Tinder for Idling Hogs
EPC-15-025 (RYPL)

CalPlug Workshop Series #10 - Wednesday, November 9, 2016

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Home Energy Analytics (steve@hea.com)
My Idling Hogs, circa 2007

93 things plugged in all the time
600 watts; 5,250 kWh, $2,100 per year

Have you counted the idling plug loads in your home?
Topics

- About HEA
- About Idling Hogs
- Tinder for Idling Hogs (Dr Power)
- Plug Load Database (PLDB)
- Q&A
About Home Energy Analytics

- Residential smart meter analysis since 2010
- Over **5000** California homes analyzed (opt-in)
- Strategy:
  1. **Engage & Educate** residents about energy using disaggregated hourly AMI data
  2. **Recommend** their most cost effective actions
  3. **Track & Report** their progress monthly

*Results: Average metered savings over 12%*
AMI Data exposes Idling Hogs

Home Idle Load (minimum hourly electric use): 
~0.4 kWh/hour, or 400 watts

11/7/16
Idling Loads average **36%** of electric bill

Monthly Idle Load Cost vs Monthly Total Electric Cost for Mountain View Homes (n=930)

Idle Loads account for >50% of electric use in some homes.
The Long Tail of Idling Hogs

NRDC 2015: 428 unique devices found in 10 homes

Not in Energy Star or RASS
Long life time in homes
New Hogs every week
About our EPIC Grant

• Partnership between HEA & Enervee
  (Enervee: Online marketplace of efficient products)

• “Dr Power” Smart Phone App:
  Challenge: Hard to get people to engage!
  1. Identify a home’s Idle Load (in Watts)
  2. Help user identify Idling Hogs
  3. Recommend custom, simple steps
  4. Track changes over time

• Also: Develop open Plug Load DB
  – Crowd-sourced database of “the long tail”
  – Identify efficient products & energy hogs

Average non-HVAC electric use: 6,500 kWh/year

2,360 kWh per year of continuous energy use = Idle Load of 269 Watts
Dr Power Overview

Educate

It's like leaving a blender on nonstop at your home.

Diagnose

IDLE LOAD

Identification Progress

13% identified

235 watts

61% estimated

1 Savings Tip

Add timer strip to recirculation pump
Save $83/yr

Prioritize

Whole House Lighting System
Idle: 123 W

Wine Cooler
Idle: 50 – 120 W

Refrigerator (1 of 2)
Idle: 20 – 200 W

Recirculation Pump
Idle: 30 – 105 W

Aquarium
Idle: 10 – 200 W
Dr Power: Inventory Idling Hogs
Using Tinder-like “swiping” left & right
Plug Load Database (PLDB)

• Consolidating Plug Load data
  – Energy Data plus device characteristics

• Idling Device Data obtained so far:
  • 87,587 refrigerator models from Alan Meier
  • 157,564 devices with standby loads from CEC (electronics, fridges, cooking devices, etc)
  • Crowd Sourcing from Dr Power users (next slide)
  • Data from PG&E’s “Codes & Standards Field Study”?

• Web interface & API available in 2017

• Looking for other data sources!
Dr Power: Crowd-sourcing PLDB
EPC-15-025 Goals & Objectives

• **Goal**: Reduce residential idle loads.

• **Objective**: Develop, deploy, and assess the efficacy of a software-based residential idle load reduction tool.

• **Metrics (by end of 2019)**:
  – Number of unique users. Target: 20,000.
  – Energy saved. Target: 5% of idle load.
Status & Major Milestones

• IOU integrations completed (PG&E’s SMD quite good)
• Initial browser-based version released 8/2016 (drpower.hea.com)
• Design complete for mobile app & PLDB schema
  – Swiping interface developed & tested
  – Over 30 internal releases (both Apple & Android) to date
  – PLDB populated with initial batch of fridge data
• Research begun on image recognition technologies
• Initial Apple iOS public release next month
  – Android public release to follow in early 2017
• Outreach begins early 2017, continuing through 2018
Q&A

and a few extra slides
About Enervee.com

We found 3 results for “wine cooler”

RESULTS IN FRIDGE

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<th>Model</th>
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CUBIC FEET OUT OF 100 OVER 12 YEARS
Smart Meter Load Diagnosis

Pie chart produced using remote, automated smart meter data analysis
Same Bill, Different Energy Use

Heating Efficiency: 13 BTU/sf/hdd
EE Focus: HVAC

Electric base load: 375 watts
EE Focus: Idling Hogs

$1,924/year

$1,927/year
Example Idling Hogs
Idling Hogs: What to do?

- **Educate** homeowners

- **Provide simple solutions**
  1. Unplug it (free)
  2. Reconfigure it (free)
  3. Put it on a timer ($20)
  4. Add a smart strip ($30)

- **Email regular feedback**
  - Show immediate progress
  - Ongoing tracking

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Email regular feedback

- Show immediate progress
- Ongoing tracking

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**Smart Meter data analysis**

- Home Idle Mode
- 430 Watts
- 4.4% since you registered on 1/10/11

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11/7/16
Vanquished Idling Hogs

- Art Rosenfeld’s old TV in his basement (18 watts)
- Throttled old pool pump in koi pond (800 W)
- Current Commissioner’s HEPA air filter (60 watts)
- DHW recirculation pump with timer disabled (90 W)
- Heated towel rack with no off switch (120 W)
- Heated tile floors that never go off (700 W)
- Old VCR in guest bedroom (17 W)
- Instant hot water dispenser in pool house (150 W)
- Pump for radiant heating left running all summer (90 W)
- Old game console in default sleep mode (100 W)
- Computer sound system in grown son’s empty room (12 W)
- Fan running in crawl space for 9+ months (80 W)
- Furnace fan switched ON instead of AUTO (60 W)
- Incandescent light bulb left on in basement (100 W)
Idle Loads, Internal Gains & Peak Demand

Idling plug loads are a double whammy