

Special Issue

Digitalization of Nuclear Power Plant Asset Management Using Artificial Intelligence and Machine Learning Methods

Message from the Guest Editors

The aim of this Special Issue is to promote, collect and share recent research in AI and ML advancements, including both methodological and practical research for the digitalization of nuclear systems, ranging from modeling and simulation, control, prediction, detection, diagnostics and prognostics, to reliability decision-making and risk assessment. The topics of interest include, but are not limited to, the following:

- Digital twins and digital-twin-enabling technologies for the modelling and simulation of NPP;
- AI/ML methods for prognostics and health management of NPP components and systems;
- AI/ML methods for structural health management of NPP assets;
- AI/ML methods for resilience assessment and enhancement of NPP;
- Reinforcement learning for maintenance decision-making in NPP;
- Explainability/interpretability of AI/ML methods for NPP applications;
- Risk-informed system health and asset management;
- Risk-informed condition-based predictive maintenance;
- AI/ML methods for domain adaptation;
- Other relevant AI and ML approaches for the digitalization of NPP.

Guest Editors

Prof. Dr. Enrico Zio

1. Mines ParisTech, PSL Research University, CRC, Sophia Antipolis, France

2. Energy Department, Politecnico di Milano, Via La Masa 34, 20156 Milano, Italy

Dr. Ibrahim Ahmed

Energy Department, Politecnico di Milano, Via La Masa 34, 20156 Milano, Italy

Deadline for manuscript submissions

closed (20 July 2025)



Energies

an Open Access Journal
by MDPI

Impact Factor 3.2
CiteScore 7.3



mdpi.com/si/185725

Energies
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
energies@mdpi.com

[mdpi.com/journal/
energies](https://mdpi.com/journal/energies)





Energies

an Open Access Journal
by MDPI

Impact Factor 3.2
CiteScore 7.3



[mdpi.com/journal/
energies](https://mdpi.com/journal/energies)



About the Journal

Message from the Editor-in-Chief

Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

Editor-in-Chief

Prof. Dr. Enrico Sciubba
Department of Mechanical and Industrial Engineering, University
Niccolò Cusano, 00166 Roma, Italy

Author Benefits

Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

High Visibility:

indexed within Scopus, SCIE (Web of Science), Ei Compendex, RePEc, Inspec, CAPlus / SciFinder, and other databases.

Journal Rank:

CiteScore - Q1 (Control and Optimization)