SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Power and Energy Systems (PES)

Host: Prof Dipti Srinivasan

Organizers: IEEE Power & Energy Society Singapore Chapter and NUS ECE Green Energy Management & Smart Grid Centre (GEMS)

TOPIC	:	**Integrated electricity-gas-hydrogen systems: Techno-economic modelling, challenges, and opportunities**
SPEAKER	:	**Prof Pierluigi Mancarella** **IEEE Fellow and Distinguished Lecturer of the IEEE Power & Energy Society**
DATE	:	**Wednesday, 14 May 2025**
TIME	:	**3:00PM-5:00PM**
VENUE	:	**LT1, NUS, 5 Engineering Drive 2, Singapore 117579**

ABSTRACT

As the world is accelerating the efforts to meet the net-zero carbon emission targets by or well before 2050, integrated energy systems and sector coupling are now more and more in the spotlight. In particular, hydrogen and especially "green" hydrogen could play a major role in decarbonising the whole energy system thanks to its versatility to operate across multiple energy sectors and in providing flexibility, security, reliability and resilience services to a renewables-dominated power system. In this talk we will explore the main challenges and opportunities associated with techno-economic modelling of integrated electricity-gas-hydrogen systems from different perspectives, including: integrated infrastructure modelling with hydrogen injection, gas composition and quality tracking; operational flexibility of hybrid electricity-hydrogen virtual power plants; investment planning examples on electrolysers and integrated electricity-hydrogen infrastructure; and provision of ancillary services from hydrogen plants. Several case study examples will also be presented from different ongoing projects in Australia.

BIOGRAPHY

Pierluigi Mancarella is the Chair Professor of Electrical Power Systems at The University of Melbourne (Australia) and part-time Professor of Smart Energy Systems at The University of Manchester (UK). He is author of several books and book chapters and of over 400 research papers and reports. His key research interests include grid and market integration of renewables and distributed energy resources, energy infrastructure planning under uncertainty, techno-economic modelling and analysis of multi-energy systems, and security, reliability and resilience of low-carbon networks. Pierluigi is a Fellow of the IEEE, an IEEE Power and Energy Society Distinguished Lecturer, a Senior Editor of the IEEE Transactions on Power Systems, and an Editor of the IEEE Transactions on Energy Markets, Policy and Regulation. He has been visiting researcher/professor in a number of international institutions, including NREL in Colorado, Tsinghua University in China, Ecole Centrale de Lille in France, the Universidad de Chile, and DTU in Denmark (as a 2024 Otto Mønsted Visiting Professor). He is the Australian Director of the USA-UK-Australia Global Centre in Climate Change and Clean Energy "Electric Power Innovation for a Carbon-Free Society (EPICS)".

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