



***Technical, legislative and economic conditions
for biogas injection into (natural) gas grids
in Czech Republic – present status and outlook***

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Content of presentation:

1. **Technical conditions** for admission of biogas production facilities to supply „biomethane“ into the (natural) gas network and their **standardization**
2. **Legislative** arrangement of **rights and responsibilities** of concerned parties including ownership and method for financing the underlying costs
3. **Economic incentives** for biomethane (to be) introduced into the market
4. And how biogas/biomethane could find ultimately use as a **vehicle fuel**

1. Technical aspects (1/4)

- ❑ In 2008/2009 indicative quality requirements were defined for biogas of natural gas quality („**biomethane**“) via approval of amendment of technical rules **TPG 902 02** valid since **3/2009**
- ❑ However, their inclusion into the „**Code of Conduct**“ for distribution system operators (**DSOs**) to become part of contractual conditions for connection into the (natural) gas grid has not taken place yet
- ❑ Thus, the parameters are **non-obligatory** and it is up to the DSO and biogas supplier to agree on concrete conditions...

1. Technical aspects (2/4)

- General quality requirements for any gas to be transported via publicly accessible gas grid according to present **CoC** of all DSOs (6 companies):
 - **Wobbe index** (12.7 – 14.7 kWh/Nm³),
 - **Higher heating value** (9.4 – 11.8 kWh/m³),
 - **Lower heating value** (8.4 – 10.6 kWh/Nm³)
 - **Relative density** (0.56 – 0.7)
 - **Methane content** (min 85 %)
 - **O₂** (max. 0.5 %), **N₂** (max. 10 %), **CO₂** (max. 5 %), **H₂** (max. 2 %), **H₂S** (max. 6-7 mg/m³), **CO** (max. 3 %), **total sulphur** (max. 30-100 mg/m³), **RSH** (max. 5 mg/m³), **higher hydrocarbons** (max. content of propane, butane...), no vapour, particles or condensates, **dew point of water/HCs** (same as ground temperature)

1. Technical aspects (3/4)

- Specific quality requirements on „biomethane“ according to **TPG 902 02**, in force since 3/2009:

Parameter	Unit	Value
Methane (CH ₄)	Vol. %	≥ 95
Water content (as dew point temperature)	°C	- 10
Oxygen, dry (O ₂)	Vol. %	max. 0.5 %
Nitrogen (N ₂)	Vol. %	max. 2 %
Carbon dioxide (CO ₂)	Vol. %	max. 5 %
Total sulphur content (S)*	mg/m ³	max. 30
Hydrogen sulphide (H ₂ S)	mg/m ³	max. 7
Content of mercaptan sulphur*	mg/m ³	max. 5
Ammonia (NH ₃)		not present
Halogenous compounds	mg(Cl+F)/m ³	max. 1.5
Organic silicone compounds (siloxanes)	mg(Si)/m ³	max. 6
Particles, condensates, vapour	-	not present

*) Without odorants

1. Technical aspects (4/4)

- ❑ Expected conditions biomethane gas supplies shall fulfil:
 - **Continuous quality measurement** of major parameters (content of CH₄, H₂S, O₂, CO₂, H₂, dew point of water vapour, NH₃).
 - Energy content of biomethane measured via „**officially approved**“ metering equipment (GC, flow-meter, converter), other parameters probably permissible by other instruments
 - Halogenous or silicone compounds measured according to **character** of fermented substrates (e.g. sewage sludge)
 - Increase of *W* či *H*s via addition of propane (LPG) under discussion, **non prescriptive approach** recommended

- ❑ More detailed aspects of measuring (methodology, equipment, frequency) to be defined by Technical Recommendation **TDG 983 01** which is under preparation (developed by end 2010)

2. Legislative arrangement (1/2)

- ❑ Legislative framework defined by **Energy Act** (Act No. **458/2000 Sb.**) and secondary legislation
- ❑ In current wording, rights and responsibilities for DSOs and gas producers are specified generally (for various gases including NG, biogas, mine gas...)
- ❑ Major stipulations that are relevant to biomethane supplies into gas network include:
 - (**§71, para 5**) DSO defines a way of measurement and the type of measuring equipment needed
 - (**§71 para 10**) DSO is to install, operate and monitor their metering equipment, at the gas producer's expense
 - (**§57, para 8, letter a**) The gas producer shall co-finance the specified costs of connecting to the gas network

2. Legislative arrangement (2/2)

- ❑ From undergoing discussions it appears that:
 - Gas producer is definitely responsible for **biogas upgrading**
 - **Feeding station** is subject of shared financing between gas producer and DSO
 - **Measuring the quality** of biomethane will probably be the role of DSO (= bear the costs), this also applies to **odourization** and possibly **conditioning** (ie. to increase the energy content via the addition of propane)
 - Other parts/functions of the feeding station (compressors, drying, connection pipeline etc.) are **subject of further negotiation** (inspiration Germany?)

- ❑ Roles & responsibilities are expected to be clarified **during 2010** in relation to amendments to the Energy Act and its secondary legislation

3. Economic incentives (1/2)

- ❑ Production and supply of biomethane is **more expensive** than CHP from biogas (especially for capacities < 1-2 MWe equivalent which is 500–1000 Nm³/hour of raw biogas)
- ❑ However, biogas-to-biomethane conversion leads to a **higher overall efficiency** compared to waste of heat in CHP-based biogas plants (increased to utilizing > **60 %** of energy content in original biogas compared with the usual 40-50 %)
- ❑ These facts are reflected in the **Price Decision of ERO No. 4/2009** specifying feed-in tariffs and green bonuses for E-RES for 2010
- ❑ Thus, **gas-fired CHPs may be eligible** in 2010 for a green bonus if biomethane is purchased from the market on condition that they are very effective (> 75 %) co-generation

3. Economic incentives (2/2)

- ❑ However, the current support (~ **0.1 Ec/kWhe**) is not sufficient to facilitate biogas/biomethane production from energy crops
- ❑ Moreover it lacks long-term stability (as it is subject to change in accordance with market price of electricity and natural gas)
- ❑ Therefore the support should be **changed**; several forms of support changes are being considered:
 - **Feed-in tariff** awarded to CHP operators **for electricity production** which is valid for 20 years, if they document long-term contracts with biomethane supplies
 - **Feed-in tariff for biomethane supplies** into gas grid
 - **Support of heat** from renewables incl. biogas
- ❑ The most suitable (politically acceptable) form of support should be introduced from 2011 onwards

4. How to make biomethane motor fuel

- ❑ Event **bigger obstacles** exist for the introduction of biogas/biomethane as a transport fuel
- ❑ On one hand there is an **insufficient CNG infrastructure** and only a **small number of NGVs** on Czech market, and on the other, the much **higher price of fuel energy** is not even partly offset by taxation (fossil fuel CNG currently has zero-level taxation in CR ...)
- ❑ However, the possibility of securing a fully environmentally friendly transportation infrastructure (e.g. public bus services) using biogas/biomethane/bio-CNG **produced from organic wastes** is a very attractive idea
- ❑ This has therefore been the major goal of **MADEGASCAR** in CR – to facilitate this type of project(s)

Questions/discussion:

Thank you for your attention!

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