POLITECNICO DI MILANO

PhD in SCIENZE E TECNOLOGIE ENERGETICHE E NUCLEARI / ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY - 41st cycle

INTERDISCIPLINARY Research Field: AN INTEGRATED ENERGY PLANNING APPROACH FOR BOTTOM-UP UNIVERSAL ACCESS TO FOSTER THE ENERGY TRANSITION IN OFF-GRID AFRICAN CONTEXTS

Monthly net income of PhDscholarship (max 36 months)
1700.0 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	Interdisciplinary PhD Grant The PhD research will be carried out in collaboration with research groups of the PhD programme in "**ELECTRICAL ENGINEERING**". See https://www.dottorato.polimi.it/?id=422&L=1 for further information.
Methods and techniques that will be developed and used to carry out the research	The research adopts an interdisciplinary approach, integrating various methods and techniques to ensure a comprehensive analysis of off-grid renewable energy systems. A key aspect is the use of open-source energy planning modeling tools with GIS capabilities, which enable spatial analysis and optimization of energy access solutions. These tools will be integrated with electric modeling features, allowing for a detailed assessment of system performance, grid integration potential, and expansion strategies.Additionally, the study relies on **real-world data** collected from **pilot and operational mini-grids**, ensuring that the modeling framework is grounded in empirical evidence. This data-driven approach enhances the accuracy of

	This data-driven approach enhances the accuracy of simulations and policy recommendations, making them more applicable to real-world scenarios. By combining **energy system modeling, GIS-based spatial analysis, and real-time operational data**, the research provides a robust framework for optimizing off-grid electrification strategies.Furthermore, the interdisciplinary nature of the study promotes the **integration of technical, socio-economic, and policy perspectives**, ensuring that energy planning aligns with local needs and national development goals. This holistic methodology supports a more **efficient, inclusive, and scalable** transition to sustainable off-grid energy systems.
Educational objectives	Promoting interdisciplinary collaboration, developing critical thinking, and advancing research skills
Job opportunities	Job opportunities for a successful Ph.D. candidate include both industrial and academical research or specific job positions as energy analyst and energy planning expert.
Composition of the research group	2 Full Professors 4 Associated Professors 3 Assistant Professors 10 PhD Students
Name of the research directors	riccardo mereu

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	850.0 €
By number of months	6

Stage and period abroad	
Institution or company where the candidate will spend the period abroad (name and brief description)	

By number of months abroad	0

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Educational activities: Financial aid per PhD student is available for purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences, instrumentations and computer, etc. This amount is equal to 10% of the annual gross amount, for 3 years. ***Teaching assistantship:*** Availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid 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 regulations. *Computer availability:* individual use. *Desk availability:* individual use. ***Awards***: Awards will be recognized to the PhD candidate up to Euro 3.000,00 (gross amount) per year, in case of exceptional achievements in the research project (modelling tools, scientificpapers, etc..), subject to the evaluation of the research director.