The Role of Lighting in the Carbon Footprint of Cannabis Production

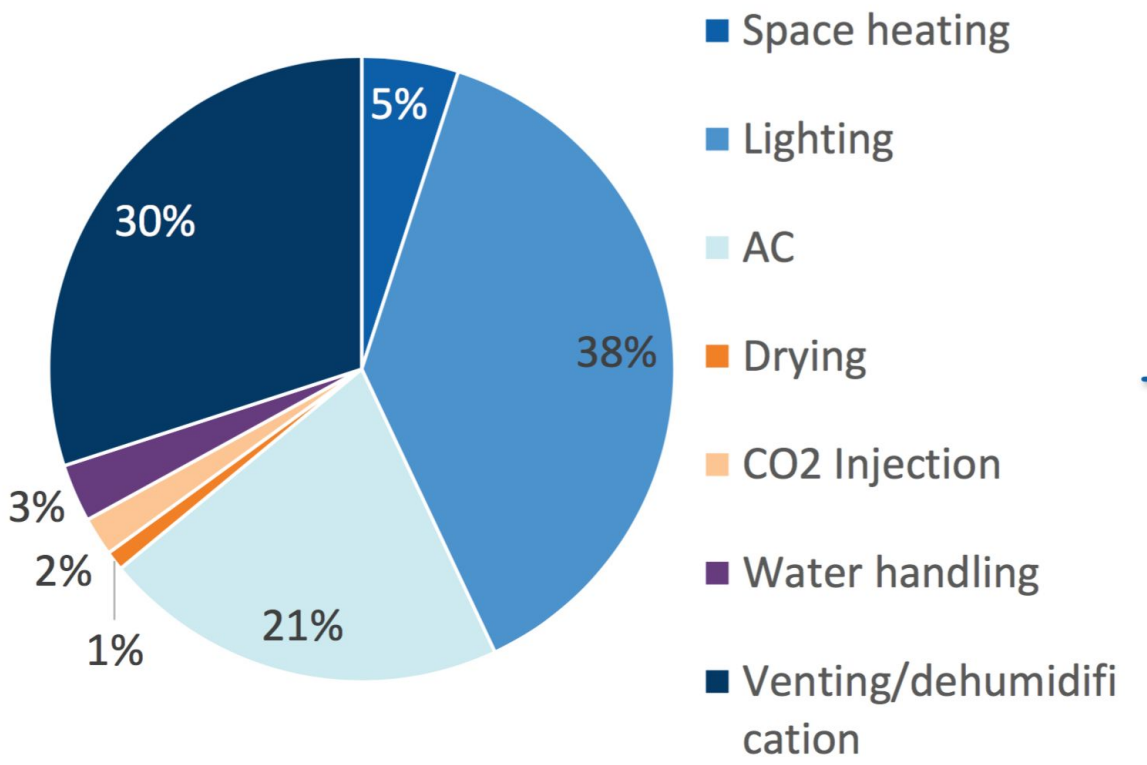
ENERGY CONSUMPTION FROM COLORADO CANNABIS COMPANIES IN 2014

200,000 MWh

155,000 Tons of CO2e

This is equivalent to 756 train cars of coal!

Electricity Use for Indoor Facility



Indoor cannabis production requires ~2,000 kWh per pound

Source: Impact of Cannabis Production in the Pacific Northwest on Regional Electricity Loads, Northwest Power Planning Council, Sept 3rd 2014

Total Cannabis consumption in Colorado - 200,000 MWh

Lighting for all operations is responsible for approximately 38% of this energy output

That's 58,000 Tons of Carbon!

Lighting Technology

HPS

Ceramic Metal Halide

LED

Plasma

Fluorescent

ISSUES IN THE FIELD

Heat

Spectrum

Maintenance Costs

Hazardous Materials

Ceramic Discharge Lighting (CDL)

5 yr bulb life in flower!

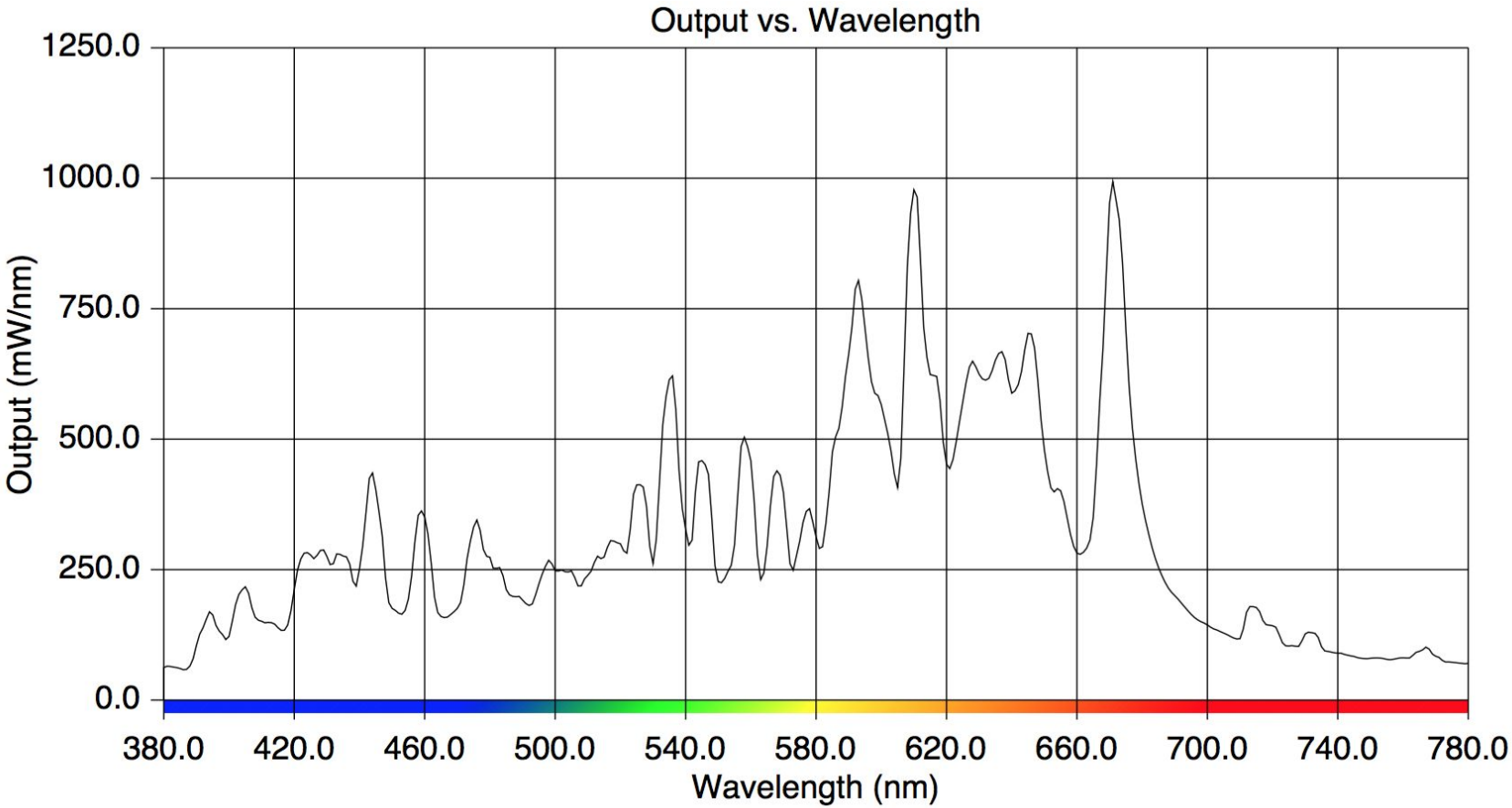
Balanced spectrum

Optimal work environment

Very efficient source of light

High Color Rendering Index (CRI)

Bulb life - 20,000 to 30,000 hrs


Output vs. Wavelength
1250.0
1000.0
750.0
500.0
250.0
0.0
Output (mW/nm)
380.0
420.0
460.0
500.0
540.0
580.0
620.0
660.0
700.0
740.0
780.0
Wavelength (nm)

Increased Electrical Efficiencies

HPS

Standard for flowering

1 - 1000 Watt HPS covers 4'x4'

Total wattage = ~1,100 W

Ceramic Discharge Lighting

2 - 315 Watt CDL cover 4'x4' footprint

Total wattage = ~672 Watts

Watts = - 38%

Increased Production Efficiencies

HPS

Standard for flowering

1 - 1000 Watt HPS covers 4'x4'

Production: 0.4 g/w < HPS < 0.8g/w

Average = 0.6 g/w

Ceramic Discharge Lighting

2 - 315 Watt CDL cover 4'x4' Footprint

Production Reports: 0.7 g/w < CDL < 1.6 g/w

Average 1.15 g/w

Efficiency Increase = 92%

Production is Difficult to Measure

Cultivation

- Grower
- Medium
- Nutrients
- Pests
- Facility Design

Reporting

- Sharing data
- Reliability
- Third-Party Certification
- State Regulators
- Utility Providers

Next Steps

ENERGY EFFICIENT LIGHTING CAN REDUCE THIS CARBON FOOTPRINT BY APPROXIMATELY 38%

THAT IS A 22,000 TON REDUCTION OR AN EQUIVALENT OF 285 COAL CARS PER YEAR

Summary

The production of Cannabis is a booming industry with an enormous carbon footprint

We can reduce this impact right now while also saving money and increasing production

Research and development in the Cannabis industry, specifically within the field of lighting, will lead to increased efficiencies

Thank You!

Sustainable
Growth Technology

I challenge all of you to implement viable technologies that actively address our carbon footprint not only in the cannabis industry but in our everyday lives.