

Energy Conversion and Conservation Division (ECCD)

Spring 2020 Newsletter

INSIDE THIS ISSUE

- Greetings from the Division Chair
- 2019 – 2020 Division Officers
- 2020 Conference Highlights
- Division Announcements
- 2020 Best Paper Awards
- 2020 Conference ECCD Sessions and Events

Message from the Division Chair

Dear ECCD Members,

Greetings, and welcome to the 2020 Annual Conference of ASEE. As you know by now, the conference has moved to an online format this year due to the challenges of COVID-19. I will miss seeing each of you in person this summer. But despite the online format for the conference this year, we have an outstanding program schedule lined up. Dr. Siamak Farhad has done an outstanding job of setting up this excellent slate of sessions and speakers. Well done Dr. Farhad!

Please take advantage of all of the excellent ECCD conference offerings including technical and panel sessions, guest speaker, and the distinguished lecture. Then join us on Thursday, June 25th at 7 PM ET for our division social event. The event will be online, but it will be interactive to allow for conversation between division members. Then on Friday, June 26th please join us at 3 PM ET for the division's Business Meeting.

I look forward to seeing you online at the sessions this week. Have a great conference.

Hossein Mousavinezhad, Idaho State University
2019-2020 ECC Division Chair

2019 – 2020 Division Officers

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Vice Chair/Chair-Elect

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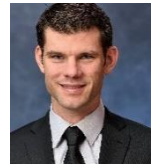
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2020 Conference Highlights

At the 2020 ASEE Annual Conference, the schedule for the Energy Conversion & Conversation Division will include 28 papers presented during six technical sessions, a panel session with four panelists, and a joint session with the Manufacturing Division with two papers presented. In addition, the week's events will feature a guest speaker presentation, a distinguished lecture presentation, a virtual tour of energy facilities, an online social event, and a business meeting.

Division Announcements

- The 2020 ASEE Annual Conference has moved online! The main page for the conference is at: asee.org/annual-conference/2020
- Find specific conference sessions and events for the 2020 annual conference and build your personalized conference schedule of sessions and events at: asee.org/public/conferences/172/registration/sessions.
- ECCD will be having its annual division social event on Thursday, June 25th at 7 PM ET. Use the link above to find and join us at the online event!
- The ECCD Business Meeting will be on Friday, June 26th at 3 PM ET. If you are a member of ECCD but are not able to attend the virtual conference this year, you can still participate in the Business Meeting!
- Technical Sessions at the 2020 ASEE Annual Conference will take the following format:
 - Presenters have already created and uploaded 15-minute presentation videos. Attendees have the opportunity to listen to the presenters' presentations ahead of time.
 - Technical Sessions will last 20 minutes each.
 - At the session, each presenter will briefly describe his or her work in approximately two minutes (depending on the session).
 - Following the speakers' brief overview, there will be approximately 10 minutes for Q&A with the presenters.
- This year's Distinguished Lecture will be given by Dr. Yunus Cengel, P.E. Dr. Cengel is Professor Emeritus at the University of Nevada, Reno and is the founding dean of the Faculty of Engineering at Adnan Menderes University in Aydin, Turkey. He is

the author several well-known textbooks on thermodynamics, heat transfer, fluid dynamics and differential equations. Don't miss his presentation on Wednesday, June 24th at 2 PM ET.

- This year's ECCD tour will be a virtual tour of several energy-related facilities, including Covanta's Sustainable Waste and Energy Solutions, The Largest Rooftop Solar System in Wisconsin, and the Bucknell Sustainable Energy Research Team's Residential Demonstration Micro-Grid. Representatives from the facilities will be available during the virtual tour to answer any questions about the plants. The tour will occur on Wednesday, June 24th at 7 PM ET.
- Please join the ECCD LinkedIn group for all of the latest information! The URL for the group is: <https://www.linkedin.com/groups/12134751>

Best Paper Awards

- Congratulations to the Best Paper Award Winners for 2020! The award winners are:

1st Place and Best Paper: Enlightened Education: Solar Engineering Design to Energize School Facilities; Dr. Kenneth A. Walz (Madison Area Technical College), Mr. Joel B. Shoemaker (Madison Area Technical College), Steven Michael Ansorge (Madison Area Technical College), Mr. Adam Gusse (Sunvest Solar, Inc), and Nicholas J. Hylla (Midwest Renewable Energy Association)

2nd Best Paper: A Comparison of the Renewable Energy and Energy Storage Sectors in Germany and the United States, with Recommendations for Engineering Teaching Practices; Dr. Lisa Bosman (Purdue University, West Lafayette), Jennifer Brinker (Northeast Wisconsin Technical College), and Dr. Kenneth Walz (Madison Area Technical College)

3rd Best Paper: Graded Homework vs. Quizzes on Homework Material: Impacts on Student Performance in a Thermodynamics Course; Dr. John R. Reisel (University of Wisconsin, Milwaukee)

ECCD 2020 Conference Sessions

[M216 ECCD - Technical Session 1 - Energy & Electrical Engineering](#)

Mon. June 22, 2020 10:00 AM to 10:20 AM ET
Moderators: Dr. Seyed "Hossein" Mousavinezhad P.E. and Dr. Herbert L. Hess P.E.

1. Electrical Energy Engineering Education for the 21st Century; Dr. Radian G. Belu (Southern University and A&M College) and Prof. Lucian Ionel Cioca (Lucian Blaga University of Sibiu)
2. A Multidisciplinary Energy Project: Rebuilding a Non-working Electric Car with Students; Dr. Faruk Yildiz (Sam Houston State University), Dr. Keith L. Coogler (Sam Houston State University), Dr. Reg Pecan (Sam Houston State University), and Dr. Ulan Dakeev (Sam Houston State University)
3. Teaching Substation Battery Testing to Undergraduates; Dr. Glenn T. Wrate P.E. (Northern Michigan University)
4. Voltage and Current Loop Controlled Three-stage, Three-port Solid State Transformer; Mr. Abdullah Al Hadi (Texas A&M University-Kingsville) and Dr. Rajab Chaloo (Texas A&M University-Kingsville)
5. Harnessing Drag Energy in Electric Automobiles; Mr. Aman Luthra (University of Georgia), Dr. Tom Lawrence P.E. (University of Georgia), and Dr. John M. Mativo (University of Georgia)

[M416 Panel: Innovations in Energy, Environment, and Engineering Education](#)

Mon. June 22, 2020 1:00 PM to 1:30 PM ET
Moderators: Dr. Siamak Farhad and Dr. Herbert L. Hess P.E.

1. Dr. Bala Maheswaran, Northeastern University
2. Dr. Veera Gnanaswar Gude P.E., Mississippi State University
3. Dr. Tooran Emami, United States Coast Guard Academy
4. Dr. Ramanitharan Kandiah P.E., Central State University

[T216 ECCD - Technical Session 2 - Solar Energy](#)

Tue. June 23, 2020 10:20 AM to 10:40 AM ET
Moderators: Dr. Ted Song and Dr. Robert J Kerestes

1. Enlightened Education: Solar Engineering Design to Energize School Facilities; Dr. Kenneth A. Walz (Madison Area Technical College), Mr. Joel B. Shoemaker (Madison Area Technical College), Steven Michael Ansorge (Madison Area Technical College), Mr. Adam Gusse (Sunvest Solar, Inc), and Nicholas J. Hylla (Midwest Renewable Energy Association)
2. Photovoltaic Solar Grill; Mrs. Brittany Weber (Renewable Energy Society), Miss Katelyn Renee Dunnagan (Renewable Energy Society), and Dr. Matthew Aldeman (Illinois State University)
3. Prototype Automated Solar Tracking with Power Generation System; Dr. Saeed Sean Monemi (California State Polytechnic University Pomona)
4. Mitigation of Solar Photovoltaic Production Variability with Geographical Aggregation; Mr. Bennet Thomas Krull (Illinois State University), Dr. Matthew Aldeman (Illinois State University), and Dr. Jin Ho Jo (Illinois State University)
5. The Scaled Omni-directional Solar Tracking Unit; Dr. Saeed Sean Monemi (California State Polytechnic University Pomona)

[T316 ECCD Technical Session 3: Energy and Multidisciplinary](#)

Tue. June 23, 2020 11:20 AM to 11:40 AM ET
Moderators: Dr. Matt Aldeman and Dr. Robert J. Kerestes

1. Development of a Multidisciplinary Renewable Energy Laboratory for Research and Education; Prof. Jacques Belanger (California Polytechnic State University, San Luis Obispo), Dr. Andrew Davol (California Polytechnic State University, San Luis Obispo), Ms. Huy A Duong (California Polytechnic State University, San Luis Obispo), and Trent Hamilton (Affiliation unknown)
2. A Multidisciplinary Undergraduate Course in Energy Engineering; Dr. Radian G. Belu (Southern University and A&M College) and Dr. Fred Lacy (Southern University and A&M College)
3. An Educational Tool to Optimize the Consumption of Primary Energy in Thermal-based Distributed Energy Systems; Dr. Joana Marques Melo (Purdue University, West Lafayette), Dr. Cynthia

Website: <http://eccd.asee.org>

Howard-Reed (Pennsylvania State University, University Park), and Dr. Catherine G.P. Berdanier (Pennsylvania State University, University Park)

4. Experimental Vehicles Program Improves Student Performance Through Energy Conversion and Conservation with Hands-on Learning; Dr. Saeed D. Foroudastan (Middle Tennessee State University)
5. Implementation of the Question Formulation Technique as a Teaching Strategy in Renewable Energy Engineering Education; Dr. Claudia Torres Garibay (Oregon Institute of Technology), Jessica Kerby (Oregon Institute of Technology), and Mr. Andrew Powers Minigan (Right Question Institute)

[T335 Green Energy Manufacturing and Sustainable Energy Management](#)

Tue. June 23, 2020 11:20 AM to 11:40 AM ET
Moderator: Prof. Tzu-Liang Bill Tseng

1. Project-based Learning with Implementation of Virtual Reality for Green Energy Manufacturing Education; Dr. Richard Chiou (Drexel University), Toshika Fegade (Drexel University), Ms. Yu-Chieh (Jamie) Wu (Drexel University), Prof. Tzu-Liang Bill Tseng (University of Texas at El Paso), Dr. Michael G. Mauk (Drexel University), and Dr. Irina Nicoleta Ciobanescu Husanu (Drexel University)
2. Design and Construction of an Aesthetically Pleasing Vertical Axis Wind Turbine (APVAWT) – A Case Study of Art and Engineering Collaboration in Engineering Capstone Course; Dr. Jung-Uk Lim (Liberty University), Dr. Kyung K. Bae (Liberty University), and Dr. Hector E. Medina (Liberty University)

[T416 ECC and Manufacturing Divisions - NSF Guest Speaker Session](#)

Tue. June 23, 2020 1:00 PM to 1:30 PM ET
Moderators: Dr. Siamak Farhad and Dr. Seyed "Hossein" Mousavinezhad P.E.

Speaker: Dr. Pushpa Ramakrishna, Program Director, Division of Undergraduate Education, NSF

[W216 ECCD Technical Session 4: Energy and Analysis](#)

Wed. June 24, 2020 10:00 AM to 10:20 AM ET
Moderators: Dr. Matt Aldeman and Dr. Sandip Das

1. A Comparison of the Renewable Energy and Energy Storage Sectors in Germany and the United States, with Recommendations for Engineering Teaching Practices; Dr. Lisa Bosman (Purdue University, West Lafayette), Jennifer Brinker (Northeast Wisconsin Technical College), and Dr. Kenneth Walz (Madison Area Technical College)
2. Relationship of the Industrial Assessment Center to the Land-grant Mission of Oklahoma State University; Dr. Hitesh D. Vora (Oklahoma State University), Ms. Pragya Niraula (Oklahoma State University), Amrit Sunil Chugani (Oklahoma State University), Mr. Nilesh Anil Baraskar (Oklahoma State University), Anusha Sunil Saraf (Oklahoma State University), and Dr. Michael L. McCombs (Oklahoma State University)
3. An Evaluation of Focused Outreach and Recruiting Efforts in a Nuclear-related Workforce Development Program; Dr. Hayrettin B. Karayaka (Western Carolina University), Dr. Chip W. Ferguson (Western Carolina University), and Dr. Amber C. Thompson (Western Carolina University)
4. Analysis and Field-based Learning of Energy Conservation Measures in an Engineering Thermodynamics Course; Dr. Arash Kialashaki (California State University, Chico)

[W316 ECCD Technical Session 5: Energy and Wind and Design](#)

Wed. June 24, 2020 11:00 AM to 11:20 AM ET
Moderators: Dr. Sandip Das and Dr. Ted Song

1. Power Generation Through Small-scale Wind Turbine; Prof. Bala Maheswaran (Northeastern University), Ms. Alya Abd Aziz (Northeastern University), Mr. Evan Alexander (Northeastern University), Ms. Laura Brigandi (Northeastern University), and Cole Branagan (Northeastern University)
2. Air-conditioning Unit Performance Analysis Equipped with a Shaded Condenser; Dr. Maher Shehadi (Purdue Polytechnic Institute)

Website: <http://eccd.asee.org>

3. Mobile Renewable Response Trailer (MRRT) for Disaster Relief Efforts; Dr. Reg Pecen (Sam Houston State University), Dr. Keith L. Coogler (Sam Houston State University), Dr. Faruk Yildiz (Sam Houston State University), and Dr. Ulan Dakeev (Sam Houston State University)
4. Hybrid Green Vessel Design; Joseph C. Rodriguez (United States Coast Guard Academy), Scott C. Pierce (United States Coast Guard Academy), Brennen McCulloch (Affiliation unknown), Mr. George McBurney (United States Coast Guard Academy), and Dr. Tooran Emami (United States Coast Guard Academy)
5. Sustainable Low-cost Household Energy Systems: Solar Photovoltaic and Shallow Geothermal Systems; Dr. Michael F. MacCarthy (Mercer University), Ms. Michelle E. Graham (Mercer University), Mr. Gabriel Xavier Ramirez (Mercer University), Alviez Aziz Chagan (Mercer University), and Miss Kyla T. Semmendinger (Cornell University)

[W416 DISTINGUISHED LECTURE: Smart Energy: Opportunities and Challenges](#)

Wed. June 24, 2020 2:00 PM to 2:30 PM ET
Moderators: Dr. Lynn A. Albers and Dr. Maryam Younessi Sinaki

Speaker: Dr. Yunus A. Cengel, P.E., University of Nevada, Reno

[W716 Virtual Tour - Energy Facilities](#)

Wed. June 24, 2020 7:00 PM to 9:00 PM ET

1. Virtual Tour 1: Covanta's Sustainable Waste and Energy Solutions
2. Virtual Tour 2: The Largest Rooftop Solar System in Wisconsin
3. Virtual Tour 3: Bucknell's Sustainable Energy Research Team: Residential Demonstration Micro-Grid

[R716 Social: Energy Conversion & Conservation Division and Manufacturing Division](#)

Thu. June 25, 2020 7:00 PM to 9:00 PM ET

[F216 ECCD - Technical Session 6 - Energy & Thermodynamics](#)

Fri. June 26, 2020 10:20 AM to 10:40 AM ET
Moderators: Dr. Lynn A. Albers and Dr. Maryam Younessi Sinaki

1. BITES and TEST Web Tools to Enhance an Undergraduate Thermodynamics Course; Dr. Abhijit Nagchaudhuri (University of Maryland, Eastern Shore)
2. Integration of Service Learning to Teaching Thermodynamics; Dr. Farshid Zabihian (California State University, Sacramento)
3. Teaching Thermodynamics Online: Instructor and Student Perspectives; Dr. Farshid Zabihian (California State University, Sacramento)
4. Graded Homework vs. Quizzes on Homework Material: Impacts on Student Performance in a Thermodynamics Course; Dr. John R. Reisel (University of Wisconsin, Milwaukee)

[F516 ECCD Business Meeting](#)

Fri. June 26, 2020 3:00 PM to 4:00 PM ET