

## Commercial Cannabis Cultivation in Massachusetts: Implications for Energy Use

Remarks to Massachusetts EEAC, November 15, 2017

### Current state of cannabis cultivation in Massachusetts:

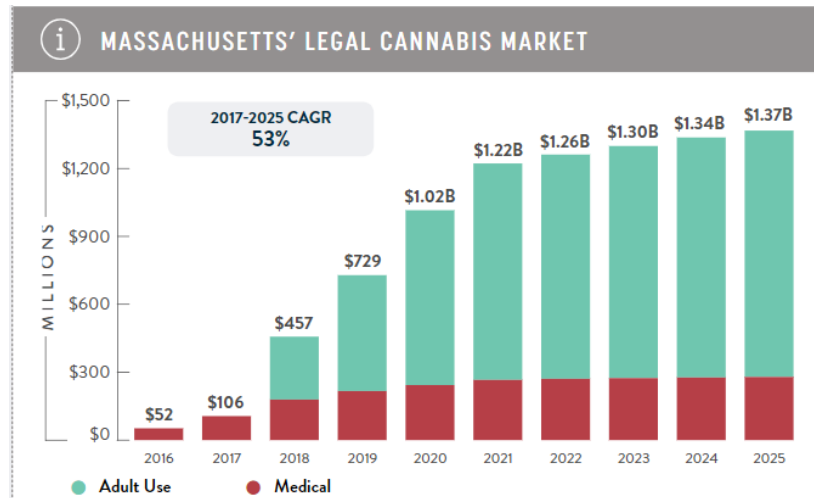
Present - Around a dozen cultivation facilities supply the state's legal medical marijuana market.

March 15, 2018 - Deadline for the Cannabis Control Commission (CCC) to issue regulations for licensing, sale and control of legal marijuana, including those covering *energy and environmental performance of cultivation facilities*.

April 1, 2018 - CCC may begin to accept license applications from new commercial enterprises.

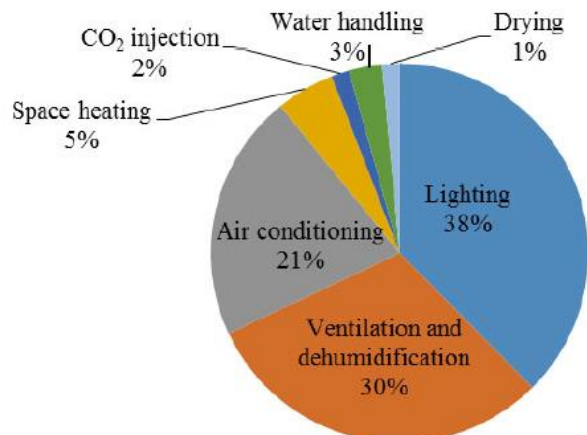
July 1, 2018 - Retail sales to the adult-use (a.k.a. recreational) market may begin.

Projection of market size of Massachusetts legal cannabis<sup>i</sup>



### Industry trends in energy use:

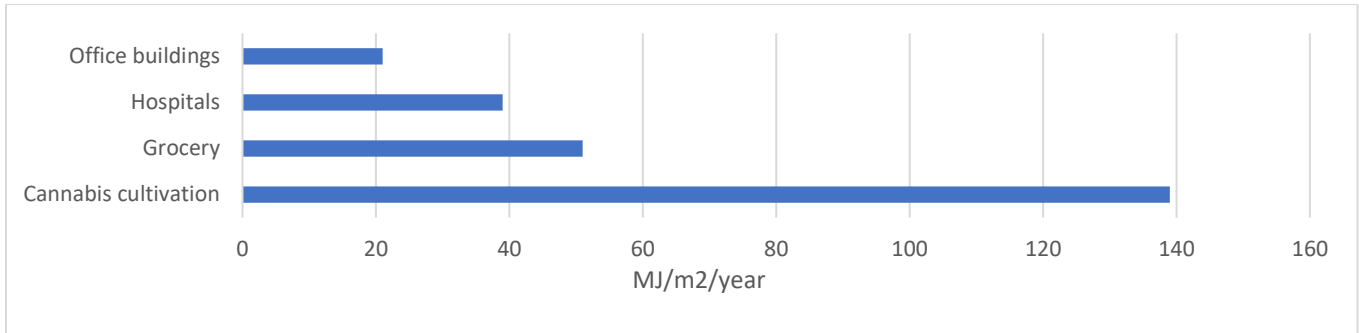
Breakdown of energy use for indoor cannabis production<sup>ii</sup>



Industry standard practices for lighting<sup>iii</sup>

Stage	Fixture	Hours of use	Cost
Seedling	4-foot 220 W 4 lamp T5 fluorescent	24	\$100–\$200
Vegetative	600 W MH	18–24	\$200
Flowering	1000 W DE HPS	12	\$400–\$500

Comparative energy intensities, by U.S. building type<sup>iv</sup>



Cannabis cultivation in the states<sup>v vi vii</sup>:



Massachusetts: Using basic assumptions (total value of legal cannabis market in 2019 at \$729 million, price of flower at \$1,250/lb, and 568 kWh/lb average energy intensity), total energy use from indoor cannabis cultivation *may equal* 331,363 MWh, or ~0.6% of total state electric consumption.



California: In 2012, indoor cultivation estimated to equal ~3% of total statewide electricity use. Note that there is significant illicit and residential-based cultivation activity in California and that in-state production vastly exceeds in-state demand.



Colorado: In 2014, indoor cultivation used 200,000 MWh (about 0.4% of the state's electricity usage) an increase of over 40 percent from the previous year; 1,200 licensed grow facilities in Colorado consumed 2.2% of electricity in the city of Denver.



Oregon: Pacific Power in Portland reported at least seven power outages during the summer of 2015 due to indoor cannabis cultivation.



Washington: Seattle City & Light estimates a 3% increase in demand on their overall system as a result of legal indoor cannabis operations. The Northwest Power and Conservation Council (covers ID, MT, OR, and WA) forecasted that regional energy loads from indoor cultivation could grow from an estimated 80-102 MW in 2014 (about 1% of total demand in Washington) to 180-300 MW by 2035.

<sup>i</sup> ArcView Market Research, Massachusetts State Profile, 2016.

<sup>ii</sup> Mills, E. 2012. "The Carbon Footprint of Indoor Cannabis Production." *Energy Policy* 46: 58-67.

<sup>iii</sup> Remillard, Jesse and Nick Collins. 2017. *Trends and Observations of Energy Use in the Cannabis Industry*.

<sup>iv</sup> Mills, E. *ibid*

<sup>v</sup> Mills, E. *ibid*

<sup>vi</sup> Evergreen Economics. 2016. *SDG&E Cannabis Agriculture Energy Demand Study*. Prepared for the San Diego Gas & Electric Company.

<sup>vii</sup> Crandall, K. 2016. *A Chronic Problem: Taming Energy Costs and Impacts from Marijuana Cultivation*. EQ Research.