

AIT/IEEE PES Austria Chapter Lecture Series

# RESILIENT HYBRID ENERGY AND TRANSPORTATION INFRASTRUCTURES

*Hossam A. Gabbar, Professor, [Ontario Tech University](#), Oshawa, Ontario, Canada*

Thursday, June 13, 2024, 13:00 - 14:00 (hybrid)

## Registration

Participation is free but [registration](#) is required! Login information for joining the online event will be provided right before the event starts!

## Abstract

This talk will present development strategies for hybrid energy systems and transportation charging stations and their integration within energy and transportation infrastructures. The design and control strategies of hybrid energy systems and integrations with fast charging stations will be presented with hybrid energy storage. Modeling and simulation approaches will be discussed and utilized in case studies. Hardware-in-the-loop and real-time simulations are used to evaluate the proposed design and implementation scenarios. Integrated nuclear-renewable hybrid energy systems using Small Modular Reactors (SMR) or Micro Modular Reactors (MMR) within micro energy grids are used to achieve resilient energy supply within charging stations. Integration between hydrogen and fuel cell systems is demonstrated to achieve hybrid charging stations and support the transition to clean transportation. Transactive mobility will be discussed to support the deployment of charging stations within energy and transportation infrastructures, as integrated with community applications in city, urban, and remote communities. Performance measures are modelled and evaluated for different design and operation strategies. Resiliency and performance measures will be discussed in view of a number of operation and control strategies to meet user requirements.

## About the Speakers

*Dr. Gabbar* is a full Professor in the Department of Energy and Nuclear Engineering, the Faculty of Engineering and Applied Science, at Ontario Tech University (UOIT), where he has established the Energy Safety and Control Lab (ESCL), Smart Energy Systems Lab, and Advanced Plasma Engineering Lab. He is the recipient of the Senior Research Excellence Award for 2016, UOIT. He is recognized among the top 2% of worldwide scientists with high citations in the area of energy. He is a Fellow IET (FIET) and a Distinguished Lecturer – IEEE NPSS on Nuclear-Renewable Hybrid Energy Systems and Plasma-based Waste-to-Energy. He is leading national and international research in the areas of smart energy grids, energy safety and control systems, and waste-to-energy using advanced plasma technologies. Dr. Gabbar obtained his B.Sc. degree in 1988 with first class of honor from the Faculty of Engineering, Alexandria University (Egypt). In 2001, he obtained his Ph.D. degree from Okayama University (Japan). From 2001 to 2004, he joined Tokyo Institute of Technology (Japan), as a research associate. From 2004 till 2008, he joined Okayama University (Japan) as an Associate Professor, in the Division of Industrial Innovation Sciences. From 2007 to 2008, he was a Visiting Professor at the University of Toronto. He also worked as a process control, safety, and automation specialist in the energy and oil & gas industries. Dr. Gabbar has more than 270 publications, including patents, books/chapters, journal and conference papers.

## Organizers

This event is jointly organized by the [IEEE PES Chapter Austria](#), the [IEEE IAS/PELS/IES Joint Chapter Austria](#), and the [AIT Austrian Institute of Technology - Center for Energy](#).

**Location**

Hybrid - AIT Austrian Inst. of Technology, Giefinggasse 2, 1210 Vienna, Austria, GG2\_F3\_M1B, 3rd floor and online

**Contact**

Thomas Strasser ([thomas.i.strasser@ieee.org](mailto:thomas.i.strasser@ieee.org))