Eni develops an innovative technology to fix the CO2 using artificial light

Pilot plant started up at the Eni Research Center in Novara

San Donato, 12 November 2020 – Eni announces the launch of an experimental plant for the biofixation of carbon dioxide through the cultivation of microalgae with the aid of artificial LED light. The plant, built at the Eni Research Centre for Renewable Energy and the Environment in Novara, represents a further important step forward for towards its objectives of decarbonisation and promoting a circular economy.

The algal biofixation process allows to fix carbon dioxide by exploiting chlorophyll photosynthesis to enhance CO2 as a raw material in high-value products such as algal flour for food / nutraceutical markets, and / or bio-oil - not in competition with agricultural crops – to be used as a raw material in bio refineries.

This is a technology based on an entirely Italian supply chain. Eni is accelerating its application in the field as it sees it as a strategic solution for the reduction of climate-altering emissions.

The pilot plant, consisting of 4 photobioreactors, is integrated with renewable energy sources and is based on Photo B-Othic technology, with which Eni has signed a License Agreement. Photo B-Otic was created to support the development of biofixation technology and starts from the initiative of MEG, Everbloom, Abel Nutraceuticals and the Arcobaleno Cooperative, which is a majority shareholder and has promoted this entrepreneurial initiative, which is the result of decades of research work in field of nutraceuticals and biotechnologies in collaboration with the DIATI of the Politecnico di Torino.

The photobioreactors on which the technology is based are composed of innovative hydraulic panels, in which the micro-algae circulate, equipped with LED lighting panels that spread the light evenly, identifying the preferred wavelengths for photosynthesis. The modulation of light for intensity and quality is controlled according to the optimal growing conditions.

The advantages of this technology are its high CO2 fixation efficiency, simplicity, modularity and compactness, as well as its ability to operate 24/7. These factors make it interesting as a potential solution to be implemented across all logistically favorable areas, even in sites that cannot be used for agriculture or abandoned and converted industrial areas.

Currently, the pilot plant has reached very promising daily biomass productivity data which - where confirmed on a larger scale - could allow a plant with a footprint of 1 hectare to produce 500 tons of biomass per year, trapping 1000 tons of CO2.

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