



CONJURING UP CANNABIS ENERGY USE IN ILLINOIS AND MICHIGAN

Nick Collins, P.E.

How Much Cannabis Are We Talking About?

ILLINOIS EDITION

- Demand is likely to be between approximately 350,000 lbs-550,000 lbs. of dried cannabis per year for a fully mature market in which consumers are broadly aware of the program and the manner in which legal cannabis can be purchased and suppliers are sufficiently able to meet that demand. The range accounts for varying assumptions for consumption rates for residents and out-of-state visitors as well as other caveats.
- Illinois can expect the existing medical cannabis market to have the capacity to supply between 35 percent and 54 percent of the mature, adult-use market, subject to the caveats and assumptions listed in this report.



FREEDMAN&KOSKI

How Much CANNABIS ARE WE TALKING ABOUT? MICHIGAN EDITION



Monthly Report
January 1, 2020 – January 31, 2020



Governor
Gretchen Whitmer



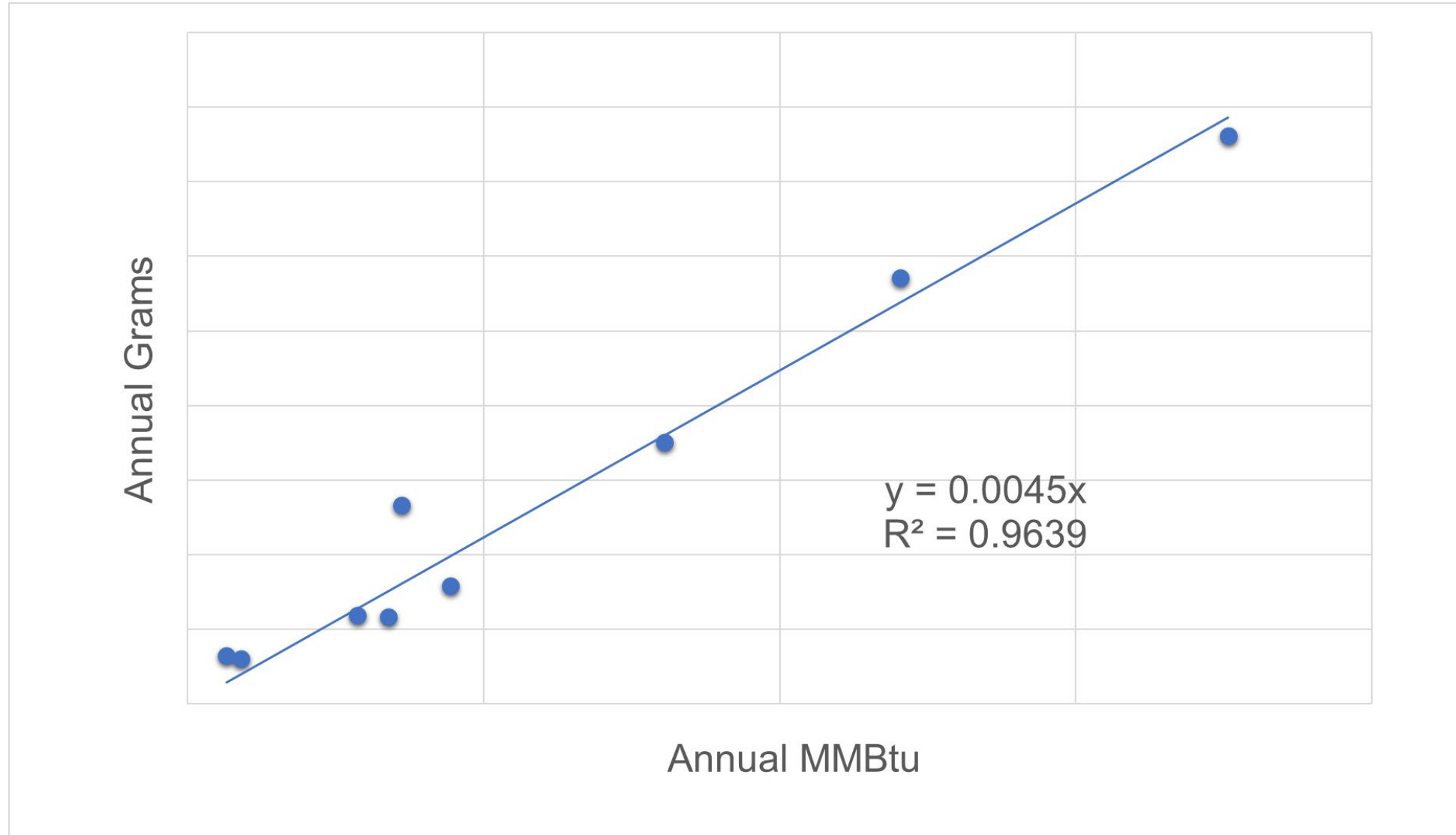
Director
Orlene Hawks

Very rough
estimate based on
1 month of sales

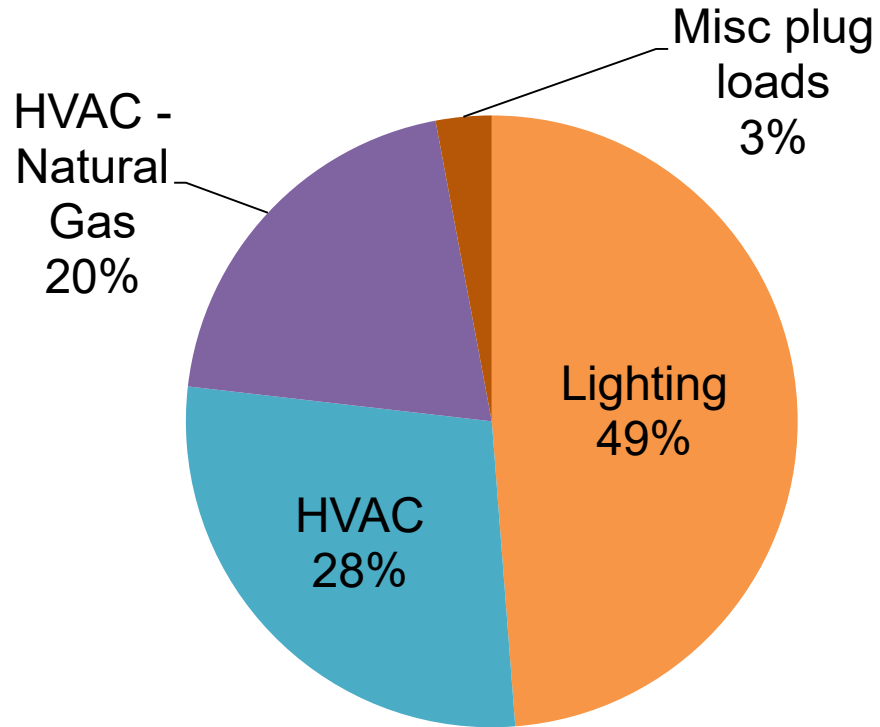
276,000 lbs/year



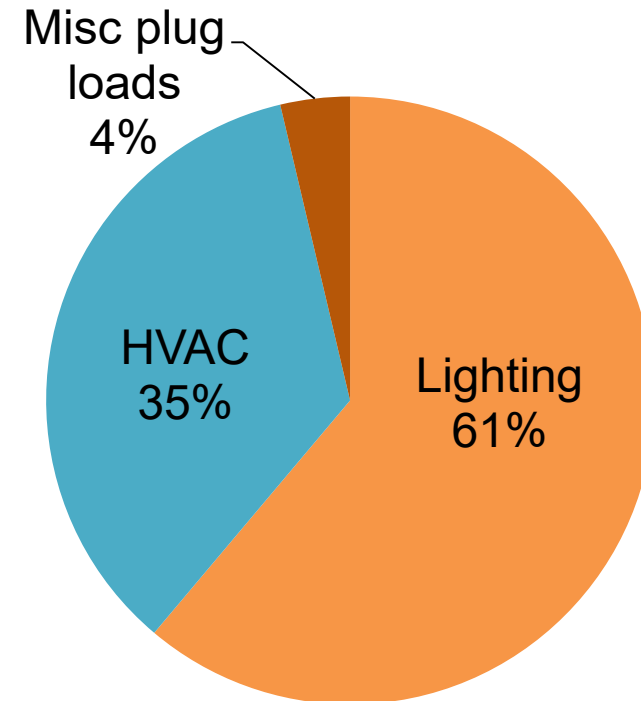
HOW MUCH ENERGY IS USED?



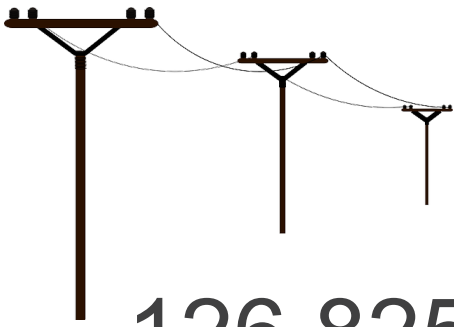
How Is This ENERGY USED?



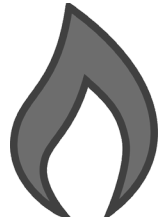
All Fuels - MMBtu



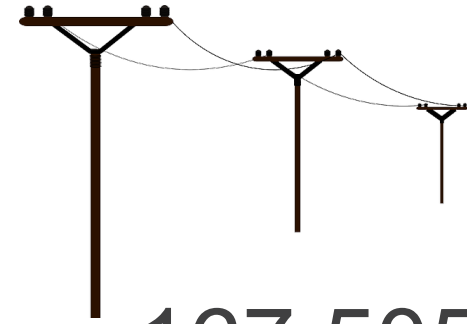
Electric Only - kWh



126,825 MWh



108,182 MMBtu



167,505 MWh



142,882 MMBtu

**THE POTENTIAL
IMPACT**

MORE EFFICIENT OPTIONS - LIGHTING

LED Horticultural Fixtures

- High Efficacy – 1.9-2.6, $\mu\text{mol}/\text{joule}$
- High Flux – 1,600-1,700, $\mu\text{mol}/\text{sec}$
- Warranty – 3 to 5 years
- UL/ETL - Safety
- DLC Horticultural QPL
- Compare systems based on equivalent PPFD (it's the best we've got)
 - PPFD = photosynthetic photon flux density, $\mu\text{mol}/\text{m}^2/\text{s}$

SPYDR 2 SPECS

2i 47" 2i 40" 2i 33" 2p 47"
2x 47" 2x 40" 2x 33"

SPYDR 2i is a high-performance, full-cycle top-lighting solution for commercial horticulture cultivation, with the power to scale from vegetative growth to higher light intensities in bloom. It was designed for commercial growers to push the envelope with high-PPFD cultivation practices along with sophisticated CO₂ supplementation.

Light Output PPF
1700 $\mu\text{mol}/\text{s}$

Efficacy
2.7 $\mu\text{mol}/\text{J}$ @ 277 AC

AC Input Power
631W @ 277V AC

Certifications
UL 8800, UL 1598 Wet Location, DLC

Warranty
5 Year Standard Warranty

Spectrum
PhysioSpec Indoor™

Part	Length	Width	Height	Weight
SPYDR 2i 47"	47"	42.80"	1.26"	16.7 lbs
Light Fixture	1194 mm	1087 mm	32 mm	7.6 kg

FLUENCE
BY OSRAM

MORE EFFICIENT OPTIONS - HVAC

- Indoor (sealed) cultivation spaces generate atypical HVAC loads
- Evapotranspiration leads to low sensible heat ratios loads (0.4-0.7) relative to typical commercial HVAC equipment sensible heat ratio performance (0.7-0.9)
- Look for systems with lower or variable SHR's
 - These come in many forms
 - There are numerous specialty vendors serving this industry
- Look for heat recovery opportunities

OTHER HVAC CONSIDERATIONS

- Many facilities struggle. The load calculations are specialized, but not impossible.
- Low ambient kits on packaged equipment
- Missed opportunity: Outdoor air economizing
 - Cultivators do not want to bring in outdoor air, due to:
 - CO₂
 - Biological contamination
 - Odor control



LESS PROMISING HVAC SYSTEMS

Where do you find supplemental dehumidifiers?

“Always if they use heat pumps”

“Every time with mini-splits”

“With VRF systems”

“About 30% of DX systems”

Mini-splits, multi-splits, and VRF systems generally have high sensible heat ratios with limited dehumidification (latent) capacity. Not a good fit for cultivation space conditions.



CONTACT Us



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ERS is an energy and engineering consulting firm providing services in energy efficiency customer engagement, implementation, evaluation, both pre- and post-installation M&V, custom feasibility studies, and distributed and renewable generation assessment.