



**POLITECNICO**  
MILANO 1863

<b>Fellow</b>	<b>Host Institution No.1:</b> Politecnico di Milano <b>Host Institution No.2:</b> Baker-Hughes	<b>Country:</b> Italy <b>Country:</b> Italy
DC10	<b>Supervisor:</b> Prof. Giacomo Persico <b>Co-supervisor:</b> Eng. Lorenzo Cosi	<b>WP No:</b> 3
<b>Title:</b> Megawatt scale axial sCO <sub>2</sub> turbine flow path enhancements to improve off-design performance		
<b>Research Objectives:</b> (1) To explore the optimisation of the turbine flow path including inlet chamber, flow path, gland seals, tip seals and diffuser to maximise the performance of the machine. (2) To assess and quantify secondary losses in sCO <sub>2</sub> turbines and investigate the impact of low aspect ratio blading. (3) To evaluate strategies to enhance the mechanical and rotordynamic integrity of highly loaded blades. (4) To produce off-design performance maps for the optimised flow path		
<b>Mobility rules (eligibility of applicants):</b> more information <a href="#">here</a> <ul style="list-style-type: none"><li>• Researchers funded by Doctoral Networks should comply with the mobility rules: in general, they must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting organisation for more than 12 months in the 36 months immediately before their recruitment date<sup>1</sup>.</li><li>• In addition, they:<ul style="list-style-type: none"><li>○ must not have a doctoral degree at the date of their recruitment.</li><li>○ can be of any nationality.</li></ul></li></ul>		
<b>Applicant - specifications:</b> in addition to the general specifications (eligibility criteria) listed above, the applicant must feature the following requirements: <ul style="list-style-type: none"><li>• <b>Earned degree:</b><ul style="list-style-type: none"><li>○ MSc in Energy, Mechanical or Aerospace Engineering (or related area). In the latter two cases, preference will be given to candidates with a specialization in energy/power/propulsion or related areas</li><li>○ MSc with a final score no lower than 95/110 (or 86/100) or minimum average score in exams indicated below:</li></ul></li></ul>		

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<sup>1</sup> This rule applies to the first contract only (Politecnico di Milano)





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COUNTRY	MINIMUM GPA
BANGLADESH	3,3/4
CHINA	70/100
COLOMBIA	3,5/5
European Countries (ECTS grading system)	C+
EGYPT	65/100
ETHIOPIA	3/4
GHANA	65/100
INDIA	70/100
INDONESIA	2,8/4
IRAN	14,5/20
NIGERIA	3/5
PAKISTAN	3,3/4,0
SERBIA	7,5/10
TURKEY	3/4
VIETNAM	7/10

(for the Countries not included in this list, the evaluation will be carried out directly by the Selection Committee).

- **Background (mandatory):**
  - Thermodynamics
  - Turbomachinery design and analysis
  - Power plant engineering (design and analysis)
  - Matlab/Python programming
  - Fundamentals of CFD and FEM
- **Additional background that will be valued in the selection process:**
  - Optimization techniques in engineering
  - Rotordynamics
  - Material science
- **English language:**
  - A certification of the level of English is required. A list of the certifications accepted by the Politecnico di Milano and the corresponding levels is given below:

TEST	MINIMUM LEVEL REQUIRED
CAMBRIDGE	≥ FCE grade B
CAMBRIDGE IELTS (International English Language Testing System) (Academic)	≥ 6
ETS - TOEFL (Test of English as a Foreign Language)	paper based (total score): ≥ 547
ETS - TOEFL (Test of English as a Foreign Language)	computer based (total score): ≥ 210
ETS - TOEFL (Test of English as a Foreign Language)	internet based (total score): ≥ 78
ETS - TOEIC (Test of English for International Communication - Listening and Reading Test)	≥ 720
TRINITY COLLEGE LONDON	≥ ISE II

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**Scheme:**

- M1-M24: the applicant is employed by Politecnico di Milano
- M19-M24: the applicant is seconded to Easy Energy Consulting & Technology SA
- M25-M36: the applicant is employed by Baker Hughes (Nuovo Pignone Tecnologie SRL), without undergoing another selection process

**Locations (place of work):**

- M1-M18: the applicant will be employed by Politecnico di Milano and located at the Department of Energy:  
Building BL25, Via Lambruschini 4, 20156 Milano (Italy)  
Google Maps: <https://goo.gl/maps/VNXoxeHir3cSs99z7>
- M19-M24: the applicant, while being hired by Politecnico di Milano, will be seconded to Easy Energy Consulting and Technology SA and located at:  
Via Industria 18, 6814 Lamone (Switzerland)  
Google Maps: <https://goo.gl/maps/uX3mZaczhj6ei6z18>
- M25-M36: the applicant will be employed by Baker-Hughes (Nuovo Pignone Tecnologie SRL) and located at:  
via Felice Matteucci 2, 500127 Firenze (Italy)  
Google Maps: <https://goo.gl/maps/p9uXuyjwoLbdaDTLa>

**Planned secondments:** DC10 is expected to carry out the following secondment:

- Easy Energy Consulting and Technology SA: investigate off-design and part-load performance of sCO<sub>2</sub> turbines

**How to apply:** submit application package (see below) to Prof. Giacomo Persico via the form at the following link <https://forms.office.com/e/Rqb5X3ce5d> before May 31<sup>st</sup> 17:00 h CET.

The Application Package is comprised of:

- CV Europass (<https://europa.eu/europass/en/create-europass-cv>)
- Letter of motivation
- *Analysis of the challenges faced by the energy sector to accomplish Carbon Neutrality by 2050, and the associated needs for technology development* (max 3 pages)
- Short video (less than 2min): *why I should be selected for the position*. The candidates should address some of the following questions:
  - D1: Why did you decide to apply for a position in ISOP?
  - D2: What do you expect/want to gain from an MSCA programme?
  - D3: How do you think you can add value to an MSCA programme?
  - D4: Summarise your strengths and weaknesses.
  - D5: Describe a time when you had to deliver a challenging project. What was your role and what was the outcome?
  - D6: Where do you see yourself in 10 years?
  - D7: Why should you be selected for the position?





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- The application package must not exceed 15 Mb

**Contract:**

- Start date (estimate): October 2023
- Type: full-time exclusive
- Annual gross salary:
  - Politecnico di Milano: € 38,052.72
  - Baker-Hughes (Nuoco Pignone Tecnologie SRL): € 37,930.00 (BH – level B1 of the "National Collective Bargaining Agreement – CNNL in force for employees in the private engineering and system installation industry, including € 31,000.00 annual salary, post-employment/performance and additional benefits)
- An additional (family) allowance is available for candidates who have family obligations (applied from and until this condition applies)

**Equal Opportunity Employers:**

Politecnico di Milano and Nuovo Pignone Tecnologie SRL are Equal Opportunity Employers. We believe that no one should be discriminated against because of their differences, such as age, disability, ethnicity, gender, gender identity and expression, religion or sexual orientation. All employment decisions shall be made without regard to age, race, creed, color, religion, sex, national origin, ancestry, disability status, sexual orientation, gender identity or expression, genetic information, marital status, citizenship status or any other basis as protected by European and Italian laws. For details, read the Gender Equality Plan of Politecnico di Milano.

