

## New Space for Biofuels

Through the support of the EU's Horizon 2020 programme the FORBIO research consortia is aiming at finding sustainable value chains and market barriers of advanced biofuels that would enable or disable bioenergy projects take off.

### FORBIO

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The main driver behind the research spanning from 2016 to the end of 2018 is finding and assessing land suitability in Europe where industrial crop production is not in competition with other land uses, land utilized for food, feed, recreation etc. In the 36-month long project 12 partners are conducting agronomic, tecno-economic studies, sustainability assessments and run intensive consultation with relevant stakeholders. At half time of FORBIO project implementation the accumulated know-how containing biomass value chains, including economical and agronomical calculations is ready to be shared via workshops, field visits, webinars for targeted spectators.

#### Three case studies across Europe

FORBIO project is organized along target countries (Germany, Italy, Ukraine) where detailed studies are completed and outreach countries (Ireland-UK, Belgium, Poland, Hungary, Romania) where instant knowledge transfer is primarily envisaged. The objective of the main project activities is to foster the market uptake of sustainable bioenergy projects in target and outreach countries.

#### Germany

In Germany reclamation sites of lignite mining in in the Eastern German Lignite District (Lusatia, South Brandenburg and North-East Saxonian Lowlands) and former sewage irrigation fields in the Federal States Berlin, Brandenburg, and Saxony were identified as target areas. Reclamation sites of about 15,000 ha are designated for agricultural land use and are suitable for the cultivation of conventional energy crops. Sewage irrigation fields of more than 10,000 ha are designated for phytoremediation through the cultivation of special undemanding energy crops and woody biomass species. The case study areas are scattered, which creates a challenge for economic biomass feedstock production.

#### Italy

In Italy, 22,000ha in the Sulcis area of Sardinia were identified for the case study. The area used to have intensive industrial activities and so far, no restoration measures were implemented here. In bits of this land agricultural cultivation is forbidden due to high levels of contamination. The areas experienced de-industrialization and abandonment of industrial production. Sustainable biomass feedstock production could be a solution for the restoration of abandoned areas. Arundo Donax was identified as potential feedstock for second generation bioethanol production.

#### Ukraine

In Ukraine about 4 million ha are under the status of set-aside land. 10% thereof (400,000 ha) could be used to produce advanced biofuels from willow and the rest could be used to produce solid biofuels and biogas. The case study area (2,000 ha) is in the region of Kyiv, Ivankiv municipality. The FORBIO project assesses sustainable bioenergy production potential in the case study areas on available underutilized lands

#### Sustainability assessments of value chains

For the comprehensive planning of feedstock production and processing a thorough sustainability assessments which covers all steps of the chain should always be carried out before project implementation. In addition, monitoring bioenergy sustainability throughout the lifespan of a given investment is a necessary condition to understand whether there is alignment with the intended direction of the management measures and actions undertaken. The assessment of sustainability in bioenergy must encompass all three dimensions (i.e. pillars) of sustainable development including economic growth, environmental protection, and social equality.

The assessment of the sustainability of advanced bioenergy value chains studied in FORBIO is based the set of Sustainability Indicators for Bioenergy developed by the Global Bioenergy Partnership (GBEP). In the context of FORBIO, the approach is to adapt the calculations of sustainability performances of bioenergy planned (i.e. ex-ante) at the local level (i.e. sub-national). Specifically, with regards to the local level character of the assessments, in FORBIO a novel concept was introduced. The target area is an area to be identified by the sum of geographical features (e.g. watersheds), or political features (e.g. municipality borders), or cultural (e.g. regions as identified by cultural heritage of an area) that contain the entire bioenergy value chain or its most relevant components and that are used to define the borders of the analysis.

The assessment of sustainability in the context of FORBIO project aims at determining the actual change between the current situation (i.e. baseline) and a hypothetical future scenario in which bioenergy is produced (i.e. target). The differences between these two points in time are evaluated to establish their performances under the selected sustainability indicators. The changes are, where possible, checked against existing EU regulation and directions, to assess whether

they contribute or not to achieving the intended targets for sustainable development set by the European Commission.

#### Policy barriers and market uptake

A major part of the FORBIO project is to analyse economic and non-economic factors as well as identify best practices for bioenergy policies, regulations and support schemes which allow the most sustainable and efficient use of bio-resources from under-utilized land in the target and outreach countries. A collaborative study was performed by all project partners that uses country specific information.

The initial task of this work identified three major strategies provide the framework to the EU approach to renewable energy. They determine specific targets and goals for the Member States to achieve until 2020, 2030 and 2050 respectively.

The biofuel legislation is based on the Directive 98/70/EC on the quality of petrol and diesel fuels. Its latest amendment of 2015 determines that „Member States are (...) to require suppliers of fuel or energy to reduce by at least 6 % by 31 December 2020 the life cycle greenhouse gas emissions per unit of energy of fuels used in the Union by road vehicles, non-road mobile machinery, agricultural and forestry tractors and recreational craft when not at sea." Another pillar to biofuels is the sustainability criteria laid down in Directives 98/70/EC and 2009/28/EC which requires the Member States and the Community to increase the use of biofuels in a way which brings a net benefit to the environment.

A White Paper from 2011 presented another relevant Roadmap which aims at achieving a resource efficient transport system. This strategy foresees a 60 % GHG reduction in the transport sector by 2050 and to halve the conventionally-fuelled cars in urban transport by 2030. The Commission released in 2013 a strategy on the use of alternative fuels which is non-binding.

Action in the frame of FORBIO project will largely focus on knowledge sharing and finding opportunities and identify replicability potentials across Europe in 2017 and 2018.

Information on events as well as further project reports and documents will be publicly available via the project website (<http://www.forbio-project.eu/>).  
Figure - FORBIO project study sites

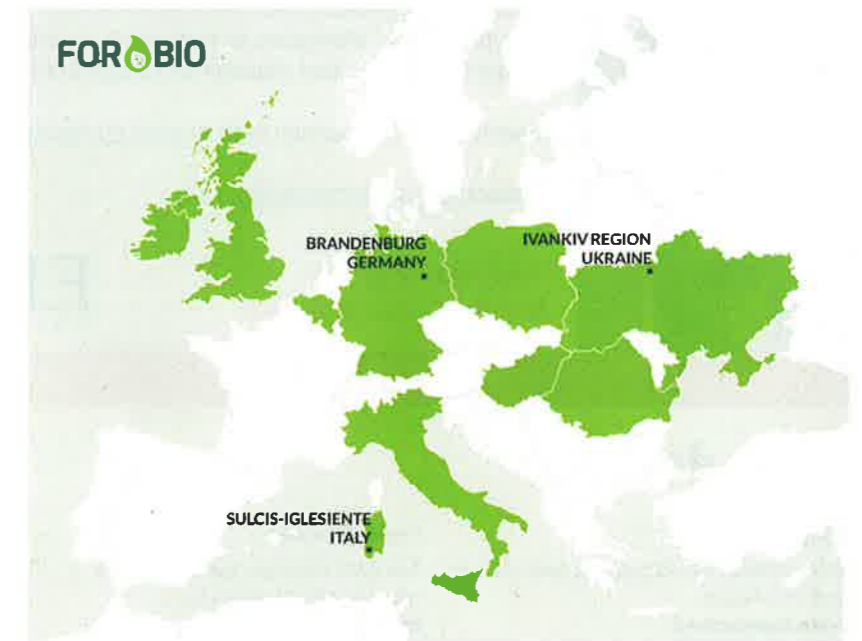


Figure - FORBIO project study sites

FORBIO BIOENERGY SUSTAINABILITY INDICATORS		
ENVIRONMENTAL	SOCIAL	ECONOMIC
Life-cycle GHG	Land Tenure	Productivity
Soil Quality	Change in Income	Net Energy Balance
Non GHGs	Jobs in Bioenergy Sectors	Gross Value Added
Water Use and Efficiency	Modern Energy Access	Trainings
Water Quality		Infrastructures and Logistics for Bioenergy Distribution
Biodiversity		Capacity and Flexibility of use of Bioenergy
Land Use Change		

Figure - FORBIO sustainability indicators (FAO)



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