

IEEE PES/IAS talk by Prof. Deepak Divan on “A Future Decentralized Grid with PV, EV and Microgrid Penetration”.

Dr. Deepak Divan is Professor, John E Pippin Chair, GRA Eminent Scholar and Director of the Center for Distributed Energy at the Georgia Institute of Technology in Atlanta, GA. His field of research is in the areas of power electronics, power systems, smart grids and distributed control of power systems. He works closely with utilities, industry and is actively involved in research, teaching, entrepreneurship and starting new ventures. He is an elected Member of the US National Academy of Engineering, member of the National Academies Board on Energy and Environmental Systems, Committee on the Future Grid and Committee on Deep Decarbonization. He a Fellow of the IEEE, past President of the IEEE Power Electronics Society, is a recipient of the IEEE William E Newell Field Medal and is International Steering Committee Chair of the IEEE Empower a Billion Lives global competition to crowdsource scalable energy access solutions. He has 40 years of academic and industrial experience, 70 issued and pending patents, and over 400 refereed publications.



IEEE-PES/IAS talk in IIT Kanpur, Uttar Pradesh, India (on 03rd January, 2020).

The rapid growth of exponential technologies such as photovoltaics, electric vehicles, energy storage and microgrids are creating unique opportunities for power electronics, especially when we consider issues related to grid integration. The move from centralized control to massively decentralized and distributed control raises further challenges, both in terms of the converters and feasible control strategies, as well as the architecture and infrastructure required to manage and operate such a system. This presentation will discuss power converter topologies, control strategies and system architecture for managing such a future grid and related loads. Key topics include grid integration strategies for managing a fleet of such devices to deliver value for the future and present grid. This presentation will cover ongoing research at the Center for Distributed Energy at Georgia Tech in these areas.

From the audience perspective, the talks were very interactive and practically relatable, and the speaker presented an overall view on future decentralised grid with PV, EV and microgrid penetration. It was a very informative event, which inspired the listeners and also directed a new path for further research.

Bandi Ravi Kumar (Research Scholar, Dept. of Electrical Engineering, IIT Kanpur)

Convener, Newsletter, IEEE PES Student Branch Chapter, IIT Kanpur

IEEE PES/IAS talk by Dr. Efstratios Batzelis on "Towards grid-friendly PV systems: keeping power reserves."

Dr. Efstratios Batzelis is an expert in Photovoltaic systems modelling, control and integration. He is a Royal Academy of Engineering Research Fellow at Imperial College London (UK) working on solar integration challenges in developing countries, and is member of the UK-India collaboration on clean energy (JUICE). Prior to this he held an EU Marie-Curie fellowship at Imperial on more grid-friendly PV systems in 2017-2019, and he received his PhD degree from the National Technical University of Athens in 2016. Dr Batzelis's research on PV systems has been published in about 30 journal and conference papers. His research interests include renewable energy technologies and distributed generation, especially solar photovoltaics, power converters control and power system stability.

To allow for massive amounts of solar energy into our power system, we have to overcome technical barriers that limit the solar integration levels. One major direction towards this goal is to make the photovoltaic (PV) systems more "grid-friendly", i.e. more supportive of the grid and more dispatchable power stations. This talk expanded on the solar integration challenges and explore how a PV system can become more grid-friendly by maintaining "power reserves", i.e. keeping some backup power for grid-support functions, without installing energy storage. The talk was conducted on 22nd January, 2020.

From the audience prospective, the talks were very interactive and practically relatable, and the speaker presented an overall view on the grid friendly PV systems by maintaining power reserves. It was a very informative event, which inspired the listeners and also directed a new path for further research.

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VISIT to 'SMART GRID CONTROL CENTRE' in IIT Kanpur with Dr. Efstratios Batzelis

Smart energy grids are the backbone of the future Smart Cities. The smart distribution system of the smart grid will be responsible for intelligent management and operation of energy networks in cities.

- Smart grid at IIT Kanpur includes 11 substations of IIT Kanpur power distribution network.
- 11 substations of IIT Kanpur feed around 10.5 MW load of the institution.
- The main substation is 33kV/11kV substation that takes supply from the grid.
- The other substations are 11kV/440V substations which are connected to the main substation are responsible to feed the academic and residential load of IIT Kanpur.
- The Smart City pilot is designed in such a way that the future expansion, upgradation, research and development works are possible.
- Most of the smart devices will be connected in plug and play format. The technology framework will use smart grid standards and protocols such as IEC61850, Common Information Model for the seamless interoperability of data and message among various applications.
- Enterprise Service Bus (ESB) will serve as the backbone for the data exchange under the smart city pilot.
- It also includes home automation of 20 houses along with the 5kWp installation of rooftop PV system at each house.



Visit to SGCC in IIT Kanpur, Uttar Pradesh, India (on 23rd January, 2020).

IEEE PES SBC IITK Orientation Programme:

The orientation program conducted on 13th February, 2020. In this all the members and volunteers of executive committee of years 2019 and also the newly elected members of IEEE PES SBC IITK for 2020, along with the faculty advisors are gathered. It was very helpful to present Exe-Com to hear about the leadership skills of past Exe-Com and the challenges faced by them. Many suggestions and opinions were shared to further improve the quality of the events in upcoming days. Certificates and mementos were distributed for recognition of their service. The advices from faculty advisors Dr. Ankush Sharma and Dr. Sandeep Anand were so motivated and encouraging.



IEEE PES SBC IITK Orientation programme (on 13th February, 2020).

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