EUCI
ONLINE CONFERENCE

THE CANNABIS INDUSTRY ENERGY CHALLENGE

A Power Industry View of the Cannabis-Energy Nexus

January 27-28, 2021
Online | Central Time

> ***"Great information! Used actual case studies; all info was really great and speakers were very professional."***
>
> Business Sustainability Coordinator, City of Boulder

EUCI ONLINE CONFERENCE

EUCI is pleased to offer this virtual conference on its online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and budget. You will gain new knowledge, skills, and hands-on experience from the convenience of your remote location.

POST-CONFERENCE WORKSHOP

Designing and Implementing Utility Energy Efficiency Incentive Programs for Cannabis Growers

THURSDAY, JANUARY 28, 2021

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AUTHORIZED IACET PROVIDER

EUCI is authorized by IACET to offer 0.9 CEUs conference, 0.3 CEUs workshop

OVERVIEW

The rapid growth of the legal marijuana market has been nothing short of an economic and cultural phenomenon, transforming what was once a criminal market into a mainstream, multi-billion-dollar global industry. Projections on the continued growth of the legal cannabis industry are strong, with one recent study estimating American marijuana businesses could reach an annual value of $130 billion in the U.S. economy by 2024 – increasing a staggering 181% from the ~$42 billion revenue of legal cannabis sales in 2019 (Marijuana Business Factbook 2020, 8th Ed.).

As the paradigm of marijuana legalization continues to grow across the U.S., it is important to take note of the profound nexus between the cannabis and energy industries. Marijuana cultivation is an extremely energy-intensive business, with indoor-growing facilities requiring 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.
This virtual conference will explore the role of energy industry engagement with their new cannabis customers, evaluating key considerations and planning needs that electric utilities must confront when operating in a market for legal marijuana grows, considering:

- Energy and technical requirements for marijuana cultivation
- Cutting edge research on horticultural lighting, best equipment, and facility design solutions for efficiency
- Designing effective utility programs and efficiency rebate incentives for cannabis customers
- The growing landscape of energy codes and standards in various state marijuana markets
- Power operations, grid reliability and load forecasting
- Policy/rate-design options
- Legal and regulatory compliance

LEARNING OUTCOMES

- Review growth of the legal cannabis industry on a national level and its impact on electricity consumption
- Identify states that are enacting energy codes and standards specifically for marijuana cultivators
- Discuss the impact of the cannabis industry to utility system operations and the power grid
- Discuss the unique legal, regulatory, and financing challenges for utilities
- 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
- Review case studies and hear 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

> ***"This was a terrific program."***
>
> Engineer, Southern California Edison

> ***"Excellent conference for interchange and exchange of a timely topic affecting utilities"***
>
> President & COO, EYE Lighting International

AGENDA

WEDNESDAY, JANUARY 27, 2021 – CENTRAL TIME

8:45 – 9:00 am **Log in**

9:00 – 9:05 am **Conference Introduction & Overview**

9:05 – 10:15 am **The Cannabis Energy Challenge – Understanding the Nexus of the Energy and Cannabis Industries**

- Cannabis industry landscape and projected growth in legal marijuana sales
  - Status of U.S. marijuana laws – recreational and medicinal
  - Global cannabis industry growth and legality trends
  - Trends for growing style: greenhouse, indoor and outdoor
- National cannabis electricity consumption and the cannabis''carbon footprint conundrum'
- Status of industry standards
  - standards are evolving
  - State energy standards/codes specific to cannabis cultivation
- What utilities need to know and track – tips for navigating the ever-changing marijuana landscape and their impacts to their marijuana business partners
- Grid impacts of legal grows: challenges for electric utilities
- Data challenges and barriers to information sharing, best practices and collaboration
- Cultural and social challenges
  - Benchmarking and disclosure
  - Product labeling
- Energy challenges for marijuana industry
  - High cost of capital
  - Utility inexperience
- "Utility Primer" toolkit for effectively working with cannabis industry
  - Strategic planning and collaboration
  - Program design
  - Evaluation and market engagement
- Overview of peer reviewed industry best practices for controlled environment agriculture for cannabis grow-ops

Gretchen Schimelpfenig, Technical Director, Resource Innovation Institute (RII)

10:15 – 11:45 am **Marijuana Cultivation, Energy Consumption and Sustainability 101: Optimizing Design of Cultivation Facilities**

- 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 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?

Jacob Policzer, President, Cannabis Conservancy

AGENDA

WEDNESDAY, JANUARY 27, 2021 – CENTRAL TIME (CONTINUED)

11:45 am – 12:30 pm **California Energy Codes & Standards for Growers and the Proposed LED Mandate**

- California Energy Commission (CEC) regulation process – how are regulations created?
  - Considerations for achieving state decarbonization and building electrification mandates
- CEC standards applicable to cannabis cultivation grow equipment
  - lighting, venting, HVAC
  - appliance standards on fans and blowers for indoor horticulture
  - other technologies being looked at
- Proposed CEC standard for mandated LED lighting in marijuana grow facilities
  - overview of CEC stakeholder engagement process
  - what it would mean for cannabis growing facilities and retrofits
- How are agricultural buildings regulated by the Energy Code?
- Possible other regulations/future developments that could impact cannabis
  - renewables
  - upcoming California commercial building efficiency standards

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

12:30 – 1:15 pm **Break for Lunch**

1:15 – 2:00 pm **Utility Lessons Learned Across the U.S. – Program Design, Streamlining Hookups & Managing Power Delivery**

- Key considerations for effectively designing utility programs for cannabis customers
  - Utility program design research with utilities across the country
  - Case studies on different approaches to utility programs
- Helping growers plug into utility programs for energy efficiency
- Overcoming delays for power delivery to new customers
- Managing constraint/capacity
- Helping growers navigate customer hook up processes
- Regional coordination
  - Consistent messaging about energy issues to growers
  - Providing the right type of incentives and time of use rates

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

2:00 – 2:45 pm **Utility Case Study: National Grid – East Coast Efficiency Strategies for Cannabis Customers**

- Overview of marijuana markets in National Grid territory
  - Recreational: Maine and Massachusetts since 2018
  - Medical markets: RI, VT, MA, NY
- Massachusetts' energy code – impacts on growers and National Grid's efficiency efforts
- Overview of National Grid's energy efficiency measures & incentives for cannabis customers
  - program design
  - program trends, uptake, & growth rate
  - solutions: what's working?
- Efficiency strategies & technologies for cultivators:
  - HVAC
  - Gas and driven chillers
  - Heat recovery methods
- Issues with small vs. large growers
  - Upfront system costs impacting technology choice

Francis Boucher, Energy Efficiency Program Manager, National Grid

AGENDA

WEDNESDAY, JANUARY 27, 2021 – CENTRAL TIME (CONTINUED)

2:45 – 3:00 pm **Afternoon Break**

3:00 – 4:30 pm **Cannabis in the Midwest – Update on State Programs, Energy Codes & Utility Engagement**

- Cannabis Midwest market update
  - Recreational: Illinois and Michigan in 2020
  - Medicinal: Iowa, Minnesota, Wisconsin, Indiana, Ohio, Missouri and Kansas
- How cannabis programs are being developed and rolled out
- How is the energy industry and utilities in these midwestern states engaging with cannabis customer?
- Illinois Energy Code update: lighting efficiency requirements specific to marijuana cultivators

Molly Graham, Programs Director, Midwest Energy Efficiency Alliance (MEEA)
Patrick Walters, Energy Specialist – Environmental Services, Lansing Board of Water & Light
Lauren Gaikowski, Agriculture Energy Advisor, ComEd Energy Efficiency Program

4:30 – 5:15 pm **Utility Case Study: Sacramento Municipal Utility District (SMUD)**

- Managing 150+ 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 that encourage investment in energy efficiency
  - Efficiency options for lighting, HVAC, & additional load
  - What the industry looks like on the grid
  - Perspectives on efficiencies
- 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?

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

> ***"Overall, an excellent group of speakers."***
>
> VP Marketing & Strategic Planning, Girtz Industries

> ***"The Cannabis Industry Energy Challenge concentrates many of the cannabis efficiency experts in one room."***
>
> Senior Engineer, Energy Solutions

> ***"Interesting, informational and educational. Great networking opportunities and contacts."***
>
> Manager-Line Loss Prevention, ENMAX Power Corp

AGENDA

THURSDAY, JANUARY 28, 2021 – CENTRAL TIME

8:45 – 9:00 am **Log In**

9:00 – 9:40 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 September 2018, 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
  - Saving energy
  - Optimizing plant growth and health
  - 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
  - Test procedures
  - Alignment on performance needs
  - 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

Kasey Holland, Technical Manager, Design Lights Consortium (DLC)

9:40 – 10:20 am **Boulder County Cannabis Cultivator Energy Efficiency Assessment**

This session will discuss a recently published study that conducted energy assessments of cultivation facilities in Boulder County to assess the current energy use, productivity, and energy efficiency opportunities at these facilities. The study will present key findings from the analysis of electric interval data for 14 different facilities, evaluating:

- Complete electric, heating fuel (natural gas and/or propane), and production data for 9/14 facilities
- Analysis of average annual peak electrical demand for combined facility production
- Comparison of performance of indoor and greenhouse cultivation facilities with Resource Innovation Institute (RII) PowerScore
  - Data on horticultural lighting and HVAC energy requirements
- Findings on Boulder County facility productivity compared to national data
- Identification of cost-effective energy efficiency opportunities at each facility site
- Timelines for paybacks after applying incentive estimates based on different technologies
- Overall key findings and recommendations for Boulder County grow facilities that consider:
  - Energy intensity
  - Productivity
  - Emissions
  - Lighting & HVAC

Nick Collins, Associate Director, Energy & Resource Solutions (ERS)
Jesse Remillard, Senior Engineer, Energy & Resource Solutions (ERS)

10:20 – 10:30 am **Morning Break**

AGENDA

THURSDAY, JANUARY 28, 2021 – CENTRAL TIME

10:30 – 11:15 am **Microgrid Applications for Powering Cannabis Grow-Ops**

- Distributed generation applications and solutions for cannabis cultivation facilities
  - o The utility business case for distributed generation as a solution to cannabis energy management
    - Saving money and reducing emissions
  - o Clean technology applications
  - o Evaluating the right mix of technologies
- Microgrid case studies for cannabis grow operations
- Microgrid technology applications
  - o Status of microgrid technology in the United States
  - o Understanding the value proposition: grid resiliency, economics and emissions

Gene Okun, President, Microgrid Energy

11:15 am – 12:30 pm **The Path Forward to Achieving Cannabis Energy Savings – Debating the Role of Facility Design, Codes & Standards, and Enabling Optimal Utility Incentive Programs**

- What is best way to achieve energy savings –evaluating the opportunities and challenges:
  - o Energy codes and equipment standards
  - o Education and training
  - o Market transformation strategies
- Facility design: best practices, what's been tested, & integrating new technologies
  - o New technologies and best strategies to improve resource efficiency in cannabis cultivation & production facilities
- Collaborating to achieve optimal rebates for energy savings – the role of the grower, utility and manufacturer
- Evaluating the pros and cons of new technologies (i.e., liquid cool LEDs)

Corinne Wilder, Vice President – Global Commercial Operations, Fluence Engineering
Gretchen Schimelphenig, Technical Director, Resource Innovation Institute (RII)
Thao Chau, Electrical Engineer- Building Standards Office of the Efficiency Division, California Energy Commission (CEC)
Francis Boucher, Energy Efficiency Program Manager, National Grid

> ***"Good conference. Well-rounded selection of topics."***
>
> Resource Management Consultant, New Energy Technology

> ***"This is my first conference of this type and I loved it! All of the speakers had great content and I am much more informed about the challenges the industry is facing."***
>
> Technical Manager, Design Lights Consortium

POST-CONFERENCE WORKSHOP

Designing and Implementing Utility Energy Efficiency Incentive Programs for Cannabis Growers

THURSDAY, JANUARY 28, 2021 – CENTRAL TIME

1:00 – 1:15 pm **Log In**

1:15 – 4:45 pm **Workshop Timing**

**Short breaks will be integrated every hour*

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

> ***"Excellent conference."***
>
> National Account Executive, Trane

> ***"Super smart and informative speakers"***
>
> President, Forever Green Indoors

WORKSHOP AGENDA

THURSDAY, JANUARY 28, 2021 – CENTRAL TIME

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.

INSTRUCTIONAL METHODS

Case Studies, Panel Discussions and PowerPoint presentations will be used in the program.

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 0.9 CEUs conference, 0.3 CEUs workshop

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must login for the entirety of conference to be eligible for continuing education credit.

ONLINE COURSE DELIVERY & PARTICIPATION DETAILS

EUCI is pleased to offer this virtual course on its online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and budget. You will gain new knowledge, skills, and hands-on experience from the convenience of your remote location.

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our on-line administrator will relay your question to the instructor.

You will receive a meeting invitation that will include a link to join the meeting.

Separate meeting invitations will be sent for the morning and afternoon sessions of the course. You will need to join the appropriate meeting at the appropriate time.

If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.

The remote meeting connection will be open approximately 30 minutes before the start of the course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

PLEASE SELECT

- ◯ **BUNDLE PRICE: THE CANNABIS INDUSTRY ENERGY CHALLENGE AND POST-CONFERENCE WORKSHOP**
  JANUARY 27-28, 2021: US $1,595 (Single Connection)
- ◯ **THE CANNABIS INDUSTRY ENERGY CHALLENGE ONLINE CONFERENCE ONLY:**
  JANUARY 27-28, 2021: US $1,195 (Single Connection)
- ◯ **PACK OF 5 CONNECTIONS:** US $ 4,780 *(20% Discount)*
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- ◯ **POST-CONFERENCE WORKSHOP ONLY:**
  DESIGNING AND IMPLEMENTING UTILITY ENERGY EFFICIENCY INCENTIVE PROGRAMS FOR CANNABIS GROWERS
  THURSDAY, JANUARY 28, 2021: US $495 (Single Connection)

Please call us at 303-770-8800 if you have any specific questions on the volume discounts.

** all other discounts do not apply to license packs*

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Online Course Delivery & Participation Details
See page 10 for information

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.

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 December 18, 2020 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.