Zero Pollution Farms with Biogas

1 June 2021 | 10:30 CEST Online

EU GREEN WEEK 2021 PARTNER EVENT

ZERO POLLUTION #EUGreenWeek
for healthier people and planet

EBA
European Biogas Association

Agenda

WELCOME

KEYNOTE SPEECH: Viviane André (Clean Air Unit, DG Environment, European Commission)

OPTIMISING FARM RESOURCES WITH BIOGAS PRODUCTION
Moderated by Oliver Jende

- *Discovering the benefits of the organic carbon cycle*
  Piero Gattoni (EBA Vice-President, President of Consorzio Italiano Biogas)
- *Not just Net Zero but Net Negative*
  Philipp Lukas (Chief Executive Officer of Future Biogas)
- *Biogas for the development of innovative circular economy systems*
  Erik Meers (Professor at Ghent University, representing Nutri2Cycle)

PANEL DISCUSSION
Moderated by Michael Niederbacher

- Viviane André (Clean Air Unit, DG Environment, European Commission)
- Laura Jalasjoki (Policy Analyst, European Network for Rural Development)
- Sean Finan (Vice-President, European Council of Young Farmers)
- Joao Pacheco (Senior Fellow, Farm Europe)
- Bruno Sander Nielsen (COO, Danish Biogas Association, Chief Advisor, Copa-Cogeca/ Danish Agriculture & Food Council)
- Margherita Tolotto (Senior Policy Officer for Air and Noise, European Environmental Bureau)

Keynote Speeker

Viviane André

Viviane André works in the **Clean Air Unit of Directorate General for Environment, European Commission**, where she leads the team in charge of the implementation of the NEC Directive (National Emission reduction Commitments Directive 2016/2284). She has been working in DG Environment since 2008, including several years on mainstreaming environmental considerations into climate and energy policies.

“Zero Pollution Farms with Biogas”: **Overview of the EU instruments to monitor and limit air pollution, in particular ammonia and methane**

Viviane André

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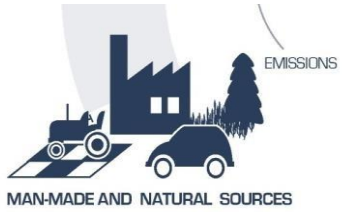
EU Clean Air Policy framework

Air Quality Directives

Maximum concentrations of air polluting substances

CONCENTRATIONS

EMISSIONS



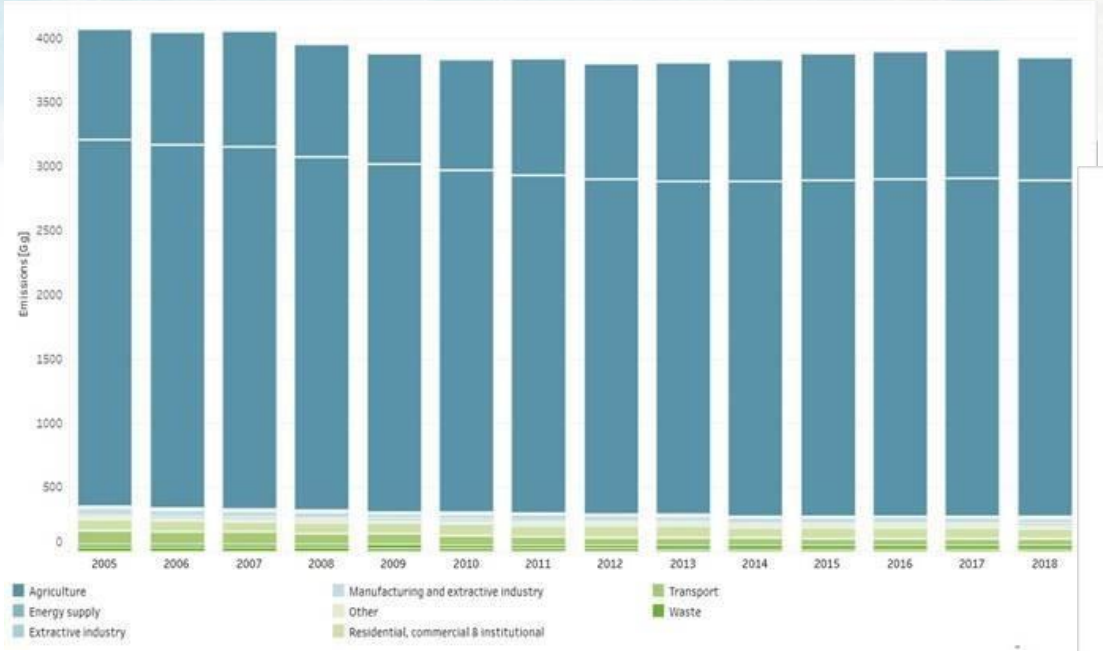
NEC Directive

Emission Reduction Commitments for SO_2, NO_x, NMVOC, $PM_{2.5}$, NH_3

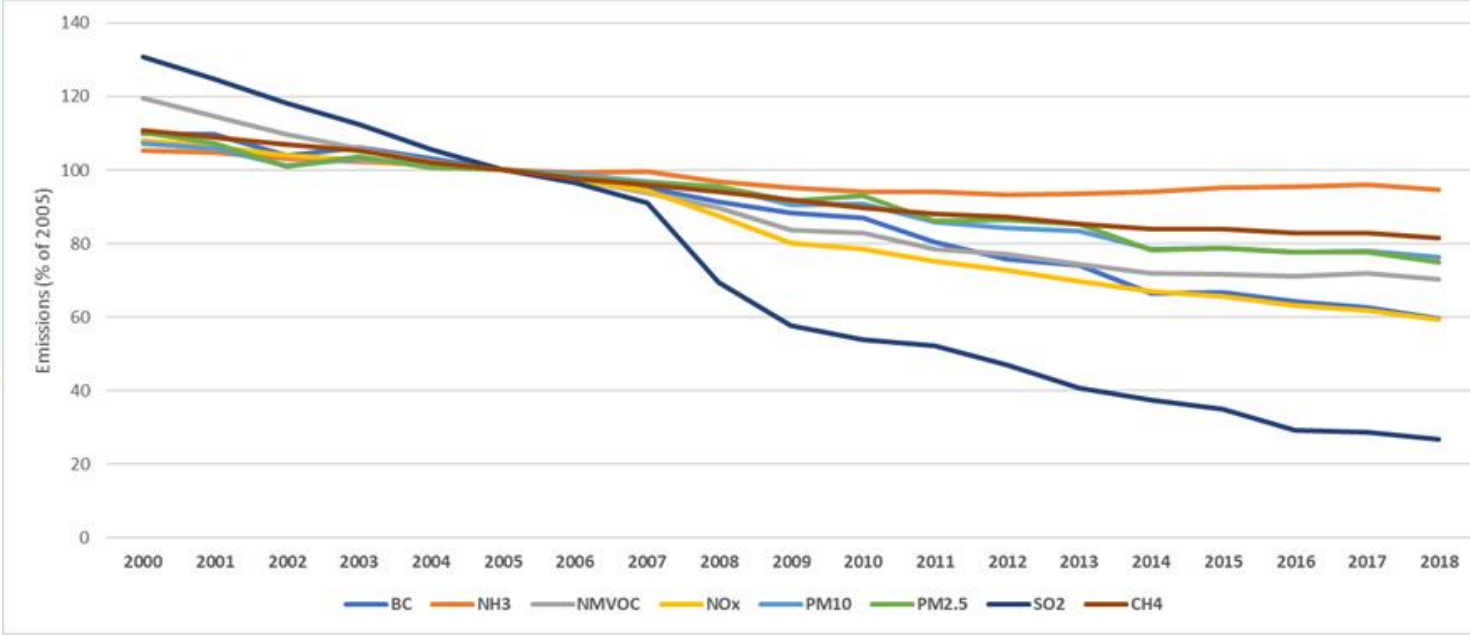
Source-specific emission standards

-IED Directive
-MCP Directive
-Eco-design Directive
-Energy efficiency
-Euro and fuel standards

Ammonia emissions (EEA)

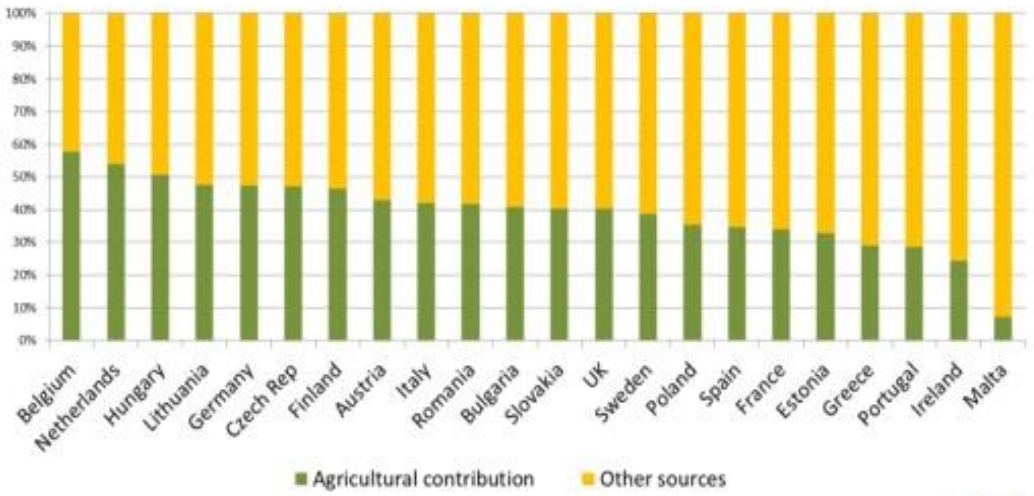


EU-28 emissions, % of 2005 levels (Source: EEA)



EU agriculture: **Almost 95% of ammonia emissions**
More than 50% of methane emissions

Contribution of agriculture to urban PM2.5 levels



Annex III of the NEC Directive:

a) nitrogen management, taking into account the full nitrogen cycle;

b) livestock feeding strategies;

c) low-emission manure spreading approaches;

d) low-emission manure storage systems;

e) low-emission manure processing and composting systems;

f) low-emission animal housing systems;

g) low-emission approaches for mineral fertiliser application.

Based on the **2001 UNECE Framework Code** for Good Agricultural Practice for Reducing Ammonia Emissions.

More information:

https://ec.europa.eu/environment/air/index_en.htm

Optimising Farm Resources with Biogas Production

With Piero Gattoni, Philipp Lukas, Erik Meers

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‘Discovering the benefits of the organic carbon cycle’

Piero Gattoni

Piero operates his family’s farm in North Italy with great passion for breeding, cheese production and renewable energy, promoting biogas and biomethane technology. He is the President of **CIB – Consorzio Italiano Biogas** since 2011. He was appointed Vice-President of EBA in 2019.

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Discovering the benefit of the organic carbon cycle

Piero Gattoni
Vice-President EBA, President CIB

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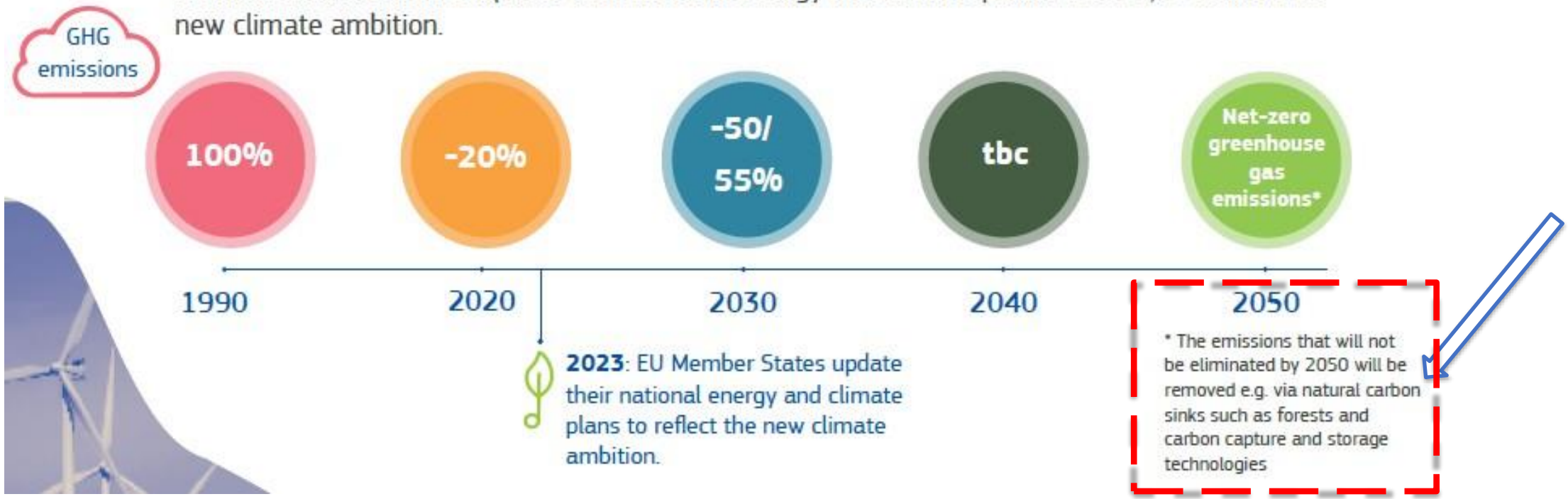
AGRICULTURE & THE EUROPEAN GREEN DEAL

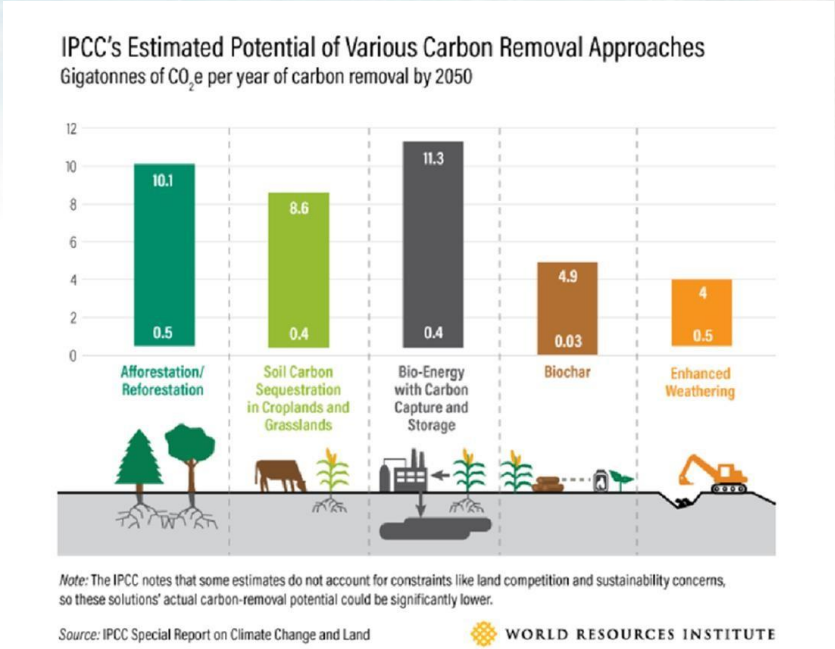
The European Commission will make proposals to increase the EU's climate ambition for 2030.

Relevant energy legislation will be reviewed and where necessary revised by June 2021. EU Member States will then update their national energy and climate plans in 2023, to reflect the new climate ambition.

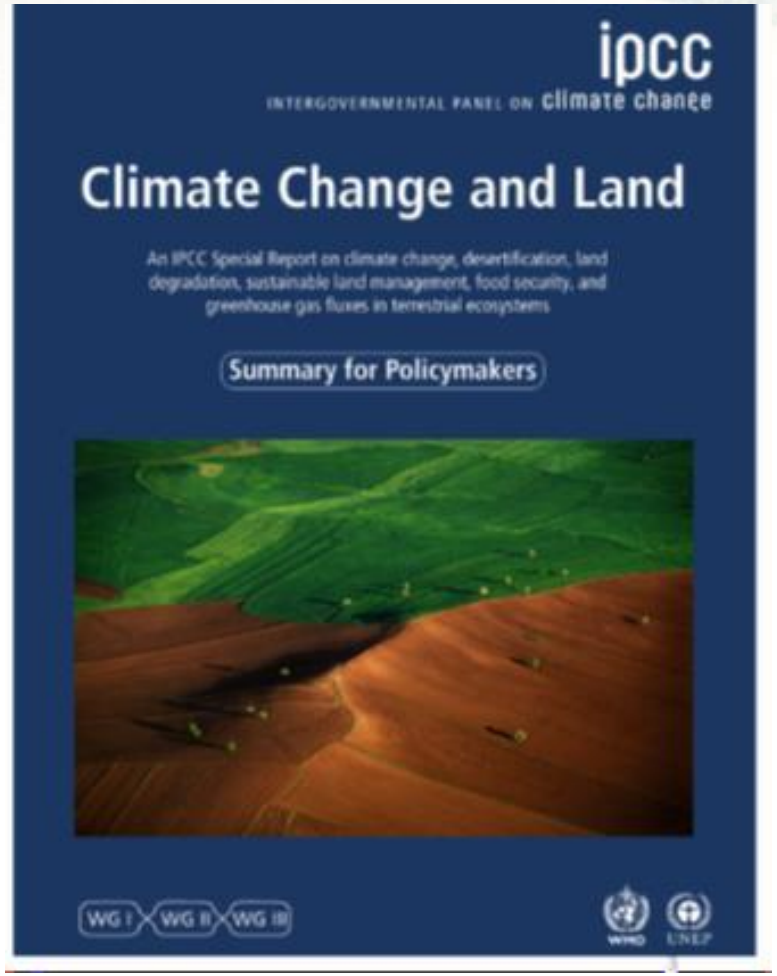


BENEFIT OF ORGANIC CARBON CYCLE :

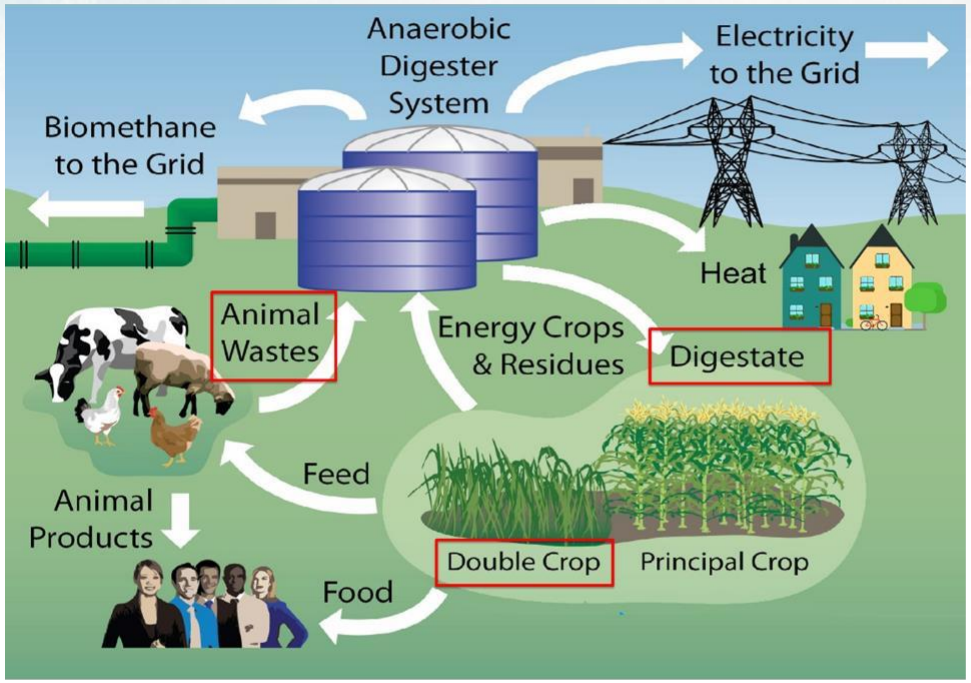
Agriculture is part of the problem but can be part of Climate solution

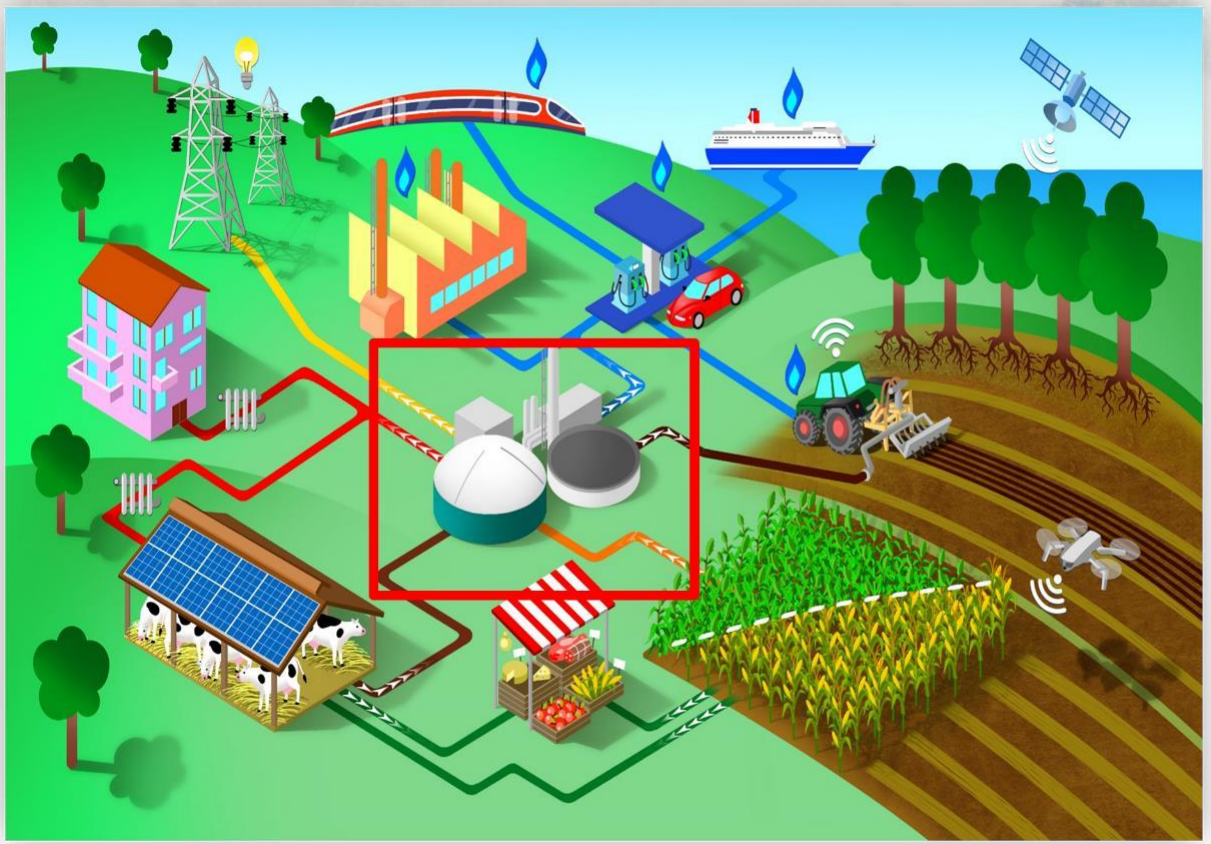


- IPCC October 2019 Climate and Land main messages :
  - *Land is under growing human pressure.*
  - *Land is a part of the solution.*
  - *But land can't do it all*



FROM BIOGASDONERIGHT® TO FARMING FOR FUTURE





BIOGASDONERIGHT® AS FACILITATOR TO AGROECOLOGICAL TRANSITION

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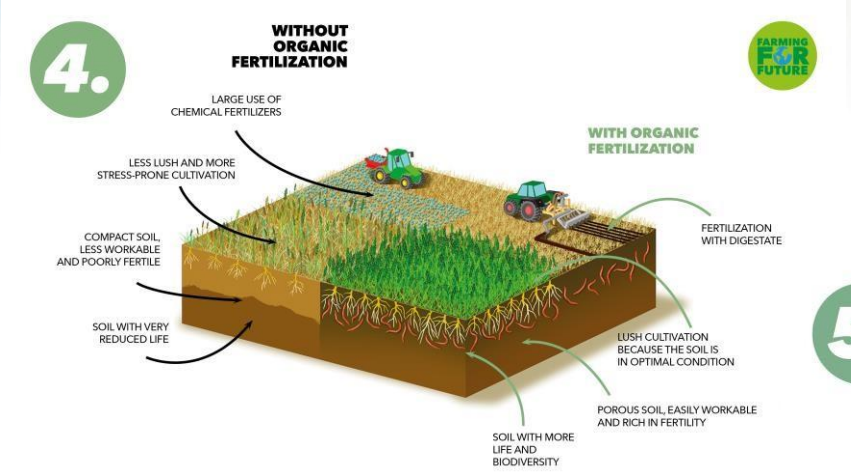
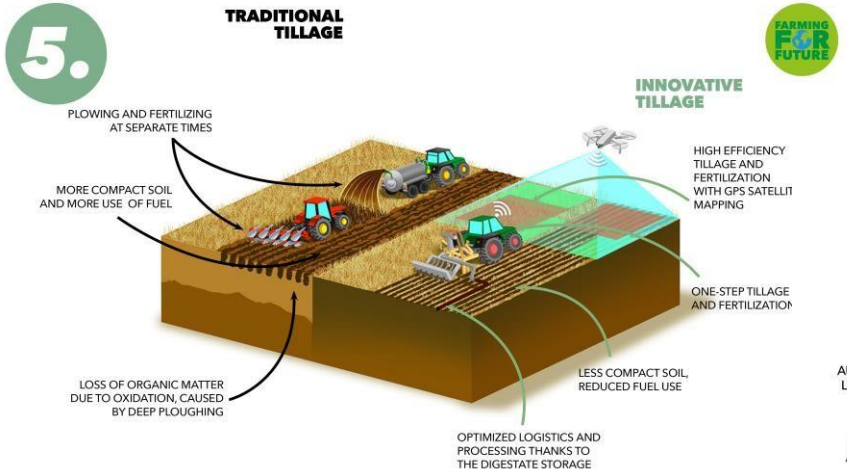
BENEFIT OF ORGANIC CARBON CYCLE: THE CORE OF FARMING FOR FUTURE PROJECT

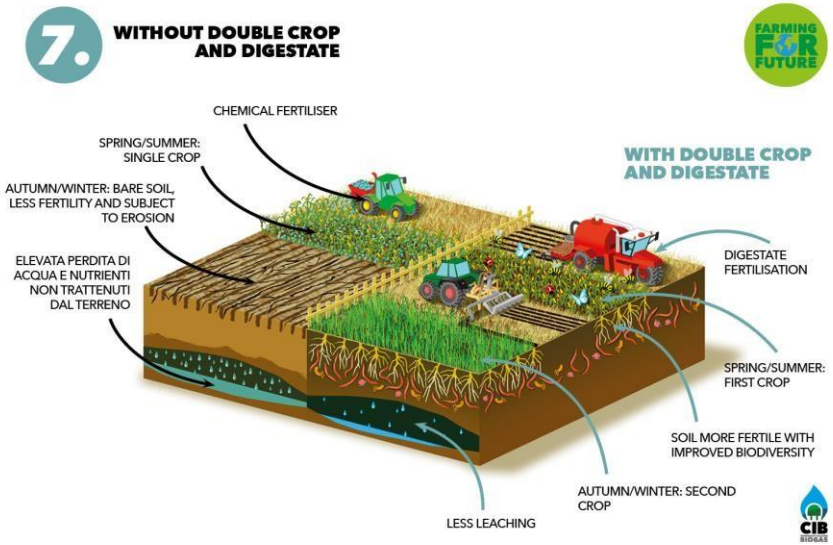
4. Organic fertilisation



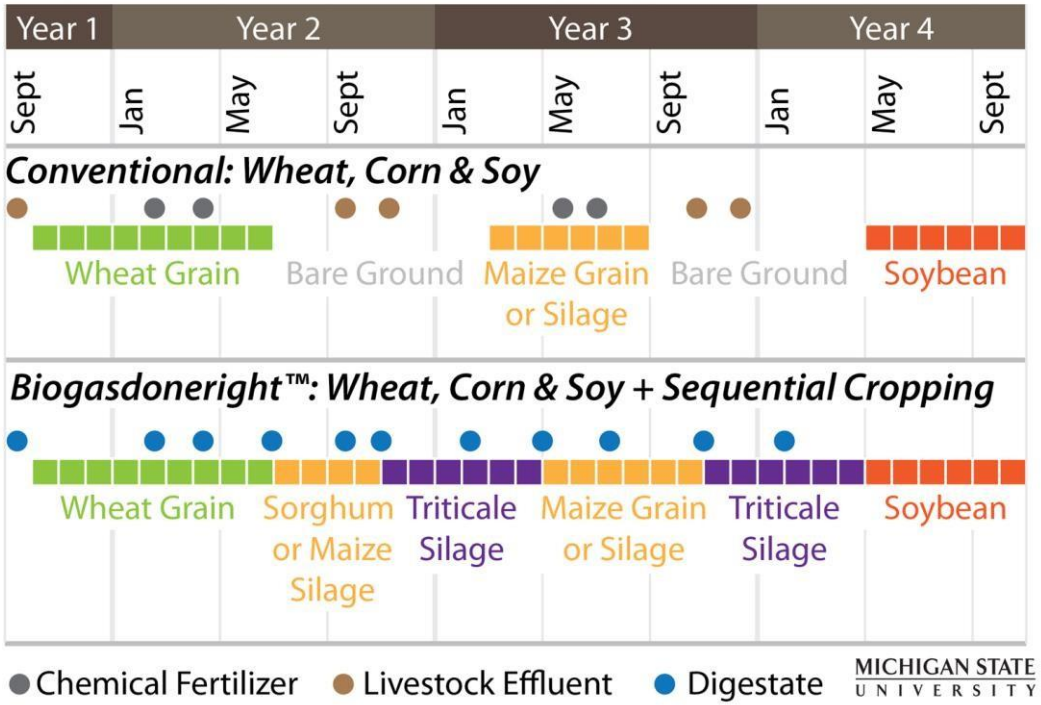
5. Innovative techniques, minimum tillage



7. Sequential crops (double crops)

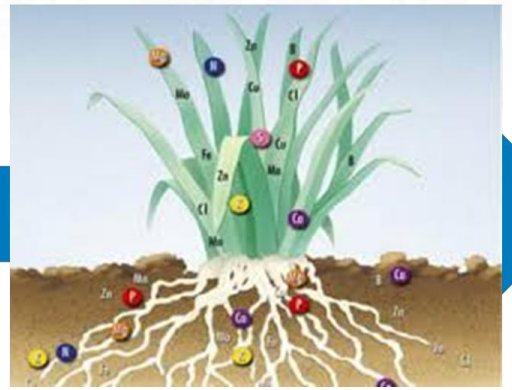


BENEFIT OF ORGANIC CARBON CYCLE
Sequential cropping, more photosynthesis per land unit



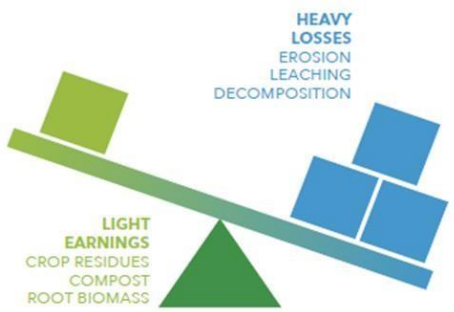
BENEFIT OF ORGANIC CARBON CYCLE:
From NPK to C-NPK with digestate fertilisation and nutrient recycling

NPK



C-NPK

SOIL CARBON DEPLETION



SOIL CARBON SEQUESTRATION

BENEFIT OF ORGANIC CARBON CYCLE FOR FARMERS

More photosynthesis per land unit means:

- Two crops for different markets
- More roots in soil
- More digestate for organic fertilisation

More soil carbon means:

- Stability of crop yield
- Less chemical fertilizer
- More water retention capacity
- Reduction of tillage intensity
- Reduction of diseases and use of pesticides

BENEFIT OF ORGANIC CARBON CYCLE FOR EVERYBODY

More photosynthesis per land unit and more soil carbon mean:

- More CO_2 capture from atmosphere
- Increase resilience to climate change
- Preserve and increase biodiversity
- Produce quality food, ensure food safety
- More easy to do “organic farming” thanks to digestate as organic fertiliser (EU objective 25% of agricultural area will be organic)

BENEFIT OF ORGANIC CARBON CYCLE: WHAT WE NEED

Farmers need:

- Clear rules that allow agriculture to be productive and sustainable;
- Correct implementation of the RED II (especially Annex IX);
- Appropriate approach to “carbon farming” in the CAP


FARMING FOR FUTURE
10 ACTIONS TO FARM THE FUTURE.
Thank you!
CIB
BIOGAS
www.farmingforfuture.it

‘Not just Net Zero but Net Negative’

Philipp Lukas

Philipp is Chief Executive Officer at **Future Biogas**, one of the pioneers of AD in the UK and the UK’s largest green gas producer. Philipp’s background is in law and renewables, having worked for corporate firm Travers Smith in London and run a cellulosic ethanol developer. He is also Executive Board Member of the European Biogas Association.

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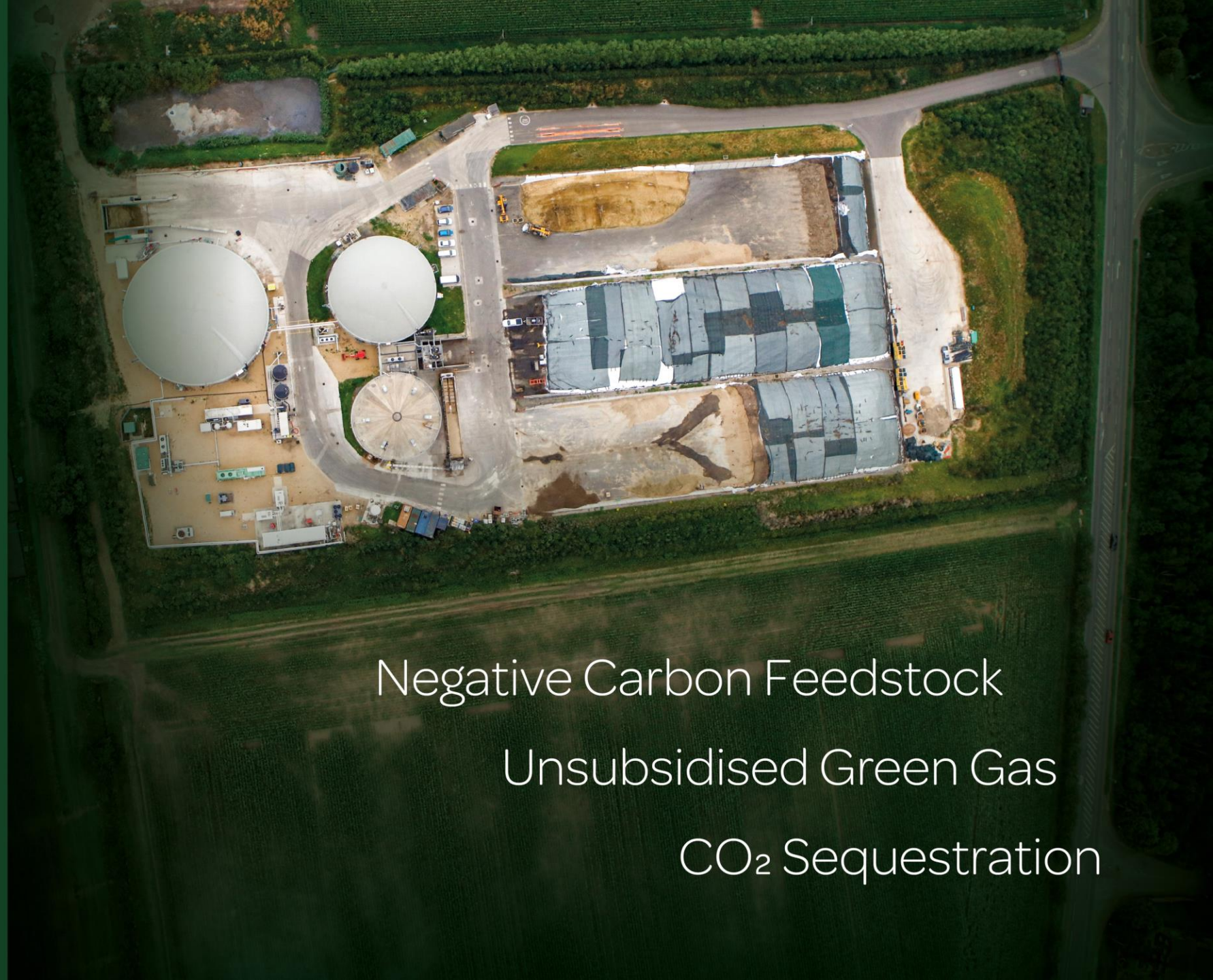
Not just Net Zero but Net Negative

June 2021

A journey that started in

2010

Largest UK biomethane operator



Negative Carbon Feedstock

Unsubsidised Green Gas

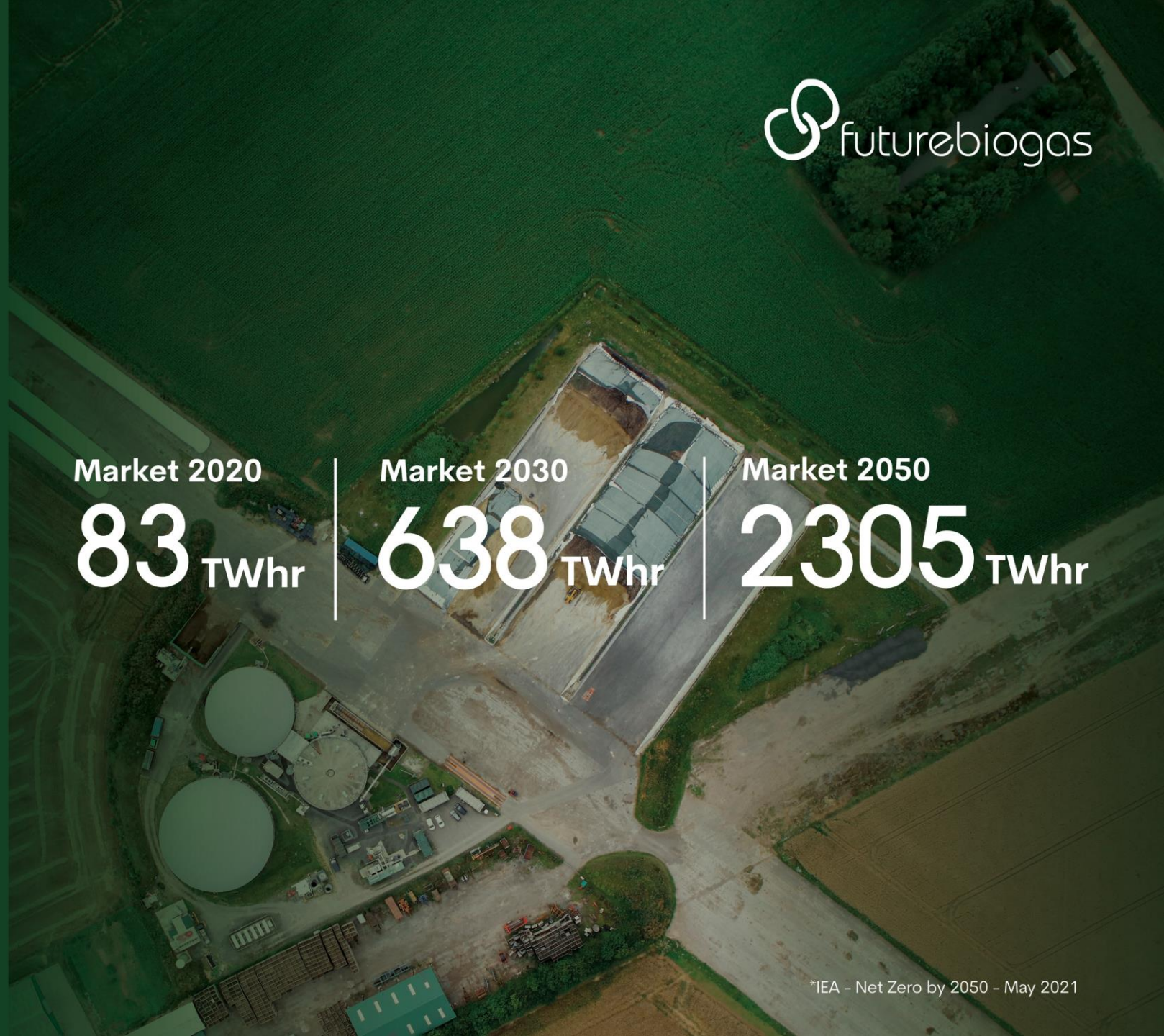
CO_2 Sequestration

Markets

Green Gas

Unsubsidised pricing 2021

€59-€100 MWhr



CO_2 Soil

Negative Carbon Farming

Feedstock on long-term contracts with digestate return.

Strict adherence to conservation/regen farming

- Minimum tillage
- Diverse rotation
- No bare soils (cover and break crops)

Soil carbon sequestration through increase in organic matter

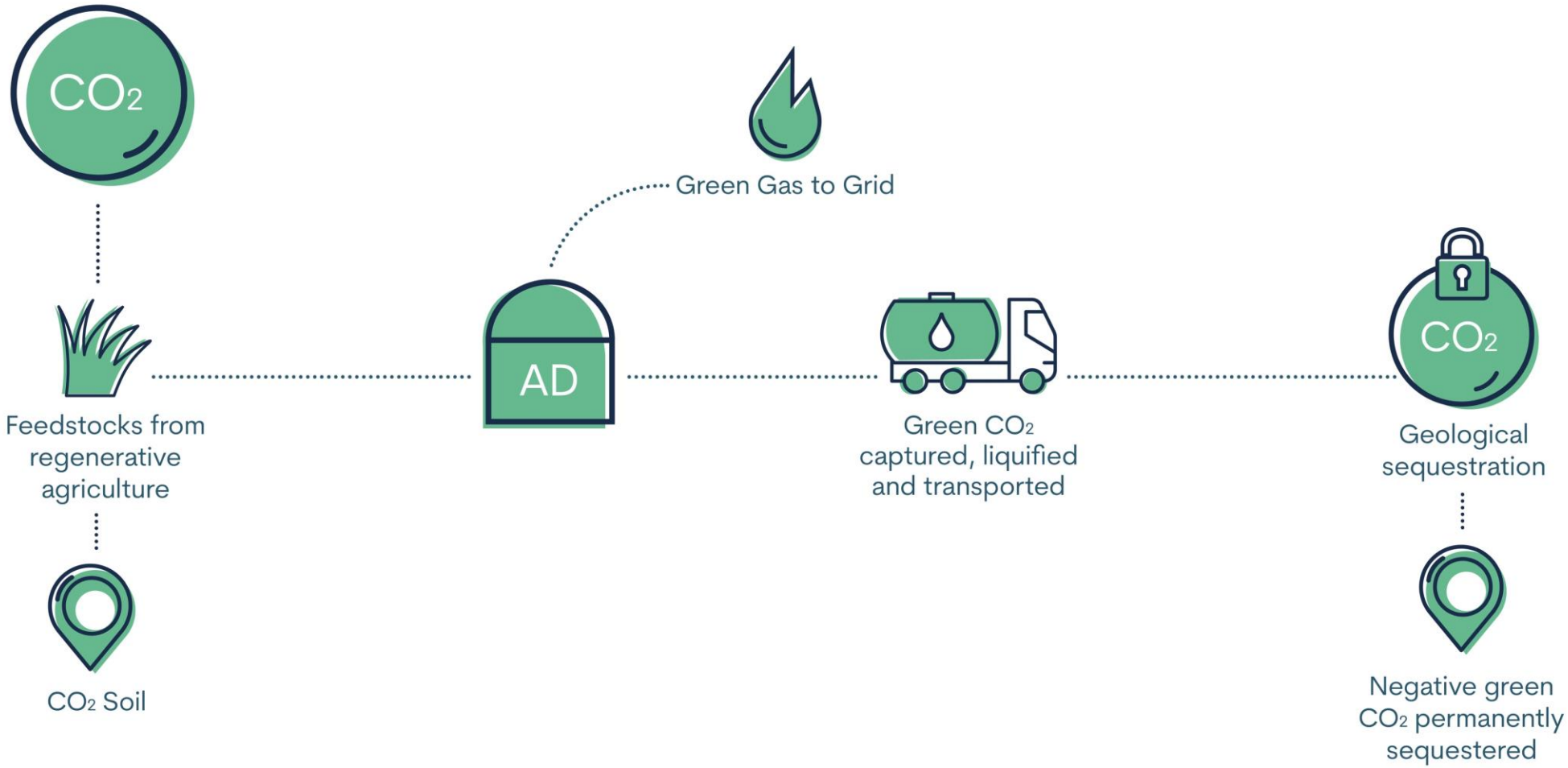
- Increased fertility
- Reduced inputs (fertilizer/sprays)
- Improved water retention

Delivering increased food crop yields while supplying renewable energy and storing carbon

NFU 4 POUR 1000 CLA CFA COOL FARM ALLIANCE

The Negative Carbon Factory

futurebiogas



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Thank you

www.futurebiogas.com

‘Biogas for the development of innovative circular economy systems’

Erik Meers

Erik is Professor associated to the Ghent University (Belgium) where he coordinates research in resource recovery. He is founder of the EU project cluster Biorefine Cluster Europe. In recent years, Erik Meers has supported EBA as chairman to the Scientific Advisory Council. He is also the Project Coordinator of **Nutri2Cycle**.

EBA European Biogas Association

Biogas for the development of innovative circular economy systems

Erik Meers

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Nutri2Cycle

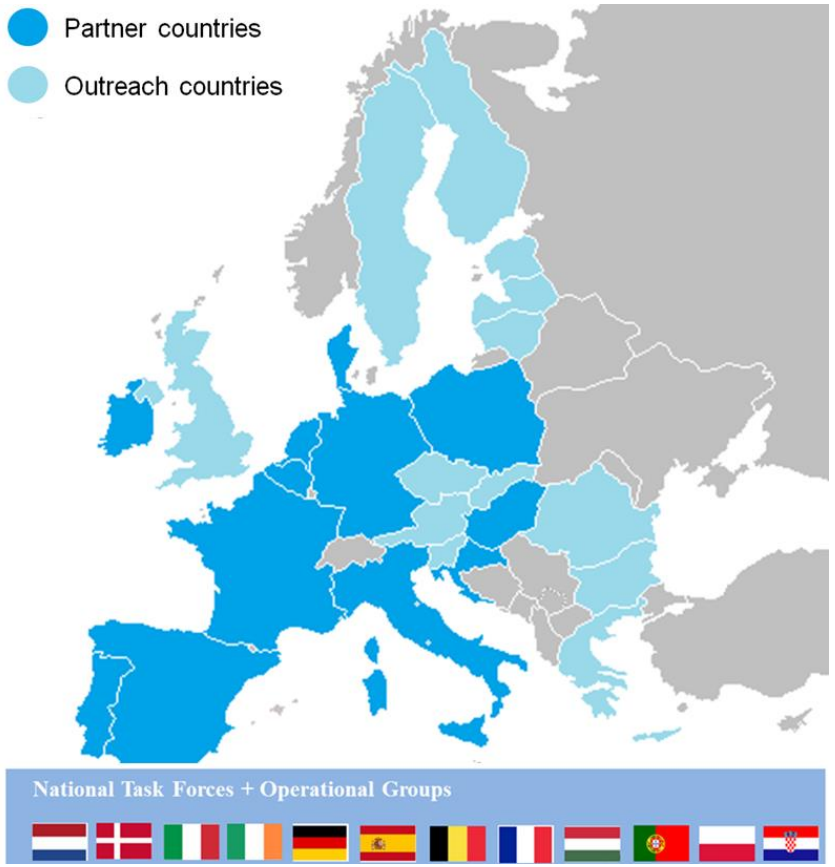
Transition towards a more carbon & nutrient efficient agriculture in Europe

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773682.

Nutri2Cycle: what?

Nutri2Cycle

- H2020 Research & Innovation Action, Grant number: 773682
- Start date: 1 October 2018
- Duration: 48 months
- Consortium:
  - 19 partners
  - 12 countries



Nutri2Cycle: rationale

Nutri2Cycle

Plant production and animal husbandry have each independently intensified over the last century

ANIMAL CROP

Crucial for EU food suply & self-sufficiency

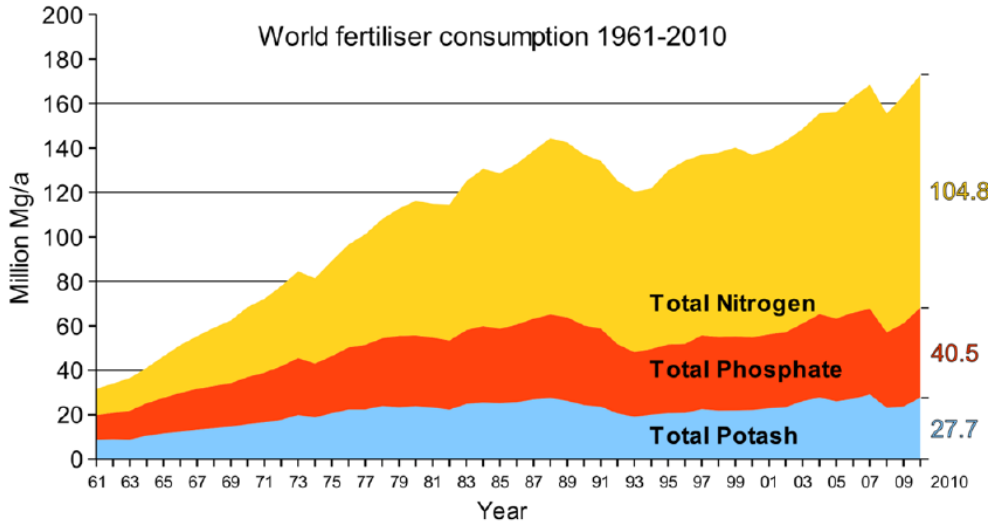
Environmental challenges & economic pressure

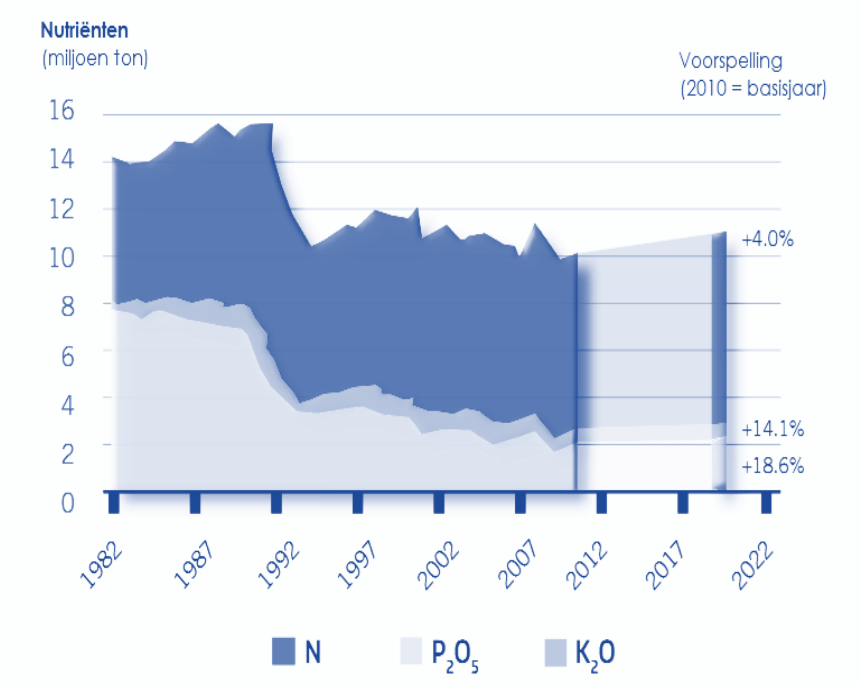
⇩

Import of primary nutrients & energy

Increasing demand mineral fertilizers

Nutri2Cycle





- The industrial production of mineral fertilizers worldwide has increased almost tenfold in the past seven decades.

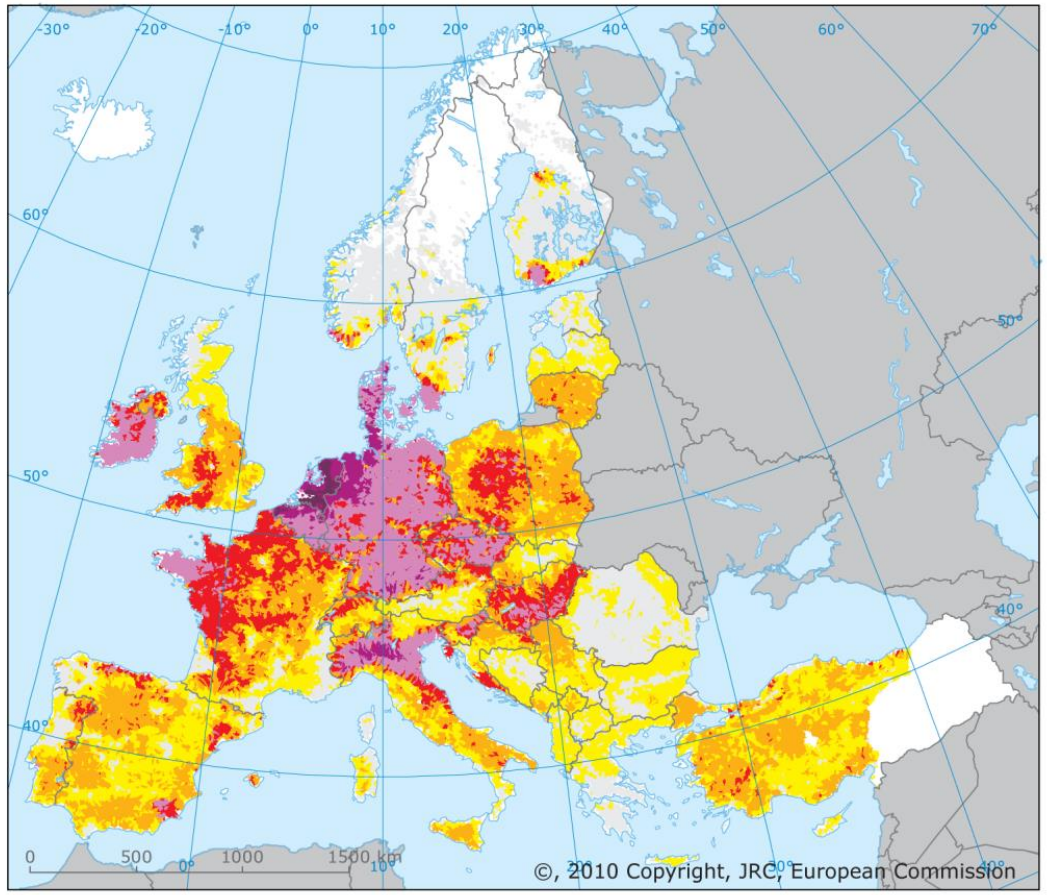
- The EU farming industry consumed >12 Mt of fertilisers in 2015 (Eurostat)

- Virtually all P = imported

Nutrient paradox

Nutri2Cycle

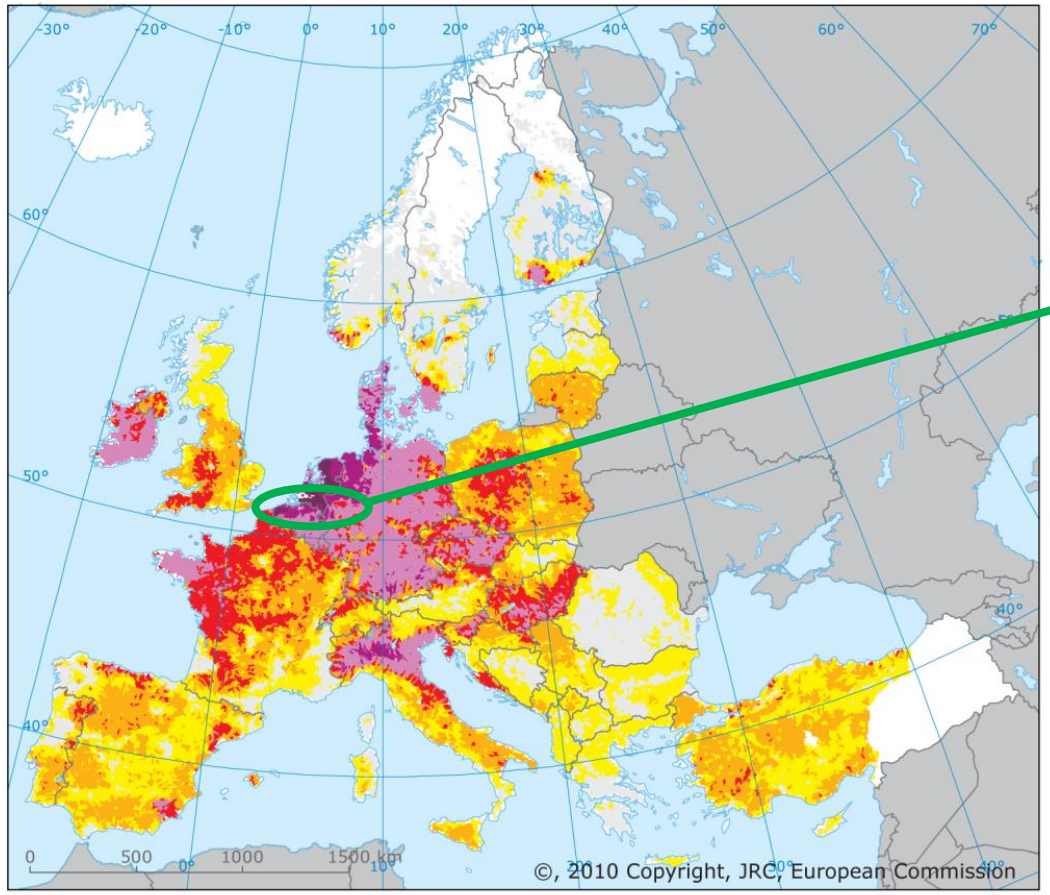
On the other hand….local nutrient excess from manure

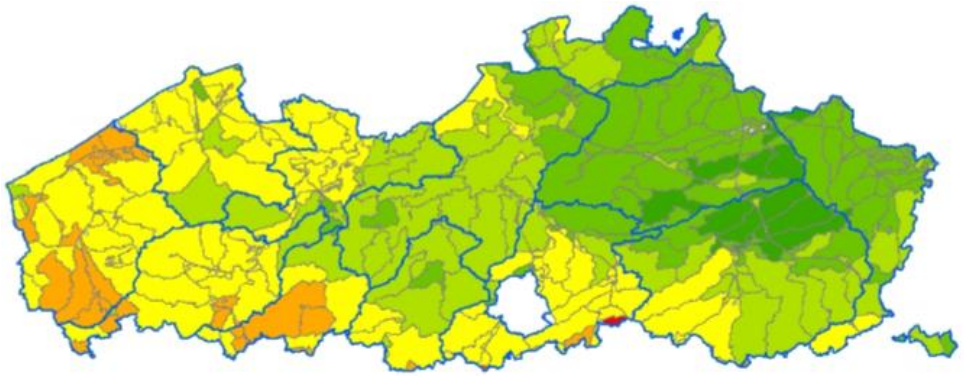


Increasing demand mineral fertilizers

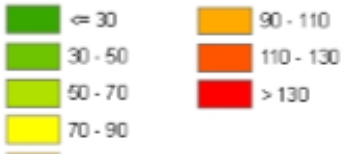
Nutri2Cycle

On the other hand….local nutrient excess from manure ⇔ use of artificial fertilizer





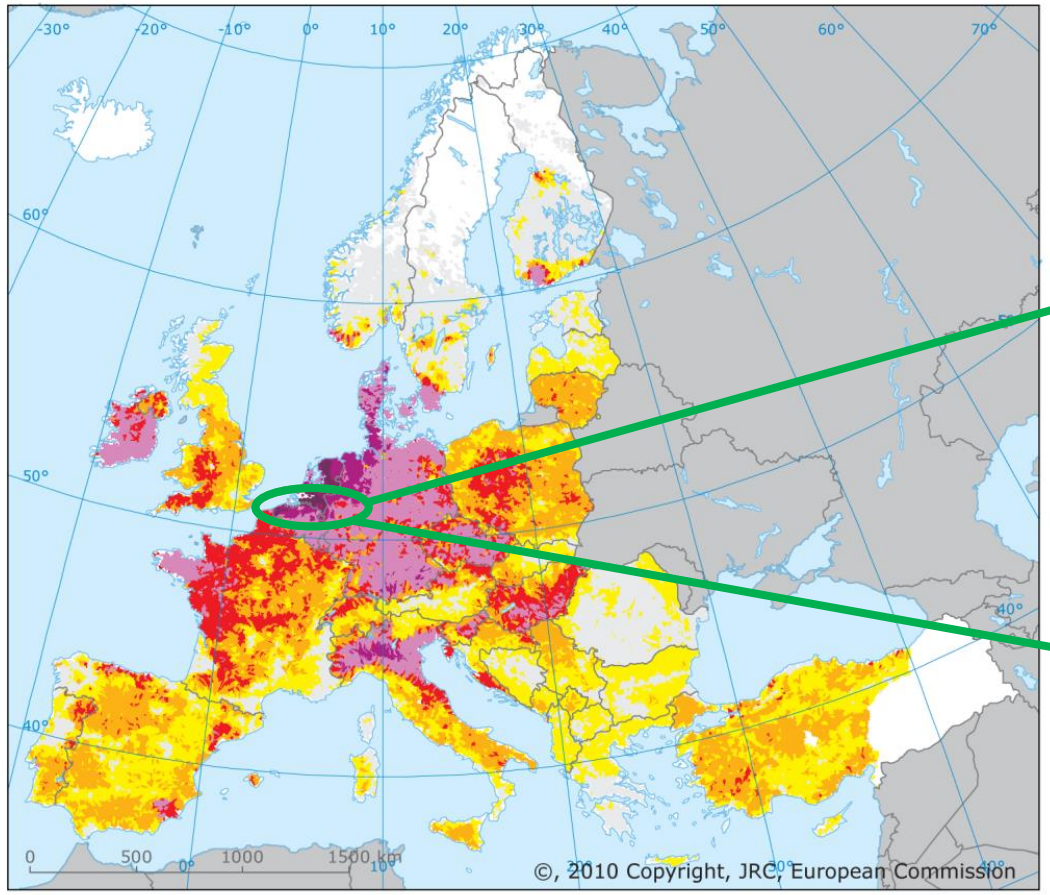
Use of artificial fertilizer (kgN/ha) (Source: VLM)

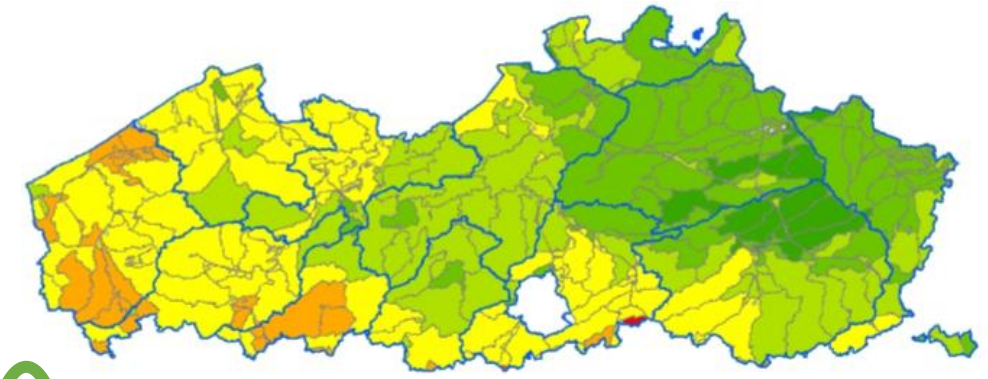


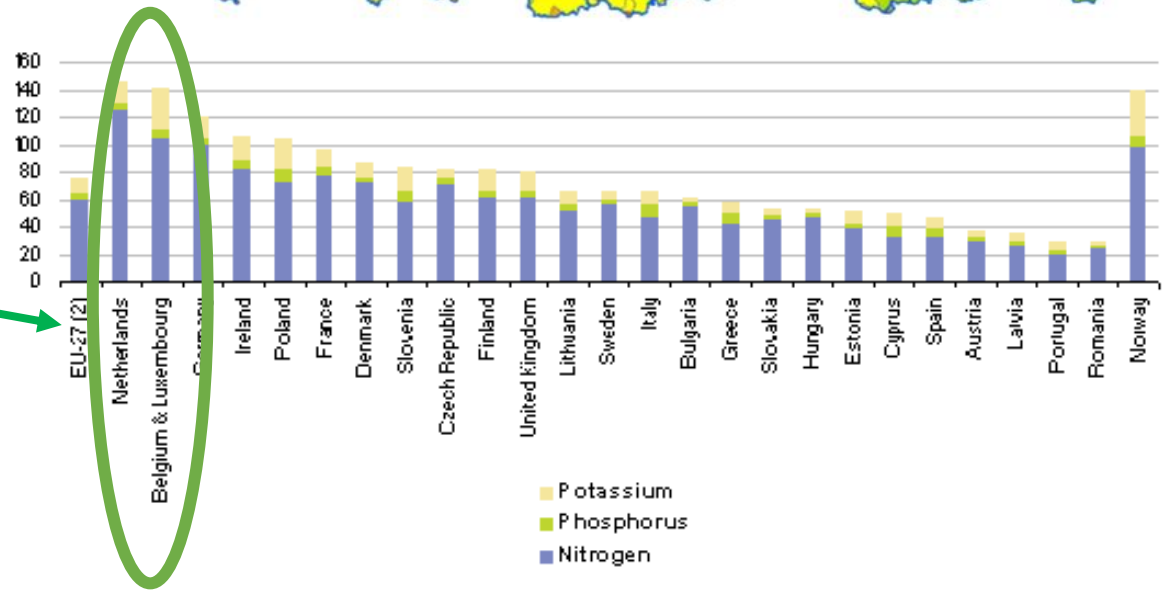
Nutrient paradox

Nutri2Cycle

High mineral fertilizer use – even in nutrient pressure regions





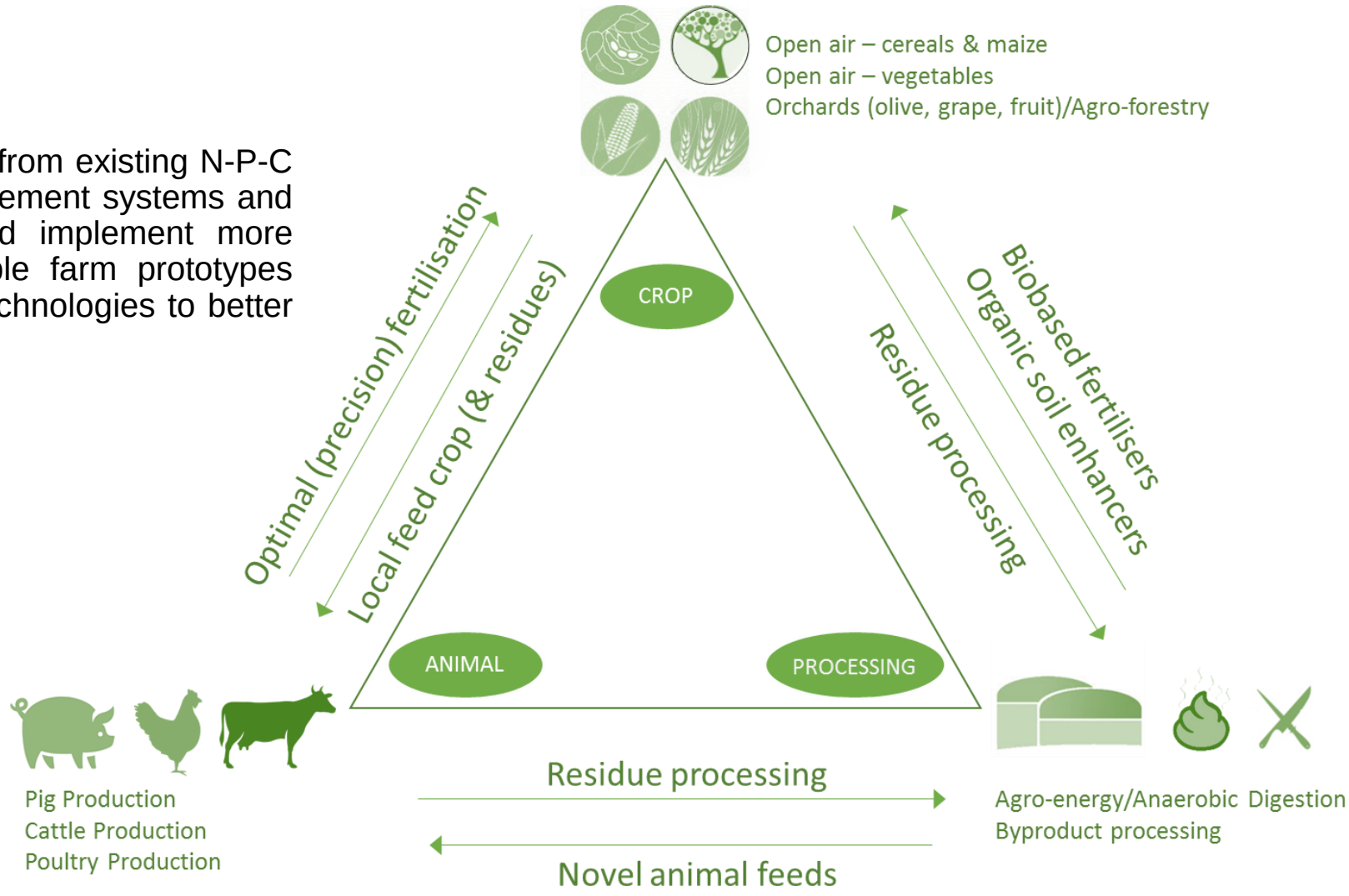


Nutri2Cycle
Nurturing the Circular Economy

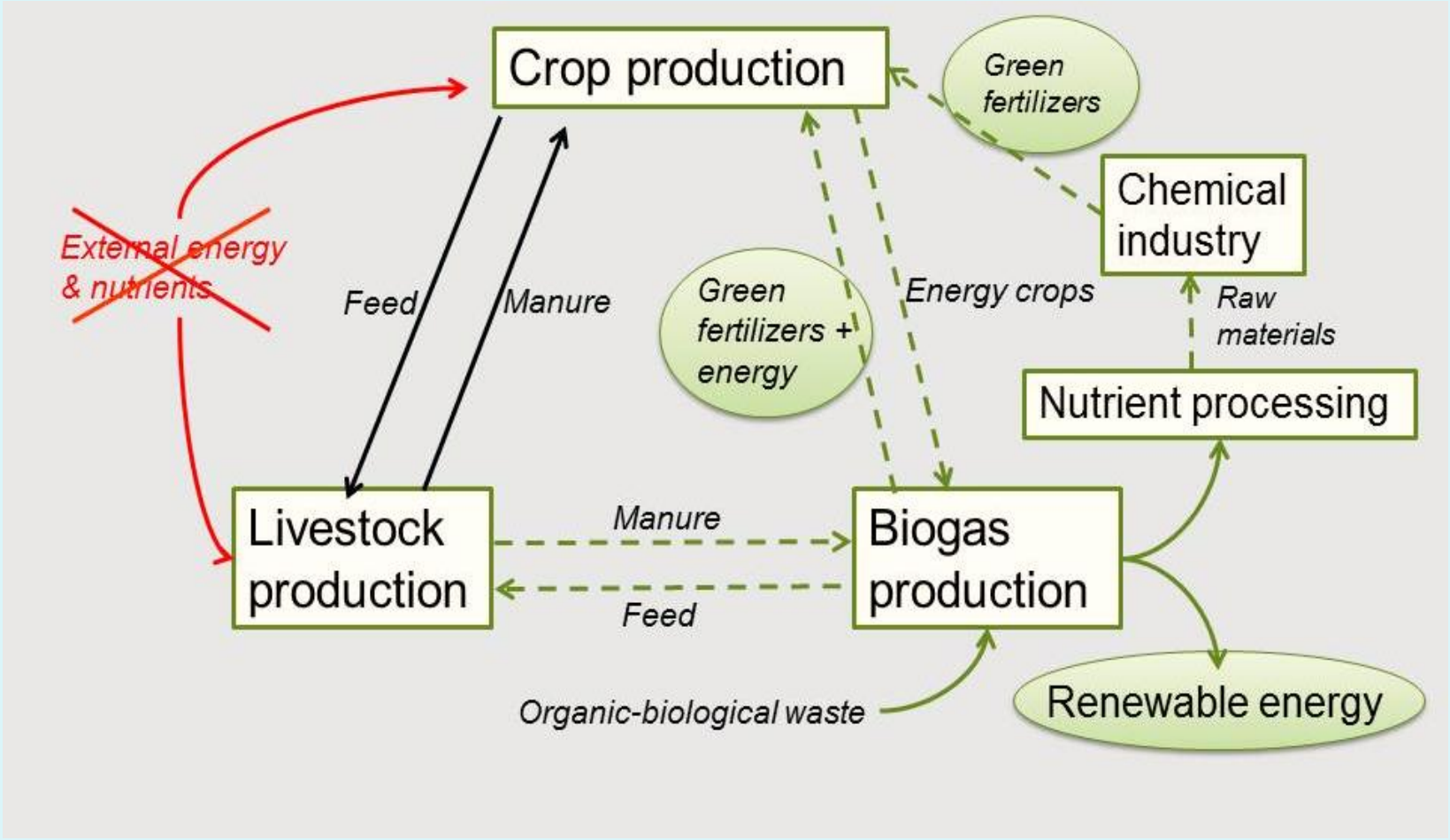
Central Concept

To improve nutrient & carbon cycles within agricultural systems a third pillar is required : agro-processing

NUTRI2CYCLE starts from existing N-P-C flows and farm management systems and will propose, test and implement more mature and sustainable farm prototypes including innovative technologies to better close the loops.



ROLE OF THE BIOGAS PROCESS IN OPTIMISING NUTRIENT & ENERGY CYCLES



NUTRI2CYCLE investigates 24 prioritary technical/management solutions/scenarios across 5 general research lines (I-V)

I Crop management

II Replacement of primary resources by biobased products

III Novel animal feeds produced from agro-residues

IV Innovative management systems, tools & practices for optimized nutrient & GHG management

V Techniques & instruments voor precision fertilisation

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Approximately half out of 24 investigated solutions also enjoy a direct link to biogas related research

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2. Catch crops to reduce N losses and increase biogas production
(Added value of digestate in OC restoration)

1. Practices for Soil Organic Matter
(Added value of digestate in OC restoration)

3 & 4. Substituting external mineral nutrient input from synthetic fertilisers by recycled organic based fertilizers in orchards & agroforestry / arable farming

5. Blending of raw and treated organic materials to produce organic fertilizers or growth substrates

6. P recuperation via struvite crystallisation

19 & 24. Nitrogen Sensors (e.g. Near Infra Red) to handle the variable composition in biobased fertilizers

13. Digestion at farm scale
(lab & pilot investigation on pig manure in BE)

14. Tailor made digestate products
(tool development)

12. Upcycling nutrients to algae proteins for animal feed

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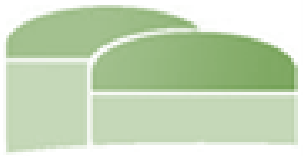

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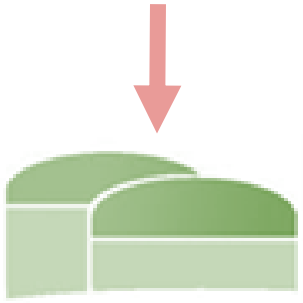
II Replacement of primary resources by biobased products

III Novel animal feeds produced from agro-residues

IV Innovative management systems, tools & practices for optimized nutrient & GHG management

V Techniques & instruments voor precision fertilisation

2. Catch crops to reduce N losses and increase biogas production
(Added value of digestate in OC restoration)



13. Digestion at farm scale
(lab & pilot investigation on pig manure in BE)

14. Tailor made digestate products
(tool development)

1. Practices for Soil Organic Matter
(Added value of digestate in OC restoration)

3 & 4. Substituting external mineral nutrient input from synthetic fertilisers by recycled organic based fertilizers in orchards & agroforestry / arable farming

5. Blending of raw and treated organic materials to produce organic fertilizers or growth substrates

6. P recuperation via struvite crystallisation

19 & 24. Nitrogen Sensors (e.g. Near Infra Red) to handle the variable composition in biobased fertilizers

Challenges & next steps (1/2)

(related to AD-relevant research)

- Relation between digestate derivates* and RENURE criteria
- Field scale investigation in several member states on agronomic and environmental performance of digestate derivates*
- Demonstration pilots on digestate treatment processes*

* Processes & products under investigation : raw digestate, liquid fraction of digestate, NH4SO4 & NH4NO3 from stripping/scrubbing, struvite

Challenges & next steps (2/2)

(related to AD-relevant research)

- Identifying added value of digestate (OM, biostimulating effects,…) in addition to mineral nutrient effects
- Greenhouse gas emission measurements digestate & derivates in comparison to mineral fertilizer and animal manure
- Tools for dealing with fertilising products with variable composition (such as digestate) : tool for tailor made product development, sensors & tools for precision farming
- Upcycling nutrients from digestate to protein as alternative, local, sustainable animal feed

Thank you!

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@Bioref_Cluster

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Question and Answer Session

With Piero Gattoni, Philipp Lukas, Erik Meers

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EU GREEN WEEK 2021 PARTNER EVENT

Panel discussion

With Viviane André, Laura Jalasjoki, Seán Finan, Joao Pacheco, Bruno Sander Nielsen, Margherita Tolotto

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EU GREEN WEEK 2021 PARTNER EVENT

Meet our panelists

Viviane André

Clean Air Unit of Directorate General for Environment, European Commission

Laura Jalasjoki

Policy Analyst, European Network for Rural Development

Seán Finan

Vice-President, European Council of Young Farmers

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European Biogas Association

Meet our panelists

Joao Pacheco

Senior Fellow, Farm Europe

Bruno Sander Nielsen

Chief Advisor, Copa-Cogeca/
Danish Agriculture & Food Council

Margherita Tolotto

Senior Policy Officer for Air & Noise,
European Environmental Bureau

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Panel discussion

Agriculture and animal farming have been lately associated with methane emissions.

What policy instruments should be developed to strengthen climate change mitigation?

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Panel discussion

The Farm to Fork Strategy, the Biodiversity Strategy, and more recently the Zero Pollution Action Plan identified the target for 2030 to reduce nutrient losses by 50%. Additionally, the Zero Pollution Action Plan sets a new target to reduce by 25% the EU ecosystems where air pollution through nitrogen deposits and eutrophication threaten biodiversity.

As for methane, what policy instruments should be developed? Is it possible to create synergies between methane and nitrogen goals?

Join us on Thursday 3 June!

10:30 Welcome by Harmen Dekker (EBA Director)

10:40 Keynote speech: MEP Anne Sander

10:50 From net to negative: cutting down CO2 emissions in transport

- *Shaping a performant EU mechanism to measure CO2 emissions*
  Maria Malmkvist, CEO of Swedish Gas Association
- OEM perspective: past-present-and future
  Giandomenico Fioretti, IVECO
- *CARREFOUR: fueling the energy transition with biomethane*
  Thomas Mathieu, Manager of Sustainability at CARREFOUR
- *Clean maritime transport with bio-LNG*
  Reetta Kaila, Technology & Development Manager, Wärtsilä Biogas Solutions
- *Developing the EU biomethane market*
  Milenko Matosic, DENA representing REGATRACE project

11:30 Deploying the full potential of biomethane in transport (panel discussion moderated by Harmen Dekker)

- Jens Andersen, Secretary General at NGVA Europe
- Steve Esau, General Manager at SEA-LNG
- Roxana Caliminte, Deputy Secretary General at GiE
- Susanna Pflüger, EBA Secretary General

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Thank you for joining us!

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