



This project is co-financed by the European Union and the Republic of Turkey

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ABOUT THE PROJECT

Integrated Biorefinery Concept for Bioeconomy Driven Development

Project INDEPENDENT is carried out as part of the Competitive Sectors Programme co-funded by the European Union and the Republic of Turkey, and implemented by the Ministry of Industry and Technology.

With Project INDEPENDENT, it is aimed to obtain products and technologies for food, agriculture, livestock, and environmental sectors, particularly energy and health, the main current account deficit items of Turkey, with an integrated production system based on a growth model focused on bioeconomy. In order to process sustainable natural resources based entirely on algae without depending on fossil resources, an integrated carbon-negative biorefinery system with a zero-waste target has been designed under the umbrella of Istanbul Microalgae Biotechnologies Research and Development Center (IMBIYOTAB) operating on Boğaziçi University's Sarıtepe Campus within the scope of the project.

Dietary supplement products, pharmaceutical ingredients, animal feed practices, organic biofertilizers and biofuels are being developed from algae cultivated in 80m3 outdoor ponds and 30 m3 indoor production reactors installed at an R&D area and production site of 2,500 m². The fully wind-powered plant is the first carbon-negative integrated biorefinery in Turkey and Europe.

The total 5.7 million euros budget of the project, which is set to process approximately 1,200 tons of wet algae mass per year, is funded by the European Commission at 85% and the Ministry of Industry and Technology at 15% as part of the Competitive Sectors Programme. Within the scope of Project INDEPENDENT, consultancy, project development, know-how and technology transfer, equipment design, product test and analysis services are provided to the SMEs operating in various sectors that utilize algae-based products, such as petrochemical, cosmetics, textiles, particularly in the project's target sectors, within the scope of Government University Industry Collaboration (KÜSİ) and industrial development is ensured by creating jobs.



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Alternative source MICROALGAE



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TEST-ANALYSIS

From Lab Scale to Industrial Scale

From laboratory scale up to industrial production scale in the field of algal biotechnologies, test-analysis, consultancy, project development and implementation services for all products and technologies are provided by the Project INDEPENDENT team who have systems biology-based R&D knowledge and experience.

- Extensive algal culture collection
- Genomics and transcriptomics analyses
- Metabolomics and proteomics and analyses
- Bioinformatics analyses
- Analytical characterization
- Biochemical characterization
- Species identification and microbiological characterization
- Single-cell studies
- Molecular and cellular imaging
- Biofuel analyses
- Value-added product analyses

TRAINING

Training and Human Resources in The Field of Algal Biotechnologies

Project INDEPENDENT aims to raise awareness of information and technology-oriented economic development in the food, agriculture, livestock, health, energy, and environmental sectors. Accordingly, trainings will be held and an information retrieval platform will be formed to increase the use of algae-based biotechnological products, establish communication between all stakeholders in the relevant sectors, enable collaboration, be a guide on taking strategic steps, and support the R&D activities.

Project INDEPENDENT team will provide resources, databases and literature related to information, documents and legislation that will guide industry stakeholders in their important and strategic planning, in addition to their scientific and technological contributions. In this context, Project INDEPENDENT will expand the product and processing methods of microalgae biotechnologies in critical areas by reducing the information and technology gap through awareness raising and practical knowledge generation.

Training Modules

- Basic principles in algae cultivation
- Algae Biotechnologies
- Large-scale Algae Production and Processing



ENERGY

Microalgae-based bio-jet fuel, bio-diesel, bio-hydrogen and bio-methane applications stand out to offer sustainable biofuel alternatives for transportation and logistics industry. Biofuels produced in accordance with international standards are an alternative to fossil fuels and contribute to the reduction of greenhouse gas emissions.



FOOD

Plant-based, non-GMO, natural functional food and beverage product applications derived from microalgae are becoming popular in the food industry, which has gained importance due to rapidly increasing population density and climate change. Microalgae, which stand out as an alternative source of protein, are an important source of raw materials for healthy and nutritious food products.



HEALTH

Microalgae products with a prophylactic effect and high antioxidant properties are starting to offer innovative products to the health industry. As part of INDEPENDENT project, microalgae-based active substances are used in various pharmaceutical applications and biological activity studies.



AGRICULTURE

Algae, which are rare organisms with the potential to capture free nitrogen, are of high importance to the agricultural industry with biofertilizer production and enhancement of soil organic content. Agricultural production capacity is increased by means of microalgae with biostimulant applications for efficient crop production.



LIVESTOCK

The production of quality feed is of high importance for obtaining high-quality livestock products. And with Project INDEPENDENT, forage practices based on microalgae, with high protein content, increased nutritional properties, and supporting the immune system are being developed for ovines and bovines, seafood and fishing industries.



ENVIRONMENT

Increasing demand for water as a result of population growth, rapid urbanization and industrialization activities, and effective use and protection of water resources due to this demand are of high importance. Microalgae are at the service of the environmental industry with nitrogen and phosphorus removal, domestic & industrial wastewater treatment applications. It reduces greenhouse gas emissions in cities with its ability to capture carbon dioxide, while providing flue gas disposal opportunities for companies.

