

Marginal lands and industrial crops for the European bioeconomy

A new Horizon Europe project connects bio-based products, climate resilience and biodiversity protection, through innovative agricultural value chains deployed in marginal land.

10 March 2023 - The European Green Deal aims at transforming the EU into a resource-efficient and competitive economy with zero net greenhouse gas emissions in 2050, decoupling economic growth from the use of fossil resources, while making our ecosystems more resilient to climate change and protecting our environment.

To achieve this goal, Europe's agriculture must ensure the production of enough food for a growing population in a sustainable and inclusive manner, as well as the supply of renewable biomass both for energy and materials, complementing the circular use of residues and wastes in the transition from a fossil-based to a bio-based economy. This must be accomplished without reducing the land available for food production, and with sustainable farming systems that protect and possibly enhance the health of our soils and the biodiversity of ecosystems in rural areas.

Matching all these goals is the ambition of MIDAS, a recently launched Horizon Europe project to grow climate-resilient industrial crops on marginal agricultural land available in Europe, and to develop full value chains for the production of a wide range of bio-based products.

Bio-based value chains designed for marginal land can be a win-win approach

The extension, the characterization, and the solutions for the recovery of marginal, abandoned and degraded agricultural land in Europe have been investigated by past and ongoing research; it is estimated that around 60 million hectares of agricultural land in the EU can be defined as marginal. Although this category partly overlaps with other categories of unused, abandoned and degraded land, this value represents as high as 28% of the total agricultural area available in Europe and it could still increase, particularly in some areas of Central and Mediterranean Europe that are subject to increasing heat waves and droughts. This is why it is vital that climate change resilience strategies are in place to protect those areas; therefore the approach of MIDAS to produce biomass feedstock on those land for bio-based products is potentially a win-win situation.

Coordinated by the Greek Centre for Renewable Energy Sources (CRESES), the four-year project involves 23 partners from 13 countries including research organizations, industries and SMEs, that carry out a wide range of activities at all the levels of multiple bio-based value chains.

Crop selection and agronomic strategies for water scarcity, soil health and biodiversity protection

At agricultural level, the project works to optimize and select industrial crops that can cope well with water scarcity through a combination of breeding, agronomic practices and innovative farming systems, mitigating soil erosion and maintaining or possibly strengthening the ecosystem services and the biodiversity. The use of melliferous and pest- or disease-tolerant crops that can be grown successfully with low input systems, provides habitat and benefits to different wild taxonomic groups including pollinators. At the same time, using both perennials and annual crops (including catch and cover crops) in agroforestry and intercropping



schemes, increases the structural diversity at landscape level of rural areas dominated by traditional crop rotations.

Working with the farmers and for the farmers is the project ambition, therefore this approach is demonstrated with 15 farm-scale cases studies in 9 countries, and with the direct engagement of regional farmers and experts' groups.

Process integration and resource-efficiency

At process level, the project aims at improving the performance and the resource efficiency of eleven specific value chains adopting a biorefinery concept, to develop a wide range of bio-based products.

Oilseeds from annual crops (castor, crambe, safflower and carinata) are used to produce biodegradable mulch films, bio-lubricants, bio stimulants, bioherbicides and phytosanitary products. Hemp, sorghum, miscanthus, willow and Siberian elm are used to produce MDF panels, particle boards, biochar and nanocarbons. Specialty crops (guayule and lavender) are used to produce rubber for car tires, latex for gloves, adhesives and coatings. Some of those products such as the mulching films, the bio-stimulants, the bioherbicides and the biochar, will also be tested back in the farm-scale case studies to demonstrate the circularity of the approach.

Contributing to a competitive and resource independent bioeconomy for Europe

In the next four years MIDAS is expected to generate a multitude of results ranging from scientific knowledge advancement, for example on the future potential of marginal land considering climate change and on the biodiversity effects of industrial crops and farming practices, as well as improved breeding materials, marketable bio-products, business plans and sustainable upscaling strategies for the value chains.

This will provide a tangible contribution to the deployment and market uptake of innovative technologies and products, the sustainability, resource independence and competitiveness of the European bioeconomy, in line with the objectives of the Green Deal, the EU Bioeconomy Strategy as well as the UN Sustainable Development Goals.

About MIDAS

MIDAS – *Marginal land Industrial Crops and Innovative Biobased Value Chains* is a Horizon Europe Innovation Action started on 1 November 2022 that will continue through 30 October 2026.

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