



Optimal use of biogas from waste streams

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CE Delft

- Independent research and consultancy since 1978
- Transport, energy and resources
- Know-how on economics, technology and policy issues
- 50 employees, based in Delft, the Netherlands
- Not-for-profit



Clients



Industries
(Small and medium
size enterprises,
trade associations)



Governments
(European Commission,
European Parliament,
regional and local governments)



NGOs

The project

Client: DG Energy

Main aim: to provide input and technical assistance to

1. The review of the 2020 renewable energy directive (RED)
2. The proposals for the follow-up policy for 2030.

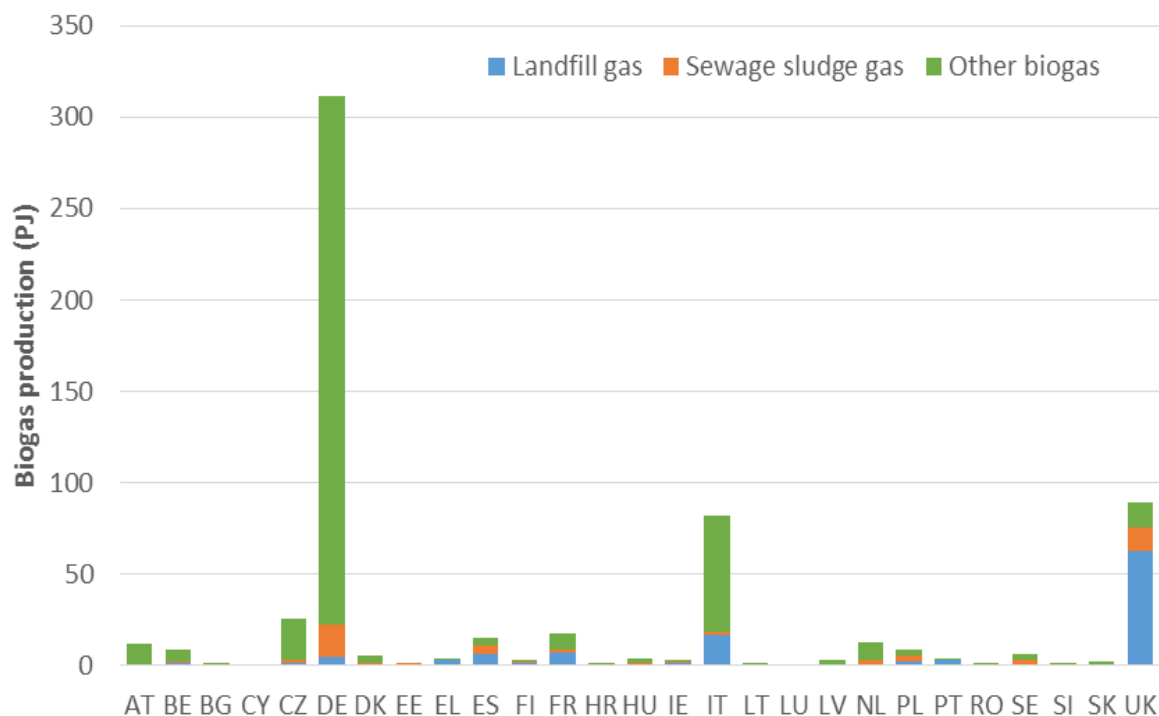
Main deliverables:

- An **up-to-date overview** of current biogas en biomethaan production and use, and the EU potentials for 2020 and 2030
- An estimate of the **potential contribution** of biogas and biomethane to EU goals for climate and renewable energy **until 2030**
- An overview of current **barriers for biogas and biomethane growth**
- An analyse of **policy options** to remove these barriers.

Projectteam: CE Delft, eclareon, Wageningen University

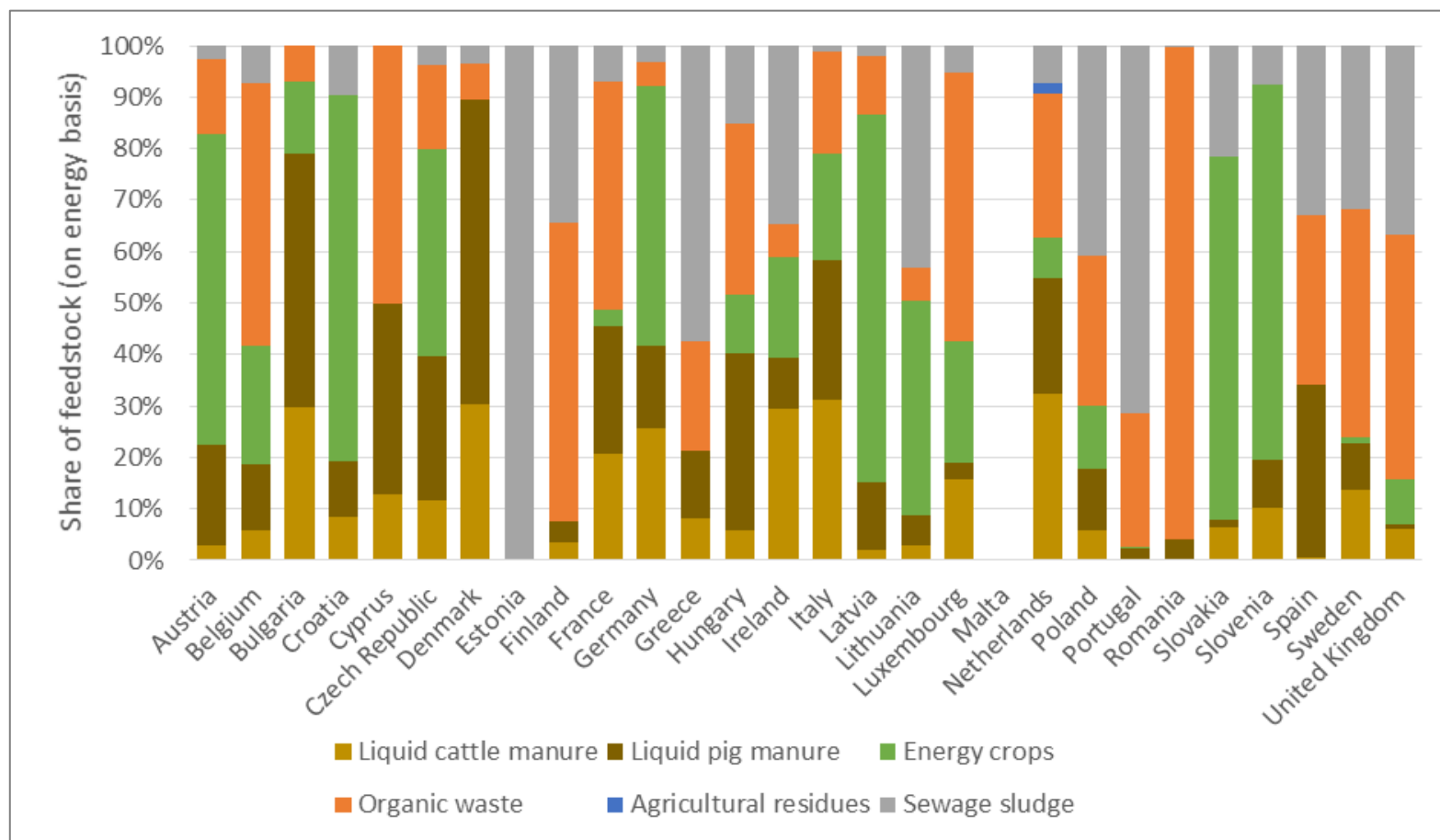
Current status biogas/biomethane

- 7,6% of the total renewable energy in the EU (15 Mtoe)
- Total production of Germany, UK and Italy: > 77% of the EU total
- Mostly from anaerobic digestion, of manure and maize





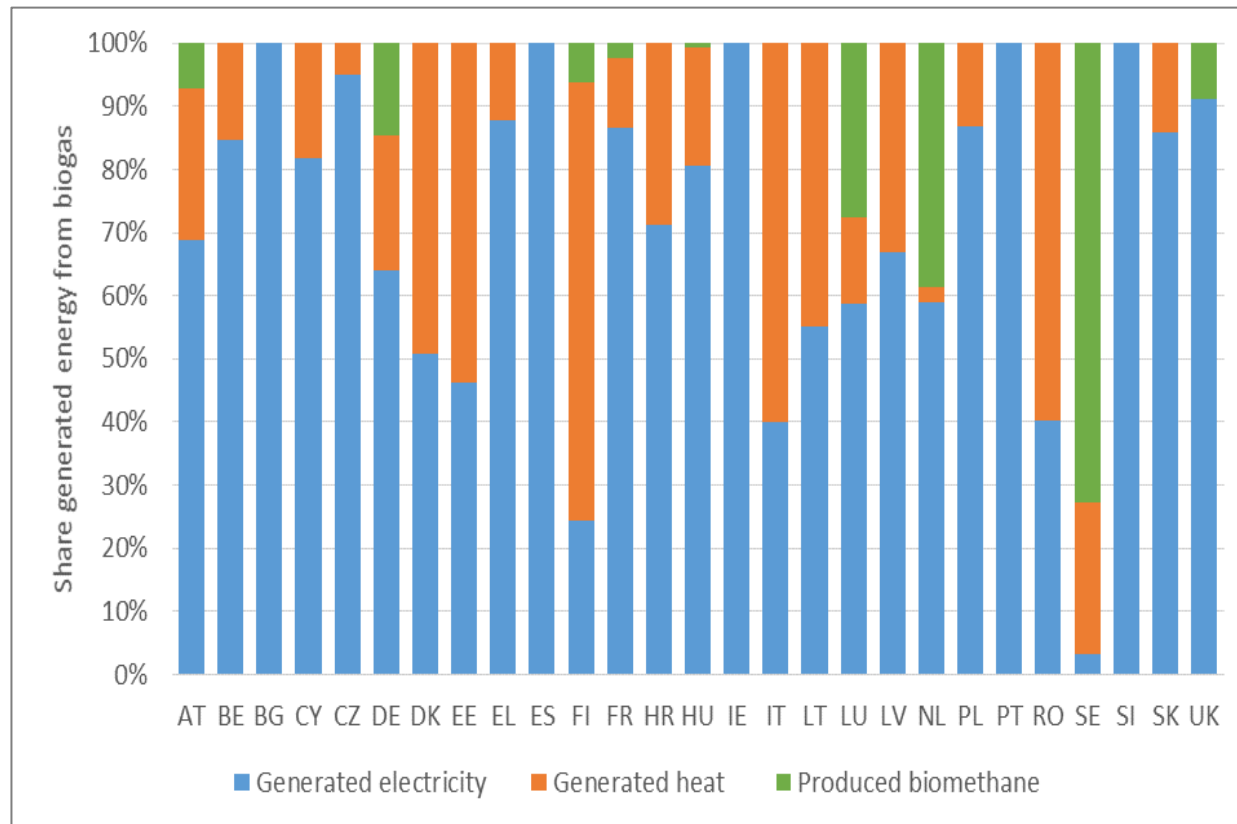
Current feedstock for biogas production



Current biogas use (2014)



Mainly for electricity production, but also for heat and transport



Key drivers

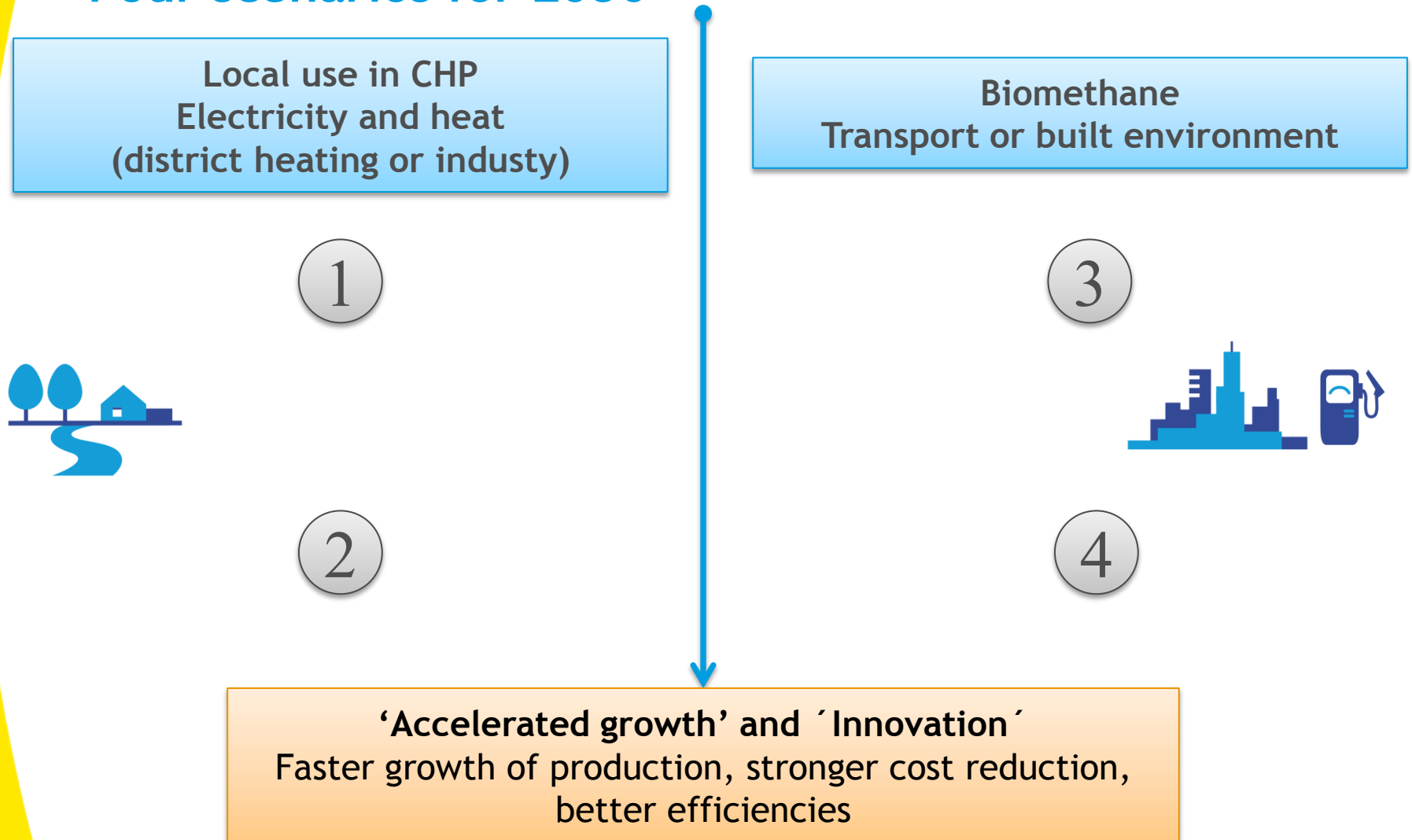
- Existence, stability and reliability of the policy framework and support scheme(s)
- National targets and goals
 - GHG reduction, renewable energy or biogas/biomethane specific targets
- Feedstock potential or availability of feedstock
- Stakeholder efforts
- Also
 - growing confidence in biomethane technology (the United Kingdom),
 - regions with poor electricity and high unemployment rate (France),
 - large customer demand for green gas (Ireland)

Key barriers for growth

In all sectors and throughout the EU:

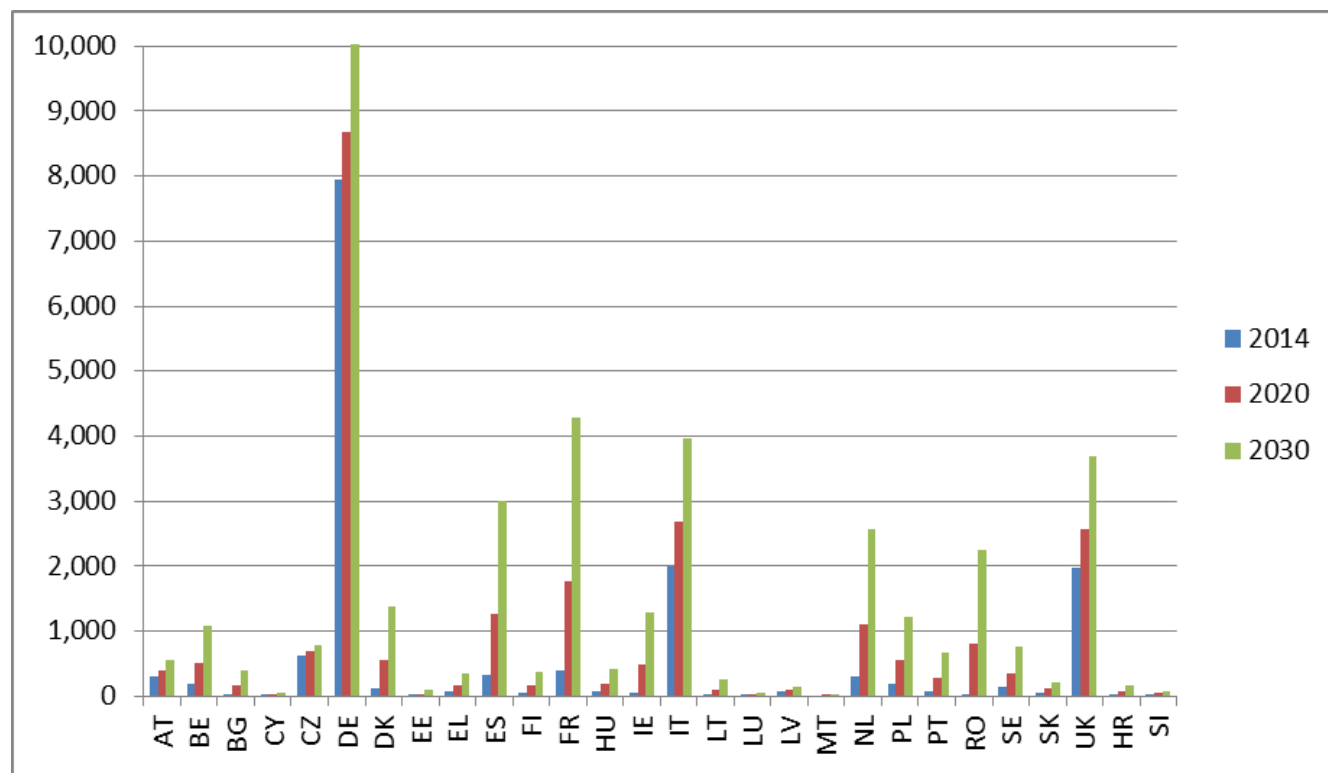
- Lack of a policy framework and support schemes, their instability and/or unreliability.
 - Revision of the existing support schemes in some Member States and lack of support schemes, especially in heat and transport sectors, in a variety of Member States
- Access to finance, especially in the electricity and heat markets
- In transport: lack of EU and/or national goals, policy uncertainty (ILUC), mass balancing rules related issues, negative perception and low public awareness
- Regulations related to the treatment of biogas by-products
- Access to suitable waste streams
- Lack of expertise and stakeholder efforts (in immature markets)

Four scenarios for 2030





Potential biogas growth - Innovation scenarios (ktoe)

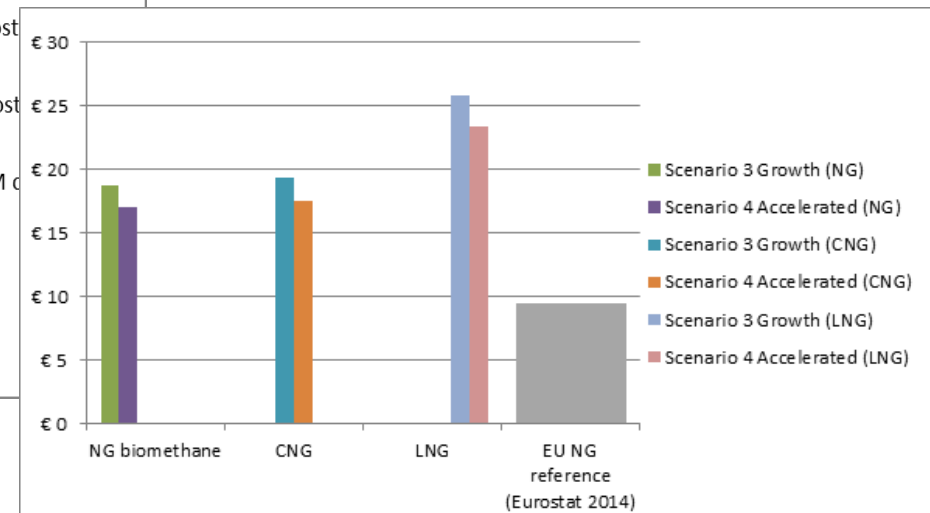
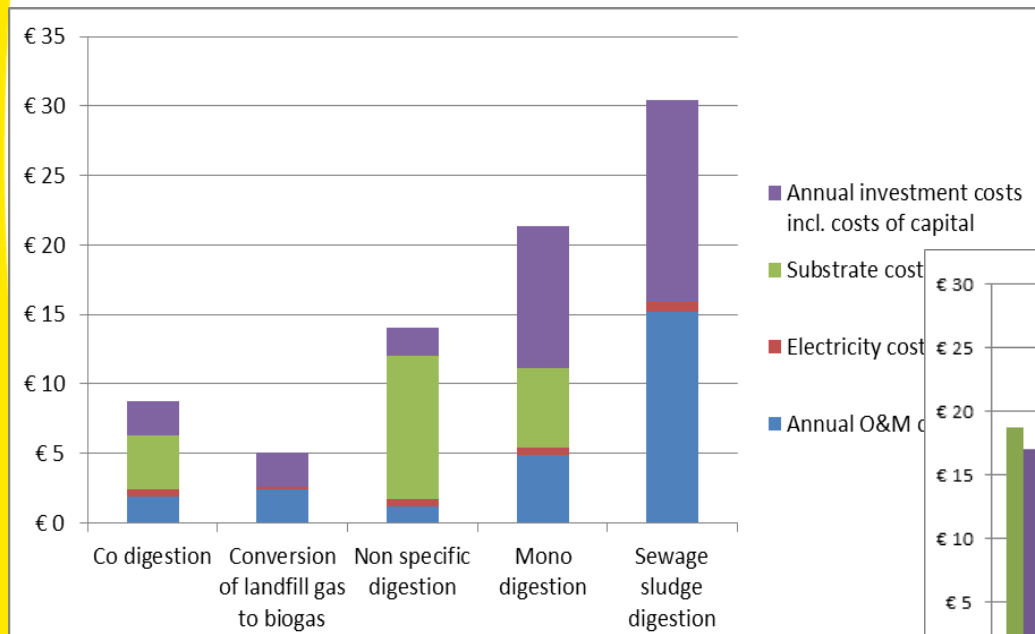


NB. Maize is only used in co-digestion with manure, mass ratio at least 80% manure and 20% maize



Cost

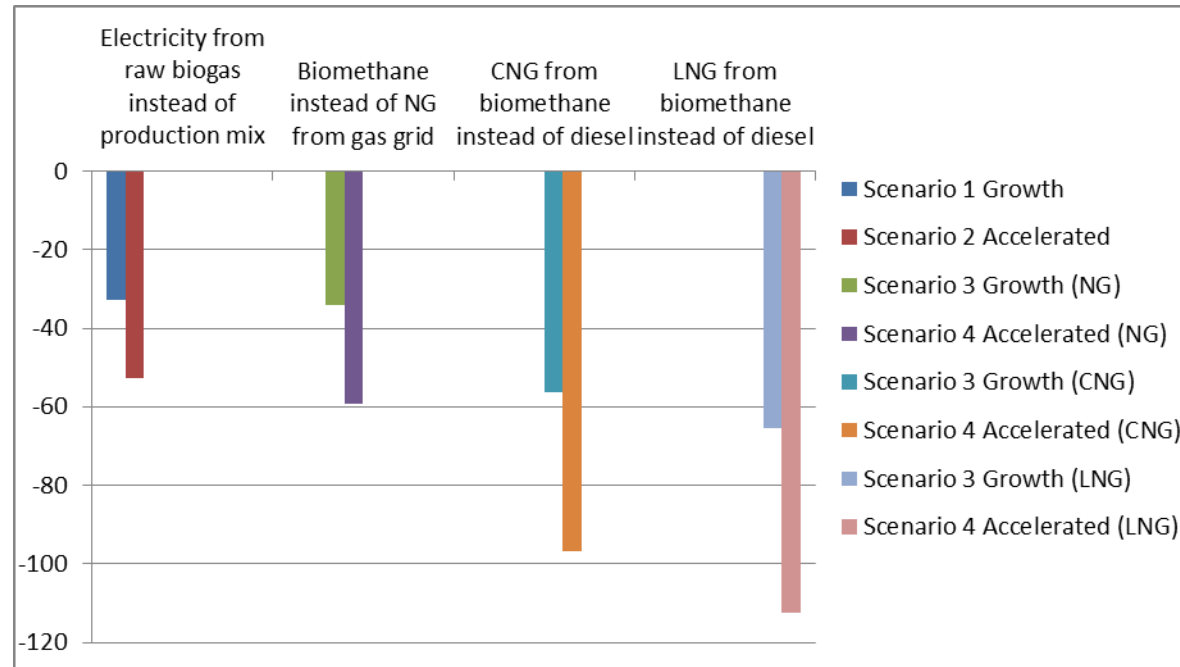
- Production cost vary, on average about 12 to 14 €/GJ biogas
- Use in CHP: 1.8 tot 2.5 times the cost of natural gas
- Total cost of scenarios 3 and 4 in 2030: 5.7 to 7.7 billion Euro





Greenhouse gas reduction depends on use

GHG reduction in 2030, in MtCO_2_{eq}



GHG reduction of CHP limited because we assume that:

- The average electricity mix is replaced
- Only 25% of the heat is used (current practice)

Main policy recommendations - EU



- Realisation of the existing biogas potential requires stable and effective policies, and a favourable long term outlook.
 - Climate and renewable energy goals
 - Sustainability criteria for biogas and biomethane
 - Harmonisation of co-generation regulations
- Enforce waste regulations (collection of organic waste, avoid land fill)
- Promote use of the heat produced in CHP
- To increase biomethane volumes:
 - Ensure access to gas grid, incl. standards and data transfer, infrastructure
 - Develop a system of Guarantees of Origin for biomethane, to promote trade
- Let Member States decide where the biogas is used



Policy recommendations - for Member States

- Develop a national strategy and future outlook for biogas and biomethane
 - Map feedstock availability
 - Assess and compare the different end-use options
- Convert the strategy into concrete targets for 2030 and beyond, and implement stable and effective policies to meet these targets
 - Focus on use of existing waste streams
 - Long term policies/financial support needed for an attractive business case
- Implement adequate flanking policies, such as
 - Support for CHPs and heat utilisation
 - Valuation of electricity production in times of low wind and solar
 - Support for CNG/LNG fuelling infrastructure and vehicles,
 - etc.

Thank you!

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