



GRAND RAPIDS 2030 DISTRICT
CANNABIS
WEBINAR SERIES

**CANNABIS SUSTAINABILITY REQUIREMENTS :
THE GAME-CHANGING METRICS THAT MATTER**

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INTRODUCTIONS

Moderator

Gillian Giem, Program Manager,
Grand Rapids 2030 District

Speakers:

João Oliveira, Energy and Performance Management
Specialist, City of Grand Rapids

Alison Waske Sutter, Sustainability and Performance
Management Officer, City of Grand Rapids



Agenda

1. Overview about Cannabis Industry

- i. Energy Consumption
- ii. Wastewater
- iii. Solid Waste
- iv. Energy-Efficiency Measures
- v. Water-Efficiency Measures

2. Sustainability Requirements in the Grand Rapids Ordinance

- i. 2030 District
- ii. Energy Star Portfolio Manager
- iii. Energy Load
- iv. Sustainability Plan
- v. ASHRAE Level II Audit
- vi. Renewal Process

Cannabis Guide – USGBC

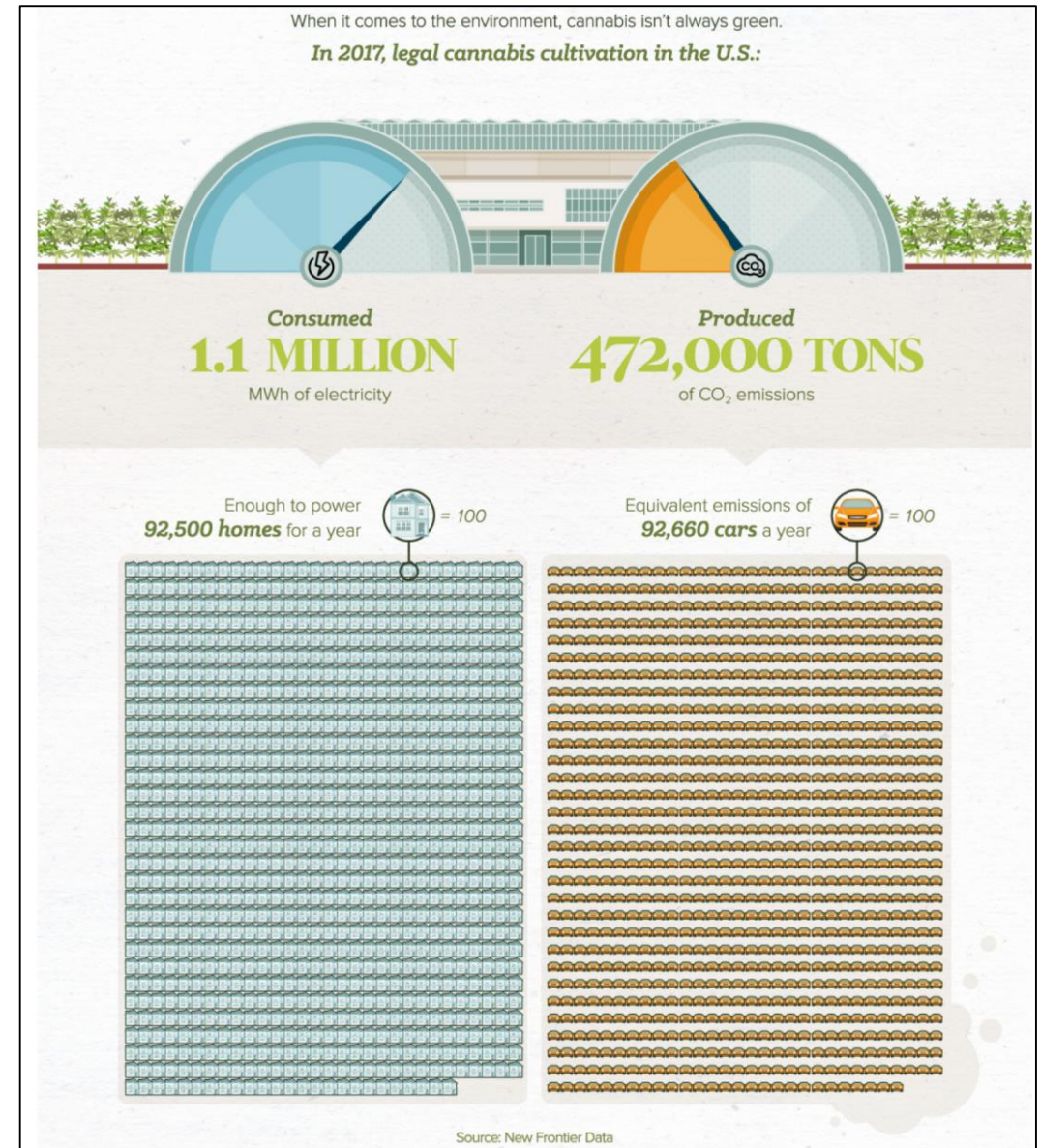
Coming soon!



Cannabis Industry Energy Consumption



- Indoors agriculture systems may operate 24 h/day
- Energy is the second highest cost in the Cannabis Industry (labor being the first driver of cost)
- Facilities are very energy-intensive due to Lighting, Heating, Ventilation and Humidification needs
- Portland (OR) reported that indoor cannabis grows caused seven power outages in 2015
- The cannabis grow sector accounted for 45% of the increase in electricity consumption in Denver (CO) in 2016
- US Legal and illegal cannabis cultivation combined uses almost three times the amount of electricity as the entire Starbucks Corp



Cannabis Industry Wastewater



- Large-scale cannabis cultivation operations may require significant water usage or water withdrawal
- Pollutants specific to the cannabis industry can include plant material (pieces of leaves, stems, seeds, etc.), nutrients (fertilizer), pesticides, solvents, and soil or water containing any of other materials. This type of waste causes algae blooms in natural bodies of water, depriving aquatic species of oxygen
- The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters
- In Michigan, cannabis growing and processing operations may be subject to Michigan Department of Environment, Great Lakes, and Energy (EGLE) reporting and permitting requirements:
 - *In the State of Michigan, large quantity water withdrawal - more than 100,000 gallons per day (gpd) from groundwater or surface water - requires businesses to use the **Water Withdrawal Assessment Tool (WWAT)***

Grand Rapids Code of Ordinance: [Chapter 27 –Sewage Disposal System](#)

[Guide from EGLE](#)

Cannabis Industry Solid Waste

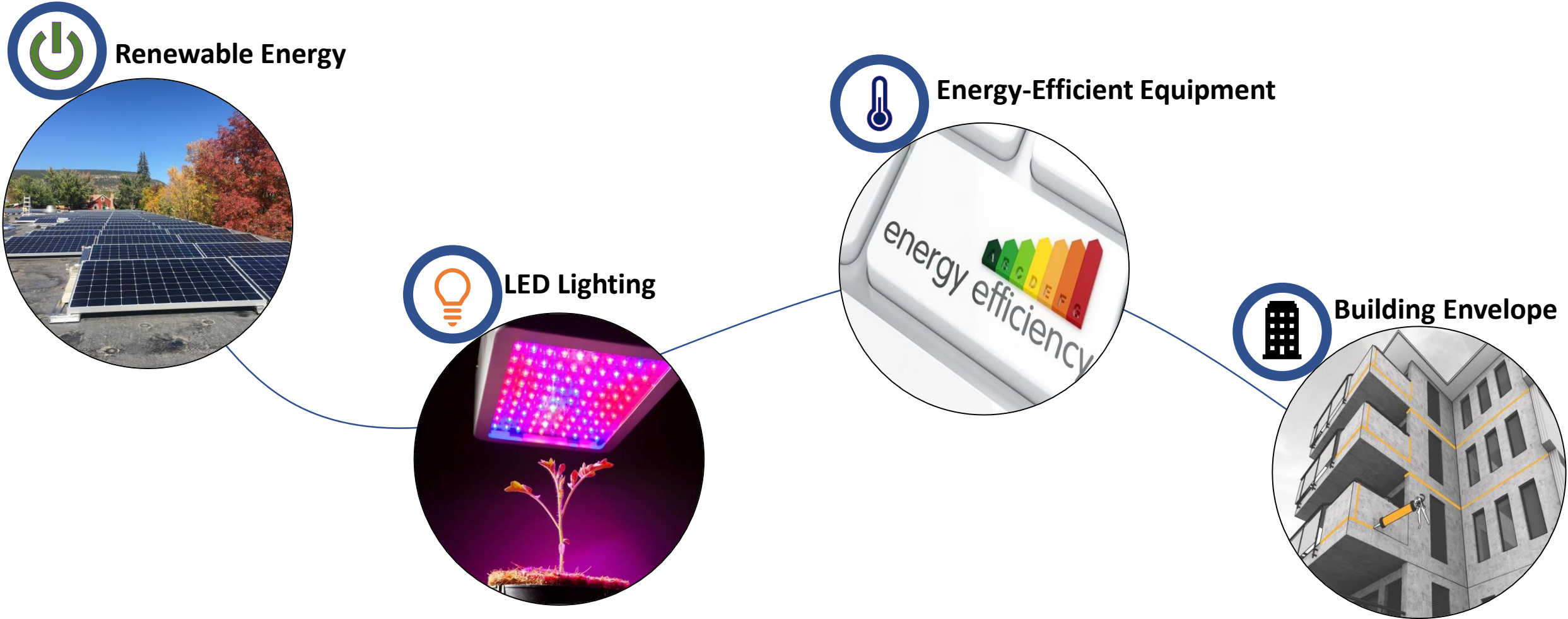


- Like any agricultural industry, cannabis generates a fair amount of solid waste
- Organic matter from cannabis production can be disposed of via four different methods: incineration, landfill, composting and anaerobic digestion
- Colorado has a 50-50 mixed waste rule - All cannabis waste has to be mixed with 50% non-cannabis waste before it exits the grow facility
- Under current regulations, cannabis plant wastes may be disposed at the following: a licensed municipal solid waste incinerator, municipal solid waste landfill, anaerobic digester, or registered composting facility; or the wastes may be composed on-site.

[Grand Rapids Code of Ordinance: Chapter 25 – solid waste management](#)

[EGLE – Paper about impacts of cannabis industry](#)

Renewable Energy and Energy– Efficiency



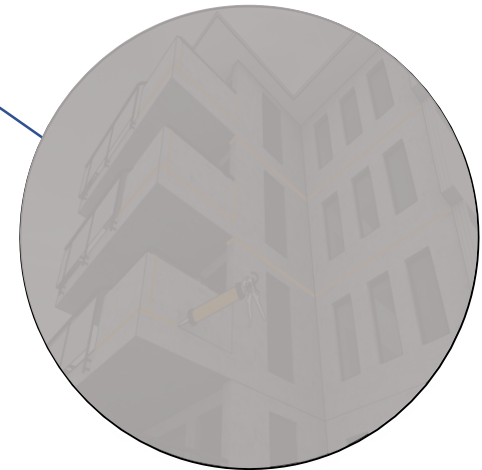
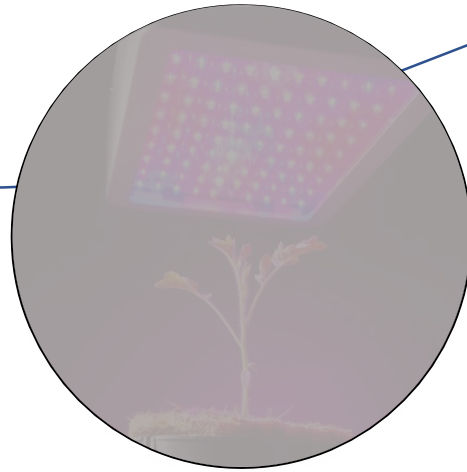
Renewable Energy and Energy– Efficiency



Renewable Energy



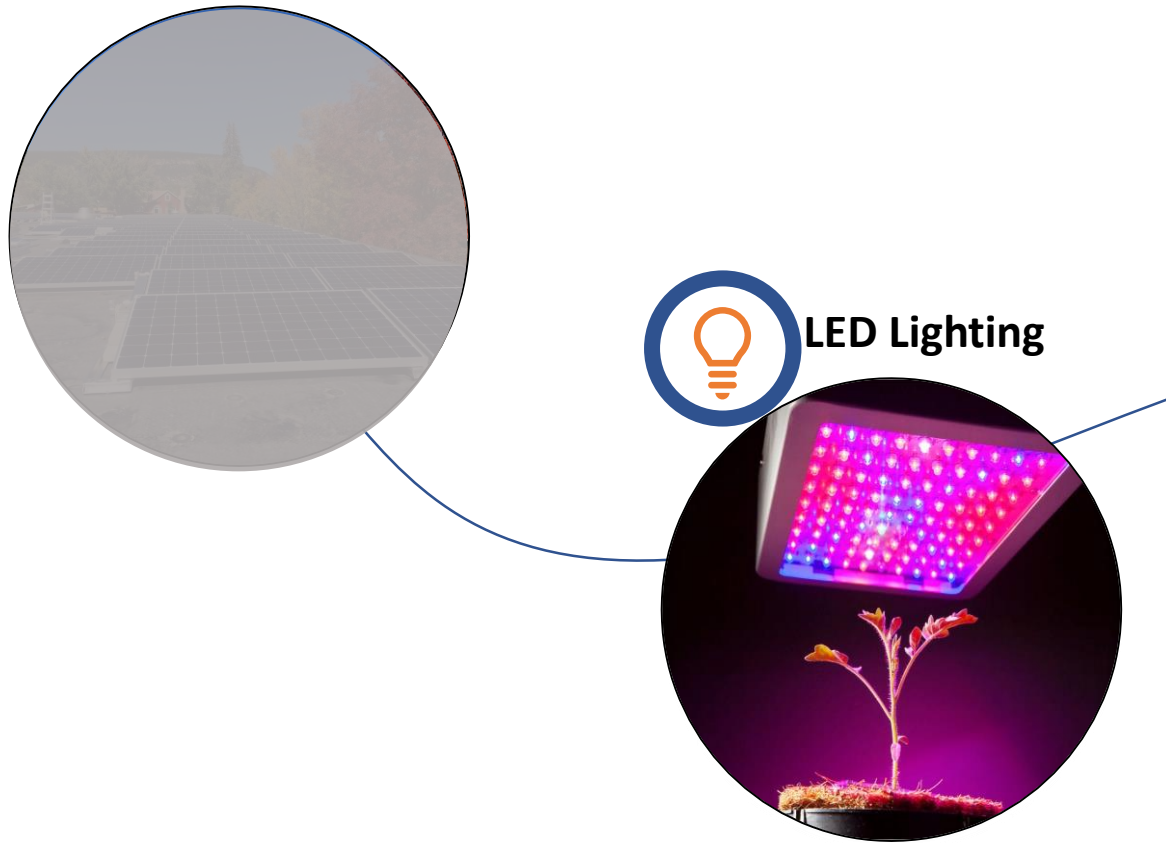
By harnessing solar energy to power their lighting and HVAC systems, cannabis companies can reduce their monthly power bills while at the same time reducing their greenhouse gas footprint



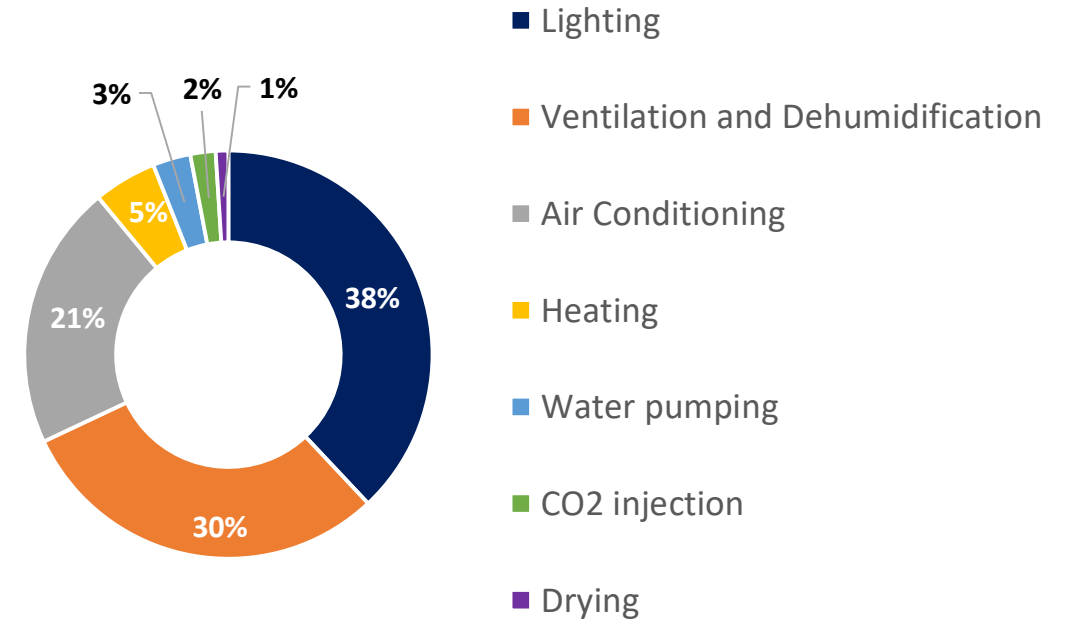
Renewable Energy and Energy– Efficiency



For lighting, medium size facilities could save up to 50% in the vegetative rooms through installing LEDs, and 25-30% in the flower rooms through a hybrid of HPS and LEDs, for total lighting savings of 35-40%.



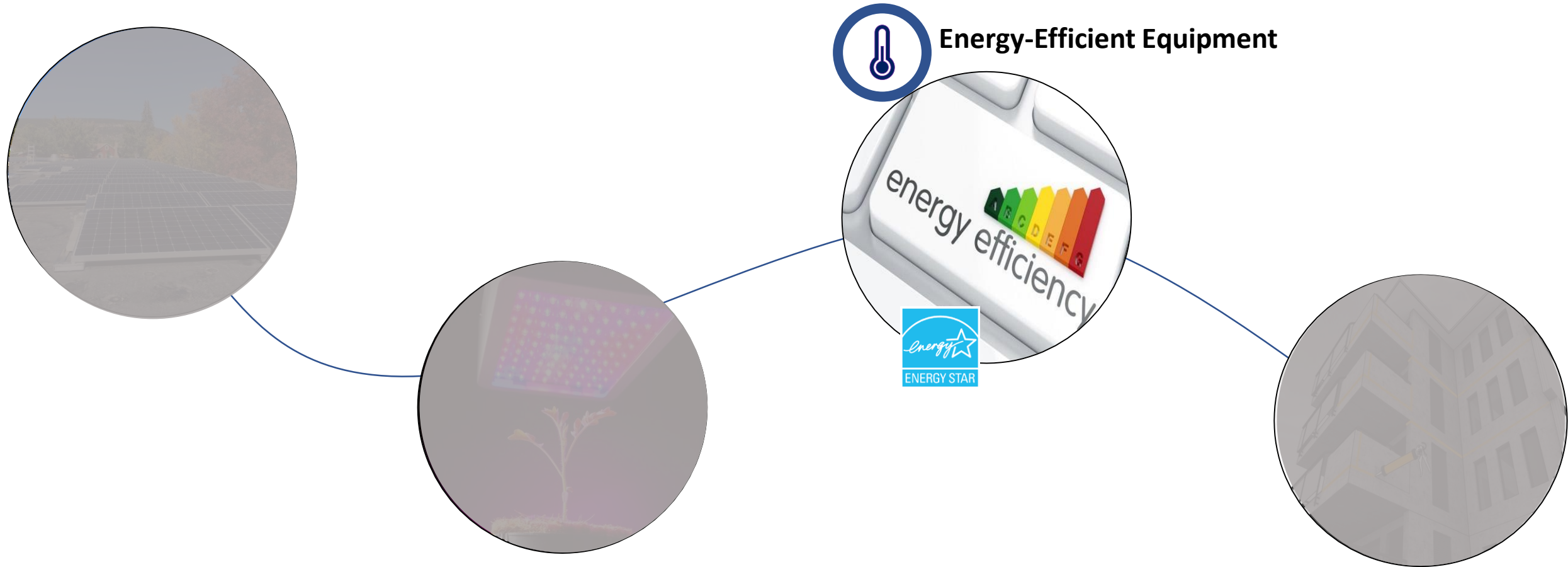
Breakdown of energy use in indoors cannabis



Renewable Energy and Energy– Efficiency



- For cooling and dehumidification, a medium size facility could save up to about 35% by installing a energy-efficient systems.
- Lighting and HVAC/ dehumidification efficiencies can lead to energy savings up to 30%.



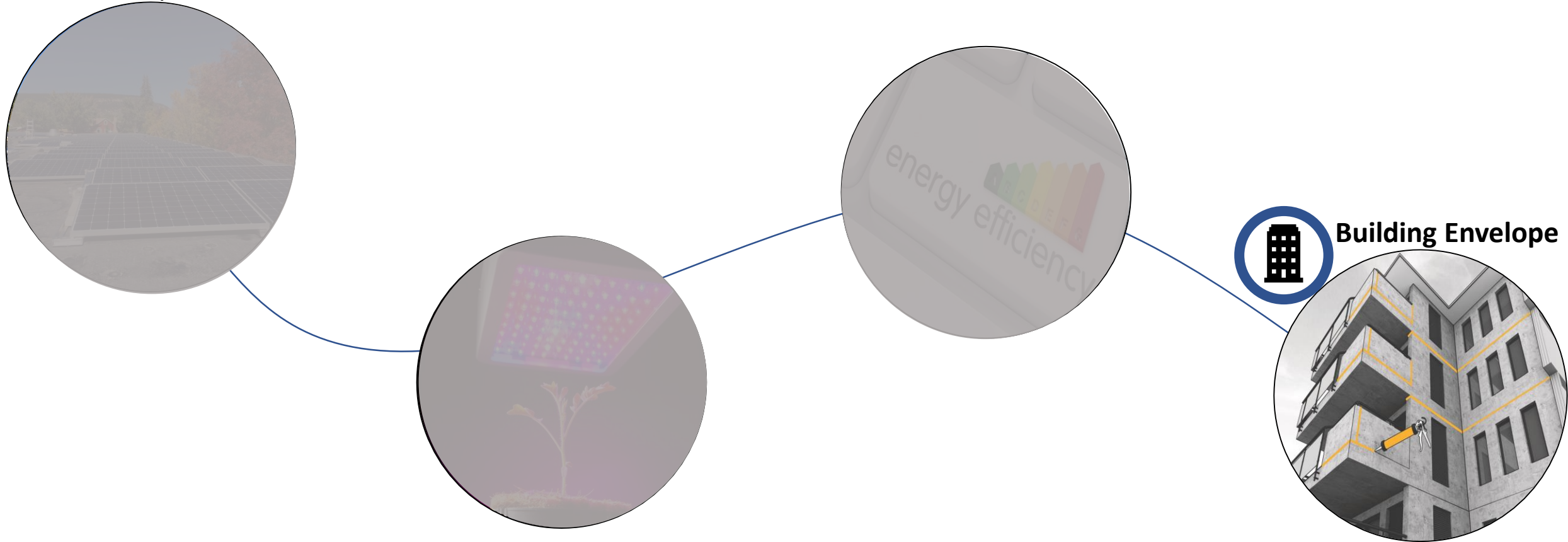
Energy-Efficient Equipment



Efficiency programs have the opportunity to influence the choices and direction of this emerging industry toward more efficient designs by engaging growers and providing guidance and incentives.

Energy – Efficiency Measures

A building envelope is what separates the outside from the inside of a building. Building envelope items include **insulation, roofs, windows, doors, walls**, etc. Having a tight building envelope is fundamental to good energy performance. Poor performing building envelopes results in wasted energy, increase energy costs, and may have ancillary impacts like neighbor smell complaints.



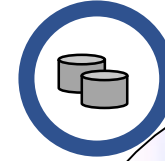
Water – Efficiency Measures



Minimize Wastewater



Recirculating /Recycling Systems



Reservoirs For Cannabis Wastewater

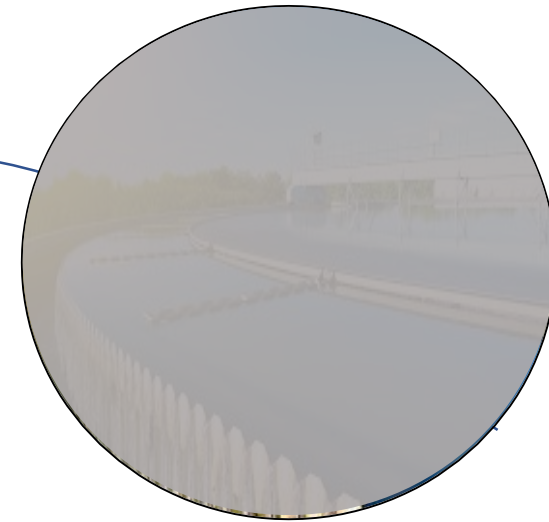
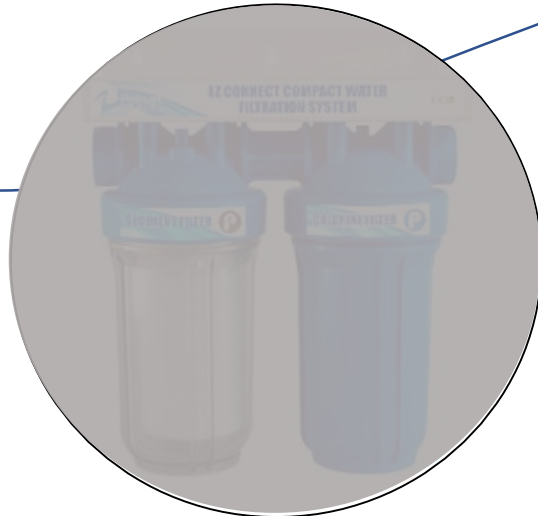
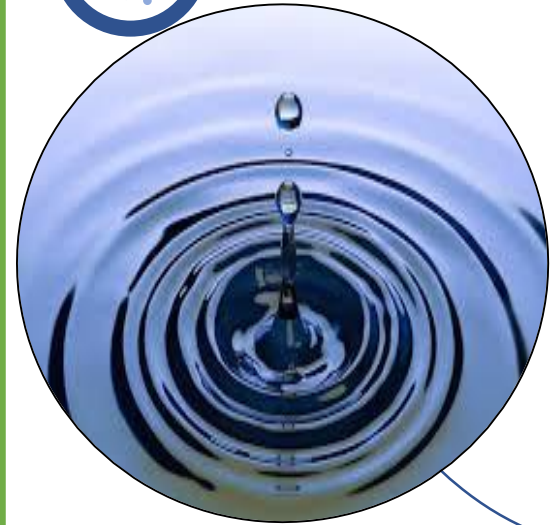


Water – Efficiency Measures



Minimize Wastewater

- Setting up effective irrigation systems
- Not overwatering when hand watering
- Having the appropriate amount of plants on a flood table
- Using the correct amount of nutrients



Water – Efficiency Measures

- Primary treatment, which removes sediment
- Filtration
- Reverse Osmosis

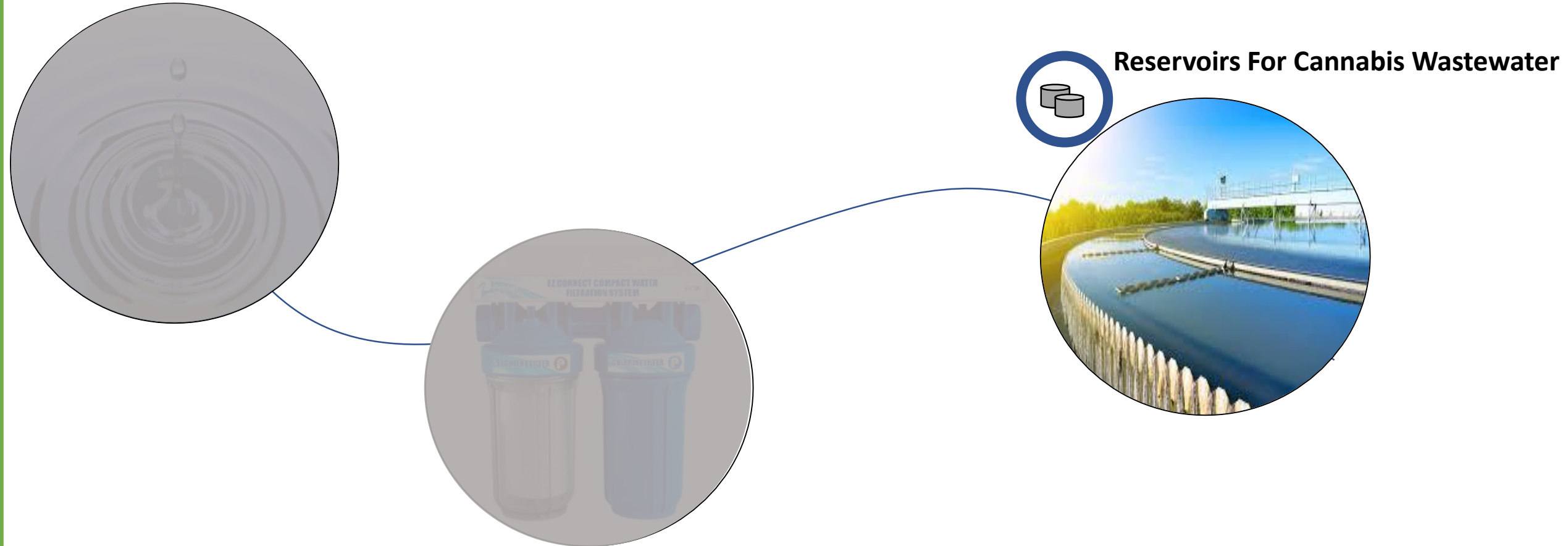


Recirculating /Recycling Systems



Water – Efficiency Measures

- Storage method for any filtration system is a tank



Financing Opportunities for Efficiency Projects



FINANCING OPPORTUNITIES

- [PROPERTY ASSESSED CLEAN ENERGY \(PACE\)](#): financing tool that enables cashflow positive investment in comprehensive energy efficiency, water efficiency and renewable energy projects.
- [Michigan Saves](#): with fixed interest rates as low as 6.50% APR and amounts starting at \$5,000, Michigan Saves affordable financing can be used for nearly any energy-efficiency and renewable energy project
- Power Purchase Agreements (PPA) for Solar PV projects: mechanism that avoids up-front cost associated to the project and provides savings by paying for a levelized cost of energy (LCOE) usually cheaper than the utility rate

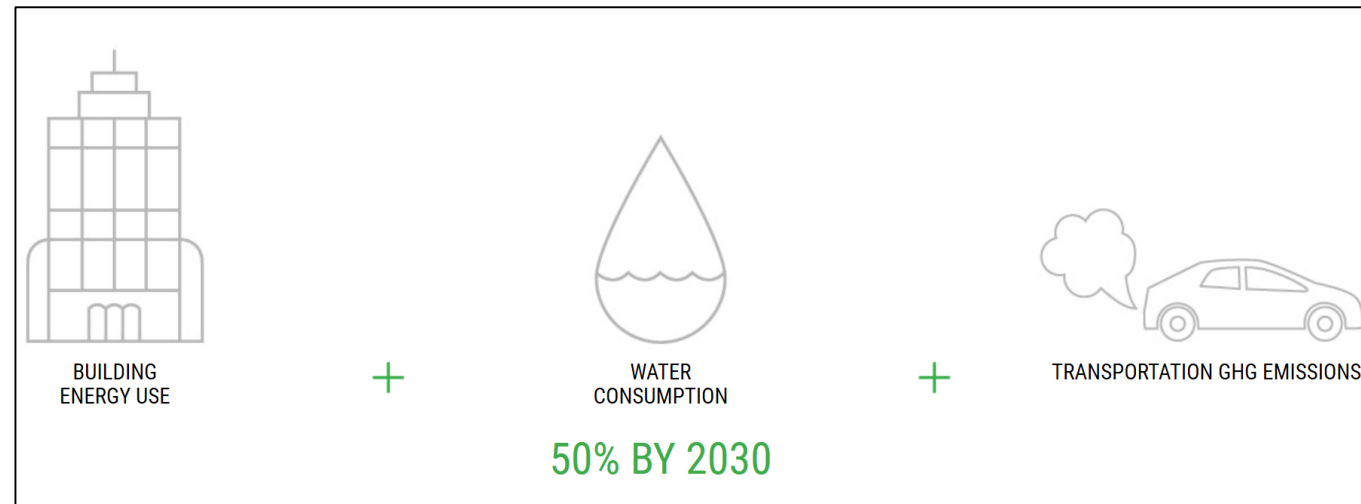
REBABATES FROM UTILITY COMPANIES

- [CONSUMERS ENERGY](#)
- [DTE](#)

Cannabis Sustainability Requirements

- ✓ **All establishments shall enroll in 2030 District prior to operation.**

The 2030 District is a public-private partnership committed to create a high performance building sector and smart mobile options. The main goals of the 2030 District are to reduce:



The USGBC of West Michigan administers the [Grand Rapids 2030 District](#). They have been implementing strategies and solutions to lower carbon emissions through education, advocacy, tools and resources.

Cannabis Sustainability Requirements

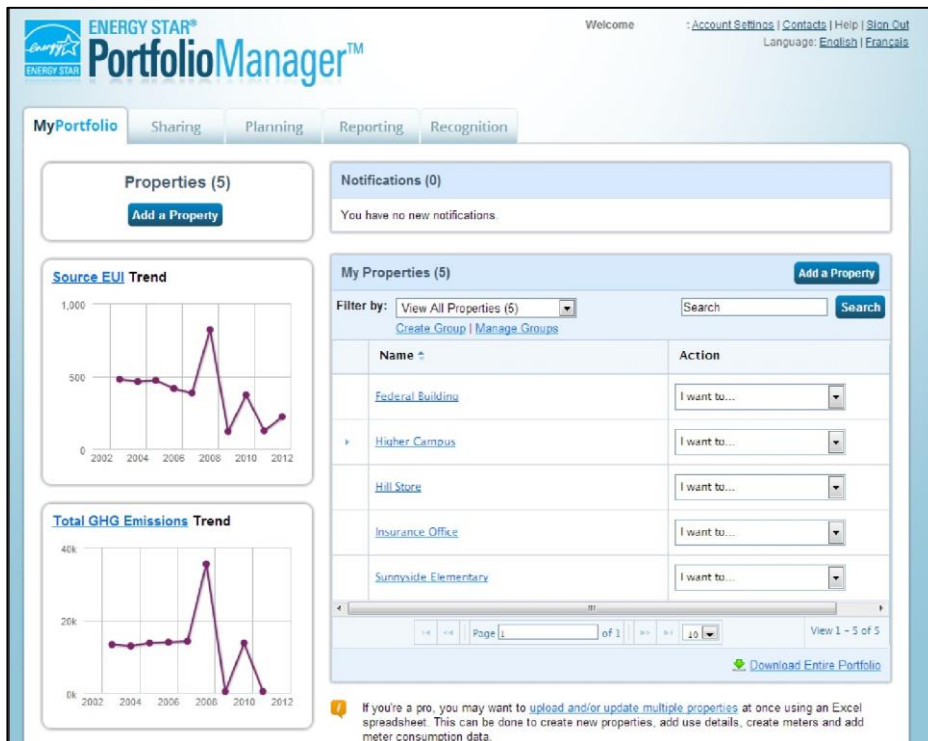
- ✓ **Energy consumption data shall be reported via Energy Star Portfolio Manager on at least an annual basis and no later than sixteen (16) months after operations commence.**

• Management Tool

- Assess whole building energy and water consumption
- Track changes in energy, water, greenhouse gas emissions, and cost over time
- Track green power purchase
- Share/report data with others
- Create custom reports
- Apply for ENERGY STAR certification

• Metrics Calculator

- Provides key performance metrics to integrate into a strategic management plan
- Energy consumption (source, site, weather normalized)
- Water consumption (indoor, outdoor)
- Greenhouse gas emissions (indirect, direct, total, avoided)
- ENERGY STAR 1-to-100 score (available for 15 building types)



Cannabis Sustainability Requirements

- ✓ Create and submit an analysis of predictive energy load, including design energy use intensity (EUI) to the City's Office of Sustainability (sustainability@grcity.us) as well as all energy utilities serving the applicant, including electricity, natural gas, and steam, at the time of the Cannabis Related Municipal License application.

Work with Utility Companies to forecast energy consumption. An upcoming webinar will be presented on this topic.

Electricity Utility in Grand Rapids: [Consumers Energy](#)

Steam Utility in Grand Rapids: [Vicinity Energy](#)

Natural Gas Utility in Grand Rapids: [DTE Energy](#)

Cannabis Sustainability Requirements

- ✓ **Create and submit an environmental sustainability plan to the City's Office of Sustainability (sustainability@grcity.us) at the time of the Cannabis Related Municipal License application, that includes the following items:**
- Estimated greenhouse gas (GHG) emissions for the coming year and reporting on the past year's GHG emissions;
 - Identification of water efficiency measures planned;
 - A list of wastewater pollutant loadings and toxics; and
 - A solid waste management plan detailing disposal plans and anticipated amounts for plants, soils and other wastes that will be generated

Cannabis Sustainability Requirements

- ✓ **At least fifty (50) percent of plant canopy area that is partially or fully illuminated by electric lighting shall be illuminated by fixtures with photosynthetic photon efficacy of at least 1.9 $\mu\text{mol}/\text{J}$ at the time operations commence.**
- Energy use varies dramatically by type of room (seedling, vegetative, flowering). - literature reports that lighting accounts up to 38% of all energy consumption
- LED grow lighting has been identified as the primary energy efficiency opportunity for indoor grow facilities, but the industry has been slow to adopt the technology due to the cost premium associated with LEDs, as well as concerns about the effectiveness of the fixtures in terms of product yield and quality.
- Payback period for LED investment varies from type and size of facility, however it has been proven financial benefit due to rebates and energy savings associated

Cannabis Sustainability Requirements

- ✓ **Submit a whole building energy audit meeting ASHRAE Level II guidelines or better to the City's Office of Sustainability within sixteen (16) months after operations commence.**
 - An energy audit is the first step to making your commercial facility more energy efficient. It identifies how, when and where energy is being used in a building
 - ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) defines best practices for energy audits for those providing energy services. ASHRAE Audit Levels 1, 2, and 3 have standards, which vary in depth.

PRELIMINARY

Preliminary Energy Use Analysis:

- Most basic energy audit
- Analysis of historic energy use and costs.
- Energy use is typically benchmarked

LEVEL 1

ASHRAE Audit Level 1 – Walk-Through Analysis:

- The basic starting point for building energy optimization
- Involves interviews with select facility staff
- A review of utility bills or other operating data
- A walkthrough of the facility
- The goal is to identify glaring areas of energy inefficiency
- The data is compiled and used to complete a preliminary report detailing low-cost/no-cost measures and potential capital improvements for further study in subsequent audits.

This level of detail is adequate for prioritizing energy efficiency projects and to assess whether a more detailed audit is necessary.

LEVEL 2

ASHRAE Audit Level 2 – Energy Survey and Analysis:

This includes the ASHRAE Level 1 analysis, and adds:

- Detailed energy calculations and financial analysis of proposed energy efficiency measures
- Energy consumption is broken out by end-use, identifying areas which present the greatest efficiency opportunities.
- Utility rates are analyzed to determine if there are rate change opportunities
- Key building representatives are interviewed for insights into building operational characteristics, potential problem areas, and to define financial and non-financial goals of the audit.

This level of detail is adequate to justify project implementation.

REQUIRED BY THE CITY

LEVEL 3

ASHRAE Audit Level 3 – Detailed Analysis of Capital Intensive Modifications:

- Engineering analysis of the potential capital-intensive projects identified in the ASHRAE Level 2 Analysis.
- More detailed field data gathering and more rigorous analysis.
- Existing utility data is supplemented with sub-metering of major energy-consuming systems and monitoring of those system's operating characteristics.

This level of detail is typically reserved for complex commercial and industrial buildings.

Cannabis Sustainability Requirements

- ✓ All applicants for renewal of any license shall include the sustainability plan and can be submitted to sustainability@grcity.us





QUESTIONS?

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CITY OF
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GRAND RAPIDS 2030 DISTRICT
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NEXT WEBINAR

SMART BUSINESS: MANAGE YOUR ELECTRIC
USE IN ALIGNMENT WITH COMMUNITY GOALS

Please fill out our 2 minute survey at the end of this
webinar. Thank you!

Thank you to our Visionary Supporters!

