

# PRODUCT EVALUATION HUB: USER GUIDE

The Product Evaluation Hub provides rigorous and unbiased evaluations of products that reduce and/or manage demand for energy consumption in commercial buildings and agriculture. To get started, select a product category that you are interested in.

## STEP 1: SELECT A PRODUCT TYPE

There are multiple ways to navigate to products:

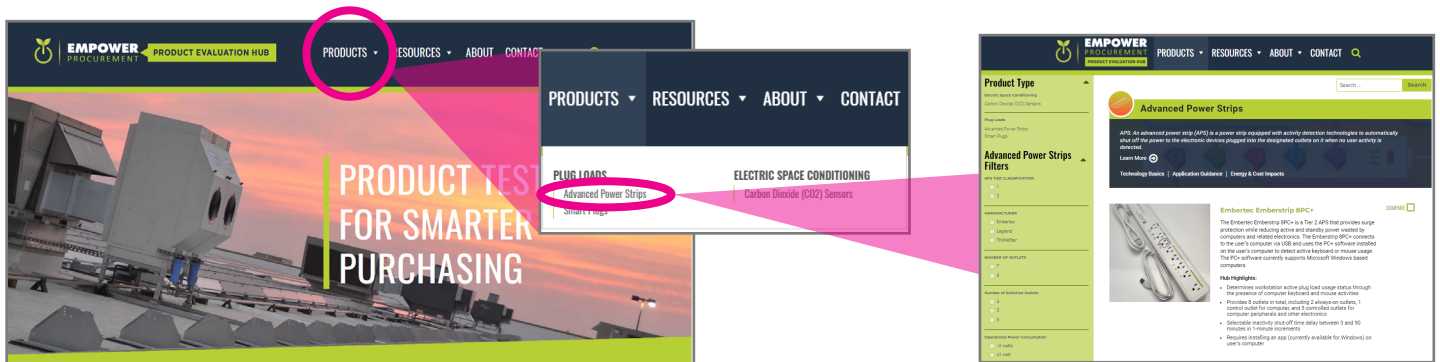
**A:** Top Navigation PRODUCTS feature

**B:** Homepage Product Type Buttons (only highlighted buttons are currently available)

**C:** Search feature

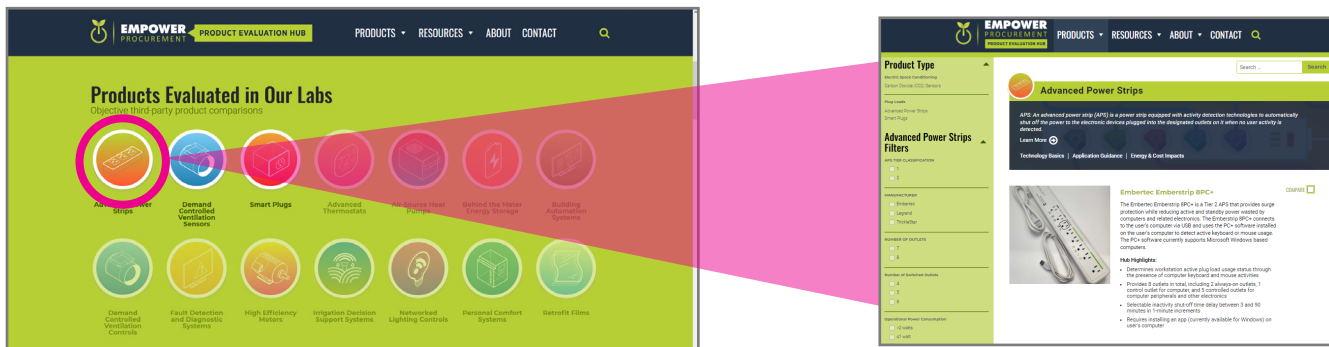


### A: TOP NAVIGATION PRODUCTS FEATURE



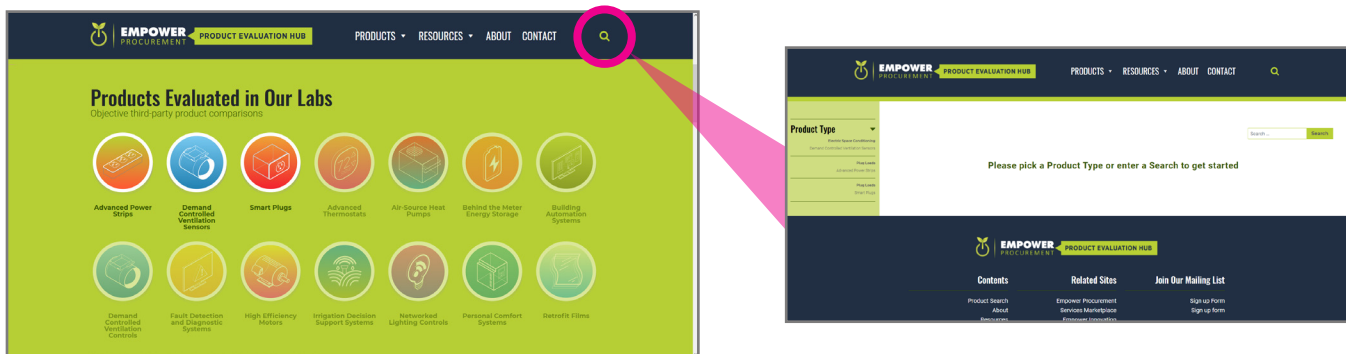
Clicking this button will display the Product Types. Clicking on a product type will take you directly to the list of specific products that have been evaluated to date, complete with search and filter features (discussed in detail in **STEP 2: USING PRODUCT SEARCH**).

## B: HOMEPAGE PRODUCT TYPE BUTTONS



Scrolling down to these Product Types and clicking on the available images will take you directly to the list of specific products within that Product Type, complete with search and filter features (discussed in detail in **STEP 2: USING PRODUCT SEARCH**).

## C: SEARCH PRODUCT TYPE BUTTON



Clicking on the Search icon will take you directly to the list of Product Types. Choose a Product Type from the left Side Menu to see all products and reveal the search and filter features (discussed in detail in **STEP 2: USING PRODUCT SEARCH**).

## STEP 2: USING PRODUCT SEARCH

The screenshot displays the Empower Procurement Product Evaluation Hub. The top navigation bar includes the logo, 'EMPOWER PROCUREMENT', and links for PRODUCTS, RESOURCES, ABOUT, and CONTACT. A search bar is located on the right. The left sidebar contains a 'Product Type' dropdown menu with options like 'Electric Space Conditioning' and 'Carbon Dioxide (CO2) Sensors'. Below this, there are 'Plug Loads' and 'Advanced Power Strips' sections. The 'Advanced Power Strips' section is highlighted with a green background and contains a description of APS: 'An advanced power strip (APS) is a power strip equipped with activity detection technologies to automatically shut off the power to the electronic devices plugged into the designated outlets on it when no user activity is detected.' It also includes a 'Learn More' link and three tabs: 'Technology Basics', 'Application Guidance', and 'Energy & Cost Impacts'. Below the tabs, there is a 'COMPARE' button. The main content area shows a list of products, with the 'Embertec Emberstrip 8PC+' highlighted. It includes a description of the product, its features, and a list of 'Hub Highlights'.

**Product Type**

Electric Space Conditioning  
Carbon Dioxide (CO2) Sensors

Plug Loads  
Advanced Power Strips **(A)**  
Smart Plugs

**Advanced Power Strips Filters**

APS TIER CLASSIFICATION

☐ 1  
☒ 2 **(B)**

MANUFACTURER

☐ Embertec  
☐ Legrand  
☐ TrickleStar

NUMBER OF OUTLETS

☐ 7  
☐ 8

Number of Switched Outlets

☐ 4  
☐ 5  
☐ 6

**Advanced Power Strips**

APS: An advanced power strip (APS) is a power strip equipped with activity detection technologies to automatically shut off the power to the electronic devices plugged into the designated outlets on it when no user activity is detected.

Learn More

Technology Basics | Application Guidance | Energy & Cost Impacts

**Embertec Emberstrip 8PC+**

The Embertec Emberstrip 8PC+ is a Tier 2 APS that provides surge protection while reducing active and standby power wasted by computers and related electronics. The Emberstrip 8PC+ connects to the user's computer via USB and uses the PC+ software installed on the user's computer to detect active keyboard or mouse usage. The PC+ software currently supports Microsoft Windows based computers.

**Hub Highlights:**

- Determines workstation active plug load usage status through the presence of computer keyboard and mouse activities
- Provides 8 outlets in total, including 2 always-on outlets, 1 control outlet for computer, and 5 controlled outlets for computer peripherals and other electronics
- Selectable inactivity shut-off time delay between 3 and 90 minutes in 1-minute increments
- Requires installing an app (currently available for Windows) on user's

To search for a product, first select the **(A)** Product Type, then, if desired, **(B)** choose specific filters to narrow your results and/or, **(C)** select up to 4 similar products to compare their technical specifications and performance results.

### A: PRODUCT TYPE SELECTION

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**Embertec Emberstrip 8PC+**

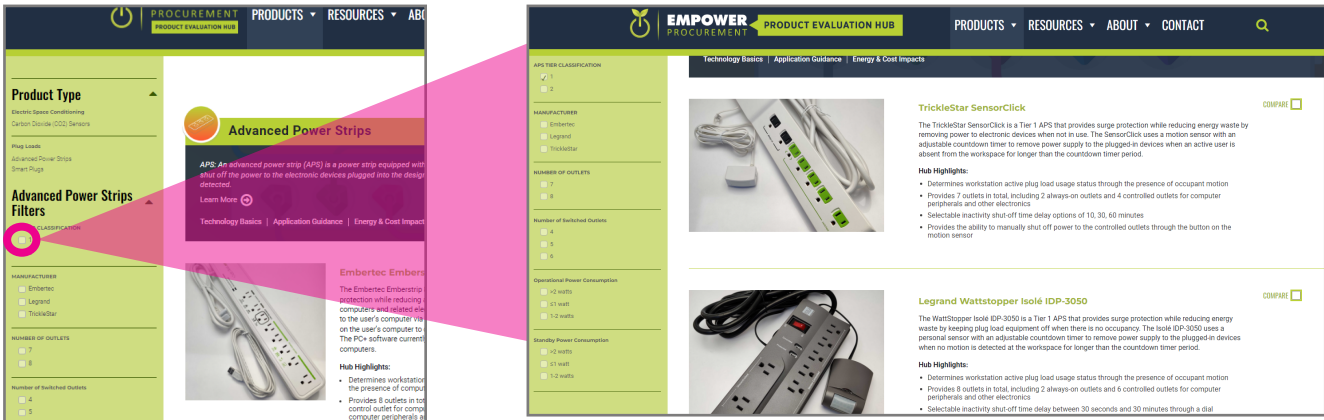
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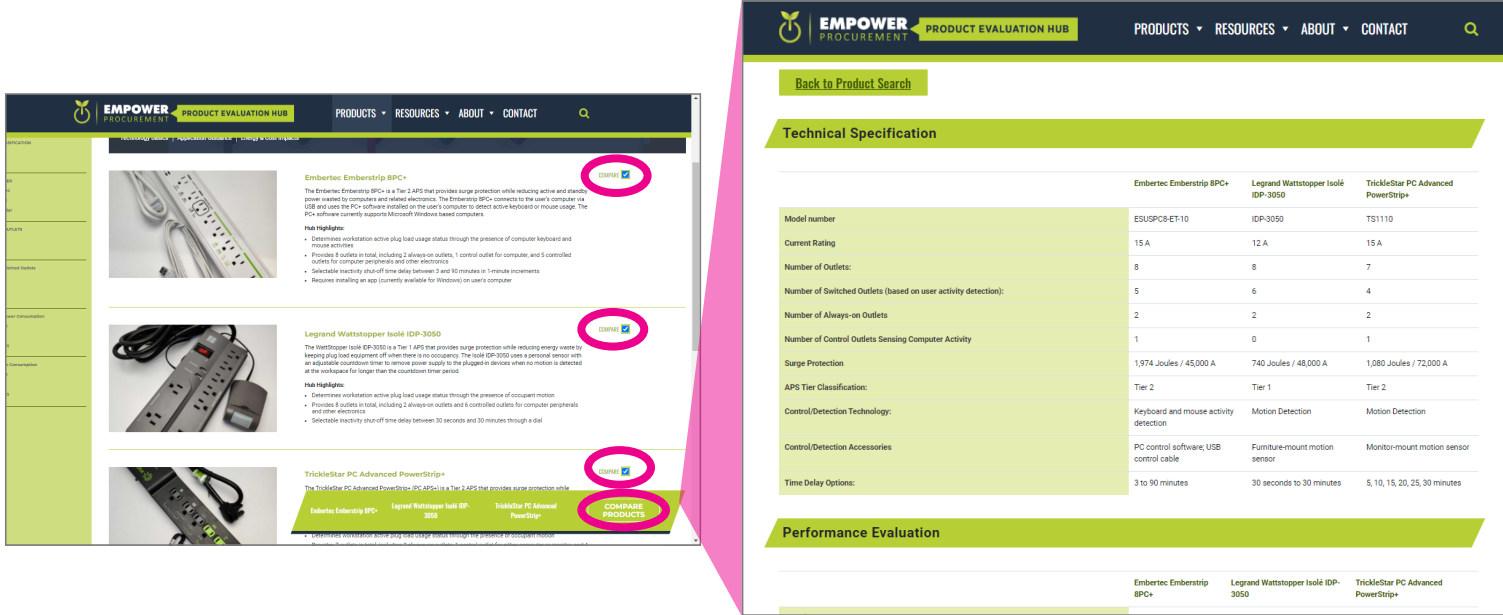
Clicking on a Product Type will display all the products relevant to that product type and includes the product name, brief description, and some quick specs on the Product Type. This also reveals context sensitive filtering options for greater search control.

B: CONTEXT SENSITIVE FILTERING



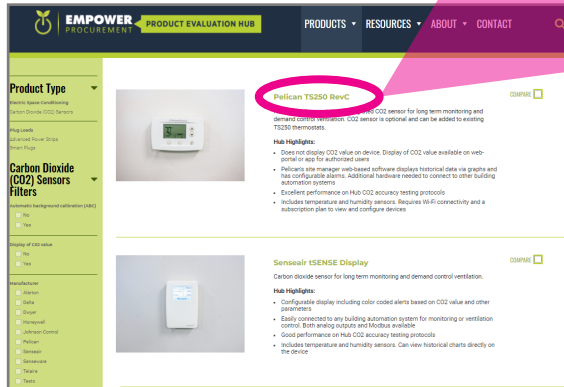
Filtering is context-sensitive to the Product Type. This allows you to find the most relevant products based on specific features you require.

C: COMPARISON TOOL OF LIKE PRODUCTS



The comparison tool allows you to choose up to 4 similar products within the same product type to quickly compare their technical specifications and performance evaluations.

## STEP 3: SPECIFIC PRODUCT PAGE

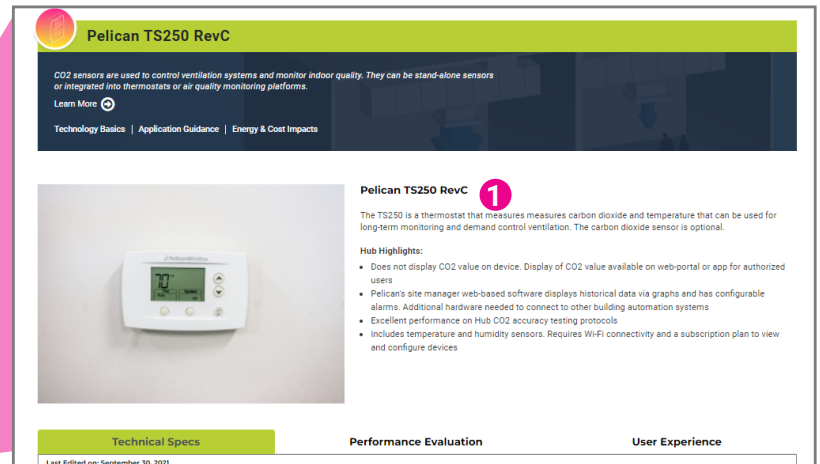


Specific pages offer (1) a more detailed description, photos and general specifications.

Also, the Technical Specs tab below the main photo shows you (2) the technical specifications of the specific product with (2a) the technical specifications in Excel format.

The Performance Evaluation tab (3) adjacent to the Technical Specs tab allows you to view testing results, download the evaluation results in Excel format (3a), and download a PDF of the test procedures (3b) used to test this Product Type.

The User Experience tab (4) on the far right hand side allows you to view experience results and download the results in Excel format (4a).



Technical Specs	Performance Evaluation	User Experience
Last Edited on: Oct 18, 2021		
Model number	TS250 RevC	
Last Updated	3/16/2021	
Sensor Type	Non-dispersive infrared (NDIR) Manufacturer: Winsen	
Power Input	24VAC	
Outputs	WiFi to cloud-based interface (requires gateway)	
Altitude Correction Method	None	
Measurement Range	0-2000 ppm	
Reported Accuracy	±50 ppm	
Display of CO2 Value	Web (account required)	
Uses Automatic Background Calibration (ABC)	Yes	
Tech Specs		

Technical Specs	Performance Evaluation	User Experience
Last Edited on: Oct 18, 2021		
Model	TS250 RevC	
Date of Test (including warm-up period if device uses automatic background calibration)	August 8, 2021- August 17, 2021	
Sample Size	5	
Error of CO2 measurement @1100 ppm (average) (ppm)	-66	
Error of CO2 measurement @1100 ppm (standard deviation) (ppm)	25	
Noise of CO2 measurement @1100 ppm (Average) (ppm)	16	
Operating Power for Sensor (watts)	0.69	
Operating Power for Gateway (watts)	1.43	
Maximum Number of Sensors per Gateway	2000	
Full results	See Box Plot	
Performance Evaluation Results		
Test Procedures		

Technical Specs	Performance Evaluation	User Experience
Last Edited on: Oct 18, 2021 Data Source: Staff at the UC Davis Western Cooling Efficiency Center		
User interface	Can the sensor display the CO2 level to occupants? If yes, describe.	Yes - Display available through web, account required
User interface	Can the sensor display a visual indicator to occupants that the CO2 level has exceeded a programmed threshold? If yes, describe (what does the indicator look like, what the default thresholds are, and can the threshold be changed).	Yes - Thermostat has a feature available to blink black dot on display to indicate a programmed alarm condition
Reporting capabilities	Can the sensor alert facilities (such as an email, text, or call phone application) when the CO2 level has exceeded a programmed threshold? If yes, describe (what does the indicator look like and can the threshold be changed).	Yes - The site manager can be used to configure alerts for elevated CO2 levels that are then sent by text or email.
Reporting Capabilities, Integration capabilities	How can the CO2 sensor data be logged? If proprietary software, describe (what type of account is needed, what logging intervals are available, what does it look like, and describe its capabilities including data download capabilities).	Wifi with proprietary software. The site manager allows viewing historical data via graphs. Data collection interval is automated and not adjustable. Data can not be downloaded from the website.
Integration capabilities	Can the CO2 sensor interface with a building automation system (BAS) or demand control ventilation (DCV) system controller? If yes, describe if integration capabilities are vendor specific.	Yes - Pelican BAS and Pelican Pearl DCV controller only
Integration capabilities	If sensor can interface with a BAS or DCV system controller, is additional hardware required?	No
Installation	Does the sensor require specialized software for installation? If yes, describe	Yes - Requires connecting to gateway and logging into web portal for setup
Installation	Does the sensor require specialized training for installation? If yes, describe	No
Operation	Does the sensor require on-going maintenance? If yes, describe?	No
Operation	Does the sensor require service contracts for ongoing data access? If yes, describe	Yes - The service contract for the first year is free. Multiple paid subscription options thereafter.
User Experience Data		



## STEP 4: EXTENDED PRODUCT TYPE INFORMATION

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Search ... Search

**Advanced Power Strips**

APS: An advanced power strip (APS) is a power strip equipped with activity detection technologies to automatically shut off the power to the electronic devices plugged into the designated outlets on it when no user activity is detected.

**1** Learn More

**2** Technology Basics | **3** Application Guidance | Energy & Cost Impacts

**Embertec Emberstrip 8PC+**

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COMPARE

**1** **TECHNOLOGY BASICS: What are Advanced Power Strips**

APS: An advanced power strip (APS) is a power strip equipped with activity detection technologies to automatically shut off the power to the electronic devices plugged into the designated outlets on it when no user activity is detected.

**Technology Overview**  
Detect and deny power to unused electronic devices

An advanced power strip (APS) is equipped with one or more activity detection technologies to automatically shut off the power to the electronic devices plugged into the designated outlets on it. The activity detection technologies include:

- Motion sensing: Use of a passive infrared (PIR) sensor to detect the presence of a user.
- Current sensing: A built-in circuitry to determine active usage based on whether the current drawn by the device, typically the

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Advanced Power Strips > Application Guidance

**2** **APPLICATION GUIDANCE: Advanced Power Strips**

- Advanced power strips (APS) can be used in workspaces – typically with computers – where occupants need to plug in multiple items. **Energy savings can be derived from occupant activity detection** so that when no one is present, accessories are turned off.
- Advanced power strips augment native power savings strategies provided by a computer (e.g. power save modes); some APS can take over this function (e.g. Tier 2 APS). It is up to the occupant to decide which loads are control loads that remain constantly powered and which ones are accessory loads that can turn off when no one is present.
- All APS have adjustable time periods for occupant activity detection; a shorter time delay leads to higher energy savings but may be more disruptive to occupants, especially for those who are in and out of their workspaces frequently, as they will often find their computers put in power save mode and accessories turned off upon returning to their workspace.

**View our tested Advanced Power Strips Solutions →**

Technology Basics ▾ **Energy & Cost Impacts ▾**

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Advanced Power Strips > Energy & Cost Impacts

**3** **ENERGY & COST IMPACTS: Advanced Power Strips**

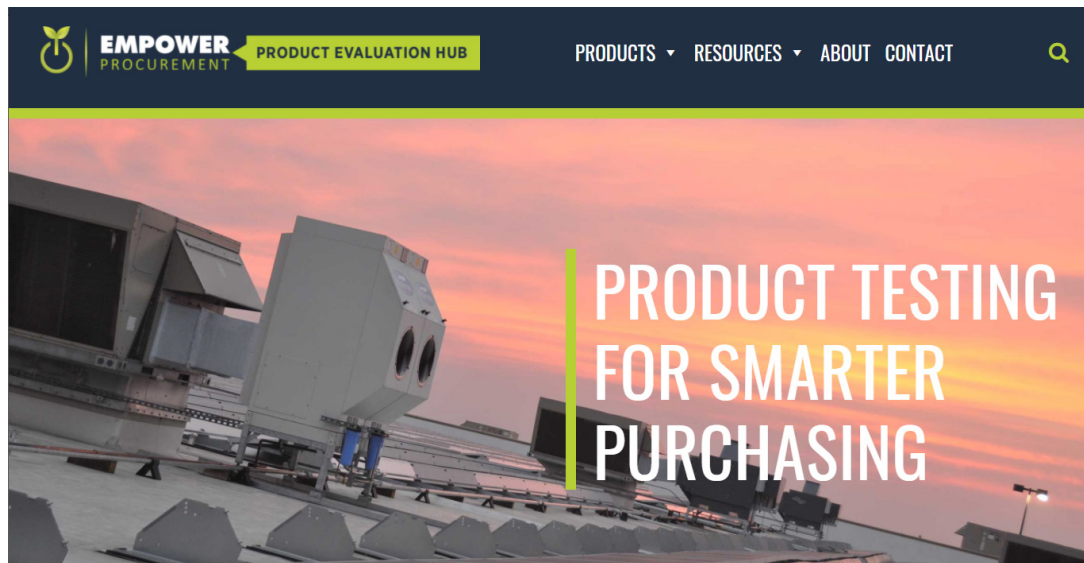
- Specific energy savings for an APS unit depends on the exact devices and appliances plugged into its controlled outlets.
- The savings also depend on the countdown timer settings; the faster the countdown timer times out, the higher the savings.
- APS units also exhibit a small amount of internal power consumption that is necessary to support the intended functionalities of the APS units. This internal power consumption will slightly offset the savings realized by the APS. The internal power consumption is listed for each evaluated product model.
- To unlock even higher savings, especially for energy-conscious users, some, but not all, APS models provide users a way to manually shut off power to the controlled outlets before leaving their workspace.
- Computers and other workspace accessories are typically plugged into a regular power strip that provides surge protection. Therefore, when considering the cost of APS, it is prudent to account for only the cost incremental of a regular power strip and/or surge protector.

**View our tested Advanced Power Strips Solutions →**

Technology Basics ▾ **Application Guidance ▾**

Extended information includes information on **(1)** how to best use these products, **(2)** a deeper explanation for each Product Type of what is involved with the category technology and **(3)** information about the energy and cost impacts.

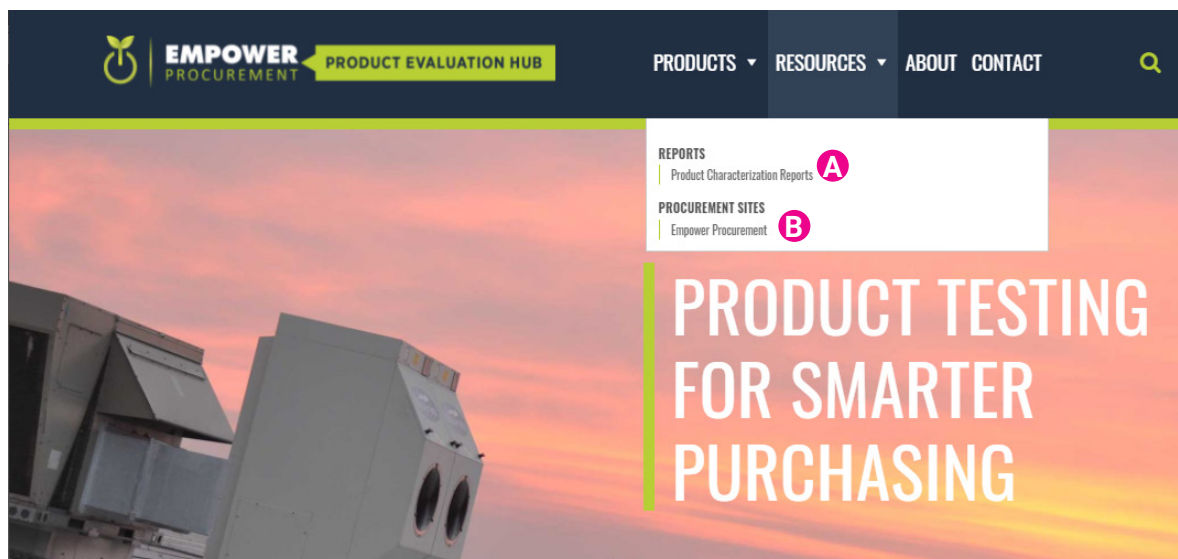
## STEP 5: ADDITIONAL RESOURCES



Specific features include:

- 1:** Product Characterization Reports that describe each Product Type in more detail.
- 2:** Research Team member and bio information
- 3:** Organizational partner information.

## PART 2: RESOURCES



### A: PRODUCT CHARACTERIZATION REPORTS



Downloadable PDF characterization reports from the identified and described product categories eligible for evaluation through the Hub. (Brings you to the Energy and Efficiency Institute website)

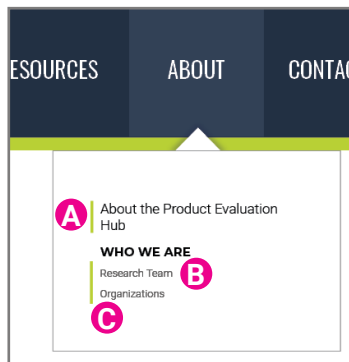
### B: EMPOWER PROCUREMENT



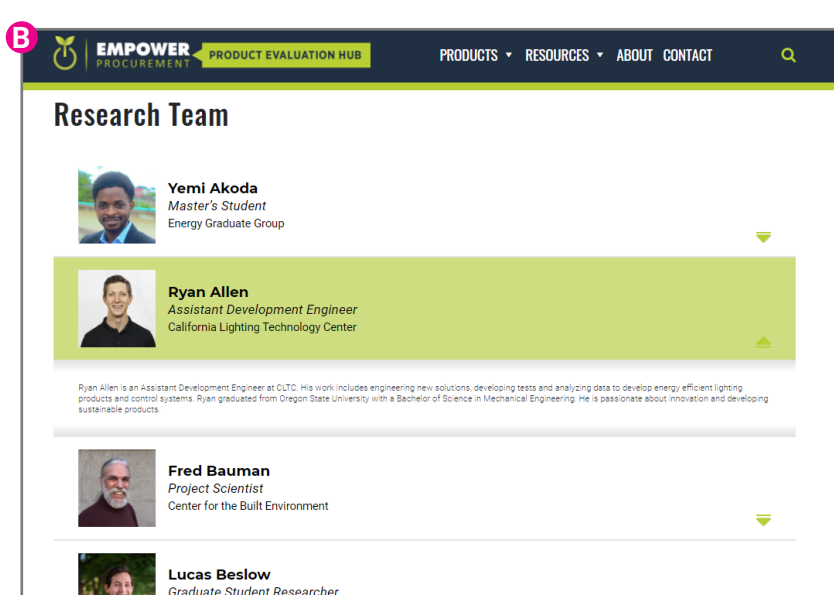
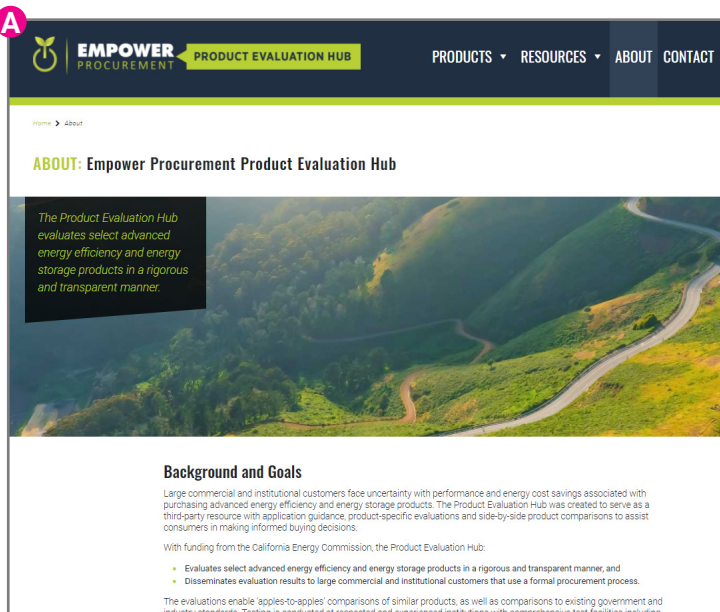
Link to our sister website, Empower Procurement, which aims to help organizations reach their clean energy goals by improving the procurement process to acquire Distributed Energy Resources (DER) products and services.




## PART 3: ABOUT



The About section includes a **(A)** detailed description of the background and goals of the Empower Procurement Product Evaluation Hub website, **(B)** Research Team listing with biographies, and **(C)** a list of organizations involved in this project.



## PART 4: CONTACT

 **EMPOWER**  
PROCUREMENT

PRODUCT EVALUATION HUB

PRODUCTS ▾ RESOURCES ▾ ABOUT CONTACT

# Contact

**A**

## Questions

Please contact us with questions about the Product Evaluation Hub.

[energyproductevals@ucdavis.edu](mailto:energyproductevals@ucdavis.edu)

**B**

## Submit a Product for Evaluation

Please let us know if you have a product that you would like to see evaluated.

[energyproductevals@ucdavis.edu](mailto:energyproductevals@ucdavis.edu)

**C**

## Join our mailing list

Please sign up to receive periodic emails with updates on products evaluated and general Hub news.

To join our mailing list, please fill in the following fields and hit submit.  
Thanks and Welcome!

Email \*

First Name \*

The contact page directs you to email [energyproductevals@ucdavis.edu](mailto:energyproductevals@ucdavis.edu) to either **(A)** answer any questions you may have about the products or testing methods; and allows you to **(B)** submit a product to be considered for evaluation. If you would like to **(C)** receive updates on product additions and general news regarding the Product Evaluation Hub, you may submit your information in our registration form.