

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

Host: Professor Dipti Srinivasan

Organized by: Green Energy Management and Smart Grid Research Centre

TOPIC	:	Design and Development of Smart Grid Management System in Industrial Microgrids for Energy Market participation in Singapore
SPEAKER	:	Dr. Rohit Chandra Senior Optimization Engineer, Envision Digital Singapore
DATE	:	Tuesday, 11th April 2023
TIME	:	7.00PM to 8.00PM
VENUE	:	Block E1-06-03 College of Design and Engineering, NUS

ABSTRACT

Ancillary services play a crucial role in maintaining the reliability and stability of electrical power grids with integrated intermittent renewable energy generation. They can also provide additional revenue streams for systems with distributed energy resources (DERs), e.g., battery energy storage systems (BESSs) and gas turbines (GTs). This seminar discusses the design and development of smart grid management system for industrial microgrids based on hierarchical mixed integer linear programming. Details of industry-standard engineering design of the software applications for cloud and edge deployment are included. Further, this work investigates cost effectiveness of behind-the-meter BESSs to reduce system costs and provide frequency regulation service. The BESS is modeled to support different operational modes, including energy arbitrage and frequency regulation service, either one at a time or concurrently. Further, we evaluate the benefits of the joint optimization and coordinated control of the BESS and GT for energy arbitrage and ancillary services provision. Numerical simulations results based on existing rules of Singapore's energy market for behind-the-meter BESSs, and GTs are included to demonstrate the efficacy of proposed solutions.

BIOGRAPHY

Rohit Chandra received the B.Tech. and M.Tech. degrees in electrical engineering from the Indian Institute of Technology (BHU), Varanasi, India, in 2014, and Ph.D. degree in electrical engineering from the National University of Singapore in 2021. He worked in the Engineering Department with the Central Electrical Power Transmission Utility in India, from 2014 to 2017. His research was focused on application of TE principles to support transformation of Buildings from passive demand centers to sustainable grid interactive-buildings. Currently, he is working as a Senior Optimization Engineer in the Research & Development Centre of Excellence, Envision Digital Singapore. His roles include formulation and development of optimization models for optimal operation / bidding strategy of renewable asset owners, aggregators and microgrids.

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