

# PowerScore CEA: All Survey Questions

This document previews all survey questions, other than periodic open-ended questions about your facility's uniqueness. Most questions are optional, but the more data you put in, the more KPIs you'll get out of the survey.

<https://powerscore.resourceinnovation.org/go-cea>

## Describe your cultivation facility

Calculating your PowerScore depends on a few dozen details about your facility. You will need information about your energy bills, lighting equipment, and HVAC systems.

- Which crops do you grow at this facility? (Select all that apply)
  - Floriculture
    - Finished Plants (perennials, grasses, herbs, ferns, succulents)
    - Young Plants for Wholesale (plugs and cells of varying cultivars like veggies, herbs, perennials)
  - Leafy Greens
    - Lettuce, Arugula, Spinach
    - Macrogreens (Radish, Beet, Cabbage, Kale, Arugula, Mustard)
    - Microgreens (Radish, Beet, Cabbage, Kale, Arugula, Mustard)
    - Genetics (Lettuce, Arugula, Spinach, Radish, Beet, Cabbage, Kale, Mustard)
  - Cole Crops
    - Mustard family including Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kale, Kohlrabi
    - Genetics
  - Specialty Greens
    - Herbs (Basil, Cilantro, Oregano, Lavender, Amaranth, Sorrel, Cress)
    - Genetics (Basil, Cilantro, Oregano, Lavender, Amaranth, Sorrel, Cress)
  - High Wire Fruit and Vegetable Specialty Crop
    - Vine Tomatoes
    - Tomato Genetics
    - Vine Cucumbers
    - Cucumber Genetics
    - Specialty (Pepper)
  - Fruit
    - Berries (Raspberries, Blueberries, Blackberries)
    - Strawberries
    - Grapes
    - Melons (Watermelon, Cantaloupe, Honeydew)
    - Genetics

- Mushrooms
  - Humulus (Hops)
- What type of facility are you wanting to benchmark?
  - Greenhouse
  - Vertical indoor
  - Single-level indoor
  - Outdoor
- Which part of your facility are you wanting to benchmark?
  - Your main production environment(s)
  - Your research chamber(s)
  - Both
- Facility's postal code
- Name of facility
 

Optional. Will only be used for communication between us and you.
- Year of production
- Last reporting month
 

The last full month you have complete energy, water, and production information you can report.
- For each crop, what is the average area under production throughout the 12-month reporting period? ( Square Feet / Square Meters)
- For each crop, what is the total production throughout the same 12-month reporting period?
  - Measure Method
    - Fresh weight
    - Dry weight
    - Number of Plugs/Cells
    - Number of Pots/Baskets
  - Units
    - Kilograms
    - Pounds
    - Hundredweight (cwt)
    - Units
  - Annual total production

## Describe your lighting fixtures

- **Details for Each Light Type within Each Space:**
  - Make
  - Model
  - Lighting fixture wattage
  - Number of these fixtures
  - While in operation, how many hours a day are the lights in this space turned on? (hours)

- How many days a year are the lights in this space in operation? (days)

## Describe the heating, ventilation, air conditioning, and dehumidification (HVAC) systems you use

There are many variables in your cultivation facility that impact HVAC equipment selection, unit size and cost of operation. These system types simplify the complex variety of options in grow operations today.

Due to the limited data and unique aspects of greenhouses, we will not yet be able to estimate an HVAC score for systems F and G.

- Describe the HVAC system you use for your cultivation and processing spaces.  
(Select system, then associate with Spaces)
  - System 0: No Heating or Cooling with Supplemental Standalone Ventilation and Dehumidification Equipment  
Heating, Ventilation, and Air Conditioning (HVAC) systems are not used, and supplemental, standalone ventilation or dehumidification equipment are the only components controlling your grow environments. Outside air may or may not be used for ventilation.
  - System A: Conventional Heating, Ventilation, and Air Conditioning (HVAC) with Supplemental Standalone Dehumidification Equipment  
Conventional factory-built or packaged HVAC equipment with cooling components sized to handle the entire sensible cooling load of the room are used to control your grow environments. Standalone dehumidification equipment in your cultivation spaces and/or HVAC equipment using an internal hot gas reheat coil is used to control your grow environments when lights are off, or to supplement the dehumidification capacity of the cooling components.
  - System B: Conventional Heating, Ventilation, and Air Conditioning (HVAC) and Enhanced Dehumidification  
Conventional factory-built or packaged HVAC equipment with cooling components sized to handle the entire sensible cooling load of the room are used to control your grow environments. Permanently installed dehumidifier equipment containing heat exchanger plates or heat pipes is used to improve the moisture removal capacity effectiveness of your system.
  - System C: Conventional Heating, Ventilation, and Air Conditioning (HVAC) with Split Dehumidification System  
Conventional factory-built or packaged HVAC equipment with cooling components sized to handle the entire sensible cooling load of the room are used

to control your grow environments. Split dehumidifiers with remote air-cooled condensers to provide dehumidification and supplemental cooling with improved effectiveness over portable dehumidification equipment installed in cultivation spaces using internal hot gas reheat.

- System D: Conventional Heating, Ventilation, and Air Conditioning (HVAC) with Desiccant System for Dehumidification and Sensible Cooling  
HVAC equipment with cooling components sized to handle the entire sensible cooling load of the room are used to control your grow environments. Additional desiccant dehumidification equipment with gas or electric heat is used when lights are off or to supplement the dehumidification capacity of cooling components. Your system can be integrated units that provide both sensible cooling and dehumidification for your cultivation spaces.
- System E: Fully Integrated Heating, Ventilation, and Air Conditioning (HVAC) and Dehumidification System  
Completely integrated equipment is used to control your grow environments using control systems that adjust sensible heat ratios to perform heating, ventilation, cooling, and dehumidification for your cultivation spaces.(Due to the limited data, we will not yet be able to estimate an HVAC score.)
- System F: Hydronic Chilled Water and Boiler System  
A central chilled water system can allow for heating and cooling for an unlimited number of independent growing zones within your facility. Hydronic fan coil units or air handlers exchange heat between the building and the outdoors, served by air- or water-cooled equipment located outside the building. Air-cooled chiller systems can reject their heat directly to outside air, while water-cooled chiller systems are often located indoors in a mechanical room and are connected to evaporative cooling towers located outdoors via separate condenser water loops in order to reject heat to the outside air.
  - Some portions of the chiller and/or boiler system can recover heat to recycle energy for dehumidification reheat and/or primary building heat
  - Chiller can be heat recovery type, otherwise a secondary source of hot water is required from a site-generated source (like a boiler)
  - Dry coolers can be utilized for free cooling in winter without introducing outside air into the space
- System G: Year-round Greenhouse HVAC Systems  
HVAC equipment addresses the ventilation, cooling and heating loads of your grow environments throughout the year. These systems may be a factory-built central system or may be composed of packaged, standalone components that maintain greenhouse indoor environmental conditions within acceptable ranges.

- Other HVAC Systems: Your system is not described in A thru G above
- Does your facility use any of these thermal technologies? Please describe anything interesting at the end of this page.
  - Heat pump technology
    - What type of heat pump?
      - Air-to-air (ducted or ductless systems)
      - Air-to-water (hydronic systems)
      - Ground-source (ducted or hydronic geothermal systems)
      - Heat pump rooftop unit
  - Direct use geothermal (not a heat pump system)
  - Pelton wheel
  - Other

## Describe your electricity sources and usage

For the most accurate and current results, answer the following questions for the most recent 12-month period.

- Does your reported electricity consumption include non-facility usage, such as a residential dwelling or unrelated business?
  - Please estimate the percentage of your overall reported electricity consumption that is attributable to crop cultivation operations. (0-100%)
- Does your facility produce renewable electricity onsite?
  - What types of renewable electricity does your facility produce onsite?
    - Solar PV
    - Wind
    - Other
  - Our numbers are reported as net electricity consumption and include renewable energy production. ( Y / N )
  - **For each month of the reporting year:**
    - Renewable Electricity Generated (kWh)
- Over the 12-month period, how many total annual kilowatt hours (kWh) did your facility use? Enter 0 for any months that you did not consume any electricity from the grid. Please report the most recent 12 months of energy consumption, or the previous calendar year's energy consumption.
 

**For each month of the reporting year:**

  - Electricity Usage (kWh)
  - Peak Electric Demand ( kW / kVA )
- Would you like to upload images or files of your electricity bill data?
- Does your facility use an electric utility as a fuel source? We're still building a more complete database of utilities and energy providers.
- Do you work with your utility to source your electricity from solar, wind, or hydro?

## Describe your other energy sources

- Did your facility use natural gas in the last 12 months?
  - What is the name of your natural gas utility?
- Does your operation consume other delivered fuels?
  - What delivered fuels does your operation consume?
    - Back up generator
    - Biofuels (cord wood, wood pellets, other)
    - Propane
    - Fuel oil

## Describe your other energy usage

For the most accurate and current results, answer the following questions for the most recent 12-month period.

- **For each month's consumption of the reporting year:**
  - Natural Gas ( Therms / CCF )
  - Back Up Generator ( Gasoline Gallons / Diesel Gallons / Natural Gas Therms / Natural Gas CCF )
  - Biofuels ( Tons / Cords )
  - Propane ( Gallons )
  - Fuel Oil ( Gallons )

## How would you like to move forward?

- E-mail address  
We will e-mail your PowerScore, but we will not share your e-mail with anyone.
- Yes, I would like to occasionally receive email updates from the Resource Innovation Institute
- Would you like to support RII's conservation efforts by joining as a member?  
[ResourceInnovation.org/joinwithus/](http://ResourceInnovation.org/joinwithus/)
- Are you considering a lighting, HVAC and/or dehumidification upgrade over the next 12 months? ( Y / N )
- Have you used incentives from a utility program? ( Y / N )
- Would you like to be contacted by your utility representative to learn more about incentives for which you may be eligible? ( Y / N )