

Biomethane market dynamics & framework conditions in Europe (the project GreenMeUp)

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GreenMeUp is a Horizon Europe project to facilitate the wider market uptake of biomethane in the EU



Fostering **biomethane production** in Member States with less-developed market rates



Increasing **social acceptance** and awareness through science-based evidence

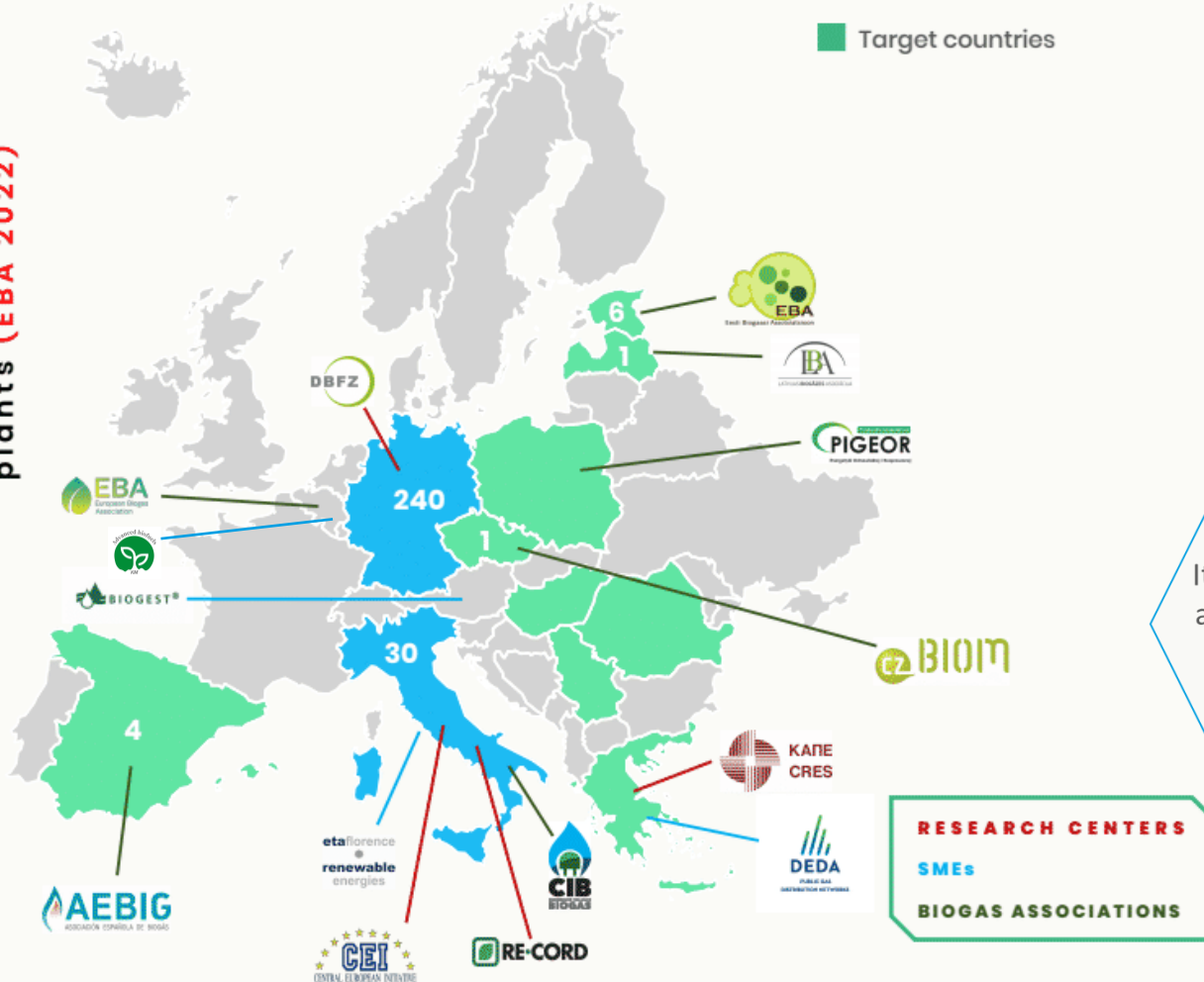


Designing a set of **market uptake** measures for biomethane deployment

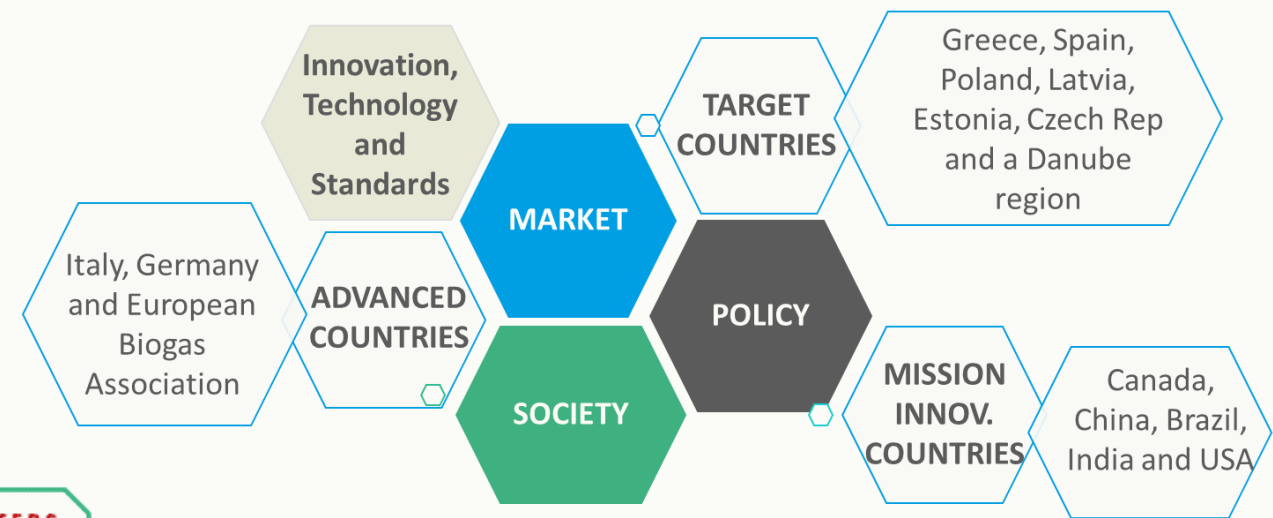
Consortium

Number of biomethane plants (EBA 2022)

- Advanced countries
- Target countries



Aligned in three pillars: **Market, Policy and Society** that run throughout **Geographic and country-relevant specificities in Europe and beyond** (Advanced and Target European countries, Mission Innovation countries), tackling also **innovation and standardization** issues.



Objective: to identify the biomethane market dynamics & framework conditions in Europe

Present the **status of biomethane market** in each country

Identify, list and describe the **production routes**

Identify the **regulatory framework and supportive policies**



Benefit from Country Specific Analysis of Biomethane Market in:
EU: AT, DK, FR, DE, IT, NL, NO, SE and UK.
M.I: Brazil, Canada, China, India, USA.



Good practices from the 10 advanced countries

Vision and targets

Direct investment and production support

- Feed-in Tariffs
- Feed-in Premiums
- Contract of Difference
- Investment subsidies

Indirect production support

- Regulatory incentives
- Financial incentives

Demand-side incentives

- Tax incentives
- Quota system
- Public procurement rules

Market access enabling regulation

- *Injection into networks*
 - Right to inject
 - Cost-sharing mechanism
 - Continuity of injection all-year round
- *Trade: GO or CoO system and registry*

Current situation in the target countries

CZECH REPUBLIC



- 603 biogas plants (417 agricultural, 95 sewage-based, 66 landfills, 17 using industrial wastes and 8 plants using municipal solid waste)
- 8 biomethane plants, 12 GWh of biomethane
- **2030 target: 1.2 bcm of biomethane**
- **Direct investment and production support:** Investment supports for the construction of biogas plants and shortly for biogas upgrading to biomethane plants. Operating support – green bonus for
- **Demand-side incentives:** Power Purchase Agreement for ‘green gas’ purchase –yet not attractive
- **Market access enabling regulations:** on conditions to connect the NG grid, on reporting the biomethane produced, GoO

ESTONIA



- 17 biogas plants, mostly agricultural feedstocks (83% from grass lands, 9.8 agricultural wastes and the rest MSW and landfill)
- 7 biomethane plants +2 new plants
- 2030 target: 1 TWh of biomethane
- NECP in place
- **Direct investment and production support:** for RE acceleration reform, increasing biogas production and deployment, energy efficiency in small residential buildings, integrate RE in the grid, subsidies for transport and non-transport uses.
- **Indirect production support:** for innovative technologies (liquefaction, CO2 upgrading, power-to gas, etc)
- **Demand side incentives** for transportation uses
- **Market access enabling regulations:** Certification, Guaranties of Origin

GREECE



- 69 biogas plants (58 agricultural, 7 from landfill, 1 municipal waste, 3 sewage sludge)
- No biomethane plants
- 2030 target: 1.5 TWh of biomethane
- NECP in place
- **Direct investment and production support:** for RE investments
- **Market access enabling regulations:** for enabling biomethane injection and trade

LATVIA



- 49 biogas plants (91% from manure)
- 1 biomethane plant producing biomethane for own transportation use
- 2030 target: 1.56 PJ of biomethane
- NECP in place



POLAND



- 381 biogas plants (18,8% wastes from distilleries, 16.4% manure, agriresidues,
- No biomethane plants
- **2030 target: 0.7 – 1 bcm of biomethane**
- NECP in place
- **Direct support schemes:** European funds, Regional Operation Programmes, Green certification scheme
- **Demand side incentives:** zero excise duties for CNG/biomethane, LNG, H2 for transport
- **Market access enabling regulations:** Definition of alternative fuels / ecomobility, technical and regulatory conditions for access into the gas grid for enabling biomethane injection and trade

SPAIN



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- 255 biogas plants (55 agricultural/livestock, 80 WWTP, 80 Municipal wastes, 50 municipal wastes and 40 other)
- 7 biomethane plants (2 municipal wastes, 4 agricultural/livestock, 1 WWTP)
- 2030 target: 10% of biomethane over gas consumption
- NECP in place



DANUBE REGION (HUNGARY, ROMANIA, SERBIA)

HUNGARY

- 78 biogas plants
(55% agricultural/livestock, 31% Sewage, 13.7% landfill)
- 2 biomethane plants
- 2030 target: 0,5-0,6 bcm
- NECP in place
- **Direct investment and production support:** only for biogas investments
- **Market access enabling regulations:** technical and regulatory conditions for access into the gas grid for enabling biomethane injection and trade

SERBIA

- 35 biogas plants (agricultural/livestock, WWTP),
- No biomethane 2030
- Target: 87ktoe - NECP in preparation



Romania

- 16 biogas plants
(agricultural/livestock, WWTP)
- No biomethane plants
- 2030 target:
- No NECP in place
- **Direct investment and production support:** for biogas investments
- **Market access enabling regulations:** definitions of biogas/biomethane, technical and regulatory conditions for access into the gas grid for enabling biomethane injection and trade



Current situation (1/2)

The biomethane market

- Among the Target countries, **Czech Republic and Estonia are leading the way, along with Spain.** In Czech Republic 8 plants are in operation by the beginning of 2024, producing 12 GWh, having a capacity of 372 m³/h of biomethane. In Spain another 7 biomethane plants are operating
- Apart from the biomethane plants, another 603 biogas plants are in operation showing the huge biomethane potential of the country. In Estonia on the contrary to all countries, only 17 biogas plants are operating, however the 7 of which are producing biomethane, and another one is currently under a start-up process. Moreover, in Estonia 28 CNG filling stations, 2 LNG filling stations and 5 grid injection points on distribution network grids are built facilitating thus the use of biomethane in the transport sector mainly.

The production routes and end uses

- Production routes mainly refer to agricultural resources (manure and agricultural residues), with municipal wastes holding a lower share. Biomethane plants in all countries are mostly agricultural ones and prospects show that this trend will continue until 2030 and beyond.
- All target countries have in place gas infrastructure and storage,
- In most of the target countries the main existing of foreseen use is in transportation and to a lesser content for power and heat.



Current situation (2/2)

The regulatory framework and supportive policies

- The existence, stability and reliability of targeted policy and financial support is considered as the number one enabler, regardless of whether they already have a mature biogas/biomethane market in place or not. Dedicated national targets are also identified as an important driver for the sector, as is the year-round availability of suitable feedstocks
- The policy and regulatory framework is still limited in all countries, consisting mainly of the National Energy and Climate Plans (NESPs) and adjustments of the REPowerEU.
- Production-side direct investment supports is the usual supporting system in almost all target countries. Demand-side supports exist in Estonia that has a robust biomethane roadmap with identified strategies and has set mixing obligations to fuel companies which has created a demanding market for GOs.

Conclusions

Barriers (1/3)

The national policies / regulatory framework

- The absence of well-defined roadmaps outlining planned regulatory and legislative changes, along with short, medium-, and long-term biomethane production targets, creates uncertainty and risks hindering the country's ability to achieve EU targets.
- National goals regarding biogas/biomethane production lack ambition and are non-binding, which diminishes their effectiveness as incentives.
- Full transposition of RED II into national legislation is pending in most countries
- Long licensing procedures

The available incentives

- Lack of incentives specifically supporting biomethane or biogas production, with only electricity production from biogas being subsidized
- Lack of incentives for biogas upgrading infrastructures and biomethane injection infrastructures
- Biomethane is not adequately promoted in the transport sector, primarily due to the absence of relevant legislation.

Conclusions

Barriers (2/3)

The feedstock availability

- Low biomass mobilization, due the fragmentation of the agricultural sector, characterized by numerous small farms. The fragmented availability of agricultural feedstock results in additional operational costs for potential producers who must collect feedstock from multiple sources (distances greater than 50 km are considered economically unviable).
- Insufficient biowaste management practices limit the utilization of available feedstock.
- There is a significant bureaucratic burden associated with using feedstock mixtures for biogas production.
- Non-fixed short-term contracts with feedstock providers are prevalent, leading to financial challenges for plants when suppliers fail to deliver substrates.

Conclusions

Barriers (3/3)

Connection to the grid

- Challenges related to oxygen volume limits ($\leq 0.02\%$ for international pipelines) may arise when connecting to the transmission system. In the distribution system, the limiting factor is consumption capacity.
- The connection process to the gas grid is costly, with no existing incentives for biomethane producers.
- Underdeveloped natural gas grid system with low access to biomethane producers. Support for connection installation is lacking. Lack of adequate CNG filling stations

Trading systems

- Lack of certification mechanism or national registry for biogas/biomethane. Uncertainty exists regarding the accounting of injected biomethane.
- Digestate, which could be treated into valuable fertilizer does not have enough market opportunities and is mostly given back to substrate suppliers for free.
- Long-term profitability is still under a big question mark.

Societal

- Lack of society awareness on the importance, potential environmental and economic impact of plants



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Thank you!

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