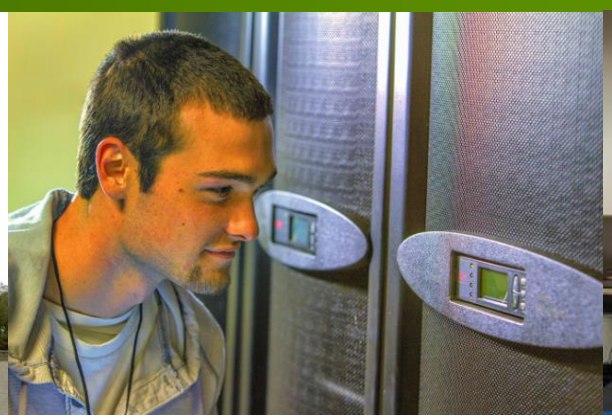
CalPlug 2018 Update
Plug Loads: Targeting Efforts

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California Institute for Telecommunications and Information Technology

April 10th 2018 - Workshop #12

www.calplug.org

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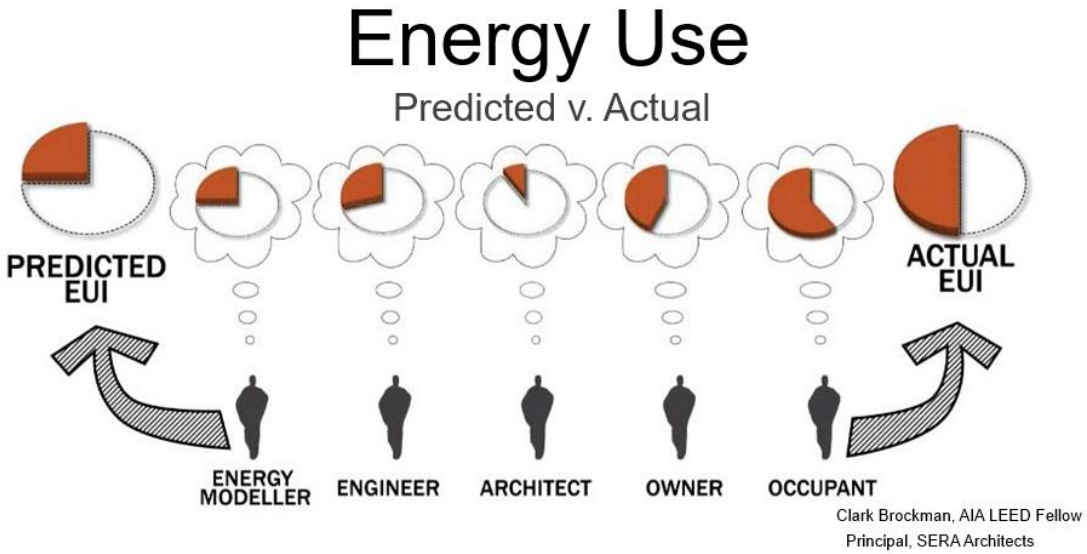
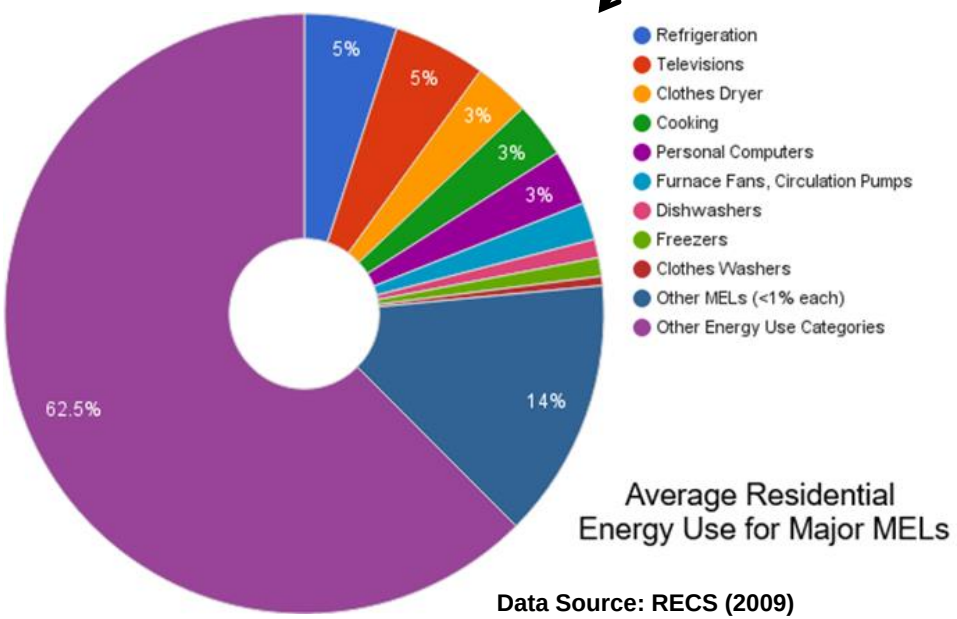
Why investigate plug loads?



What are the contributors to this "other" category, and how can this issue be addressed?

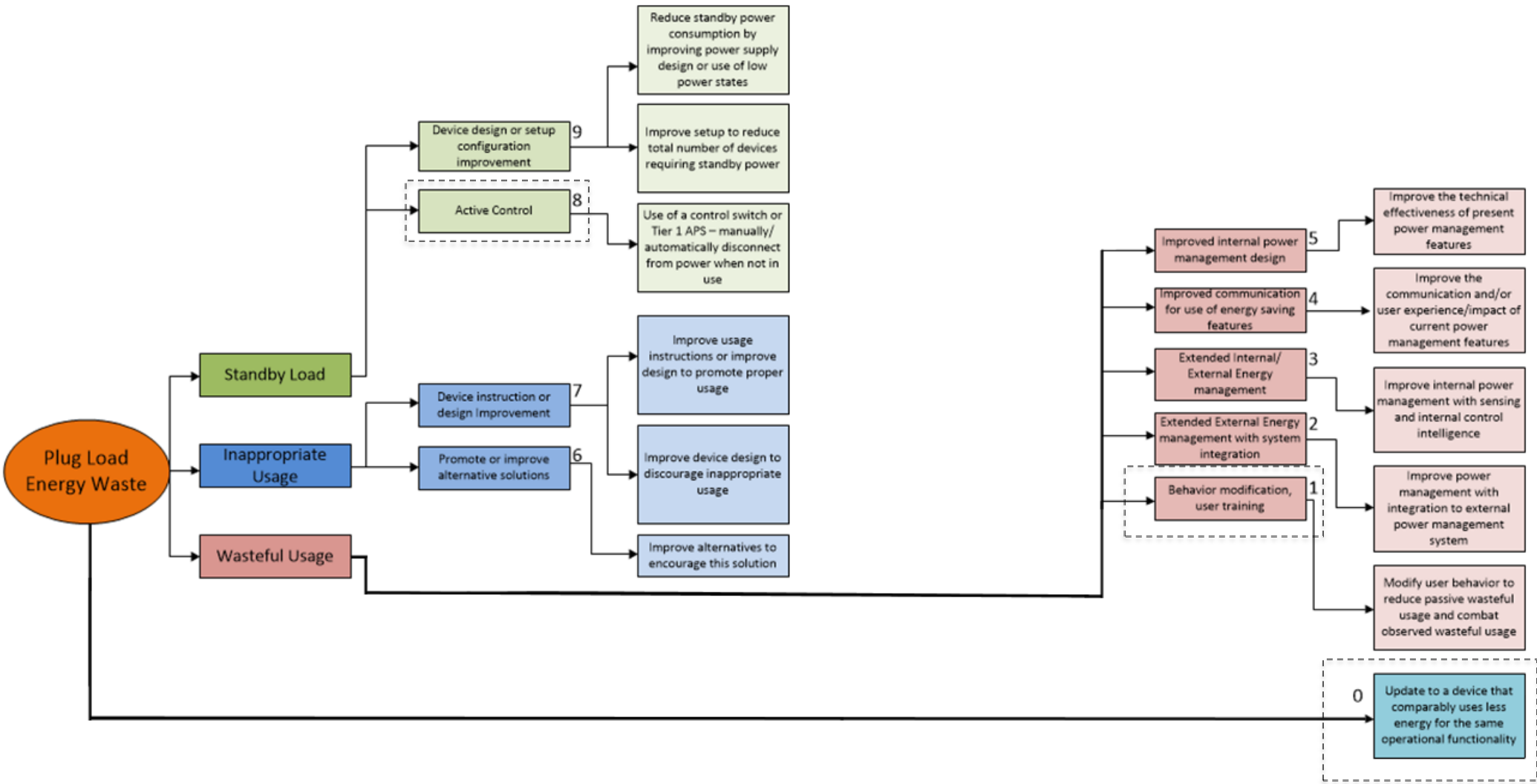
How is the "distribution" of plugloads changing?

What are plug loads becoming 'more' of a problem?



Data Source: RECS (2009)

Addressing Individual Devices: Focus Points



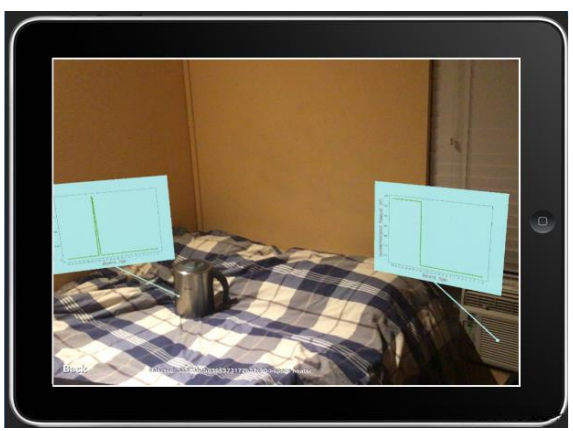
Major Efforts at CalPlug

- **Sim Home Extension / Program Review (CalPlug/SCE)**
- **Evaluation and Testing Protocol Development**
  - **Tier 2 APS – Qualified Product List (CalPlug/PG&E)**
  - **Tier 2 "Extended" Device Evaluation**
  - **Imaging Equipment Evaluation (SCE/EPA)**
- **Intelligent Control**
  - **Algorithm Development and Evaluation**
  - **Topology and control methodology**
  - **Observational Studies**
- **Accessibility to energy management solutions**
  - **Promoting solutions for low income customers**
  - **Improving solution usability and value**

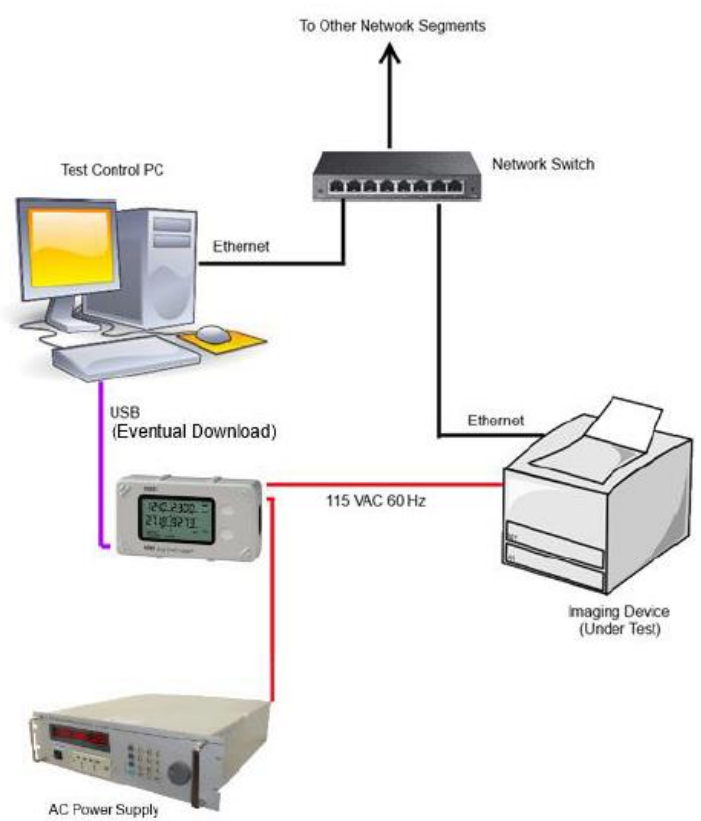
Easier access to Energy Management Tools

Problem: Easy access to clear, useful energy use visibility and management.

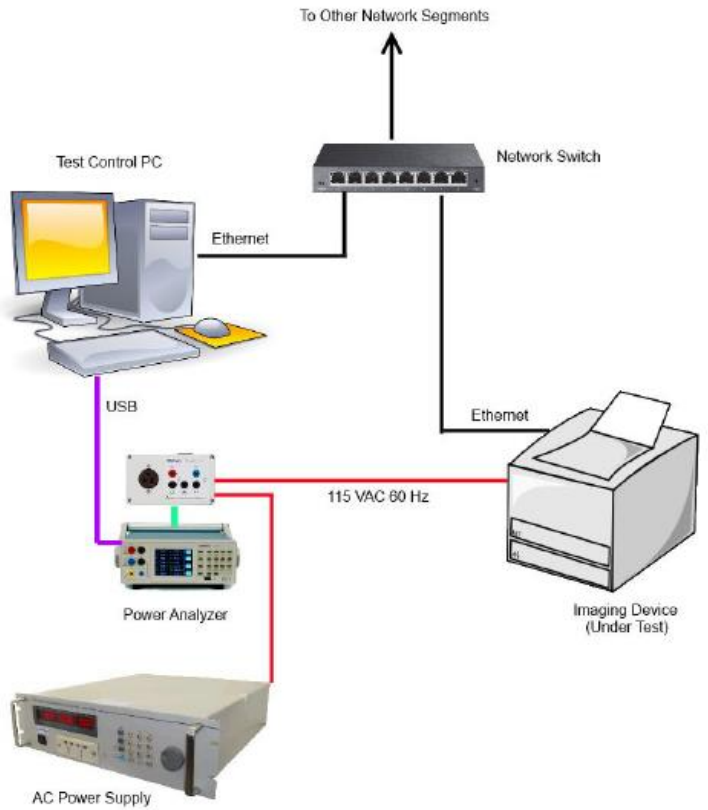
- Target trouble areas – low income, split-incentive
- Focus on behavior and market transformative change
- Drive education as a focus (align with AB793's goal)
- Leverage devices already in use (smart meters, smart phones, HA)
- Provide easy, meaningful communication of information (Voice / Visual)
- Promote incentives/rebates and determine eligibility
  while managing free-ridership
- Provide easy access to information and programs to enable customers
  to take place in incentive programs



Imaging Device Evaluation



Bench Test



Operational Test

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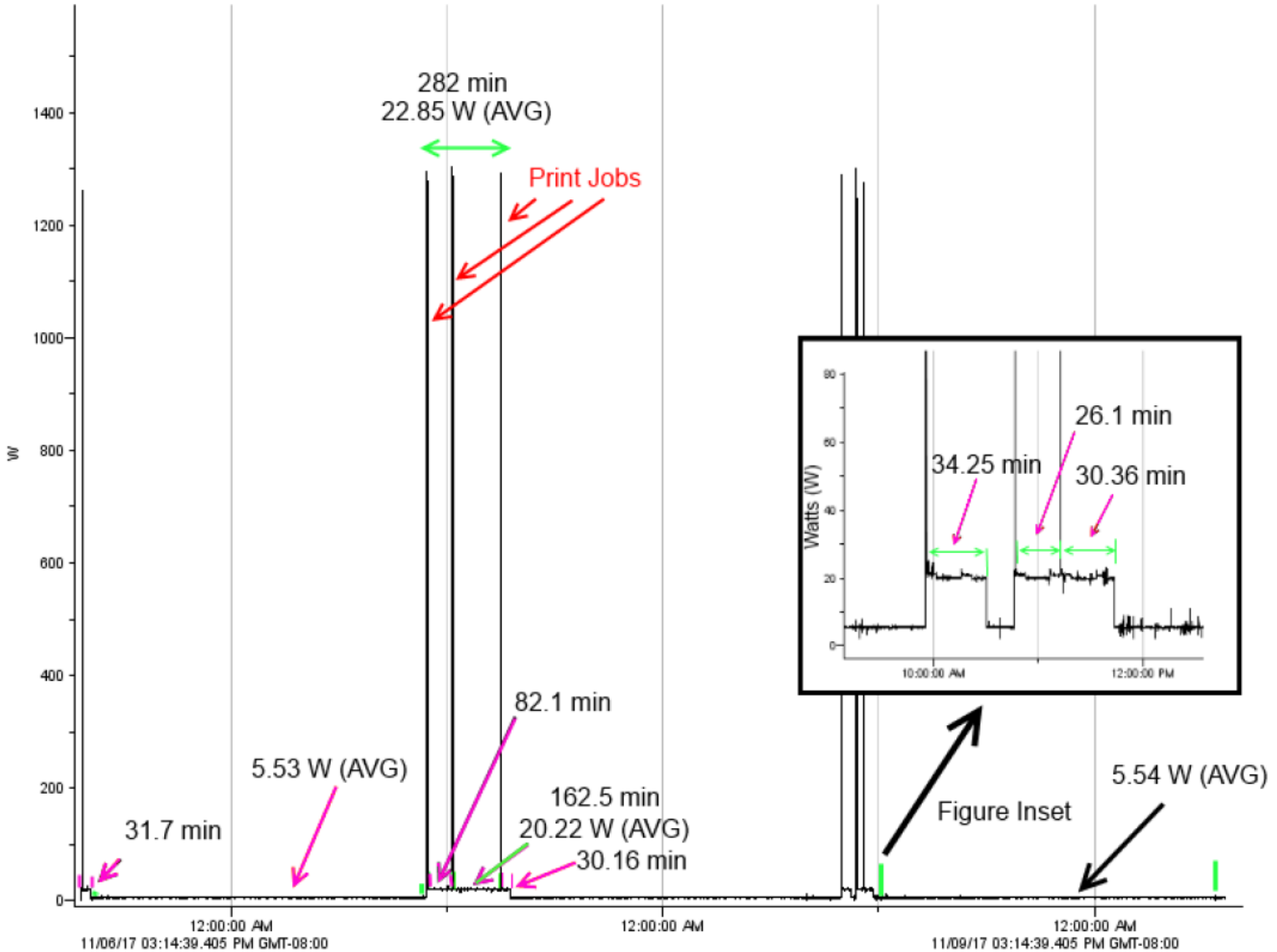
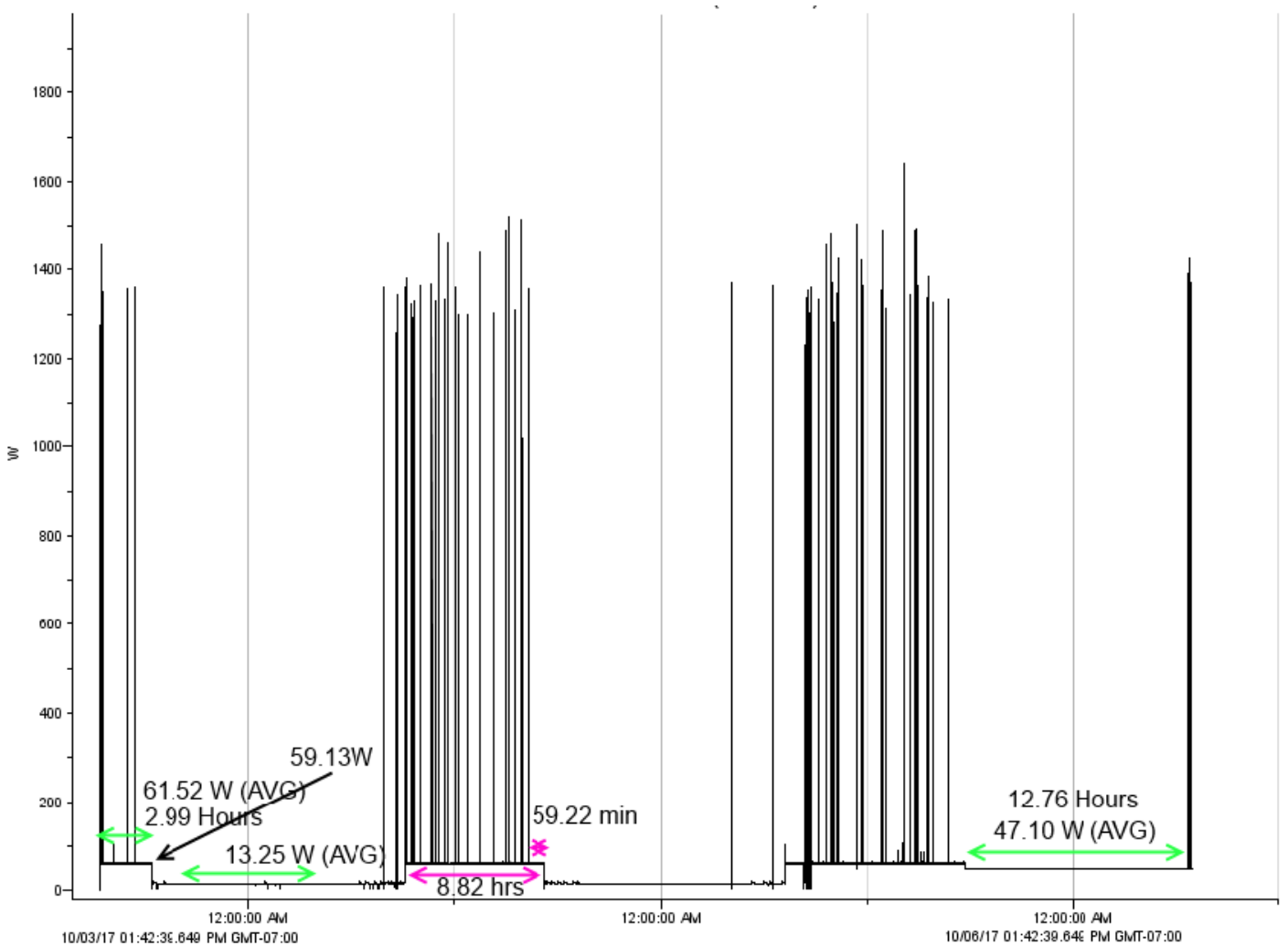
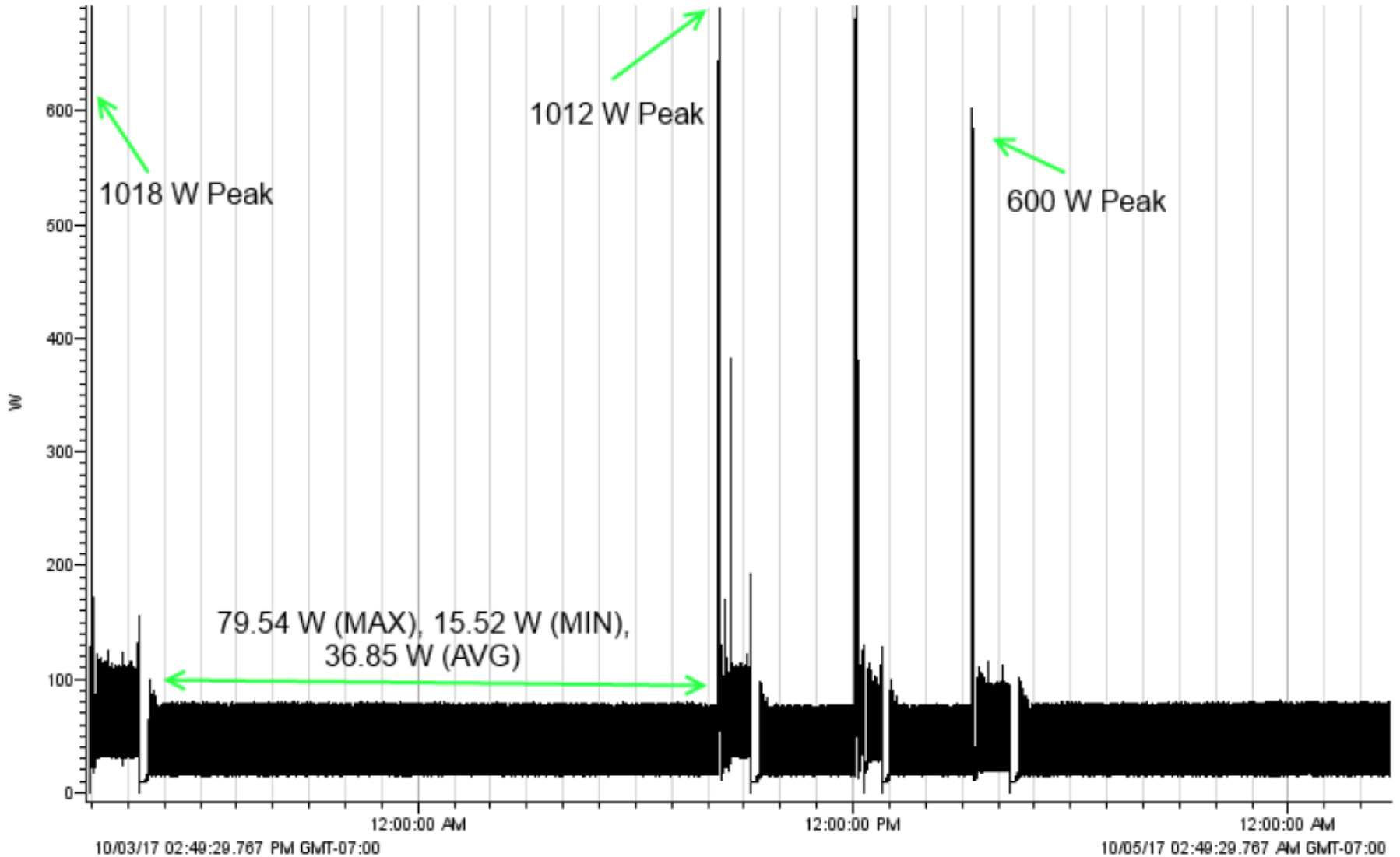
Imaging Device Evaluation: The Good



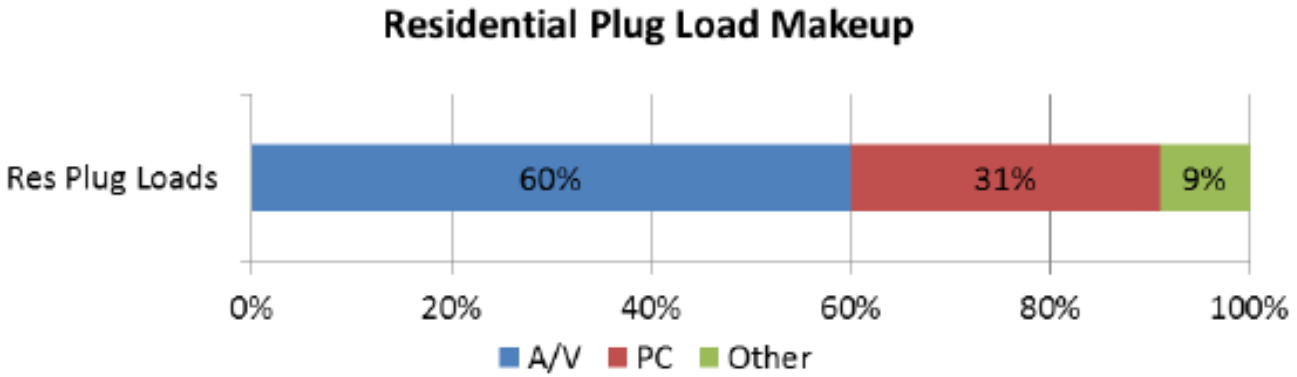
Imaging Device Evaluation: The Bad



Imaging Device Evaluation: The Ugly



Advanced Power Strips: The case for residential Tier 2



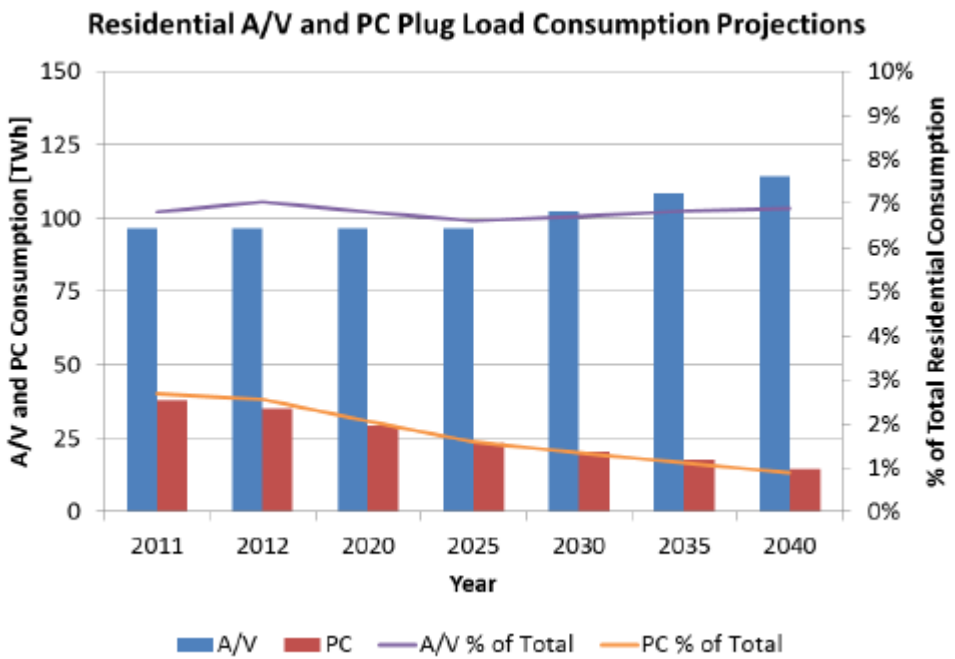


Figure Source: ET14SDG8021, 2015

Home Entertainment – 60%

Home Office – 30%

Tier 2 APS Qualified Product List

<u>Project Goal:</u> Expedite manufacturer access to the market, improve quality of devices in the market. Develop extendable approach

- **Standardized evaluation metrics to assess tested devices**
- **Evaluation of device feature set & estimated savings potential**
- **Expedited evaluation process based on device features**
- **Repository for Tier 2 APS educational materials**
- **List and information posted on a public accessible website**
- **Expedite manufacturer access to the market, improve quality o devices in the market**
- **Field Trial agnostic in current form**

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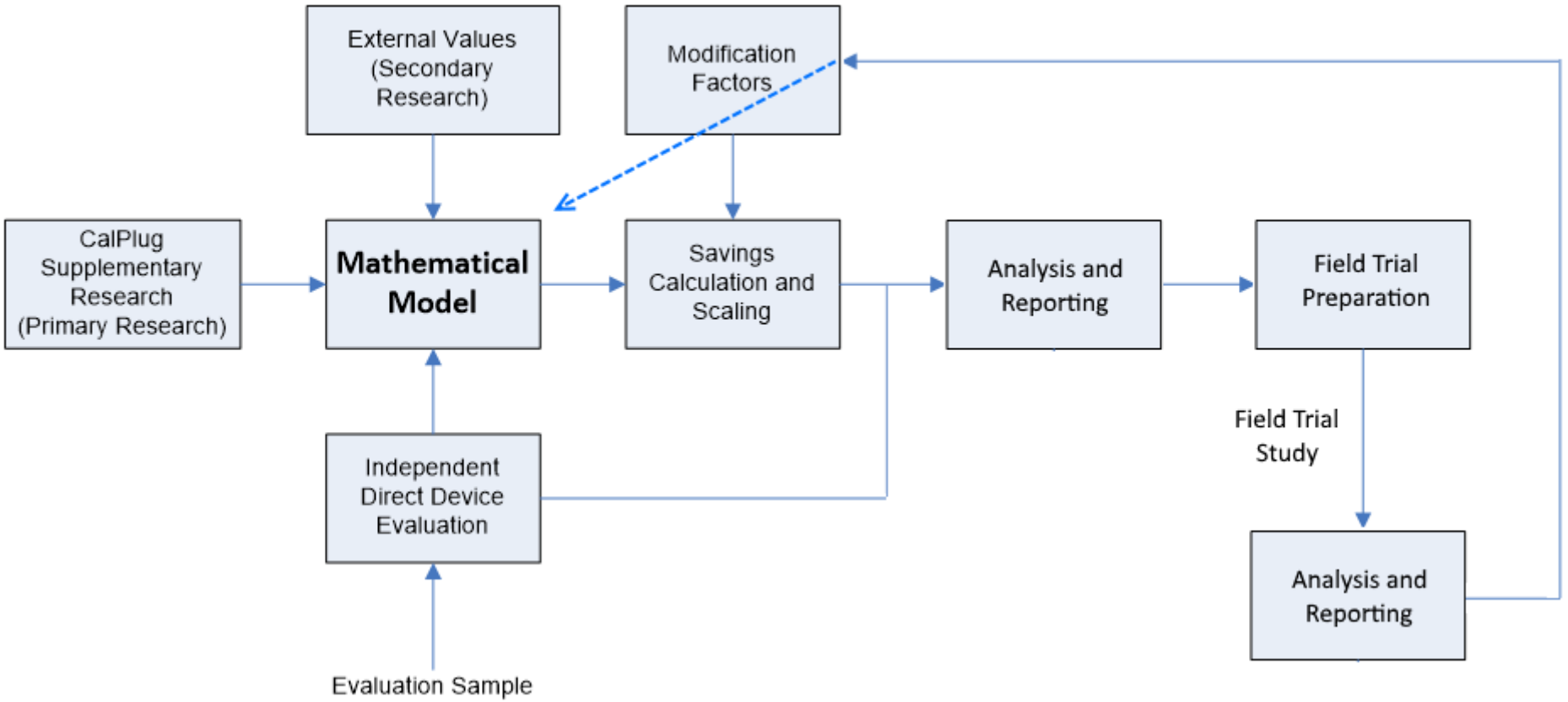
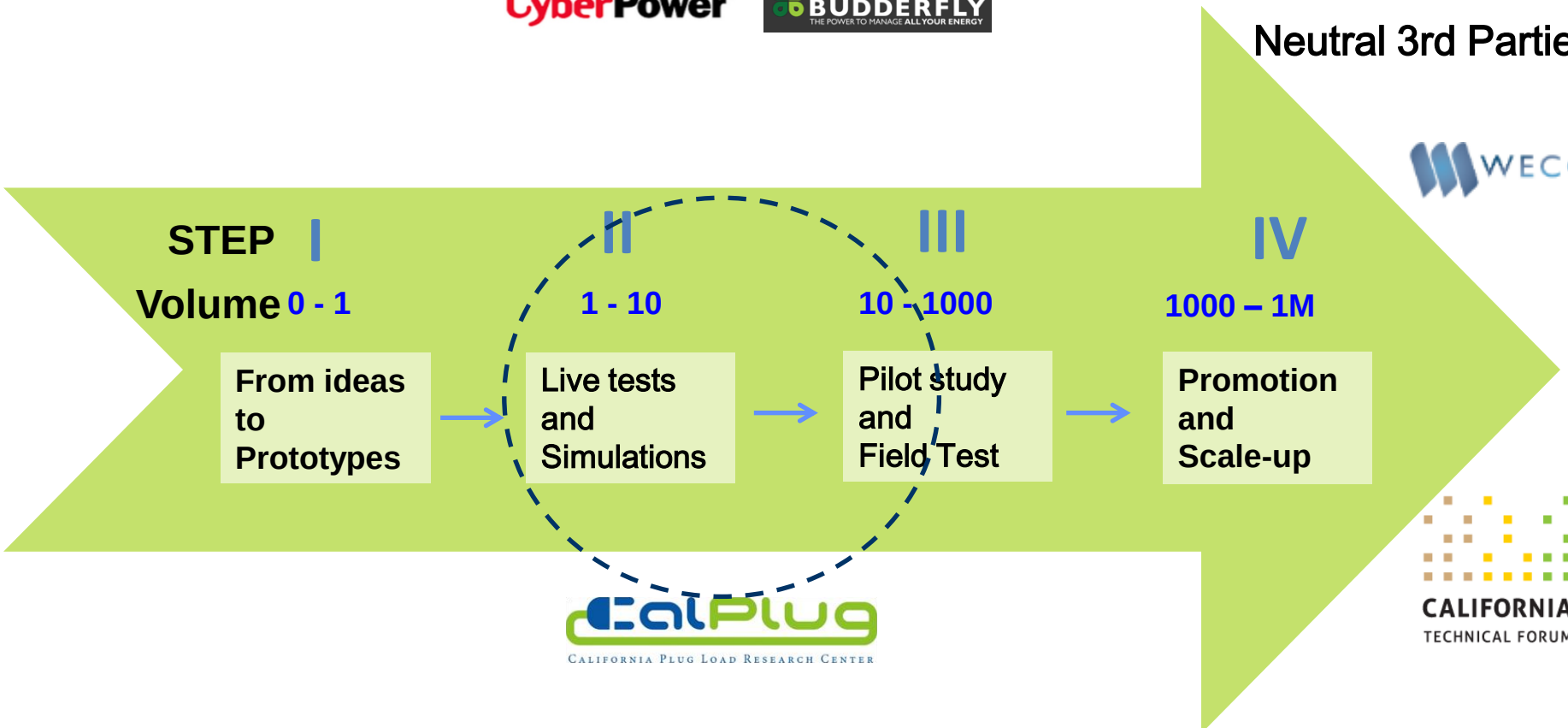
Advanced Power Strips – Entertainment Tier 2



Manufacturer Roadmap

Manufacturers

Neutral 3rd Parties



Utilities

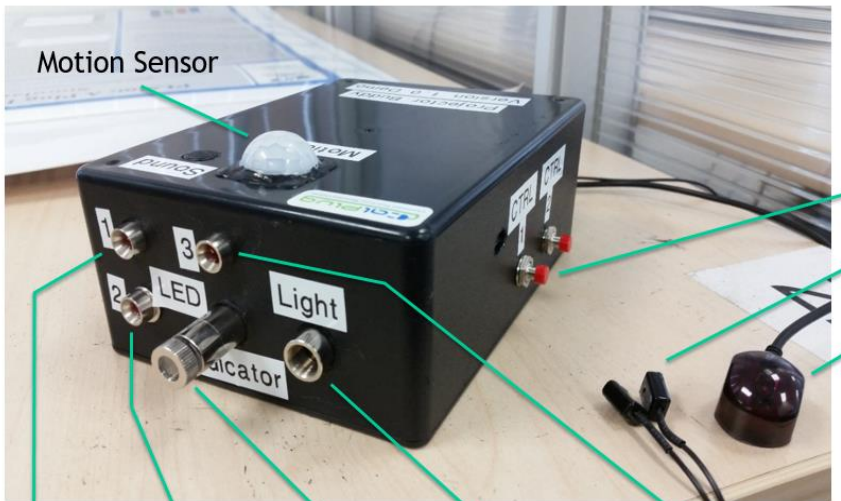
Control of Projectors in Classrooms

HOW MUCH ENERGY DOES PROJECTOR BUDDY SAVE?

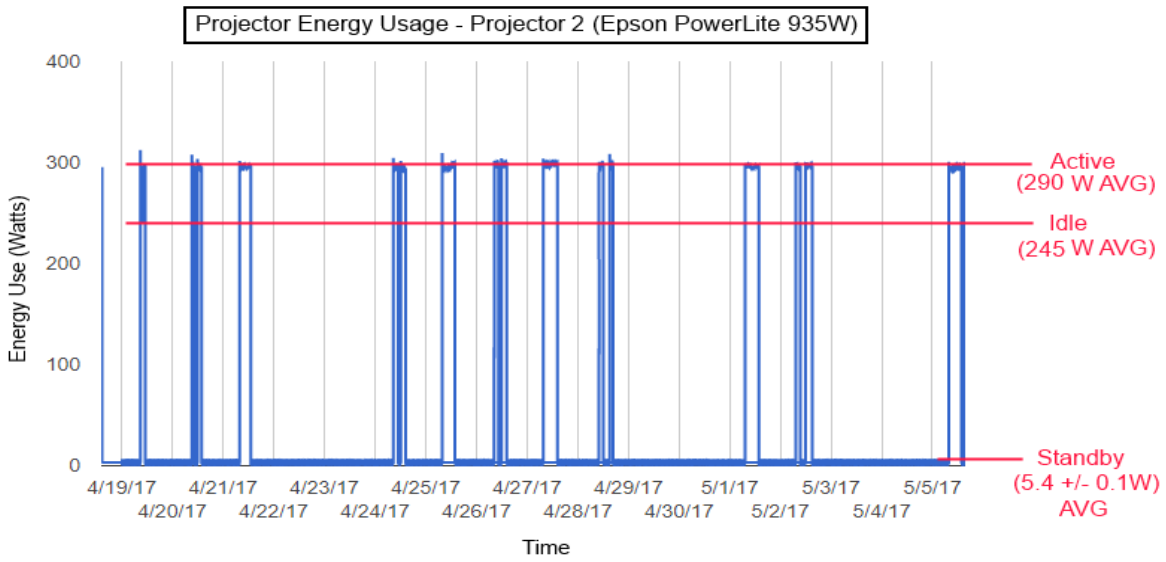
	VIEWSONIC PJD5134	EPSON POWER-LITE X17	EPSON POWER-LITE 97	HITACHI CX-X2530WN
AVG. ON POWER	250 Watt	283 Watt	294 Watt	330 Watt
STANDBY POWER	1.0 Watt	2.9 Watt	2.9 Watt	0.5 Watt
ENERGY USAGE WITHOUT PB	541 kWh/yr	615 kWh/yr	639 kWh/yr	714 kWh/yr
EST. ENERGY USAGE WITH PB	266 kWh/yr	303 kWh/yr	315 kWh/yr	349 kWh/yr
EST. TOTAL ENERGY SAVED	275 kWh/yr or 50.8%	312 kWh/yr or 50.7%	324 kWh/yr or 50.7%	365 kWh/yr or 51.1%

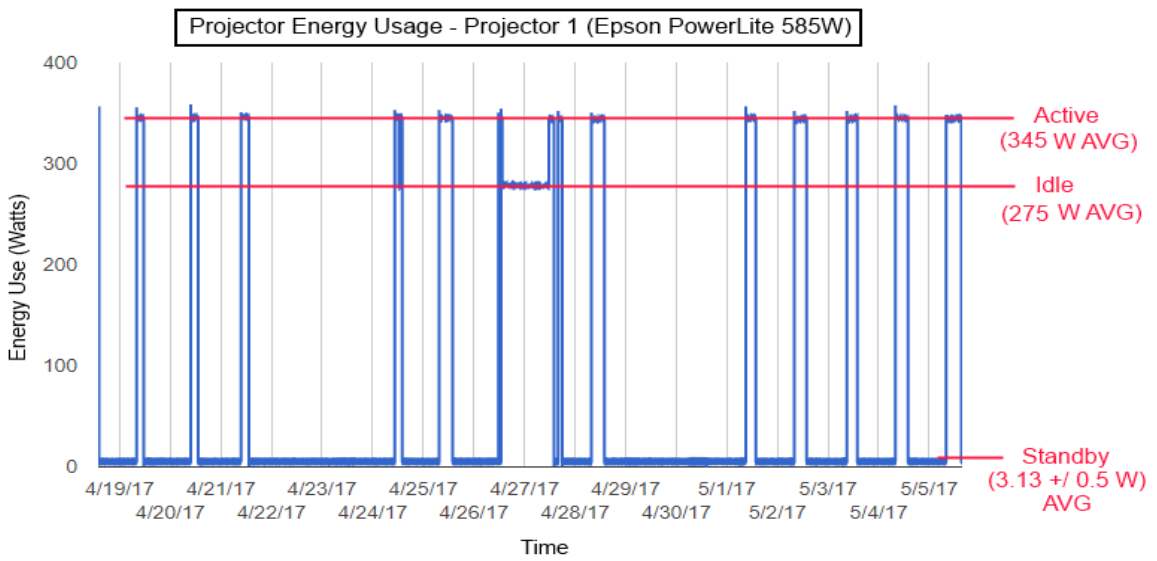
Without Projector Buddy, projectors are on for 24 hours per day for 2 days and 8 hours per day for 3 days per week for 30 weeks per year.

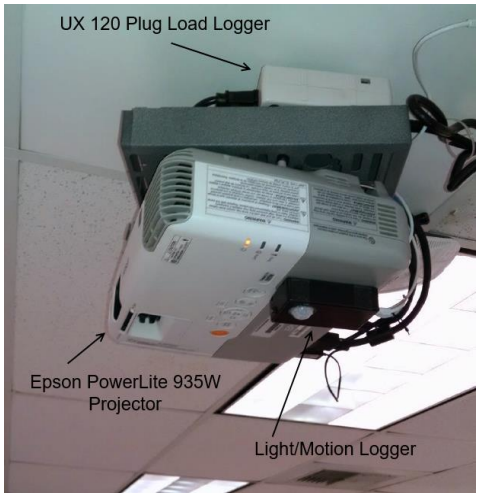
With Projector Buddy, projectors will be on for 7 hours per day for 5 days per week for 30 weeks per year.



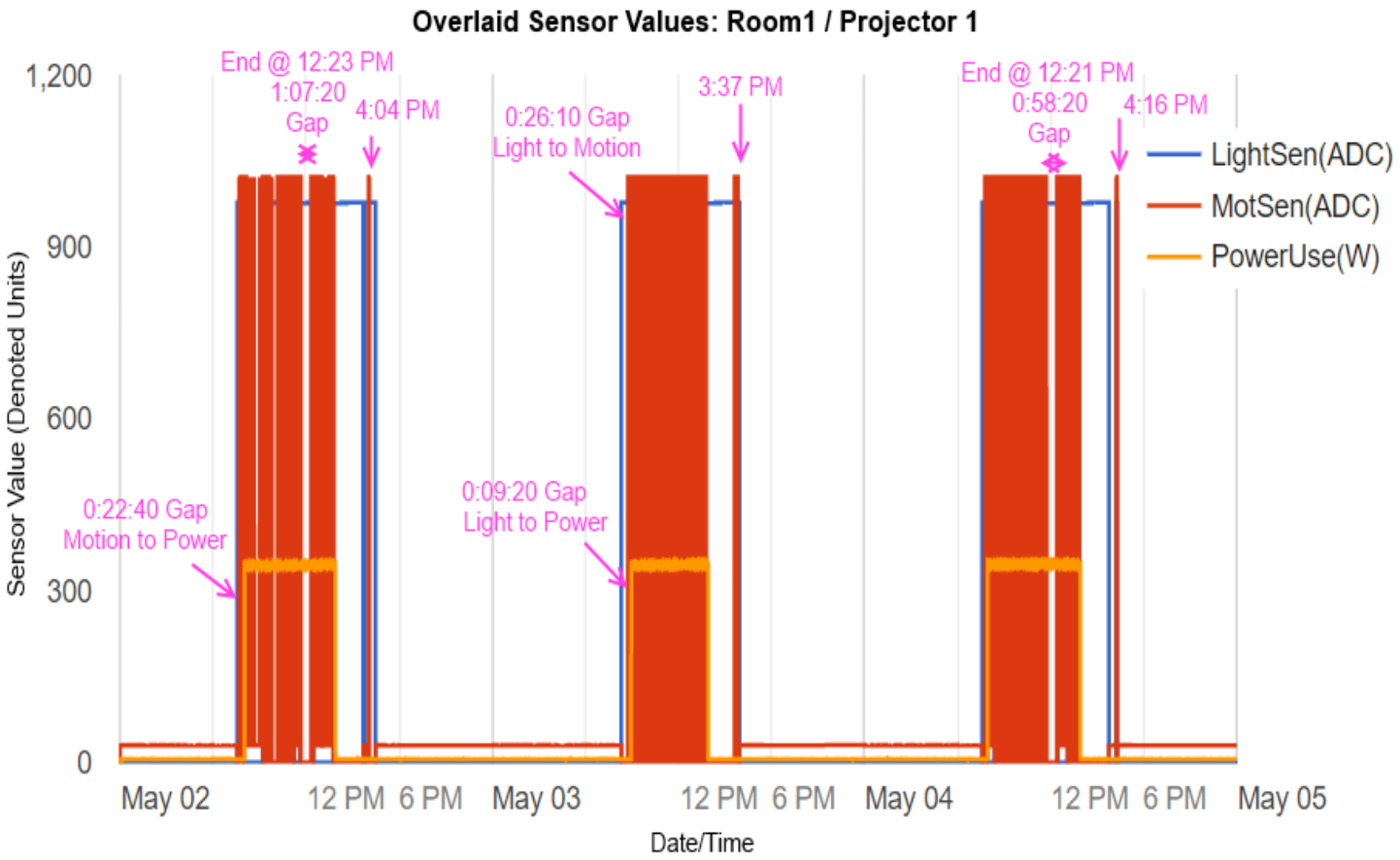
Energy Use in Classroom Projectors

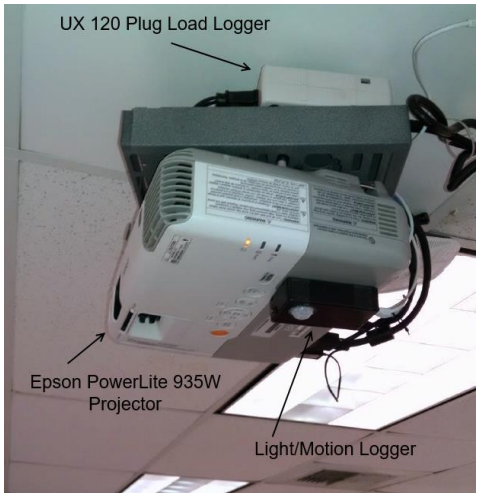






Energy Use in Classroom Projectors





Evaluation of Savings

$$E\_Tier\ 2(WHr) = E\_Tier\ 2\_Extra + E\_Tier\ 1$$
$$= P_{TV\_Absent}(W) \times \left(T_{TV\_Absent} - T_{IR\_Timer}\right)(Hr/Day) \times (365.25)(Days)$$

Borrowed from Tier 2 APS LME/Simulated Approach

- **Standby Load Alone: 27kWh/year**
- **Operational/Standby: 50-118 kWh/year per device! (~260 kWh baseline)**
- **Potentially 50MW in just classroom projectors (K-12)**

Commitment to training the leaders of tomorrow

- **Projector Buddy (Evaluation)**
- **Coffee Buddy/Water Cooler Buddy (Evaluation)**
- **“PlugLoad Perceptoscope”**
- **EMMA 2.0 – CalPlug Voice Energy Auditor**

Thank You

Questions?