



MFVI Energy Efficiency Audit Training

Module 2.1: Plug Loads

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Introduction to MFVI

MiPyMEs Futuros Verdes Initiative (MFVI) advances clean, reliable, and affordable energy solutions for micro-, small-, and medium-sized businesses (Spanish acronym “MiPyMEs”) in the Yucatan Peninsula through targeted technical training and affordable finance support. MFVI aims to increase financial inclusion, maximize the energy cost savings available to MiPyMEs, empower business owners to make strategic energy investments, and catalyze economic growth within the MiPyMEs sector.

The following modules were developed as part of a two-part targeted training series to equip university students with the skills and expertise needed to conduct Level-2 energy audits for local MiPyMEs. This module was designed for undergraduate students from different backgrounds to perform audits for small and micro business buildings. The energy savings measures will reflect this overall purpose.

What Is the Purpose of MFVI?



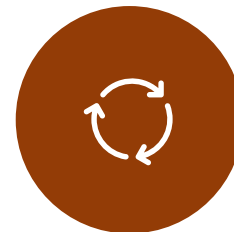
Help MiPyMEs implement energy efficiency



Determine simple energy conservation measure (ECM) savings through targeted energy efficiency audits



Enable MiPyMEs to qualify for affordable “green” loans

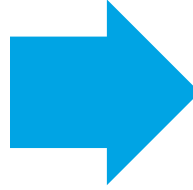


Begin a cyclical process of building green credit

MFVI Two-Part Training Process

Phase 1 Training

- Understand and measure energy efficiency via on-site audits



Phase 2 Training

- Conduct analysis of data collected during audits, and recommend ECMs

Training Breakdown

Module 1: Lighting

- 1.1 Introduction to Efficient Lighting
- 1.2 Lighting Analysis

Module 2: Plug Loads

- 2.1 Introduction to Plug Loads
- 2.2 Plug Load Analysis

Module 3: HVAC

- 3.1 Introduction to Cooling Systems
- 3.2 HVAC Analysis

What You Will Need

- A copy of your field tool sheet
- A wattmeter
- Pencil, ruler, and extra sheets of paper.

Introduction to Plug Loads

Training Module 2.1



Module Map

1. Determine the most appropriate strategy to optimize plug load usage.

- Create an inventory of plug loads in the building
- Check computer power settings
- Measure wattages for equipment lacking wattage labels
- Determine if extraneous loads are needed.



What Are Plug Loads?

Plug loads are devices that plug into a building's electrical system. They include:

- Office equipment (fax machines, computers, printers, and copiers)
- Appliances
- Soda machines
- Drinking fountains
- TVs
- Space coolers.

Applied Student Exercise

Identify the plug loads.



Photo image credit: (From the left) :

- [Drinking fountain](#)
- [Equipment](#)
- [Laptop](#)
- [Printer](#)

Applied Student Exercise

Task light: light or
plug load?



Photo by rejuvenation.com

Determine the Most Appropriate Strategy To Optimize Plug Load Usage



Step 1: Take a Plug Load Inventory

- Count plug loads in each room. Note:
 - Type
 - Manufacturer
 - Model
 - Max. wattage.



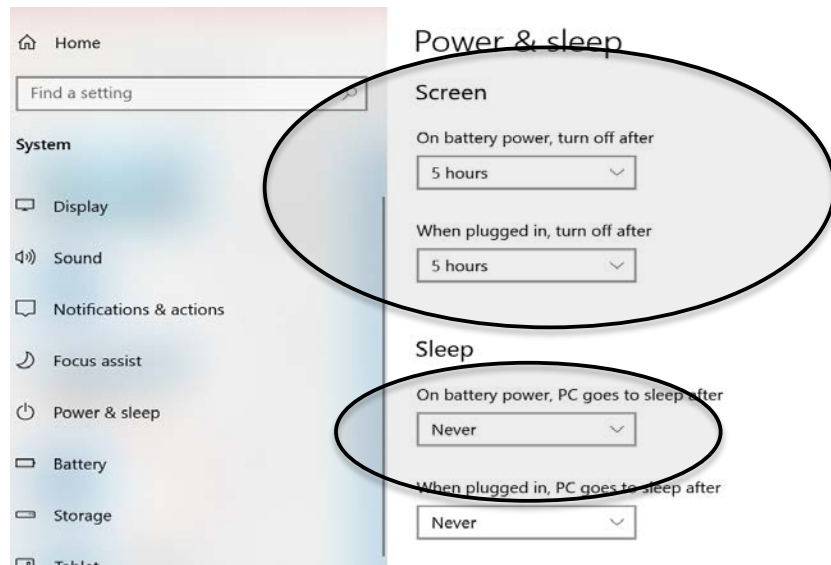
- If some of this data is not printed on the equipment, the manufacturer and model number can help you find this information online.



Image by [ebay.com](https://www.ebay.com)

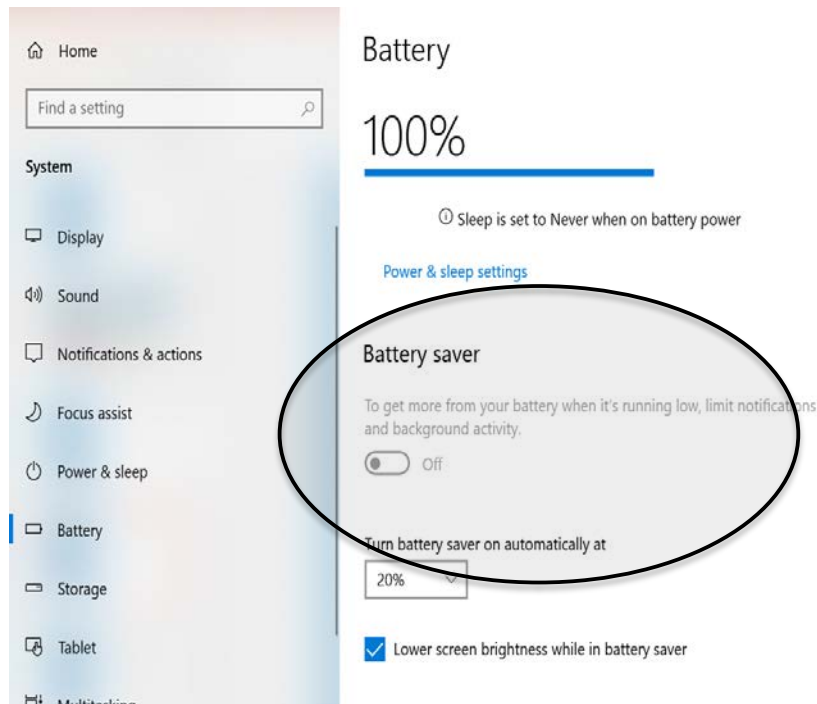
Step 2: Check Computer Power and Sleep Settings

- Check if:
 - “Turn off screen” is set to 5 minutes
 - “Sleep” is set to 10 mins
 - “Turn off hard disk” is set to 10 mins.



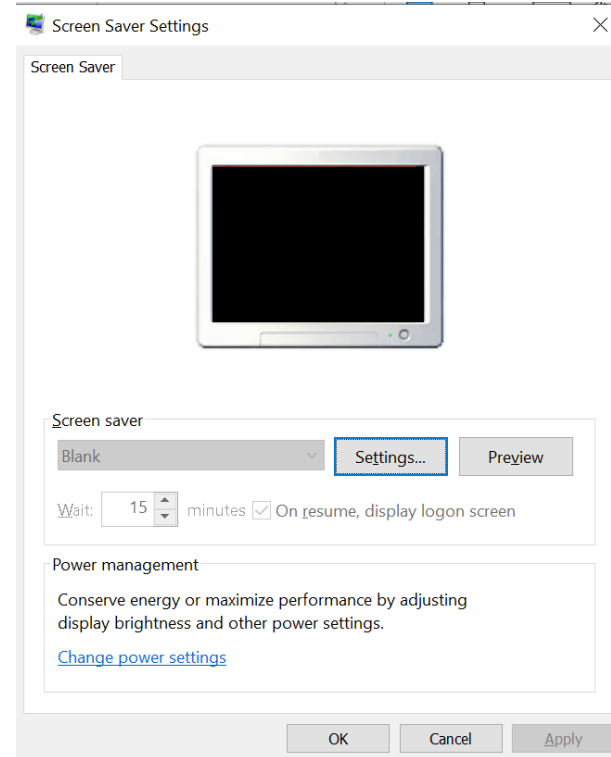
Step 2: Check Computer Battery Settings

- Check if:
 - “Power saver mode” is activated
 - The “power saver” mode is activated when the device is unplugged.



Step 3: Check Computer Screen Saver Settings

- Check whether the screen saver is turned off in the “Screen Saver Settings page.



Step 4: For Plug Loads That Do Not Have a Nameplate, Use a Watt Meter To Record Power

For plug loads that don't have a wattage reading nameplate, use a watt meter to record the wattage of plug loads in the building.

Getting To Know a Watt Meter

Refer to this document for instructions on how to use this meter: www.manualscat.com/en/steren-her-432-manual



Image by listado.mercadolibre.com

How To Use a Watt Meter

- Check to ensure no one is using the device (or load)
- Unplug the device
- Plug watt meter into the socket
- Plug device into the watt meter
- By default, a watt meter measures watts rather than watt-hours. (If your watt meter is recording a different measurement, use the function keys to toggle to the watt recording).

Applied Student Exercise

Let's try out the watt meter!



Step 4: Measure the Wattage of Large Plug Loads Using a Watt Meter

If possible, leave the setup for an entire day, measure the output every hour from beginning of workday to 1 hour after everyone has left the building.

If not, record four readings:

- One at beginning of workday
- Two at middle of workday
- One hour after everyone has left the building.

Example: If an office operates from 9 a.m.–5 p.m., recommended measurements:

- 10 a.m.
- 12 p.m.
- 3 p.m.
- 6 p.m.

Note this in Appendix A of your field guide.

Step 5: Check for Extraneous Loads

- Are there any unusual loads in the building?
 - For example, a textile manufacturing space with a lot of TVs running, a bakery with a large number of computers, etc.
- How long are these loads used for (and how frequently)?
- What is their purpose?
- Would it be noticeable if the device were not there?
- Note the answers down in Appendix A of your field guide.

Opportunities To Reduce Plug Loads: The 5 Rs

- *Review* the inventory to focus on equipment being used the most
- *Remove* unnecessary equipment
- *Replace* inventory with ENERGY STAR®-rated equipment
- *Reduce* energy consumption by turning off or powering down equipment
- *Retrain* workforce on the why, when, and how of power downs.

We will discuss the 5 Rs further in Phase 2 of this training!



Questions?

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