PSerc Industry Advisory Board Meeting
December 6 - 8, 2017
Arizona State University, Tempe, AZ

“Solar energy for the Next Generation Power System”

The Power Systems Engineering Research Center (PSerc) is a university-industry collaboration focusing on research and education needs in the electric power industry. Its Industry Advisory Board (IAB), composed of PSerc's industry members, meets twice per year with PSERC researchers and students to conduct Center business, and to engage in discussions about the Center's research and education activities. This is a stimulating meeting with presentations on research projects, discussions of research ideas, and conversations on current issues facing the electric power industry. This year, the meeting theme is taken from PSerc's several thrusts in renewable energy resources, namely, solar energy.

Objectives and Meeting Highlights
The objectives of this IAB meeting are to:
- Promote interaction among researchers, industry members, and students
- Communicate the status of current PSerc research projects and education activities
- Present research results and discuss ideas for new research projects.

Highlights of this meeting include:
- Presentations on research results for proposed projects for PSerc funding the next year
- Posters describing research on continuing PSerc projects
- Discussions on present and future research and education activities
- A mini-job fair, ‘Career Conversations’, for members and students
- Two informational tutorials relating to solar energy: one on concentrated solar power (CSP), and the other on photovoltaics (PV)
- PSerc research stem committee meetings
- A dinner hosted by two PSerc sponsors: Arizona Public Service and Salt River Project
- A luncheon hosted by PSerc sponsor First Solar
- Some flavor of the American Southwest: Arizona, the Grand Canyon State

Our speakers from industry and academia bring a wealth of experience in the electric power industry. With times for formal and informal discussions, this meeting provides an excellent opportunity for networking as well as for information gathering and dissemination.

Intended Audience
The meeting is for PSERC’s industry and university members, and students at PSerc universities. We invite individuals from organizations that would like to consider PSerc membership to join us. Before registering, such individuals are asked contact Dr. Anna Rosa Lampis, PSERC Deputy Director, at (480) 965-4894 or ar.lampis@asu.edu.

Our hosts
Our local host for this meeting is Arizona State University. Salt River Project and Arizona Public Service are hosts of the PSerc dinner and First Solar is hosting the luncheon on Thursday December 7. Thank you SRP, APS and First Solar!
# Meeting Agenda

## Wednesday, December 6

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>Begins at 2:00</td>
<td>Registration</td>
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<tr>
<td>3:00 – 4:00</td>
<td><strong>T&amp;D Technologies Stem Committee Meeting</strong></td>
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<tr>
<td></td>
<td>Ward Jewell, Chair, Wichita State University</td>
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<td>Jeff Fleeman, Vice-Chair, American Electric Power</td>
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<tr>
<td>4:00 – 5:00</td>
<td><strong>Systems Stem Committee Meeting</strong></td>
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<td>Venkataramana Ajjarapu, Iowa State University</td>
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<td>Baj Agrawal, Vice Chair, Arizona Public Service</td>
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<tr>
<td>5:00 – 6:00</td>
<td><strong>Markets Stem Committee Meeting</strong></td>
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<td>Shmuel Oren, Chair; UC Berkeley</td>
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<td>Tongxin Zheng, ISO-New England, Vice-Chair</td>
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<tr>
<td>6:00 – 7:30</td>
<td>Reception</td>
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<tr>
<td>6:45 – 7:30</td>
<td><strong>Career Conversations: A Mini Job Fair</strong>, Basha Family Room</td>
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<tr>
<td>7:30 – 9:00</td>
<td><strong>Executive Committee Meeting</strong>, Tooker Boardroom</td>
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## Thursday, December 7

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>Begins at 7:15</td>
<td>Registration</td>
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<td>Breakfast at the Residence Inn, light breakfast at the meeting room</td>
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<tr>
<td>8:00 – 8:15</td>
<td><strong>Welcome to Arizona State University</strong></td>
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<td>Kyle Squires, Dean of Engineering at Arizona State University</td>
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<td>8:15 – 8:35</td>
<td><strong>Challenges of the Future Electric Power Utility</strong></td>
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<td>Daniel Haughton, Arizona Public Service Co.</td>
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<td>8:35 – 9:00</td>
<td><strong>Director’s Comments</strong></td>
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<td>Dr. Vijay Vittal, PSerc Director, Arizona State University</td>
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<td></td>
<td>presented by Jerry Heydt, PSerc ASU Site Director</td>
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<td>9:00 – 10:00</td>
<td><strong>Proposed Project Presentations</strong></td>
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<td>10:00 – 10:15</td>
<td>Break</td>
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<tr>
<td>10:15 – 11:45</td>
<td><strong>Proposed Project Presentations</strong></td>
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<td>12:00 – 1:30</td>
<td>Lunch, hosted by First Solar</td>
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<td>1:30 – 2:30</td>
<td><strong>Proposed Project Presentations</strong></td>
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<td>2:30 – 3:45</td>
<td><strong>Poster Session with Discussions on Ongoing PSerc Projects</strong></td>
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<td>3:45 – 5:00</td>
<td><strong>Closed Industry Meeting (IAB members only)</strong></td>
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<td>6:15 – 8:45</td>
<td><strong>Dinner with Musical Entertainment</strong>, hosted by Arizona Public Service</td>
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<td>and Salt River Project</td>
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## Friday

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<tr>
<td>7:15 – 8:15</td>
<td><strong>Breakfast</strong> at the Residence Inn, light breakfast at the meeting room</td>
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<td>8:15 – 8:45</td>
<td>Feedback from the IAB Business Meeting</td>
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<td>Jeff Fleeman, American Electric Power</td>
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<td>8:45 – 9:15</td>
<td><strong>The ASU Automated Power Laboratory</strong>: a newly developed laboratory simulator used in some undergraduate power engineering courses, hosted by Dr. Karady and his students.</td>
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<td>9:15 – 10:00</td>
<td><strong>Informational Tutorial: Photovoltaics</strong></td>
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<td>Mahesh Morjaria, First Solar</td>
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<td>10:00 – 10:45</td>
<td><strong>Informational tutorial: Concentrated Solar Power</strong></td>
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<td>Sobia Naqvi, Arizona Public Service Company</td>
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<td>11:00</td>
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Wednesday Evening: Career Conversations between Students and IAB Members
From 6:45 – 7:30 pm on Wednesday evening interested IAB members are invited to engage in
conversations with students pursuing potential internships or career opportunities. This job fair
typically involves up to about 40 students from PSerc universities, most of whom are graduate
students. The Career Conversations shall be held in the Old Main Building.

Thursday Afternoon: Poster Session
Posters will include PSerc project status reports and student research projects.

Information for Planning Your Attendance

Registration
(Click here to register. Early bird rate ends November 10, 2017). On or before November 10, the
eyearly bird registration fee is:
• $250 for all attendees
• No charge for students (eligible students - only from PSerc universities)

After November 10, the registration fees are:
• $325 for all attendees
• $50 for students

Additional charges:
• $20 charge for students to attend the Thursday night dinner
• $40 charge for dinner companions of all attendees, including students.

Hotel Reservations
The conference hotel is the Residence Inn by Marriott, 510 S. Forest Ave, Tempe, AZ 85281, tel:
(480) 967-2300. A block of rooms is being held at the preferential rate of $149 plus tax – ask for
conference code PSERC when calling or use this link to reserve your room. The cut-off date for
reservations is November 10.

Airports and Transportation
The Phoenix – Scottsdale – Tempe metro area is served by Phoenix Sky Harbor International
Airport, PHX, www.skyharbor.com The airport is one of the ten busiest in the nation for passenger
traffic with a $79 million daily economic impact. On a typical day more than 1,200 aircraft and
more than 120,000 passengers arrive and depart. PHX offers non-stop flights to many US, Cana-
dian, and Mexican cities, and there is one direct flight to London Heathrow Airport daily.

A second airport, Phoenix-Mesa Gateway Airport (AZA) www.gatewayairport.com is served by
Allegiant and WestJet Airlines. The airport has direct flights to about 50 Canadian and US cities.

Residence Inn offers a complimentary airport shuttle to and from the airport. If guests wish to
use the shuttle, inform them ahead of time (480) 967-2300 so they can make shuttle arrange-
ments. The shuttle does not run on a continuous schedule. The shuttle holds 7 passengers.
Meeting Location: Old Main Building, Arizona State University (Carson Ballroom)

All sessions will be held on the campus of Arizona State University in Tempe, Arizona. The sessions are in a historic landmark building on the ASU campus. Constructed before Arizona achieved statehood, Old Main represents a rich tradition for Arizona State University and the state. Old Main has been refurbished to period standards, and is listed on the National Register of Historic Places. The building decoration and murals are original.

Dedicated February 4, 1898, Old Main was the first building in Tempe wired for electric lighting. President Teddy Roosevelt dedicated the Roosevelt Dam from the front stairway of this building in 1911. The power generation facilities at Roosevelt Dam are now operated by PSerc sponsor Salt River Project. Note that the building and its decorations pre-date Arizona statehood which was attained on February 14, 1914. On that date, the man who would become Arizona’s first Governor, George P. Hunt, walked from his hotel in Washington D.C. to the Capitol building to watch President Taft sign Arizona into statehood. Hunt had refused to ride in a carriage, perhaps because he wanted to show that Arizonans were a breed of tough, independent people who took care of themselves and thrived under any conditions. That spirit still survives today!

Murals by Joseph M. Henninger, entitled “Spanish Influence in Arizona” and “Industrial Development in Arizona,” are now displayed in Old Main. Both 1930s murals were originally commissioned for the Matthews Library as part of a Franklin D. Roosevelt New Deal art project.

The flag of Arizona consists of 13 rays of red and weld-yellow on the top half, the colors of the flag of Spain, representing the 13 original states. The red and yellow also symbolize Arizona’s picturesque sunsets. The copper star represents the copper mining industry in Arizona. Arizona is the last of the 48 contiguous states to be admitted to the union of the United States.

Old Main now is at the center of the ASU campus. Meetings and special events are held in the building. A half block to the east of the building is Palm Walk with more than 100 stately Mexican Fan Palms. To the North across University Drive is the Fulton Center which houses much of the ASU administration. The building is an energy efficient structure part of ASU’s commitment to a green future.
**Walking Between the Hotel and Old Main**

Conference attendees are asked to walk three blocks between the conference hotel and Old Main (where all conference sessions will be held).

**Directions:** leave the hotel walking south (opposite to the direction of ‘A Mountain’). You are walking on Forest Avenue and you will pass 6th St., 7th St., and you will come to University Drive, a main East-West thoroughfare. Cross University Dr. and you are now on the ASU campus. The grassy area to your left has a historic fountain, and an older red sandstone building. That building is Old Main.

The Carson Ballroom is one flight up. There is an elevator on the south side of the building.

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**Meeting Attire, Wi-Fi, and further information**

Meeting attire is business casual. Wireless internet service will be available.

If you have questions about logistics, please contact Paula Baker at (480) 965-1643 paula.baker@asu.edu. For information about the meeting agenda or PSerc, please contact Dr. Anna Rosa Lampis, PSerc Deputy Director at ar.lampis@asu.edu, (480) 965-4894.
What to Visit in Arizona in December

For information, click on the following links:

- The City of Tempe Convention and Visitor’s Bureau is located ½ mile from the Residence Inn. Feel free to walk in and grab some brochures and talk to the tourist agents about everything Arizona has to offer! Toll Free: 1-866-914-1052.
- Go online and request a free vacation guide from the Arizona Office of Tourism. This is the official Arizona travel and vacation guide from Arizona, the Grand Canyon State.
- Greater Phoenix Convention and Visitors Bureau features visitor information, an event calendar, and a travel planner.
- National Geographic Visitors Center: Grand Canyon. This site has online specials to the IMAX Theater movie on the Grand Canyon, visitor’s center, tours and tickets, web cam, and a photo gallery.

GRAND CANYON (about 250 miles)
Arizona is the Grand Canyon State! Good time to visit – no crowds– but it could be cold. Nearby Flagstaff is likely to have snow. The canyon itself is always amazing and a true wonder of the world. Hotel reservations in Tusayan are easy to get – but the best view is at El Tovar Hotel at the South Rim. Book well in advance at Grand Canyon Lodges. Toll free: 1-888-297-2757.

SEDONA (about 130 miles)
An upscale, red rock, scenic place. Go on a Pink Jeep trip tour – it is a truly a memorable experience (no booking needed). Hotel bookings will be easy to obtain in December. Expect cool days and cold nights. Snow is unlikely but possible. Discovery Treks: Leave no Trace Ethics; Adventure travel and ecotourism for Sedona, the Grand Canyon, Glen Canyon, Lake Powell, and Havasu Falls. Toll free: 1-888-256-8731.

PRESCOTT (about 110 miles)
An old west town with saloons and casinos. Scenic and historic area. Expect cool days and cold nights. Snow is unlikely. Prescott Chamber of Commerce Visitor’s Center.

JEROME (about 125 miles)
A ghost town (population 25?). Old west saloon, and a funky hotel on the hilltop: Jerome Grand Hotel. Many bed and breakfasts. Expect cool days with a chance of snow.

METEOR CRATER (about 190 miles)
Phoenix/Tempe Area Attractions

CENTRAL PHOENIX
See Arizona Square (restaurants, shops); the Hyatt Hotel Compass Restaurant—a rotating restaurant at the top of the Hyatt – panoramic view); Diamondbacks Baseball Arena (tours are available). Winters are usually pleasant with cool nights and warm days.

APACHE TRAIL
You will need a rental car. Go East to Apache Junction, and then North on Apache Trail. It is paved for about 20 miles, and then a very good dirt road. Scenic views ending at Roosevelt Dam. About midway is Tortilla Flat - - a tourist ghost town. Goldfield is another ghost town at the south end of the Apache Trail. You can do the whole thing in about 3-to-4 hours.

SOUTH MOUNTAIN
You will need a rental car. Follow Central Avenue (runs North/South) heading South in Phoenix, and it climbs up the mountain. From Tempe, take Baseline Road (runs East/West) heading West to Central Avenue, turn South (left). Panoramic views. You can do the round trip in less than 2 hours. Also available: Horseback riding.

DOWNTOWN SCOTTSDALE
Buy a $3,000 paperweight, see the many art galleries, and boutique shops for that perfect gift (like an encapsulated scorpion or a nice cactus plant). Many good restaurants - - especially Mexican food.

MUSICAL INSTRUMENT MUSEUM
Rated #1 attraction in Phoenix, one of the top 20 museums in the United States. Galleries of musical instruments from around the world. On December 9th, an educator exhibit focuses on STEM: How Science Brings Music to Life.

HEARD MUSEUM
Focuses on “the presentation, interpretation and advancement of American Indian art, emphasizing its intersection with broader artistic and cultural themes.” Exhibits feature Native People in the Southwest and Sculptural Stories in Stone and Bronze.

DESSERT BOTANICAL GARDENS
Walk trails within the gardens and view sculptures by Japanese artist Jun Kaneko. December 8-10, the garden will host Las Noches de las Luminarias. The event features “more than 8,000 hand lit luminaria bags, thousands of white twinkle lights and the sights and sounds of 10 unique entertainment ensembles.”