

**The UK - India
Joint Virtual Clean Energy Centre (JVCEC)
Final Conference Programme
24-25 February 2022
ONLINE**

organised by



funded by



Thursday, 24 February 2022 (Day 1)

Start UK 9:00 = India 14:30 End UK 14:00 = India 19:30

08:30 (India 14:00) Online meeting room opens

09:00 (14:30) Session 1: **Overview of JVCEC Achievements**
Murray Thomson, B G Fernandes, Chandan Chakraborty

10:00 (15:30) Session 2: Power Systems (Chairs: Jovica Milanovic and Surya Doolla)

10:00 (15:30) "Long-term Expansion Planning of the Transmission Network in India under Multi-dimensional Uncertainty" (15 mins)

Spyros Giannelos, Stefan Borozan, Paola Falugi, Alexandre Moreira, and Goran Strbac (*Imperial College London*)
Anjali Jain, Rohit Bhakar, Jyotirmay Mathur (*MNIT Jaipur*)

10:15 (15:45) "Power system stability with increasing PV penetration" (15 mins)

Bandopant Pawar, Saikat Chakrabarti (*IIT Kanpur*)
Efstratios Batzelis (*University of Southampton*)
Bikash Pal (*Imperial College London*)

10:30 (16:00) "Assessment of Maximum Permissible PV penetration and Size of Disturbance in RE integrated Power Systems" (15 mins)

Zakir Hussain Rather, Dhanuja Lekshmi J (*Indian Institute of Technology Bombay*)
Bikash C Pal (*Imperial College London*)

10:45 (16:15) "Network Agnostic Adaptive P-Q Adjustment Control For Grid Voltage Regulation in PV Systems" (15 mins)

Anubrata Das, Sandeep Anand, Soumya Ranjan Sahoo (*IIT Kanpur*)
Efstratios Batzelis (*University of Southampton*)

11:00 (16:30) Discussion (20 mins)

11:20 (16:50) Break (10 mins)

11:30 (17:00) Session 3: Power Electronics (Chairs: Murray Thomson and L. Umanand)

11:30 (17:00) "Grid-tied multilevel photovoltaic inverter with batteries power balancing" (15 mins)

M. Amer Karout, Oleh Kiselychnyk, Jihong Wang and Mark Dooner (*University of Warwick*)
Srinivas Bhaskar Karanki, Chandrasekhar Perumalla (*IIT Bhubaneswar*)

11:45 (17:15) "A Lumped, Resonant Switched Capacitor Converter for PV Applications" (15 mins)

Andrew Cross (*Loughborough University*)
Nakul Narayanan K., L. Umanand (*Indian Institute of Science, Bangalore*)



12:00 (17:30) "A Comparative Investigation of Isolated DC-DC Converters for Microgrid Applications" (5 mins)

Ramesh P, Swetha C, Saravana Kumar A, Aby Joseph (*Power Electronics Group, C-DAC, Trivandrum, India*)

12:05 (17:35) "Fault Tolerant Operation" (10 mins)

Prabodh Bajpai and Bonu Ramesh Naidu (*IIT Kharagpur*)
B. Kalyan Kumar and Malkonda Reddy Muli (*IIT Madras*)

12:15 (17:45) Discussion (15 mins)

12:30 (18:00) Break (10 mins)

12:40 (18:10) Session 4: Energy Storage (Chairs: **Billy Wu and S. Srinivasa Murthy**)

12:40 (18:10) "Redox Flow Batteries for Energy Storage" (15 mins)

Miji E Joy, Manoj Neergat (*IIT Bombay*)
Richard Wills (*University of Southampton*)

12:55 (18:25) "Modeling and Implementation of Virtual Energy Storage Systems for Power System Flexibility Enhancement" (15 mins)

Yue Zhou, Jianzhong Wu (*Cardiff University*)
Sumanth Yamujala, Anjali Jain, Rohit Bhakar, Jyotirmay Mathur (*MNIT Jaipur*)

13:10 (18:40) "Optimization and Performance of Stand-alone PV-Wind Hybrid Microgrids with Metal Hydride based Hydrogen Storage" (15 mins)

Sachin Kumar, Rakesh Sharma, S. Srinivasa Murthy, Pradip Dutta (*IISc Bangalore*)
Wei He, Jihong Wang (*University of Warwick*)

13:25 (18:55) "PV-Supercapacitor Cascaded Topology for Grid Frequency Support Services" (15 mins)

Karpana Sivakrishna, Suman Maiti, Chandan Chakraborty (*IIT Kharagpur*)
Efstratios Batzelis (*University of Southampton*)

13:40 (19:10) "Characterisation of FZSoNick battery" (5 mins)

Chrispin Gogoda Mbewe, Richard Blanchard (*Loughborough University*)

13:45 (19:15) Discussion (15 mins)

14:00 End of day 1 (India 19:30)



Friday, 25 February 2022 (Day 2)

Start UK 9:00 = India 14:30 End UK 14:00 = India 19:30

08:30 (India 14:00) Online meeting room opens

9:00 (14:30) Session 5: Microgrids (Chairs: Tapas Mallick and Kishore Chatterjee)

9:00 (14:30) White Paper “The role of minigrids for electricity access and climate change mitigation in India” (30 mins)

Chiara Candelise (Imperial College London, Bocconi University, Milan, Italy)

Phil Sandwell, Billy Wu (Imperial College London)

Berlin Solomon Jovica Milanovic (University of Manchester)

Sheridan Few (University of Leeds) (Imperial College London)

Richard Blanchard, John Barton (Loughborough University)

Contributors:

Murray Thomson (Loughborough University)

Jenny Nelson (Imperial College London)

Konika Das Bhattacharya, Samarjit Sengupta, Hiranmay Saha (IEST Shibpur)

9:30 (15:00) “Electricity demand in populations gaining access: impact of rurality and climatic conditions, and implications for microgrid design” (15 mins)

Sheridan Few (University of Leeds) (Imperial College London)

John Barton, Murray Thomson (Loughborough University)

Philip Sandwell, Jenny Nelson (Imperial College London)

Chiara Candelise (Imperial College London, Bocconi University, Milan, Italy)

Richard Mori (Meshpower Limited, Kigali, Rwanda)

Prasad Kulkarni (Gram Oorja Solutions Private Limited, Pune, Maharashtra, India)

9:45 (15:15) “Improving urban air quality in India by replacing diesel generation” (15 mins)

Jonathan Radcliffe, Francis Pope, Ajit Singh (University of Birmingham)

Amruta Joshi (University of Warwick)

Bhim Singh, Mukesh Khare, Sri Harsha Kota (IIT Delhi)

10:00 (15:30) “An intelligent cloud-based energy management system with Hybrid Renewable Sources in a Rural Microgrid Cluster” (15 mins)

Ankur Bhattacharjee (BITS-Pilani Hyderabad Campus)

Hiranmay Samanta, Indrajit Bose, Konika Das Bhattacharya, Samarjit Sengupta, Hiranmay Saha (IEST Shibpur)

Aritra Ghosh, Tapas K Mallick (University of Exeter)

10:15 (15:45) “Comparative Study of Various Communication Technologies for Secondary Controllers in DC Microgrid” (5 mins)

Shyam AB, Soumya Ranjan Sahoo (IIT Kanpur)

Sandeep Anand (IIT Bombay)

Joseph M. Guerrero (Aalborg University)



10:20 (15:50) "Optimal Techno-economic Design of Isolated Microgrids for Remote Villages" (5 mins)

Berclin Solomon & Prof. Jovica V Milanovic (*University of Manchester*)

10:25 (15:55) Discussion (25 mins)

10:50 (16:20) Break (10 mins)

11:00 (16:30) Session 6: Solar Photovoltaics (Chairs: Tom Betts and Hiranmay Saha)

11:00 (16:30) "Self-powered active cooling and cleaning for solar PV efficiency improvement" (15 mins)

Dacheng Li, Marcus King, Mark Dooner, Jihong Wang (*University of Warwick*)
Saikat Ghosh, Jatindra Nath Roy, Chandan Chakraborty (*IIT Kharagpur*)

11:15 (16:45) "Thermal and visual comfort analysis employing advanced BIPV for tropic/hot (India) and temperate / cold (UK) climate" (15 mins)

Nabin Sarmah (*Tezpur University*)
Aritra Ghosh, Tapas Mallick (*University of Exeter*)

11:30 (17:00) "Phase Change Material for Thermal Management of India PV solar Systems: Numerical and Experimental work" (15 mins)

Abdalqader Ahmad, Helena Navarro, Shivangi Sharma, Yulong Ding (*University of Birmingham*)
Saikat Ghosh, Chirodeep Bakli (*IIT Kharagpur*)

11:45 (17:15) "Loss for PV soiling and its mitigation with optimal water" (15 mins)

Saheli Sengupta, Chandan Kumar Chanda, Hiranmay Saha, Indrajit Bose, Joydip Jana, Samarjit Sengupta (*IEST Shibpur*)
Yusuf Chanchangi, Aritra Ghosh, Tapas Mallick (*University of Exeter*)

12:00 (17:30) "An efficient solar-irradiation forecasting for a large-scale PV plant" (5 mins)

Vikas Maurya, Bhaskar Pratim Mukhoty, Sandeep Kumar Shukla (*IIT Kanpur*)

12:05 (17:35) Discussion (20 mins)

12:25 (17:55) Break (15 mins)

12:40 (18:10) Session 7: Conclusions (Chairs: Murray Thomson, B G Fernandes, Chandan Chakraborty)

- New Projects Arising from JVCEC
- Future research directions

14:00 (19:30) End of Conference

