

THE CANNABIS INDUSTRY ENERGY CHALLENGE - *A Utility View of Cannabis Industry Energy Issues*

April 10-11, 2017

San Francisco Airport Marriott Waterfront
San Francisco, CA

POST-CONFERENCE WORKSHOP

**Managing Power Grid Impacts
of the Cannabis Industry:**
*Load Forecasting and Distributed
Generation Solutions*

TUESDAY, APRIL 11, 2017



EUCI is authorized by IACET to offer 1.0 CEUs for this conference and 0.3 CEUs for the workshop

OVERVIEW

The paradigm of marijuana legalization across the country will have profound impacts and consequences on power operations and electricity consumption. Following the election of November 2016, about 60 percent of Americans now live in a state where cannabis is legal or soon to be legal in some form. Voters in four states – California, Massachusetts, Nevada and Maine – chose to legalize recreational marijuana, while four others — Florida, Arkansas, North Dakota and Montana — passed measures allowing cannabis to be used for medical purposes. To date, 29 states and the District of Columbia have legalized medical marijuana and 8 have legalized it on the recreational level.

Many voters and legislatures that have legalized pot consumption do not realize that the cannabis industry is an extremely energy-intensive business. Indoor-growing facilities require massive amounts of energy for lighting, venting, and dehumidification. In 2012, even before the legalization wave started in earnest, one study found that legal indoor marijuana growing facilities accounted for 1% of national electricity use at a cost of roughly \$6 billion per year, already rivaling energy consumption of data centers. States where cannabis was first legalized — especially at the recreational level in Colorado, Washington, Oregon and Alaska — have struggled to find effective solutions to manage the industry's prodigious energy consumption. This conference will explore the impact and consequences on electricity consumption and power operations of the rapidly growing cannabis industry in the United States. It will evaluate these key considerations that utilities must confront when the laws permit marijuana consumption:

- Planning for and accommodating the cannabis industry as related to legal and financing concerns
- Power operations and grid reliability
- Estimating energy requirements
- Solutions for efficiency
- Policy/rate-design options

LEARNING OUTCOMES

- Identify the impact of the cannabis industry to utility system operations and the power grid
- Review cannabis industry growth on a national level and its impact on electricity consumption
- Discuss regulatory standards and legal issues relevant to electric utilities
- Assess energy requirements for a typical marijuana cultivation facility
- Identify best management practices for managing and curbing electricity consumption of the cannabis industry
- Evaluate optimal HVAC and engineering designs for energy efficient marijuana grow rooms
- Review case studies from electric utilities around the country on:
 - o Energy efficiency incentives
 - o Initiatives to manage energy consumption
 - o Engagement and operational planning with the cannabis industry
 - o Quantifying and offsetting cannabis energy consumption techniques
 - o Smart-metering solutions
- Assess tips to streamline hookups and manage power delivery to a pipeline of new projects

AGENDA

MONDAY, APRIL 10, 2017

7:30 – 8:00 am

Registration and Continental Breakfast

8:00 – 9:00 am

The Cannabis Industry Challenge — Understanding the Magnitude & Impacts on the Power System

- Size of industry and projected growth in legal marijuana sales
- Regional and national cannabis electricity consumption
- The future of indoor vs. outdoor growing
- How energy is used in marijuana growing facilities
- Historical barriers to collaboration and information sharing
- Energy challenges for utilities
 - o Power grid implications
 - o Load forecasting
 - o Reliability
 - o Federal government policies re: criminalization
 - o Commission policy
- Energy challenges for marijuana industry
 - o High cost of capital
 - o Utility inexperience

Tim Hade, Microgrid Specialist, Scale Microgrid Systems

9:00 – 10:15 am

Considerations for Energy Efficiency Regulations and Standards in California Environmental Impact Assessments of Cannabis Industry

- How will the outcomes impact licensing of cannabis facilities?
 - o Establishing a baseline of cannabis energy requirements and overall environmental impacts
- California draft regulations – status and components under consideration
 - o Implications for licensing commercial indoor grows in various regions
- Designing standards for energy efficiency building standards for growing operations in California
 - o Building standards – considerations for minimum requirements for efficiency
 - o Lighting and HVAC
 - o Pool pumps/water efficiency

Dave Ashuckian, Deputy Director – Efficiency Division, California Energy Commission

Amber Morris, Branch Chief - CalCannabis Cultivation Licensing, CA Department of Food & Agriculture

10:15 – 10:30 am

Morning Break

AGENDA

MONDAY, APRIL 10, 2017 (CONTINUED)

10:30 – 11:45 am

Energy Consumption Associated with Marijuana Cultivation and Introduction to Best Management Practices

- Costly upfront installations vs. costly retrofits down the road
- Cultivation factors
- Equipment overview
- Energy use factors
 - o Grow style and grow medium
 - o Strain differentiation — Indica vs. Sativa
 - o Grow methodology
- Indoor
- Greenhouse
- Outdoor
- Clean energy solutions for cultivation
- Best management practices
 - o Smart meters
 - o High quality equipment
 - o Rebates
 - o Data limitations

Jacob Policzer, President, Cannabis Conservancy

11:45 am – 12:45 pm

Group Luncheon

12:45 – 1:30 pm

Grow Room Efficiency: HVAC, Plant Dynamics and Their Energy Consequences

This session will examine engineering and design characteristics that relate to how grow room facilities can optimize energy efficiency. It will discuss:

- Typical engineering and design characteristics of indoor grow rooms
- Challenges with typical HVAC design for grow rooms
- Environmental controls and HVAC for grow operations
 - o Dehumidification/cooling/heating
- Creating a dehumidification, heating and cooling system engineered specifically for indoor cannabis facilities
- Latent flux analysis — how sensible energy is converted to latent energy in grow rooms for an optimal indoor grow environment
- Various alternatives for maintaining the crucial temperature and humidity controls that are vital for proper plant growth and maximizing yield
- The role that utilities can play in these production decisions relating to power consumption and energy efficiency

Jim McKillip, Desert Aire Corp, Western Regional Manager

AGENDA

MONDAY, APRIL 10, 2017 (CONTINUED)

1:30 – 2:30 pm

Partnering for Energy Management Solutions: Understanding Lighting Needs and Their Energy Consequences

This session will discuss how utilities and marijuana growers can build a relationship to effectively collaborate on energy efficiency solutions and managing energy load in growing facilities. It will address:

- The importance of establishing a standard vocabulary for growers and energy companies
 - o Teaching growers about electricity, peak demand, etc.
 - o Teaching utilities about agriculture and plant energy requirements for growing
- Tips for utility account manager/grower communication
- Considerations for different lighting equipment
 - o Balancing productivity with efficiency
 - o Legacy technology
 - o LEDs
- Denver's recent benchmarking requirements for commercial buildings
- Denver's Cannabis Sustainability Working Group
 - o Overview, background and operational programs
 - o Developing efficiency/rebate programs with Xcel Energy
- Standardizing metrics for horticultural lighting
- Figuring out baseline standards for energy rates and access to programs
- American Society of Agricultural and Biological Engineers (ASABE)
 - o ES-311, Electromagnetic Radiation Application for Plants
 - o X640 — Radiation metrics for plant growth applications in controlled environment
 - o X642 — Recommended methods of measurements and testing for LED radiation products in plant growth and development applications

Emily Backus, Sustainability Advisor, City and County of Denver

2:30 – 3:15 pm

Utility Lessons Learned: Streamlining Hookups and Managing Power Delivery to a Pipeline of New Projects

- Case studies: KWH LLC, Walnut Creek, Hi Fi Farms
- Overcoming delays for power delivery to new customers
- Managing constraint/capacity
- Helping growers navigate the customer hook up processes
- Helping growers plug into utility programs for energy efficiency
- Regional coordination
 - o Consistent messaging about energy issues to growers
 - o Providing the right type of incentives and time of use rates

John Morris, Founder & Board Secretary, Resource Innovation Institute

3:15 – 3:30 pm

Networking Break

3:30 – 4:15 pm

Puget Sound Energy's Approach — Energy Efficiency Incentives to Cannabis Energy Customers

Dave Montgomery, Senior Energy Management Engineer, Puget Sound Energy

4:15 – 5:00 pm

Pacific Gas & Electric: LED Energy Efficiency Offerings to Customers

Representative, Pacific Gas & Electric

AGENDA

TUESDAY, APRIL 11, 2017

7:30 – 8:00 am

Continental Breakfast

8:00 – 9:15 am

Regulatory and Legal Update on Cannabis Industry Relevant to Electric Utilities

- Status of U.S. marijuana laws and projections on developments for marijuana laws on federal and state level
- Legal considerations for utilities related to banking and payment with marijuana growers
- Status of regulations on facility sizes for marijuana growing operations and trends in facility size
- New regulations and changes to existing regulations
- Tips for navigating the ever-changing marijuana legal landscape: what utilities need to know and track

Sean McAllister, Founder/Shareholder, McAllister Garfield, P.C.

9:15 – 10:00 am

Portland General Electric—Utility Engagement and Operational Planning with the Cannabis Industry

Theresa Haskins, Business Markets Manager, Portland General Electric

10:00 – 10:15 am

Morning Break

10:15 – 11:00 am

Boulder County: Quantifying and Offsetting Cannabis Energy Consumption – RECs, Demand Charges & Reinvestment

Boulder County, Colorado, requires marijuana grows located in unincorporated areas of the county to either offset their usage with renewable energy credits or pay a 2.16-cent charge per kwh that goes to the Boulder County Energy Impact Offset Fund. This session will discuss the process in designing these regulations and the outcome of the requirements so far, as well other technical solutions to manage grower energy consumption.

- Analyzing carbon intensity of local grid and determining how to put a price on carbon emissions per kilowatt hour
- Designing regulations for cannabis industry energy consumption
- Offset options for marijuana growers
 - o On-site renewables
 - o Renewable Energy Credits (RECs)
 - o Payments to the Boulder County Energy Impact Offset Fund
- How growers used data to manipulate demand charges and save money
 - o Energy monitoring devices — data on energy usage, details on performance
 - o Manipulating demand charges to save money

Ron Flax, Chief Building Official - Boulder County Land Use, Boulder County

11:00 – 11:45 am

Smart Metering Solutions to Manage Marijuana Operations Energy Consumption

- BC Hydro's smart meter system - outcomes for managing electricity theft and saving millions
- BC Hydro's "inventory balance" power flow monitorization
- Adding metering on the grid to keep tabs on power flow to localized areas, using analytical tools to combine that data with smart meter data, and sending out an
- Average kilowatt hours for residential homes vs. growers
- How will federal legalization of marijuana impact the situation?
- Opportunities for BC Hydro's smart meter system to manage future legal marijuana growing operations

John Millard, Manager – Revenue Assurance and Customer Analytics, BC Hydro (invited)

11:45 am

Conference Adjourns

AGENDA

POST-CONFERENCE WORKSHOP

Managing Power Grid Impacts of the Cannabis Industry:

Load Forecasting and Distributed Generation Solutions

TUESDAY, APRIL 11, 2017

12:30 – 1:00 pm **Registration**

1:00 – 4:00 pm **Workshop Timing**

OVERVIEW

This workshop will review key considerations for utility operational and resource planning as a result of the quickly expanding cannabis industry across the United States. It will discuss how utilities can forecast and plan for increased load growth in their region as a result of the industry, and review how this new load will impact and challenge the electricity grid. It will assess considerations and associated costs for integrating facilities into traditional grid infrastructure. The workshop will identify best practices for managing the industry, assessing costs for integrating facilities into traditional grid infrastructure as well as evaluating new opportunities with distributed generation and microgrid applications.

LEARNING OUTCOMES

- Assess best practices in forecasting load growth from the cannabis industry
- Evaluate implications and challenges to the power grid
- Review best practices for operational planning and managing increased load growth
- Evaluate distributed generation and microgrid solutions to manage cannabis energy requirements

WORKSHOP INSTRUCTOR



Tim Hade

Co-Founder and Microgrid Specialist, Scale Microgrid Systems

Tim Hade is a Microgrid Specialist at Scale Energy Solutions, a business he co-founded to help marijuana cultivators manage their energy consumption requirements by integrating cutting-edge clean technology solutions into their facilities. He previously worked at ENER-G Rudox as Vice President of Integrated Energy Solutions and as an officer in the United States Air Force (USAF).

AGENDA

Load Profiles of Marijuana Facilities

- Energy demands over 24 hour life cycle

Forecasting Increased Load Growth from the Cannabis Industry

- Best practices for analyzing overall energy consumption requirements

Power Grid Implications and Challenges

- Analyzing the impact of hundreds of marijuana facilities coming onto the grid
- Power grid resiliency and reliability issues

Resource Planning Considerations Related to Regional Clean Energy Goals and Regulations

- How do you reduce carbon emissions when experiencing increased load growth?

Operational Planning for Managing Increased Load

- Strategic planning considerations for utilities
- How can utilities get involved in the licensing process?

Preparing Traditional Grid Infrastructure to Accommodate Cannabis Facilities

- Infrastructure upgrades and associated costs
 - o Substations
 - o Service engines
- How do you pay for infrastructure upgrades required to pay for this industry?

Distributed Generation Applications and Solutions

- The utility business case for distributed generation as a solution to cannabis energy management
 - o Saving money and reducing emissions
- Clean technology applications
- Evaluating the right mix of technologies

Microgrid technology applications

- Status of microgrid technology in the United States
- Understanding the value proposition: grid resiliency, economics and emissions



INSTRUCTIONAL METHODS

PowerPoint presentations, keynote presentations, and panel discussions will be used in this program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the conference to be eligible for continuing education credit.

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for this conference and 0.3 CEUs for the workshop

EVENT LOCATION

A room block has been reserved at the San Francisco Airport Marriott Waterfront, 1800 Old Bayshore Highway, Burlingame, CA 94010, for the nights of April 9-11, 2017. Room rates are US \$179 plus applicable tax. Call **1-650-692-9100** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is March 12, 2017 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to these conferences may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.





Please make checks payable to: "PMA"

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PLEASE SELECT

- THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE AND WORKSHOP:** APRIL 10-11, 2017: US \$1895,
EARLY BIRD on or before MARCH 24, 2017: US \$1695
- THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE ONLY:**
APRIL 10-11, 2017: US \$1495,
EARLY BIRD on or before MARCH 24, 2017: US \$1295
- POST-CONFERENCE WORKSHOP ONLY:** TUESDAY APRIL 11, 2017: US \$595
EARLY BIRD on or before MARCH 24, 2017: US \$495

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name

Job Title

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What name do you prefer on your name badge?

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List any dietary or accessibility needs here

CREDIT CARD INFORMATION

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Billing Zip Code/Postal Code

Exp. Date

Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

OR Enclosed is a check for \$ _____ to cover _____ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before March 10, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of conference cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at (201) 871-0474.