The experience in Germany, Italy and Ukraine (FORBIO project) with an adapted version of the GBEP indicators

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FORBIO (Fostering Sustainable Production of Biofuels on Underutilized Lands in Europe) assessed the feasibility of using underutilized lands in Italy, Germany and Ukraine for biomass production without interfering with the production of food or feed, or with land currently used for recreational and/or conservational purposes. Romania, Poland, Ireland, UK and Hungary are outreach countries.

Competition with other uses of the land is only one component of bioenergy sustainability and a number of cross-cutting environmental, social and economic aspects may present challenges while ensuring that sustainability standards are met.

FORBIO developed a methodology to assess sustainable bioenergy production potential on available “under-utilized lands” in Europe (contaminated, abandoned, fallow land etc.) at national and local level.
FORBIO is made of **11 partners** from **8 EU Member States** + **1 partner** from Ukraine

Started in January 2016 and expected to end in **December 2018**, for a duration of **36 months**, the project received funding for **1.9 million EUR**

The coordinator of FORBIO is **WIP-Renewable Energies (Germany)**

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This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No691846.
FORBIO

STUDY SETTING:

CASE STUDY PRESENTATION

ITALY
Italy

- The Sulcis is one of the «Siti Interesse Nazionale» (sites of National interest) due to heavy metal contamination of the soils;
- Starting from March 2014, the Municipality of Portoscuso enacted a decree that prohibits the sale of agricultural goods produced within the Site of National Interest (SNI);
- The bioenergy pathway selected is lignocellulosic ethanol with Combined Heat and Power within the biorefinery. Sources of biomass studied is giant reed (Arundo donax) both on irrigated under rainfed management regimes.
Italy

- The hypothetical biorefinery was located in the industrial pole of Portovesme.

- The target area of Sulcis, Italy is entirely inscribed within a 30 km radius from the industrial pole of Portovesme.

- Portovesme is strategically located also for its connections with the mainland and other EU and Mediterranean countries.
Italy

• Within the *target area* (total surface 35,745 ha), a total of 18,706 ha of current agricultural land is to be considered *underutilized* because contaminated

• These lands have been identified as suitable for biomass production in the agronomic assessment carried out in Deliverable 2.1

• The Sulcis is one of the least developed provinces of Italy, environmental and social challenges are a relevant burden for the local population

• Given the results of D 2.1 (agronomic feasibility) a 40,000 t/year bioethanol biorefinery was tested in the sustainability assessment
STUDY SETTING:

CASE STUDY PRESENTATION

GERMANY
Germany

- The German case study is characterized by two study areas both located in Brandenburg, Northeastern part of Germany.
  - The former sewage irrigation fields near the city of Berlin will be tested for the production of biomethane from spontaneous grass.
  - The lignite reclamation sites in Lusatia were tested for Lucerne (alfalfa) and sorghum, also for biomethane production.
Germany

• In the disused sewage irrigation fields case study 1,140 ha were selected for the provision of biomass to existing biogas plants in the area.

• In the case of former lignite mining sites, 7,295 ha were tested for the production of biomethane according to combinations of scenarios. However, there are some «use restrictions» that interest some 1,200 ha

• The most likely arrangement of crops would foresee some 3,648 ha of alfalfa and 2,431 ha of sorghum for a total of 6,079 ha.
STUDY SETTING:
CASE STUDY PRESENTATION

UKRAINE
• The analysis targeted the non-exclusion zone just south of the Chernobyl disaster area in the Ivankiev Region of Ukraine

• Two types of lands are found in this area:
  - abandoned agricultural land, i.e. land that is not needed any more for the production of food and feed crops or for other purposes;
  - degraded or low productive land, i.e. land that is not suitable or no longer suitable for conventional commercial agriculture.

• The bioenergy pathway selected is lignocellulosic ethanol with Combined Heat and Power within the biorefinery. Sources of biomass studied is willow (Salix viminalis).
FORBIO

SUSTAINABILITY ASSESSMENT PROCESS
FORBIO approach to the Sustainability Assessment:

- Harmonized Data collection campaign (Data entry sheets + literature)
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- Harmonized Data collection campaign (Data entry sheets + literature)
- Development of tailored set of Sustainability Indicators (adapted from GBEP SI)

<table>
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<th>FORBIO SUSTAINABILITY INDICATORS</th>
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<th>SOCIAL</th>
<th>ECONOMIC</th>
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<td>Biodiversity</td>
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- Development of tailored set of Sustainability Indicators (adapted from GBEP SI)
- Indicators measurement through purpose built calculator
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- Indicators measurement through purpose built calculator
- Further discussions with local stakeholders
LESSONS LEARNED
Lessons Learned:

• The GBEP Indicators represented an optimal starting point for the development of ex-ante sustainability analyses in the context of advanced biofuels in Europe.

• Their intrinsic cross-cutting architecture is the principal advantage for sound and comprehensive assessments of sustainability.

• Most methodological approaches could be applied to the case of the value chains on the underutilized lands studied, others required relevant adaptation.

• Through multistakeholder discussions, workshops and info-days, the GBEP Indicators have supported the development of the capacity of local stakeholders to understand and evaluate the importance of environmental, social as well as techno-economic sustainability.
Thank you