

# CIVIL AND ENVIRONMENTAL ENGINEERING

## MUR DM 117/ENI - Optimization of technologies related to planar photobioreactor for the production of microalgal biomass and post processing

<b>Funded By</b>	ENI S.P.A. [Piva/CF:00905811006] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [Piva/CF:97429780584] Politecnico di TORINO [Piva/CF:00518460019]
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<b>Contact</b>	
<b>Context of the research activity</b>	<p>The activity of the doctoral grant will focus on the definition of procedural standards for various activities related to microalgal growth in planar photobioreactor with artificial light. For example, the coding of the procedure for optimizing the species-specific wavelength. Or the definition of the Production – Intensity curves useful for modeling the growth process. The activity will also focus on the processes of collection and conservation of the biomass obtained.</p> <p>Progetto finanziato nell'ambito del PNRR - DM 117/2023 - CUP E14D23001990004</p>
<b>Objectives</b>	<p>In this doctoral scholarship we will focus mainly on the definition and preparation of protocols to be used as standard procedures for a whole series of activities related to the management of the experimental apparatus developed by the Polytechnic of Turin for the growth of microalgae. Specifically, the activity will cover various areas of investigation such as: the definition of the best method for identifying the parameters necessary for carrying out a biokinetic simulation; the best instrumental management before, during and after growth tests on pilot plants; the management and sharing of data obtained from telemetry; the characterization and management of the liquid growth substrate, with particular attention to the recycling of both the liquid component and the nutrients; the development of the biomass collection protocol through the use of an industrial centrifuge and the optimization of the procedures for its conservation for different ultimate purposes through drying and/or freeze-drying. Finally, analyzes will be carried out to evaluate the quality of the biomass obtained (in terms of proteins and lipids) as well as more specific analyzes for the identification of valuable metabolites (for example pigments, antioxidants, etc.). The activity</p>

will conclude with the creation and development of various specific procedural documents for the various points listed above and which will constitute a sort of manual of good operational practices.

**Skills and competencies for the development of the activity**

Buona conoscenza delle pratiche di laboratorio, esperienza pregressa in ambito di accrescimento microalgale, dimestichezza nell'acquisizione di dati da sorgenti analogiche e digitali, post processing di serie numeriche con strumenti avanzati quali matlab o python, conoscenza dei processi legati all'assorbimento di anidride carbonica con metodi fototrofici.