

The state of the art of biogas in Hungary

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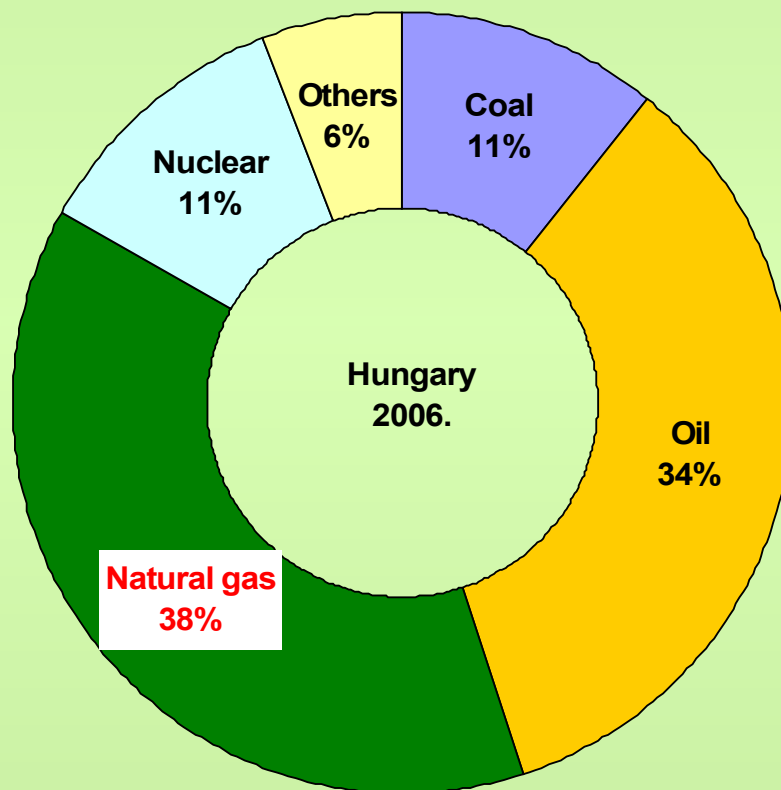


Strategic Issues

- Dominant energy \Rightarrow natural gas
- RES \Rightarrow in insufficiently developed state
- Electricity from RES \Rightarrow compulsory acceptance on fix price
- **Biogas \Rightarrow environmental business, no energetic one**
- No cultivation for biogas raw material
- No biogas injection to natural gas systems
- No correct and reliable information
- Distance between plans and facts



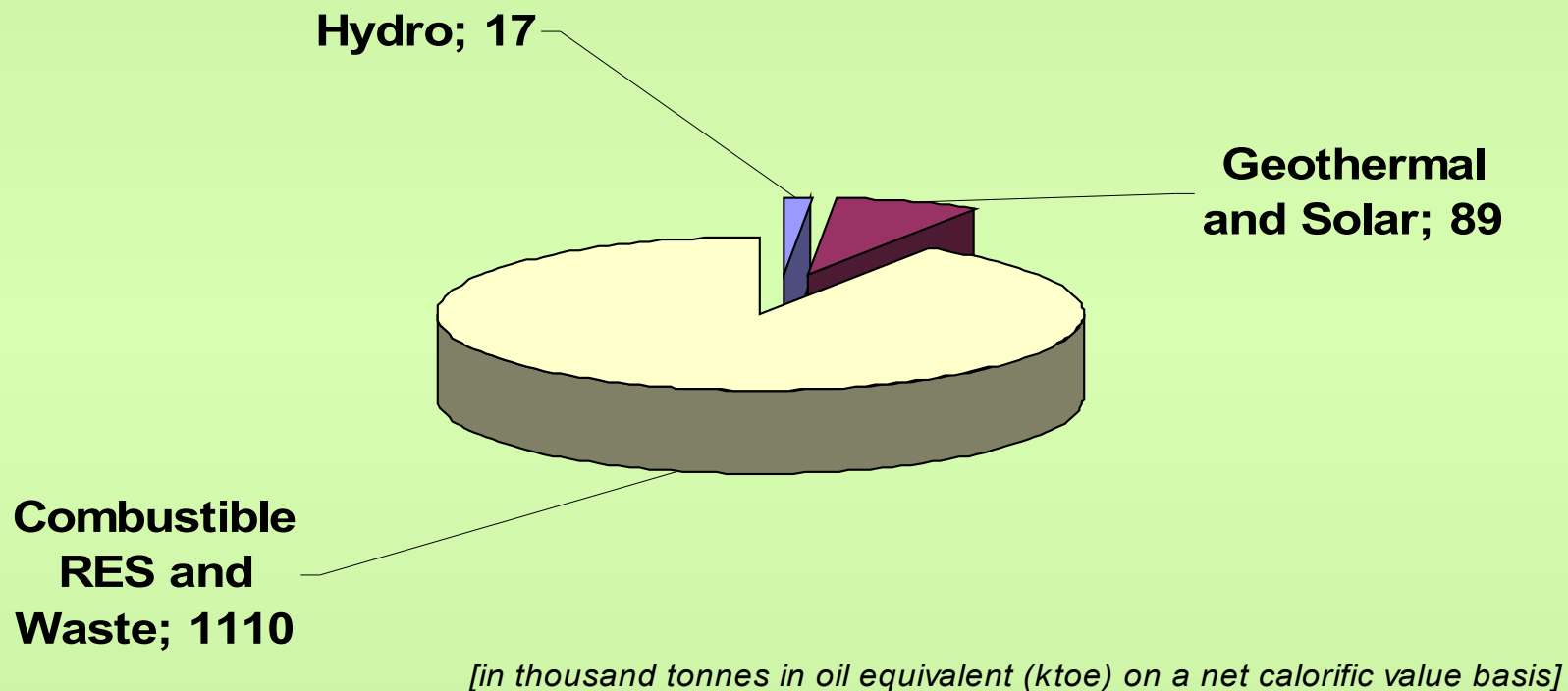
Total Primary Energy Supply, 2006.



Source: GKM, 2007.



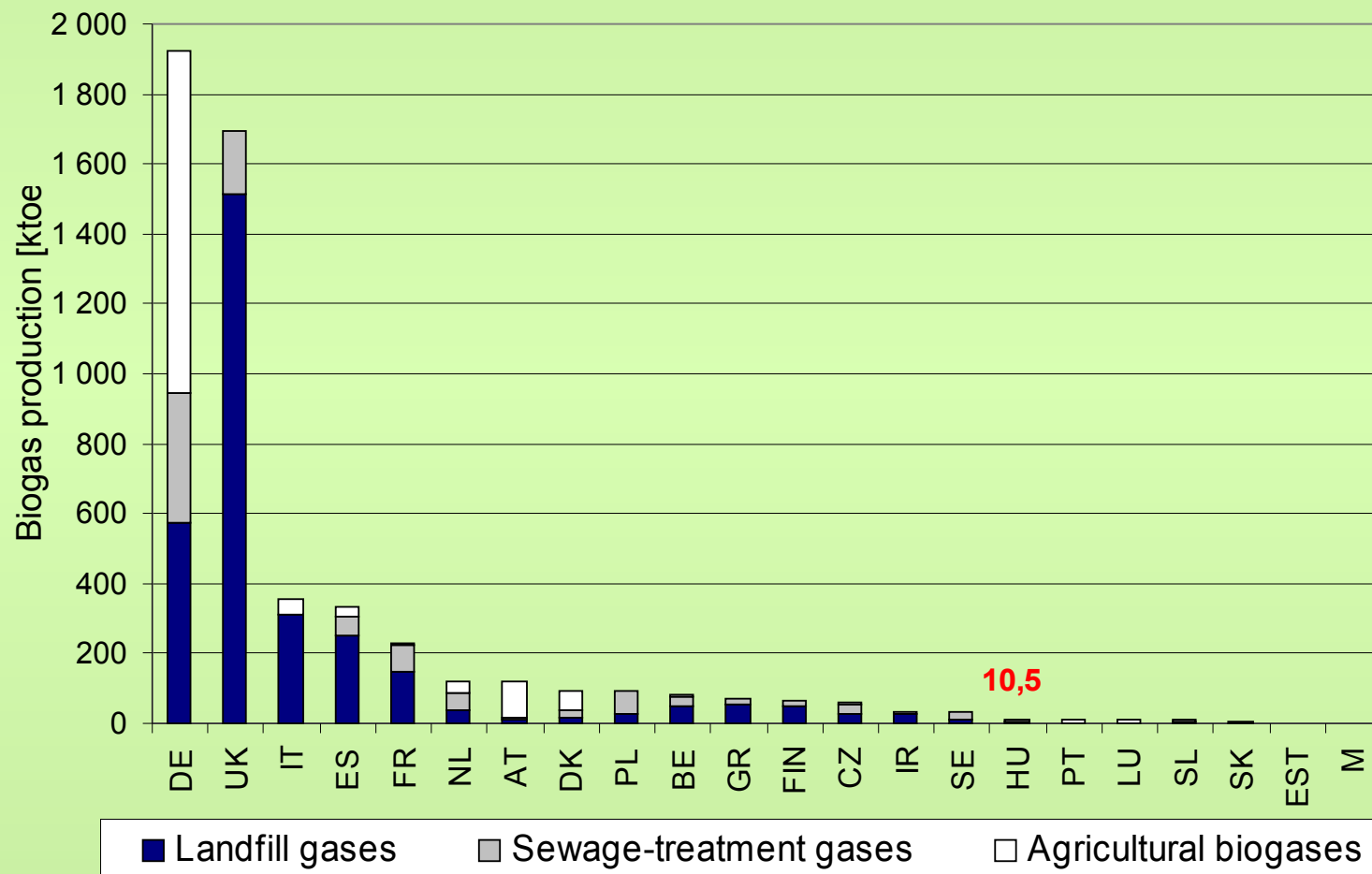
TPES from RES, 2005.



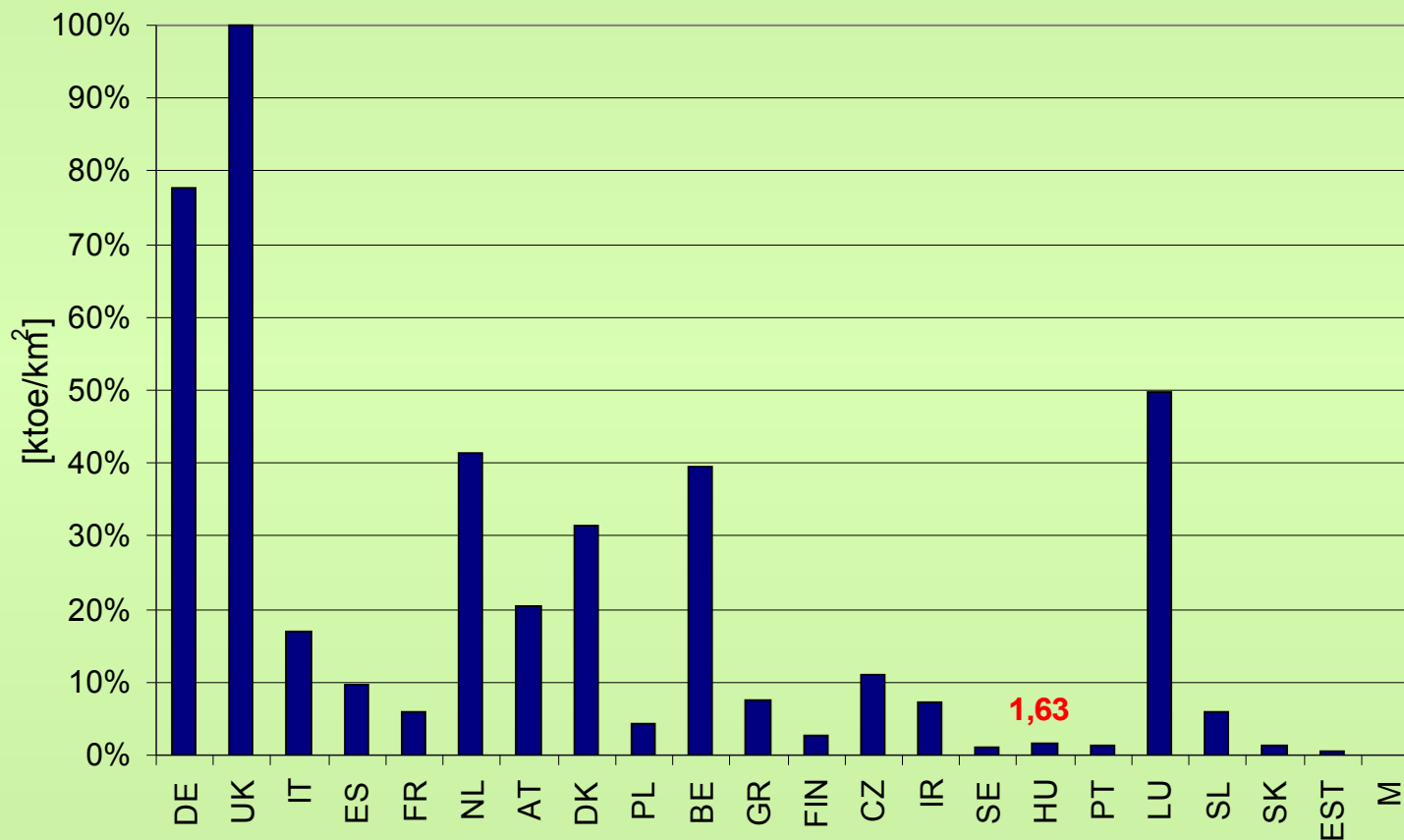
Source: IEA, 2008.



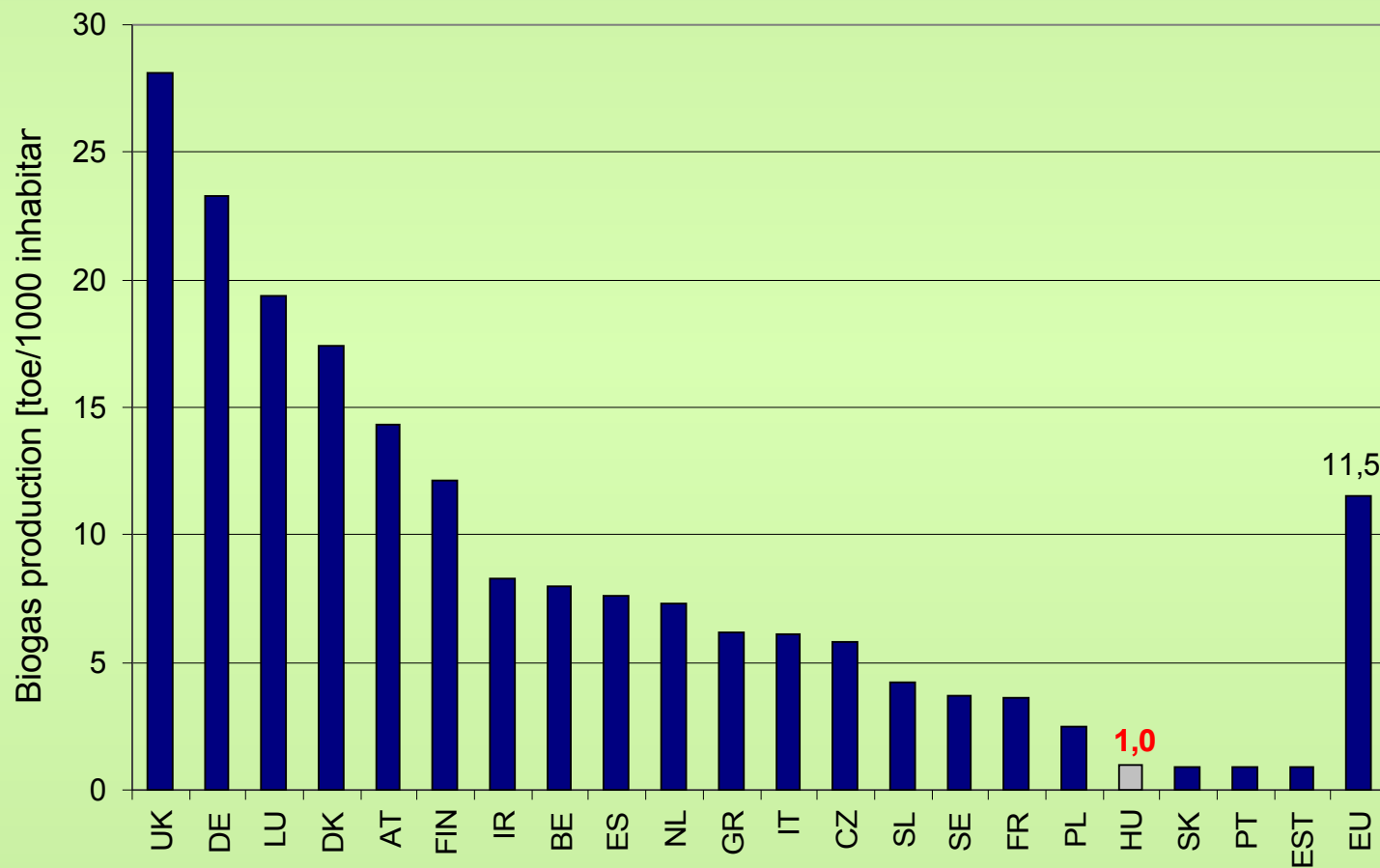
Biogas Production [ktoe], 2006.



Biogas Production [ktoe/km²], 2006.



Biogas Production [toe/1000 inhabitants], 2006.



Typical Feedstock

- **Sewage water** in municipal sewage treatment plants
(approx. 10...20 plants)
- **Organic wastes** in landfill/deposits plants
(no authentic data)
- **Several digesting agriculture wastes** in biogas plants
(4 operating plants)



Sewage-treatment gases

- 522 communal sewage treatment plants
- 145 of them larger plants (>10.000 inhabitants)
- 2 of them in Budapest (~1.8 million inhabitants)
- **BUT: 55 % of total in criticizable conditions!**
- Biogas systems just in 10...20 plants
- Local utilization only, some of them CHP
- No correct and up-to-date statistic



Plant in Szeged



A case-study: Budapest, Southern Plant, 2001.



Comment: no detailed technical information



Landfill gases

- 3154 settlements in Hungary
- ~2600 community dumps
- **BUT: just ~50 dumps in suitable conditions!**
- Most of them has biogas systems
- Primarily environmental protection aims
- A few local utilization only
- No correct and up-to-date statistic



A case-study: Debrecen, 2007.

- A closed down dump with 5,2 million tons waste
- Aim: disposal of landfill gas
- 119 wells and PE gathering network
- Sucking compressor with 800 m³/h performance
- Gas chromatograph
- 3 (+1 stand-by) flaming torches



The construction of the dump in Debrecen



A case-study: Hodmezovasarhely, 2007.

- Waste from 26 settlements with 115 thousands inhabitants
- An operating dump with 650 thousands tons waste
- Energetic and environmental protection purposes
- 17 wells and PE gathering network
- ~100 m³/h biogas (50-51 % methane)
- No information about gas processing
- A local biogas power plant with 160 kW output
- Licensing process: 18 month



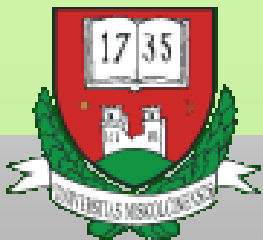
Agricultural biogases

- Agriculture is a point of impact in EU
- Agriculture is a key issue in Hungary
- Plenty of unregulated and unsolved matters in Hungary
- Ownership, subsidy, legislation, ...
- Strong indigenous and foreign interests for arable lands
- Mainly political, partly economic question



Agricultural biogases

- Operating biogas plants:
 - Nyirbator, from 2003
 - Kenderes – Banhalma, from September 2007
 - Klarafalva, from November 2007
 - Palhalma, from January 2008
- Lots of plans and a few facts



A case-study: Nyirbator, 2003.

- The 1st agrarian biogas project in Hungary
- Owner: a large multifunctional agricultural undertaking
- Plant cultivation: corn, maize, sunflower, medick
- Animal husbandry and processing: cattle and poultry
- Farm „mixed” raw material
 - 29 % livestock manure
 - 39 % animal waste
 - 13 % primary product of plant cultivation
 - 19 % secondary product of plant cultivation and waste



A case-study: Nyirbator (Equipments)

- 2 mixing tanks [600 m³]
- 6 mesophil fermenters [8000 m³, 38 °C, 18 days]
- 6 thermophil fermenters [9000 m³, 55 °C, 22 days]
- 4 manure tanks [9000 m³]
- 2 gas storages [2000 m³]
- 1 sewage treatment tank [50 m³]
- 4 power plants [2600 kWh]



A case-study: Nyirbator (Facts and figures)

Gas processing:

drying, filtering, air blowing and adding $\text{Fe}(\text{OH})_2$ against H_2S

Operating data:

- 110.000 tons/year raw material
- 17.000-20.000 m^3/d biogas
- 2600 kWh electricity

Total investment costs: 8,6 million euros



A case-study: Nyirbator



Summary and conclusions in May 2008

- Biogas in Hungary in initial stage
- Mainly environmental business, no energetic one
- Just a few operating biogas plants
- There are plans, intentions, wishes,
- Lost of work to do

„Today the biogas business in Hungary no calculable and no planable.” (Zoltan Ekes entrepreneur, December 2007)



Thank you for your kind attention!

