

THE CANNABIS INDUSTRY ENERGY CHALLENGE

A Power Industry View of Cannabis Industry Energy Issues

November 4-5, 2019
Hyatt Regency Orange County
Anaheim, CA

POST-CONFERENCE WORKSHOP

**Designing and Implementing
Utility Energy Efficiency
Incentive Programs for
Cannabis Growers**

TUESDAY, NOVEMBER 5, 2019

“

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

President & COO,
EYE Lighting International



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IACET to offer 1.0 for the
conference and 0.4 CEUs
for the workshop

OVERVIEW

Cannabis is already a \$10 billion industry and is becoming a global marketplace. In the U.S., the paradigm of marijuana legalization is already having profound impacts and consequences on power operations and electricity consumption, and these impacts will only increase as the industry grows. 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, considering:

- Power operations and grid reliability
- Estimating energy requirements
- Solutions for efficiency
- Policy/rate-design options
- Legal and regulatory compliance
- Cutting edge information on best equipment and design solutions for optimal efficiency
- Designing effective customer programs for cannabis customers

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 the unique legal, regulatory, and financing challenges for utilities as a result of the industry
- Assess energy requirements for a typical marijuana cultivation facility
- Determine methods to improve the sustainability of marijuana cultivation and energy usage
- Evaluate optimal HVAC and engineering designs for energy efficient marijuana grow rooms
- 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



“Super smart and informative speakers”

President, Forever Green Indoors



“This was a terrific program.”

Engineer, Southern California Edison

AGENDA

MONDAY, NOVEMBER 4, 2019

8:00 – 8:30 am

Registration & Continental Breakfast

8:30 – 9:45 am

The Cannabis Industry Energy Challenge – Understanding the Magnitude & Impacts on the 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
 - o Power system implications
 - o Load forecasting
 - o 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
 - o Benchmarking and disclosure
 - o Product labeling
- Energy challenges for marijuana industry
 - o High cost of capital
 - o Utility inexperience

Derek Smith, Executive Director, Resource Innovation Institute (RII)

John Morris, Vice President – Market Development, D+R International

9:45 – 10:00 am

Morning Break

10:00 – 11:45 am

Marijuana Cultivation, Energy Consumption and Sustainability 101: Indoor, Greenhouse, Outdoor Grows

- The complexity of the cannabis plant and its energy needs for growth
- Cultivation factors
- Equipment overview
- Energy use factors
 - o Grow style and grow medium
 - o Strain differentiation – indica sativa
- Indoor
- Greenhouse
- Outdoor
- Marijuana growth cycle and technology/energy requirements
 - o Veg
 - o Clone
 - o 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?

Jacob Policzer, Director of Science and Strategy, The Cannabis Conservancy

11:45 am – 1:00 pm

Group Luncheon

AGENDA

MONDAY, NOVEMBER 4, 2019 (CONTINUED)

1:00 – 2:00 pm

Regulatory and Legal Update on Cannabis Industry Relevant to Electric Utilities

- Status of state and federal law with respect to cannabis
- 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
- Potential utility liability for providing service
- Legal obligation to serve
- Power theft issues and considerations
- Utility legal obligations around cash management
- Special contract provisions to manage particular physical, financial and legal risks
- Special rates and policy concerns for high density loads
- Challenges with potential stranded assets
- California specific issues

Richard Lorenz, Partner, Cable Huston

2:00 – 2:45 pm

California Energy Requirements, Equipment Standards & Building Codes Applicable to the Cannabis Industry

- California Energy Commission (CEC) regulation process – how are regulations created?
- CEC standards on LED lighting standards
- CEC appliance standards on fans and blowers for indoor horticulture
- CEC standards for cannabis grow equipment
 - o Lighting, venting, de-humidification
- Other technologies being looked at
- How are agricultural buildings regulated by the Energy Code?
- Possible other regulations/future developments that could impact cannabis
 - o Renewables
 - o Upcoming California commercial building efficiency standards

Thao Chau, Electrical Engineer – Building Standards Office of the Efficiency Division, California Energy Commission (CEC) Representative (invited)

2:45 – 3:00 pm

Afternoon Break

3:00 – 3:45 pm

Cannabis Extraction & Manufacturing: Energy Consumption & Efficiency Solutions

- The future of cannabis manufacturing: market growth projections for nutraceuticals & pharmaceuticals
- Overview of cannabis concentrate products & their differing equipment and resource needs
- Overview of equipment and associated energy consumption
 - o Manufacturing equipment utilized
 - o Support equipment
 - o Ancillary production equipment
- Energy management strategies & solutions for cannabis manufacturing
 - o US manufacturing energy consumption
 - o Current practices for energy efficiency in manufacturing
 - o Recommendations for HVAC, lighting & building materials
- Opportunities for biofuels: energy production from cannabis & hemp biomass

Saman Razani, Founding Partner/COO, Lost Horse Supply

AGENDA

MONDAY, NOVEMBER 4, 2019 (CONTINUED)

3:45 – 4:30 pm

Utility Case Study: Sacramento Municipal Utility District (SMUD)

- Managing 300+ cannabis business entities in SMUD's territory
 - Helping customers navigate energy landscape to save time, energy and money
 - Ensuring cannabis customers' electricity needs and managing electrical service upgrades
- Engaging & collaborating with cannabis cultivation customers – indoor growing operations
 - Incentives and financing options that encourage investment in energy efficiency
 - Efficiency options for lighting, HVAC, & additional load
 - What the industry looks like on the grid
- SMUD R&D test results – energy efficient practices for indoor cultivation
 - LED vs. HPS lighting – impact on quality and quantity of cannabis product
 - Financial cost savings to customer
 - Is technology viable for application?
- Managing the energy footprint of cannabis extraction customers in SMUD's territory
 - Product overview – oils, edibles, topicals, vape pen solvents
 - Energy intensity of cannabis extraction & efficiency solutions

Matt McGregor, Strategic Account Advisor – Cannabis Operations, Sacramento Municipal Utility District (SMUD)

4:30 – 5:00 pm

Optimizing Utility Engagement & Operational Practices with Cannabis Customers

- Why should utilities care about this market?
- Seattle City Light: overview and lessons learned with cannabis industry engagement
- Efforts to engage power industry collaboration regionally and nationally to facilitate best practices
- Best practices & considerations for utilities:
 - Pragmatic ways to engage with the cannabis industry
 - Learning from existing mechanisms, data & case studies
 - Ensuring high quality customer service to important new industrial customers
- Considerations for utility energy efficiency programs for cannabis customers
 - Different ways to structure programs
 - Technical requirements
- Moving forward in a positive direction
 - How utilities can best operate in the cannabis industry space

John Arthur Wilson, Stakeholder Solutions Manager – Lighting Design Lab, City of Seattle



"All the topics were productive."

Distribution Supervisor, Imperial Irrigation District



"Good selection of speakers."

Interconnection Manager, BC Hydro

AGENDA

TUESDAY, NOVEMBER 5, 2019

8:00 – 8:30 am

Continental Breakfast

8:30 – 9:15 am

Utility Case Study: Southern California Edison (SCE)

- Managing and working with cannabis business customers in SCE's territory
- Working to provide adequate power to cannabis customers
 - o Customer outreach & collaboration strategies
 - o Collaborating with cannabis industry on energy efficiency issues
 - o Engineering & design solutions for lighting & HVAC
- Load forecasting practices for cannabis cultivation facilities
- Working through the challenges:
 - o Cannabis legalization – an unforeseen wrench in SCE's 10-year planning process
 - o Tremendous unforeseen load growth in SCE's territory
 - o Lengthy regulatory approval timelines for new SCE programs with the California Public Utilities Commission (CPUC)
 - o Lack of infrastructure to provide to communities where load is increasing substantially
- Solutions to move forward
 - o Improving communications between communities, growers and the power industry in the planning phases

Gary Corlett, Energy Analysis & Customer Outreach – Business Customer Division, Southern California Edison

9:15 – 10:00 am

Design Lights Consortium's Horticultural Lighting Specification: Implications & Moving Forward

Design Lights Consortium (DLC) is a non-profit whose mission is to drive efficiency in the commercial lighting sector. In October 2019, the DLC will release their new policy and technical requirements for a Horticultural Lighting Specification. This session will discuss their Specification, process and implications, addressing:

- The need for a well-designed horticultural lighting product
 - o Saving energy
 - o Optimizing plant growth and health
 - o Enabling utility program design and product testing
- History and process for designing the specification
- Overview of specification & results to date
- Qualifying high performance horticultural lighting products through the DLC specification
 - o Test procedures
 - o Alignment on performance needs
 - o Industry best practices
- Addressing areas of technical uncertainty and issues with measuring below visible light
- Implications for utilities – better management of increasing energy demand from horticultural facilities through incentive programs for efficient and effective horticultural lighting products

Damon Bosetti, Program Manager, Design Lights Consortium (DLC)

10:00 – 10:15 am

Morning Break

10:15 – 11:45 am

Closing Panel: Optimizing Utility-Cannabis Relationships & Technical Practices for Energy Efficiency & Grid Reliability

Moderator: John Morris, Vice President – Market Development, D+R International

Bob Gunn, Founder, Seinergy LLC

Gary Corlett, Energy Analysis & Customer Outreach – Business Customer Division, Southern California Edison

POST-CONFERENCE WORKSHOP

Designing and Implementing Utility Energy Efficiency Incentive Programs for Cannabis Growers

TUESDAY, NOVEMBER 5, 2019

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



“Well-rounded selection of topics.”

Resource Management Consultant,
New Energy Technology



“Overall, this was a very good session.”

Account Manager,
Snohomish PUD

WORKSHOP AGENDA

- 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 retrofit efficiency 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

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.

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.

INSTRUCTIONAL METHODS

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

EVENT LOCATION

A room block has been reserved at the **Hyatt Regency Orange County**, 11999 Harbor Blvd, Garden Grove, CA 92840, for the nights of November 3-4, 2019. Room rates are \$159 plus applicable tax. Call **1-714-750-1234** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is October 3, 2019 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.

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 the conference and 0.4 CEUs for the workshop.

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PLEASE SELECT

SPECIAL BUNDLE PRICE THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE AND POST-CONFERENCE WORKSHOP: NOVEMBER 4-5, 2019: US \$1895

EARLY BIRD on or before OCTOBER 18, 2019: US \$1695

THE CANNABIS INDUSTRY ENERGY CHALLENGE CONFERENCE ONLY

NOVEMBER 4-5, 2019: US \$1495

EARLY BIRD on or before OCTOBER 18, 2019: US \$1295

POST-CONFERENCE WORKSHOP ONLY

TUESDAY, NOVEMBER 5, 2019: US \$595

EARLY BIRD on or before OCTOBER 18, 2019: US \$495

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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 October 4, 2019 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. EUCI reserves the right to alter this program without prior notice.