



POLITECNICO
MILANO 1863

Opportunity for M.Sc. dissertation

Title	Development of an Artificial Intelligence-based Virtual Meter Tool for Carbon Capture and Storage Applications
Motivations and objectives of the research	<p>Carbon capture and storage will play a critical role in future decarbonisation efforts to meet the Paris Agreement targets and mitigate the effects of climate change. The process typically involves mass flow from a compression station to the injection wells through a network system and the safely storing of the CO₂ into a depleted oil and gas reservoir.</p> <p>In this regard, accurate real-time evaluation of the CO₂ injection rates is critical for allowing an optimal management of the asset while guaranteeing environmental safety. However, it is difficult for traditional flowmeters to meet the accuracy requirements due to the complex properties of CO₂ flow. In this context, the aim of the thesis work is the development of an Artificial Intelligence (AI) - based Virtual Meter for the estimation of CO₂ injection rates in a Carbon Capture and Storage (CCS) asset.</p>
Activities	<p>PART I:</p> <ul style="list-style-type: none">• Literature review on on AI-based Virtual Meters focusing on Oil&Gas industry applications;• Definition of synthetic and real case studies;• Selection of the AI method for the development of the Virtual Meter; <p>PART II:</p> <ul style="list-style-type: none">• Development of the AI-based Virtual Meter.• Application to the synthetic and real case studies
Industrial collaborations	ENI
Required competencies and skills	<ul style="list-style-type: none">• Interest in developing innovative Artificial Intelligence algorithms to tackle real applications;• Good knowledge of Python programming or a willingness to learn before starting the assignment.
Composition of the research group	<ul style="list-style-type: none">• Number of Full Professors: 2• Number of postdoctoral researcher: 1
Name of the research director	Enrico Zio
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Duration of the dissertation	
Total thesis duration	9 months. At most 1 pending exam