15th Annual

2015 ICEPAG

The Clean Energy Conference

Clean Generation and Clean Utilization

Conference Program

March 23-24, 2015

UC Irvine, Advanced Power and Energy Program

Henry Samueli School of Engineering

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WELCOME

Thank you for joining us on the beautiful University of California, Irvine campus for ICEPAG 2015, our 15th annual Colloquium! We chose the campus as our venue this year in celebration of UCI's 50th, and ICEPAG's 15th anniversaries. As with our past Colloquiums, we believe that you will find the caliber of presentations to reflect the current state-of-the-art over the broad spectrum of technologies that will comprise the future grid.

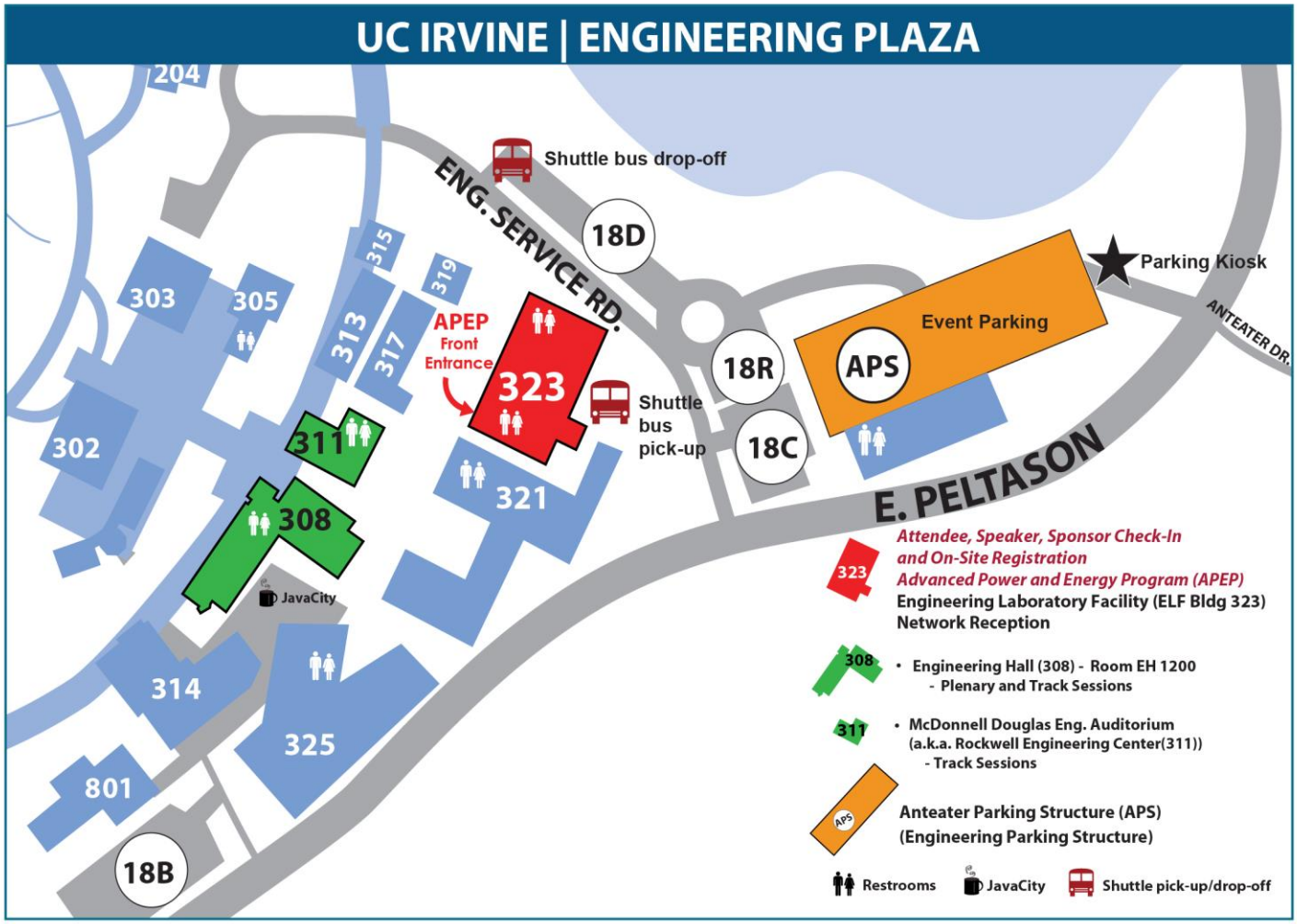
ICEPAG began from a series of biannual meetings of the Pacific Rim Consortium on Energy, Combustion, and the Environment (PARCON). Established in 1992 at Seoul University, with representation by two industries and two universities from countries flanking the Pacific Ocean, PARCON has sought to promote advanced power generation for high efficiency and low criteria pollutant impact, promote communication and dialog not only within the Pacific Rim – but worldwide - and thereby accelerate the development and deployment of advanced technology from distributed generation to central generation.
ICEPAG was conceived by PARCON with three goals:

- **Facilitate** on an annual basis a shared understanding of the various advanced energy technologies under development.
- **Promote** strategic alliances to enhance collaboration among the world's communities.
- **Inspire** students to embrace the challenges and opportunities associated with advanced power generation and environmental quality.

ICEPAG is structured on the premise that power generation, distribution, and utilization is comprised of many interconnected and interacting, existing and emerging components that require an understanding in the context of a **system.** Therefore, while ICEPAG includes sessions on component technologies, the overlying theme of ICEPAG is the perspective of the **system** as a whole. However the **system** considered is not limited to power, but also embraces:

- Water resources and water quality
- Agriculture
- Economics
- Socio-political considerations and policy

We trust that you will find the conference both relevant and insightful, and that the contacts you make during ICEPAG 2015 will further advance the goal of a more sustainable energy future for the world's community.



Day	Shuttle Bus	Departures	Arrivals
March 23 Morning	Bus 1	Radisson 7:00 am Wyndham 7:15 am	UCI (Lot 18D) 7:35 am
	Bus 2	Radisson 7:15 am Wyndham 7:30 am	UCI (Lot 18D) 7:50 am
March 23 Evening	Bus 1 – For those not attending reception	UCI ELF 323 5:45 pm	Radisson Wyndham
	Bus 2	UCI ELF 323 7:00 pm	Radisson Wyndham
	Bus 3	UCI ELF 323 7:15 pm	Radisson Wyndham
March 24 Morning	Bus 1	Radisson 7:00 am Wyndham 7:15 am	UCI (Lot 18D) 7:35 am
	Bus 2	Radisson 7:15 am Wyndham 7:30 am	UCI (Lot 18D) 7:50 am
March 24 Evening	Bus 1	UCI ELF 323 5:15 pm	Radisson Wyndham
	Bus 2	UCI ELF 323 5:30 pm	Radisson Wyndham

PROGRAM - MONDAY, MARCH 23 | DAY 1 | MORNING

7:30 am **NETWORKING BREAKFAST**

WELCOME AND TECHNICAL SESSIONS

8:30 am

Welcome
Scott Samuelsen, Colloquium Program Chair
Director, National Fuel Cell Research Center and Advanced Power and Energy Program
University of California, Irvine

TECHNICAL SESSIONS

	Track 1: Clean Generation	Track 2: Clean Utilization
	Session 1-1 **Fuel Cell Systems (DG)**	**Session 2-1** **Electric Vehicle Fueling**
	Chair: Shailesh Vora (DOE) **Co-Chair:** Jack Brouwer (UCI)	**Chair:** Tyson Eckerle (Governor's Office) **Co-Chair:** Brendan Shaffer (UCI)
9:00 am	***Overview of DOE Office of Fossil Energy's Solid Oxide Fuel Cell Program*** Shailesh Vora U.S. DOE	***Assessing the Current PEV Charging Landscape and Modeling Future Infrastructure Needs*** Mike Nicholas UC Davis
9:30 am	***California Climate Policy Implementation and Fuel Cell Systems*** David Mehl California Air Resources Board	***The Cost to Fuel Electric Vehicles Using Level 3 Chargers*** Robert Flores UCI
10:00 am	**BREAK**	**BREAK**
10:30 am	***Growing Commercial Applications of the Direct FuelCell™*** Tony Leo FuelCell Energy	***The California Hydrogen Fueling Roll-Out: Status and Future*** Tyson Eckerle Governor's Office of Business and Economic Development
11:00 am	***Pure Cell™ Assured Power*** Derek Hildreth Doosan Fuel Cell America	***SERA Scenarios of Early Market Fuel Cell Electric Vehicle Introductions: Modeling Framework, Regional Markets, and Station Clustering*** Marc Melaina NREL
11:30 am	***Development and Commercialization of Hybrid Solid Oxide Fuel Cell Systems at GE*** John McGuinness GE Fuel Cells	***California's Hydrogen Refueling Stations: 2015 and Beyond*** Kersey Manliclic UCI
12:00 pm	***Evolving PEM Fuel Cell Market Applications*** Randy MacEwen Ballard Power Systems	***Trace Carbon Monoxide Contaminant Monitoring for Hydrogen Vehicle Refueling Applications*** Peter DeBarber Horiba Instruments, Inc.
12:30 pm	**LUNCH ON YOUR OWN**	**LUNCH ON YOUR OWN**

PROGRAM - MONDAY, MARCH 23 | DAY 1 | AFTERNOON

TECHNICAL SESSIONS

	Track 1: Clean Generation	Track 2: Clean Utilization
	Session 1-2 **Gas Turbine Systems (DG)**	**Session 2-2** **Utility Grid Technologies**
	Chair: Mike Kashani (OC Waste/Recycling) **Co-Chair:** Vince McDonell (UCI)	**Chair:** Scott Samuelsen (UCI) **Co-Chair:** Brian Tarroja (UCI)
2:00 pm	***Introduction to Gas Turbines for Distributed Generation*** Vince McDonell UCI	***Reliable Sustainability: Maintaining Grid Reliability in a Shifting Grid Paradigm*** Russ Neal Power Innovation Consultants
2:30 pm	***Criteria Development for Gas Turbine Premixer Flameholding Tendencies of Natural Gas and High Hydrogen Content Fuels*** E. Sullivan-Lewis UCI	***Community Renewable Energy Deployment Projects*** Valentino Tiangco SMUD
3:00 pm	***Exploring Prediction of Emissions and Stability Performance of Fuel Flexible Gas Turbine Combustion Systems*** Andres Colorado UCI	***The Role of Smart Inverters in Renewable Utility Grids*** Scott Fei Lee UCI
3:30 pm	**BREAK**	**BREAK**
4:00 pm	***Gas Turbines for Power Generation with Ultra Low BTU Fuels*** Doug Hamrin Ener-Core	***European Grid Interconnection Standards for Distributed Generation: Implications for Interconnection in North America*** Brian Budzyn Capstone
4:30 pm	***32.5 MW LFGTE Combined Cycle Power Plant at Olinda Landfill*** M. Kashani, P. Livingston OCWR	***The Future of the Electricity Market in a Diversified Grid*** Lori Schell Empowered Energy
5:00 pm	***Material Degradation of Gas Turbine Components with Alternative Fuels*** Dan Mumm UCI	***Battery Energy Storage Functionality and Performance Providing Grid-Support Services*** Paul Scott Transportation Power, Inc.
5:30 pm	**Day 1 Technical Program Concludes**	**Day 1 Technical Program Concludes**
5:30 pm	**Networking Reception: APEP Laboratory Facility ELF 323**	**Networking Reception: APEP Laboratory Facility ELF 323**
5:45 pm	**Bus Departs for Hotels for Those Not Attending Reception**	**Bus Departs for Hotels for Those Not Attending Reception**
7:00 pm *7:15 pm*	**Buses Depart to Hotels**	**Buses Depart to Hotels**

PROGRAM - TUESDAY, MARCH 24 | DAY 2 | MORNING

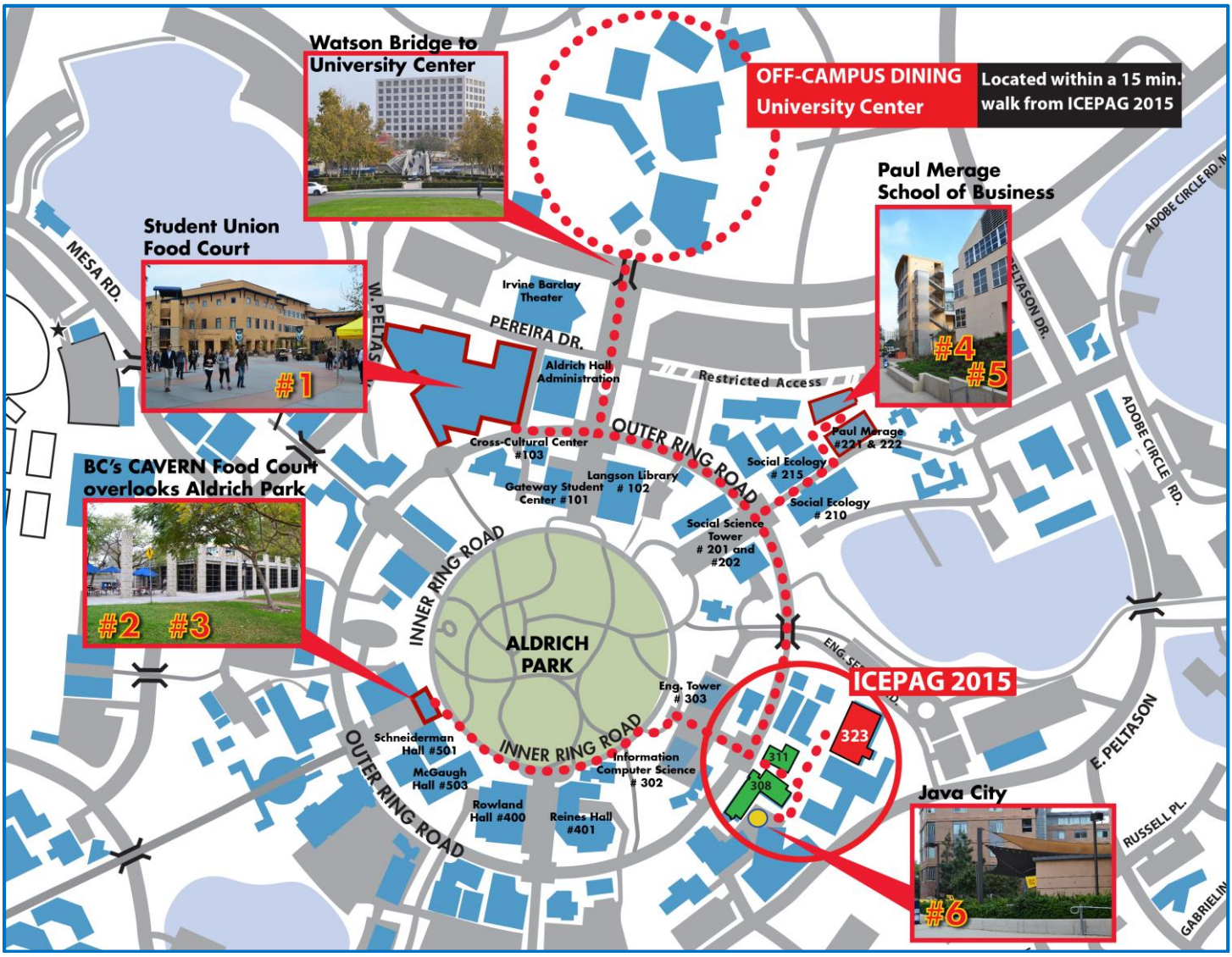
7:30 am	**NETWORKING BREAKFAST**	
	TECHNICAL SESSIONS	
	Track 1: Clean Generation	**Track 2: Clean Utilization**
	Session 1-3 **Applications and Systems Integration (DG)**	**Session 2-3** **Microgrid Technologies**
	Chair: Rizaldo Aldas (CEC) **Co-Chair:** Rich Hack (UCI)	**Chair:** Russ Neal (PIC) **Co-Chair:** Ghazal Razeghi (UCI)
8:30 am	***Novel Flex-Fuel Oxidation for Distributed Generation*** Marisa Zuzga ZERE Energy and Biofuels	***Critical Power Distribution and Source Transfer Switching*** Randal Kaufman ABB
9:00 am	***Boiler Burner Energy System Technology (BBEST)*** John Kelly Altex Technologies Corp	***Utilities' Role in the Integrated Grid*** Brian Dupin, Jimmy Herren EPRI
9:30 am	***Microturbine History of Operation at Chiquita Water Treatment Facility*** Tracy Wallace Santa Margarita Water District	***Application of Power Systems Analyses to Microgrids*** Tanuj Khanderwal ETAP
10:00 am	**BREAK**	**BREAK**
10:30 am	***Fuel Cell Operations at a Waste Water Treatment Facility*** Jeff Wall Eastern Municipal Water District	***Monitoring Based Commissioning of the Existing Central Utility Plant*** Lucas Hyman Goss Engineering
11:00 am	***Long Term History of Microturbine Absorption Chiller Operation*** Mark Iverson Eastern Municipal Water District	***Microgrid Feasibility – Case Studies*** Walter Levesque DNV GL
11:30 am	***Combined Heat and Power with Thermal Storage for Modern Greenhouses*** Keith Davidson DE Solutions	***An Integrated PV/Battery for Electric Vehicle Charging in a Microgrid Topology*** Laura Novoa UCI
12:00 pm	**LUNCH: ON YOUR OWN**	**LUNCH: ON YOUR OWN**

PROGRAM - TUESDAY, MARCH 24 | DAY 2 | AFTERNOON

TECHNICAL SESSIONS

	Track 1: Clean Generation	Track 2: Clean Utilization
	Session 1-4 **Central Plant Natural Gas, Coal, Biomass** **Brayton, Rankine, and Fuel Cell Cycles**	**Session 2-4** **Nanogrid Technologies**
	Chair: Rich Dennis (DOE) **Co-Chair:** Ashok Rao (UCI)	**Chair:** Jack Brouwer (UCI)
1:30 pm	***Power Cycles Based on Supercritical Carbon Dioxide as the Working Fluid Applications, Challenges, and Benefits*** Rich Dennis DOE NETL	***Novel Smart Grid Integration of Molten Carbonate Fuel Cell Technology*** Pinakin Patel FuelCell Energy
2:00 pm	***Gas Turbine Technology and Product Advancements for Natural Gas Combined Cycle Electrical Power Generation*** Roger Schonewald GE Power & Water	***Optimal Dispatch of Building Integrated Distributed Generation and Vehicle Charging*** Robert Flores UCI
2:30 pm	***U.S. DOE's Advanced Gasification Technologies Program – An Update*** Bhima Sastri DOE	***Affordable Sensing and Energy Management Technology for Buildings and Microgrids*** Michel Kamel MelRoK
3:00 pm	**BREAK**	**BREAK**
3:30 pm	***Highly Efficient Warm Gas Carbon Capture System for IGCC Power Plants*** Ambal Jayaraman TDA Research Inc.	***Fuel Cell Power in the Datacenter*** Eric Peterson Microsoft
4:00 pm	***Performance Analysis of an SOFC Based Triple Power Generation System with Oxy Combustion CO_2 Capture*** Tong Seop Kim Inha University, South Korea	***Air Quality Impacts of the Goods Movement Sector and Potential Mitigation Strategies (Cold Ironing) at Ports*** Michael Mac Kinnon UCI
4:30 pm	***Combined WGS and CO_2 Removal Technology for Pre-Combustion CO_2 Capture*** Qin Chen UCI	***Design and Demonstration of a 175-kWe Woody Biomass Gasification to PEM Fuel Cell Generator*** Jim Zoellick Humboldt State University
5:00 pm	**COLLOQUIUM ENDS**	**COLLOQUIUM ENDS**
5:15 pm *5:30 pm*	**Buses Depart for Hotels**	**Buses Depart for Hotels**

ON AND OFF CAMPUS LUNCH OPTIONS



ON-CAMPUS – Spring Break Hours Vary: Open Mon-Thurs Only		OFF-CAMPUS | UNIVERSITY CENTER Standard Business Hours	
#1 - UCI Student Center Food Court:	**HOURS OF OPERATION**	Blaze Fast Fire'd Pizza	Nekter Juice Bar
Subway Sandwich	7:30 am – 5:00 pm	California Gogi Korean Grill	Peet's Coffee & Tea
Wahoo's	11:00 am – 5:00 pm	California Teriyaki Grill	Snow Monster
Wendy's	7:30 am – 5:00 pm	Cha FOR TEA	Stax Cookie Bar
Zot n Go	7:30 am – 5:00 pm	Chick-fil-A	Sweet Tooth
Starbucks	7:00 am – 5:00 pm	Chipotle Mexican Grill	Taco Bell
#2 – BC's CAVERN Food Court	9:00 am – 3:00 pm	DelSushi.com	Tender Greens
#3 – Subway @ BC's CAVERN	9:00 am – 3:00 pm	Eureka!	Veggie Grill
#4 – Au Bon Pain @ Paul Merage	8:00 am – 2:00 pm	Gen Grill	Wetzel's Pretzels
#5 – Starbucks @ Paul Merage	7:00 am – 5:00 pm	In-N-Out Burger	Jack In The Box
#6 – Java City Kiosk	7:30 am – 5:00 pm	Kochee Kabob House	Yogurtland
		Le Diplomate Bakery Cafe	Yushoken

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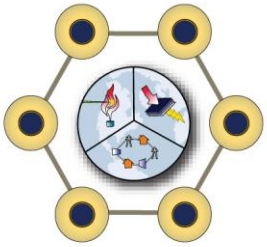

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