



# **Digestate, an interesting fertilizer for organic agriculture**

Naturland Online Workshop, 15/03/2024

**Lucile Sever, EBA Policy Officer**



# EBA members operate across the whole biogases value chain

+240 companies

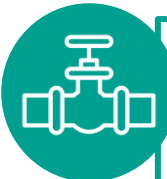
51 National  
Associations


Research Centres



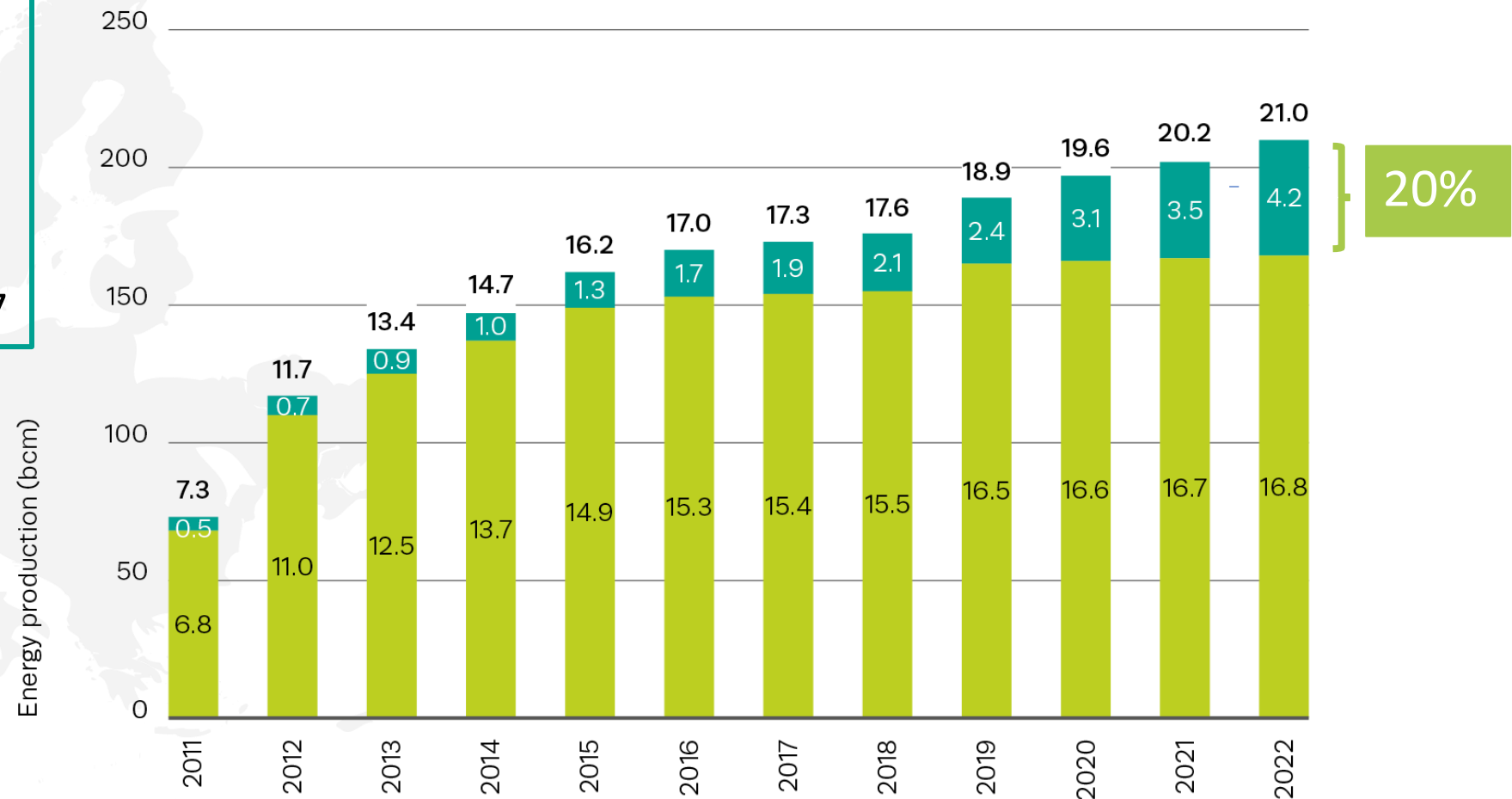
# Europe produced 21 bcm of biogases in 2022

Combined biomethane and biogas production in Europe

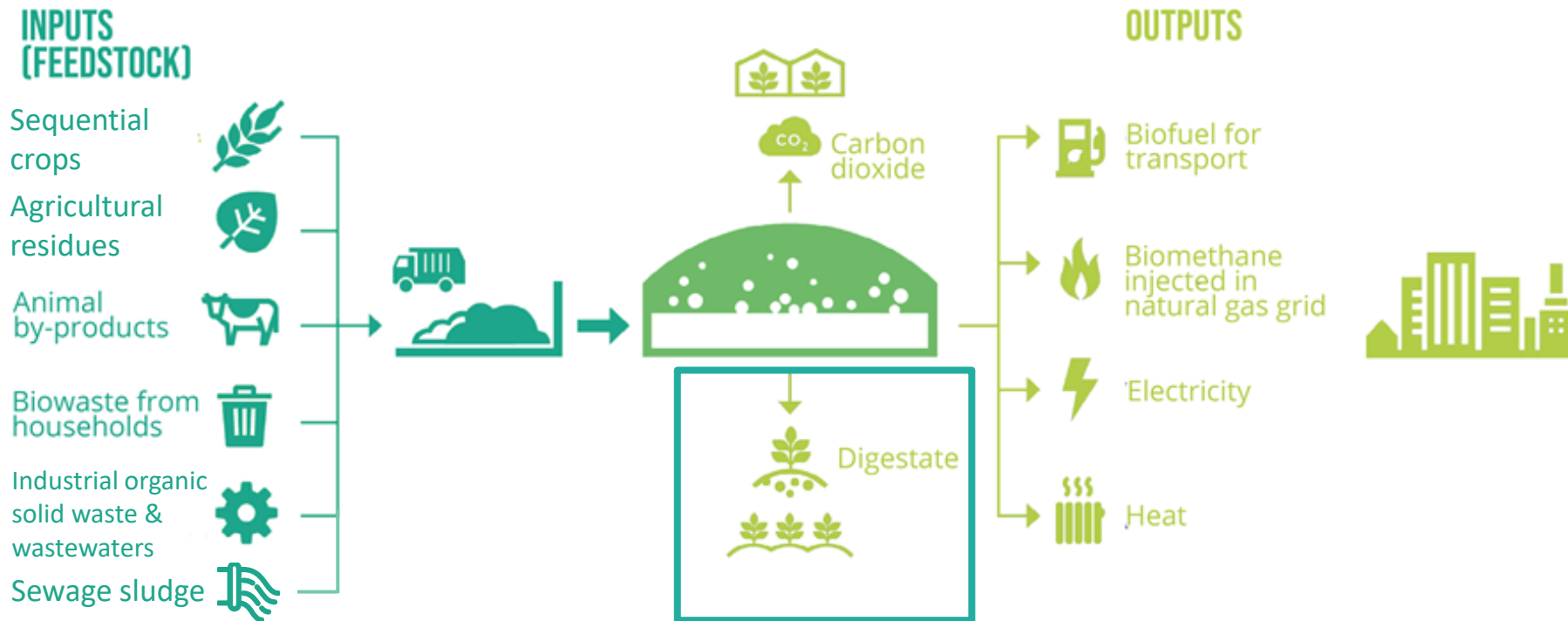
 **> gas demand of Poland**  
= 6% EU gas consumption

 **20% biogases upgraded**  
18 bcm produced in EU-27

■ Energy from biogas (bcm)  
■ Energy from biomethane (bcm)



# Re-thinking our economic model switching to a circular economy



Source EBA Statistical Report 2023

# How much digestate is Europe producing? And what is its potential to displace synthetic fertilisers?

Consultation with  
EBA members & experts

## Conversion factor

(ton of digestate (DM) per GWh  
of biogases production)

Feedstock specific

Agricultural  
factor

Biowaste factor

**193**  
tons  
DM/GWh

**253**  
tons  
DM/GWh

Biogases  
production in 2022

Total digestate  
production  
in Europe in  
2022

Average nutrient  
composition of  
digestate

Nutrient  
content (N, P,  
K) potential of  
digestate in  
2022

Average nutrient  
content of  
fertilisers **used**  
in Europe

Synthetic fertiliser  
displacement  
potential  
(N, P, K) in 2022



# Digestate offers an alternative to synthetic fertilisers



**31 Mt (DM)**  
digestate produced  
Europe, **2022**

Digestate can already displace:  
**15%**

**Nitrogen-based fertilisers**  
(N applied in EU-27: 11.1 Mt/year)

**11%**

**Phosphorus fertilisers**  
(P applied in EU-27: 2.8 Mt/year)

**6%**

**Potassium fertilisers**  
(K applied in EU-27: 3.1  
Mt/year)



GHG reduction potential when displacing  
synthetic N-fertilizers with digestate

**10 Mt**  
**of CO<sub>2</sub> equivalent**  
**in 2022**

**Natural gas** is the main feedstock and  
energy source to produce **synthetic**  
**fertilisers**

The replacement of 15%  
of **synthetic nitrogen fertilisers** with  
digestate could save today around  
**2 bcm of natural gas**



# Digestate is an enabler of carbon sequestration



**9,3 Mt** of Total Organic Carbon, **2022**

More **stable organic carbon**, particularly **recalcitrant to biodegradation**

- High potential for **carbon sequestration**
- Leads to **humus** and **structure formation** in the soil and increases its **fertility, functionality, microbial activity, aeration, and water storage capacity**

## Carbon sequestration potential of digestate

	% of remaining TOC after 92 days
Solid fraction of digestate	86%
Digestate 1	73%
Digestate 2	56%
Cattle manure	58%
Maize straw	43%
<i>Reuland, G.; Sleutel, S.; Li, H.; Dekker, H.; Sigurnjak, I.; Meers, E. Quantifying CO<sub>2</sub> Emissions and Carbon Sequestration from Digestate-Amended Soil Using Natural <sup>13</sup>C Abundance as a Tracer. Agronomy 2023, 13, 2501.</i>	

➔ The application of (solid fraction) digestate on soil is both a **sustainable soil management** and a **carbon farming practice**

# European digestate production



**Most common end-use:**  
directly applied biofertilizer

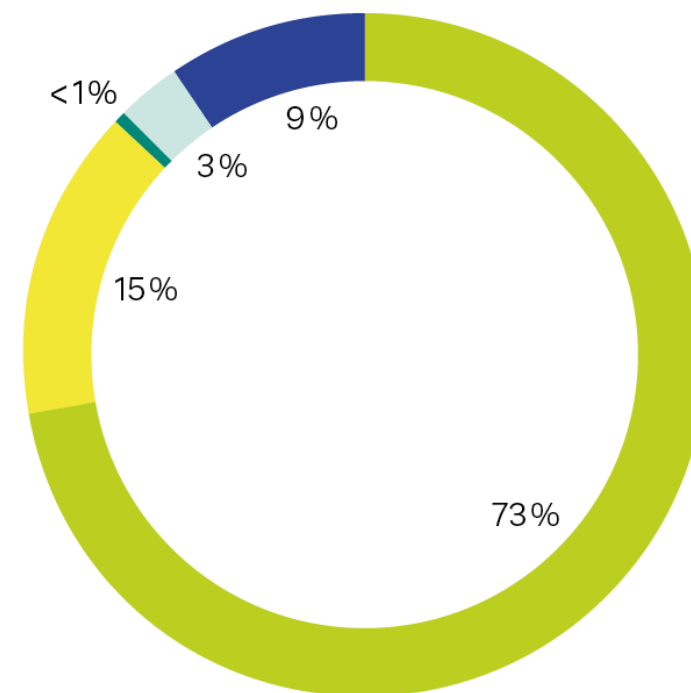


**Mostly non-separated digestate**  
Austria, Denmark, Germany, Poland,  
Slovakia, Sweden, and Ukraine



**Mostly liquid digestate**  
Serbia, Croatia, Slovenia, UK,  
Switzerland and Belgium

## Digestate end-uses in Europe

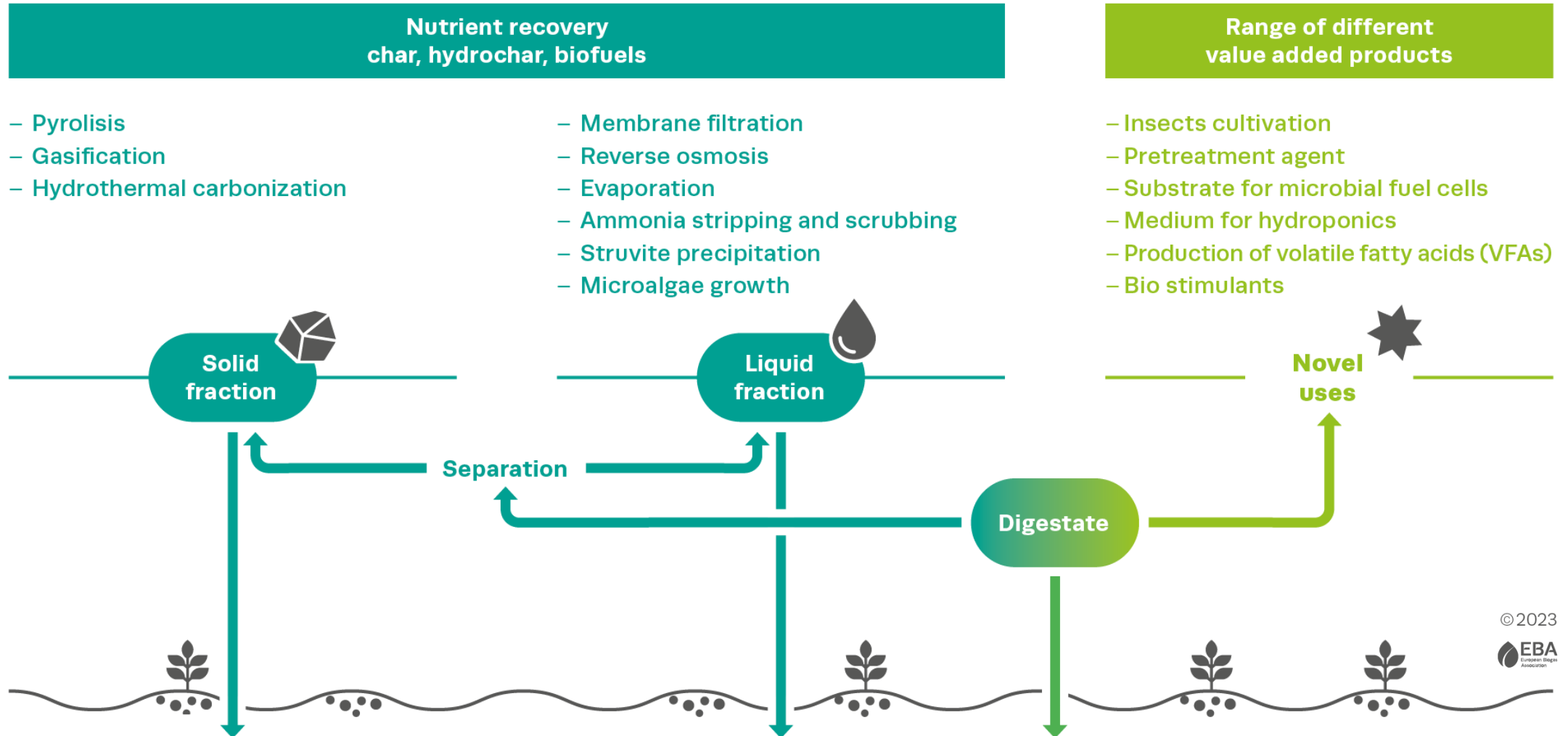


- Usage as a biofertiliser (direct)
- Usage as a biofertiliser (after upgrading)
- Biological processing (nitrification/denitrification)
- Exported
- Other usage

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# Digestate valorization routes



# Regulatory challenges and opportunities for digestate



## Challenges

- **Fertilising Products Regulation** (EU 2019/1009): setting heavy requirements for digestate to be CE-marketed as organic fertiliser or soil improver.
- **Animal By-Products Regulation** (EC 1069/2009 & EU 142/2011, EU 2023/1605): setting additional requirements for certain *animal by-products* to be placed on the market.
- **Nitrates Directive** (91/676/EEC): restricting the application of digestate from *manure*.
- **Sewage Sludge Directive** (86/278/EEC): restricting the application of digestate from *sewage sludge* in agriculture.



## Opportunities

- **Soil Monitoring Law:** promoting the application of circular fertilisers as a sustainable soil management/regeneration practice.
- **Common Agricultural Policy:** incentivizing the use of organic fertilisers through eco-schemes.
- **Carbon Removal Certification Framework:** setting a voluntary framework for carbon removal activities including carbon farming.
- **Waste Framework Directive:** encouraging the recycling of *bio-waste* through anaerobic digestion with use of digestate.
- **Urban Wastewater Treatment Directive:** stimulating the recovery of nutrients from *sewage sludge*.

# WEBINAR

**Dig Deep!**

Understanding Digestate  
Nutrient Cycle, Soil Quality, Energy Resilience

WEDNESDAY 27 MARCH 2024

**10H – 11H30 AM CET**

[info@europeanbiogas.eu](mailto:info@europeanbiogas.eu)

[www.europeanbiogas.eu](http://www.europeanbiogas.eu)



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# Thank you for your attention!

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