

Minutes for 2021 IEEE PESGM PEEC Research Subcommittee Meeting

July 23, 2021
2PM - 4PM EDT
Virtual Zoom Meeting

1. Introduction

- Le Xie introduced the meeting.
- Meeting started with the attendee's introduction.

2. Approval of Minutes from 2020 Meeting

- Brian Johnson moved and Anil Pahwa seconded.
- All members voted in favor of approving the minutes.

3. Announcements of PESGM 2021: Sara Eftekharnjad

- Several panel sessions (co)-sponsored by PEEC (3 pre-recorded, 6 live):
 - Machine Learning for Power System Modeling and Control, Moderators: Lingling Fan and Aranya Chakraborty, Monday, July 26, 2021, 12:00 PM - 12:00 PM, Pre-recorded.
 - Research and Educational Experiences of NSF CAREER Awardees in Power Systems: Part I, Moderators: Anil Pahwa and Aranya Chakraborty, Monday, July 26, 2021, 12:00 PM - 12:00 PM, Pre-recorded.
 - Research and Educational Experiences of NSF CAREER Awardees in Power Systems: Part II, Moderators: Aranya Chakraborty and Anil Pahwa, Monday, July 26, 2021, 12:00 PM - 12:00 PM, Pre-recorded.
 - University Research to Advance Solar Integration, Moderators: Guohui Yuan and Zhenyu (Henry) Huang, Monday, July 26, 2021, 6:00 PM - 8:00 PM, Live.
 - Real-time Simulation advancing Education and Training on Power and Energy Systems, Moderators: Panos Kotsampopoulos and Nikos Hatzigiorgiou, Tuesday, July 27, 2021, 6:00 AM - 8:00 AM, Live.
 - Curriculum Development and Gap Analysis via Grid Ready Energy Analytics Training with Data (GREAT) Initiative, Moderators: Steven Coley and Tom Reddoch, Tuesday, July 27, 2021, 7:00 PM - 9:00 PM, Live.
 - Data-driven and ML Approaches for Enabling Resiliency with High DERs, Moderators: Noel Schulz and Anurag Srivastava, Tuesday, July 27, 2021, 7:00 PM - 9:00 PM, Live.
 - Interdisciplinary Education and Training in Smart Grid Paradigm, Moderator: Anamika Dubey, Wednesday, July 28, 2021, 7:00 PM - 9:00 PM, Live.
 - Application of Electric Grid Simulators for Education, Moderator: Thomas Overbye, Wednesday, July 28, 2021, 7:00 PM - 9:00 PM, Live.
- Live Q&A session for Panels: Research and Educational Experiences of NSF CAREER Awardees in Power Systems (Parts I and II):
 - Time: Jul 26, 2021 04:00 PM Eastern Time (US and Canada)
 - ZoomGov meeting link:
<https://nsf.zoomgov.com/j/1619634522?pwd=V2s0MEk0aIBDZnJGYUN0NWQvVjVtdz09>
 - Meeting ID: 161 963 4522
 - Passcode: 544988

- Tutorials: 8 tutorials co-sponsored by PEEC.
- Student Poster Session: July 26.

4. NAPS Reports

- 52nd North American Power Symposium, 2021 (Arizona State University): Meng Wu.
 - Conference was converted to virtual format and was postponed to April 2021 due to COVID-19.
 - Conference was well organized and well attended.
 - The organizing committee members of this NAPS were not in the PEEC Research SC meeting. Le Xie suggested following up with the organizing committee members offline for updated reports.
 - Updated reports from Mojdeh Khorsand Hedman:
 - ❖ 180 papers were accepted out of 220 submitted papers.
 - ❖ The conference brought 298 students, faculty members, national lab researchers, and industry representatives together.
 - ❖ Conference highlights:
 - Welcome remarks from Stephen Philips, director of School of ECEE, ASU.
 - Plenary Session: Anuradha Annaswamy – MIT, Ben Kroposki – NREL, Duncan Callaway – UC Berkeley.

- 53rd North American Power Symposium, 2021 (Texas A&M University): Kate Davis.
 - In-person on Nov. 14-16.
 - Website: <https://na.eventscloud.com/tamunaps21>
 - Paper deadline extended to Aug 15.
 - Registration will be open soon.
 - Field trip to Washington on the Brazos, Texas on Nov 14.
 - IEEE Young Professionals networking lunch and mini job fair.
 - IEEE technical co-sponsorship.
 - Student housing from IEEE PEEC.
 - Applied for NSF travel grant for student travel.
 - Applying for Visiting College Station grant to be applied to culture/tourism events (field trip, banquet).
 - Currently seeking industry and other sponsors.
 - Accepting proposals for NAPS 2024 (56th): two-step process
 - ❖ Submit application to NAPS site selection committee
 - ❖ Site selection committee does preliminary selection and invites NAPS hosting candidates to present their proposal at NAPS steering committee meeting on Sunday at TAMU's 53rd NAPS.
 - ❖ Please send your proposal via email to the chair of organizing committee of the 53rd NAPS:
 - ✓ Kate Davis (katedavis@tamu.edu)
 - ✓ Please include in subject line "NAPS Host <Year> Proposal"
 - ✓ Proposal submission deadline: 10/14/2021.
 - ❖ Selection criteria:
 - ✓ Sustained participation in previous NAPS
 - ✓ Time since last hosting NAPS
 - ✓ Plans to maintain low registration costs
 - ✓ Plans to support student participation
 - ✓ Evidence of long-term interest in power
 - ✓ Need for exposure

- ✓ Quality of facilities
 - NAPS 2023 (55th) will be held at West Carolina University (person in charge: Hayrettin Karayaka)
- 54rd North American Power Symposium, 2022 (University of Utah): Mostafa Ardakani.
 - In the planning process
 - Identified several venue options
 - Conference hotel booked
 - Tentative dates: Oct 9-Oct 11, subject to change

5. Proposed Subcommittee Sponsored Activities for PESGM 2021

- Logistics on panel and tutorial proposals:
 - Le Xie mentioned tutorial proposal submissions follow a different (much earlier) deadline and a different mechanism.
 - Le Xie mentioned co-sponsorship across different committees/subcommittees is encouraged by TCPC.
 - Sukumar Brahma suggested proposals need to be tied to education.
 - David Gao suggested inviting more participants from Europe, Asia, and other international locations for promoting global participation.
 - Sukumar Kamalasan mentioned 2-hour panel is preferred over 4-hour panels to accommodate more panels within PEEC's allowed hours for panels. PEEC only has 16 hours for panels. Last year PEEC received a good number of panel proposals and coordinated with other committees and obtained 2 more hours (18 hours in total) for panels.
- Anil Pahwa and Aranya Chakraborty: Continue the NSF CAREER panel next year.
 - Aranya Chakraborty and/or Anil Pahwa will lead/co-lead.
 - Will invite a new group of speakers (NSF CAREER awardees)
- Anil Pahwa: Panel on grid edge technologies.
 - Based on the NSF-PSERC workshop on grid edge technologies (led by Mladen Kezunovic).
 - Need to add education components to the panel.
 - Invite panelists from industry and academia.
 - Le Xie will reach out to Mladen Kezunovic for leading this panel.
- Henry Huang: Panel on DOE SETO's grid-forming technologies consortium
 - This DOE SETO FOA award is anticipated to be announced in a few weeks.
 - This FOA will fund 1 project (\$25 million) for 5 years to establish the research consortium for grid-forming technologies.
 - Members in this consortium can lead the panel or serve as panelists.
 - The panelists can discuss their plan and results on organizing the consortium, developing platforms for engaging industry participants.
 - Henry Huang will reach out to Guohui Yuan for leading this panel.
- Lingling Fan: Panel on university trainings and courses for EMT modeling
 - There are needs from the industry for engineers with EMT modeling expertise. However, there are not many universities which offer trainings/courses on EMT modeling.

- University offering these trainings and courses can exchange their experience and ideas for setting up their curriculum.
- Le Xie suggested inviting panelists from universities, vendors, consulting firms, etc.
- Sukumar Kamalasan and Brian Johnson will work with Lingling Fan on leading this panel.
- Anurag Srivastava: Encourage resubmission of panel proposals not selected last year
 - 2 proposals submitted to PEEC Research SC were not selected last year by PEEC Main. One of them obtained sponsorship from another committee (with PEEC being the co-sponsor).
 - Irfan Khan will resubmit his panel proposal on transition from face-to-face to remote labs for power engineering under COVID-19 (not selected last year).
- Kumar Venayagamoorthy: Panel on emerging technologies for power system research and education.
 - Emerging technologies could include IoTs, block chains, AI, etc.
 - Focus on research and education at universities rather than technical advancements.
 - Henry Huang suggested narrowing down the topics in the panel to strengthen the connections between the proposal and the PEEC Research Subcommittee.
 - Le Xie and Henry Huang suggested seeking joint sponsorship from other committees.
 - Sukumar Brahma suggested bringing up the research and education aspects in the proposal.

6. DOE SETO Research Opportunities: Henry Huang

- 2021 lab call, Dec 2020. 7 topics in total. 2 topics below are related to power engineering.
 - Topic 1: transient and dynamic models for solar grid integration
 - ❖ Distribution system transient and dynamic behavior
 - ❖ Large-scale electromechanical and electromagnetic models
 - Topic 5: data, analysis, and tools to reduce solar soft costs
 - ❖ Technical and economic potential for solar energy
 - ❖ Tools for solar system planning
- 2021 FOA, Dec 2020
 - Topic area 1: grid-forming technologies research consortium (\$25 million for 5 years)
 - Topic area 2: integrating behind-the-meter solar resources into utility data systems
 - Topic area 3: hardware incubator
- SETO MYPP (multi-year program plan), May 2021
 - Low-cost electricity
 - ❖ Increasing flexibility to reduce grid integration
 - ✓ Goal: utility-scale PV plus energy storage systems cost less than \$1.36/WDC
 - Reliable electricity
 - ❖ Supporting the reliability of the power system
 - ✓ Goal: reliable operation is demonstrated at scale in a power system with 75% power contribution from inverter-based resources (i.e., solar, wind, and battery storage)
 - ❖ Enhancing the resilience and security of the grid
 - ✓ Goal: a power system uses PV and storage to demonstrate rapid recovery of critical electricity services after a cyberattack or physical event

- Energy justice and equity
 - This topic is being incorporated into various DOE programs.
 - DOE EERE has implemented 10% scoring for proposals for their energy justice and equity aspect.
- Question from Le Xie to Henry Huang: How does different offices in DOE work together?
 - Usually, each office has its own program focus and issues its own FOAs.
 - There are trends that lots of cross-cutting challenges require collaborations among different DOE offices.
 - Example 1: Grid Modernization Initiative (GMI)
 - ❖ The GMI was established a few years ago for the purpose of bringing multiple DOE offices together to address the grid issues.
 - ❖ The GMI involves 5 offices: OE, EERE, Fossil Energy, Nuclear Energy, and CESER (cyber security, energy security, and emergency response).
 - ❖ Each office contributes certain amount of funds to support one funding program under the GMI: Grid Modernization Lab Consortium (GMLC).
 - ❖ The GMLC is strong and is ongoing.
 - Example 2: Energy Storage Grand Challenge (ESGC)
 - ❖ The ESGC was established 2~3 years ago
 - ❖ Multiple DOE offices work together on the development, manufacturing, and application/deployment of energy storage.
 - ❖ The ESGC involves OE, EERE, and several other offices.
 - Example 3: Offshore wind generation
 - ❖ Target: 30GW offshore wind by 2030.
 - ❖ Brings together OE and EERE offices to discuss the offshore wind issues.
 - Suggest paying attention to special funding calls for cross-cutting issues.
 - Many stakeholders are involved in the discussions before framing the cross-cutting programs and funding calls. There are workshops, seminars, webinars, and other opportunities for everybody to attend.

7. Quick Update from NSF: Aranya Chakraborty

- New EPCN program directors: Aranya Chakraborty, Donald Wunsch, Eyad Abed, and Mahesh Krishnamurthy
 - Anil Pahwa, Tony Kuh, and Alireza Khaligh (managing the power electronics program) finished their terms and went back to universities.
 - Aranya Chakraborty joined after Anil Pahwa left.
 - Donald Wunsch (Missouri S&T) joined after Tony Kuh left. He serves as the new program director for handling signal processing, data science, machine learning proposals.
 - Radhakisan Baheti passed away this year.
 - Eyad Abed (University of Maryland) serves as the new program director for handling both power systems and control proposals.
 - Mahesh Krishnamurthy (Illinois Institute of Technology) joined after Alireza Khaligh left.
- Seven CAREER awardees 2021 in power system engineering:
 - Zhaoyu Wang (Iowa State), Mads Almassalkhi (University of Vermont), Line Roald (Wisconsin), Kyri Baker (Colorado Boulder), Hector Pulgar-Painemal (University of Tennessee Knoxville), Richard Zhang (UIUC), Subhonmesh Bose (UIUC).

- Broad range of topics: DER modeling and control, learning from smart meters, grid observability, energy storage, data-driven optimization, risk-sensitive market design, hybrid optimal controls for switching devices, risk management in severe weather.
- Plan to invite 2021 CAREER awardees in the proposed CAREER award panel for PESGM 2022.
- NSF vision on next-generation engineering challenges:
 - Climate change: environmental engineering, environmental resilience, and natural hazards.
 - Integration of renewable energy, clean transportation.
 - Tremendous amount of interest in workforce development & broadening participation: equity and maintaining fairness of education and outreach to underrepresented communities.
 - Suggest having more concrete plans on realizing the education and outreach efforts in the proposal submissions.
- New \$40 million NSF Midscale Research Infrastructure-2 award:
 - DERconnect at UC San Diego (PI: Jan Kleissl)
 - Creating a microgrid testbed for optimization and control of DERs for nationwide use.
 - The testbed will be open to the public a few years later for universities, national labs, and industries to access remotely and run remote experiments for closed-loop control/optimization on renewable integration and microgrid.
- Solicitations of interest to power and energy:
 - ASCENT – bringing ECCS cluster together (sensors, devices, systems, controls, data)
 - ❖ Started 2 years ago. This year is the 2nd year for this program
 - ❖ Encourage more submissions to this program from the power engineering society for the next year.
 - ❖ Goal: bring different subcommunities within electrical engineering together to solve grand challenges (e.g.: people in sensors, devices, energy harvesting, signal processing, control, power, data science, etc.).
 - SRS – Sustainable Reginal Systems
 - ❖ Led by CBET
 - ❖ Goal: explore how do different rural and urban communities interact with each other, and how to better synergize these interactions to increase the happiness of both rural and urban communities.
 - ❖ The program focuses more on social science and economics.
 - ❖ There are components on power and transportation in this program.
 - ❖ Suggest having power engineering and transportation engineering people on the proposal teams as participants (not as the leads).
 - MoDL – Mathematics of Deep Learning
 - ❖ Structure of MoDL is similar to CPS Medium (\$1.2 million, 3~4 people in the team).
 - Convergence Accelerator
 - ❖ University teams and industry teams work in conjunction with each other for developing different kinds of prototypes of the interest to the whole country.
 - CPS and S&CC
 - ❖ Usual investments in ECCS.
 - Infrastructure grants:
 - ❖ Not research grants. Focus more on developing infrastructures, testbeds, etc. (such as national renewable testbeds which will be used by the communities for decades).

- ❖ Midscale Research Infrastructure-1 (\$6~20 million).
 - ❖ Midscale Research Infrastructure-2 (\$20~100 million), award on microgrids went out to UCSD.
 - ❖ Talk to Aranya Chakraborty if interested.
- Workshops and conferences:
 - Successful PSERC-NSF workshop on “Grid at the Edge” conducted by Texas A&M University on March 23-24, 2021 (Organizers: Mladen Kezunovic – Texas A&M, Anuradha Annaswamy - MIT)
 - Successful NAPS 2021 (Organizer: Mojdeh Hedman - ASU)
 - ENG assistant director (AD) change:
 - Dawn Tilbury completed her term and went back to University of Michigan.
 - New AD will be Susan Margulies, Georgia Tech, Biomedical Engineering.
 - In memorium – Dr. Kishan Baheti passed away on March 9, 2021.
 - Memorials are being planned in upcoming conferences.
 - Current openings for program director positions in EPCN, EPMD, CCSS.
 - An open search for EPCN: focusing on control theories and optimization.

8. Status of University Power Programs

- Masood Parvania: University of Utah has 1 opening on power electronics and devices.
- Vijay Vittal: Arizona State University has 1 new hire
 - Mike Ranjram (PhD from MIT), working on power electronics, joining in Fall.
- Le Xie: Texas A&M University has 1 new hire
 - Adam Birchfield (PhD from Texas A&M), joined as a faculty member in Nov 2020.
- Hiring under COVID-19:
 - Anil Pahwa: Kansas State University is in hiring freeze due to financial situations. No new openings.
 - Vijay Vittal: Arizona State University hiring is all virtual. No on-campus visits for candidates until they accept the offers.
- Leonard Bohmann: Michigan Tech University has 2 new hires:
 - Yunting Liu (Postdoc at UTK), working on power electronics and solar integration.
 - Flavio Costa (from Brazil), working on power systems.
 - They were invited on campus during the hiring process.

9. Future Activities

- Kumar Venayagamoorthy: IEEE PRESS SERIES on Power and Energy Systems
 - Publish books on power and energy systems.
 - Kumar Venayagamoorthy is the editor.
 - Invite potential authors who have ideas for books

10. New Secretary Election

- Three nominees:
 - Tim Hansen (Associate Professor, South Dakota State University).
 - Lina He (Assistant Professor, University of Illinois at Chicago).
 - Wei Sun (Associate Professor, University of Central Florida).

- 30 valid votes collected out of 31 live meeting attendees.
- Tim Hansen is the new secretary, effective Jan 1, 2022.

Meeting adjourned at 4pm EDT.