



PhD in ARCHITETTURA, INGEGNERIA DELLE COSTRUZIONI E AMBIENTE COSTRUITO / ARCHITECTURE, BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING - 39th cycle

THEMATIC Research Field: CLEAN ENERGY TRANSITION IN THE BUILDING SECTOR

Monthly net income of PhDscholarship (max 36 months)
€ 1275.0
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	<p>The research aims to explore the critical role that the built environment can play in meeting climate change mitigation challenge, identifying a set of clean energy technologies and systems at multiple scales. It includes the investment needs and strategies to enable the buildings sector transition, and the multiple benefits that transformation would deliver.</p> <p>The objective is to develop innovative technologies/systems/ configurations/operation models to support the clean energy transition at building or district scale.</p> <p>Some of the specific areas of research that can be addressed are listed below:</p> <ul style="list-style-type: none"> •Renewable energy systems and communities; •Novel HVAC systems; •Multi-energy systems; •Innovative (low temperature, RES based etc.) district heating and cooling systems; •Energy storage and dispatching solutions for thermal and electric purposes.
Methods and techniques that will be developed and used to carry out the	Candidates must plan their research and training activities



<p>research</p>	<p>and define the specific methodologies to be used to find the answer to their research question, immediately after the official start of their PhD Programme, in accordance with their Supervisors.</p> <p>The plan and the methodologies will be detailed in their PhD Agreement, giving evidence of their aims and of the global amount of time to be spent in each of them.</p> <p>The PhD Agreement will be endorsed by Candidate's Supervisor and approved by the Head of the Programme (or by a delegate).</p> <p>SDGs related to this research:</p> <ul style="list-style-type: none"> •7 - Affordable and clean energy •9 - Industry, innovation and infrastructure •10 - Reduced inequalities •11 - Sustainable cities and communities •13 - Climate action
<p>Educational objectives</p>	<p>The PhD position aims at training experts in clean energy transition, integrating related areas of technology development, sustainability, and digital solutions. The mission emphasizes the students' engagement in the study program, university-student collaboration, and a strong multidisciplinary perspective. The learning objectives are:</p> <ul style="list-style-type: none"> • Acquire a critical thinking and Research skills. • Learn advanced lectures in the theoretical literatures that underpin modern technologies and development studies on sustainable energy transition. • Learn research methods ranging from quantitative and deductive methods to qualitative and inductive ones. • Master a specific set of methods appropriate to the dissertation, with the depth needed to produce methodologically rigorous research. • Master the theories that underpin their dissertation, to produce advanced Research. • Produce an original thesis on the specific themes; • Integrate interdisciplinary knowledge and citizens'



	<p>participation.</p> <p>The main skills that will be developed are:</p> <ul style="list-style-type: none"> •Detailed experience in dynamic energy simulations using the most advanced tools; •Deep knowledge on innovative technical solutions for renewable energy generation, energy conversion and distribution; •Deep knowledge of the specific application context (buildings and HVAC systems, also at district level); •Deep knowledge on the holistic and integrated design approach involving energy, economic, social and environmental issues; •Ability to work in an interdisciplinary research group. <p>Besides acquiring the above-mentioned skills, it is expected that the candidate will develop a publication record in recognized international journals (at least one per year) of repute and conferences.</p>
<p>Job opportunities</p>	<p>The ABC-PhD Candidate will gain high-level scientific knowledge, significant experience and proven R&D management skills, transferrable to other activities. This, together with the habit of communicating and working in English, acquired interacting with colleague at a global scale, during visits and stays abroad, and a deep knowledge of the academic world qualifies the Candidate for positions offered by the best international universities and research centres. ABC-PhD experience, nevertheless, will offer occupational opportunities also for employments in architectural and engineering design enterprises, in public bodies and wherever highly qualified personnel (at an international level), specific competencies at the highest level, the attitudes and the network of a researcher is acknowledged.</p> <p>ABC-PhD candidate will be trained to problem solving, to model complex environments, to understand complex questions and to apply critical thinking.</p> <p>Job opportunities are available with profit and non-profit companies, public institutions, as well as with international institutions involved in energy transition sector, in particular, in following sectors:</p>



	<ul style="list-style-type: none"> •Energy efficiency sector; •Construction sector; •Sustainable heating and cooling systems sector; •Energy management sector; •Policy-maker sector; •R&D sector.
Composition of the research group	2 Full Professors 5 Associated Professors 3 Assistant Professors 5 PhD Students
Name of the research directors	Profs. Paola Caputo & Claudio Del Pero

Contacts	
paola.caputo@polimi.it	
claudio.delpero@polimi.it	

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	637.5 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information	
Additional support: Budget for the research activity (only for positions supported by scholarship): total amount Euro 5197.60 per student In detail: - 1st year Euro 1732.53 - 2nd year Euro 1732.53 - 3rd year Euro 1732.53	
Additional information about the organization and regulations of ABC-PhD programme can be found in the Regulations for the 39th Cycle of ABC-PhD:	



download is available at link:

<https://www.dottorato.polimi.it/corsi-di-dottorato/architettura/architettura-ingegneria-delle-costruzioni-e-ambiente-costruito>

Additional information about ABC department and ABC-PhD programme:

available at link:

<https://www.dabc.polimi.it/>

Desk availability:

The ABC department provides non-permanent desks to be temporarily booked in common PhD rooms.