

# Ripe for savings:

*The energy efficiency opportunity with indoor agriculture*

MEEA | Chicago | 2-28-20



## Meet RII

- **Objective non-profit**  
founded 2016 in Oregon
- **Researching efficient cultivation**  
techniques & technologies
- **Connecting dots** between governments,  
utilities, the supply chain & cultivators  
*Policy | Intelligence | Education*
- **Providing tools and resources** to help  
accelerate efficiency



*Courtesy of Phyre*



# Trusted by Cultivators, Supply Chain, Governments & Utilities



# POLICY: State support & stakeholder engagement

## IAES'20

Indoor Agriculture Energy Solutions

[Home](#) [About](#) [Accommodations](#) [Program & Fees](#) [Registration](#) [Sponsor or Exhibit](#) [Contact](#)



Shape the future of energy policies and utility programs for controlled environment agriculture

### INDOOR AGRICULTURE ENERGY SOLUTIONS CONFERENCE

February 24-26, 2020  
San Diego Marriott - La Jolla, CA

Featuring Keynotes By:



Kay Doyle,  
Massachusetts  
Cannabis  
Control Commission



Dr. Mark Lefsrud,  
McGill University



Dr. Nadia Sabeh,  
Dr. Greenhouse



# INTELLIGENCE: Benchmarking Facility Performance

- **Free**, confidential survey
- **Accurately** captures facility & energy data
- **Ranks** your facility's efficiency to others
- **Analyzes** energy (kWh & kBtu), carbon emissions, water & waste
- **Trusted** by 300+ farms

## Calculated PowerScore

Indoor #3737, Mockup, MI, Climate Zone 5A

### ENERGY & CARBON

Facility	236 Btu / sq ft		95 <sup>th</sup> percentile
Production	54.4 g / Btu		98 <sup>th</sup> percentile
Lighting	15.8 W / sq ft		55 <sup>th</sup> percentile
HVAC	91.3 kWh / sq ft		47 <sup>th</sup> percentile

### Overall: Leader

Your farm's overall performance within the data set of greenhouse/ hybrid/ mixed light farms in the U.S. and Canada.



82<sup>nd</sup>  
percentile

Cannabis  
**PowerScore**  
.org



“RII is moving the industry a giant leap forward with the Cannabis PowerScore by helping companies like ours obtain a clear picture of financials while working to minimize our environmental footprint. They’re a partner we trust to maintain our information in strict confidence and an invaluable asset for growth in this highly competitive market.”

– Jesse Peters and Kate Guptill



# EDUCATION: Events



Best practices on energy. Grower led. No sales pitches.

- Feature **vett**ed experts
- Sponsored by utilities & governments
- Not “pay to play”



## MICHIGAN

Grand Rapids - April  
Ann Arbor - Sept.  
Lansing - Nov.

## MASSACHUSETTS

Worcester - May

## WASHINGTON

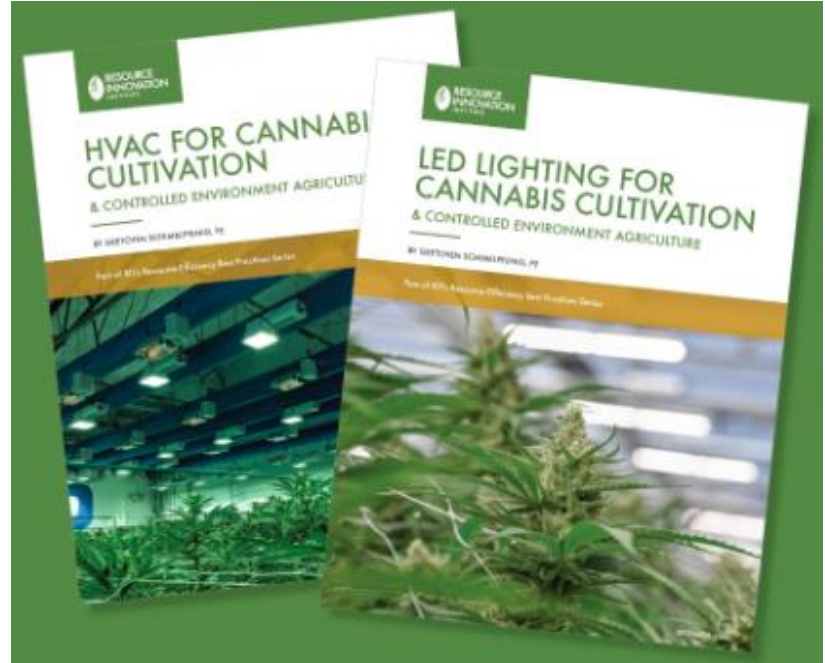
Seattle - June  
Everett - Fall  
Tacoma - Winter



# EDUCATION: Guidance Documents & Reports

- **50+ contributors and peer reviewers**, including cultivators, architects, engineers, equipment manufacturers
- Defines key terms
- Recommends KPIs
- Meets all growers where they are

*Free download at*  
[ResourceInnovation.org/Resources](https://ResourceInnovation.org/Resources)



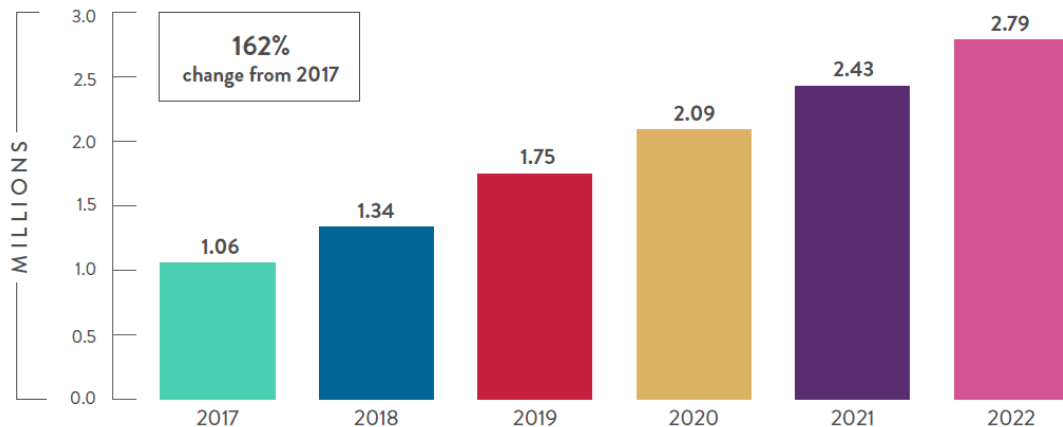
THE 2018

# CANNABIS ENERGY REPORT

“ By 2020, legal and illicit cannabis production will produce more than 2.6 million tons of electricity-based CO<sub>2</sub>e emissions.

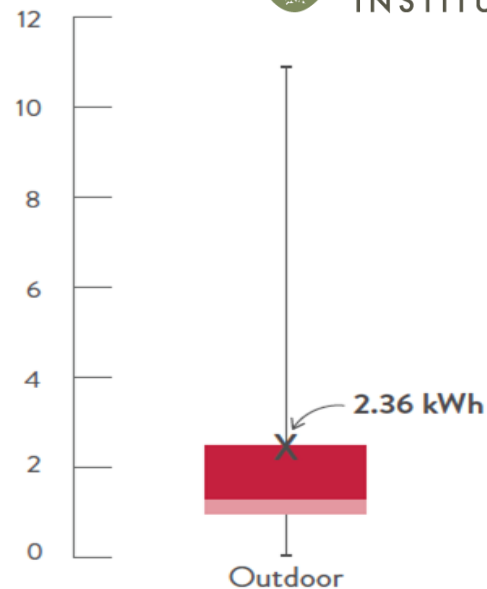
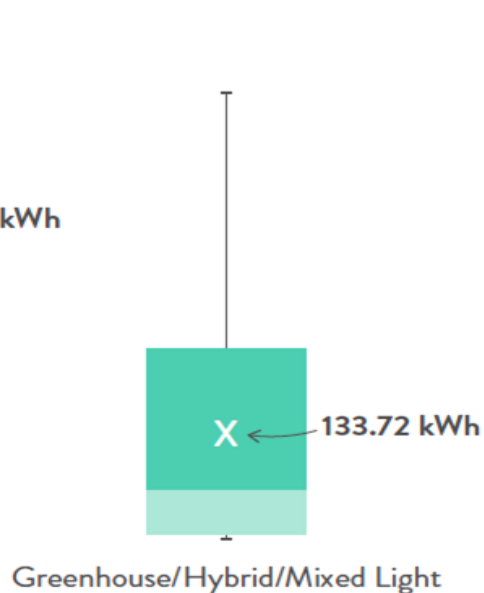
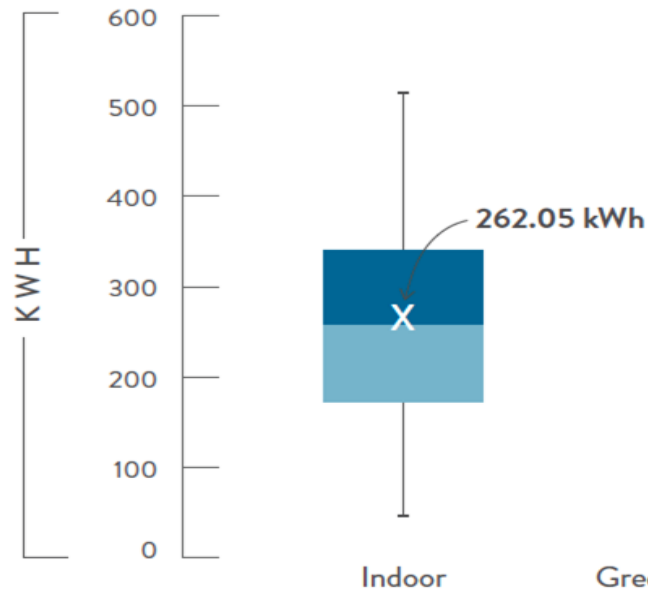


TOTAL ELECTRICITY USAGE FOR LEGAL CULTIVATION (MWh)

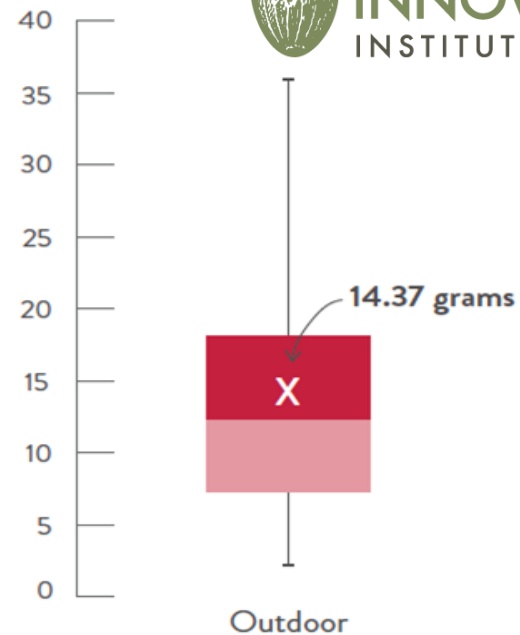
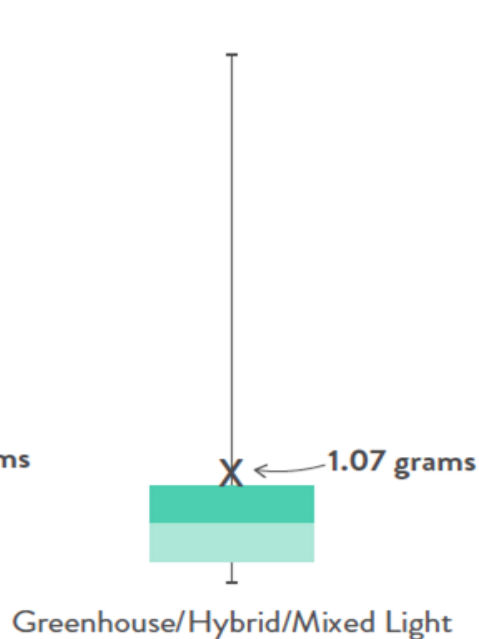
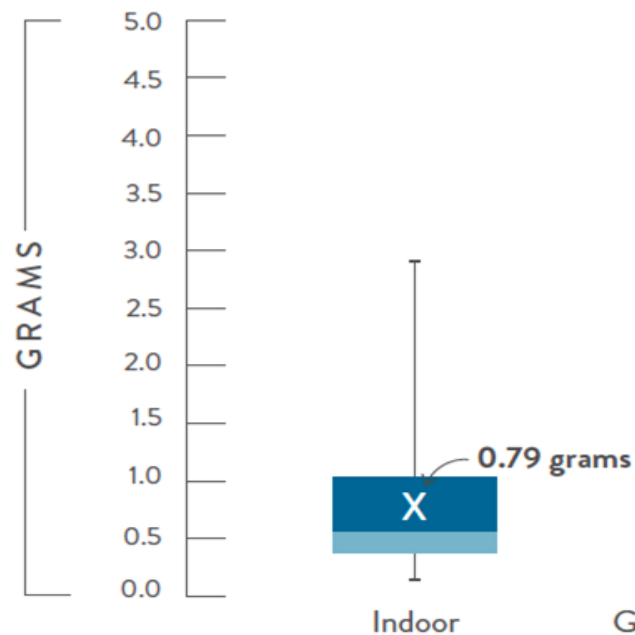




# Benchmarks: kWh/square foot of flowering canopy



# Benchmarks: grams/kWh



# What is indoor agriculture?

- **Any controlled environment**  
Warehouse, greenhouse, barn...
- **Energy controls growing environment**  
Light, temperature, humidity...
- **NOT the same as typical C&I building**  
Plants are the occupant, not people
- **Both cannabis & food are growing sectors**  
These markets are here to stay





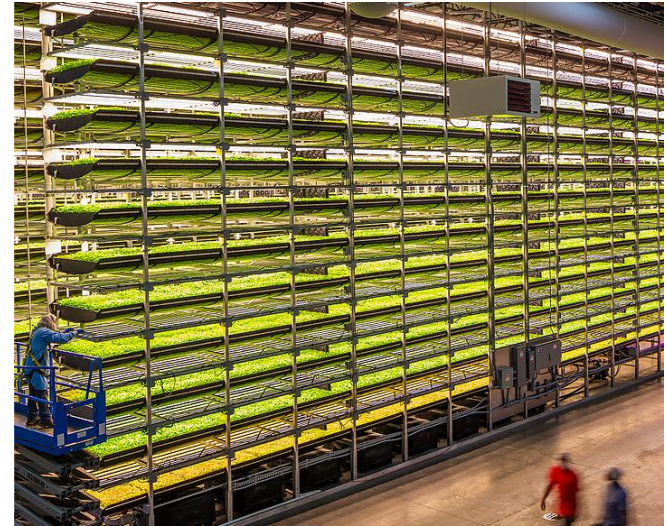
# Cannabis

- \$65 billion by 2025
- 30+ states regulated, multiple countries
- Medical & adult use
- History of secrecy - few data
- Strange economics:
  - State-by-state regulation
  - Valuation just now considering profit



# Controlled Environment Ag (CEA)

- \$ Billions - no good estimates
- Food & societal revolution - millennials love local, traceability, pesticide & carbon potential
- Big-time capitalization of leading companies
- Leafy greens, berries, tomatoes, floriculture
- Lots of vertical integration & proprietary business models



## Key learnings so far

- **Every facility is a snowflake**  
There is no “average” facility
- **No one knows how to optimize**  
We need more data & funded research
- **Best practices education is essential**  
Technology alone is not enough
- **Incentives are critical**  
Even as codes & standards are set

