



Name of the Chapter: PES/PELS/IAS Joint Chapter, IEEE Hyderabad Section
Name of the Activity: PES Distinguished Lecturer Program– PES Joint Chapter & IEEE Hyderabad Section

Event Date: Oct 27, 2024 (Sunday) **Event Time:** 2:30 PM – 4:00 PM

Organizer: IEEE PES/PELS/IAS Joint Chapter of IEEE Hyderabad Section

Title of the Talk: Webinar on "Inverter-based Resource Technologies and Control"

Speaker: Dr. Babak Badrzadeh, Managing Director at ETIK Energy

Event Summary:

IEEE Hyderabad Section PES Joint Chapter and IEEE Madras Section PES Chapter has organised Power and Energy Society Distinguished Lecturer Program a webinar on “Inverter based Resource Technologies and Control” by Dr. Babak Badrzadeh, Managing Director at ETIK Energy. This PES DLP is in association with PES Student Branches of National Institute of Technology Warangal, MVSR Engineering College, G Pulla Reddy Engineering College, G Pullaiah College of Engineering & Technology, SR University, Vaagdevi College of Engineering, JNTUK University College of Engineering Narasaraopet, Geethanjali College of Engineering and Technology.

Event Highlights:

1. Introduction and Welcome:

The event is started by Dr. D. Hari Krishna, Vice-Chairman, PES/IAS/PELS Joint Chapter, Hyderabad Section. He welcomed the DL speaker, Excom members and all the participants to this PES DLP and briefed about this event. Then **Dr. G. Siva Kumar**, Chair of the PES/IAS/PELS Joint Chapter, has delivered the welcome address and informed the participants about the importance of the topic and shared the IEEE Hyderabad Section PES Joint Chapter activities and upcoming events.

2. Speaker Introduction:

Dr. D. Hari Krishna, Vice-Chair of the PES/IAS/PELS Joint Chapter has introduced the PES DL speaker Dr. Babak Badrzadeh, Managing Director at ETIK Energy. He has more than 20 years of multi-sector subject matter expertise including positions at ETIK Energy, AEMO, Vestas, Aurecon, and Mott MacDonald. He has provided consultancy services to many national and international organizations ranging from system operators, network owners, plant owners and developers, policy makers, original equipment manufacturers, and research institutions.

3. Technical Presentation:

Dr. Badrzadeh's lecture in the PES Distinguished Lecturer Program delivered exceptional insights into the complexities of grid-following inverters, including an exploration of synchronous reference frame (SRF) PLLs and fault ride-through strategies. He broke down these technical elements with clarity, explaining how SRF PLLs enable effective synchronization, while fault ride-through and current limitation techniques play vital roles in maintaining grid stability under stress. This

discussion provided a foundation for understanding how inverters adapt during dynamic grid conditions.

Dr. Badrzadeh also shared valuable considerations around GFL inverter performance, especially the balancing act between settling time and overshoot—highlighting why these aspects are crucial in designing resilient systems. He discussed key bandwidth requirements, emphasizing that optimized bandwidth management is central to the smooth operation of GFL inverters. For grid-forming inverters, he described various synchronization techniques, offering practical insights into the unique role they play in aligning with grid requirements.

Finally, his explanation of droop versus swing equations, coupled with an analysis of GFL and GFM impacts on system stability, presented a clear view of inverter capabilities. Dr. Badrzadeh illustrated how grid-forming inverters contribute a stabilizing force, especially when facing converter-driven instabilities. His holistic approach to GFM's capabilities underscored its vital role in building a more stable and reliable grid, making complex technical concepts accessible and relevant.

4. Interactive Q & A Session:

Following the presentation, there was an interactive Q & A session handled by Dr. B. Madhuri, Treasurer, PES/IAS/PELS Jt. Chapter, where the participants from industry and academia had the opportunity to ask the questions to the PES DLP speaker Dr. BABak. Dr. Madhuri's thoughtful facilitation allowed all the participants to dive deeper into Dr. Badrzadeh's insights and ensured that the attendees could engage directly with him.

5. Participant Engagement:

The PES DLP webinar was well received with 50 participants (30 IEEE members and 20 Non-IEEE members). The participants include IEEE Members, students, academicians, industry professional and research scholars.

6. Closing Remarks:

Dr. D. Hari Krishna, Vice-Chair of the PES/IAS/PELS Joint Chapter has provided the closing remarks and vote of thanks. He thanked Dr. Babak Badrzadeh for his valuable insights in "Inverter based Resource Technologies and Control". He also thanked the excom members of **IEEE PES/IAS/PELS Joint Chapter of Hyderabad Section and PES Chapter of IEEE Madras Section**, along with all associated PES Student Branches and all the participants for their active involvement.

Event Feedback:

The PES DLP received a positive feedback form the participants who appreciated the speaker for his insightful and informative lecture in this webinar.

Conclusion:

This PES DLP has provided valuable insights about concepts of GFM and GFL inverters. This webinar has inspired further learning and exploration in the field of inverter-based resources and control. The PES/PELS/IAS Joint Chapter of Hyderabad Section is committed to continuing its efforts in providing high-quality educational events and looks forward to organizing more such insightful sessions in the future.



PES Jt chapter of IEEE Hyderabad Section & PES Chapter of IEEE Madras Section
in association with PES SBs – NIT Warangal, MVSREC, GPREC, GPCET,
SRU, Vaagdevi CE, JNTUK UCEN, Geethanjali CET

Invitation PES Distinguished Lecturer Program (DLP)

Webinar on

“Inverter-based Resource Technologies and Control”

by



Dr. Babak Badrzadeh

Managing Director at ETIK Energy.

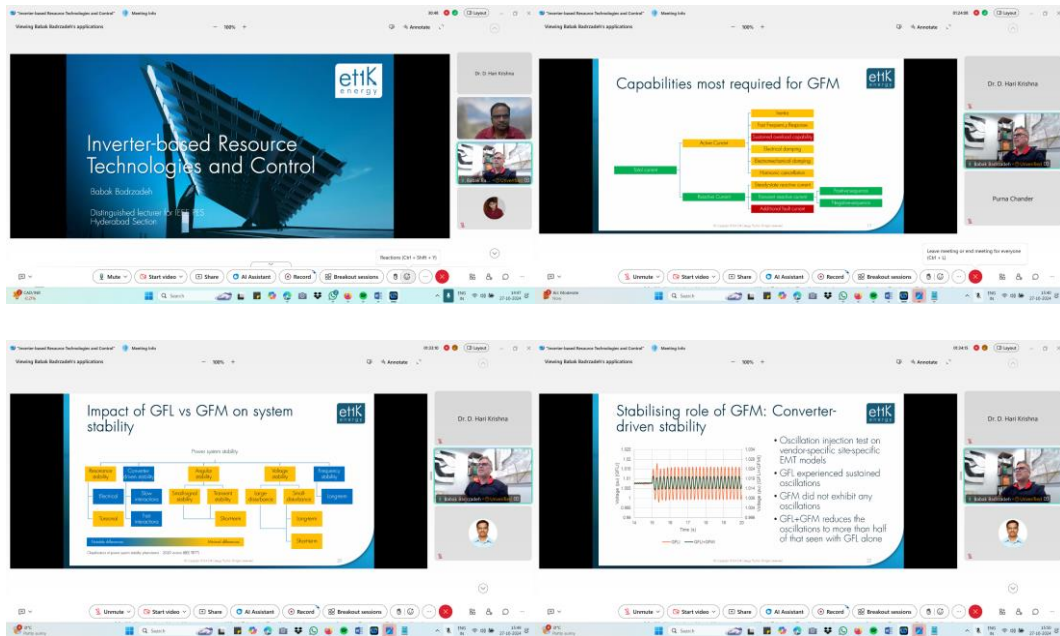
Date & Time:

27th October 2024 (Sunday)

2.30 PM to 4.00 PM (IST)

Registration link: <https://forms.gle/XcgV2bR0q9yzBHUN8>

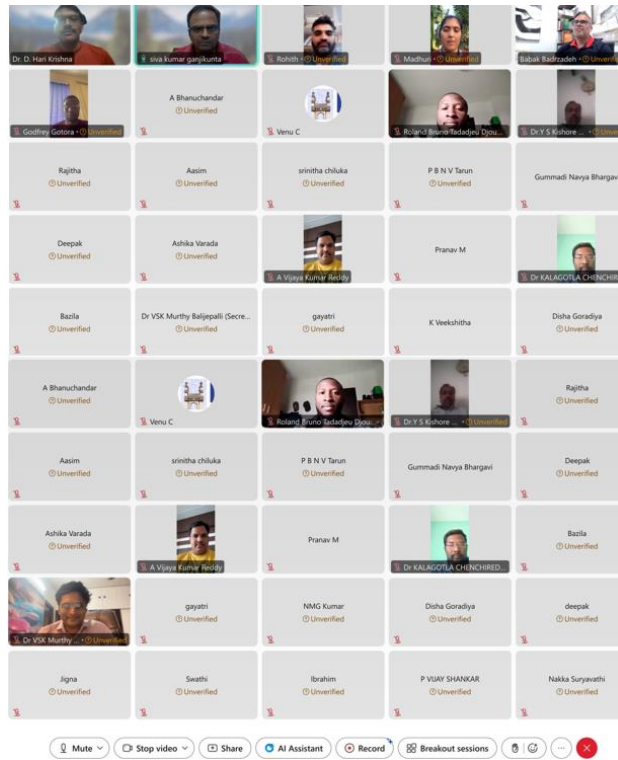
Flyer of PES DLP



Pics of the PES DLP event



Virtual Momento to PES DLP Speaker



Participants in PES DL