

Introduction to the Concept of Flexibility in Energy Systems

Webinar

by Dr Shahab Dehghan

Jointly organized by IEEE Power and Energy Society (PES) Singapore Chapter and Newcastle University in Singapore (NUI5)



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Time: 5.00pm – 6.00pm (SGT)

Venue: Online Meeting (Zoom)
(Meeting link will be sent to the provided email upon registration)

Abstract: Flexibility in energy systems is essential for maintaining a continuous balance between energy production and consumption. Fluctuations in production and consumption, influenced by factors such as unexpected disruptive events, necessitate adjustments on both the supply and demand sides. Flexibility becomes increasingly crucial in future net-zero emission energy systems, considering the rising integration of renewable resources with weather-dependent intermittent production and electrification trends. This talk will present an introduction to the concept of flexibility, addressing the emerging challenges of net-zero emission energy systems and emphasising its significance in ensuring a reliable and resilient energy system.

Speaker: Dr. Shahab Dehghan is a Lecturer in Power Systems at the Electrical Power Group in the School of Engineering at Newcastle University. Over the past decade, he has conducted research on modelling and analysing power and energy systems, intending to make future energy networks more sustainable, resilient, reliable, and cost-effective under static and dynamic techno-economic constraints. This includes the design of uncertainty-aware data-driven tools for investment and operation planning in multi-vector net-zero emission energy systems, transmission and distribution networks, and microgrids, with a specific focus on the integration of renewable resources, electric vehicles, storage systems, and power-to-gas/gas-to-power technologies as flexible sources. His research involves the development of several practical software packages, including an open-source Python-based Energy Planning (PyEPLAN) model developed at the University of Leeds for creating sustainable microgrids in remote areas and a Whole-Electricity System Investment Model (WeSIM) developed at Imperial College London for creating net-zero emission whole energy systems. He also serves as Associate Editor in IEEE Transactions on Sustainable Energy and IEEE Power Engineering Letters.



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