THE CANNABIS INDUSTRY ENERGY CHALLENGE: An Electric Utility Perspective

October 11 – 12, 2017
Hyatt Regency San Francisco
San Francisco, CA

POST-CONFERENCE WORKSHOP

Designing and Implementing Utility Energy Efficiency Incentive Programs for Cannabis Growers

THURSDAY, OCTOBER 12, 2017
OVERVIEW

The paradigm of marijuana legalization across the country is already having profound impacts and consequences on power operations and electricity consumption. 60 percent of Americans now live in a state where cannabis is legal or soon to be legal in some form. To date, 29 states and the District of Columbia have legalized medical marijuana and 8 have legalized it on the recreational level.

Many communities and governments that have legalized marijuana growth and consumption do not realize that the industry is an extremely energy-intensive business. Indoor-growing facilities require massive amounts of energy for lighting, venting, and de-humidification. 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 focus on evaluating key considerations and planning needs that electric utilities must confront when operating in a market for legal or recreational marijuana grows.

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:
  - Energy efficiency incentives
  - Initiatives to manage energy consumption
  - Engagement and operational planning with the cannabis industry
  - Quantifying and offsetting cannabis energy consumption techniques
  - Smart-metering solutions
- Assess tips to manage power delivery to a pipeline of new cannabis customers
- Review initiatives to standardize best horticultural lighting practices and understand how national standards will help utilities create optimal incentive programs

“Excellent conference.”
National Account Executive, Trane

“Good introductory conference. Well-rounded selection of topics.”
Resource Management Consultant, New Energy Technology
AGENDA

WEDNESDAY, OCTOBER 11, 2017

7:30 – 8:00 am  Registration and Continental Breakfast

8:00 – 9:15 am  The Cannabis Industry Challenge — Understanding the Magnitude & Impacts on the Power System

- Industry size and projected growth in legal marijuana sales
- National cannabis electricity consumption
- Cannabis’s “carbon footprint conundrum”
- The projected trends for growing style — greenhouse, indoor and outdoor
- Properly assessing grid impacts of legal grows — challenges for electric utilities
  - Power system implications
  - Load forecasting
  - Reliability
- Data challenges and barriers to information sharing, best practices and collaboration
- Utility incentive payments to growers, financing and the law
- Cultural and social challenges
  - Benchmarking and disclosure
  - Product labeling
- Energy challenges for marijuana industry
  - High cost of capital
  - Utility inexperience

Duane Jonlin, Energy Conservation Advisor, City of Seattle
John Morris, Vice President – Market Development, D+R International

9:15 – 10:15 am  Regulatory and Legal Update on Cannabis Industry Relevant to Electric Utilities

- Status of U.S. marijuana laws and projects on development for marijuana laws on federal and state level
- Legal, regulatory considerations for utilities establishing business relationships with marijuana growers
- What utilities need to know and track — tips for navigating the ever-changing marijuana legal landscape and their impacts to their marijuana business partners
- Ensuring compliance for operations, land use, zoning, and environmental issues
- Renewable energy requirements for indoor growers in California – achieving 42%
- California coastal zone compliance challenges — siting issues in the prime region for business opportunity
  - California Environmental Quality Act (CEQA)
  - Working with operators and local jurisdictions

Pamela Epstein, Owner and Founder, GreenWise Consulting, and Of Counsel, Ho Ban Law Group

10:15 – 10:30 am  Morning Break

“Excellent conference for interchange and exchange of a timely topic affecting utilities.”

President & COO, EYE Lighting International
AGENDA

WEDNESDAY, OCTOBER 11, 2017 (CONTINUED)

10:30 – 11:45 am  Marijuana Cultivation, Energy Consumption, and Sustainability: Indoor, Greenhouse, Outdoor Grows

- The complexity of the cannabis plant and its energy needs for growth
- Cultivation factors
- Equipment overview
- Energy use factors
  - Grow style and grow medium
  - Strain differentiation – indica vs. sativa
- Indoor
- Greenhouse
- Outdoor
- Marijuana growth cycle and technology/energy requirements
  - Veg
  - Clone
  - Flowering
- Clean energy and sustainable solutions for cultivation
- Best energy usage and water management practices
- Evaluating practices and pathways to make the cannabis industry more environmentally viable
- Developing sustainable standards and practices for both indoor and outdoor certification
- Enabling siting policies for greenhouse growing facilities — is this a viable path?

_Derek Smith, Executive Director, Resource Innovation Institute (RII)_
_Jacob Policzer, President, Cannabis Conservancy_

11:45 am – 12:45 pm  Group Luncheon

12:45 – 2:00 pm  Considerations for Energy Efficiency Regulations and Standards in California

- Environmental impact assessments of cannabis industry
- California Energy Commission (CEC) appliance standards
  - Phase II looking at fans/blowers applicable to indoor growing industry
- Appliance standards for grow equipment
  - Lighting, ventilation, de-humidification
- Building standards for grow facilities
  - Indoor agriculture as a covered process
  - Agricultural spaces as process spaces
  - Agricultural equipment as process loads
- Appliance efficiency standards
- How are agricultural buildings regulated by the Energy Code?
- Is there a need for indoor agriculture regulations?
- CEC wants to know:
  - Who are major suppliers of equipment?
  - Are there distribution suppliers, or who are major equipment manufacturers, the agency would be able to glean from?

_Dave Ashuckian, Deputy Director – Efficiency Division, California Energy Commission_
_Amber Morris, Branch Chief – CalCannabis Cultivation Licensing_
2:00 – 2:45 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 and typical HVAC design for grow rooms
• Environmental controls and HVAC for grow operations
  o De-humidification/cooling/heating
• Creating a de-humidification, 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, Western Regional Manager, Desert Aire Corp

2:45 – 3:00 pm  Afternoon Break

3:00 – 3:30 pm  Western Cooling Efficiency Center Research Project: Energy Efficient De-humidifiers for Indoor Marijuana Farms
The Western Cooling Efficiency Center (WCEC) at the UC Davis conducts research projects to accelerate the development and commercialization of efficient heating, cooling, and energy distribution solutions. This session will discuss WCEC’s research on how HVAC and de-humidification technologies can be optimized to enhance energy efficiency for indoor cannabis farming operations, discussing:
• Developing an energy model to track the different energy flows of an indoor farming facility
• Laboratory testing and managing demonstrations of evaporative cooling technologies.
• Research and technology for water generation and energy recovery to help indoor facilities for marijuana reduce their energy costs while optimizing their indoor environment
  
  Theresa Pistochini, Engineering Manager, Western Cooling Efficiency Center (WCEC)

• Cannabis in Washington state
• Cannabis industry impact to PSE post legalization
• Cannabis production in Puget Sound Energy’s territory
  o Licensing and regulations
  o Indoor and outdoor grows
  o Grow lighting
• PSE energy conservation initiatives for grow facilities and their energy efficiency results
• Implementing energy efficiency incentives with cannabis customers
  o Analysis of billing histories to project proposals for energy savings potential
  o Calculating project energy savings for use in incentive formula
• Providing excellent customer service to project contractors and customer
  
  Peter Liljesve, Senior Energy Management Engineer, Puget Sound Energy (PSE)
AGENDA

WEDNESDAY, OCTOBER 11, 2017 (CONTINUED)

4:15 – 4:45 pm  State of States: A Review of Public Utility Commission Activities
This session will discuss findings of a recently completed, national review of state commission and public power agency responses related to the emerging cannabis industry. The study examined the details of energy efficiency programs and ratemaking to determine current activities and develop insights on future trends. This session will review the methodology of the study and key findings, addressing:
• Specific commission responses to the growth of the cannabis industry
• Notable utility energy efficiency activity and rate design
• Distribution of rebate activity across lighting, HVAC and custom programs
• Emerging trends and opportunities at state public utility commissions
  Cameron Brooks, President, E9 Insight

4:45 pm    Program Adjourns for Day

THURSDAY, OCTOBER 12, 2017

7:30 – 8:00 am  Continental Breakfast

8:00 – 8:45 am  BC Hydro – Efforts to Specifically Address Opportunities with Cannabis Grow Facilities
This session will discuss how BC Hydro, the largest utility in the Canadian province of British Columbia, is currently evaluating how to develop specific approaches to best address the utility business opportunity with cannabis grow facilities. It will also touch on the dynamics of Federal and provincial cannabis legalization regulations and how they are impacting the Canadian power industry.
  Kymm Girgulis, Key Account Manager, BC Hydro

8:45 – 9:30 am  Snohomish Public Utility District – Enabling Incentives for Federal Power
Snohomish Public Utility District (SPUD) receives 80% of its power from Bonneville Power Authority (BPA), a federal power organization. Despite this obvious conflict, Snohomish was able to work with BPA to develop specialized energy efficiency incentives for the SPUD’s cannabis customers. This session will discuss this process and speak generally to Snohomish’s experiences and lessons learned along the way.
  Lou Loos, Account Manager, Snohomish PUD

9:30 – 9:45 am   Morning Break
9:45 – 11:15 am  Establishing Standards for Horticultural Lighting: Enabling Optimal Utility Incentive Programs
There are currently a number of lighting industry associations working to establish standards and baseline metrics for horticultural lighting, with regard to energy efficiency and improved plant production. Establishing standards such as these would be of huge benefit to electric utilities in designing optimal incentive programs for cannabis energy customers. This session will give an overview and update of the latest standards for horticultural lighting form both industry and the US governments, focusing on LED lighting. It will explain the objectives and procedures for measuring equipment, discussing:
• Photonic radiation — how plants/marijuana respond to light
• Establishing universal metrics for plant responses to radiations
• Overview of horticultural lighting technologies and their performance in marijuana grows
• Objectives, procedures and rational for measuring long-term horticultural lighting characteristics
  o Lighting characteristics
  o Measurement equipment and instruments
  o Research and standardization
• Initiatives and stakeholder groups working to establish Horticultural Lighting Standards
  o American Society of Agricultural and Biological Engineering (ASABE) LED Horticultural Lighting Standards
  o ETL and UL Testing Labs
  o Design Lights Consortium
• Applying standards development to utility industry and energy savings
  Moderator: Bob Gunn, President & Founder, Seinergy
  Jianzhong Jiao, Chair – Plant Growth LED Lighting Committee, American Society of Agricultural and Biological Engineers (ASABE)
  Tom Salpietra, President & COO, EYE Lighting International
  Irina Rasputnis, Program Manager, DesignLights Consortium

11:15 – 11:45 am  Will the Cannabis Industry Follow the C&I Renewable Procurement Trend?
As the legal cannabis industry continues to evolve, it’s reasonable to assume marijuana growers may strategize to become more sustainable to garner a more positive public opinion of their industry practices. This session will discuss what a more responsible sustainability profile might look like, considering the cannabis industry may take a path similar to the increasing trend of corporate and industrial (C&I) businesses procuring their own renewable energy. The presenter will draw from his experience in C&I renewable procurement and discuss the potential this trend could have for cannabis growers.
  Joshua Belcher, Of Counsel, Eversheds Sutherland

11:45 am  Conference Adjourns
AGENDA

POST-CONFERENCE WORKSHOP

Designing and Implementing Utility Energy Efficiency Incentive Programs for Cannabis Growers

THURSDAY, OCTOBER 12, 2017

12:30 – 1:00 pm  Workshop Registration
1:00 – 4:30 pm  Workshop Timing

OVERVIEW

Indoor cannabis growing operations consume immense amounts of electrical energy and to date, very little research based literature has been published to document energy efficiency opportunities for these utility customers. This workshop will focus on how utilities can best leverage incentive funds to mitigate the electric grid impacts associated with these types of facilities. A primary goal will be understanding the equipment required for growing operations (lighting, de-humidification, and air-conditioning equipment) and providing insight on how these operations can accomplish their production more efficiently. A major discussion point will be on how to effectively translate these efficiency opportunities into efficiency incentive programs, and the best outreach approaches for these customers, as well as the future direction of the cannabis industry.

LEARNING OUTCOMES

• Evaluate opportunities for improving the overall energy efficiency of indoor cannabis grow operations
• Review data analytic techniques to quantify cannabis production energy consumption
• Assess best practices in the design and implementation of utility incentive programs for commercial cannabis producing customers

“Overall, this was a very good session.”
Account Manager, Snohomish PUD

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AGENDA

THURSDAY, OCTOBER 12, 2017

I. Understanding the engineering behind the cannabis production process
II. Overview of energy-intensive equipment in indoor cannabis production facilities
   o Lighting
   o De-humidification
   o Air conditioning equipment
III. Energy efficiency opportunities in indoor cannabis production facilities
   o Designing the facility
   o Implementing efficiency measures post initial design
IV. Common barriers to adoption of energy efficiency measures
   o Expedition of facility set up often resulting in poor lighting and HVAC choices
   o High up-front costs
   o Lack of energy usage data
V. Technologies and data analytics for improving energy efficiency in cannabis growing facilities
   o Quantifying and offsetting cannabis energy consumption
   o Metering efforts to fill data gaps
   o Analyzing known data into useful applications
VI. Designing and implementing optimal incentive programs for cannabis
   o Review of utility programs in usage and their effectiveness
   o Customizing programs for specific customer needs
   o Effectively designing products and programs with pricing and technology
   o Motivating customer participation

WORKSHOP INSTRUCTORS

Jesse Remillard
Senior Engineer, Energy & Resource Solutions (ERS)
Jesse Remillard, is a Senior Engineer at Energy & Resource Solutions (ERS), focusing on the value verification of mechanical equipment upgrades for commercial and industrial facilities. He regularly performs engineering analysis for custom technologies, process improvements, HVAC, refrigeration, variable frequency drives, and lighting for new construction and retrofitefficiency projects. His specialties include establishing baselines for custom technologies, investigating energy efficiency program measure costs, and reviewing power generation and energy storage technologies. Mr. Remillard earned an MS in mechanical and aeronautical engineering from the University of California, Davis, and a BS in mechanical engineering from the University of Maine.

Nick Collins, PE
Senior Engineer, Energy & Resource Solutions (ERS)
Nick Collins, is a Senior Engineer for Energy & Resource Solutions (ERS) whose areas of expertise include the monitoring and verification of energy efficiency projects, as well as the analysis of energy efficiency and demand-limiting measures in commercial and industrial facilities. He is proficient in project and construction management, with an emphasis on sustainable design, high-performance buildings, and building methods in commercial and residential construction. Prior to joining ERS, Mr. Collins worked in construction management on a diverse array of commercial and institutional projects including Gillette Stadium, Terminal A at Logan Airport, and the Walker Art Building restoration and renovation at Bowdoin College.
INSTRUCTIONAL METHODS

PowerPoint presentations and test cases will be used to present course information.

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 Hyatt Regency San Francisco, 5 Embarcadero Center, San Francisco, CA 94111, for the nights of October 11-12, 2017. Room rates are US $289 plus applicable tax. Call 1-415-291-6514 or click here for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 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 this conference may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

SPONSORSHIP OPPORTUNITIES

Do you want to drive new business through this event’s powerful audience? Becoming a sponsor or exhibitor is an excellent opportunity to raise your profile before a manageably sized group of executives who make the key purchasing decisions for their businesses. There is a wide range of sponsorship opportunities available that can be customized to fit your budget and marketing objectives, including: Platinum, gold, or VIP sponsor, Reception host, Networking break host, Tabletop exhibit, Workshop sponsor, Lanyard sponsor, Luncheon host and Breakfast host.

Please contact Maggie Field at mfield@euci.com or 720-988-1250 for more information.
PLEASE SELECT

- **THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE AND WORKSHOP**: OCTOBER, 11 – 12, 2017: US $1795
  EARLY BIRD on or before SEPTEMBER 22, 2017: US $1595

- **THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE** ONLY
  OCTOBER, 11 – 12, 2017: US $1395
  EARLY BIRD on or before SEPTEMBER 22, 2017: US $1195

- **POST-CONFERENCE WORKSHOP** ONLY
  THURSDAY, OCTOBER 12, 2017: US $595
  EARLY BIRD on or before SEPTEMBER 22, 2017: US $495

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

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OR Enclosed is a check for $ to cover registrations. Make checks payable to EUCI.

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 September 8, 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 course 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 303-770-8800. EUCI reserves the right to alter this program without prior notice.