

Cannabis Cultivation

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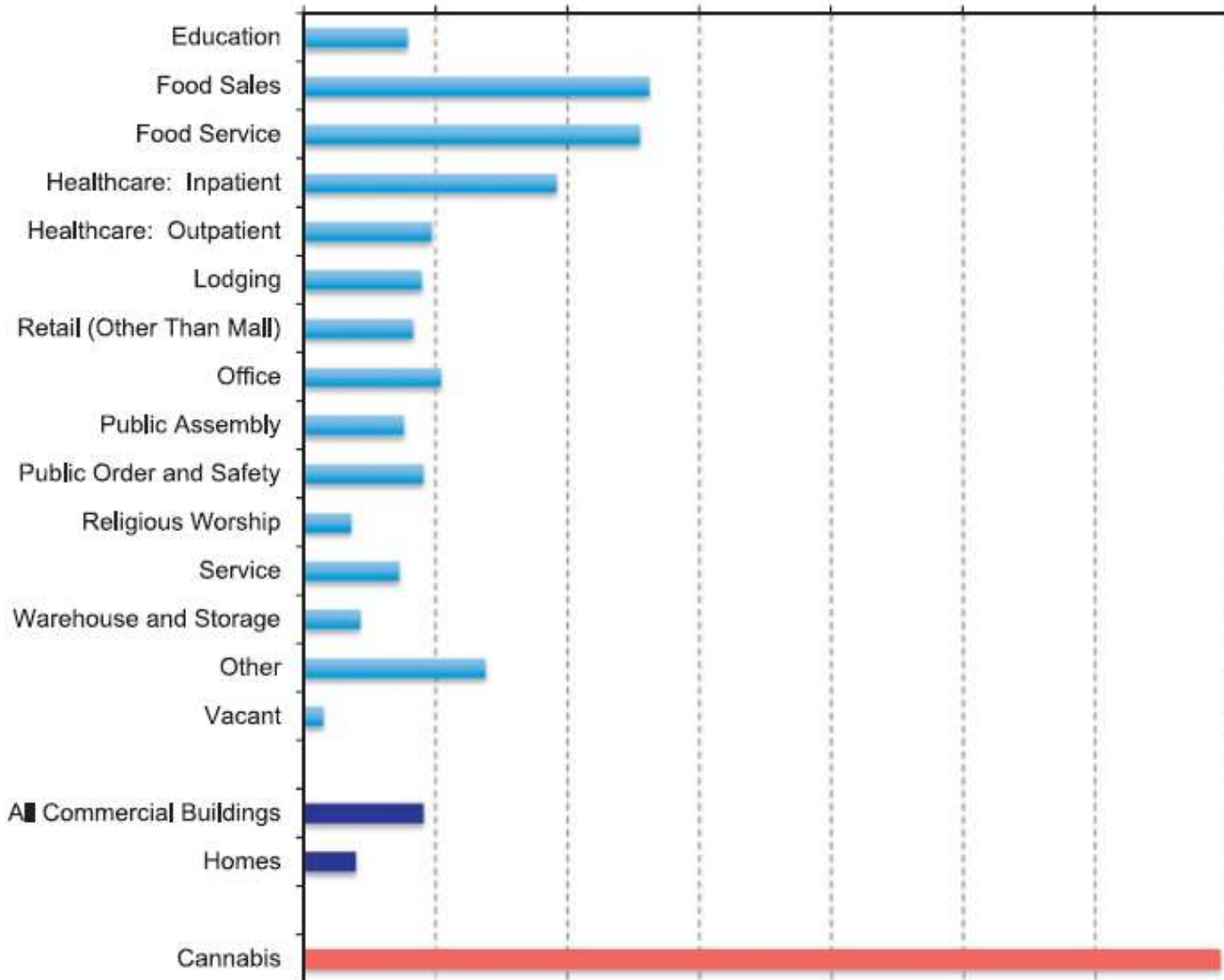
October 15th, 2014



Energy Use of Indoor Cannabis Cultivation – Comparative Energy Intensities

Primary energy (MJ/m²-year)

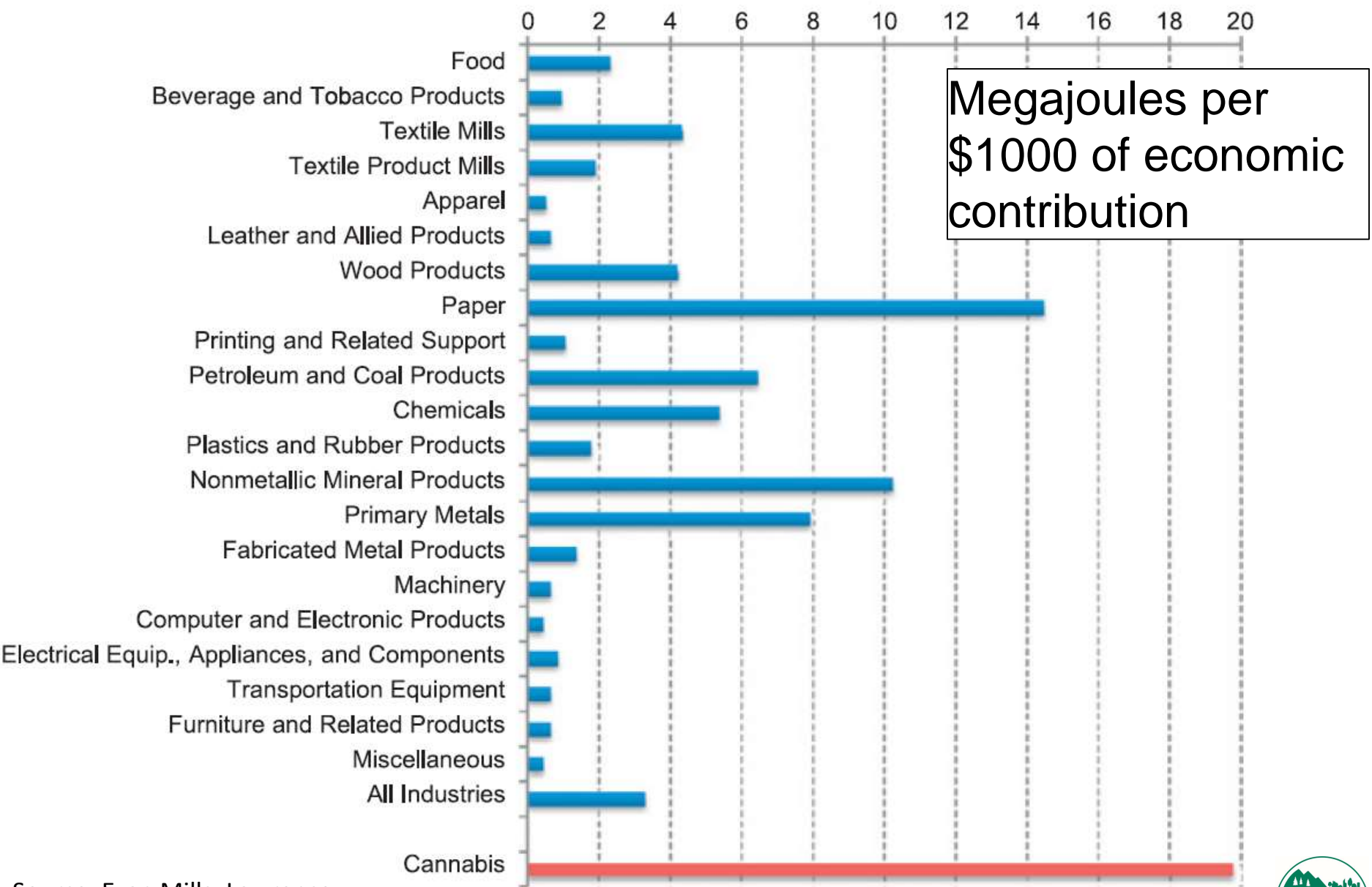
0 20 40 60 80 100 120 140



Source: Evan Mills,
Lawrence
Berkeley National
Laboratory, *The
Carbon Footprint of
Indoor Cannabis
Production*



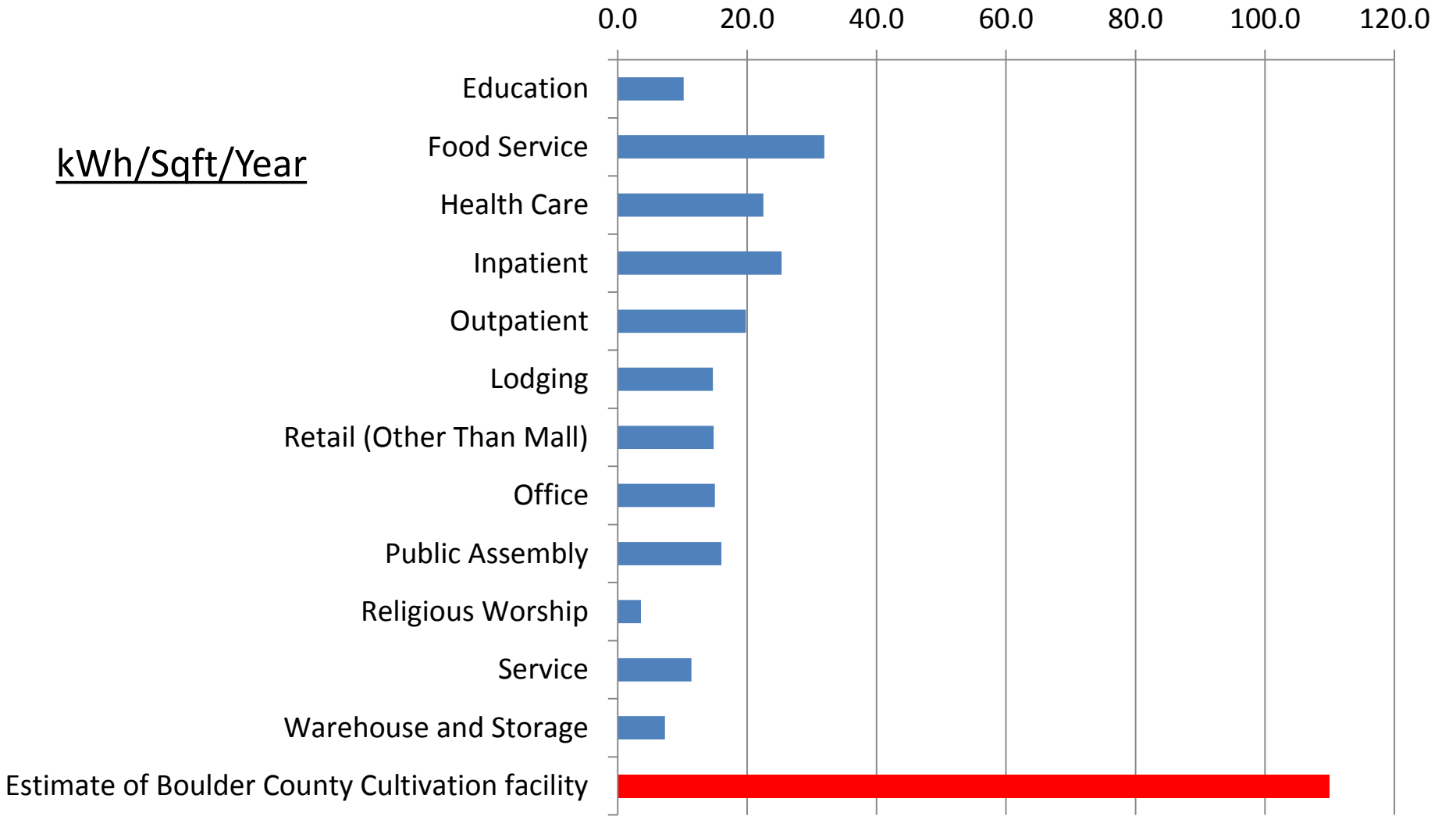
Energy Use of Indoor Cannabis Cultivation



Source: Evan Mills, Lawrence Berkeley National Laboratory



Energy Use of Indoor Cannabis Cultivation



Source: EIA & Local Cultivator



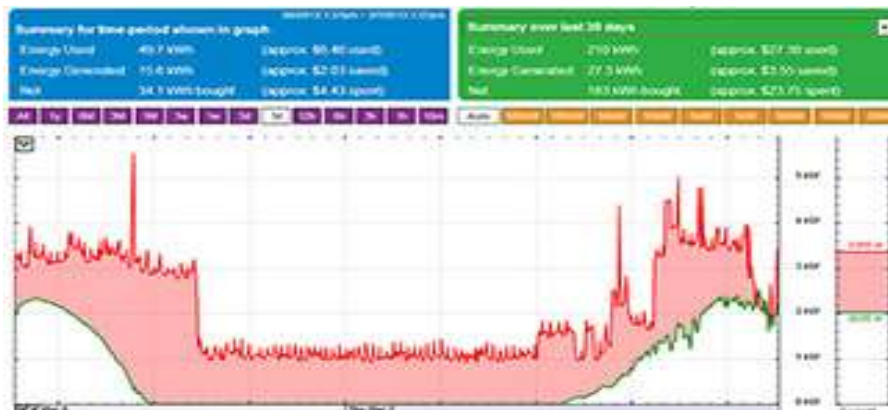
Current Regulations:

- Land Use / Zoning Restrictions
- Sustainability Requirements
 - 100% renewable energy offset
 - On-site renewables
 - Community Solar Gardens
 - Energy Impact Offset Fund
 - Safe disposal of used lamps
 - Compostable Waste Stream & water usage (future discussions)



Implementation of Energy Impact Offset Fund

- Install energy monitors (paid for by the fund) on all participating grows.
 - Provide detailed business-specific energy data and training to owners and operators about Load Shifting, Peak reduction, Energy usage patterns and operational opportunities
 - Use energy data to quantify consumption and assess fees for fund participation



Subtract “Baseline Consumption Value” using Commercial Buildings Energy Consumption Survey (CBECS)

Table C15. Electricity Consumption and Conditional Energy Intensity by Census Region for Non-Mall Buildings, 2003

	Total Electricity Consumption (billion kWh)				Total Floorspace of Buildings Using Electricity (million square feet)				Electricity Energy Intensity (kWh/square foot)			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
All Buildings*	147	216	375	152	12,809	16,701	22,766	11,030	11.5	12.9	16.5	13.8



Carbon Intensity of Regional Grid



RMPA total output emission rate: pounds of carbon dioxide equivalent (CO₂e) per kWh = 1.90627

eGRID subregion representational map (eGRID 2010 Version 1.0)



Technical Support Document: - Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866 -

Interagency Working Group on Social Cost of Carbon, United States Government

Revised Social Cost of CO₂, 2010 – 2050 (in 2007 dollars per metric ton of CO₂)

Discount Rate	5.0%	3.0%	2.5%	3.0%
Year	Avg	Avg	Avg	95th
2010	11	32	51	89
2015	11	37	57	109
2020	12	43	64	128
2025	14	47	69	143
2030	16	52	75	159
2035	19	56	80	175
2040	21	61	86	191
2045	24	66	92	206
2050	26	71	97	220

Extrapolating to 2014 and adjusting for inflation the Social Cost of Carbon = \$41.38 per ton

Carbon emissions of regional electric grid

X

Social Cost of Carbon

= 3.578 ¢ per kWh

Boulder County Commissioners approved a price of 2.16 ¢ per kWh for 2015, with future pricing TBD.

Mission: To support measures that offset carbon emissions

Examples include (but are not limited to):

- Low interest loans or grants to income qualified property owners for rooftop solar or energy efficiency measures.
- Programs that accelerate the adoption of new technologies and operational methods that will result in less energy intensive cannabis grow operations.
- Programs that improve the industry's integration with local agricultural practices and organic farming methods for the purposes of reducing our dependence on fertilizers derived from fossil fuels.
- Purchasing and installing energy monitoring equipment at cultivation establishments and industry education for the use of this data.

Additional Topics and Codes



Thank you!

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