

European Biomethane Market Today

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Biogases today

22 bcm

of biogases produced in Europe, more than the entire inland natural gas consumption of Belgium, Denmark and Ireland combined



4.9 bcm

biomethane produced in Europe in 2023, with 6.1 bcm/year of installed capacity

25

European countries are active in biomethane production

18%

increase in biomethane produced in Europe



■ New producing countries in 2022 and 2023

Balanced distribution across end-uses:

23%

In transport

17%

In buildings



15%

In power generation

13%

In industry



Potential to replace

15%

of nitrogen-based fertilisers in the EU with 2022 digestate production



29 Mton

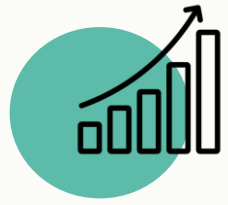
of bio-CO2 produced from biogas and biomethane production



250,000

green jobs in Europe

22 bcm of biogases are produced today in Europe

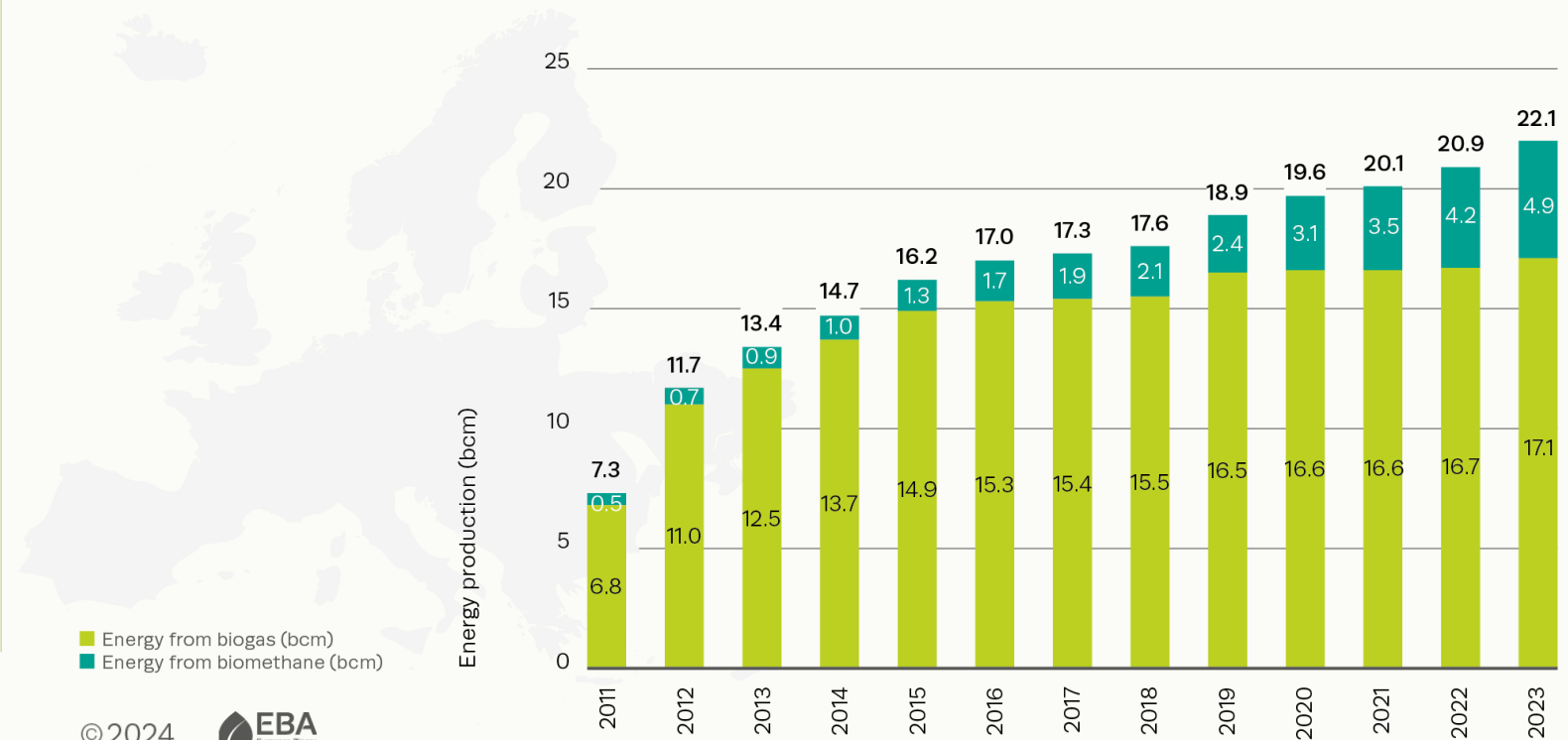


Combined biomethane and biogas production in Europe

= Gas consumption of Belgium, Denmark and Ireland combined
= 7% EU gas consumption in 2023

19 bcm of combined production in EU-27

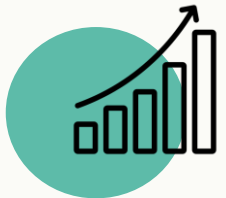
Combined biomethane and biogas production in Europe (bcm)



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Biggest growth on biomethane production to date



In 2023: 4.9 bcm biomethane production (4.1 bcm in EU-27)

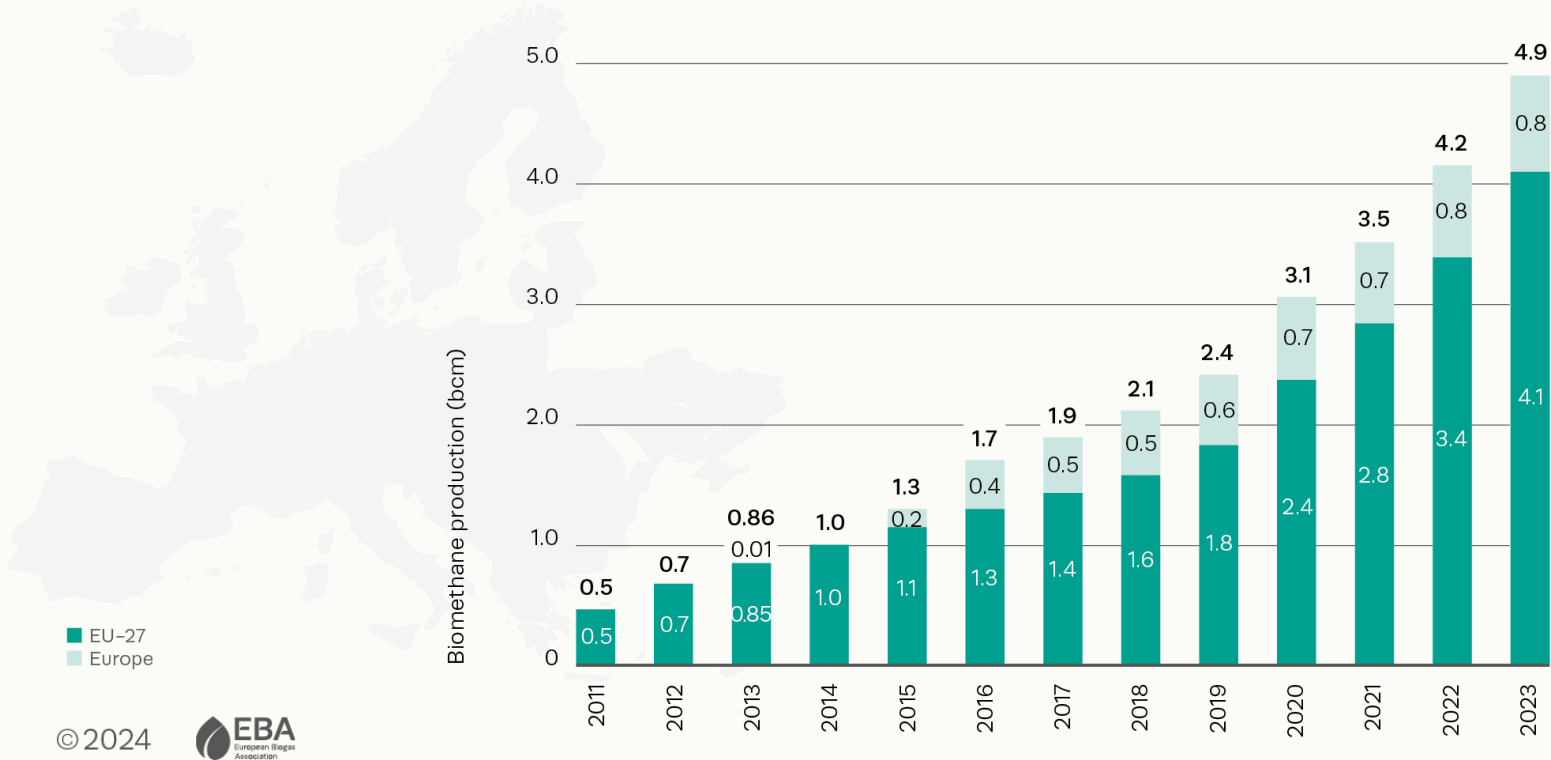
- 18% YoY growth in Europe
- 21% YoY growth in EU-27

In Q1 2024: **6.4 bcm biomethane installed capacity**

Italy, France, Denmark, and the UK are leading the production and scale-up of biomethane



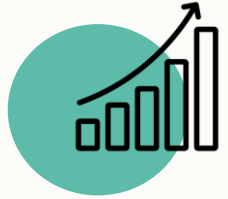
Biomethane production in the EU-27 and Europe (bcm)



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> 200 new biomethane plants in 2023



Development of number of plants in Europe

In 2023:

- **1,510 biomethane plants in Europe**
- **1,324 biomethane plants in EU-27**

25 biomethane-producing European countries.

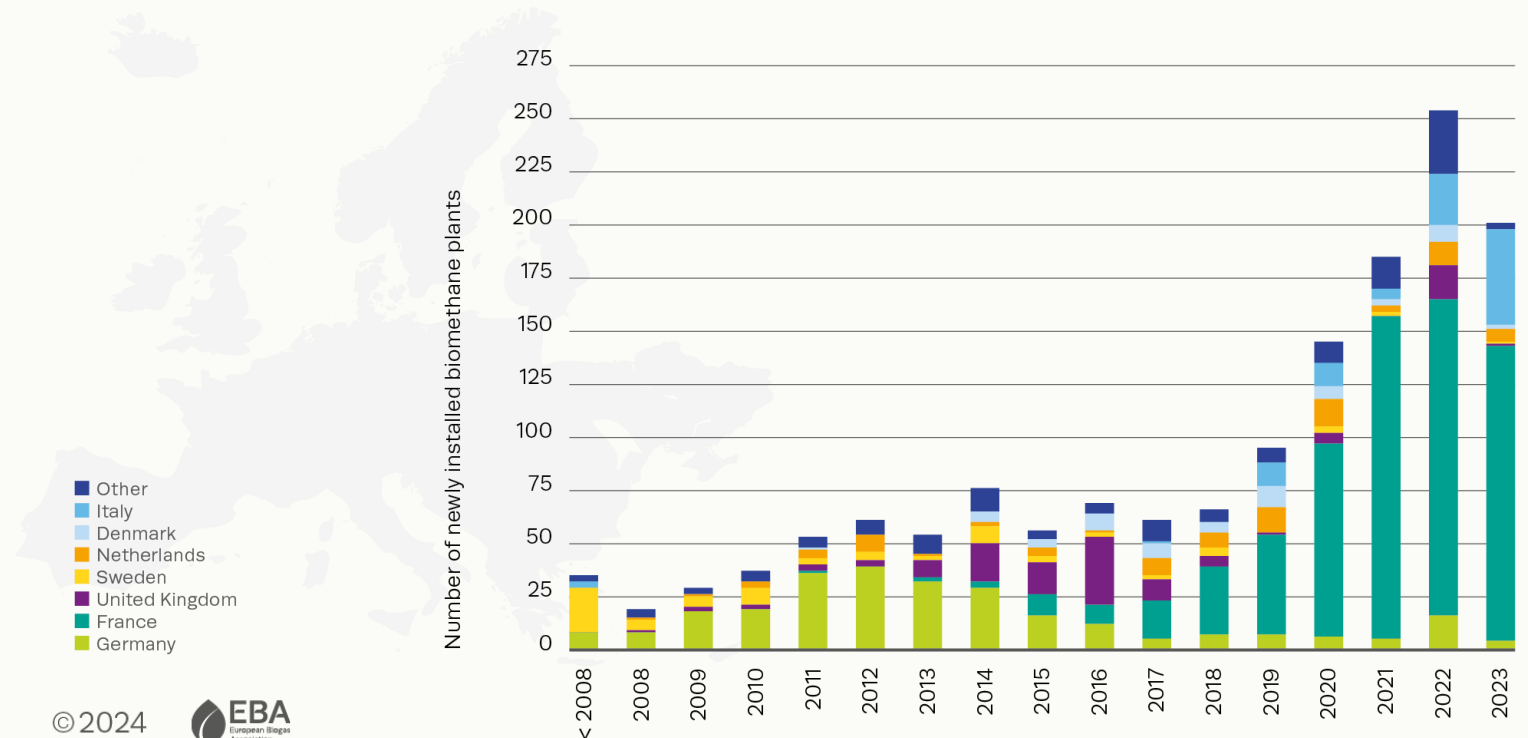
The most recent additions are:

- Portugal (2022)
- Lithuania and Ukraine (2023)



> 85% connected to gas grid, mainly distribution grid

Number of new biomethane plants in Europe each year, 2008 – 2023, overall per country



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Biomethane: a versatile renewable fuel



End-uses depend on country

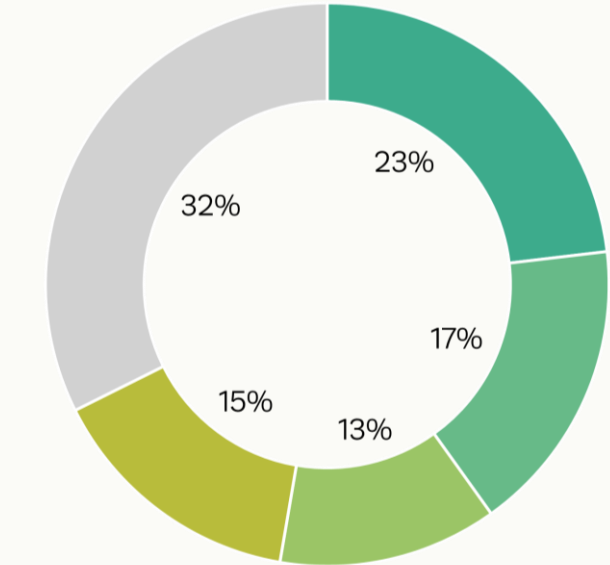
Transport



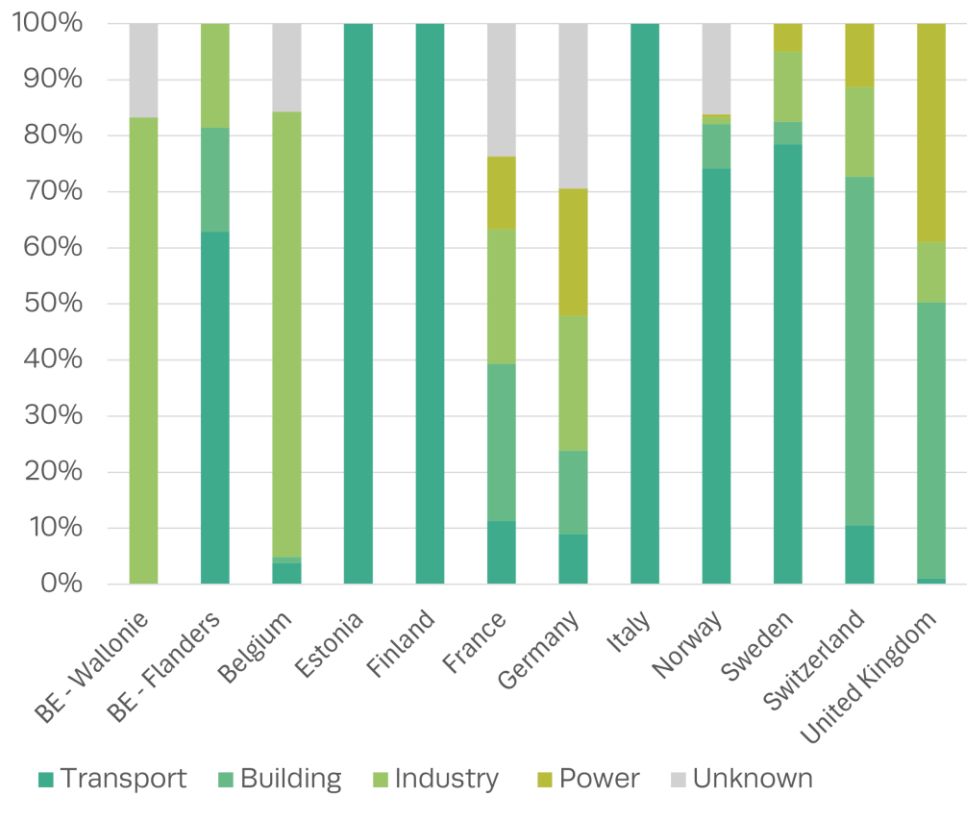
Heating or electricity



Percentage of biomethane production used in different sectors overall (left) and per country (right)



- Transport
- Building
- Industry
- Power
- Unknown



Future potential of biomethane in Europe

Transition towards sustainable feedstocks

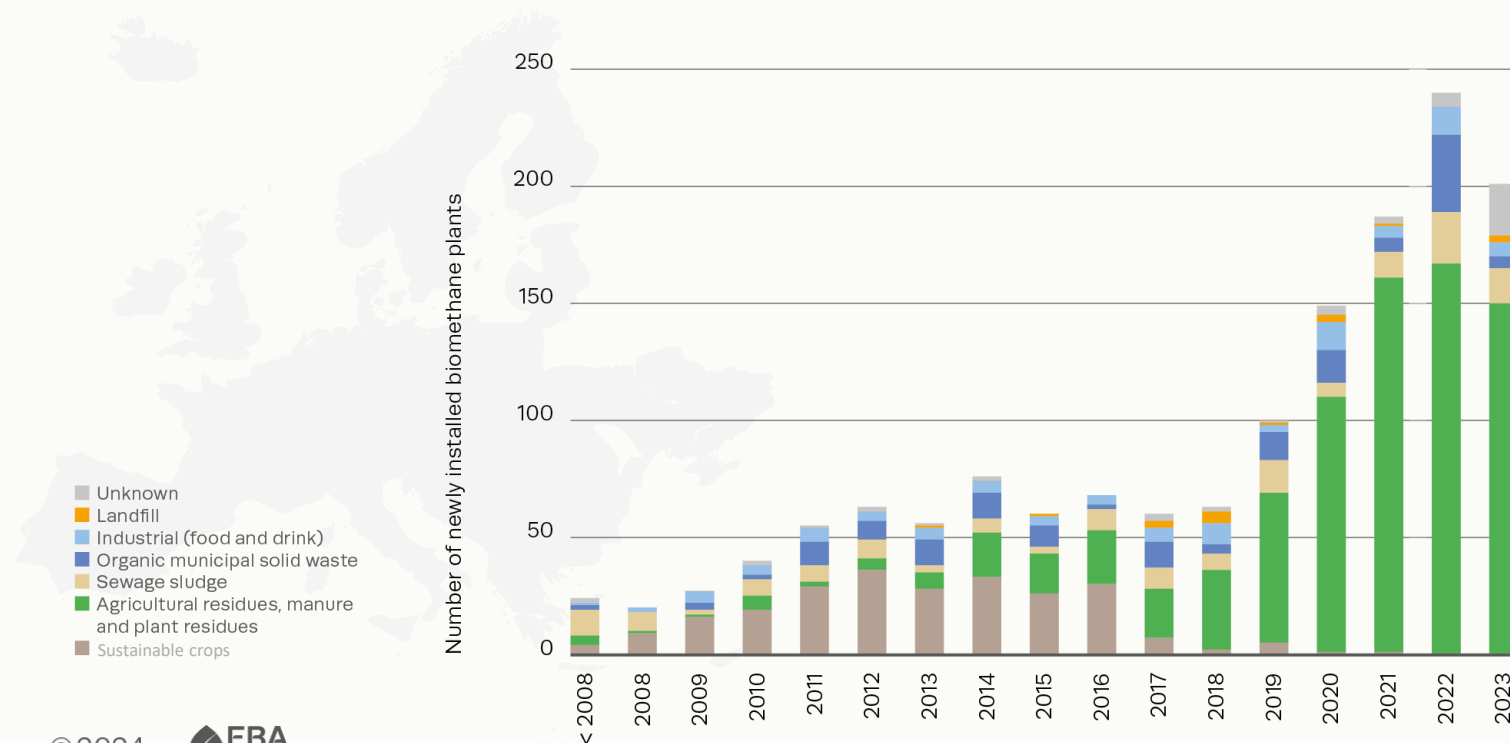


Utilisation of feedstock delivering the best GHG savings

Since 2020, no new plants were established to run on energy crops as main feedstock.

Instead, new plants are being built to run on agricultural residues, organic municipal solid waste, sewage sludge and industrial waste.

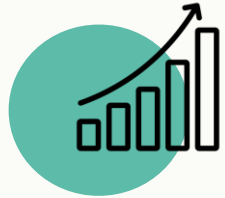
Number of new biomethane plants in Europe per feedstock type, 2008 – 2023



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Growth prospects for biomethane towards 2030



Accelerated growth needed to reach 35 bcm target by 2030

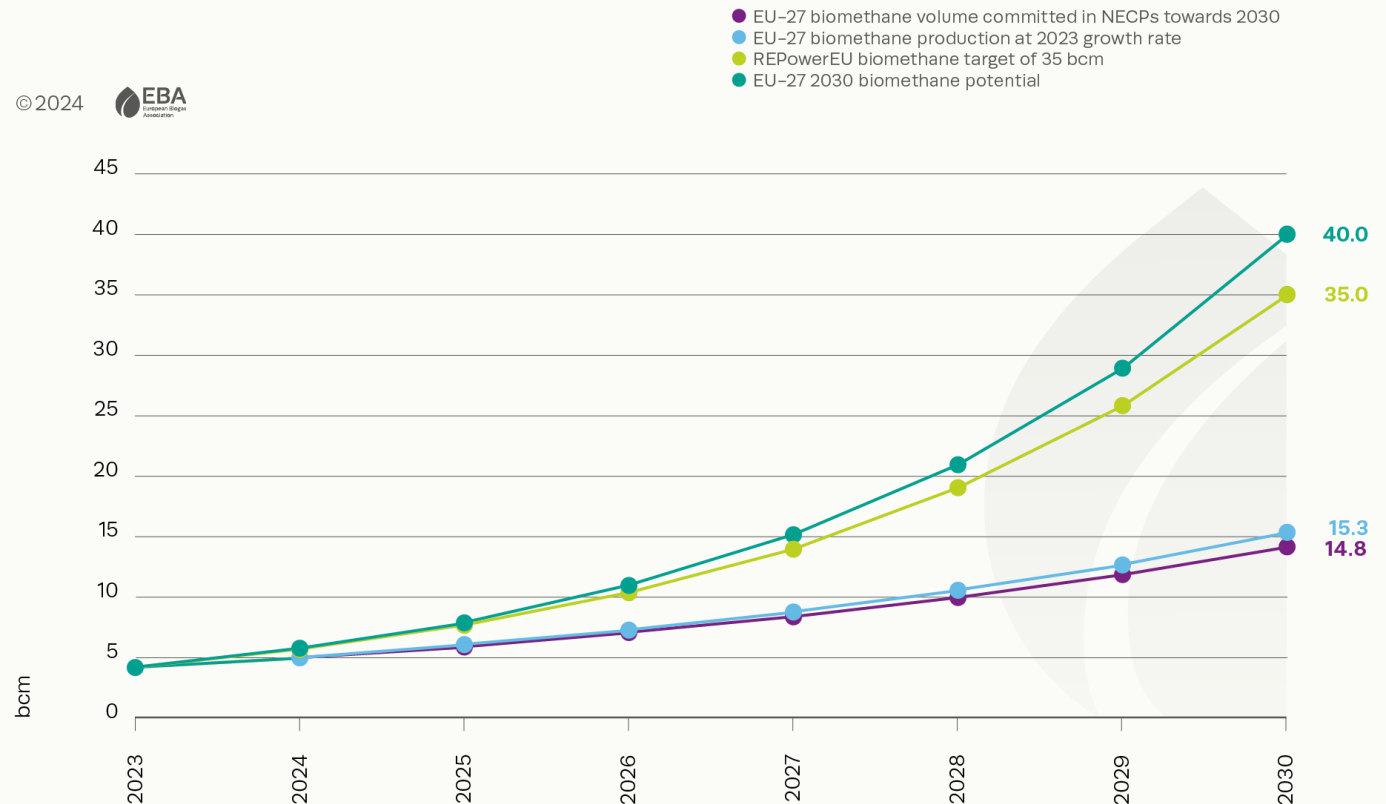
Current biomethane growth rate of 21%

- Close to the biomethane volumes committed in the NECPs towards 2030

Optimal market and regulatory conditions: essential for sustained growth.

- Coherent planning of biomethane potential
- Faster permitting procedures

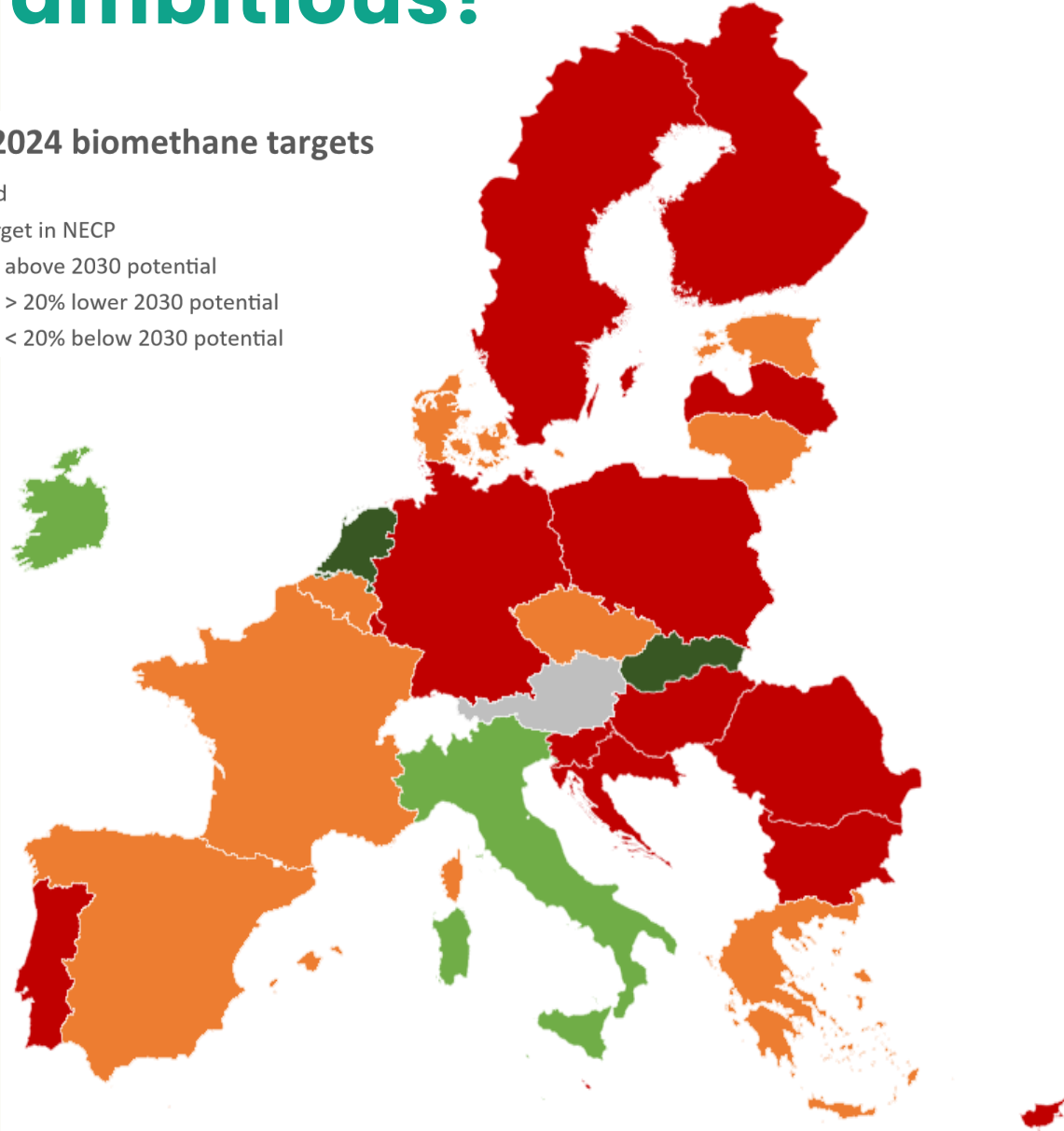
EU-27 biomethane growth curves towards 2030



NECPs 2030: Is the planned growth ambitious?

Gap analysis NECP 2024 biomethane targets

- NECP not published
- No biomethane target in NECP
- Biomethane target above 2030 potential
- Biomethane target > 20% lower 2030 potential
- Biomethane target < 20% below 2030 potential



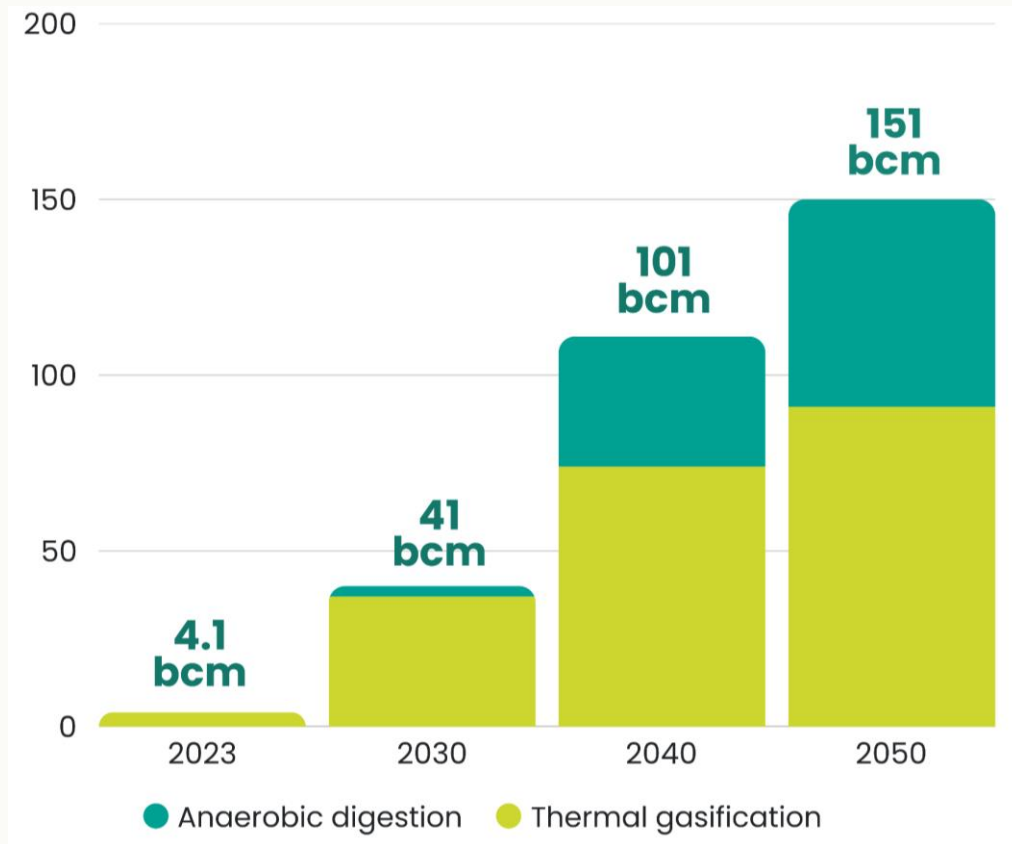
15 bcm: Total volume of biomethane committed towards 2030

13 countries have a biomethane-only target

18 countries have a biomethane and/or a biogas target

Enabling a resilient transition

Production potential in EU-27 until 2050 compared to existing production (bcm)

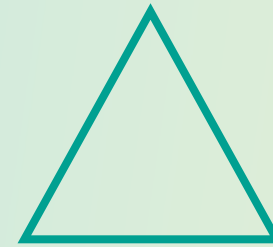


Sources: EC, *Impact Assessment Report, SWD(2024) 63 final* (2024), EBA, *Statistical Report 2023* (2023); Gas for Climate, *Biomethane Production Potentials in the EU* (2022); Guidehouse, *Biogases towards 2040 and beyond* (2024).

2040

Biomethane production could supply **85%** of gaseous fuels demand

SUSTAINABILITY



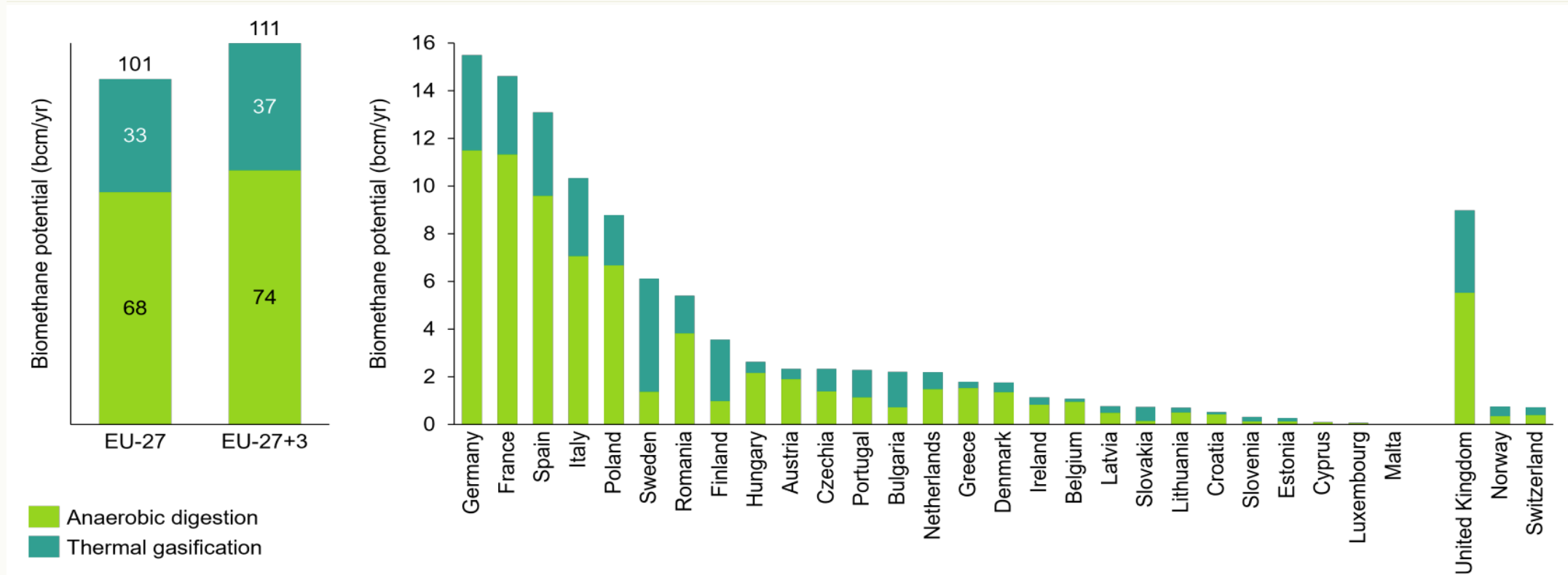
SECURITY

EQUITY

Balancing the **ENERGY TRILEMMA** while responding to great societal challenges: waste management, farming emissions abatement, affordability.

Biomethane potential of 111 bcm/yr in 2040

Biomethane potential per country



* Production based on sustainable feedstocks such as agricultural residues, manure, sequential crops, municipal solid waste, wood waste and forest residues.

Increasing biomethane production

Biomethane production potential can be further increased by deploying novel feedstocks and technologies, as well as landfill gas

Feedstocks

Digestate from anaerobic digestion



Digestate can be used to produce additional biomethane using either Hydrothermal gasification or Pyrolysis, in specific cases

Marginal and contaminated land



Significant potential for underutilised lands to produce bioenergy crops, without contributing to increase in land use change, or compromising existing food or feed production

Seaweed



Interest in using 'cast' seaweed as a sustainable feedstock for biomethane production, while also delivering multiple co-benefits

Technologies

Hydrothermal gasification



Versatile technology that can process a wide variety of (wet) biogenic and fossil wastes and effluents into biomethane, as well produce multiple co-products

Landfill gas



Existing landfill gas sites represent an important source of low cost biomethane production in the short to medium term

Renewable methane



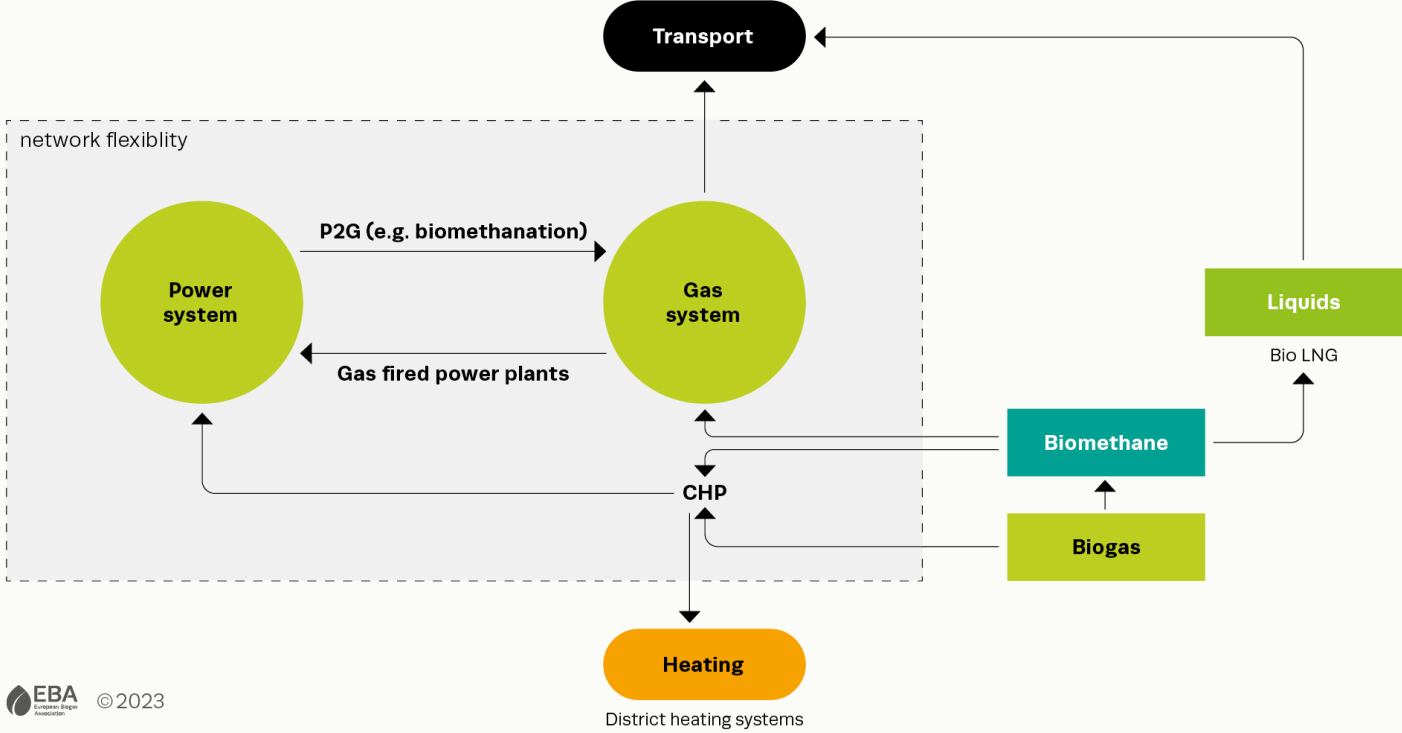
Renewable methane production can facilitate energy system integration, and also help to increase overall biomethane production yields

Methanation

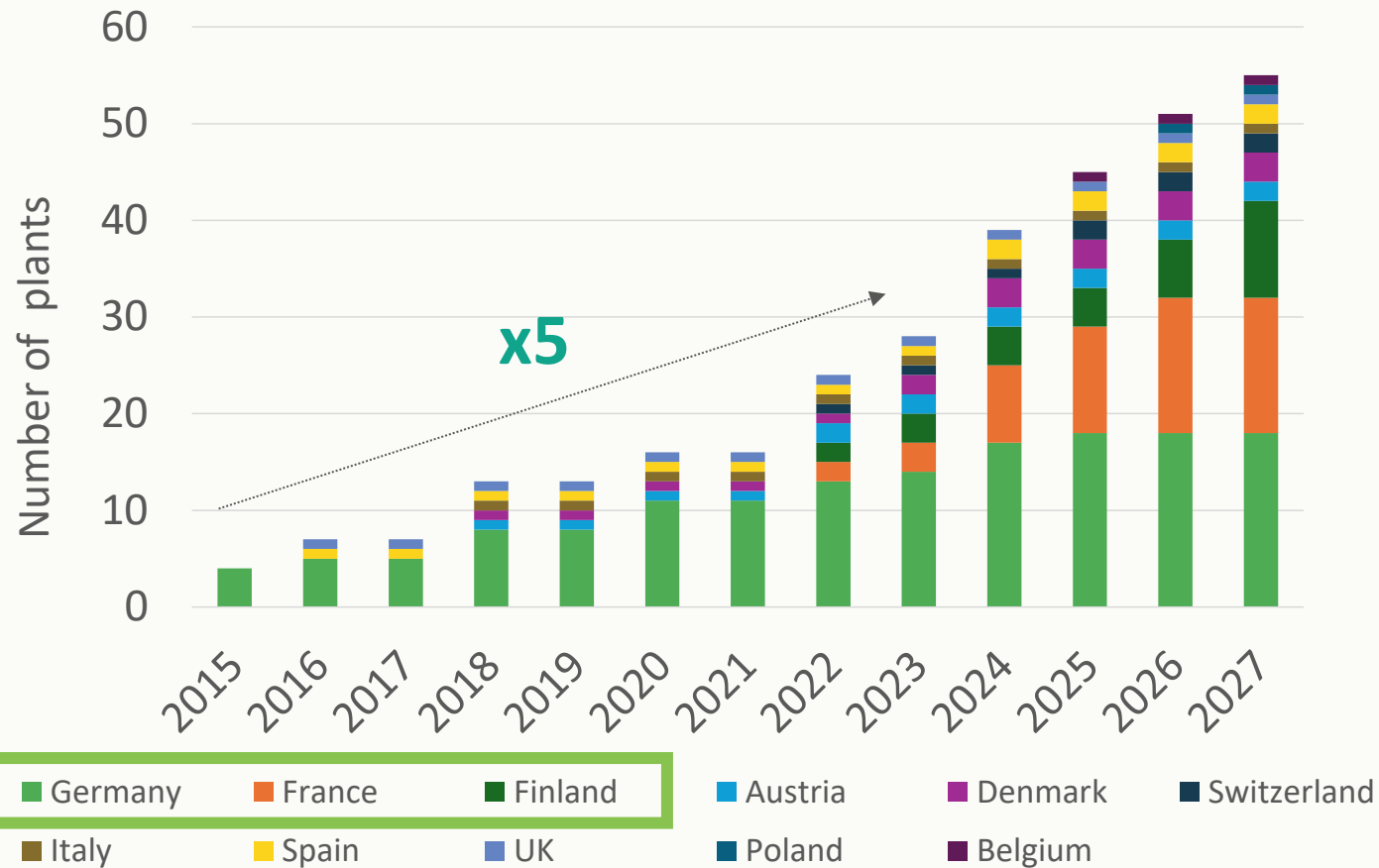
Integration of the energy system Stronger connection between the electricity and gas grid

Seasonal energy storage Excess renewable electricity is stored in the gas grid in the form of e-methane

Complementary roles for **hydrogen and biomethane**



5 times more plants in 8 years



10 European countries have running or expected plants by 2027

Growth expected

- France (+11 plants)
- Finland (+8 plants)
- Germany (+6 plants)

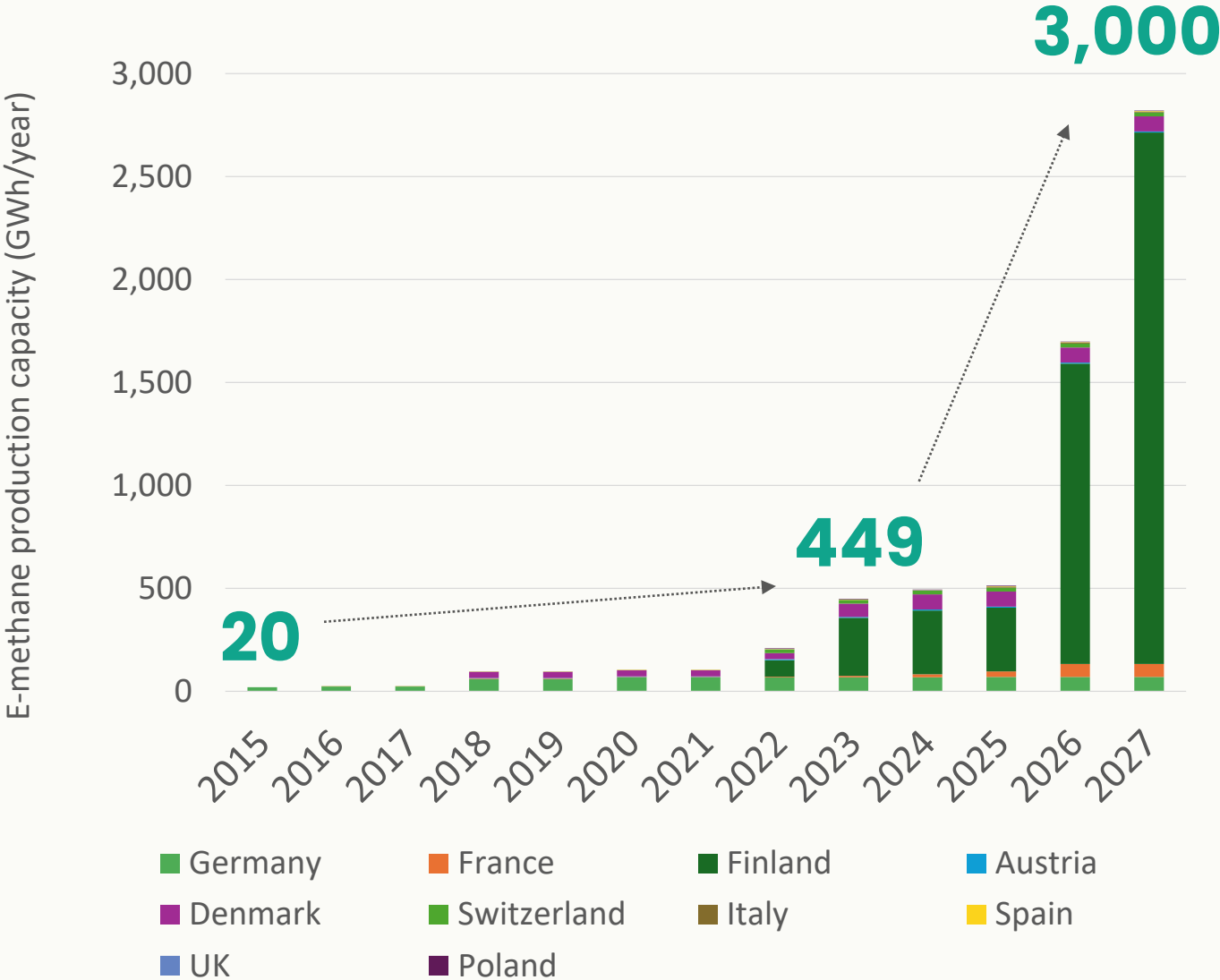
Nearly 3,000 GWh of e-methane by 2027

Production capacity shows even steeper growth

Biggest production capacities in 2023

- Finland (282 GWh/year)
- Germany (68 GWh/year)
- Denmark (64 GWh/year)

Finland has big biogenic reserves, linked to district heating facilities, pulp and paper, waste-to-energy and AD



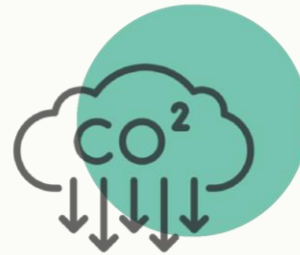
Bio-CO₂ potential from biogas and biomethane production



29 Mtonne today



46 Mtonne by 2030



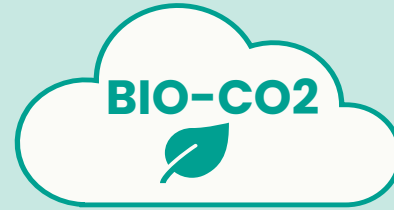
145 Mtonne by 2040



215 Mtonne by 2050

Today, CO₂ as feedstock is mainly from fossil origin, obtained from the production of synthetic fertilisers, which is highly energy-intensive. CO₂ is a needed input to produce chemicals, fuels, food and beverage products or construction materials, among others. **Replacing fossil CO₂ by a sustainable and circular alternative such as bio-CO₂ leads to a negative emissions footprint** which is not possible in the production of CO₂ from fossil origin.

Uses of bio-CO₂



DIRECT USE



YIELD BOOSTING

- Greenhouses
- Algae
- Urea/fertiliser



SOLVENT

- Enhanced oil recovery
- Dry cleaning



HEAT TRANSFER FLUID

- Refrigeration
- Supercritical power system



OTHER

- Food and beverages
- Welding
- Medical uses

CONVERSION



FUELS

- Synthetic methane
- Methanol



CHEMICALS

- Chemicals intermediates (methane, methanol)
- Polymers (plastic)



BUILDING MATERIALS

- Aggregates (*filling material*)
- Cement
- Concrete

Source: EBA 2022 'Biogenic CO₂ from the biogas industry'

Mapping bio-CO₂ plants in Europe



Biogases' contribution to the biogenic CO₂ industry

25 bio-CO₂ plants in Europe

- Producing 189 ktonne of biogenic CO₂/year

42 additional bio-CO₂ plants expected by 2027

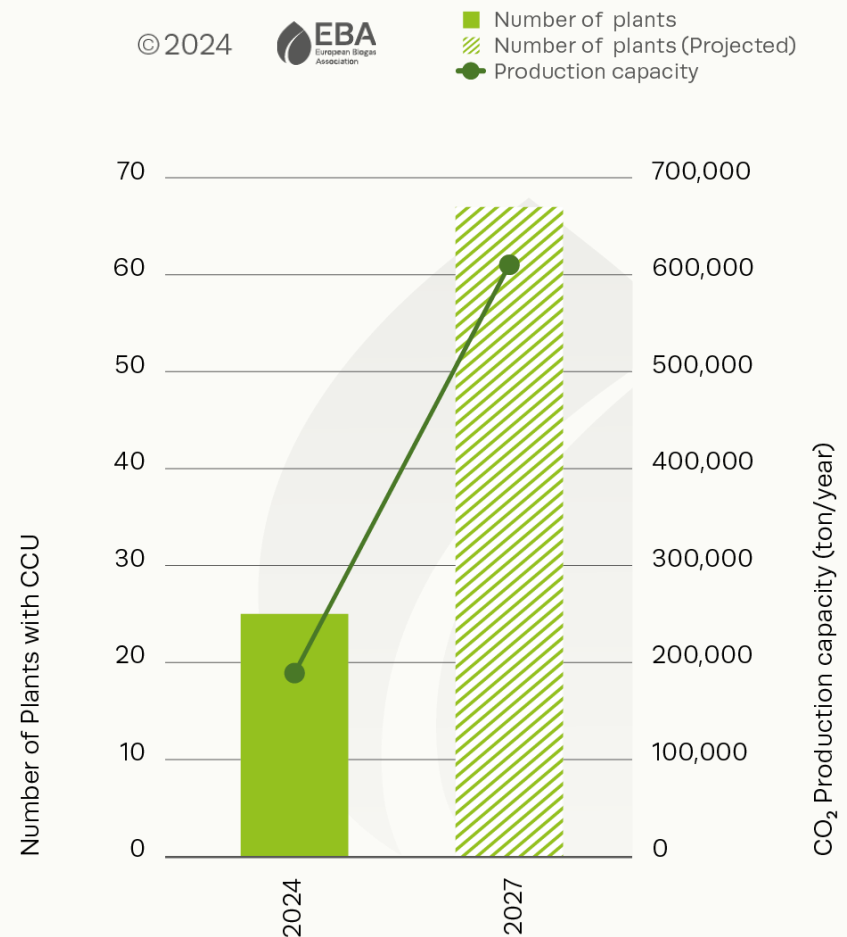
- Set to add 421 ktonne of biogenic CO₂/year

66% of plants use or will use agricultural residues

Several European countries are developing support schemes to promote CCU and CCS.



Current and future development of the number of plants with CCU and CO₂ production capacity (t / year)



How to boost the scale-up of Biomethane?

How to boost the scale-up of biomethane?



Solid and consistent **regulatory framework** (clear objectives and guidelines for the industry, positive signals for investors)



Encourage **sustainable** biomethane **production** (compliance with RED III, access to sustainable financing and EU ETS)



Facilitate **grid injection** and **cross-border trade** of biomethane



Increase investments on **R&D** to speed-up the development of new technologies, novel feedstocks and improve efficiency



Valorise **digestate and bio-CO2** as biogases co-products

GREENMEUP

Thank you!

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