BIKE

Safe and reliable biomass value chains for sustainable biofuels and the bioeconomy

EU project presentation
EUBCE 2021

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About the project

Biofuels production at low ILUC risk for European sustainable bioeconomy, is a Horizon 2020 project that supports the implementation of the Renewable Energy Directive II by

providing evidence, measuring and widely disseminating the market potential of low ILUC risk value chains for biomass, biofuels and bioliquids in Europe.

Coordinated by RECORD-Renewable Energy Consortium for Research and Demonstration, BIKE is carried out by a consortium of:

13 partners from 8 European countries

including research organizations, industries, SMEs and international organizations.

Start:

1 September 2020

End:

31 August 2023

Budget:

2 976 668 €

Partners

BIKE

RE·CORD

FAO FIAT PANIS

Cerulogy

ISCC International Sustainability & Carbon Certification

Imperial College London

AKI Agrárközgazdasági Intézet

CIB CONSORZIO ITALIANO BIOGAS

КАПЕ CRES

eXergia CLIMATE CHANGE CONSULTANTS

WAGENINGEN UNIVERSITY & RESEARCH

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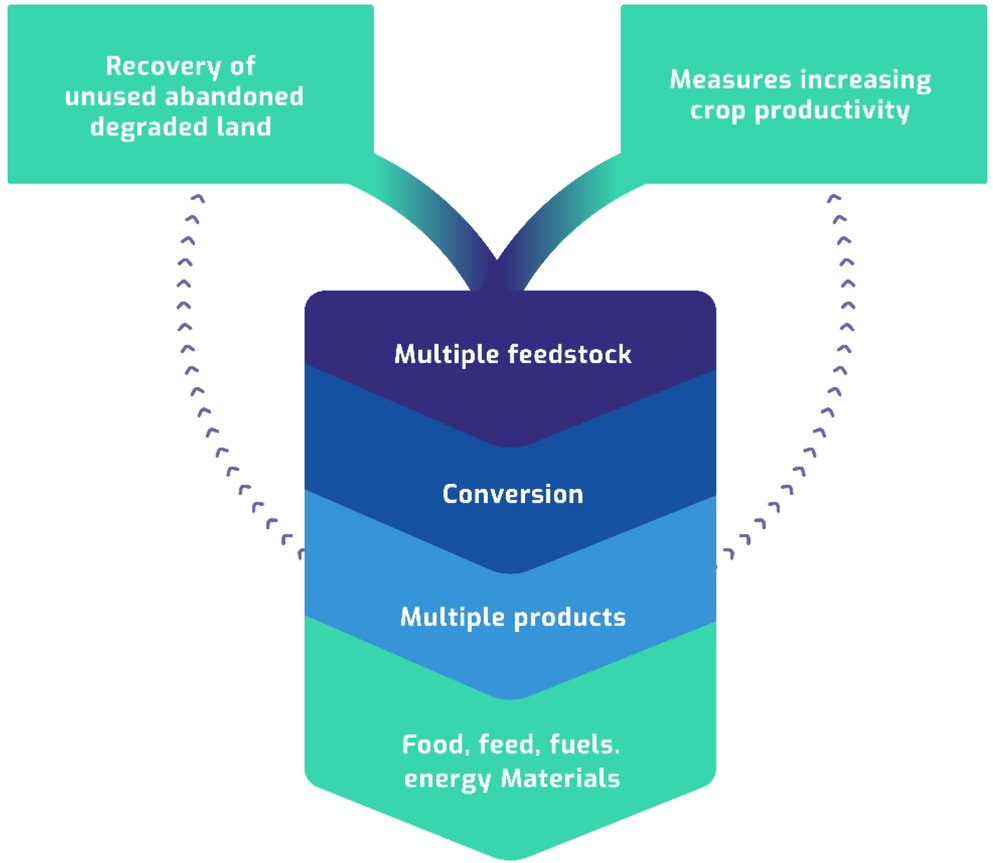
Low ILUC risk feedstocks for biofuels

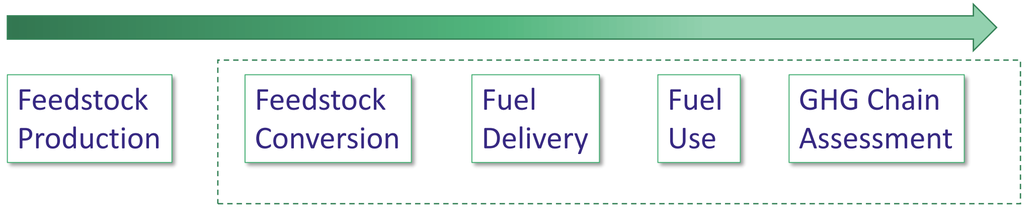
Low ILUC risk biofuels are produced in a way that mitigates ILUC (Indirect Land Use Change), either because they result from **productivity increases**

or they come from

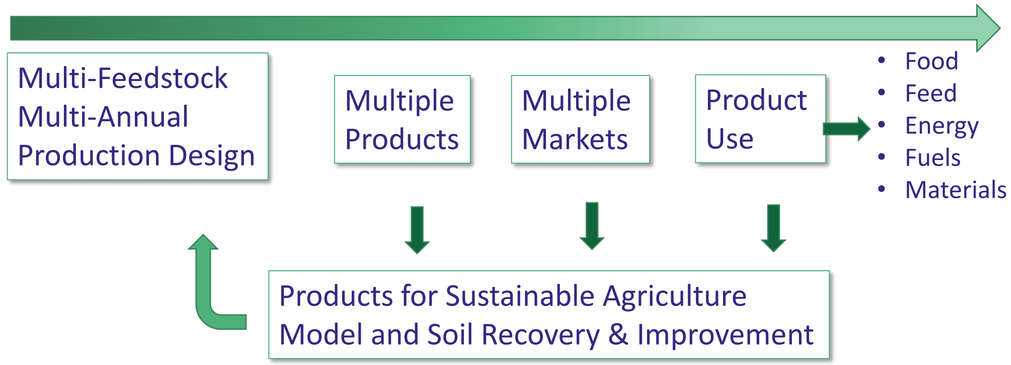
crops grown on abandoned or severely degraded land



Enhancing soil health, enabling green resilience and climate neutrality by growing low ILUC risk biomass feedstock



***How** to make this linear biofuel thinking **sustainable (GHG) enough**?*



*Bioenergy & Bioeconomy can make **agriculture more sustainable** (beyond GHGs, towards **SDGs**)*

*This approach will **boost the Economy***

From linear to circular, from energy-driven to sustain.agricultural models

Bioenergy / Bioeconomy enabling Sustainable Agriculture

Well designed biomass value chain support post Covid19 economic recovery and bring Carbon back to soil

Main focus

The focus of BIKE is

- to **investigate and to demonstrate the reliability of a series of low-ILUC risk biofuels production routes**,
- assessing their environmental, social and economic **sustainability**.

- develop the **first ever certification module for low ILUC risk biofuels** and

- to inform future policy and decision making

Activities and work packages

Certification module

- Development of a **certification module for low ILUC risk biofuels**
- **Guidelines** to identify and classify low-ILUC risk feedstocks

Biomass supply options

Understanding and evaluation of biomass supply options,

- feedstock from productivity increases of crops which benefited from improved agricultural practices,
- crops grown on unused, abandoned or severely degraded land, and from other climate positive farming solutions

Activities and work packages

Operational capacity and scale up potential of sustainable biofuels

Full sustainability assessment of low ILUC risk biomass value chains

Evaluation of the

- **operational processing capacity of sustainable biofuels** available in Europe
- **potential for scale up** and replication

- Assessment of **the environmental, social and economic performances** of the biomass value chains
- their contribution to the **UN SDGs**
- Based on the **methodologies and the tools** developed by the Global Bioenergy Partnership (GBEP).

Activities and work packages

Policy and Legal framework

- Overview of the regulatory framework relevant for the project objectives
- policy enablers favouring the market uptake of low ILUC risk biofuels

Good practice

A review and a compilation of the **good practices and lessons learnt** from the BIKE case studies, underlining their overall **replicability at EU level** and ways to help the market uptake of low ILUC risk biomass value chains.

BIKE case study #1 - Castor oil for HVO

FEEDSTOCK

Castor (*Ricinus communis*) is a perennial flowering plant indigenous to the south-eastern Mediterranean area, and widespread in tropical regions. It can be cultivated in arid and semi-arid land and the seeds have an oil content of about 50%.

CONVERSION TECHNOLOGY

HVO – hydrogen is added to the vegetable oil to convert unsaturated compounds such as alkalenes and aromatics that are chemically unstable, into more stable and less reactive saturated alkanes (paraffins).

PROPOSED USE

HVO from castor bean can be a sustainable solution for green diesel production, to be used in light-duty and heavy-duty vehicles, in addition to upgrading to produce sustainable aviation fuel.

Castor oil for HVO

upgrading to produce sustainable aviation fuel.

BIKE case study #3 – *Brassica carinata* for renewable diesel

FEEDSTOCK

Brassica carinata (Ethiopian mustard) is an oilseed crop that can be grown in rotation with conventional food crops, as an additional high biomass cover crop, during seasons when the land is not typically in productive use for the main crop. It produces both oil for biofuels and protein for animal feed.

CONVERSION TECHNOLOGY

Hydrotreated Vegetable Oil (HVO) – hydrogen is added to the vegetable oil to convert unsaturated compounds such as alkalenes and aromatics that are chemically unstable, into more stable and less reactive saturated alkanes (paraffins).

PROPOSED USE

Light-duty, heavy-duty vehicles and sustainable aviation fuels. The production of this biofuel is already certified as “low ILUC risk” by the Roundtable on Sustainable Biomaterials and by ISCC.

Brassica Carinata for renewable

BIKE case study #2 - Perennial crops for bioethanol

FEEDSTOCK

Perennial grasses including *mischantus* and switchgrass cultivation on unused abandoned and severely degraded land.

CONVERSION TECHNOLOGY

Hydrolysis and fermentation of lignocellulosic biomass for ethanol production.

PROPOSED USE

Lignocellulosic ethanol is an advanced biofuel that can be used in light-duty and heavy-duty vehicles, with significant potential for reduction of GHG emissions when compared with fossil-based fuels and also with conventional grain-based ethanol.

BIKE case study #4 – Biogas done right for biomethane to liquid fuels

FEEDSTOCK

Double cropping with a primary crop for food or feed and a secondary crop for energy production with crop rotation. The BDR model, based on cover cropping, ensures year-long covered soil and improves the soil quality for the main crop.

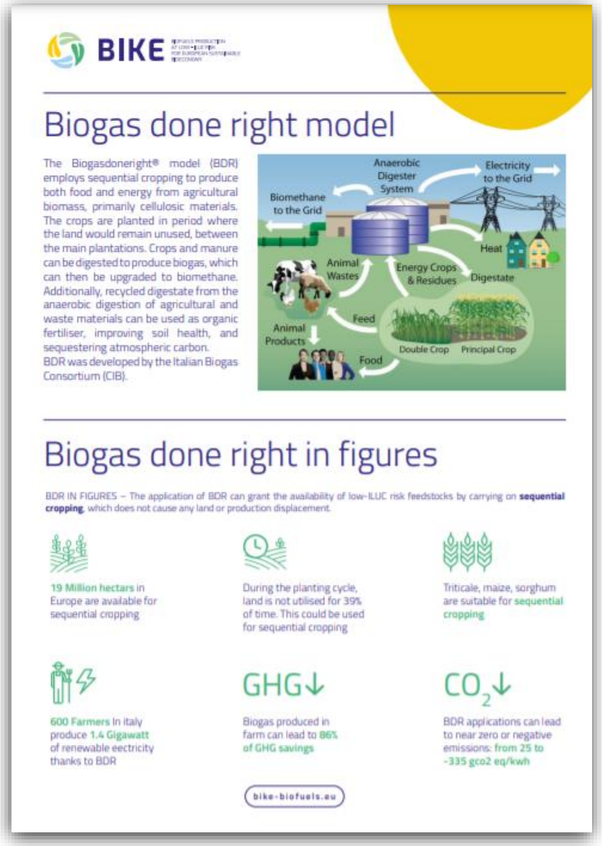
CONVERSION TECHNOLOGY

Production of biogas through BDR model in decentralized plants, injection of **biomethane into the grid, and further processing in centralized biomethane-to-liquid conversion plants for F.T. diesel or MeOH production.**

PROPOSED USE

BDR ensures the sustainable production of biomethane, avoids soil erosion and nitrogen emissions, in addition it increases the availability and use of organic fertilizers. The conversion to liquid of biomethane can

produce **diesel or gasoline substitutes to be used in light-duty or heavy-duty vehicles and kerosene** as a sustainable aviation fuels.



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Thank you!

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RE-CORD (Coordinator)

ΚΑΠΕ CRES

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