BIP Task Force 3

Dr Nick Primmer
Policy Lead
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Leader of TF3.1

BIP Europe
Biomethane Industrial Partnership

Introduction to the BIP and Task Force 3

About the Partnership

The launch of the BIP by EVP Timmermans and Commissioner Simson on the 28th of September during the European Sustainable Energy Week.

- The Commission's REPowerEU plan set the target of 35 BCM of biomethane by 2030.
- A new Biomethane Industrial Partnership (BIP) was established upon the REPowerEU plan to *'support the achievement of the target and create the preconditions for a further ramp up towards 2050'*.
- Scaling up the biomethane production is vital because of:
    1. The need to reduce European dependency on natural gas imports from Russia;
    2. To achieve EU energy independence;
    3. The high energy prices;
    4. The aggravation of the climate crisis.

Task force 3

Potential of innovative and sustainable biomass sources

3.1	3.2	3.3	3.4
EU-wide potential assessment for sustainable **rotational and sequential cropping**	EU-wide potential assessment for feedstock production on **marginal and contaminated land**	**Environmental co-benefits** through integrated food and energy systems	Identification of additional **innovative** sustainable biomethane feedstocks

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Potential of innovative and sustainable biomass sources

Rotational and sequential cropping	Marginal and contaminated land	Environmental co-benefits	Innovative

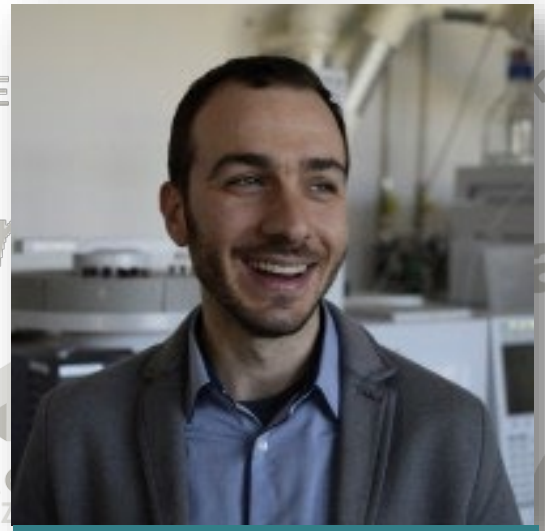
Nordzucker

VATTENFALL

Task force 3

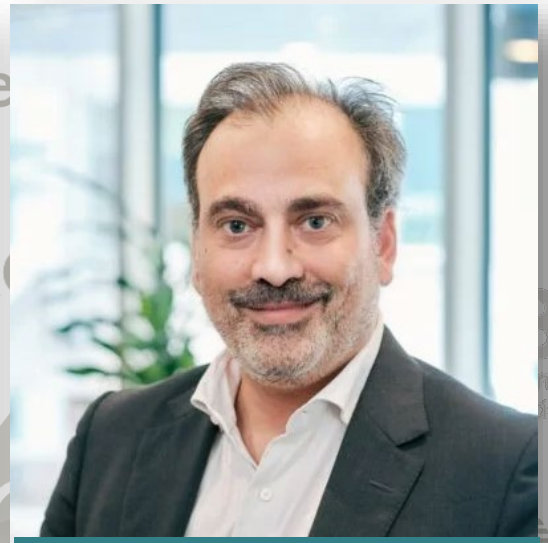
Potential of innovative and sustainable biomass sources

Rotational and sequential cropping	Marginal and contaminated land	Environmental co-benefits	Innovative



Marco Buffi

Scientific Project Officer
JRC



Piero Gattoni

President
Consorzio Italiano Biogas

Philipp Lukas

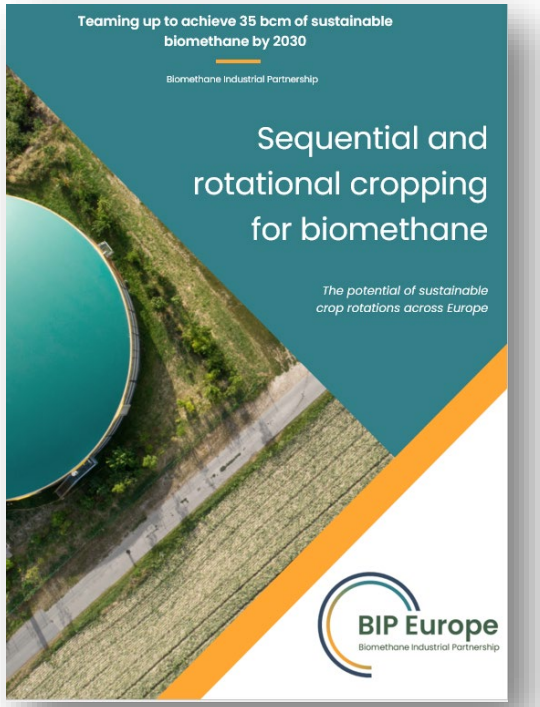
CEO
Future Biogas

Co-Chairs

Task force 3

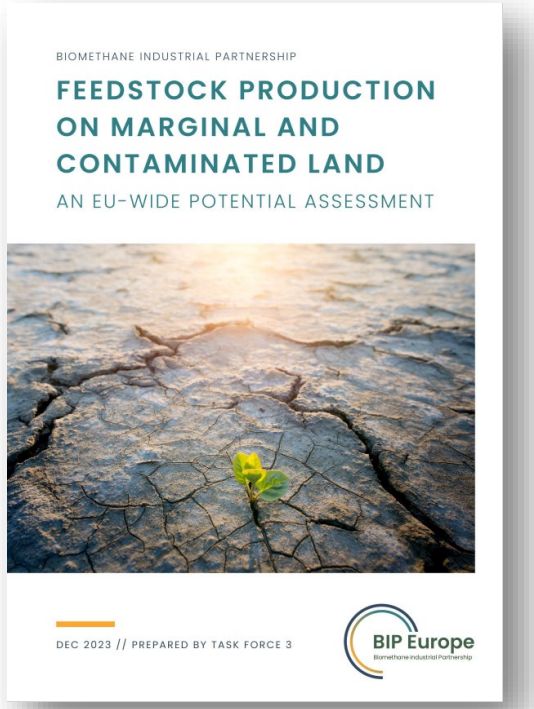
Potential of innovative and sustainable biomass sources

Rotational and sequential cropping



Publishing ASAP

Marginal and contaminated land



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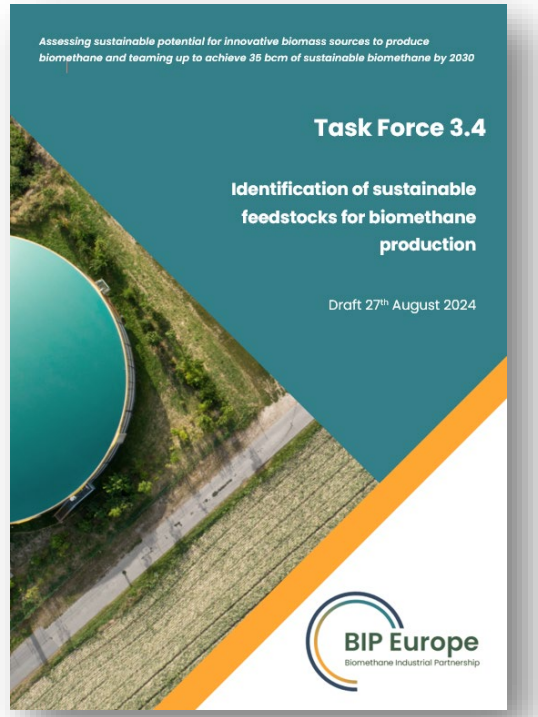
Environmental co-benefits

Re-focusing work

Innovative



Draft complete

Rotational and sequential cropping

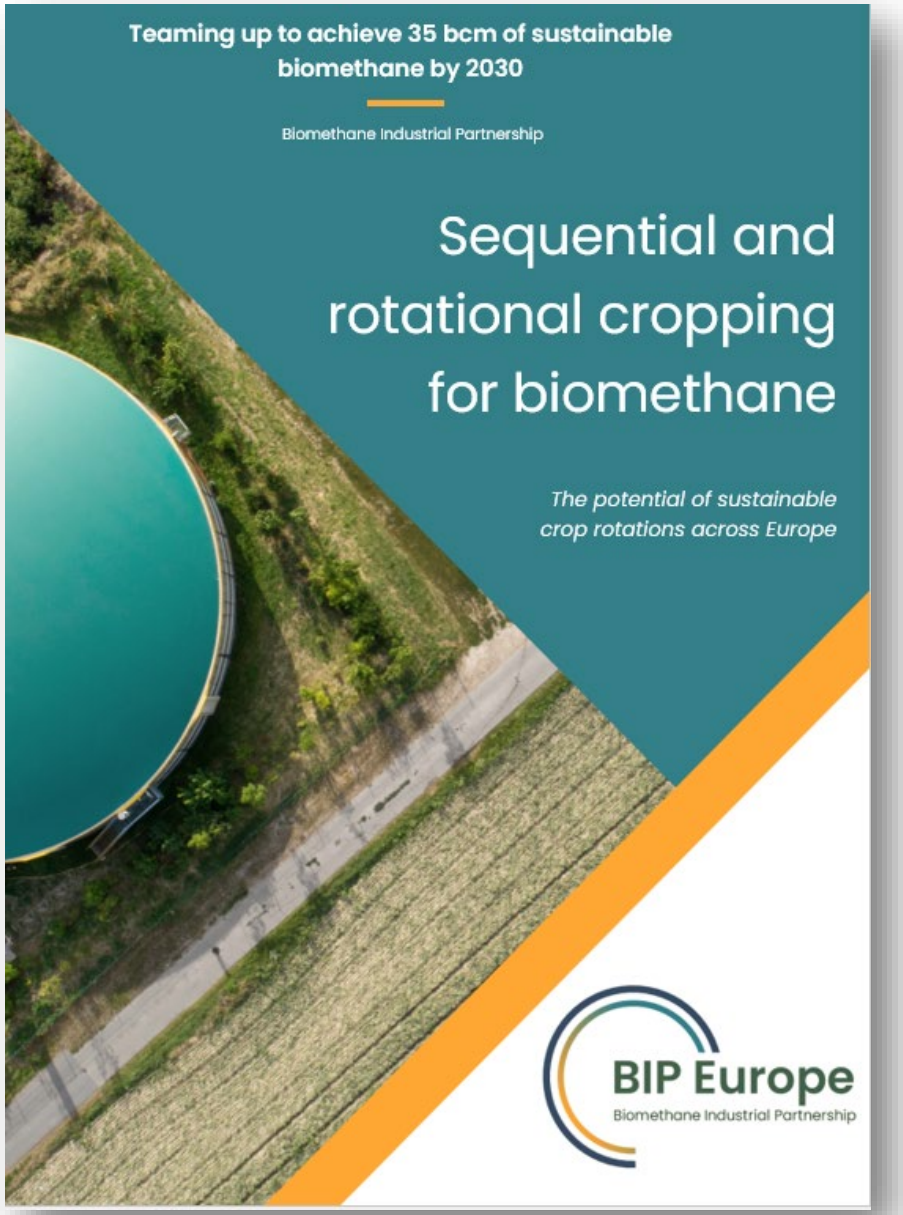
Sequential and rotation cropping for biomethane:

The potential of sustainable crop rotations across Europe

- ✓ Improve agricultural resilience
- ✓ Restore soil health
- ✓ Sequester carbon in soils
- ✓ Diversify agricultural incomes
- ✓ Enrich biodiversity
- ✓ Enhance food security

AND

- ✓ Increase the production of biomethane

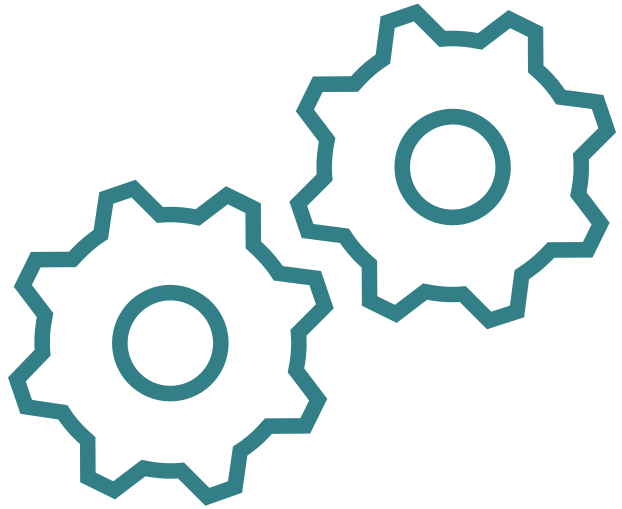


Rotational and sequential cropping

Principles for sustainable growth

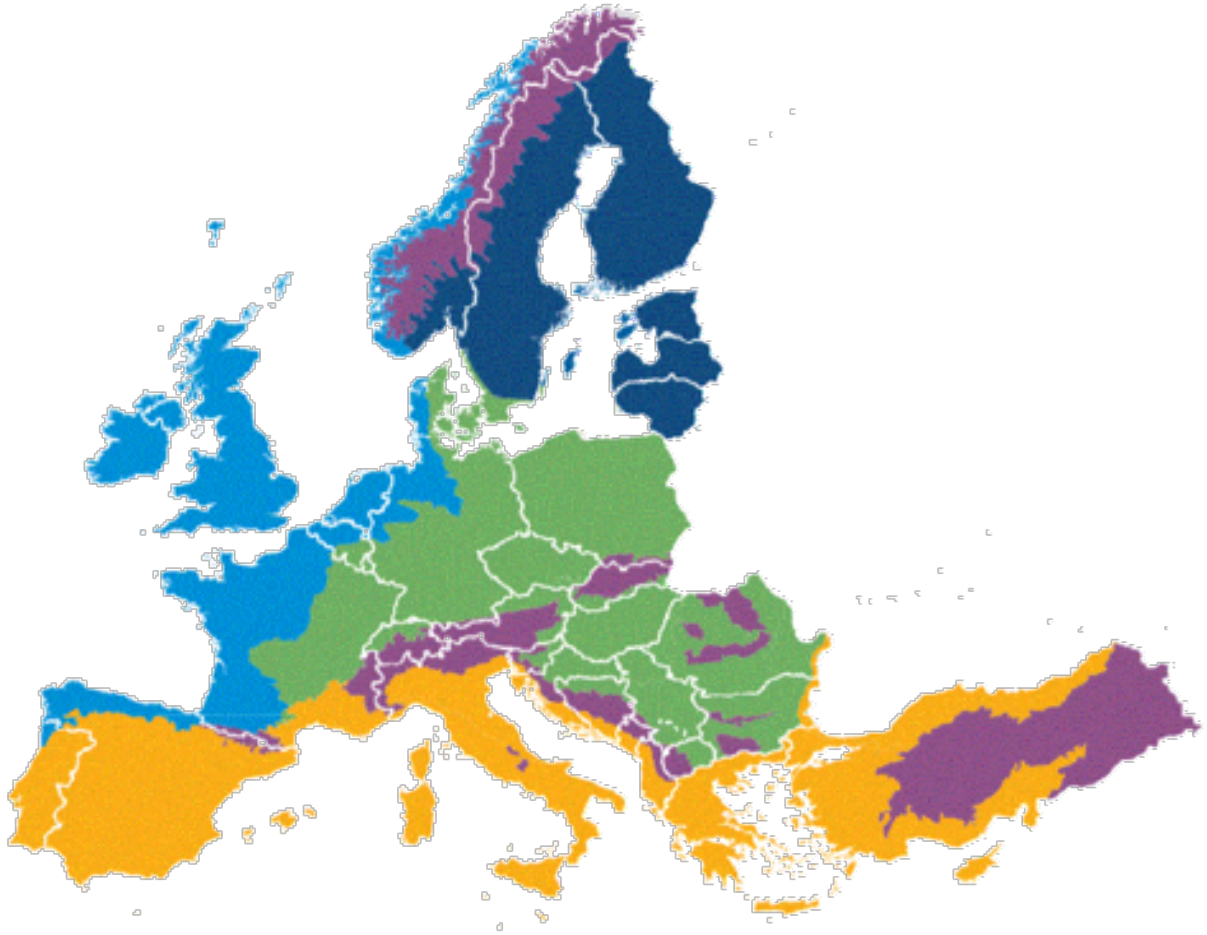
Explores a set of principles in which arable farms should seek to align with when growing crops for biogas – the following introduces the key considerations:

1. GHG emissions
2. Soil health
3. Carbon Sequestration
4. Biodiversity
5. Agricultural resilience
6. Productivity
7. Pollution and contamination



Analysis:

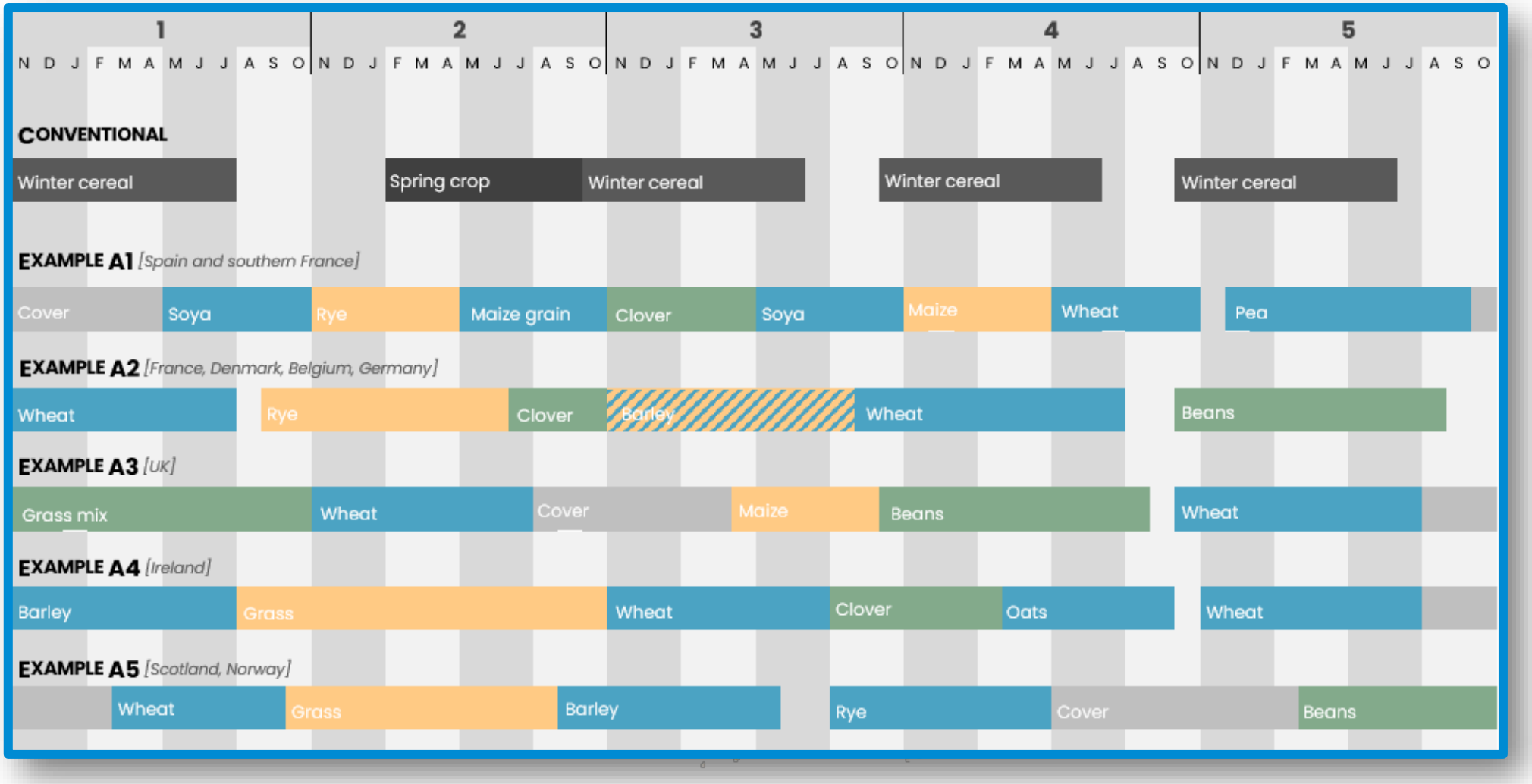
Developed potential crop rotations for each European region



Analysis:

Developed potential crop rotations for each European region

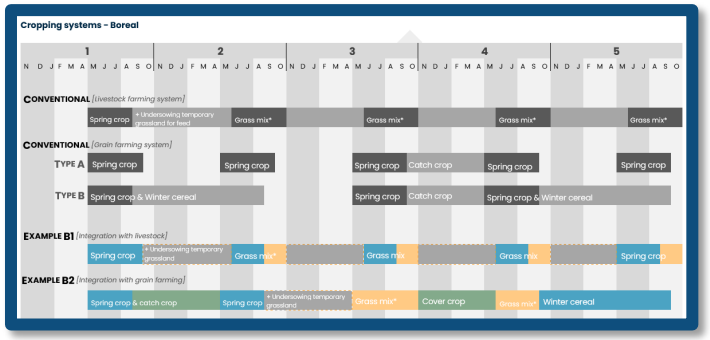
Atlantic



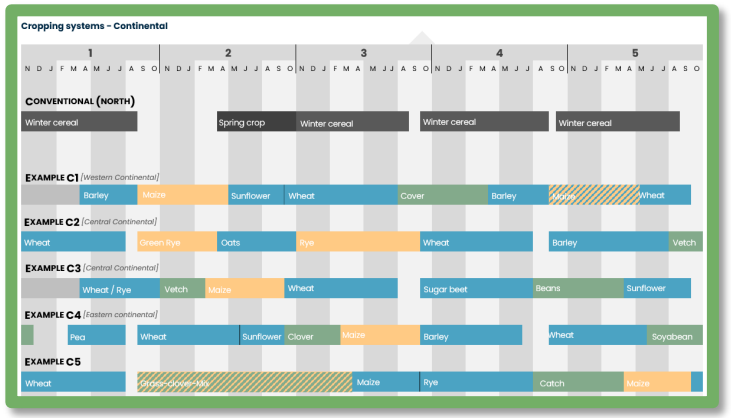
Analysis:

Developed potential crop rotations for each European region

Boreal



Continental



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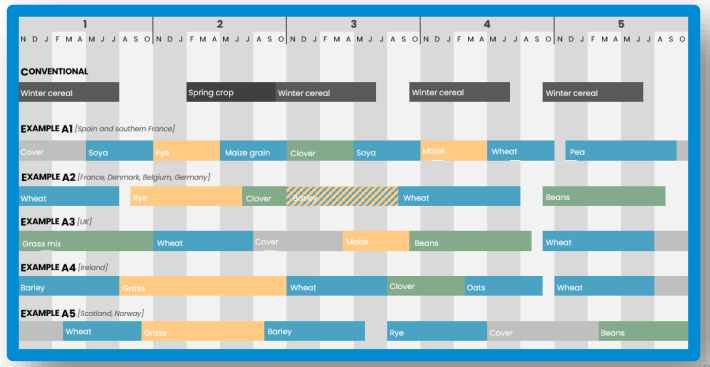
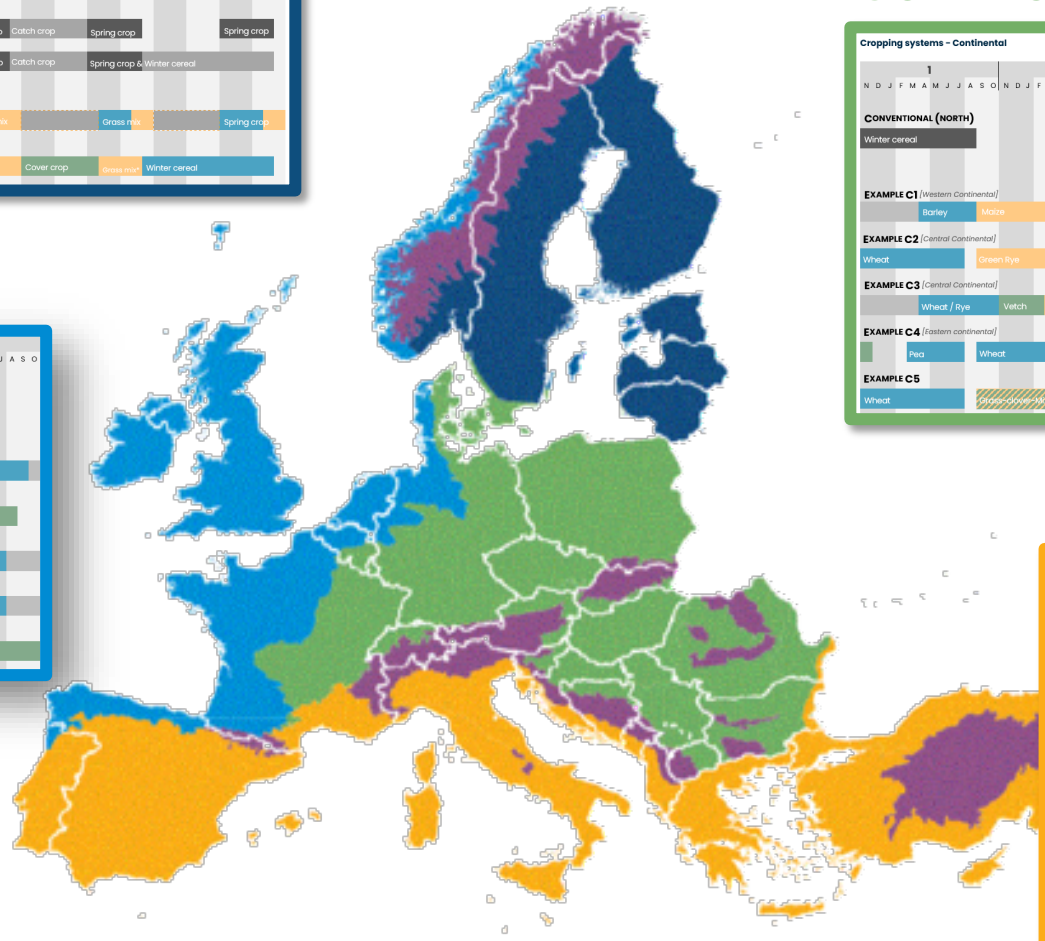
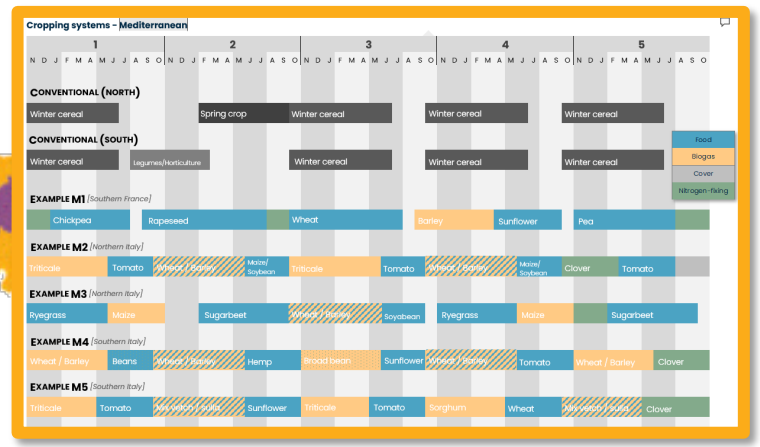




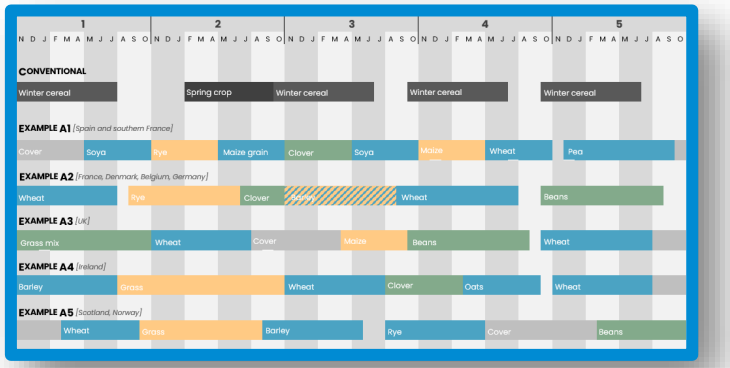
Mediterranean



Analysis:

Developed potential crop rotations for each European region

Atlantic



Country	Total arable land (ha)	Proportion of land within the Atlantic biogeographical region (%)	Crop rotation assumed	Average annual biomass grown for AD (tonnes)	Biomethane max potential per year (bcm)
Belgium	870,420	50%	2	1,175,067	0.3
Denmark	2,357,950	30%	2	1,909,940	0.6
France	18,044,450	50%	$1^{(10\%)}$ & $2^{(90\%)}$	26,976,453	8.7
Germany	11,657,900	20%	2	6,295,266	1.9
Ireland	434,940	100%	4	1,043,856	0.2
Netherlands	1,003,450	100%	2	2,709,315	0.8
Spain	11,732,660	10%	1	6,570,290	2.1
Non-EU					
Norway	804,310	15%	5	193,034	0.0
UK	5,857,460	100%	$3^{(50\%)}$ & $5^{(50\%)}$	12,886,412	3.4

Analysis:

Applied correction factors

Maximum
biomethane potential
= 90.7 bcm
(EU27 + UK, Switzerland and Norway)

		Example data
1.	Food vs Fuel	100%
2.	Biomass competition	98%
3.	Arable competition	89%
4.	Soil readiness	78%
5.	Climate change	Unknown
6.	Uncertainty	80%

Deliverable
biomethane potential
= 45.7 bcm
(EU27 + UK, Switzerland and Norway)

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Analysis:

Comparison with other estimates


agronomy

MDPI

Article

The Role of Sequential Cropping and Biogasdoneright™ in Enhancing the Sustainability of Agricultural Systems in Europe

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Abstract: Sequential cropping in the Biogasdoneright™ (BDR™) system in Italy has recently gained attention to combine food and renewable energy production in a sustainable way, as well as for carbon sequestration. However, little is known on the potential to expand the practice in other regions of Europe. In this paper, sequential crop calendars were developed for different EU climate regions, and the EU biomethane potential of the anaerobic digestion (AD) of sequential crops was estimated for a *Conservative_Scenario* and a *Maximum_Scenario*, assuming different percentages of primary crop land dedicated to the practice and biogas yields. A total EU biomethane potential of 46 bcm/yr and 185 bcm/yr was estimated from the AD of sequential crops in the two scenarios, respectively, and the Continental region registered the highest potential compared to the other regions. The additional benefits of the combination of sequential cropping with other agricultural conservation practices and digestate use included in BDR™ systems were also discussed. In conclusion, the paper shows that with appropriate innovations in crop management, sequential cropping could be applied in different agroclimatic regions of Europe, contributing to climate and renewable energy targets.

Keywords: Biogasdoneright™; biomethane; carbon sequestration; circular bioeconomy; sequential cropping

1. Introduction

Agriculture is at the heart of the most important global challenges mankind is currently facing and will face in the future, including food security, environmental degradation, economic development and climate change [1]. Agriculture is highly exposed to climate change, as its activities directly depend on climatic conditions [2]. At the same time, the agricultural sector itself is responsible for direct GHG emissions, such as nitrous oxide emissions from soils, fertilizer application and livestock farming, as well as indirect GHG emissions from land-use changes, such as land clearing and defor
agriculture holds the potential to also help mitigate climate chang
sions and sequestering carbon. The magnitude of the net effect i
factors, such as land-use changes that are directly or indirectly c
the fossil energy input required [4]. In turn, these factors are infla
ing practices used [5]. In order to reach the climate-neutral goal s
and cut European GHG emissions by 55% by 2030 [6], while estab
circular bioeconomy [7], agricultural practices need to increasing
role in tackling climate change while concurrently providing qu


Title: The Potential for Expanding Sustainable Biogas Production in Selected Countries and Some Possible Impacts in Specific Countries

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Abstract

Current food production practices tend to damage and deplete soil, diminish biodiversity and degrade water supplies. For agriculture to become environmentally sustainable and simultaneously increase food output for a growing world population, fundamental changes in agricultural production systems are required.

Renewable energy can reduce greenhouse gases (GHGs). But we also need simple, low-cost approaches to remove atmospheric carbon and sequester it in stable forms. Recycling of digestate from anaerobic digestion of agricultural and waste materials to soils can sequester atmospheric carbon and provide many other economic, social and environmental benefits.

Biogasdoneright™ (BDR) is a set of practices that link biogas production with sustainable agriculture. The BDR approach to sustainable agriculture is being implemented at large scale in Italy. In this paper, we examine the potential impact of implementing BDR in selected other countries. The biomethane potential in these countries, estimated conservatively, varies from about 10-30% of their current annual natural gas consumption. Biomethane from sequential (double) crops provides by far the greatest fraction of the biomethane potential. Double-cropping also drives many of the environmental and economic benefits of BDR systems.

Depending on where and how widely it is implemented, producing biogas in BDR systems could have very significant national-level impacts. For example, sufficient biomethane could be produced in Argentina to completely eliminate imports of natural gas, equivalent to about 28% of Argentina's 2017 trade deficit. In the United States, renewable biogas could generate electricity nearly equal to all the electricity currently produced by domestic solar and wind resources.

Min

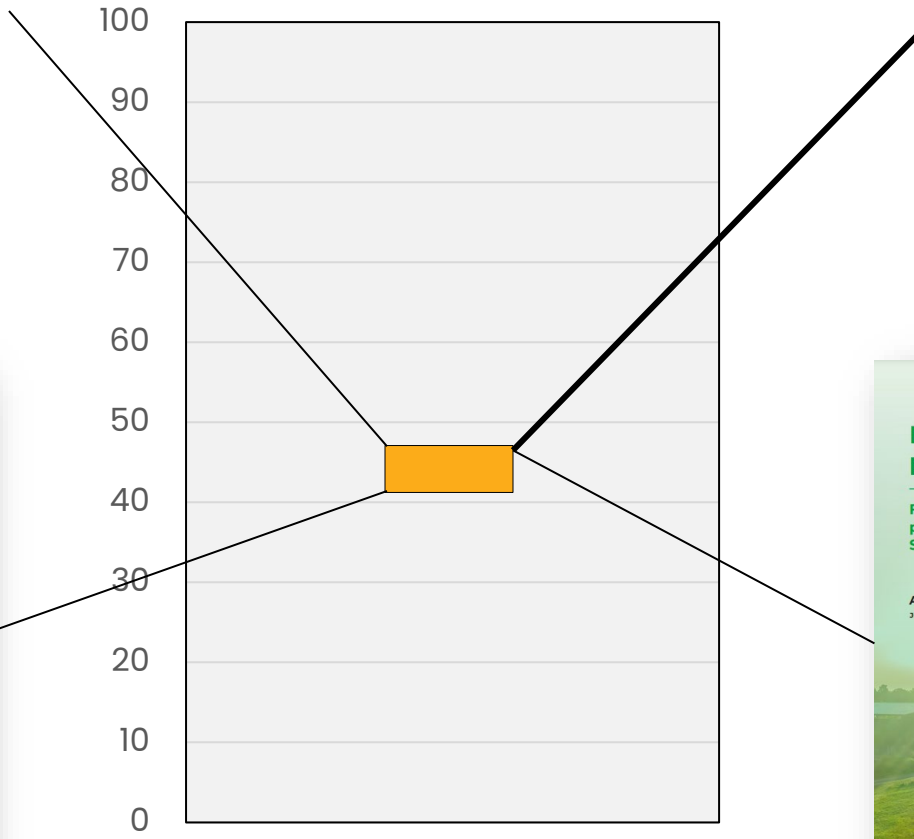
40 bcm

Dale et al. (2020)

Max

46 bcm

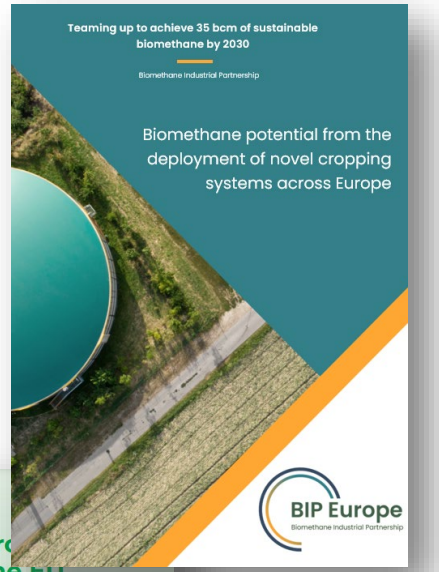
Magnolo et al. (2021)

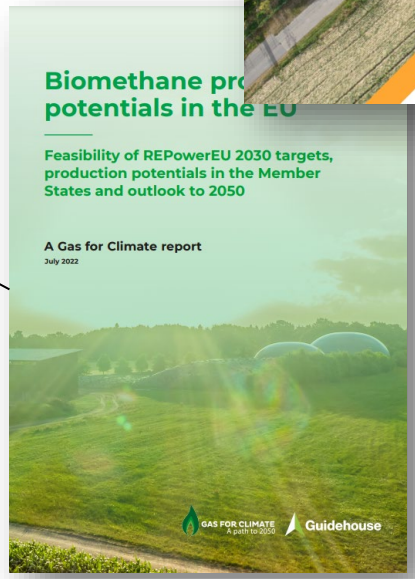


Deliverable

44-46 bcm

BIP (2024)





46 bcm

Gas for Climate (2022)

Thank you

Any questions

BIP Europe

Biomethane Industrial Partnership