EPIC
SYMPOSIUM

Accelerating Clean Energy Innovation

#caEPIC19

2019 | PROGRAM

STATE OF CALIFORNIA ENERGY COMMISSION

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Welcome

The California Energy Commission, Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company, are pleased to showcase new clean energy technologies, and bring together leading energy experts to discuss innovative strategies to help accelerate clean energy innovation. The Electric Program Investment Charge (EPIC) Program provides approximately $160 million in funding to California's clean-energy entrepreneurs, researchers, and businesses each year. EPIC takes an energy pipeline approach to creating new energy solutions, fostering regional innovation, investing in cutting-edge emerging energy solutions that enhance safety, reliability and affordability, and bringing clean energy ideas to the marketplace.

Guest Speakers

Dr. Robert B. Weisenmiller

Dr. Robert B. Weisenmiller is the Chair of the California Energy Commission. He first joined the Energy Commission in 1977, holding several positions including commissioner's assistant, manager of the Special Projects Office and director of the Office of Policy and Program Evaluation. He left in 1982 but returned in 2010 after being appointed as a commissioner by Governor Arnold Schwarzenegger. He was appointed as chair of the Commission by Governor Edmund G. Brown Jr. in 2011 and reappointed to the position in 2015.

Chair Weisenmiller brings more than 40 years of experience in energy issues including expertise in electricity and gas markets and California's regulatory policies. He is the lead commissioner on legislative and intergovernmental matters, international relations, military partnerships, energy research and development, climate change, and combined heat and power.

He holds a doctorate in chemistry, a master's degree in energy and resources from the University of California, Berkeley, and a bachelor's degree in chemistry from Providence College.

Senator Henry Stern

Senator Henry Stern is a sixth-generation Californian. He credits his passion for public service as a family trait, whose diverse history includes farming and ranching, music and film, and a steadfast commitment to helping young people fulfill their potential. Stern was elected to represent the 27th Senate District, which includes parts of Los Angeles and Ventura counties, on November 8, 2016. He currently chairs the Senate Natural Resources & Water Committee.

Stern has also lectured at UCLA and UC Berkeley, enjoys volunteering at his local Boys & Girls Club and is a member of the Santa Monica Mountains Conservancy Advisory Committee, the Jewish Federation, the American Jewish Committee, and the Truman National Security Project. He is an alumnus of Harvard University and UC Berkeley Law.

Guest Speakers

Assembly Member Eloise Gómez Reyes

Eloise Gómez Reyes has served in the California State Assembly representing California's 47th Assembly District since November 2016. The proud daughter of immigrants, her commitment to civic engagement is a culmination of her life experience—beginning as a young girl picking grapes and onions, becoming the first Latina to open a law firm in the Inland Empire and, most recently, as an adjunct professor at Cal Poly Pomona.

Reyes is a champion for her community—working with legal aid to provide free legal services in the Inland Empire, representing the residents of Colton to prevent the development of a hazardous waste dump, and co-founding the Inland Empire Community Health Center to expand access to affordable care. She is a dean on UC Riverside's Dean's Medical School Mission Committee and has served on the Executive Board for the Children's Spine Foundation, the Board of Directors for the Inland Empire Latino Lawyers Association, the San Bernardino Valley College Foundation, and the National Orange Show.

Reyes completed her undergraduate education at the University of Southern California and her law degree at Loyola Law School.

Commissioner Martha Guzman Aceves

Martha Guzman Aceves was appointed Commissioner at the California Public Utilities Commission by Governor Edmund G. Brown Jr. on Dec. 28, 2016. She has focused on issues related to fuel switching, broadband access, water affordability, access to distributed solar, and various other energy and telecommunications issues. She previously served as deputy legislative affairs secretary in the Office of the Governor, focusing on natural resources, environmental protection, energy and food, and agriculture. She was the sustainable communities program director for the California Rural Legal Assistance Foundation from 2005 to 2011. From 2006 to 2008, she worked with Swanton Berry Farm on human resources issues including a new employee-stock ownership program.

She was legislative coordinator for United Farm Workers from 1999 to 2005, working on labor and environmental issues. In 2010, she co-founded Communities for a New California, a charitable organization promoting increased civic engagement of underrepresented communities. Guzman Aceves earned a Master of Science degree in agricultural and resource economics from UC Davis, and a Bachelor of Science in International Economics from Georgetown University.

Commissioner Janea A. Scott

Janea A. Scott is one of five commissioners at the California Energy Commission. She was appointed by Governor Edmund G. Brown Jr. in February 2013, and reappointed in January 2016 to serve as the Commission's public member. She is the lead commissioner on transportation. Scott serves as the Chair of the Western Interconnection Regional Advisory Body and is on the public policy board of Veloz, a nonprofit founded by the public and private sector to advance the electric car movement. She is also a member of the California Fuel Cell Partnership and the U.S. Department of Energy's Hydrogen and Fuel Cell Technical Advisory Committee.

Prior to joining the Energy Commission, Scott worked at the Department of the Interior in the Office of the Secretary as the Deputy Counselor for Renewable Energy and at Environmental Defense Fund as a senior attorney in the climate and air program. She earned her J.D. from the University of Colorado Boulder Law School and her M.S. and B.S. in Earth Systems from Stanford University.

Thought Leaders Fireside Chat

Thought Leaders Fireside Chat

9:40 – 10:30 a.m.
Room 306 – 308

This session will offer an interactive and thought-provoking discussion on how targeted, strategic investments can be transformative in achieving California and global energy and climate goals. We are delighted to welcome leaders who have been change agents in both public and private organizations.

Danielle Applestone is CEO and co-founder of Daughters of Rosie. The organization is the first professional network for working-class women, and provides a pipeline of entry-level technicians to hardware and manufacturing companies. Prior to that, she was co-founder and CEO of Other Machine Co. (now Bantam Tools) a Berkeley-based manufacturer of desktop CNC machines. Danielle received her B.S. in chemical engineering from the Massachusetts Institute of Technology (MIT) in 2002 and a Ph.D. in materials science and engineering from the University of Texas at Austin in 2012. During graduate school, she patented energy storage materials that have been licensed to a multinational materials company. She is a member of the 2016 Class of Henry Crown Fellows and until just recently, executive-in-residence at Cyclotron Road.

David Danielson, Managing Director, Breakthrough Energy Ventures, previously served as assistant secretary of the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy, directing the U.S. government's innovation strategy in the areas of sustainable transportation, renewable power, energy efficiency, and clean-energy manufacturing. He is considered a global expert in the development of next-generation clean-energy technologies and the creation of new R&D and organizational models for high-impact clean energy innovation. He was the first hire at the Advanced Research Projects Agency-Energy (ARPA-E) and, prior to his government service, was a clean-energy venture capitalist at General Catalyst. Danielson is an Adjunct Professor and Precourt Energy Scholar at Stanford University, where he teaches Stanford's Energy Ventures course. He received a Ph.D. in Materials Science from MIT and a B.S. in Materials Science from UC Berkeley.

MODERATOR:

Dr. Danielle Applestone
CEO and co-founder of Daughters of Rosie and former executive-in-residence at Cyclotron Road

PANELISTS:

Dr. David Danielson
Managing Director, Breakthrough Energy Ventures

Dr. James Zahler,
Associate Director for Technology-to-Market, ARPA-E

Dr. James Zahler, Associate Director for Technology-to-Market, ARPA-E, previously served as Senior Director of Product Technology at GT Advanced Technologies, managing research and application development activities. Zahler was a Cell Technology Manager at BP Solar and supported BP Alternative Energy Ventures by assessing commercial and strategic value of clean-tech opportunities. He co-founded Aonex Technologies to develop and commercialize his thesis technology, developing a novel substrate technology that was acquired by a major microelectronics manufacturer. Zahler earned both a Ph.D. in Chemical Engineering and an M.S. in Applied Physics from the California Institute of Technology. He holds a B.S. in Chemical Engineering from Texas A&M University.

CalSEED Entrepreneur Pitch Session

CalSEED Entrepreneur Pitch Session

12:40 – 1:30 p.m.
Room 306 – 308

Join **Ian Rogoff**, Chairman, California Clean Energy Fund, and **Debarshi Das**, Director of Energy, Los Angeles Cleantech Incubator, for a rapid-fire, cleantech pitch session featuring the four winners of the first California Sustainable Energy Entrepreneur Development (CalSEED) Follow-on Funding Award Competition. These entrepreneurs will describe how their technologies are advancing California's transition to a clean energy future, and how the CalSEED Initiative is helping to move their projects from idea to marketplace.

In 2016, the Energy Commission launched one of the state's most significant funding opportunities. The CalSEED Initiative supports early-stage clean energy entrepreneurs by providing up to $150,000 in grants for proof of concept activities, with opportunities for an additional $450,000 in follow-on funding.

Matt Miller, CEO, Nativus, Inc., will discuss an innovative air-conditioning system that offers higher efficiency, lowered operating expenses, easier installation, quieter operation, and efficiency-minded connectivity.

Dr. Peter Frischmann, CEO & Co-founder, Sepion Technologies, Inc., will share how advanced battery membranes can extend the range and lower the price of battery electric vehicles.

Dr. Cheng Jin, Powerflex Systems, will discuss how optimized adaptive charging stations can expand electric vehicle charging at a given facility with little or no service or infrastructure upgrades.

Kim Goodrich, Director, CodeCycle LLC, will share how software is radically improving energy efficiency outcomes in buildings by streamlining the compliance process for building officials, contractors, and engineers.

MODERATORS:

Ian Rogoff
Chairman, California Clean Energy Fund

Debarshi Das
Director of Energy, Los Angeles Cleantech Incubator

PANELISTS:

Matt Miller
CEO, Nativus, Inc.

Dr. Peter Frischmann
CEO & Co-founder, Sepion Technologies, Inc.

Dr. Cheng Jin
Powerflex Systems

Kim Goodrich
Director, CodeCycle LLC

AGENDA

8:00 – 9:00 a.m. **Check In & Registration**

Opening Session | Room 306 – 308

9:00 – 9:05 a.m. **Welcome and Introduction: Laurie ten Hope, Deputy Director, California Energy Commission**

9:05 – 9:15 a.m. **Opening Remarks: Dr. Robert B. Weisenmiller, Chair, California Energy Commission**

9:15 – 9:35 a.m. **Keynote Address: Senator Henry Stern, California's 27th Senate District**

9:35 – 9:40 a.m. **EPIC Awardee Spotlight Video – Sunfolding: Getting to the Grid**

9:40 – 10:30 a.m. **Thought Leaders Fireside Chat**

Moderator: **Dr. Danielle Applestone**, CEO and co-founder of Daughters of Rosie and former executive-in-residence at Cyclotron Road

Panelists: **Dr. David Danielson**, Managing Director, Breakthrough Energy Ventures
Dr. James Zahler, Associate Director for Technology-to-Market, ARPA-E

Breakout Sessions | 10:40 – 11:40 a.m.

Room 309 – 310 **Survival Tips for Entrepreneurs**

Moderator: **Dr. Danielle Applestone**, CEO and co-founder of Daughters of Rosie and former executive-in-residence at Cyclotron Road

Presenters: **Dr. Gregory Poilasne**, Chairman and CEO, NUVVE
Kristin Sampayan, CEO and Founder, Opcondys, Inc.
Tim Latimer, Co-Founder, Fervo Energy
Leila Madrone, Chief Technical Officer and Founder, Sunfolding
Dr. Kristin Denault, Founder and CEO, Fluency Lighting Technologies, Inc.

Room 306 – 308 **Electrifying Buildings**

Moderator: **Panama Bartholomy**, Director, Building Decarbonization Coalition

Presenters: **Theresa Pistochini**, Engineering Manager, UC Davis Western Cooling Efficiency Center
Dr. Paul Raftery, Professional Researcher, UC Berkeley Center for the Built Environment
Bryan Dove, Director of Asset Management, Mutual Housing California
Cathy Higgins, Research Director, New Buildings Institute
Ryohei Hinokuma, Manager, Strategic Alliances, Daikin US Corporation

Room 304 – 305 **Wildfire Prevention Technologies**

Moderator: **David Erne**, Supervisor of Technology Systems Integration, California Energy Commission

Presenters: **Dr. Brian Chen**, Principal Manager of Grid Resiliency & Public Safety, Southern California Edison (SCE)
Brian D'Agostino, Director of Fire Science & Climate Adaptation, San Diego Gas & Electric (SDG&E)
Dr. Larry Dale, Staff Scientist, Lawrence Berkley National Laboratory (LBNL)

Room 302 – 303 **Electrified Transportation–on the Road to V2B and V2G**

Moderator: **Janea A. Scott**, Commissioner, California Energy Commission

Presenters: **Anthony Harrison**, Director of Smart Cities and Fleet Policy, ChargePoint
Dr. Tim Lipman, Co-Director, Transportation Sustainability Research Center, UC Berkeley
Dr. Sunil Chhaya, Technical Executive, Electric Power Research Institute (EPRI)
Alissa Harrington, Program Manager for Connected eMobility, BMW North America

AGENDA

Boxed Lunch Pickup | 11:45 – 12:15 p.m., Foyer

Lunch Sessions | 12:15 – 1:30 p.m., Room 306-308

12:15 – 12:35 p.m. **Afternoon Keynote Address - Assemblymember Eloise Gómez Reyes, California's 47th Assembly District**

12:35 – 12:40 p.m. **EPIC Awardee Spotlight Video - Nuvve Corporation: INVENT**

12:40 – 1:30 p.m. **CalSEED Entrepreneur Pitch Session**

Poster Session | 1:30 – 2:15 p.m., Room 301/Hallway

Meet EPIC grantees and discover the latest innovations in clean energy

Breakout Sessions | 2:15 – 3:30 p.m.

Room 309 – 310 **Broadening Storage Technologies Beyond Lithium Ion**

Moderator: **Edward Randolph**, Deputy Executive Director, Energy and Climate Policy, CPUC

Presenters: **Laurence Abcede**, Manager of Distributed Energy Resources, SDG&E
Richard Wirz, Scientific Advisor, Element 16
Philippe Bouchard, Senior Vice President of Business Development and Marketing, Eos Energy Storage
Rick Winter, CEO, UniEnergy Technologies
Byron Washom, Director of Strategic Energy Initiatives, UC San Diego

Room 306 – 308 **Connecting New Technology Solutions to California's Underserved Communities**

Overview: **Erik Stokes**, Manager, California Energy Commission

Presenters: **Kathryn Collins**, Senior Consultant, Navigant Consulting
Thomas Jensen, Executive Director, iCatalysts
Laura Vogel, Managing Consultant, Navigant Consulting

Room 304 – 305 **Enabling Localized Clean Energy Portfolios**

Moderator: **Max Gomberg**, Climate and Conservation Manager, California State Water Resources Control Board

Presenters: **Dr. Hanna Breunig**, Research Scientist, LBNL
Thomas Gratz, US Sales Manager, HZI
Logan Olds, General Manager, Victor Valley Wastewater Reclamation Authority
Dr. Sebastien Tilmans, Director of Operations, Stanford University Codiga Resource Recovery Center
Mark McDannel, Engineer, Los Angeles County Sanitation Districts

Room 302 – 303 **Efforts to Operationalize Investor Owned Utility EPIC Demonstration Projects**

Moderator: **Aaron Renfro**, Senior Advisor, SCE

Presenters: **Mark Esguerra**, Director of Integrated Grid Planning and Innovation, Pacific Gas & Electric (PG&E)
Simon Han, Principal Manager of Transmission & Distribution, Grid Operations, SCE
Christine Asaro, Aviation Services Project Advisor, SDG&E

AGENDA

Networking Break | 3:30 – 3:45 p.m.

Breakout Sessions | 3:45 – 5:00 p.m.

Room 309 – 310

Non-Battery Solutions for Grid Flexibility

Moderator: **Matthew Tisdale**, Executive Director, Gridworks

Presenters: **Tom Tansy**, Chairman, SunSpec
Dr. Ajit Renjit, Smart Grid Systems Engineer, EPRI
Dr. Edward Cazalet, Founder & CEO, TeMix Inc.

Room 304 – 305

Resilient and Equitable Communities

Moderator: **Martha Guzman Aceves**, Commissioner, CPUC

Presenters: **Michelle Tirto**, Associate Sustainability Asset Manager, LINC Housing
Ram Narayanamurthy, Technical Executive, EPRI
Andy Brooks, Director of West Coast Operations, Association for Energy Affordability
Dr. Peter Alstone, Assistant Professor, Humboldt State University
Madeline Stano, Energy Equity Legal Counsel, The Greenlining Institute

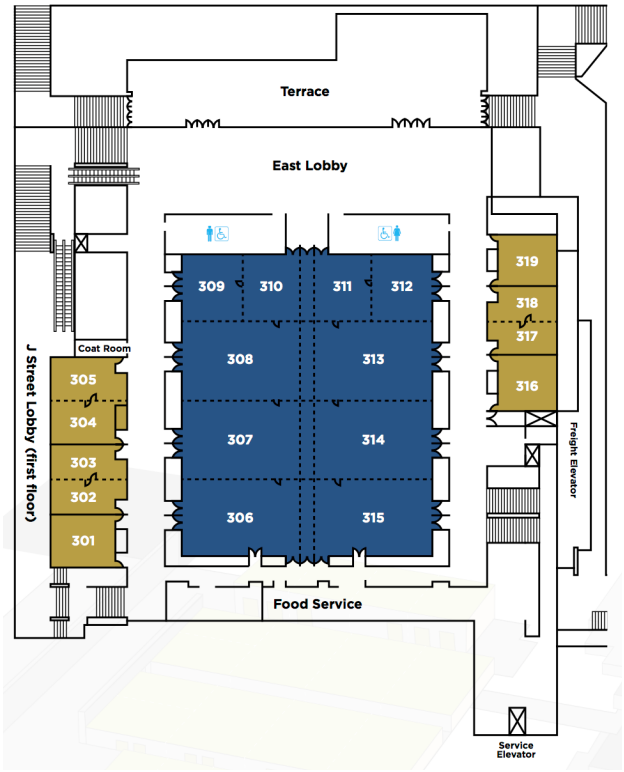
Room 302 – 303

Investor Owned Utility Coordination of Research Administration Plan & Coordination with EPIC Administrators

Moderator: **Dan Gilani**, Program Manager, PG&E

Presenters: **Dan Gilani**, Program Manager, PG&E
Aaron Renfro, Senior Advisor, SCE
Frank Goodman, EPIC Program Manager, SDG&E

Map of Symposium Rooms



BREAKOUT SESSION **ONE** PANELS **10:40 – 11:40 a.m.**

Survival Tips for Entrepreneurs

Room 309-310

Energy entrepreneurs face a number of challenges and pitfalls in bringing new energy inventions to market. These can add needless costs and delays to a new breakthrough technology's development, deterring private sector investment. In this panel session, California energy entrepreneurs will discuss lessons learned along with some of the challenges they have faced—and how to avoid them. In addition, they will provide their perspective on what contributed most to their success and suggest how California can further enhance support for clean energy entrepreneurship.

Moderator:

Dr. Danielle Applestone
CEO and co-founder, Daughters of Rosie
and former executive-in-residence, Cyclotron Road

Presenters:

Dr. Gregory Poilasne
Chairman and CEO, NUVVE, will discuss newly-deployed strategies to allow owners of electric vehicles to participate in different energy markets, adding a revenue stream for EV drivers.

Kristin Sampayan
CEO and Founder, Opcondys, Inc., will share how Opcondys is developing the Opticondistor, the next generation of power electronics that provides faster, more efficient control of electrical energy.

Tim Latimer
Co-Founder, Fervo Energy, will discuss Fervo Energy's novel and cost-effective reservoir engineering design that will develop enhanced geothermal systems that produce high flow rate wells, tap into large accessible reservoir volumes, and operate in a wide variety of geologic settings.

Leila Madrone
Chief Technical Officer and Founder, Sunfolding, will share how Sunfolding is developing an innovative single-axis PV tracker that uses significantly fewer components than traditional solar trackers, allowing for faster installation and minimal maintenance.

Dr. Kristin Denault
Founder and CEO, Fluency Lighting Technologies, Inc., will share how Fluency Lighting Technologies is developing next-generation light sources for highly efficient and flexible design illumination, using laser technology and materials design.

BREAKOUT SESSION **ONE** PANELS **10:40 – 11:40 a.m.**

Electrifying Buildings

Room 306 – 308

Building electrification is a key strategy for meeting California's greenhouse gas reduction goals. California's building sector still relies on natural gas for three key end uses: cooking, space heating, and water heating. While electric options exist for these end uses, current commercial offerings do not meet most consumers' demands for cost and performance. This panel will discuss current research to increase market traction of electric technologies in buildings.

Moderator: **Panama Bartholomy**
Director, Building Decarbonization Coalition

Presenters: **Theresa Pistochini**
Engineering Manager, UC Davis Western Cooling Efficiency Center, will discuss several projects focused on next-generation residential space conditioning such as increasing heat pump efficiency, building sealant advancements, more efficient commercial HVAC, and more.

Dr. Paul Raftery
Professional Researcher, UC Berkeley Center for the Built Environment, will share a project assessing the perception of comfort by occupants of conditioned spaces and how to efficiently and effectively resolve comfort issues.

Bryan Dove
Director of Asset Management, Mutual Housing California, will discuss Mutual Housing California's successes and challenges building and rehabbing all-electric affordable multifamily communities.

Cathy Higgins
Research Director, New Buildings Institute, will discuss the trend to all-electric multifamily and commercial buildings.

Ryohei Hinokuma
Manager, Strategic Alliances, Daikin US Corporation, will provide the manufacturer's perspective on the demand for electric heat pumps for both existing and new buildings in California.

BREAKOUT SESSION **ONE** PANELS **10:40 – 11:40 a.m.**

Wildfire Prevention Technologies

Room 304 – 305

With projections indicating increased wildfire-related risks for many parts of California, and the state already subject to increasingly deadly and destructive fires, public agencies and utilities need new solutions to further mitigate the threat and impact of wildfires. This panel will discuss scientific and technological advancements that can enable the state's extensive electric infrastructure to support more accurate, effective, and timely prediction of wildfire risks in the state, and mitigate the system's ignition potential.

Moderator: **David Erne**
Supervisor of Technology Systems Integration, California Energy Commission

Presenters: **Dr. Brian Chen**
Principal Manager of Grid Resiliency & Public Safety, SCE, will discuss how SCE has implemented improved inspection techniques to identify high fire risks, tested new reclosers that reduce the potential to cause an ignition after a fault, and developed advanced analytical techniques to detect a downed conductor.

Brian D'Agostino
Director of Fire Science & Climate Adaptation, SDG&E, will share insight based on SDG&E's role as an early adopter of new strategies for ignition prevention, including deploying drones, expanding weather monitoring systems, and testing fault detection equipment.

Dr. Larry Dale
Staff Scientist, LBNL, will provide an overview of his EPIC-funded research project exploring potential impacts of California's changing wildfire risk on transmission and distribution systems.

BREAKOUT SESSION **ONE** PANELS **10:40 – 11:40 a.m.**

Electrified Transportation – on the Road to V2B and V2G

Room 302 – 303

Concepts such as vehicle-to-building and vehicle-to-grid have the potential to improve the economics of electric vehicle ownership and drive increased adoption. The panel will discuss technology advancements that can enable vehicle-to-building and vehicle-to-grid applications in a manner that seamlessly provides value and benefits to electric vehicle owners while protecting the health and lifespan of the battery pack.

Moderator: **Janea A. Scott**
Commissioner, California Energy Commission

Presenters: **Anthony Harrison**
Director of Smart Cities and Fleet Policy, ChargePoint, will discuss progress in developing an interface between plug-in electric vehicle customers and utilities using advanced open-source communications with a vehicle charging network to demonstrate the value of managed, optimized charging.

Dr. Tim Lipman
Co-Director, Transportation Sustainability Research Center, UC Berkeley, will discuss the development of a smart charging concept to balance electric building loads with plug-in electric vehicle charging while implementing methods to mitigate the intermittency of renewable generation and minimize impacts to the distribution grid.

Dr. Sunil Chhaya
Technical Executive, Electric Power Research Institute will discuss developing, testing, and demonstrating an integrated vehicle-to-grid (V2G) system that can balance electric vehicle and local distribution grid needs using non-proprietary and secure communication technologies.

Alissa Harrington
Program Manager for Connected eMobility, BMW North America, will share research efforts to demonstrate how electric vehicle charging can be managed across multiple charging events to maximize vehicle charging benefits to the grid.

BREAKOUT SESSION **TWO** PANELS **2:15 – 3:30 p.m.**

Broadening Storage Technologies Beyond Lithium Ion

Room 309 – 310

Lithium-ion batteries are the market leader in energy storage technologies, driven largely by the growth of the consumer electronics and electric vehicle markets. However, lithium-ion batteries rely on materials that may have future supply constraints, raising concerns about whether lithium-ion technologies remain the best fit to meet the expected global demand for energy storage. This panel will discuss current efforts to develop and commercialize alternative energy storage technologies that can help meet California's projected market demand for energy storage.

Moderator: **Edward Randolph**
Deputy Executive Director, Energy and Climate Policy, CPUC

Presenters: **Laurence Abcede**
Manager of Distributed Energy Resources, SDG&E, will share his insight as a professional in distributed energy resources and give perspective on the importance of energy storage to the grid.

Richard Wirz
Scientific Advisor, Element 16, will share how Element 16 is developing and demonstrating a low-cost, quick response, small footprint, and highly flexible sulfur-based thermal energy storage technology for concentrated solar power applications.

Philippe Bouchard
Senior Vice President of Business Development and Marketing, Eos Energy Storage, will share how Eos is performing pilot testing of an AC-integrated energy storage system using Eos Znyth™ battery modules to assess its value to the grid in front of the meter.

Rick Winter
CEO, UniEnergy Technologies, will discuss how a commercial-scale microgrid is optimizing distributed energy resources using advanced energy management tools and energy storage technologies at a community college.

Byron Washom
Director of Strategic Energy Initiatives, UC San Diego will discuss research at UC San Diego and what it is teaching us about different non-lithium ion energy storage technologies.

BREAKOUT SESSION **TWO** PANELS **2:15 – 3:30 p.m.**

Connecting New Technology Solutions to California's Underserved Communities

Room 306 – 308

The Energy Commission is launching a new web platform to connect stakeholders to the development and adoption of new clean energy technologies. This session will highlight one application of this new platform, which is to provide a more structured mechanism for underserved communities and technology and project developers to connect and collaborate on proposals for funding opportunities. This platform will enable underserved communities to identify their needs and technology interests and find technology and project developers working solutions aligned with those needs and interests.

Overview:

Erik Stokes
Manager, California Energy Commission

Presenters:

Kathryn Collins
Senior Consultant, Navigant Consulting

Thomas Jensen
Executive Director, iCatalysts

Laura Vogel
Managing Consultant, Navigant Consulting

BREAKOUT SESSION **TWO** PANELS **2:15 – 3:30 p.m.**

Enabling Localized Clean Energy Portfolios

Room 304 – 305

Budget and resource constraints, combined with environmental and public health concerns, are challenging the ability of municipalities to sustainably manage waste in their jurisdictions without large rate increases. Energy is a major operating expense for waste and wastewater treatment operations. This panel will highlight new technology solutions that are helping municipalities reduce their energy expenses while simultaneously improving the carbon footprint and economics at their waste management facilities.

Moderator:

Max Gomberg
Climate and Conservation Manager, California State Water Resources Control Board

Presenters:

Dr. Hanna Breunig
Research Scientist, LBNL, will share how LBNL is exploring optimal locations for waste biomass to be used efficiently and sustainably for distributed generation.

Thomas Gratz
US Sales Manager, HZI, will discuss operation of an innovative, state-of-the-art anaerobic digestion facility in San Luis Obispo County, that converts organic waste into renewable electricity.

Logan Olds
General Manager, Victor Valley Wastewater Reclamation Authority, will discuss a project demonstrating a flow battery storage system that uses advanced communication and controls to alleviate rapid power fluctuations that cause disruption to water treatment systems.

Dr. Sebastien Tilmans
Director of Operations, Stanford University Codiga Resource Recovery Center, will discuss a project demonstrating an innovative anaerobic secondary treatment system at a wastewater treatment plant that eliminates energy-intensive aeration during treatment and reduces biosolid production.

Mark McDannel
Engineer, Los Angeles County Sanitation Districts, will discuss the potential of using these and other innovative technologies at his facility.

BREAKOUT SESSION **TWO** PANELS **2:15 – 3:30 p.m.**

Efforts to Operationalize Investor Owned Utility EPIC Demonstration Projects

Room 302 – 303

Discover how California's investor-owned utilities are incorporating and integrating research results and technologies into their mainstream operations. Projects include demand reduction through targeted analytics, proactive storm analysis, and the use of unmanned aircraft systems.

Moderator: **Aaron Renfro**
Senior Advisor, SCE

Presenters: **Mark Esguerra**
Director of Integrated Grid Planning and Innovation, PG&E, will discuss development of a tool that leverages customer data coupled with grid information and forecasts to create a robust optimization engine that identifies cost-effective solutions to defer asset upgrades and address capacity limitations.

Simon Han
Principal Manager of Transmission & Distribution, Grid Operations, SCE, will discuss a project to operationalize proactive storm analysis techniques to assess a storm's potential impact on utility operations, reduce the restoration time for outages incurred by the storm, and improve overall response times.

Christine Asaro
Aviation Services Project Advisor, SDG&E will discuss an EPIC project on demonstration of vendor tools for data analytics related to Unmanned Aircraft Systems (UAS) and how the project results have been used by stakeholders to support decisions regarding further development of SDG&E's UAS infrastructure.

BREAKOUT SESSION **THREE** PANELS **3:45 – 5:00 p.m.**

Non-Battery Solutions for Grid Flexibility

Room 309 – 310

Storage is often touted as the remedy to the challenges of managing a high-renewables, high-distributed energy resource future. However, there are other technologies and strategies with the potential to provide many of the same values to the grid and to customers at a lower cost. These technologies, building upon previous information and communications technology (ICT) and Internet of Things (IOT) approaches, bring the benefits of advanced communications to the electricity sector and can enable low-cost, low-carbon options for managing solar and wind generation intermittency. This panel will discuss how ICT and IoT advancements are providing traditionally "dumb" devices with the intelligence needed to effectively support California's renewable generation goals.

Moderator: **Matthew Tisdale**
Executive Director, Gridworks

Presenters: **Tom Tansy**
Chairman, SunSpec, will discuss development of a smart, solar PV-based distributed energy resource system that includes a smart inverter test framework and open source software tools to enable rapid product development and safety testing.

Dr. Ajit Renjit
Smart Grid Systems Engineer, Electric Power Research Institute, will discuss evaluating the advanced functions for smart inverters through computer modeling of California distribution circuits, laboratory testing, and field pilot testing.

Dr. Edward Cazalet
Founder & CEO, TeMix Inc., will discuss a project that, in collaboration with Universal Devices, is developing and testing a complete, low-cost, and standards-based energy management solution to take pre-programmed load control and demand response automation to the next level.

BREAKOUT SESSION **THREE** PANELS **3:45 – 5:00 p.m.**

Resilient and Equitable Communities

Room 304 – 305

Technological learning, also referred to as "learning-by-doing" or "learning-through-implementation," is a necessary step in the adoption of new energy technologies, especially in underserved communities that have not been primary locations for new technology demonstrations. This panel session will discuss projects demonstrating new energy technology solutions in disadvantaged and low-income communities, the technological learning that has resulted from these demonstrations, and how this learning can be applied to streamline the time and cost of future deployments in the state's most underserved communities.

Moderator: **Martha Guzman Aceves**
Commissioner, CPUC

Presenters: **Michelle Tirto**
Associate Sustainability Asset Manager, LINC Housing, and Ram Narayanamurthy, Technical Executive, EPRI, will discuss a project that is developing and demonstrating non-intrusive energy efficient retrofit packages for multifamily buildings located in disadvantaged communities.

Andy Brooks
Director of West Coast Operations, Association for Energy Affordability, will discuss a project that evaluates new electric water heating and space conditioning technologies in affordable, multifamily buildings.

Dr. Peter Alstone
Assistant Professor, Humboldt State University, will discuss a project focused on developing standardized hardware design guidelines for integrating solar, storage, and advanced load control at small commercial sites.

Madeline Stano
Energy Equity Legal Counsel, The Greenlining Institute, will provide perspective on what projects will have the most impact in underserved communities in the future.

BREAKOUT SESSION **THREE** PANELS **3:45 – 5:00 p.m.**

Investor Owned Utility Coordination of Research Administration Plan & Coordination with EPIC Administrators

Room 302 – 303

Get an overview of the investor-owned utilities' forthcoming research administration plan and plans to coordinate their EPIC investments.

Moderator: **Dan Gilani**
Program Manager, PG&E

Presenters: **Dan Gilani**
Program Manager, PG&E

Aaron Renfro
Senior Advisor, SCE

Frank Goodman
EPIC Program Manager, SDG&E

POSTER SESSION

1. **Lawrence Berkeley National Laboratory**

   Reducing Standby Power Use

   This project investigates new technologies to reduce standby power usage to zero.

2. **Opcondys**

   Ultra High-Efficiency Energy Control Using Light

   This project tests an innovative, light-controlled, electric power switching device. When used in wind and solar inverters and other equipment for the smart grid, it will provide significant energy and cost savings.

3. **Sepion Technologies, Inc.**

   Advancing Battery Performance with Materials Innovation to Enable the Electrification of Transportation

   Sepion Technologies, Inc. is testing breakthrough Li-battery membrane designs to address the biggest hurdles facing EV adoption, range anxiety and up-front cost.

4. **MOEV, Inc.**

   Using Artificial Intelligence to Enhance EV Charging for the Smart Grid

   This project is developing cost effective electric vehicle charging at the workplace to allow for more electric vehicle utilization and adoption.

5. **UC Davis**

   Improving Water and Energy Efficiency in California's Dairy Industry

   This project tests new approaches for cooling dairy cows that can significantly reduce both water and energy use.

6. **Lawrence Berkeley National Laboratory**

   Safety, Security, and Health Devices in California Homes

   This project aims to improve energy efficiency of household devices that draw loads throughout the day such as smoke detectors, alarms, and air filters.

7. **Western Cooling Efficiency Center, UC Davis**

   Improving Market Conditions for Increased Adoption of Ground-Source Heat Pumps

   This project aims to improve market conditions for increased adoption of ground-source heat pumps in California by identifying optimal engineering and designs.

8. **OhmConnect**

   Empowering Consumers to Save Energy through a Residential Demand Response Software Platform

   OhmConnect has developed a residential demand response software platform that rewards residential utility customers to save energy when the grid is stressed.

9. **Porifera, Inc.**

   Driving Energy Efficiency and Water Reuse Forward in California's Production Facilities

   This project develops forward osmosis technology that has the potential to cost-effectively reduce energy and water consumption in the treatment of industrial wastewater.

10. **UC Berkeley**

    Demand for Industrial Energy Management in California

    This project tests the demand for and impact of a software-based energy management system for compressed air systems at 100 industrial facilities.

11. **Lawrence Berkeley National Laboratory**

    Making Consumption Visible with 'Energy Reporting'

    This project is developing an interoperable protocol that will provide energy reporting on energy consumption of all plug load devices to California building owners and operators.

12. **Lawrence Berkeley National Laboratory**

    Creating Value, Driving Adoption for Cost-Effective, Demand Response-Enabling Commercial Lighting Systems

    This project seeks to quantify the value of demand response for networked lighting systems and integrate this value into a broader advanced lighting controls value proposition framework.

POSTER SESSION

13. Kennedy Jenks Consultants

Primary Filtration Improves Wastewater Treatment Efficiency & Saves Energy

This project demonstrates the use of primary filtration as a potential energy saving alternative technology to conventional primary clarification for wastewater treatment.

14. UC Davis

Energy and Water Savings from Onsite Water Reuse in the Wine Industry

This project demonstrates that large water intensive industries, like wineries, can play a role in reducing overall potable water consumption in California while also reducing energy requirements and resulting greenhouse gas generation.

15. Lawrence Berkeley National Laboratory

An Easy Zero! Validated Zero Net Energy Retrofit Tool and Packages for Small Commercial Offices

This project is demonstrating cost effective technology packages for small commercial offices to achieve zero net energy and developing additional features for an online tool to access cost-evaluative retrofit analysis for buildings.

16. Lawrence Berkeley National Laboratory

Flexible, Networked Lighting Control Systems That Reliably Save Energy

This project is developing advanced lighting control systems that are easier to install, commission, and operate.

17. Universal Devices, Inc.

Alexa, when should I run my dryer?

Using simple IOT tools to enable automatic buying and selling of electricity based on variable prices that reflect costs and grid conditions.

18. UC Davis

Advancing Demand Response in the Water Sector

This project aims to develop an energy management system to optimize energy use and operations for water districts, and help them to participate in demand response and load shifting programs.

19. UC Merced

Energy Harvesting of Highway Traffic by Piezoelectrics

The project integrates multi-layer piezoelectric generators to create roadway piezoelectric energy harvesting system with ultra-high power density and efficiency such that over 50 percent mechanical energy can be harvested as electricity.

20. Western Cooling Efficiency Center, UC Davis

Improving Indoor Air Quality in California Schools

This project will evaluate and recommend improvements to recent HVAC retrofits in schools by assessing ventilation, efficiency, and market barriers.

21. InnoSepra, LLC

Process for Low-Cost Baseload Power and Natural Gas Generation

This project offers a technology that can produce high quality renewable gas for baseload power generation or compressed natural gas at a significantly lower cost.

22. Lawrence Berkeley National Laboratory

Environmental Impacts of Organic Waste-to-Energy Options

This project provides an analytical framework to scale up operations and overcome deployment challenges through demonstration and evaluation. The project also presents wide array of environmental impacts and improvement strategies to transform organic municipal solid waste into heat, electricity, and compost via dry anaerobic digestion.

POSTER SESSION

23. Andromeda Power, LLC

Vehicle-to-Grid Interfaces for Sustainable EV Charging and Expansion

InCISIVE-VGI (iVGI) enables a facility to use higher power than the power available from the grid without any grid upgrade.

24. West Biofuels, LLC

Biomass Energy and Biochar Production Can Help Maintain Healthy Forests

This project demonstrated a viable technology to convert residues from sustainable forest management to produce renewable grid power and reduce forest fire risk.

25. Pyro-E, LLC

Regenerative Highway: Electricity from Rolling Resistance

This project distributes vehicle loads uniformly across piezo components and uses piezoelectric generators that generate an electric charge in response to applied mechanical stress from untapped resource of roadway deflection and vibration.

26. Electric Power Research Institute (EPRI)

Improving California's Grid with Solar Forecasting

The project develops an improved forecasting system for solar irradiance in California, with a particular focus on fog and stratus conditions. The improved forecasts will be integrated into operational tools for use by the California Independent System Operator and utilities.

27. UCLA Institute of the Environment and Sustainability, CA Center for Sustainable Communities

Using Big Data to Holistically Assess Benefits from Building Energy System Transition Pathways in Disadvantaged Communities

This project assesses energy transition pathways for deep greenhouse gas reductions using a holistic approach, considering energy efficiency, electrification, and urban renewable generation to improve indoor and ambient air quality in disadvantaged communities.

28. UC Berkeley, Transportation Sustainability Research Center

Using Electric Vehicle Activity Data to Inform Vehicle Grid Integration Potential

The Total Charge Management project is the largest real-world managed charging demonstration in California, encompassing about 400 households. This project uses vehicle telematics data to inform infrastructure and VGI planning in support of California's vehicle electrification and renewable electricity goals.

29. Port of San Diego

Resiliency in Terminal Operations Microgrid at the Tenth Avenue Marine Terminal

The San Diego Unified Port District is developing a new, permanent, renewable microgrid at the Tenth Avenue Marine Terminal that can be replicated at other seaport terminals and distribution facilities throughout California, the United States, and internationally.

30. Electric Power Research Institute (EPRI)

Guiding Energy Storage Project Valuation with StorageVET

Stakeholders are utilizing StorageVET® across a broad range of grid applications, locations, and technologies such as Los Angeles Department of Water and Power to evaluate meeting its California Energy Storage Requirements with a 100 megawatt, four-hour storage system under cost effective scenarios for ratepayers.

31. Smart Grid Energy Research Center (SMERC), Mechanical Engineering Dept., UCLA

Demonstrating EV Smart Charging and Storage Supporting Grid and Fleet

This project is developing EV smart charging options to enable fleet owners to meet their operational needs while reducing costs.

POSTER SESSION

32. Gridscape Solutions

Empowering California Fire Stations with Low Cost Renewable Microgrids

This project demonstrates three microgrid systems at the Fremont Fire Stations, which generate local clean power, lower energy costs, and provide emergency shelter during disasters such as wildfires or earthquakes.

33. Port of Long Beach

Resilience for Critical Facilities

The microgrid will provide resiliency for the Joint Command and Control Center, which is utilized by federal, state, and local response agencies to provide coordinated response to the Port of Los Angeles in an emergency.

34. CSU, Long Beach & UC Riverside

Enhancing Energy Efficiency and Demand Response Capability in University Buildings

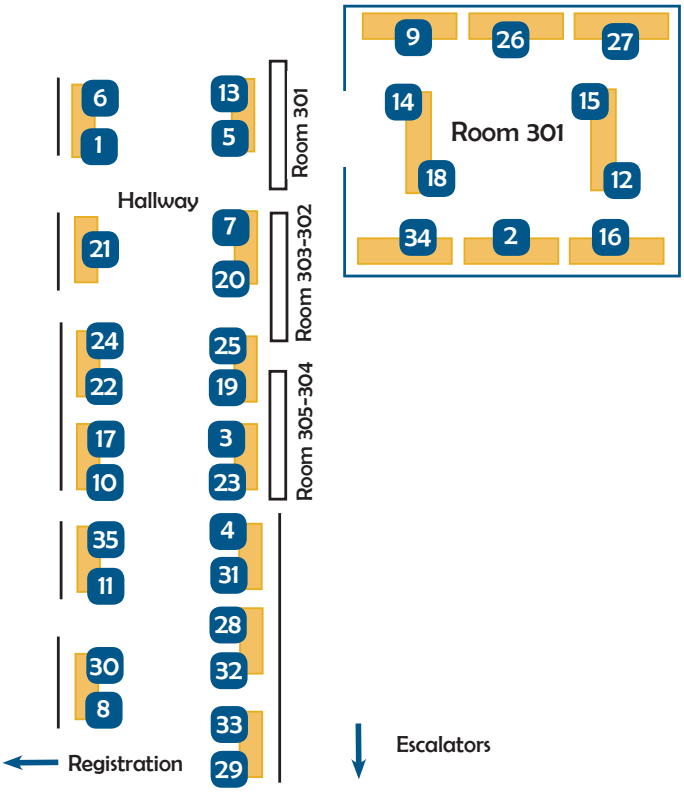
This project develops an innovative energy management system with an internet of things based platform to optimize load operations, load leveling and peak shaving for control of lighting, HVAC and plug loads.

35. Lawrence Berkeley National Laboratory

Green Gaming: Give Energy Efficiency a Role

This project provides a first-of-it-kind study characterized the statewide energy consumption associated with video and computer gaming, electricity-saving scenarios, and strategies for improving the energy efficiency performance of computer gaming products in California.

Map of Poster Session



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