

Project Acronym: **AMBITION** Project Number: **731260** Call: **LCE-2016-2017** Topic: **LCE-33-2016**

Project title: **Advanced Biofuel Production with Energy Integration**

**Main Category of the Project:** Biofuel production integrated in an energy system

**TRL:** Research performed at TRL 2 - 5

**Keywords:** Biofuel

**Technological approach of the Project:** The AMBITION project covers an ECRIA which rely on three key unit operations in the production of next generation liquid biofuels (biomass pre-treatment and fractionation, gasification and syngas fermentation) and on subsequent linking of energy systems (grid electricity and biofuels in particular) to improve overall efficiencies.

**Expected Impact of the Project:** ECRIs this support the development of the common research and innovation agendas of the SET Integrated Roadmap, develop a critical mass of research capacity in Europe to address integration aspects of the energy system. ECRIs target the coordination of national efforts in order to develop synergies and improve the impact of public investment in emerging sectors.

**Highlights (technological/non-technological):** Based on an existing comprehensive co-operation of the consortium through participation in joint projects (BRISK, BRISK2) and programs (EERA-Bioenergy) the partners form an alliance to develop the initial research and innovation agenda, namely the AMBITION project and set it into action. AMBITION is relevant for the topics Energy System integration and performs research on identified bottlenecks in two currently insufficiently integrated biomass-to-biofuel conversion technologies (namely biochemical and thermochemical conversion). The inherent deficiency of hydrogen of biomass will be counteracted by integration of the Energy Systems to sustainable biofuels, electricity-to-hydrogen from renewable sources such as wind or solar power. The project will provide both proof-of-concept (TRL 2-3) as well as laboratory/small pilot scale research (TRL 4-5) on the primary bottlenecks of and between the key technologies for the conversion of biomass to liquid biofuels.

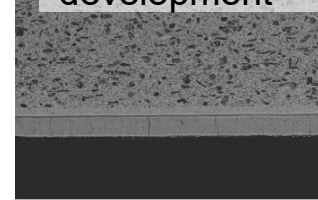
**What is needed in future:** AMBITION will provide an suggestion of future research needs and a timeline of actions needed to enable large scale introduction of biofuels into society.



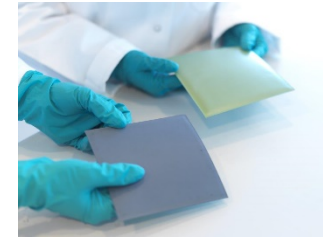
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731263



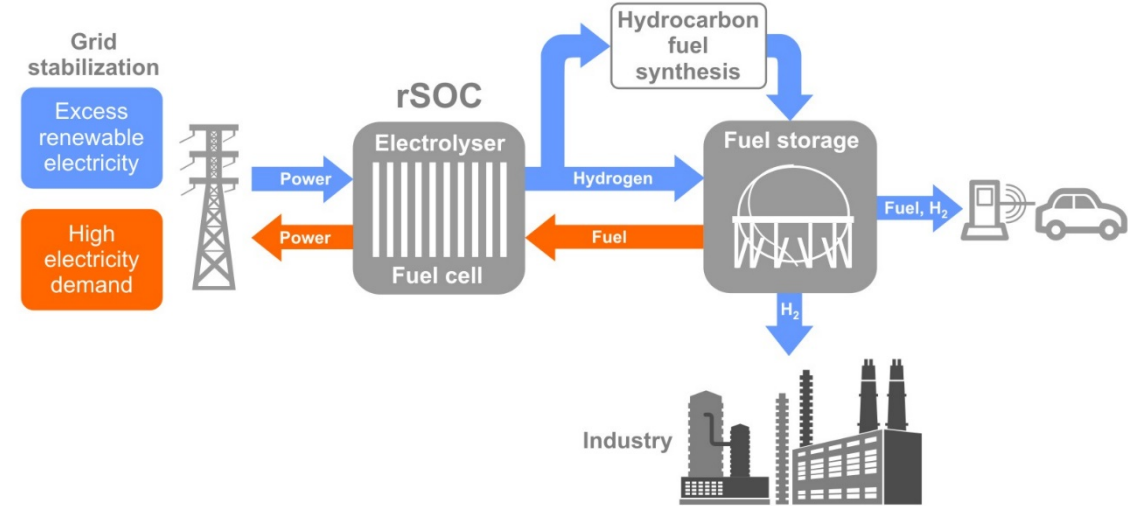
Material and microstructure development



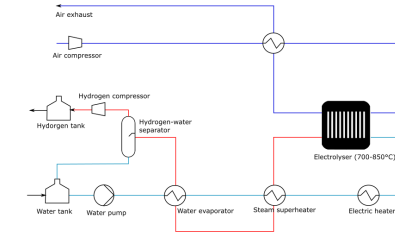
Electrochemical cell



Cell assembly for large production



Full system demonstration in Finland and France



rSOC: reversible Solid Oxide Cell

+ Final Common Research Agenda

Project title: **Increasing penetration of renewable power, alternative fuels and grid flexibility by cross-vector electrochemical processes**

**Main Category of the Project:** Electrical energy storage and renewable fuel production

**TRL:** Going to TRL 5

**Keywords:** electrochemistry, energy storage, Solid Oxide Cell

**Technological approach of the Project:** Electrochemical device that can convert electricity to hydrogen and hydrogen to electricity. Bridge the gap between chemical fuel and power sector.

**Expected Impact of the Project:** high-efficiency conversion between renewable power and hydrogen => allows high share of renewable power

**Highlights (technological/non-technological):**

What: **A European Common Research Agenda for Alternative renewable fuels, Energy storage and Sector coupling**

Where: European Energy Research Alliance (EERA) Headquarters, Rue de Namur 72, Brussels

When: 28 June 2019 [balance-project.org](https://balance-project.org)

**What is needed in future:** affordable abundant and low emission (global and local) energy





# Visual Project Presentation

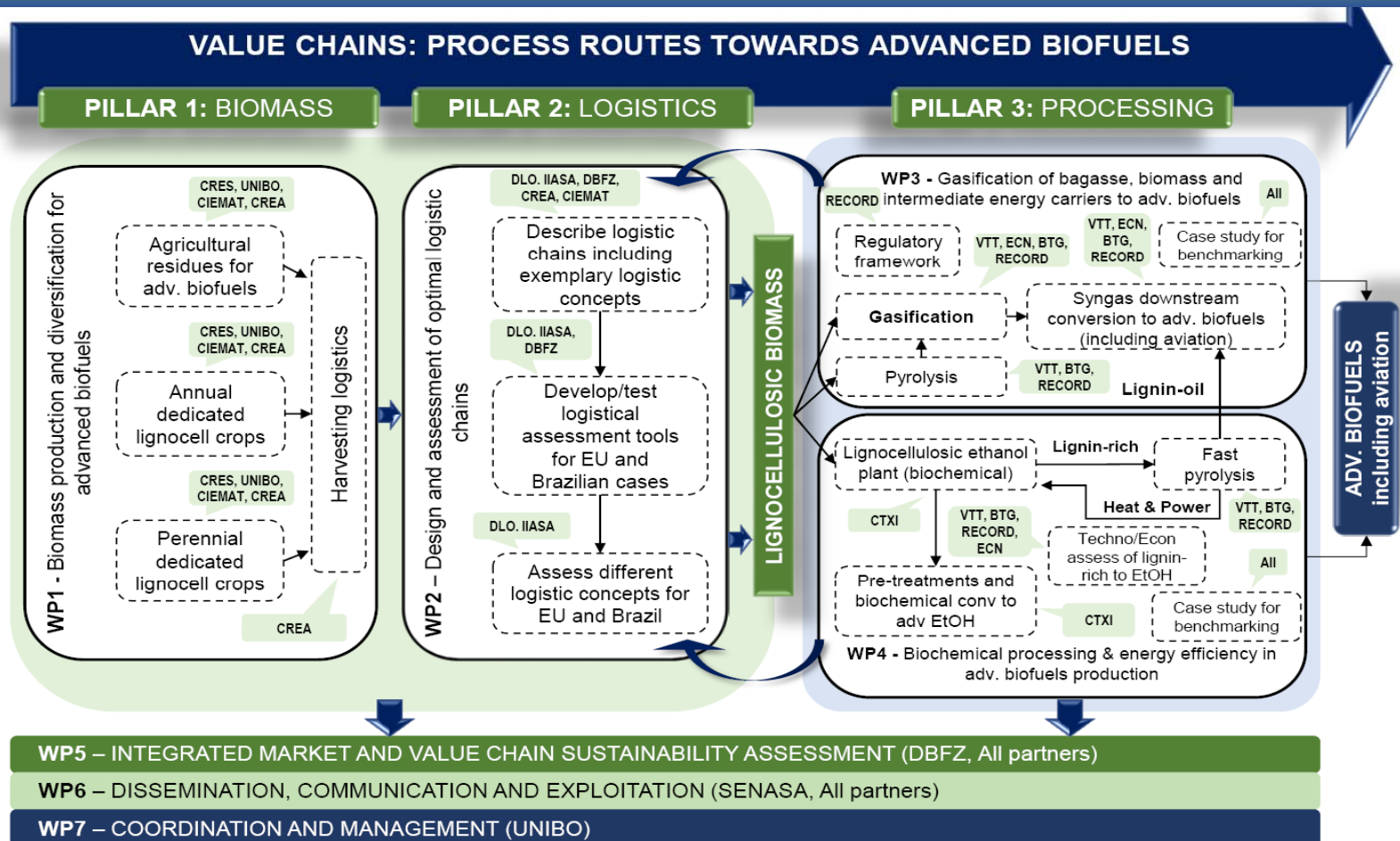


Fig. 1.7 – Simplified BECOOL workflow

Project Acronym: **BECOOL** Project Number: **744821** Call: **H2020 LCE 2016** Topic: **LCE 22-2016**

Project title: **Brazil-EU Cooperation for Development of Advanced Lignocellulosic Biofuels**

**Main Category of the Project:** Biofuel

**TRL:** 4-5

**Keywords:** Lignocellulosic Crops; Advanced Biofuels; Biomass Supply Logistics; Cropping systems; Lignin rich; Bioethanol; Aviation Fuels

**Technological approach of the Project:** The BECOOL project, in close cooperation with the BioVALUE Brazilian project, will provide solutions for highly efficient and sustainable value chains, encompassing the whole range of activities from biomass production and crop diversification to logistics and conversion pathways.

**Expected Impact of the Project:** i) providing innovative solutions for increasing lignocellulosic biomass through integrated food/feed/biofuels cropping systems and perennial lignocellulosic crops in marginal land; ii) identifying optimized and sustainable logistical concepts tailored to the selected BECOOL value chains; iii) setting up new pathways for increasing the efficiency of thermochemical and biochemical conversion technologies towards advanced biofuels; iv) providing feasible solutions for environmentally and economically sustainable value chains (from cultivation to advanced biofuels).

**Highlights (technological/non-technological):** Innovative food/feed/biofuel integrated cropping systems; Logistic concepts tailored to the selected BECOOL value chains; Innovative thermochemical and biochemical pathways; Valorization of residues (e.g. lignin-rich residues) to increase the efficiency of advanced biofuels.

**What is needed in future:** The BECOOL project has set a range of activities to valorize the whole value chain components. The work towards the implementation of aligned feedstock production, supply logistic and conversion processes need to be fine tuned to deliver congruent and functional value chains.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No **744821**



## BESTF ERANET Projects (1)

All BESTF ERANET Co-funds have enabled and supported large scale investment in close to market bioenergy projects at TRL 5/7 (demonstration/prototype)

### BESTF1:

- **BioSNG** – UK/Germany - project complete – Development of an innovative process to convert gas and biomass into bio substitute natural gas to be used in existing gas network
- **BioProgress** – Sweden/Germany – project complete – Demonstrate a novel technology to simplify gas clean-up following biomass gasification

### BESTF2:

- **CoryFee** – Denmark/Sweden – project complete – Reduce production costs of cellulosic ethanol
- **BioWaterMethanisation** – Spain/UK/Netherlands – project complete – Demonstrate feasibility of anaerobic membrane bioreactor to achieve sustainable wastewater treatment.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement Nos 321477 (BESTF), 618046 (BESTF2) and 691637 (BESTF3)



## BESTF ERANET Projects (2)

### BESTF3:

- **Pheonix** – UK/Netherlands – on going – develop port injection gas engines to provide novel approach to power generation from syngas derived from biomass gasification.
- **Waste2Bio** – Spain/UK – on going – Demonstrate a process for treatment of MSW via recovery of bioethanol and biogas to enhance valorisation of residues.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement Nos 321477 (BESTF), 618046 (BESTF2) and 691637 (BESTF3)





## Added Value and Impact

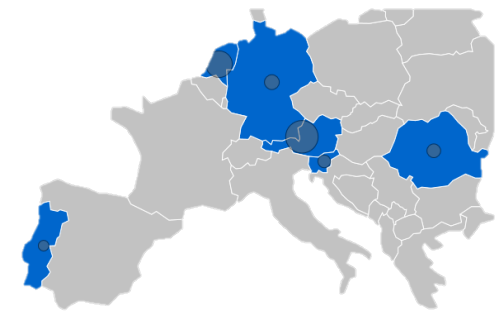
- The leverage of funding from the Member States provides a great benefit and enabler for ambitious projects to pursue the development of their innovations, which may otherwise not have taken place.
- Open discussions about priority innovation areas for bioenergy help shape the programme and creates a possibility to help influence the wider EU research and policy agenda.
- The programme offers access to and links with a wide prestigious European network in the field of bioenergy technologies and benefits from collaboration and learning from experiences of other countries.
- However, it should be noted that as demonstration projects can really only be built in one country, it can be difficult to show added value for all involved countries in transnational consortia



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement Nos 321477 (BESTF), 618046 (BESTF2) and 691637 (BESTF3)

# Paving the way towards clean energy and fuels in Europe

Talks with research, industry and EU Member States on bioenergy, advanced biofuels and renewable fuels



-  **eseia**  
european sustainable energy  
innovation alliance
-  **TU  
Graz**
-  **UNIVERSITY OF TWENTE.**
-  **GREEN ENERGY**  
Romanian Innovative Biomass Cluster
-  **eit** **InnoEnergy**  
Knowledge Innovation Community
-  **BAV**  
Bergischer  
Abfallwirtschaftsverband
-  **LNEG**
-  **GREEN  
TECH  
CLUSTER**
-  **WOOD  
K PLUS**
-  **ENERGIEAGENTUR  
Steiermark**
-  **UNIVERSITATEA  
BRASOV**
-  **TUHH**  
Technische Universität Hamburg-Harburg
-  **RIC**  
RECONSTRUCTION CLUSTER
-  **ELES**

Project Acronym: **BET** Project Number: **656760** Call: **H2020-LCE-2014-2**

Topic: **LCE-20 - The human factor in the energy system**

Project title: **BioEnergyTrain**

**www.bioenergytrain.eu**

**Main Category of the Project:** Bioenergy, Bioeconomy, Education

**TRL:** not applicable

**Keywords:** **Sustainable energy** policy; Sustainable energy systems, **education and training**, bioenergy value chain, network of networks, regional outreach, **new curricula**, **new learning and teaching formats and methods**, multi-actors

**Technological approach of the Project:** The BET project **joins Business and Higher Education Institutions** to develop novel Bioenergy Education and Training concepts to educate a skilled and Innovative workforce across the whole Bioenergy Value Cycle

**Expected Impact of the Project:** Set-up and scale up two new **European Masters Programmes** for the Biorefinery sector:

- ✓ [Biorefinery Engineering \(BRE\), TUGraz](#), Austria (since 2017)
- ✓ [Bioresource Value Chain Manager \(BVM\), University of Twente](#), The Netherlands (since 2018)

together with the development of Professional education formats, namely:

- ✓ **Industrial Student Camps, Pilot-plant courses and International Summer Schools**

**Highlights (technological/non-technological):** The master Programmes and Professional education formats have a strong link to industrial / regional players and encompassed innovative educational strategies.

**What is needed in future:** The BET project is open to establish Cooperation Agreements with European HEIs, businesses and regional partners for the use of the newly created BET Materials



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No **656760**






# BIOFIT

Bioenergy Retrofits for Europe's Industry

EU H2020 Nr. 817999  
01/10/2018 – 31/09/2021  
biofit-h2020.eu

## Rationale

- **Bioenergy technologies are now well established, however implementation can be accelerated**
- Bioenergy retrofitting provides significant benefits compared to building new plants, notably **lower capital expenditure, shorter lead times, faster implementation and less time to reach full capacity.**

 **Biofit will facilitate bioenergy retrofits in five industry sectors**

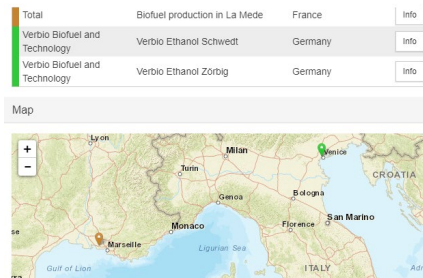
## Highlights

### 10 case studies



Case study (1 of 10): fermentation of liquor for bioethanol production at AustroCell Hallein.

### Map with retrofits



Online map with completed bioenergy retrofits

### Industry fora



Sector-specific Industry fora to communicate results and gather information



BTG Biomass Technology Group BV  
P.O. Box 835 ◦ NL-7500 AV Enschede  
+31 53 486 1186 ◦ [office@btgworld.com](mailto:office@btgworld.com)

Coordination  
Patrick Reumerman  
[reumerman@btgworld.com](mailto:reumerman@btgworld.com)



Project title: **Bioenergy Retrofits for Europe's Industry**

**Main Category of the Project:** Bioenergy

**TRL:** 8 – 9

**Keywords:** Biomass, biofuels, bioenergy, supply chains, market uptake, retrofitting

**Technological approach of the Project:** Facilitate the introduction of bioenergy retrofitting in five exemplary industries (1G Biofuels, pulp and paper, fossil refineries, fossil fired power and combined heat and power). Development of 10 concrete case studies – 2 per industry -, provide overview of options, involvement of stakeholders, framework evaluations and advice for policy makers.

**Expected Impact of the Project:** The direct impact of the project could be up to 20 PJ/y of additional renewable energy if all case studies are implemented. Indirect impact could be up to 1200 PJ/y (15% increase in bioenergy production)

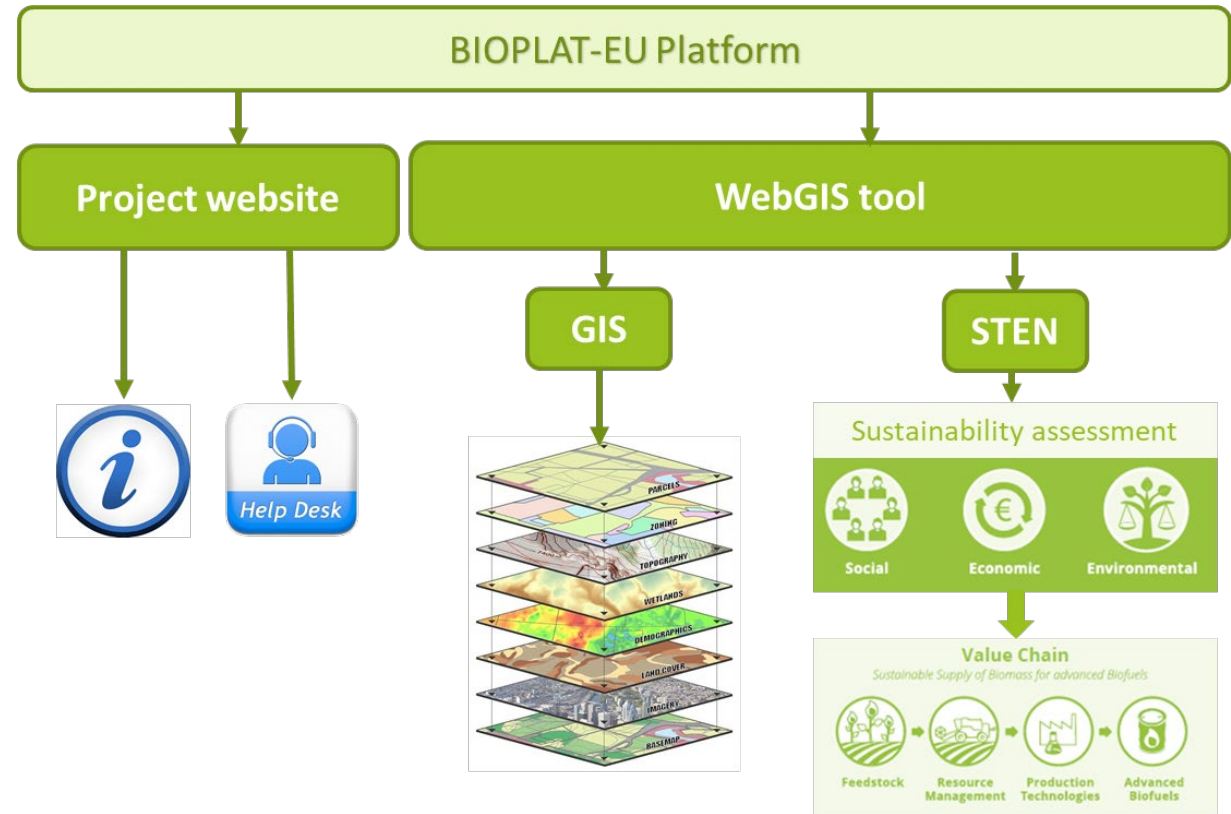
**Highlights (technological/non-technological):** Significant involvement of key industrial players, as project partners, case study partners, or industry forum partner. Focus on both techno-economic and non-technical aspects (such as acceptance issue). Biofit aims to solve actual problems of industries regarding bioenergy retrofitting.

**What is needed in future:** More information about the possibilities and benefits of retrofitting in specific industry sectors.



## Objectives

1. Creation of a database of maps on MUC lands (marginal, underutilised and contaminated) in Europe generated based on high resolution data and their attributes (GIS)
2. Development of a public user-friendly tool (STEN) to assess environmental, social and techno-economic sustainability aspects of bioenergy value chains on MUC lands.
3. Development of a web-based platform that will include mainly, a webGIS tool (GIS + STEN) + Project website
4. Mobilisation and involvement of stakeholders to encourage the launch of bioenergy projects on MUC lands
5. Communication with local and regional authorities to help removing legal or political market uptake barriers
6. Provision of technical and financial structuring support => business models and bankable projects



Project Acronym: **BIOPLAT-EU** Project Number: **818083** Call: **H2020-LC-SC3-2018-RES** Topic: **CSA**  
Project title: **Promoting sustainable use of underutilised lands for bioenergy production through a web-based Platform for Europe**

**Main Category of the Project:** (Biofuel, Bioenergy)

**TRL:** 8-9, Market uptake

**Keywords:** MUC lands, GIS mapping, sustainability assessment, platform, WebGIS tool, bioenergy, bankability

**Technological approach of the Project:**

- Development of a web-based platform which will include a public user-friendly tool (webGIS tool) using global information system
- Spatial analysis of MUC lands on EU level.
- Assessment of environmental, social and techno-economic sustainability aspects of defined value chains for bioenergy production.

**Expected Impact of the Project:**

- Identifying suitable MUC lands and mobilising stakeholders to establish bioenergy value chains on them
- Increase the share of renewable energy in the final energy consumption;
- Leading to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement;
- Developing more informed policy, market support and financial frameworks, notably at national, regional and local level, leading to more cost-effective support schemes and lower financing costs for RES facilities;



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 818083

### **Highlights (technological/non-technological):**

Development of a user-friendly web-based tool that will enable stakeholders (farmers, land-owners, investors and industry players) access to a number of high-quality services:

- Identification of suitable MUC lands on EU level;
- Support in the planning process by a user manual and step-by-step guide;
- Assess sustainability implications of bioenergy projects, based on real global earth observation data, actual statistics, and experiences from case studies and previous projects
- Standardised financial structuring service that allows direct loan applications.

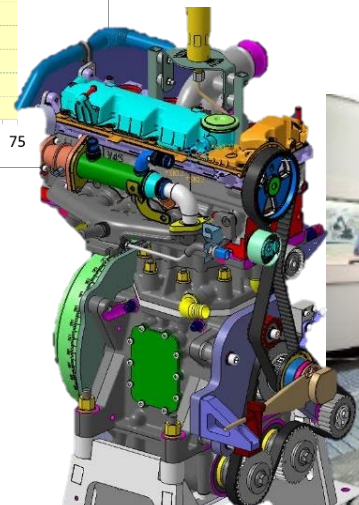
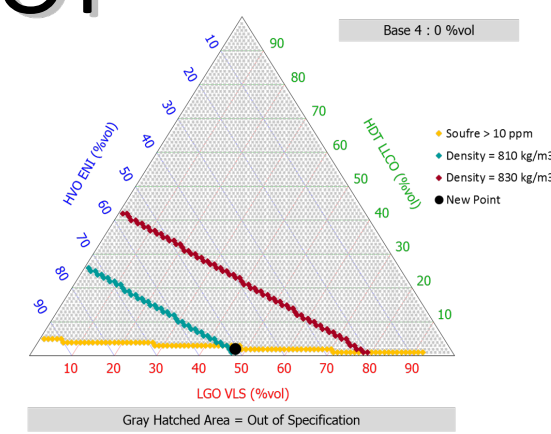
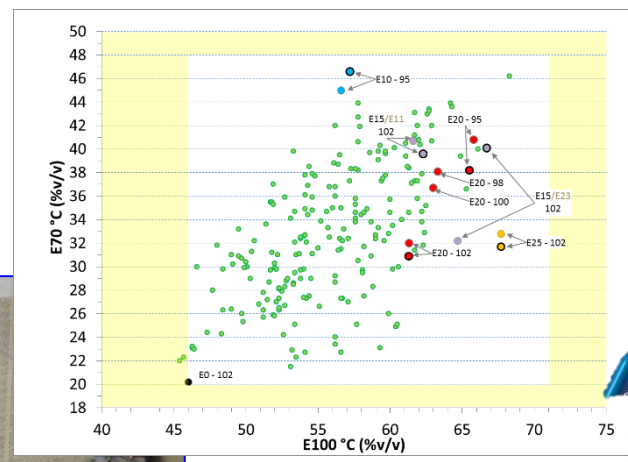
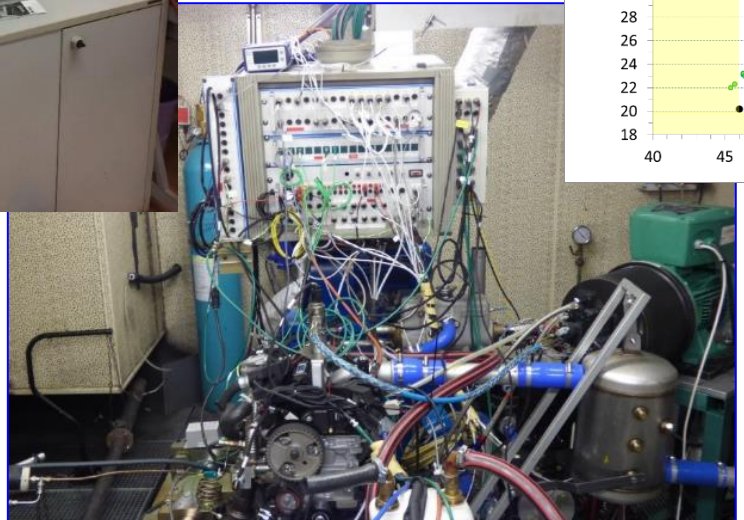
### **What is needed in future:**

- Further spatial analysis of MUC lands to address existing data gaps
- Policy, market support and financial frameworks to promote/facilitate the establishment of full value chains on underutilised land
- Special support services for the valorization of value chains on underutilised land





# Engine tests with new types of biofuels and development of biofuel standards



Project Acronym: CEN/TC 19    Project Number: Ares(2017)3358706    Call: SSC3 WP2014-2015 B.2.5  
Project title: Engine tests with new types of biofuels and development of biofuel standards

**Main Category of the Project:** Biofuel

**TRL:** 7

**Keywords:** ethanol, diesel engine, high oxygenate petrol, blends FAME, HVO,

**Technological approach of the Project:** Several .

**Expected Impact of the Project:** To prepare data for CEN standards with regards to mid-blend ethanol emission and compatibility effects. New test methods for octane, cloud point and cold filtering are expected. As well as proof for some engine concepts.

**Highlights (technological/non-technological):** E20 petrol can be placed on the market without issues at affordable community costs. Gasoline use in diesel engines is feasible and has no negative emission effects.

**What is needed in future:** Follow up work on open questions regarding E20 petrol test methods. Further work on a multi cylinder bench engine in order to do initial calibration with a view to showcase it in a vehicle



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [SA/CEN/RESEARCH/EFTA/000/2014-13](#)



**ETIP** *Bioenergy*

European Technology and Innovation Platform

# Paving the way towards clean energy and fuels in European Commission

*Talks with research, industry and EU Member States on bioenergy, advanced biofuels and renewable fuels*

**Lisbon, 29<sup>th</sup> May 2019**



Project Acronym: **ETIP Bioenergy SABS**      Project Number: **727509**      Call: **H2020-LCE-2016-2017**  
Topic: **LCE-36-2016**      Project title: **European Technology and Innovation Platform Bioenergy  
– Support of Advanced Bioenergy Stakeholders 2016 - 17**

**Main Category of the Project:** Support to the energy stakeholders to contribute to the SET-Plan **TRL: 0-9**

**Keywords:** Renewable energy sources – general, Biofuels, Advanced Biofuels, 3rd Generation, Technology Platform, Bioenergy

**Expected Impact of the Project and Highlights (technological/non-technological):**

- update and implementation of the SRIA was one main focus
- ETIP Bioenergy played a leading role in the SET Plan Temporary Working Group on renewable fuels and bioenergy (TWG 8) between October 2017 and May/June 2018.
- networking activities were a very important tool to bring together the expertise and experience of advanced biofuels and bioenergy producers, research facilities, policy makers, feedstock and conversion technology providers, road, marine and aviation end users, engineering contractors, investors and sustainability organisations
- Promotion of sustainable advanced biofuels and other bioenergy carriers; gathering feedback, recommendations and remarks from a broader panel of stakeholders

**What is needed in future:**

Key issues remain: Stable and supportive framework for all applications; Broaden and mobilise sustainable biomass feedstock supply; Flexible, efficient conversion technologies; Biofuel qualities according to market needs, for short term use in existing vehicle fleet preferably drop in qualities





**ETIP** *Bioenergy*  
European Technology and Innovation Platform

# Paving the way towards clean energy and fuels in European Commission

*Talks with research, industry and EU Member States on bioenergy, advanced biofuels and renewable fuels*

**Lisbon, 29<sup>th</sup> May 2019**



Project Acronym: **ETIP Bioenergy SABS2** Project Number: **825179** Call: **H2020-LC-SC3-2018-Joint Actions-3**  
Topic: **LC-SC3-CC-4-2018**

Project title: **European Technology and Innovation Platform Bioenergy – Support of Advanced Bioenergy Stakeholders**

**Main Category of the Project:** Support to the energy stakeholders to contribute to the SET-Plan **TRL: 0-9**

**Keywords:** Energy, fuels and petroleum engineering multi-stakeholder-Support; bioenergy, renewable fuels, biofuels, SET-Plan

**Expected Impact of the Project:**

- increase of number of activities organized by the consortium for the benefit of all stakeholders' categories compared to existing ones.
- increase the quality and awareness level of policy developing processes at EU and national level, by informing policy makers and legislators about techno-economic specificities of renewable fuels and bioenergy, throughout the project duration
- fostering stakeholder engagement in supporting the strategic R&I objectives of the SET-Plan available
- provision of a scientifically consistent, sound contribution to define stable sustainability criteria regarding the renewable fuels and bioenergy sector at social level

**Highlights (technological/non-technological):**

- Organization of different events such as WS, webinars, SPM, TEDX
- Publications such as input papers, articles, fact sheets
- Support of the IWG for the IP of SET Plan Key Action 8
- Cooperation with different initiatives, organizations and projects

**What is needed in future:**

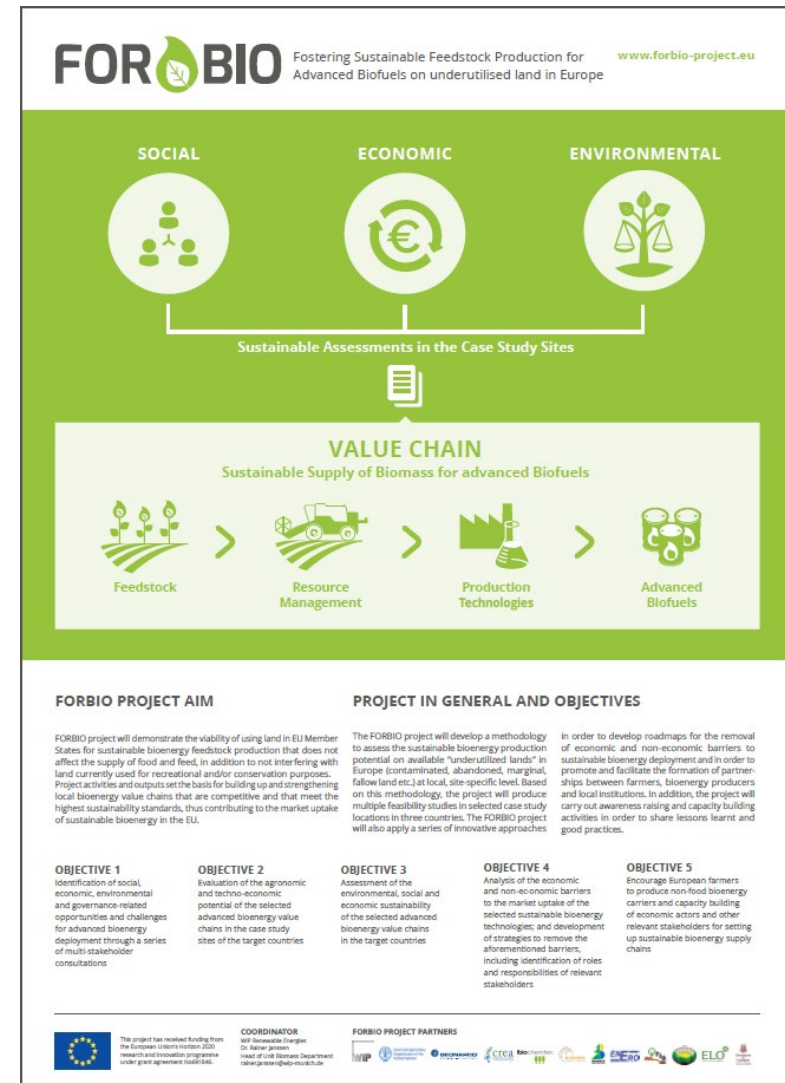
Key issues remain: Stable and supportive framework for all applications; Broaden and mobilise sustainable biomass feedstock supply; Flexible, efficient conversion technologies; Biofuel qualities according to market needs, for short term use in existing vehicle fleet preferably drop in qualities



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825179

## Objectives

- ✓ Identify social, economic, environmental and governance-related **opportunities and challenges**
- ✓ Evaluate **agronomic and techno-economic potential** of the selected bioenergy value chains
- ✓ Assess environmental, social and economic **sustainability**
- ✓ Analyse economic and non-economic **barriers to the market uptake**
- ✓ **Encourage** European **farmers** to produce sustainable biomass feedstock
- ✓ **Build capacity** of stakeholders for setting up sustainable bioenergy supply chains



Project Acronym: **FORBIO** Project Number: **691846** Call: **H2020-LCE-2015-3** Topic: **CSA**  
Project title: **Fostering sustainable feedstock production for advanced biofuels on underutilised land in Europe**

**Main Category of the Project:** (Biofuel, Bioenergy)

**TRL:** 8-9, Market uptake

**Keywords:** underutilised land, economic feasibility, sustainability assessment, bioenergy

**Technological Approach of the Project:**

- Development of a methodology to assess the sustainability of bioenergy production on available “underutilised lands” in Europe at local, site-specific level.
- Agronomic feasibility studies performed in selected case study locations in 3 countries (DE, IT, UA)
- Techno-economic feasibility studies and detailed sustainability assessments conducted.
- Investigation of economic and non-economic barriers and development of roadmaps for sustainable bioenergy market uptake.

**Expected Impact of the Project:**

- Development of full value chain concepts for advanced bioenergy production on underutilised land
- Increasing the share of sustainable bioenergy in the final energy consumption;
- Environmental impact assessments, including considerations for indirect impacts and energy balance;
- Development of better policy, market support and financial frameworks, notably at national, regional and local level;



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 691846



### **Highlights (technological/non-technological):**

- Detailed agronomic and techno-economic feasibility studies for sustainable feedstock production on underutilised land such as:
  - Lignocellulosic ethanol production from Giant Reed in Sulcis area, Sardinia
  - Lignocellulosic ethanol production from willow in Ivankiv region, Ukraine
  - Biomethane production from Sorghum and Lucerne on lignite mining reclamation land in Lusatia, Germany
- Detailed case study level sustainability assessment with newly developed FORBIO methodology
- 551 stakeholders consulted to detect the barriers
- 12 capacity building events and 3 study tours in case study regions attended by 544 stakeholders
- 9 capacity building events in outreach countries (BE, PL, RO, HU, UK, IE) attended by 229 stakeholders
- 6 webinars attended by 142 stakeholders

### **What is needed in future:**

- Policy, market support and financial frameworks to promote/facilitate the establishment of full value chains on underutilised land
- Special support services for the valorization of value chains on underutilised land
- Detailed assessment of underutilised land (marginal, contaminated etc) on European level
- Further R&I on the impacts of contamination on technological processes





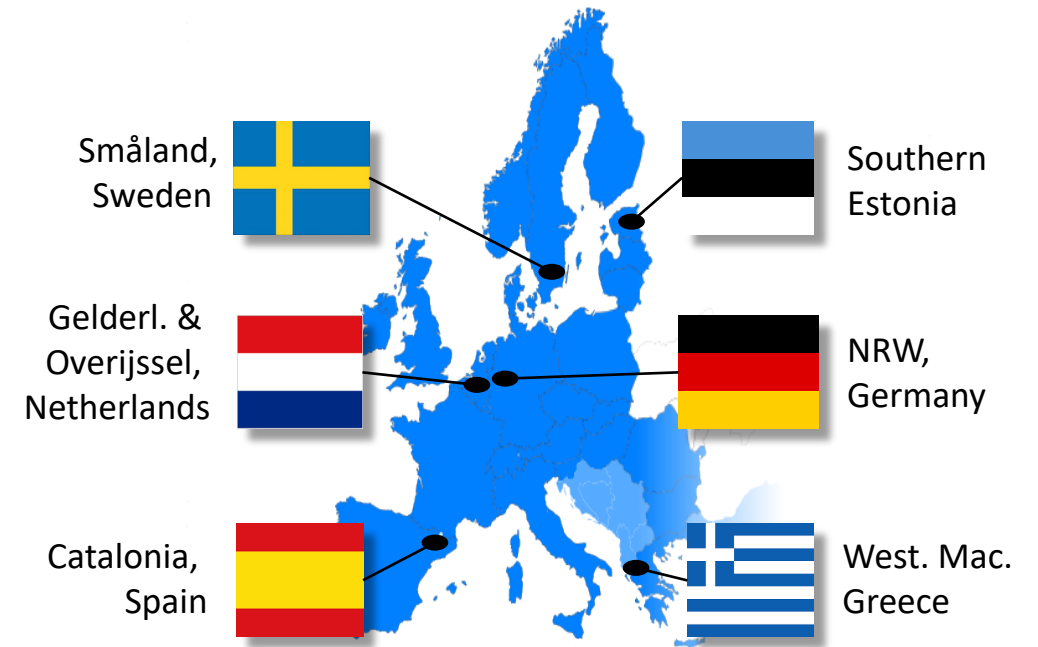
## Promotes *Sustainable Supply Chain Management* of SMEs in regional bioenergy supply chains

### Key elements

- Setting up of SSCM (Sustainable Supply Chain Management) bioenergy chains in six model regions.
- Selection of SME-led pilot projects via open competition.
- Provision of support on a) setting up the bioenergy chain, b) sustainability assessment and c) financial aspects.

### Project highlights

- *Sweden*: Municipal energy company supports 4 communities to develop joint heat supply and grid connection
- *Germany*: Waste management company improved biowaste sorting process using LCA
- *Spain*: Pellet factory scaled-up its production and developed new channels for industrial clients using certification



Project title: **Securing future-proof environmentally compatible bioenergy chains**

**Main Category of the Project:** Bioenergy

**TRL:** 8 – 9

**Keywords:** Solid biofuels, supply chains, SME's, market uptake

**Technological approach of the Project:** Setting up of SSCM (Sustainable Supply Chain Management) bioenergy chains in six model regions. Selection of SME pilot projects via open Innovation Voucher competition. Provision of support on a) setting up the bioenergy chain, b) sustainability assessment and c) financial aspects.

**Expected Impact of the Project:** The project was finished 2018. 20 SME's in six countries were supported by the project, resulting in 10.2 million EUR investment triggered, 90 FTE direct and indirect jobs created and 40,1 Mtons CO2 eq./year reduction. Ex. post evaluation showed that 70% of SME pilot project owners indicated that they had taken concrete actions based on their involvement in SecureChain.

**Highlights (technological/non-technological):** Innovation Voucher competition ensured cooperation from SME's without potential conflicts of interest. Mentoring approach region-specific, within overall approach and framework. Pilot Project evaluation both regarding 'hard' (SMART) criteria and 'soft' criteria (to identify reasons behind results).

**What is needed in future:** Hands-on, regional mentoring approach works and should be intensified. Regional business clusters facilitate market uptake and should be stimulated. Communicating best practices is a great enabler. Attention is needed for public acceptance of bioenergy



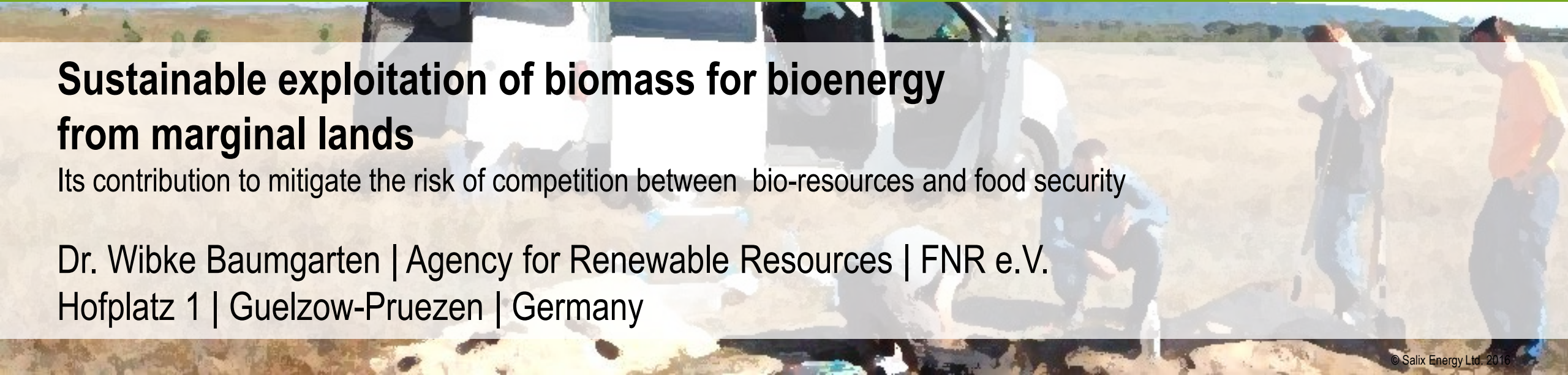


Sustainable exploitation of biomass for bioenergy from marginal lands in Europe

# Sustainable exploitation of biomass for bioenergy from marginal lands

Its contribution to mitigate the risk of competition between bio-resources and food security

Dr. Wibke Baumgarten | Agency for Renewable Resources | FNR e.V.  
Hofplatz 1 | Guelzow-Pruezen | Germany



© Salix Energy Ltd. 2016

Coordinator



Partners



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691874

Project Acronym: **SEEMLA** Project Number: **691874** Call: LCE-14-2015

Topic: **Market uptake of existing and emerging sustainable bioenergy**

Project title: **Sustainable exploitation of biomass for bioenergy from marginal lands (MagL)**



**Main Category of the Project:** Share of sustainable bioenergy in the final energy consumption

**Keywords:** marginal lands, biomass production, bioenergy, SQR tool **TRL:** 1-3

**Expected Impact of the Project:**

- 🌱 Operational assessment approach of MagLs on the basis of soil quality indicators based on the **Muencheberg Soil Quality Rating (SQR) Tool**, resulting in the **SQR index (SQR-I)** → MagL criteria and indicators
- 🌱 Application of the SQR-I in a GIS tool → assess the **availability of MagL and suitable bioenergy crops** for sustainable biomass production for bioenergy in Europe → **unlocking additional potentials to support the future energy demand**
- 🌱 Preparation, plantation, harvesting, and potential utilisation pathways were practically applied in each selected region (DE, EL, UA); → **good practice/gaining experiences in MagL management** – involving local/regional stakeholders
- 🌱 The SEEMLA approach contributes to **GHG mitigation**, offers a **sustainable agri-environmental scheme, supporting and fostering regional bioeconomy, avoiding the conflict food vs. fuel**

**Highlights (technological/non-technological):**

- 🌱 Development of a **GIS tool and a web-based application** to identify MagL by using the SQR-I;
- 🌱 **SQR-I** successfully applied in experimental pilot sites → degree of marginality, suitable MagL crops
- 🌱 Developing, implementing, and monitoring of selected **SEEMLA** pilot cases and plots under different climatic conditions, using and testing various woody and herbaceous biomass - **yield potentials energy crops in MagL;**
- 🌱 **MagL with SQR-I  $\geq 20 - 40$  to be considered economically efficient; ca. 25% of pot. agricultural land considered as MagL in EU → increasing trend**
- 🌱 **Publication** (Open Access): W. Gerwin et al. (2018), SOIL, 4, 267-290, doi: 10.5194/soil-4-267-2018

**What is needed in future:** A common definition of MagL in EU regulation, e.g. CAP; yield potential estimations for energy crops using the SQR-I (more/reliable data required); financial support/incentives for farmers who manage and take care of [in many cases] heavily degraded land | MagL → increase of MagL due to climate change; selection of persistent energy crops, ensuring flexibility/availability



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691874