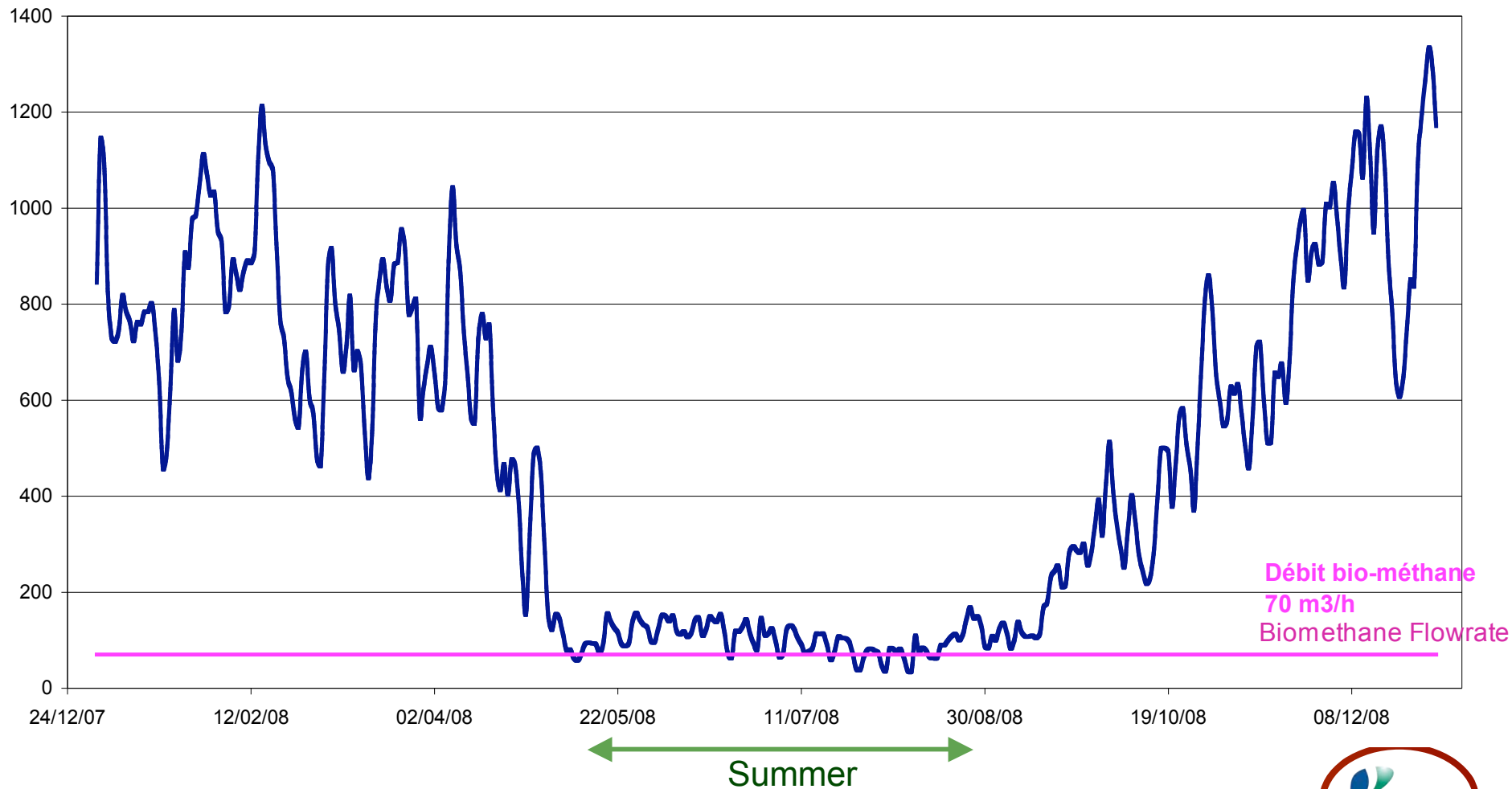
- Gas grids are locally closed, not interconnected, and one way from Transmission pipes down to distribution pipes)

→ Gas pipes can't absorb a higher flowrate than what is consumed in the area. Injection will preferably occur in main pipes with a high transit



Consumption evolution for a distribution gas grid in rural area

Débit (n)m3/h
Flowrate



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Odorisation

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- Regulation → biogaz must be odorized upstream injection
- Odorization process must be consistent with the regular practices

Bio-méthane quality control

- **Continuously** : control of specific parameters regarding distribution operator's responsibilities : ie **safety**

H₂S, water content, THT (odorization), Wobbe index, Gross calorific value (GCV) for commercial purposes

- **Continuously** of from time to time for other parameters

Injection-metering equipment

- **Secure injection**
- **Regulation**
- **Counting**
- **Filtration**

The metering equipment (volumetric and GCV meters) must comply with french metrology regulation and be certified (« Type certified »)

Recommandations to bio-methane producers regarding injection

1- Upstream injection, bio-methane must be treated in order to have the same quality than the conventional natural gas.

The **technical prescriptions** are available on GrDF website → www.grdf.fr

2- In purpose to help biomethane producer to better understand what technically represents injection into gas grid (description of odorization, quality control, metering and injection equipments), **functionnal specifications** are also available on GrDF web site → www.grdf.fr

3- A first technical **feasability study** by GrDF is necessary. At the moment *demands are collected and processed by GrDF national services : Stéphanie Legrand (stephanie-anette.legrand@grdf.fr)*

→ Following informations are required by GrDF : precize project localization, produced bio-methane flowrate, and injection pressure.

→ National working group decisions concerning economical and technical injection conditions (responsabilities) are expected by end of 2009.

→ GrDF will not be able to give producers detailed financial answers by then.



CONCLUSION

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-GrDF supports biogas injection but the consequences on grid operating and possibly on the grid integrity are to be taken into consideration very carefully. First pilot installations will be of first importance to help GrDF, as well as this complete new industry in France, get some experience.

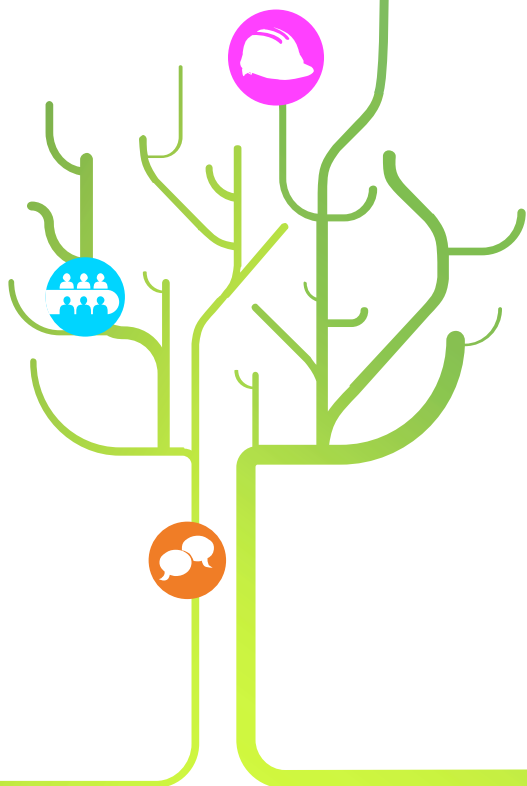
-Some questions miss answers :

- How to manage non-compliant gas?
- Remote control
- How to manage gross calorific value of bio-méthane for invoicing in the injection area?
- Biogaz production importance in the Energy Regulation Commission allocation rules
- Biogas industry economy
- These questions will be adressed by the national injection working group

- GrDF participates to the developement of biogas industry, in the full respect of its obligations in terms of safety and public service.



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Thank you for your
attention

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