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Feedback on Proposed 2022 Energy Code Industrial Process Measures - Controlled Environment Horticulture

Additional submitted attachment is included below.



November 10, 2020

Thank you for the opportunity to comment on the Proposed 2022 Energy Code Industrial Process Measures - Controlled Environment Horticulture. Our comments will relate most specifically to the lighting measures given the attention they are drawing among some stakeholders, in particular cannabis cultivators.

Resource Innovation Institute, or RII, is an objective, data-driven non-profit organization whose mission is to advance resource efficiency to cultivate a better agricultural future. Our work for the past five years has served the energy-intensive cannabis cultivation market while also establishing a framework for the broader controlled environment agriculture (CEA) marketplace, as your proposals do.

To fulfill our mission, we:

- **Measure** - Our [Cannabis PowerScore](#) resource benchmarking platform assists cultivators in confidentially understanding their relative facility energy performance while also informing governments and utilities about usage baselines and trends drawn from aggregate data analytics. The Massachusetts Cannabis Control Commission has specified the PowerScore as a compliance pathway for required reporting on energy and water usage.
- **Inform** - We convene our multi-disciplinary [Technical Advisory Council](#) to establish best practices via peer-reviewed guides like *Cultivating with LED Lighting*, publish reports like *The Cannabis Energy Report* and bring vetted resources to cultivators. We recently initiated a Policy Working Group and expect to publish a *Primer on Cannabis Energy & Environmental Policy Considerations for State Governments* this Spring.
- **Validate** - Through data, best practices and ultimately the development of standards, we are helping to validate technologies and techniques in the emerging horticultural sector.

In partnership with the American Council for an Energy-Efficient Economy, RII recently received a three-year award from the US Dept. of Agriculture to develop a comprehensive suite of data tools, coupled with a market intervention strategy to address barriers to energy conservation, access to energy use data, and adoption of energy-efficient technologies and best practices. Part of that scope of work will be to publish a best practices guide for governments on energy codes for CEA.

Our comments today are therefore generally supportive of the Commission's proposals while also pointing toward other critical considerations given the rapid development of the horticultural market and the technologies that serve it.

After nearly five years of collecting and analyzing cannabis energy use data, and engaging with cultivators, their supply chain partners, utilities and governments on energy efficiency in cannabis cultivation, we can unequivocally say that:

- The industry has the potential to be more energy efficient and productive
- Efficiency improvements have resulted from government regulations emphasizing minimum performance requirements
- Cultivators find success when they are offered educational curriculum and are connected to experts who can help them accomplish their goals in ways that meet regulations
- Researchers, practitioners and others are learning more every day about demonstrating the efficacy of efficient technologies

RII is engaged in government and utility funded projects in Massachusetts and Illinois, the two other states that have taken steps to regulate cannabis energy use. We are engaged on a near-daily basis with cultivation operations who are interested in learning best practices, reporting their resource usage via the PowerScore and attempting to meet similar regulations. In Massachusetts, we've been working with the Dept. of Energy Resources and all eight of the state's energy efficiency program administrators to provide cultivators with training and education on topics such as cultivating with LED lighting and operating HVAC and dehumidification equipment efficiently. In Illinois, we are helping to design a utility energy efficiency program within the context of energy regulations that require LED lighting and other efficient technologies.

Our experience in other states that have implemented energy regulations addressing cannabis cultivation operations has revealed challenges and opportunities. Challenges range from the loss of utility incentives to confusion over how to comply with Lighting Power Density requirements due to various interpretations of canopy square footage. Opportunities include cultivator excitement as they learn how to effectively use technologies to save energy and improve production.

With those experiences in mind, we'd like to start by comparing California's proposed actions with those taken by other states.

Stakeholder engagement - First, the stakeholder engagement in California related to the proposed horticultural standards has been more thorough and extended than we've seen in other states. There has been more time allowed between the code proposals and their effective dates. It seems this is resulting in thorough input from the market.

Illicit market - We also note that the illicit market is much more pronounced in California than other states. This has us concerned because we know from our research that the regulated market is generally more efficient in its use of energy and other natural resources than the illicit market.

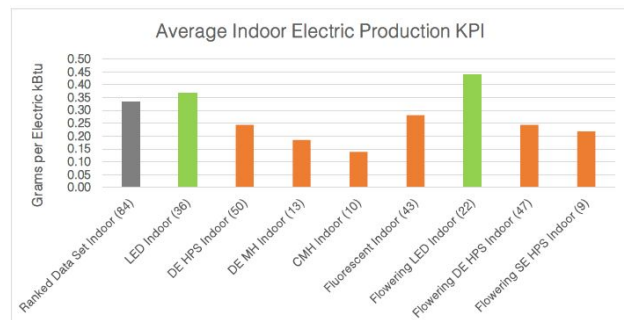
Photon efficacy - We note that this is the first proposed law that would use only photon efficacy, and not watts per square foot, as a standard. In general, this is a more straightforward requirement with which to comply and to enforce. We feel photon efficacy is a useful measure of fixture efficiency and a leading indicator of overall facility efficiency.

To whom the law applies - We note that California’s code proposals allow for greater protections for incumbent license holders who want to continue using legacy technology.

Data - Many stakeholders have called for more data, and we agree that policy decisions should be supported by data. Regarding energy use data, RII just released findings from a report that studied the energy use and production output of 84 indoor cannabis cultivation facilities, most of which are located in western US states featuring climate zones similar to California. The data are from the aggregate data set within RII’s Cannabis PowerScore energy benchmarking platform, and they are summarized below.

Our data address several primary concerns of cultivators, notably energy savings, yield and profitability. Our findings reveal that facilities using LED lighting solutions in the flowering stage vs. facilities using double-ended (DE) high pressure sodium (HPS) in the flowering stage show:

- 34% less electricity use per square foot of canopy (see Electric Facility KPI), and
- 80% greater electricity productivity (see Electric Production KPI), meaning they produced nearly double the amount of grams of dried flower per unit of electricity consumed



Source: Cannabis PowerScore, Resource Innovation Institute, Q320 Resource Benchmarking Report

Our findings also show a broad performance variability among users, an indication that training and education are key. We know there is an LED adoption learning curve from working with cultivators in Massachusetts.

Our data do not investigate or substantiate impact on product quality, another primary concern of cultivators.

We recognize energy savings and carbon emissions reductions as the primary objectives of the California Energy Code yet feel the need to underscore the behavioral issues that should be addressed for successful code adoption to occur. As we have communicated in prior rounds of engagement, High Intensity Discharge (HID) lighting is trusted by many operators and is ingrained in many growing methodologies. A significant number of cultivators, particularly cannabis growers, feel very strongly that HID lighting is a central ingredient to their business's success. We therefore strongly advise that the code process acknowledge and listen to cultivators and support their transformation as the process moves forward.

While there is an increasing body of research, the market is generally very early in its understanding of the non-energy impacts of LED technologies, ranging from yield optimization to cannabinoid expression to maintenance to mold management. This is an important area of research that warrants further exploration and education.

Further, we know that several other State agencies are currently assessing how to comprehensively streamline the regulatory burden on the cannabis industry as a whole. We believe it is wise for the State to assess these energy requirements alongside the other regulatory introductions on the horizon. We are hopeful the State as a whole can thread the needle so the result is good policy that reflects urgent action on climate change along with other state objectives, such as industry support, economic development, job growth and reduced crime. **A coordinated strategy that results in competitive, efficient producers will benefit the state long-term in terms of tax revenues and environmental benefits.**

We observed in the Oct. 27 California Energy Commission (CEC) workshop that most of the pushback from the cannabis cultivation community seemed to arise out of fears related to:

- Applicability to existing operations (e.g., would they need to rip out existing HPS fixtures and be forced to transition to LEDs?)
- Poor product quality resulting from previous attempts to incorporate LEDs
- Lack of available studies proving desired production volume and product attributes can be achieved with LEDs
- Reduced competitiveness due to the need to invest in costlier building systems
- Losing customers to the illicit market

In general, it seems all of these challenges can be overcome with education, research, financial support and ongoing evolution.

We therefore recommend the following occur as the code process moves forward:

EDUCATION

- **Communication** - Clarify that codes don't apply to existing operations unless and until major upgrades occur, and define what major upgrade means so cultivators know when the code will be triggered. For example, if it is true that only newly expanded footprints would be subject to the code rather than the expansion triggering a clawback into existing parts of facilities, then it seems CEC would do well to clarify this point.
- **Training** - Invest in training for cultivators and their supply chain partners on how to effectively use efficient technologies to ensure energy savings and cultivator satisfaction are achieved.

RESEARCH

- **Research** - Invest in research and promote peer-reviewed science that evaluates non-energy impacts of LEDs related to product quantity and quality.
- **Data** - Require energy and water reporting, including ahead of the code's effective date, to build a standardized data set that can point toward ongoing efficiency strategies.

FINANCIAL SUPPORT

- **Utility incentives** - Promote existing utility incentives between now and the code's effective date to ensure cultivators know how to take advantage of financial support. To further minimize financial hardship, CEC could consider working with the Public Utility Commission (CPUC) to maintain utility incentives during an initial phase of code adoption.
- **Financing** - Develop or extend financing programs to support businesses that may be impacted so they can access the capital necessary to renovate existing facilities and build high-performance new buildings.
- **Equity** - Ensure support for underserved businesses such as those owned by Black, Indigenous, People of Color (BIPOC).

ONGOING EVOLUTION

- **State agency coordination** - We encourage the Governor's office, CPUC and the Dept. of Food & Agriculture (CDFA) to engage with CEC in the rollout of these codes to ensure effective alignment with overall cannabis regulatory streamlining.
- **Holistic energy use** - Consider methods to reward facility-wide energy efficiency (beyond fixture efficiency), including exploration of performance-based exemption pathways. RII is increasingly thinking that indoor horticulture efficiency should be measured in terms

of how much product was produced per unit of resource input. Automation and controls are becoming key efficiency strategies, and data are revealing the energy benefits of basic approaches like dimming HPS wattage at the ballasts. We are interested in seeing a flexible evolution of policy that would reward producers for achieving leadership levels of efficiency regardless of the technologies and techniques they use.

- **Carbon** - Reward carbon emissions reductions in addition to energy savings. For example, consider opportunities for tax- and fee-based incentives that provide support for regenerative soil practices.

In summary, we are supportive of actions to address climate change and strongly recommend cultivator engagement, State agency coordination and ongoing flexibility as the market evolves and innovates toward resource efficiency.

Very best regards,

Derek Smith
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