



# PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 39th cycle

**INTERDISCIPLINARY Research Field: METALLURGY AND ENERGY STEELMAKING AND  
HEAT RECOVERY**

**Monthly net income of PhDscholarship (max 36 months)**

**€ 1400.0**

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 "**ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY**".

The main objective of the research activity is the decrease of environmental impact of steelmaking operation by heat recovery and exploitation of the biogenic resources.

**Methods and techniques that will be  
developed and used to carry out the  
research**

- Characterization of steelmaking slag by chemical and crystallographic analysis;
- Design of heat recovery systems to extract heat from slag;
- Design, modelling and experimentation of system powered by heat recovery: - stirling engine;- direct carbon fuel cell.

**Educational objectives**

Development of an integrated approach coupling metallurgical and energetic aspect to improve the efficiency of the process and the decrease of environmental impact.

**Job opportunities**

The developed skills will be applied in several fields: metallurgical industries, steelmaking industries, power generation generation, process modelling.



	The research activities are shared between the Department of Mechanical Engineering and the Department of Energy Engineering and they will be supported by ElsaFra, i-H <sub>2</sub> and RevolUp. The described project could be embedded in a next Horizon call focused on digital and ecological transition in steelmaking activities.
<b>Composition of the research group</b>	2 Full Professors 5 Associated Professors 1 Assistant Professors 4 PhD Students
<b>Name of the research directors</b>	Prof. Carlo Mapelli, Prof. Gianluca Montenegro

<b>Contacts</b>
For questions about scholarship/support, please contact <a href="mailto:phd-dmec@polimi.it">phd-dmec@polimi.it</a> .

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

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	700.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p>Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of euro 5.707,13.</p> <p>Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 700 euro/month- net amount).</p> <p>Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD candidate. 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.</p>

