



# PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 38th cycle

**THEMATIC Research Field: A SYSTEM OF PROVISION APPROACH FOR COMPLEX  
INFRASTRUCTURE**

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

**€ 1450.0**

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

This PhD Project consists in investigating the application of System of Provision to complex infrastructure, with a focus on nuclear infrastructure. This PhD is part of the Horizon - EURATOM project "ECOSSENS", sponsored by the EU and delivered in collaboration with other European Organisations.

This PhD project will address the key weaknesses of traditional project and investment appraisal methods. In the context of complex infrastructure, the candidate will develop a suite of indicators relevant to investors and a variety of stakeholders (e.g. consumers, governments, suppliers)

#### Objectives

- Derive a novel model based on the System of Provision (SoP) approach to create and calculate indicators relevant to a plethora of stakeholders (e.g. consumers, governments, suppliers).

- Create a framework to calculate and apply the "Social Discount Rate" for a socio-economic analysis in the energy sector

- Enhance the SoP model to include the limits of the planet, as reflected in the "circular economy" economic system

The scope of work consists of 6 steps. A review of the main industrial and scientific literature on the System of Provision (SoP) approach (Step 1), will enable the development of a SoP model for the energy sector (Step 2), which will leverage the perspective of relevant



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|  | <p>stakeholders. In Step 3 the candidate will propose an overall architecture of a SoP approach allowing the application of the social discount rate (or rates) in feasibility studies of energy infrastructures, particularly (but not exclusively) in the commercial nuclear sector. The SoP model will be further improved considering the Circular Economy Principles (Step 4). The newly developed economic model will then be applied to multiple case studies in European countries with different nuclear energy programmes and strategies (Step 5). The results obtained will be synthesised in a series of policy recommendations for policy and decision makers (Step 6), considering novel criteria in the economic assessment of future energy infrastructure and the role of nuclear energy in the future EU energy mix.</p>   |
| <p><b>Methods and techniques that will be developed and used to carry out the research</b></p> | <p>STEP 1: The candidate will analyse the peer-reviewed scientific literature on SoP and relevant examples in industrial sectors, including energy and other applications (automotive, etc.). The candidate will review how SoP accounts for consumer choices and electricity provision. The candidate will critically summarise and categorise the scientific and industrial literature about the SoP approach in complex infrastructure</p> <p>STEP 2: The candidate will develop a pilot SoP model for the energy sector that integrates stakeholder inputs. The candidate will create a spreadsheet enabling the assessment of energy systems (particularly nuclear energy) according to the SoP approach.</p> <p>STEP 3: The candidate will engage leading finance experts (especially discount rate calculation) through in-depth interviews and an online workshop. The candidate will create a spreadsheet to calculate the social discount rate(s).</p> <p>STEP 4: Integration will include interviews and an online workshop with leading experts in circular economy and SoP. The candidate will enhance the Spreadsheet to assess energy systems according to the SoP approach incorporating both the social discount rate and Circular Economy principles.</p> <p>STEP 5: The SoP approach/model/concept will be applied to multiple case studies in Europe, selecting target</p> |



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|  | <p>countries according to Yin's recommendations of "polar types". A case study application of the SoP model will be produced for each country, relying on desk review and interviews with relevant stakeholders (consumers, industrial actors, electrical grid managers, regulators, et al.).</p> <p>STEP 6. The candidate will disseminate the results with scientific publications, practitioners oriented text (e.g. for "The conversation") and YouTube videos.</p>   |
| <b>Educational objectives</b>            | <ul style="list-style-type: none"> <li>- To discover, interpret and communicate new project studies knowledge through original research of publishable quality which satisfies peer review</li> <li>- To present and defend original research outcomes which extend the forefront of project studies</li> <li>- To demonstrate systematic and extensive knowledge of project studies</li> <li>- To take a proactive and self-reflective role in working and to develop professional relationships with others</li> <li>- Independently and proactively formulate ideas and hypotheses -</li> <li>- To critically and creatively evaluate current issues, research and advanced scholarship in project studies</li> <li>- To demonstrate systematic knowledge of and be able to critically assess, analyse and engage with the ethical and legal context of projects and temporary organisations.</li> </ul> |
| <b>Job opportunities</b>                 | <p>At the end of the PhD the candidate will be equipped with skills and knowledge that will ideally position him/her to:</p> <ul style="list-style-type: none"> <li>- Working in organisations involved in planning and delivering infrastructure</li> <li>- Working in consultancy companies</li> <li>- Working with infrastructure owners and client</li> <li>- Working in academia</li> </ul>  |
| <b>Composition of the research group</b> | <p>3 Full Professors<br/>0 Associated Professors<br/>0 Assistant Professors<br/>1 PhD Students</p>  |
| <b>Name of the research directors</b>    | Prof. Giorgio Locatelli   |

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

| Scholarship Increase for a period abroad |         |
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| Amount monthly                           | 725.0 € |
| By number of months                      | 6       |

| Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information  |
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| <p>The candidate might be involved in dissemination activities within academia (post-grad modules), industry and other relevant organisation. The candidate will have the opportunity to present the research at international conference.</p> |