



PhD in INGEGNERIA DEI MATERIALI / MATERIALS ENGINEERING - 38th cycle

PNRR_351_PUBBL_AMMIN Research Field: DEVELOPMENT OF A LIFE CYCLE THINKING-BASED METHODOLOGY TO BE USED IN PUBLIC PROCUREMENTS FOR THE EVALUATION OF SUSTAINABILITY AND CIRCULARITY OF MATERIALS AND PRODUCTS

Monthly net income of PhDscholarship (max 36 months)

€ 1325.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

The European Green Deal encourages public authorities "to choose environmentally friendly goods, services and works" (https://ec.europa.eu/environment/gpp/index_en.htm) by introducing the Green Public Procurement (GPP). GPP has a key role to play in the EU's efforts to become a more resource-efficient economy and in the pathway towards decarbonization. However, to be effective, it requires the inclusion of clear and verifiable environmental criteria.

In the same line recovery and resilience plan (PNRR) aims to help Italy become more sustainable, resilient and ready for the green and digital transitions. In terms of climate and environmental policies, the major challenges are in the areas of waste and water management, sustainable mobility, and energy efficiency of buildings. Any project or intervention in these sectors will require attentive monitoring to assess the level of sustainability effectively reached.

Within this framework the present project aims to enable Public Authorities (PA) to receive the requirements of EU regarding the GPP criteria and targets as well as to support PNRR policies. The goal of the project is to develop a methodology that helps PA in selecting the right criteria for the evaluation of sustainability and circularity in



	<p>public procurements as well as in any other project aimed at improving sustainability of public sectors. The methodology should allow a simple, transparent, and reliable evaluation of the fulfillment of the selected criteria. Moreover, with a view to promoting digital transition, the methodology will be translated into an algorithm which makes implementation more efficient and effective. The approach will rely on scientific-based criteria and it will be based on the well-established life cycle thinking tools, i.e. Life Cycle Assessment, Social Life Cycle Assessment, and Life Cycle Costing. Moreover, criteria for the assessment of circularity will be introduced, in line with the EU Circular Economy Action Plan.</p> <p>Recognized the prominent role played by materials in the target sectors of PNRR environmental policies, the methodology will mainly focus on criteria to be applied in the selection of materials, but not exclusively. The research will be conducted in collaboration with the Municipality of Lecco, which will serve as first case study giving the point of view of a public authority. In particular, the methodology could be tested against projects under development in public areas of the Municipality of Lecco.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<ul style="list-style-type: none"> • Sustainability Life Cycle Assessment, i.e. environmental Life Cycle Assessment (LCA), Social Life Cycle Assessment (S-LCA), Life Cycle Costing (LCC); • Circularity metrics (e.g. Material Circularity Index); • LCA software (i.e. Simapro, OpenLCA, Brightway); • Programming language (e.g. Python applied to calculations in Brightway); • Multicriteria decision analysis.
<p>Educational objectives</p>	<p>The research activity should contribute to forming a professional figure expert in sustainability and circularity assessment with a special focus on materials. Training a researcher who can interact with both technical and administrative personnel, especially in public administrations, is another major educational goal of this project.</p>



Job opportunities	<p>There is an increasing demand by Public Authorities and private companies of highly trained scientific professional figures with an expertise in the broad area of sustainability and circularity.</p> <p>In particular Public administrations will have to face decisions concerning ?green issues? more and more often in the next years, therefore they have an urgent need to include in their staff qualified experts capable to manage digital tools focused on sustainability and circularity to comply with the new EU policy trends.</p>
Composition of the research group	<p>1 Full Professors 2 Associated Professors 1 Assistant Professors 6 PhD Students</p>
Name of the research directors	Prof. Giovanni Dotelli

Contacts
<p>https://mat4en2.cmic.polimi.it/ https://www.cmic.polimi.it/ricerca/elenco-gruppi-di-ricerca/mat4en2/</p>

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	662.5 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	<p>Comune di Lecco Area Ambiente (Assessore R. Zuffi) Via Fassi 18, Lecco https://www.comune.lecco.it/index.php/aree-tematiche/ambiente + Demetra Soc. Coop. Sociale Onlus - Via Viscontia 75, Besana Brianza (MB) 20842 Italia http://www.demetra.net/ (thanks to its well-known expertise in sustainability assessment and public procurement is a good partner where the PhD student can refine the methodological approach)</p>
By number of months at the company	9
Institution or company where the candidate will spend the period abroad (name and brief description)	<p>The PhD student will be expected to spend a period of at least 6 months abroad to interact with researchers and participate in joint activities potentially foreseen in the project, according to specific needs. Indeed, the project is highly interdisciplinary, and this favors the collaboration with foreign research centers where the candidate can acquire in-depth knowledge on sustainability and circularity assessment.</p>



By number of months abroad	6
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Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Individual budget for research (during the 3 years): about 5.400 euro.

Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial of for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities within the limits allowed by the regulation.