GREENMEUP

Enhancing the uptake of biomethane in Europe

Aligning the deployment
of biomethane in EU Member States

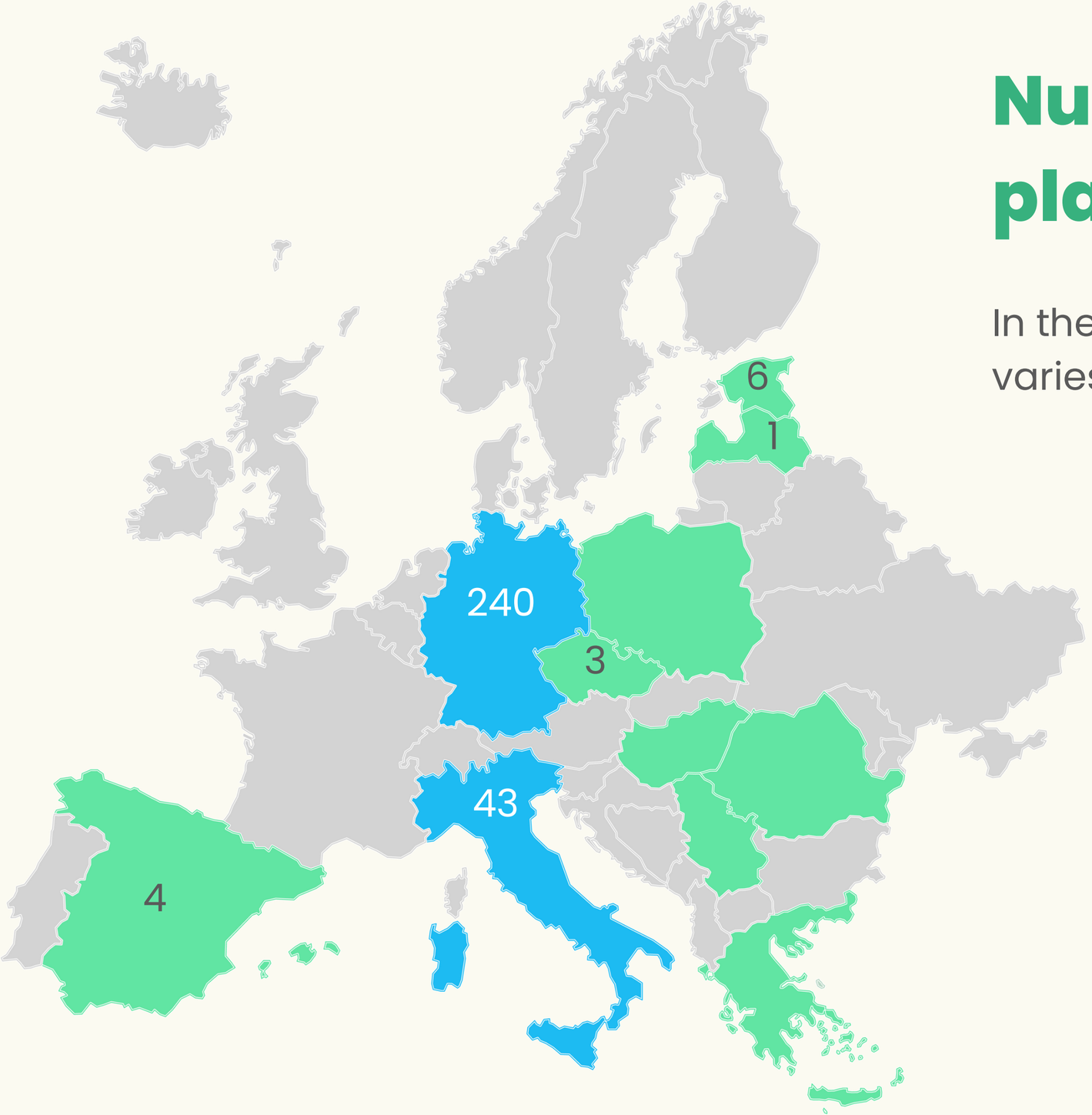
Funded by
the European Union

Biomethane is a key renewable energy source for the **decarbonisation** of EU

It reduces EU's reliance on natural gas imports

It can be transported and distributed through the existing gas infrastructure

It contributes to the circular bioeconomy enabling the reuse of residues and waste



Number of biomethane plants in the EU

In the EU, biomethane production varies among member states:

Advanced countries have higher levels of biomethane production

Target countries have lower levels of biomethane production

GreenMeUp aims at aligning the deployment of biomethane across Europe.

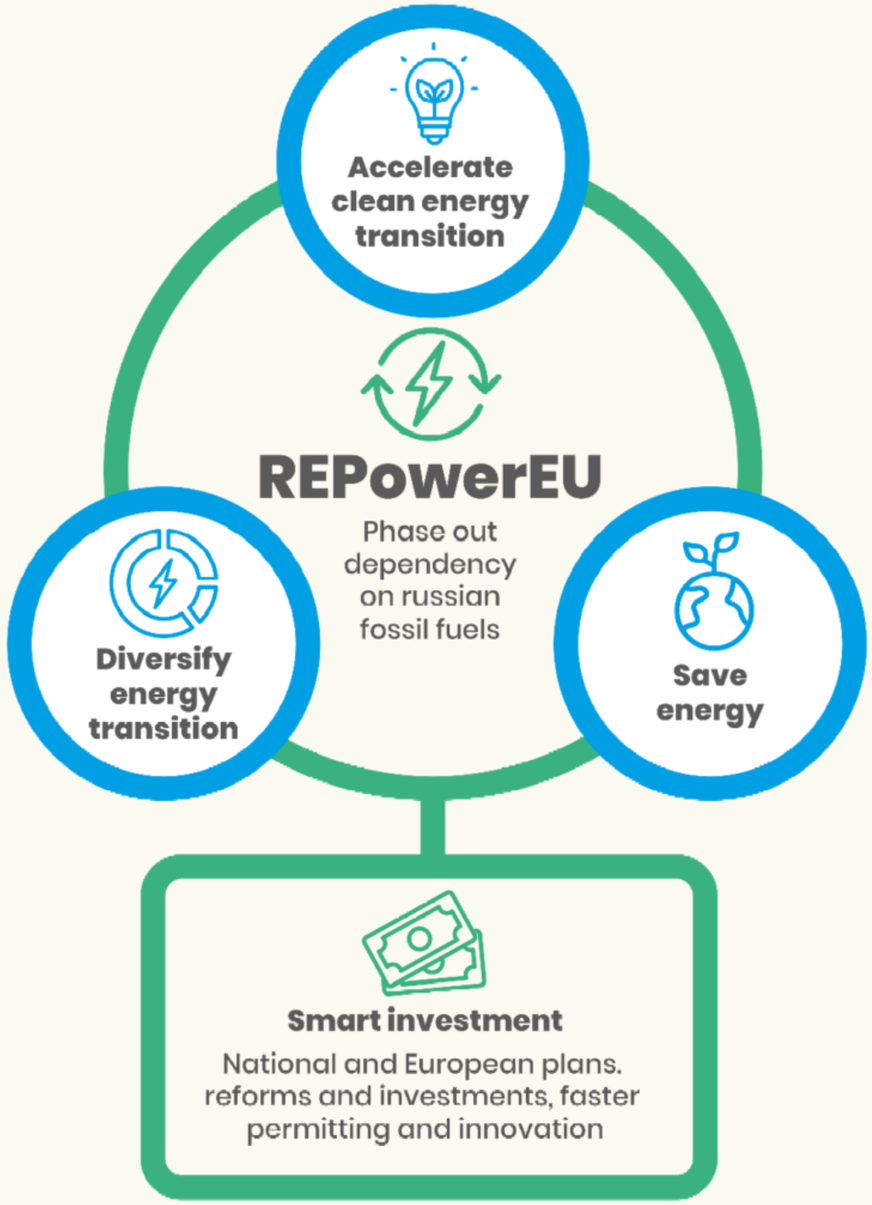
- Target countries
- Advanced countries

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



GreenMeUp will contribute to achieving the REPowerEU targets

Diversify energy transition

Diversify energy imports: enhancing the use of bioCH4 in the transport sector.

Accelerate clean energy transition

Scale up biomethane: design of market uptake policy measures and improvement of existing biomethane legislation.

Partners

GREENMEUP

GreenMeUp is carried out by a consortium of:

15 partners

from 10 European Countries including SMEs, research organizations and Biogas associations.

КАПЕ CRES
aebig
CIB CONSORZIO ITALIANO BIOGAS
DBFZ
EBA Eesti Biogaasi Assotsiatsioon
CEI CENTRAL EUROPEAN INITIATIVE
Polska Izba Gospodarcza PIGEOR Energetyki Odnawialnej i Rozproszonej
EBA European Biogas Association
Advanced biofuels KM
BIOGEST®
CZ BIOM CZECH BIOMASS ASSOCIATION
DEDA PUBLIC GAS DISTRIBUTION NETWORKS
etaflorence renewable energies
LBA LATVIJAS BIOGĀZES ASOCIĀCIJA
RE·CORD

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European Biogas Association

The voice of renewable gas in Europe

An overview on biomethane deployment in Europe

Biomethane dynamics in emerging biomethane markets

Green Me Up webinar - 18 January 2024

Angela Sainz Arnau, EBA Communication Director

sainz@europeanbiogas.eu

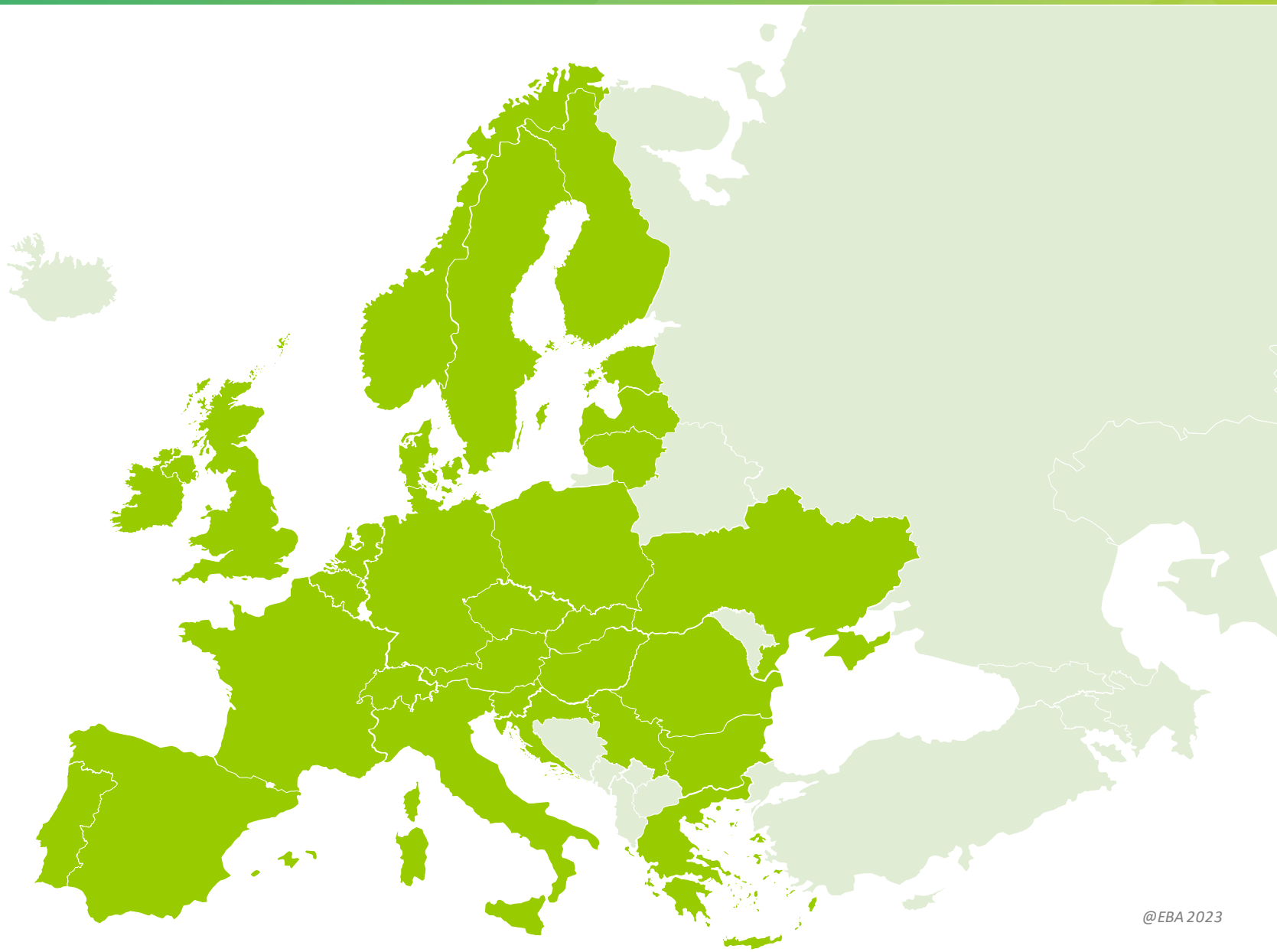
EBA: the voice of biogas and biomethane in Europe

46

National Associations

from 28 countries

in Europe



EBA members operate across the whole biogases value chain

+300 companies:

Plant operators
Technology providers
DSOs and TSOs
Feedstock suppliers
EPC contractors
Consultants
Financers
Producers
Certifying bodies
Traders
Fertiliser producers
Heating sector
End users (transport, industry, power)
Project developers
Research institutes
Universities
Service providers

What we do in a nutshell

Pave the way for positive legislative developments impacting the biogases industry at European and national level

Enhance market intelligence, scientific evidence and innovation to ensure the scale-up of biogases in Europe

Promote better understanding on the production and use of biogases, as well as their benefits for our society

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Biogases production volumes in 2022

Billions spent on EU energy crisis in 2022

Protection of EU consumers (2021-2022)

€ 195 billion

> 230 temporary national measures

Fossil fuel subsidies

€ 123 billion

+ 120% relative to 2021 as crisis response

Gas imports

€ 316 billion

+ 148 % relative to 2021
1/2 of total energy imports bill

Renewables subsidies

€ 87 billion

+ 1% relative to 2021

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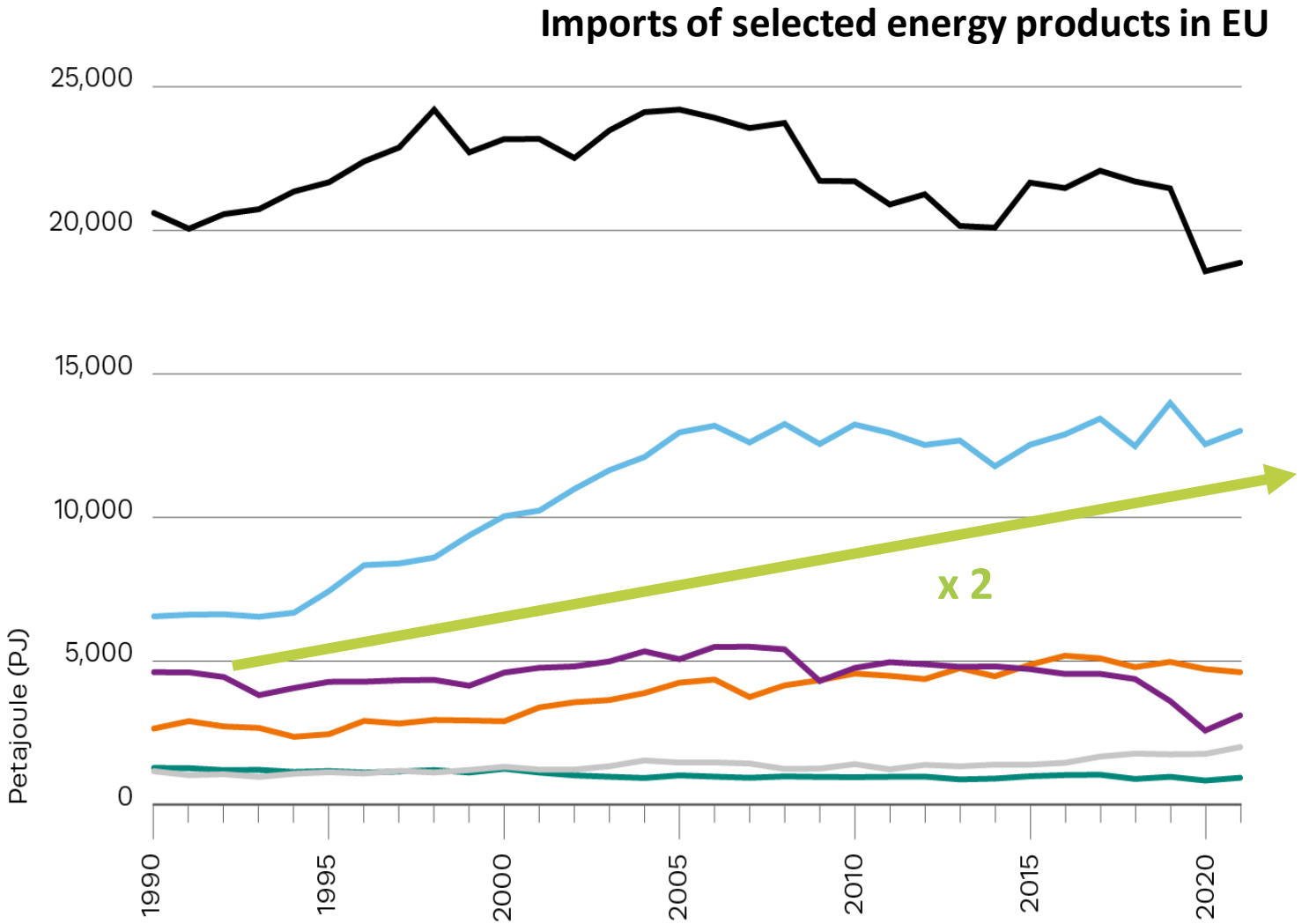
97% of EU natural gas consumption was imported

342 bcm

83% in 2021

> 90% in 20 MS

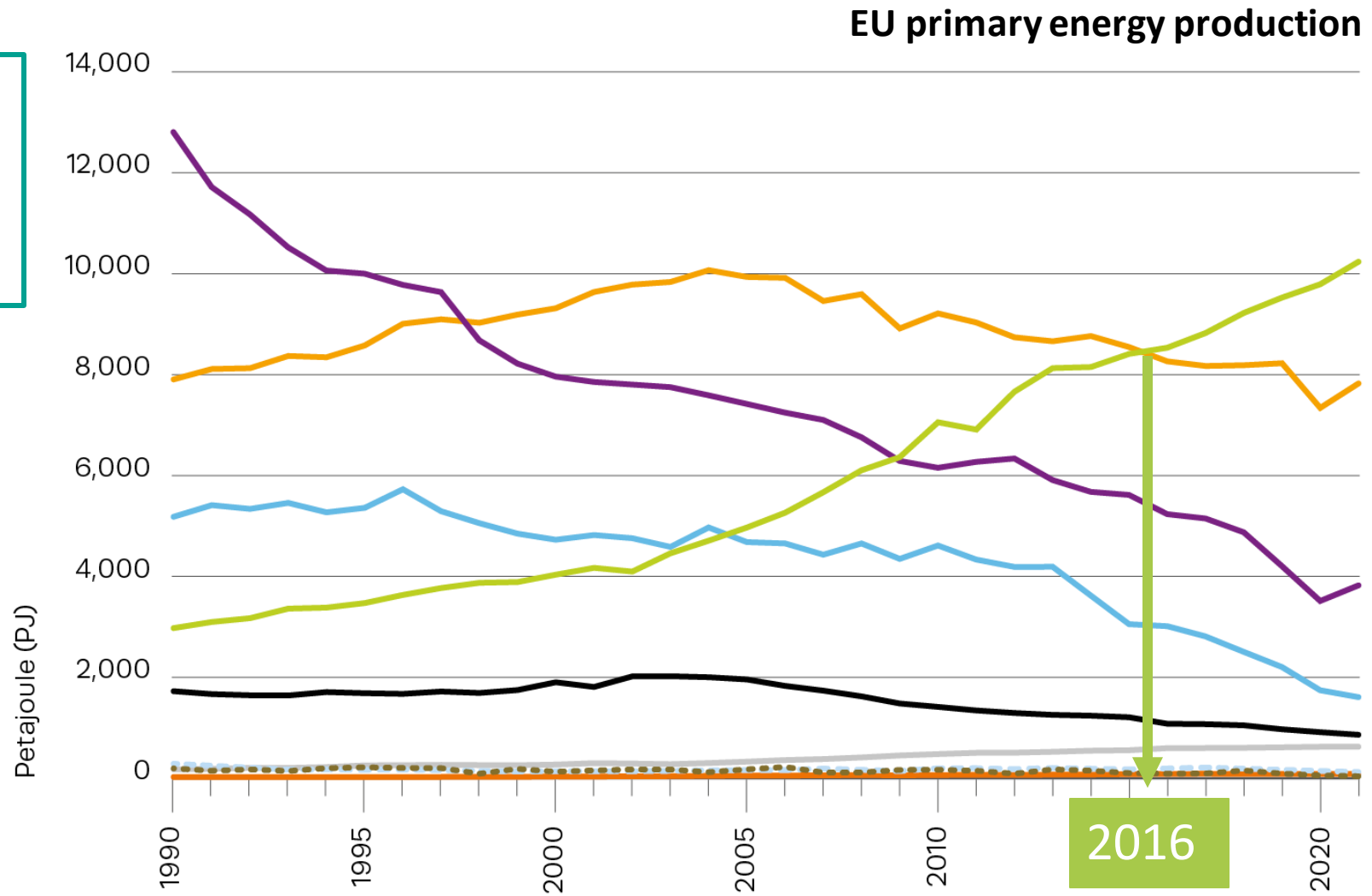


Source:
Eurostat (online data code: nrg_bal_c)

Renewables are EU's biggest energy producer

41% of energy from **renewables** in 2021

Long-term downward trend for most fuels



Source:
Eurostat (online data code: nrg_bal_c)

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Europe produced 21 bcm of biogases in 2022

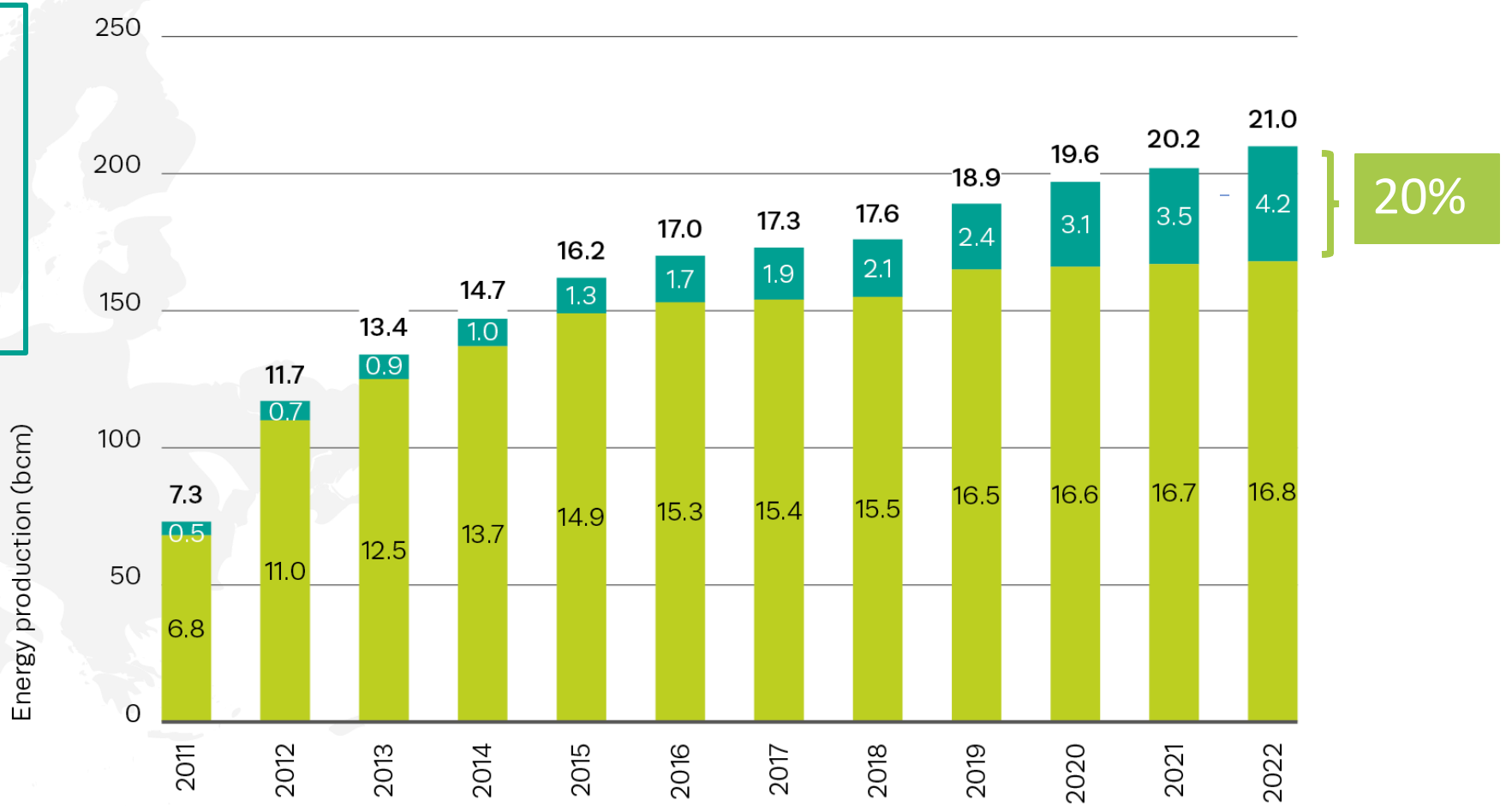
> gas demand of Poland

= 6% EU gas consumption

20% biogases upgraded

18 bcm produced in EU-27

Combined biomethane and biogas production in Europe



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18% more biomethane in Europe in 2022

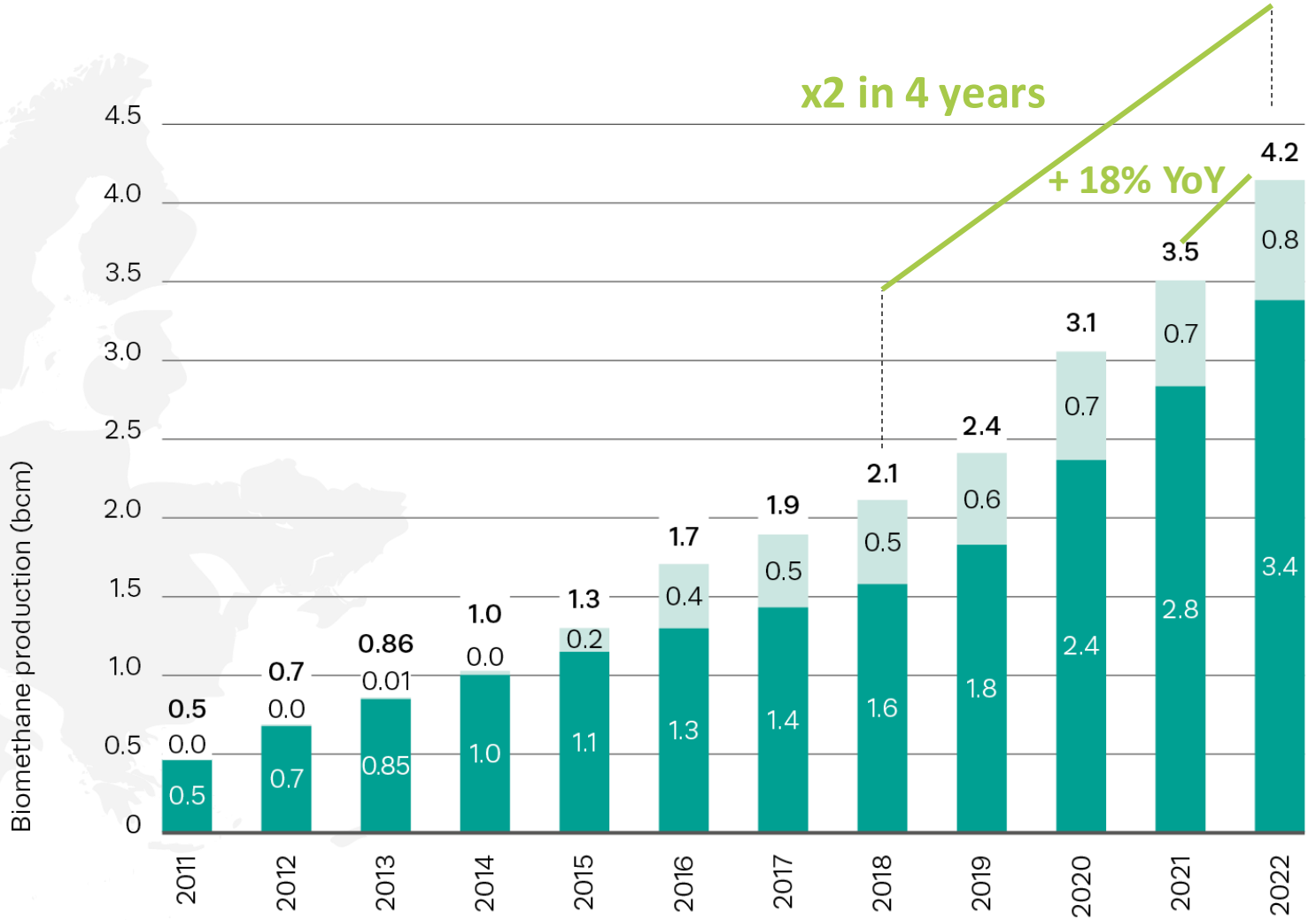
4.2 bcm (3.4 in EU-27)

4.5 bcm installed capacity

x2 production since 2018

France, Italy, Denmark, UK fastest growing countries

European biomethane production in EU-27 and Europe



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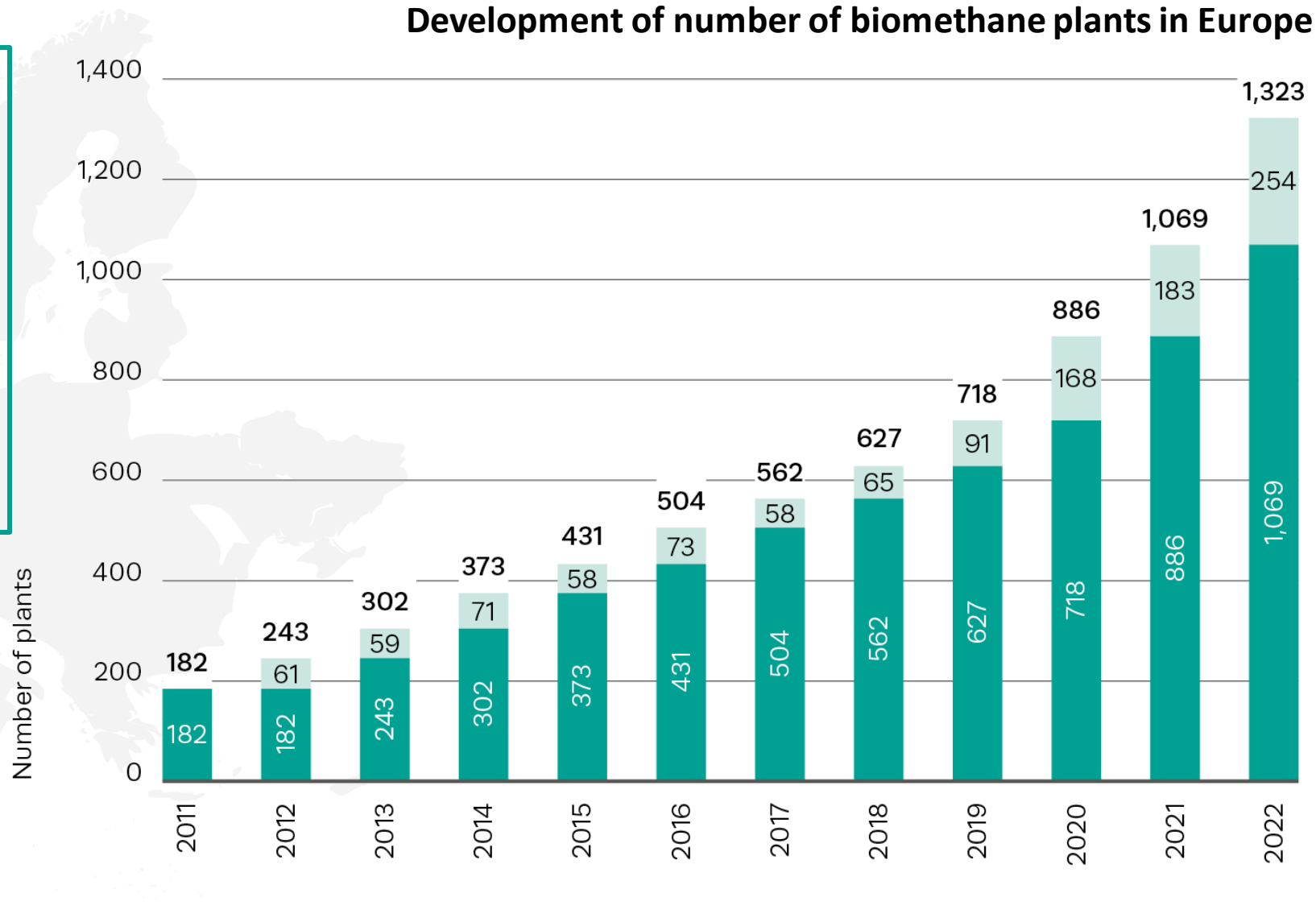
Record number of new biomethane plants in 2022

> 250 new plants
> 1,300 in Europe
(1,124 in EU-27)

24 producing countries

>75% plants **grid connected**, most to distribution grid



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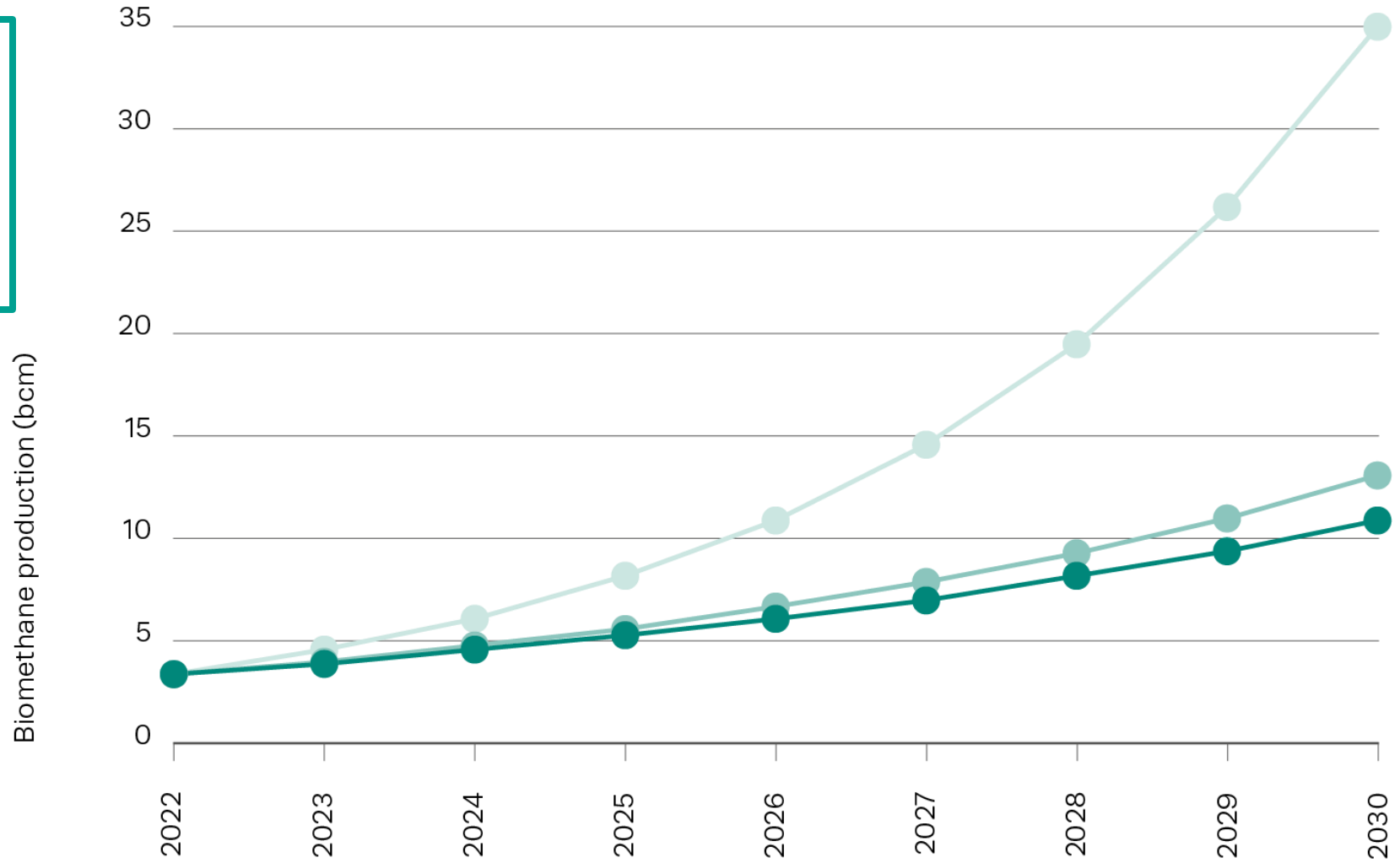
Achieving the 35 bcm target: growth rate and biomethane targets

30% annual growth required to reach 35 bcm

Achievable, but needs optimal market conditions

Current growth rate > 5-year average

Achieving the 35 bcm target: current growth rate version required growth



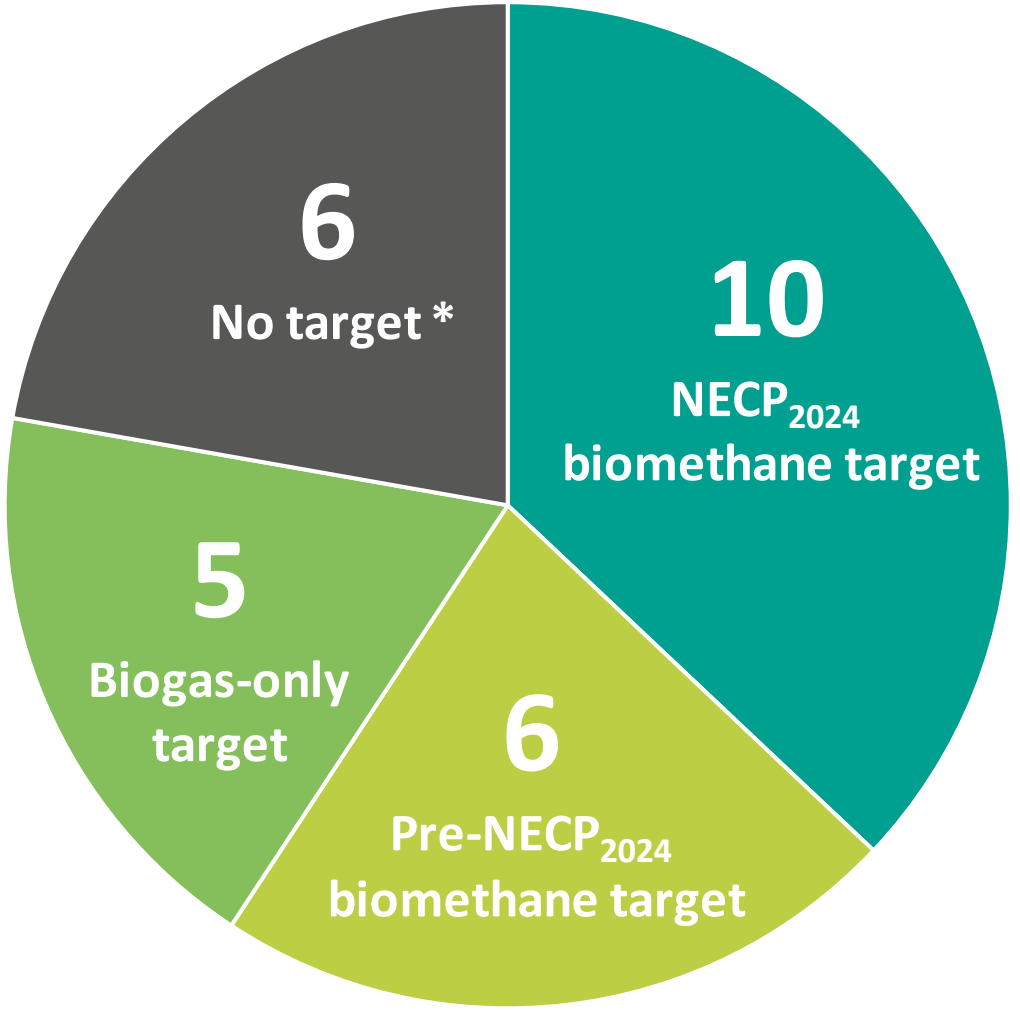
Biomethane targets per Member State

Governance of the Energy Union

Legal requirement to develop
National Energy and Climate Plans (NECPs)
to outline climate and energy goals

Expectations December 2022:
Guidance EC encourages including component on biogases and biomethane in NECP updates

June 2023: Deadline for NECPs update
November 2023: 22 NECPs submitted



* Belgium, Bulgaria, Germany, Hungary, Portugal, Romania

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22 draft updated NECPs are published

NECPs with 2030 biomethane target

Czechia	**0.5 bcm**
Denmark	**1.8 bcm** 100% green gas in grid
Estonia	**0.04 bcm** (380 GWh)
France	**4.15 bcm** (44 TWh)
Greece	**0.2 bcm** (2.1 TWh)
Italy	**5.7 bcm**
Lithuania	**0.13 bcm** (1.4 TWh)
Netherlands	**2 bcm**
Slovakia	**0.3 bcm**
Slovenia	**0.05 bcm** (480 GWh)
TOTAL	**15 bcm**

pre-NECP 2030 biomethane target (but no NECP target)

Austria	**0.39 bcm** (50% renewable gas target)
Finland	**0.38 bcm** (4 TWh)
Ireland	**0.58 bcm** (5.7 TWh)
Latvia	**0.09 bcm** (10% fossil natural gas)
Poland	**0.99 bcm** (50% renewable gas target)
Sweden	**0.94 bcm** (10 TWh)
TOTAL	**3.4 bcm**

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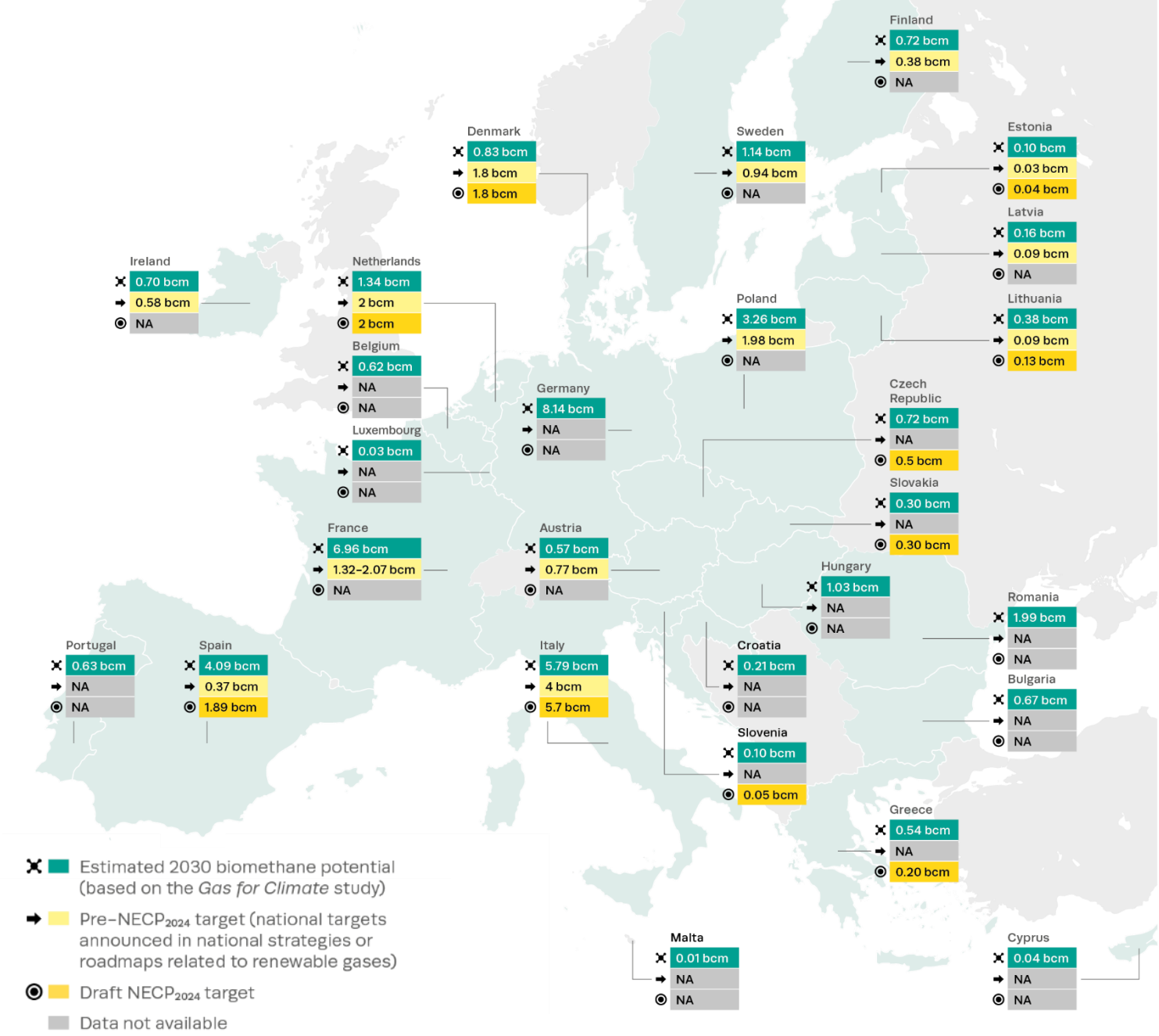
Anticipated 2030 biomethane production

Methodology

1. Draft updated $NECP_{2024}$ target
2. Pre-$NECP_{2024}$ target
3. Current production

20.2 bcm



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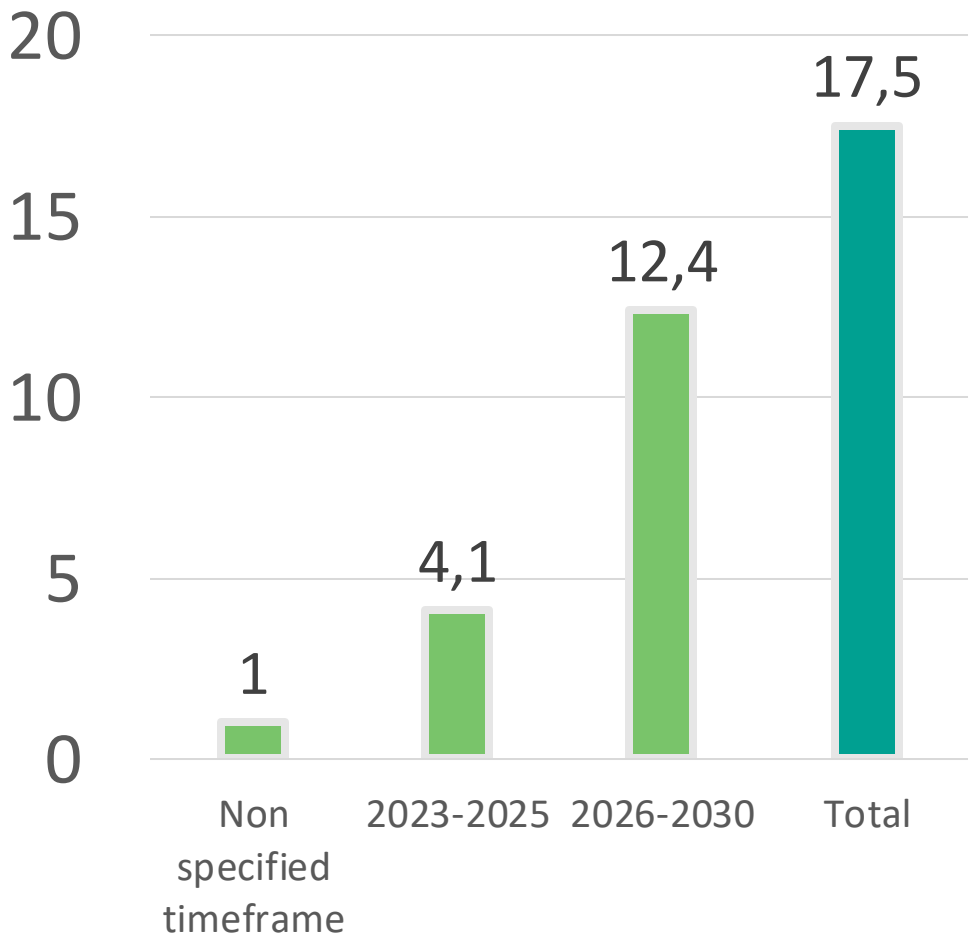
€ 18 billion investments for biomethane

1st EBA Investment Outlook for biomethane

Based on voluntary survey of investors

Almost 18 billion planned by end of 2030

Faster pace on 2nd half of this decade



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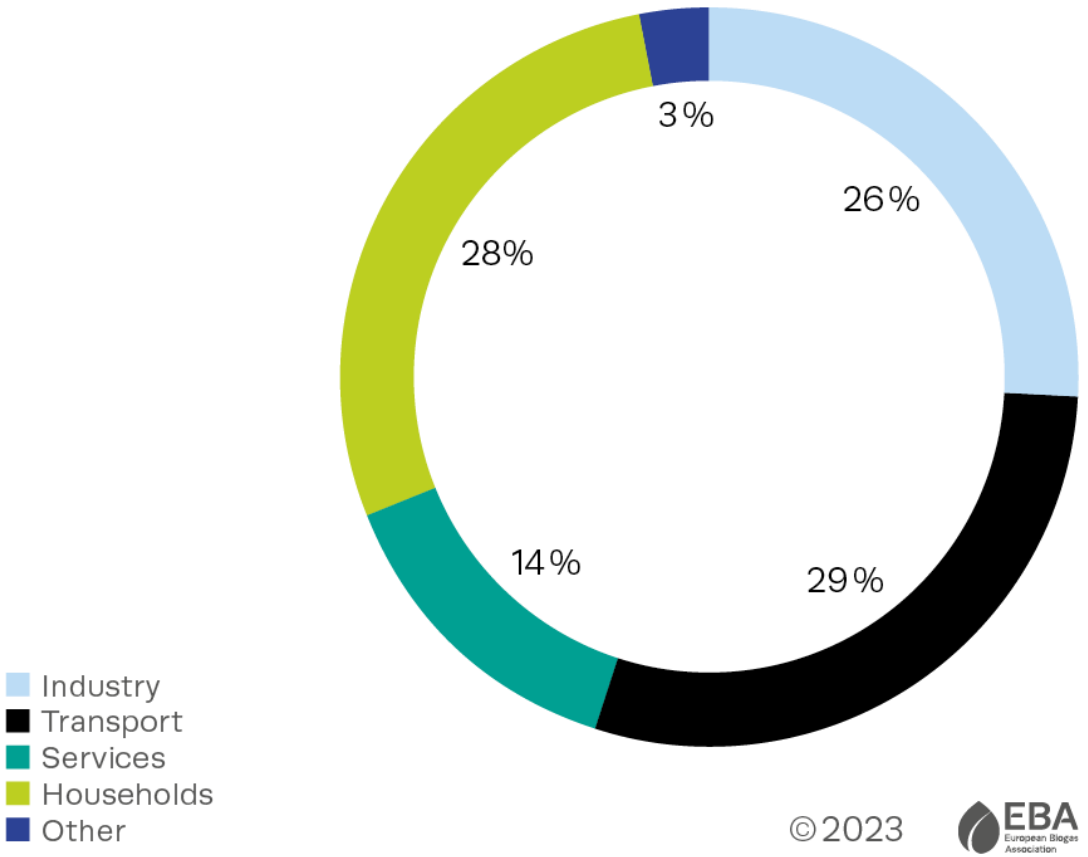
Uses of biogases

Final energy consumption by sector in EU

TOTAL CONSUMPTION
39,351 PJ (or 10,931 TWh)

Transport	**29%**
Households	**28%**
Industry	**26%**

Final energy consumption EU 2021



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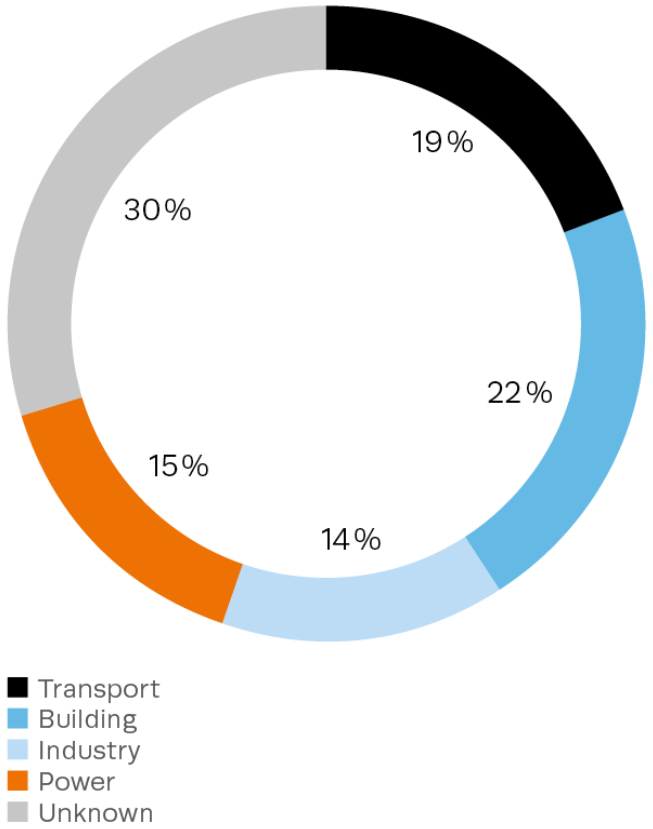
Biomethane: a versatile low-carbon fuel

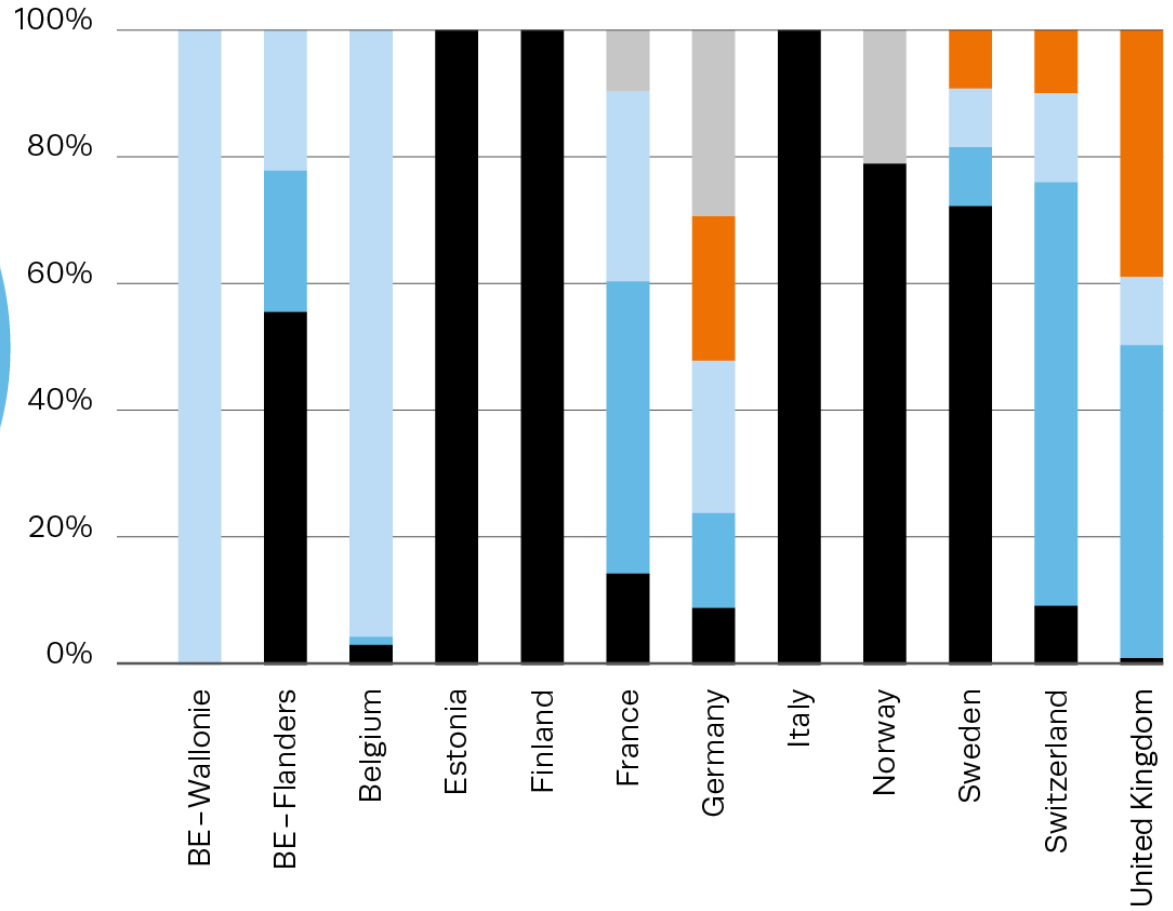
Percentage of biomethane used per sector overall and per country

End-uses depend on country

Transport

Heating or electricity





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Any questions?

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Biomethane dynamics in emerging European Markets – the case of Czech Republic

Prepared by:
Jan Habart (CZ Biom)

Date:
GreenMeUp webinar
18.01.2024

Funded by the European Union

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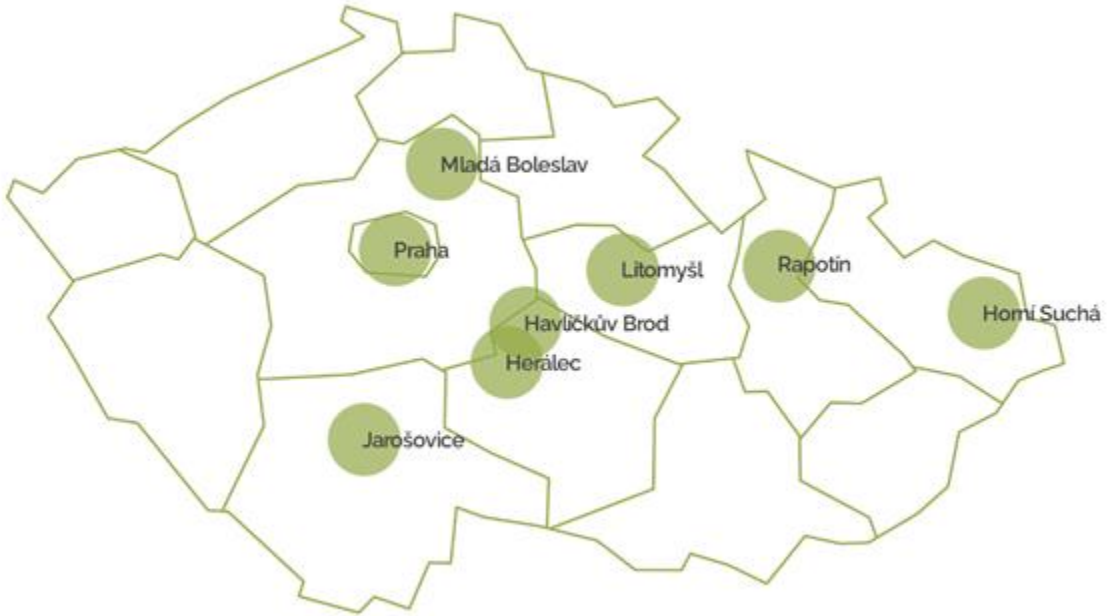
Current situation in Czech Republic



Biogas

- 603 biogas plants (417 argicultural, 95 sewage based, 66 landfill based plants…)
- Total amount of approx. 8 GWh of biogas

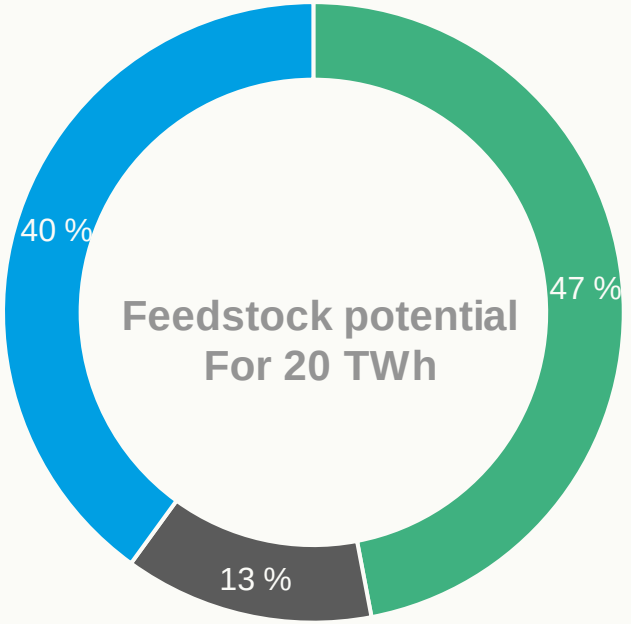
Biomethane

- 8 biomethane plants in operation
- Dozen plants under contruction

Current situation in Czech Republic

Feedstock potential for biomethane production:

- 47 % sustainable agricultural waste and residues
- 40 % rotation crops
- 13 % sewage sludge, biodegradable and gastro waste



Average Czech biogas plant: share of substrates in tons

- 46 % manure and slurry, 31 % corn, 17 % hay and GPS silage…

Future targets and how to aproach them

- Expected target according to REPowerEU for 2030 is 700 mil. m3
  - ✓ **OPEX (+ CAPEX) subsidy for biomethane**

- According to RED III – advanced biofuels in transportation at least 4,5 % (5,5 % with RFNBO)
  - ➢ **Create national strategic development plan**

- Usage of excess electricity from solars for production RFNBO biomethane
  - ➢ **OPEX subsidy needed**

Measures for the future market uptake of Czech Republic

- ✓ CAPEX subsidy – up to 85 % funding rate
- ✓ OPEX subsidy – successfully notificated – bonus for new BMP 40 EUR/MWh, upgraded BGP to BMP 30 EUR/MWh.
  - ➢ Equivalent price of gas for 2024 is 61 EUR/MWh => 1 MWh of biomethane would be 101 EUR for new BMS and 91 EUR for upgraded BGP to BMP
- ✓ National Register for Guarantees of Origin

Things to do:

- ❑ Cheaper GoO (now 38.50 EUR/MWh)
- ❑ Public acceptance of energy and sequence crops
- ❑ Biomethane injection to the mid-pressure gas network available also without adding fossil propane

Biomethane station in Herálec

- In operation since 7/2023
- 130 m^3/h biomethane
- Feedstock: grass haylage, cow manure, sugar cuttings…
- Produced biomethane is compressed to 250 bar and transported by truck to near public transport company

Final remarks

- ✓ Great biomethane potential with more than 400 agricultural biogas plants
- ✓ Already notified operational support for biomethane
- ✓ Ambitious targets
- ✓ Many biomethane experienced technology providers on market

Thank you!

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Biomethane dynamics in emerging European Markets – the case of Poland

Prepared by:
Klaudia Juga; Magda Rogulska

Date:
GreenMeUp webinar
18.01.2024

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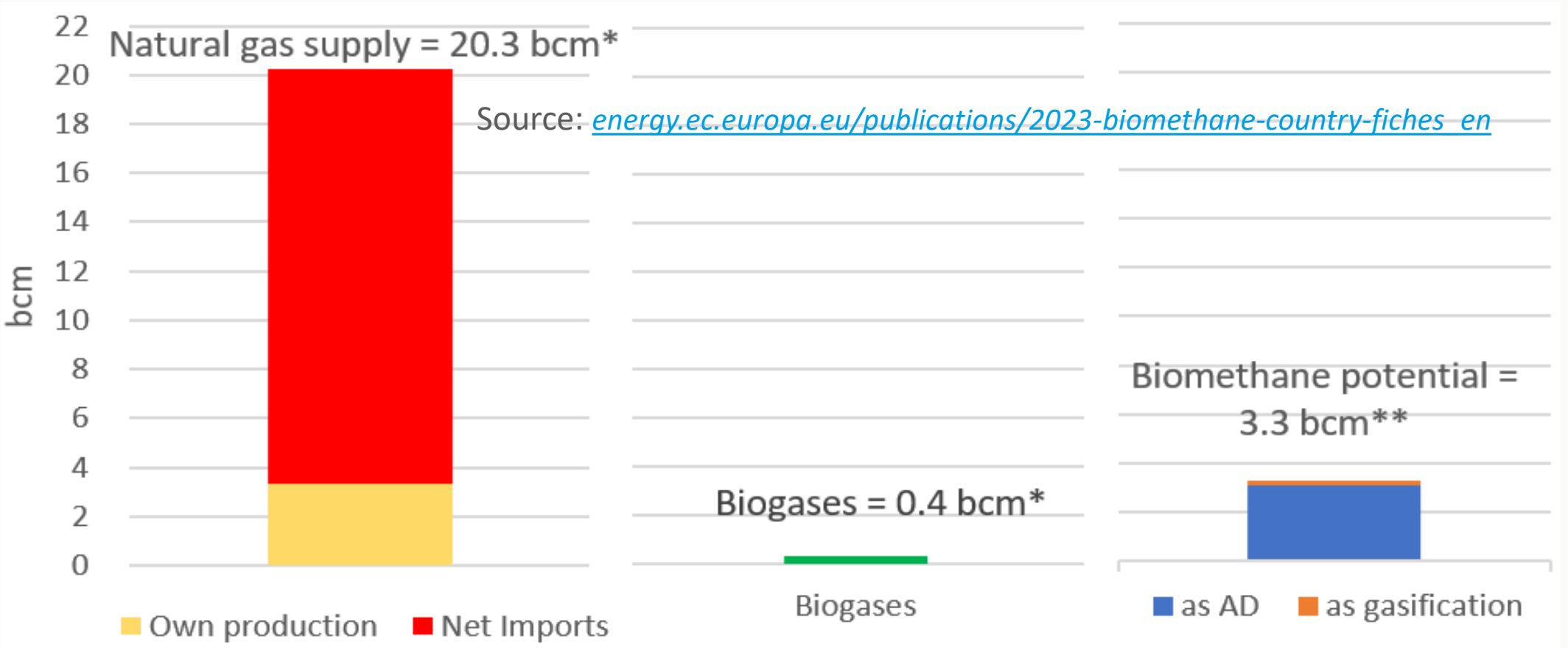
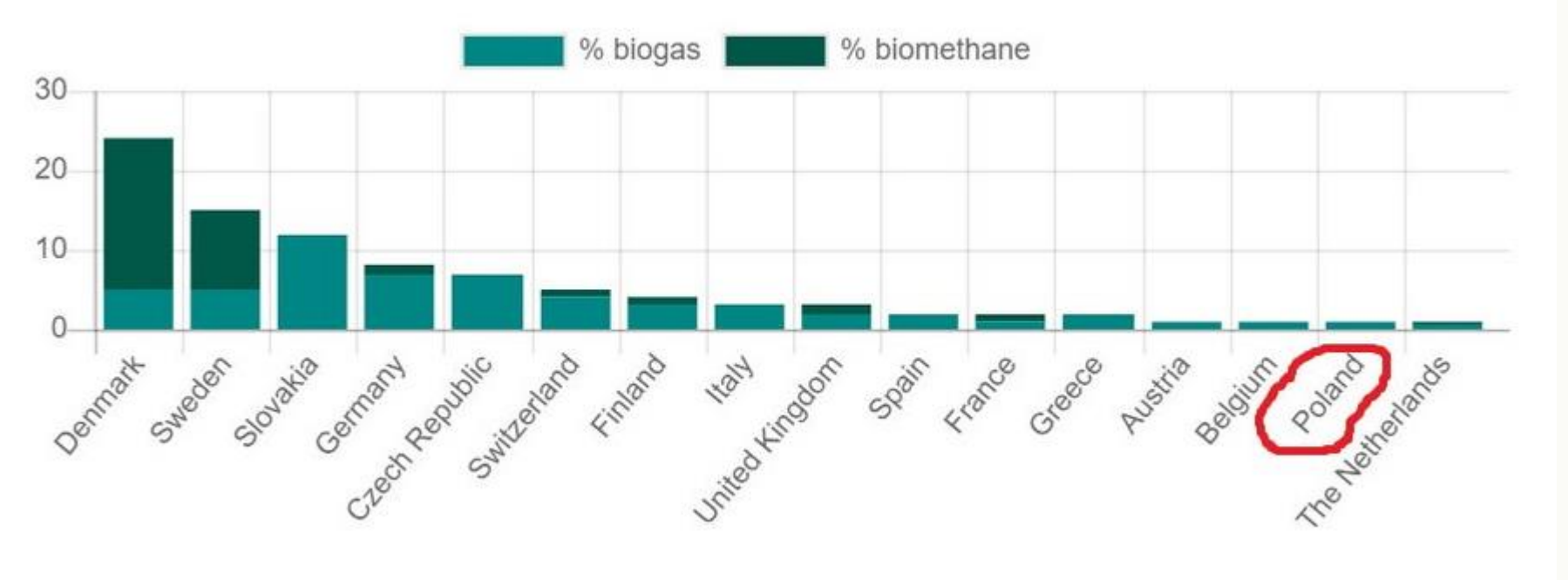
Current situation in Poland



Comparison of current natural gas supply, biomethane production and potential in Poland (2021) (sources: Eurostat: Energy Balances, 2022; Guidehouse: Gas for Climate Report 2022**)*

Current situation in Poland

Source: *EBA Statistical Report 2022*

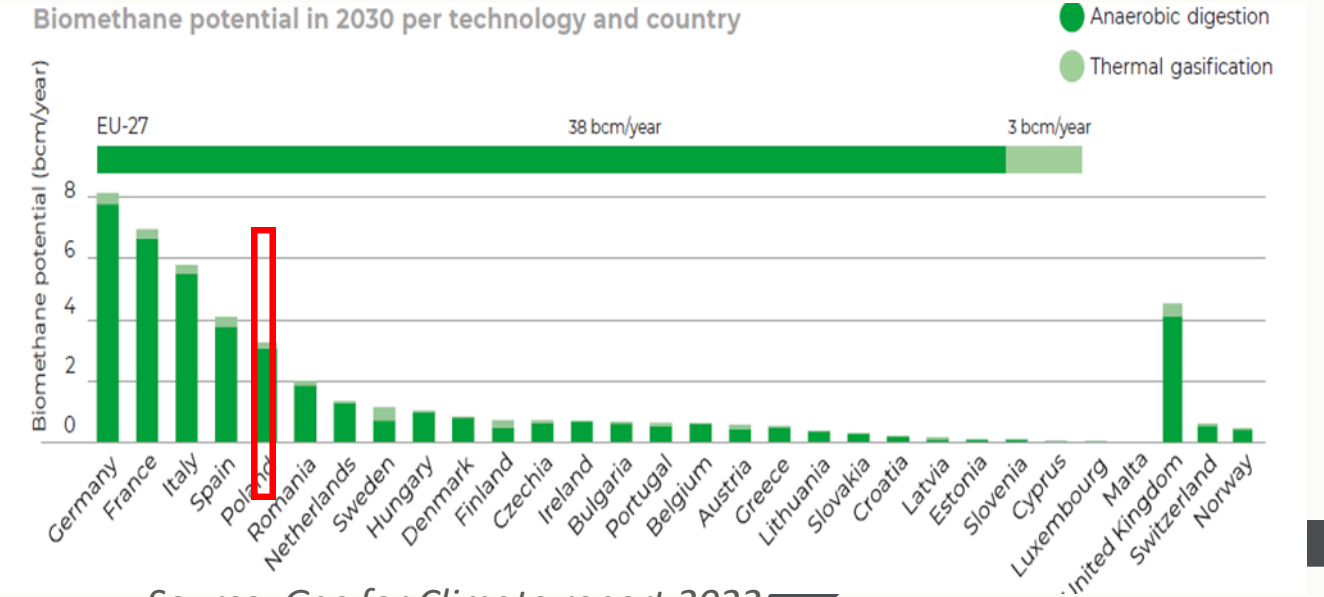


Biomethane and biogas production relative to total gas consumption in 2021 (%)

Current situation in Poland

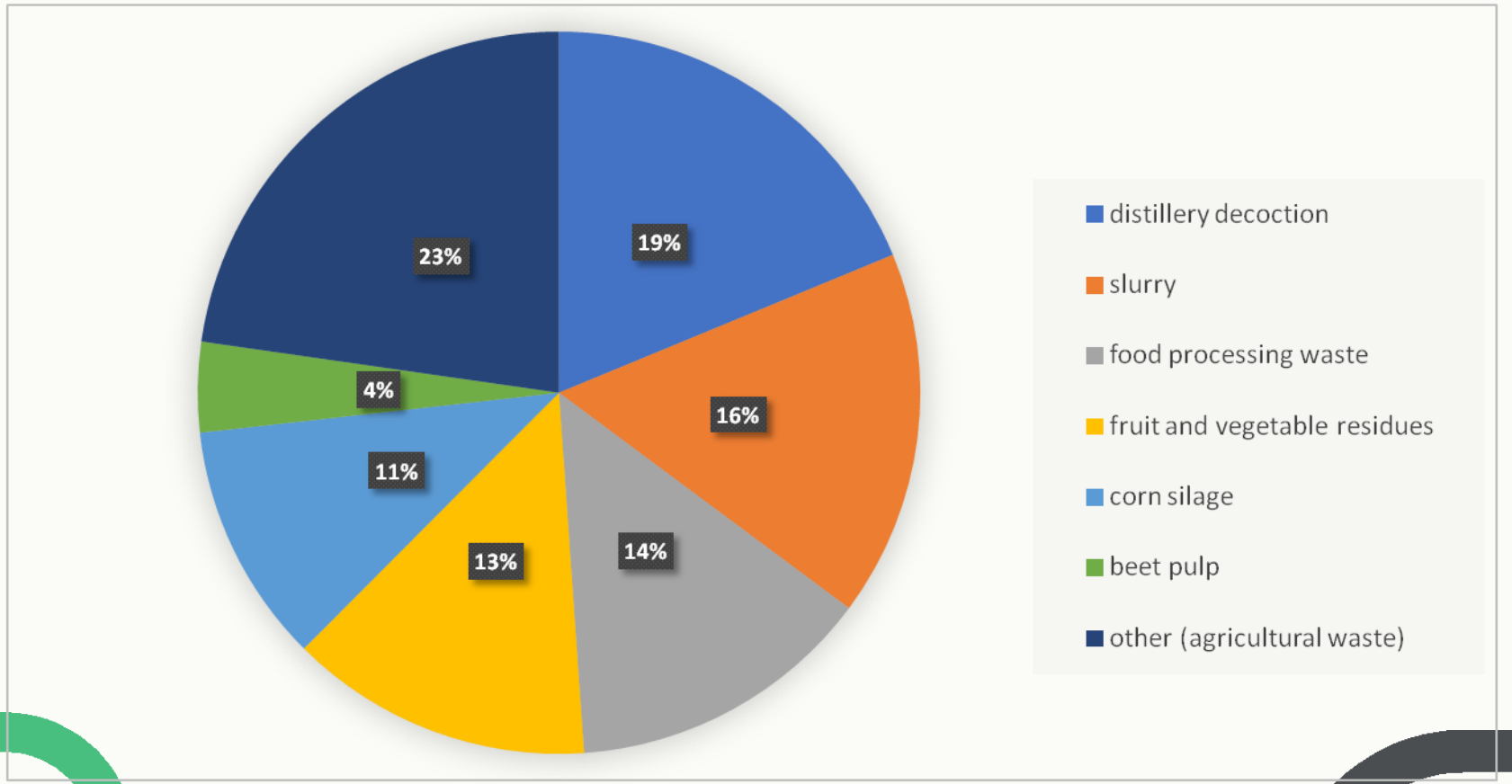
- ❑ At the end of 2023, there were **383 biogas installations** in PL with installed capacity of ca. 300 MWe, of which 168 were agricultural biogas plants.
- ❑ Presently, **there is no biomethane production** in Poland. However, the country has a large potential resulting eg. from agri-food industry.
- ❑ According to the **Polish Energy Policy PEP 2040**, 10% of gaseous fuels transported via gas grids should be renewable and low-emission ones in 2030.

- ➢ NGV vehicles - ca. 8 000 (in that 885 CNG/LNG buses)
- ➢ Filling stations - LNG 23 CNG- 28
- ➢ Projects under development – several (5-10), Gaz-System has 26 active permitts for biogas connection to its network (in 2020 – it was 3)



Source: Gas for Climate report 2022

Main feedstock used in Poland in 2022



Source: KOWR 2023

Amendment of RES Act (Dz.U. 2023 poz.1762)

- Definition of biomethane and recognition of biomethane as RES
- Obligations for producers (e.g., registries, reports)
- Rules of issuing and trading for guarantees of origin for biomethane, entry into international trading
- Support system - FiP tariffs up to 1 MW, support period - 20 years.
- Biomethane that has received support does not count towards the NIT.
- Regulation on reference prices for biomethane -538 PLN/MWh for biogas and 545 PLN/MWh for agricultural biogas

WAITING FOR – Auction system for biomethane plants > 1MW and/or increasing the FIP limit in the next term

Measures for the future market uptake of Poland

- To develop the biomethane market in Poland, it is necessary to immediately adapt regulations, focus on cost effectiveness, promote sustainable resource management and develop infrastructure.

- **Governmental strategy** stating the present and future actions of the government to support biomethane production, distribution and consumption **would be a strong political incentive** to start the biomethane production in Poland.

- The experience of more advanced countries show that the **guaranteed tariff system** is one of the most important stimuli for the development of the biomethane market. The legal regulations adopted in Poland introduce FIP support for biomethane installations below 1 MW. There is a lack of support system for larger installations.

- It is also crucial to establish clear emission reduction targets and invest in research into new technologies and business models.

Final remarks

- Production of 0.4 bcm of biogase; biogases make 1.8 % of gas supply; 0.4 bcm of biogases are mainly used to produce electricity, either in electricity only or CHP plants
- Current biogases production could be increased 8-9 times
- No biomethane production but large biomethane potential; several biomethane projects under development
- To have full effect of biomethane production on the green transition, biomethane production support is to be linked with agri-food industry that is the largest employer (1,93M persons or 80%) in the current bioeconomy and generates most of the feedstock for biomethane production
- Several measures to support biomethane production were adopted in 2023:
  - support system - FiP tariffs up to 1 MW, support period - 20 years
  - reference prices for biomethane -538 PLN/MWh for biogas and 545 PLN/MWh for agricultural biogas
- Lack of support system for larger installations (> 1 MW)

Thank you!

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Biomethane dynamics in emerging European Markets – the case of Latvia

Prepared by:
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Date:
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18.01.2024

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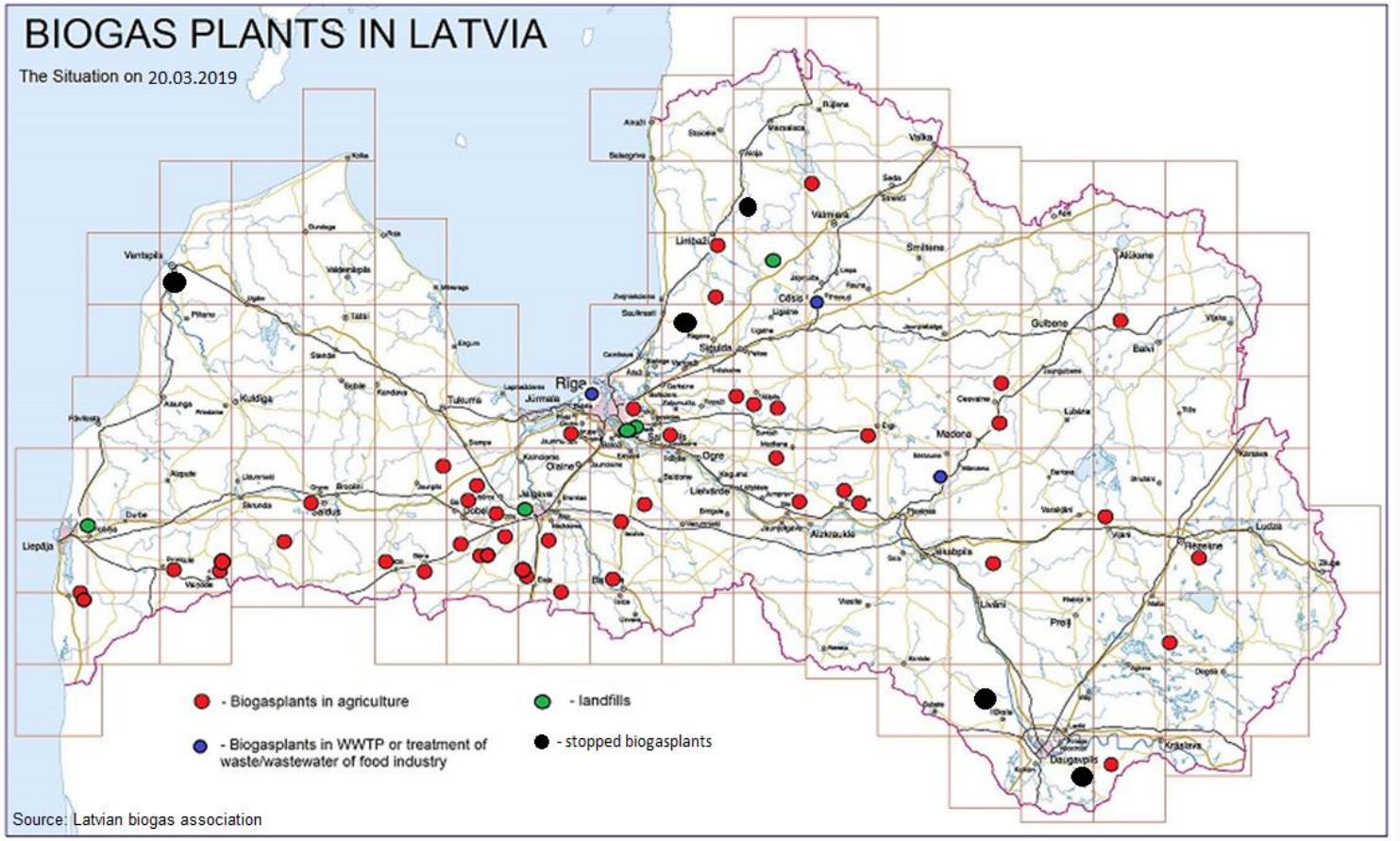
Current situation in Latvia



50 biogas plants (CHP):

- 43 agricultural
- 5 landfills
- 2 others

2 plants has their own biomethane installations

Total installed capacity 60 MW

No Feed in Tariff anymore

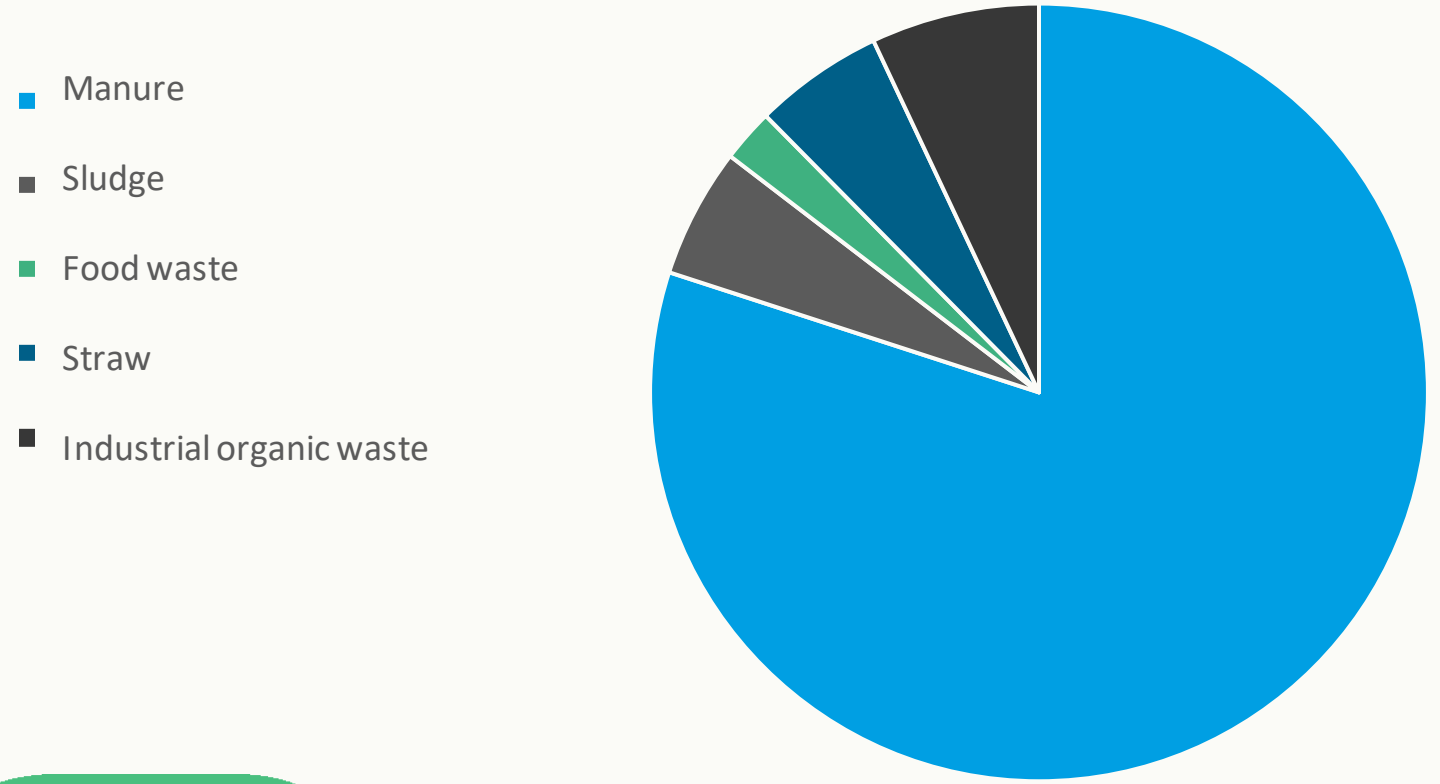
Biomethane plants under construction or planning phase (no support, biomethane for export)

Producer	Location	Planned volume 2024.	Planned volume 2025.	Feedstock	Solution	Commissioning
Egg Energy (Bogas)	Iecavas nov.		50 000 MWh	Poultry	PSA, Injection	January 2024
BM Holding	Iecava	13 000 MWh	20 000 MWh	Agricultural waste and manure	PSA, Injection	June 2024
BM Holding	Sesavas pag.	9 000 MWh	15 000 MWh	Agricultural waste and manure	PSA, Injection, Virtual pipeline	July 2024
BM Holding	Skrudalienas pag.	10 000 MWh	18 000 MWh	Agricultural waste and manure	PSA, Injection, Virtual pipeline	August 2024
Agrofirma Tērvete	Dobeles nov.	30 000 MWh	40 000 MWh	Dairy manure	Scrubber, LNG	February 2024
Vecsiljāņi	Aizkraukles nov.	5 0000 MWh	15 0000 MWh	Agricultural waste and manure	Membrane, Injection	October 2024
Ezerkauliņi	Salaspils nov.	10 000 MWh	60 000 MWh	Agricultural, food waste and manure	? Injection	October 2024
Grow Energy	Limbažu nov.	10 000 MWh	20 000 MWh	Manure, animal waste	PSA, Bio-CNG/LNG?	2024
Zemturi	Valmieras nov.	2 000 MWh	5 000 MWh	Agricultural waste and manure	PSA, Bio-CNG	

243 GWh

+2 Green field biogas/biomethane projects

Biomethane potentials 2030



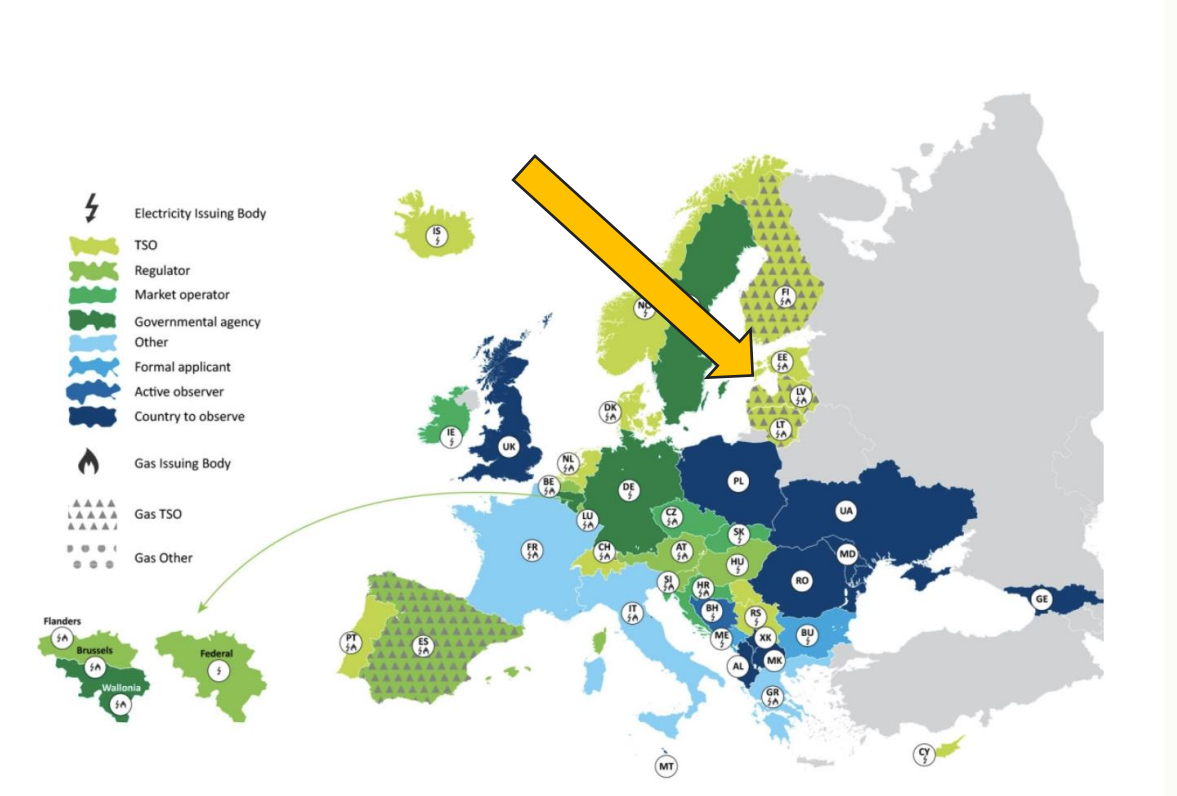
Total 1,4 TWh (15% from natural gas consumption)

Grow Energy

- One of the biggest dairy farms in Latvia;
- Since 2020 – 100 m3/h biogas for biomethane;
- 5 MWh biomethane production potential;
- 50 vehicles on biomethane;
- The best example of circular

Guarantees of Origin system

- Conexus Baltic Gas Grid operator (TSO) approved as a member of the AIB Gas Scheme Group;
- System ready;
- Should be tested in two months;
- Registry – ready for the injection, unclear situation for virtual pipeline and off –grid biomethane;
- No clear vision between EU countries



Future targets

- RED III has nearly been transposed into Transport Energy Law, with final discussions ongoing within the sector (in force from 01.2025.);

  -> 4,5% advanced biofuels/biomethane in 2030;

- NECP – 3% of biomethane share in natural gas consumption (LBA request 10%)

Measures for the future market uptake of Latvia

1. Legal Framework Enhancement: Refine the legal framework governing biomethane use in transportation and as a natural gas substitute, setting clear targets for 2030:

- For transportation, adopt and expand upon RED III directive and the Transport Energy Law.
- For natural gas replacement, aim for biomethane to constitute at least 10% of the energy mix.

2 .Infrastructure Expansion: Support the development of both liquefied and compressed biomethane refueling stations to increase accessibility (12 CNG stations, 0 LNG)

3. Sector-Specific Promotion: Advocate for biomethane utilization across various sectors, including transport, services, agriculture.

4. Organic Waste Utilization: Incentivize the conversion of organic waste into biomethane, reducing landfill use and promoting circular economy principles.

5. Digestate Use Encouragement: Encourage the adoption of digestate as a sustainable alternative to fossil-based mineral fertilizers in agriculture.

6. Construction and Network Support: Facilitate the establishment of new biomethane stations and the injection of biomethane into the existing gas network infrastructure.

7. Financial Strategy Evaluation: Assess and adjust strategies to attract European Recovery and Resilience Mechanism funds. Explore additional funding opportunities to bolster the biomethane program, particularly within the transport sector.

Final remarks

- Need support to show data-driven arguments: Presenting compelling statistics and projections about biomethane's potential to reduce carbon emissions and reliance on fossil fuels, circular economy principles;
- Need to show case studies: Showcasing successful implementations and the positive impact of biomethane in transportation and other industries in different countries;
- Need to engage stakeholders across sectors to create a unified voice on the importance of biomethane.

LATVIJAS BIOGĀZES ASOCIĀCIJA

Thank you!

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Biomethane dynamics in emerging European Markets – the case of Estonia

Prepared by:
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Current situation in Estonia

Biomethane plants

Rohegaas OÜ	55GWh/a	5 500 000m3
Biometaan OÜ	15GWh/a	1 500 000m3
Vinni Biogaas OÜ	25GWh/a	2 500 000m3
Tartu Biogaas OÜ	30GWh/a	3 500 000m3
Oisu Biogaas OÜ	20GWh/a	2 000 000m3
Bioforce Aravete OÜ	30GWh/a	3 000 000m3
EKT Ecobio OÜ ca	20GWh/a	2 000 000m3
Ebavere Bioforce OÜ	35GWh/a	3 500 000m3
Bioforce Laatre OÜ – Under Construction	ca 25GWh/a	2 500 000m3
Bioforce Viiratsi OÜ- Under development	ca 70GWh/a	7 000 000m3

Current situation in Estonia

Biogas plants

Tallina Vesi AS

Tartu Vesi AS

Narva Vesi AS

Kuressaare Veevärk AS

Eastman OÜ

Salutaguse Pärmitehas OÜ

Estover Piimatööstus OÜ

A.Le.Coq biogas plant

Landfills

Tallinna Jäätmete Taaskasutuskeskus AS

Paikre OÜ

Uikala Prügila AS

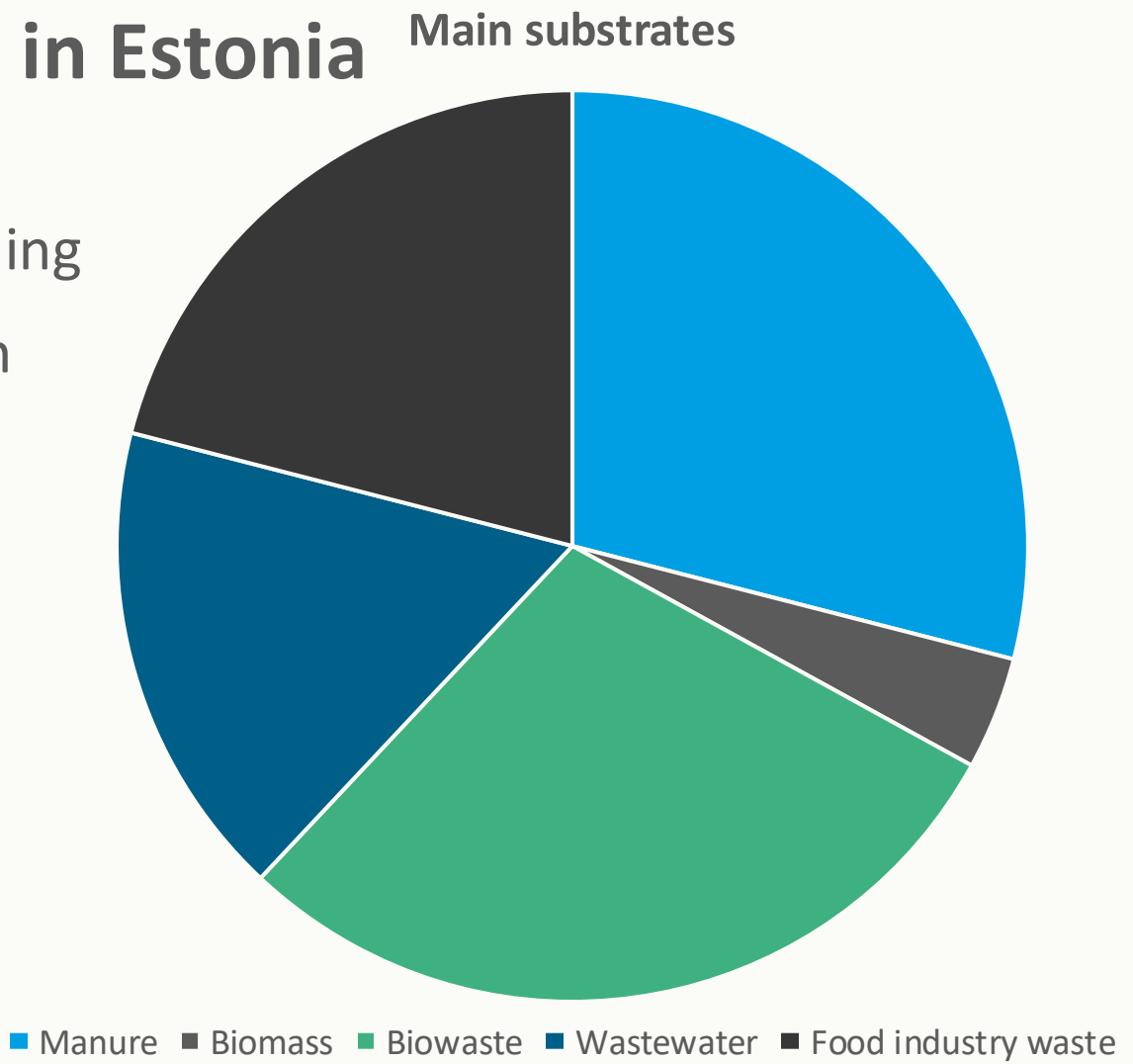
Väätsa Prügila AS

Current situation in Estonia

Main substrates according

To Guarantees of Origin

Register.



Current situation in Estonia

- Subsidy for biomethane production until end of 2024

  100EUR/MWh –natural gas market price
- Functional Guarantees of Origin register by Elering (TSO)
- 25 CNG filling stations
- 2 LNG filling stations
- 6700 gas vehicles

Future targets and how to reach them

Biomethane production

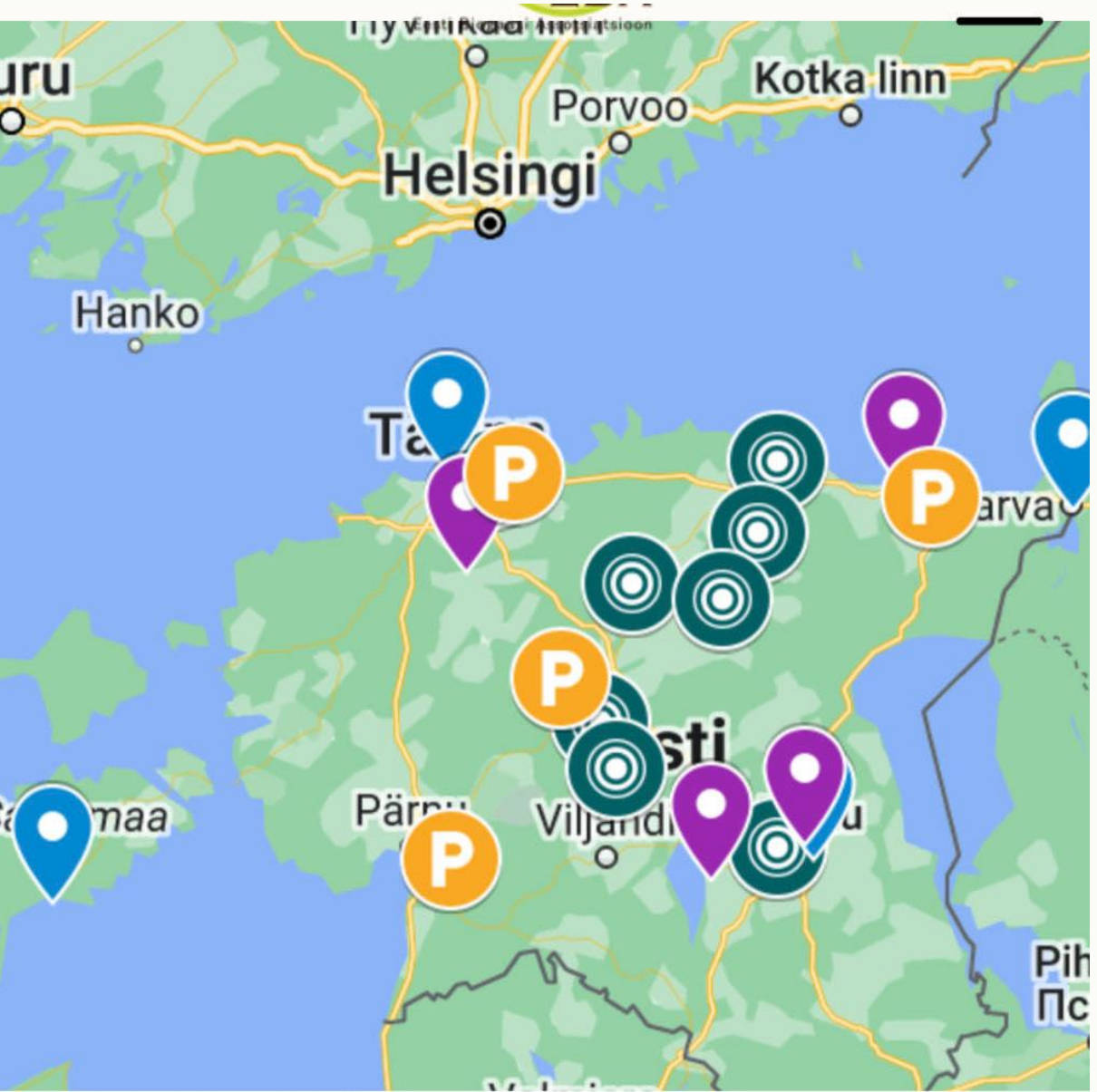
- 1- 1,3TWh by 2030
- Up to 10 new plants via RePowerEU investment subsidy in next 3 years
- 15 000 methane cars, 1500 trucks and buses and 50 filling stations by 2030
- Wider biomethane usage in shipping via public procurements
- Larger amount of biomethane produced out of biodegradable waste via waste sorting obligation

Biomethane usage

- 100% of biomethane is used in transport
- Investment subsidy for gas-trucks planned
- Injection points by TSO planned
- Wider biomethane usage in Industry and heating planned

Measures for the future market uptake of Estonia

- New high yield substrates such as slaughterhouse waste, grease, waste oil from restaurants, glycerine, and Fish Industry waste.
- Higher use of biomass collected from out-of-use agricultural land, decomissioned peatlands and wetlands by the sea and lakes
- Biomethane use in maritime sector
- Biomethane use in industries
- Public procurements to give preferences to methane powered trucks and buses
- To exempt and differentiate 40% -80% of heavy goods vehicles consuming methane fuel from road tolls and heavy-duty tax in Estonia on the basis of EURO classes
- To introduce purchase aid for the use of local gas vehicles in Estonia (renewal of the local truck fleet from EUROIII to EUROVI on the example of Germany
- To support power-to-gas technological innovations to double biomethane production (up to 2 TWh/a) in 2050



Biogas production facilities in Estonia

Sewage treatment plants

Landfills

Industrial wastewater treatment plants

Agricultural biomethane plants

Final remarks

- Biomethane market in Estonia has taken a great leap over the past 6 years. Production has ramped up from 0 to 200GWh All of the bigger biogas plants have converted to biomethane upgrading and there has been at least 1 new biomethane plant added to the map every year. Yet it will take continuous work to reach 1 TWh by 2030 and also to uptake the market for biomethane.
- To grant security for new biomethane plants, it will be essential to work towards international biomethane register and to also uptake biomethane international trading

Thank you!

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Enhancing the uptake of biomethane in Europe

Prepared by:
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CRES

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GreenMeUp Webinar
«Biomethane dynamics in emerging European markets”

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Conclusions

To facilitate reaching the 35bcm target for biomethane for 2030 we need stable policies

Vision and targets

Direct investment and production support

- Feed-in Tariffs
- Feed-in Premiums
- Investment subsidies

Demand-side incentives

- Tax incentives
- Quota system
- Public procurement rules

Indirect production support

- Regulatory incentives
- Financial incentives

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

Highlights for policy recommendations

Visions and Targets:

- Promote biomethane in order to fulfil 2030's energy and climate targets in all countries - Continue the massive penetration of biomethane until 2050.
- Foster the penetration BioLNG-BioCNG and bioH2 until 2030 - Prioritize the production of BioLNG-BioCNG and bioH2 along with the biomethane after 2030.
- Establish a coordinated policy-making framework across agriculture, waste management, energy and transport
- Co-design the required policies and measures with the organization of public consultation procedures so as to increase the interest of the end-users.
- Adopt stricter CO_2 emission and RES targets at national level than those are foreseen at European level accompanied by targeted feedstock management, digestate and biogas utilization policies.

Highlights for policy recommendations

Direct - Indirect production support

- Launch financial instruments to confront the main economic barriers (e.g. the high investment cost, the lack of subsidies and financial support programmes on a long-term basis and the high cost to interconnect small biogas projects to natural gas pipeline).
- Design measures so as to address the main technical barriers (e.g., the infrastructural challenges and the poor collection, improper segregation, lack of vehicles and adequate waste transportation).Focus also on the utilization of industrial wastes, organic municipal solid waste and sewage for biomethane.
- Address the main market barriers (e.g., the high price of biogas/biomethane, the uncertainties and regulatory hurdles related to injection of biogas into the grid and the large amount of waste feedstocks that is currently not being separately collected and diverted for processing).
- Reduce the bureaucracy during the construction and operation of the biomethane plants
- Internalize the environmental benefits into the fuel prices so as to improve the competitiveness of the biomethane compared to the fossil fuels.
- Reinforce the existing level of knowledge and the skills of the technical staff with the provision of dedicated technical training.

Feedstock:

- Facilitate the effective exploitation of the agricultural residues, which is the most prevalent feedstock type for biomethane production.
- Focus also on the utilization of industrial wastes, organic municipal solid waste and sewage for biomethane.
- Focus on the delivered benefits due to the increased waste management and the exploitation of the various by-products.

Injection to the grid:

- Facilitate the injection of the biomethane into the distribution grid.
- Enable both the injection of the biomethane into the transportation grid and the mobilization of off-grid applications

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Thank you for your kind attention!

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