

Minimizing Plug Loads in Multi-Tenant Buildings

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CRM Project Presentation

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Project Description

- ❑ Case study on plug and process load (PPL) reduction with Tower Companies & Institute for Market Transformation (IMT)
 - ❑ August - November 2015
 - ❑ 1909 K Street NW
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What are Plug & Process Loads (PPLs)?

...anything you plug into a socket!

Phone

Monitor

Desktop

Task Lighting

Equipment (e.g. calculator, speakers, printer)

+ other office equipment (think kitchen, copy rooms...etc.)



Why should we care?

33%

Energy used in commercial buildings is consumed through PPLs.

\$58,000

Can be saved annually through a 43% reduction in PPLs.

The Experiment

Key Questions

- ❑ Which PPL management strategies have the greatest impact on whole building energy usage?
 - ❑ What PPL management strategies are the most cost effective?
 - ❑ Is the PPL management strategy easily replicable with more tenants or other buildings?
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Overview

Measure the success of two methods to reduce PPLs:

- ❑ Technological intervention
- ❑ Behavioral change through education and messaging

Tenant 1: Technology
Advanced Power Strips
(Corporate Banking)

Tenant 2: Control

Tenant 3: Behavioral Change
Education & Messaging
(Law Firm)

Method One: Technology Experiment



Advanced power strips
(APSS) can reduce PPL
energy usage by

48% per month.



Intervention Timeline: Technology Experiment

Experiment Feasibility Period (30 Days)

Building Surveyed for Likely PPL Management Candidates

Tenant Floor Surveyed for Sub-Metering Capability

Tenant asked to participate in PPL Experiment

Experiment Participants Confirmed

Baseline Period (30 Days)

Start Baseline Period

Sub-Meters Installed

Team tests APSs in Management Office

Kick-off Meeting with Plug Load Champion

Team tests APSs in Management Office

End Baseline Period

Intervention Period (45 Days)

Start Intervention Period

Held Lunch & Learn

Install APS; Occupants Given Flyers

Conduct Night Audit; APS Troubleshooting

Install Additional APS

Experiment Ends

August 2015

September/October 2015

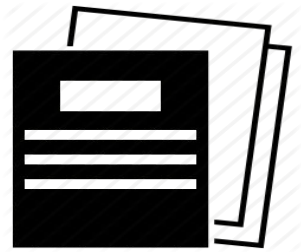
October/November 2015



Method Two: Behavioral Experiment



Kick-Off Meeting



Flyers & Emails



Posters & Signs



Lunch & Learn



Pledge

Intervention Timeline: Behavioral Experiment

Experiment Feasibility Period (30 Days)

Building Surveyed for Likely PPL Management Candidates

Tenant Floor Surveyed for Sub-Metering Capability

Tenant asked to participate in PPL Experiment

Experiment Participants Confirmed

Baseline Period (30 Days)

Start Baseline Period

Sub-Meters Installed

Kick-off Meeting with Plug Load Champion

End Baseline Period

Intervention Period (45 Days)

Held Lunch & Learn

Installed Plug Load Signage
Provided flyers

Emailed Pledge to Staff

Conduct Night Audit

Email Pledge Reminder

Experiment Ends

August 2015

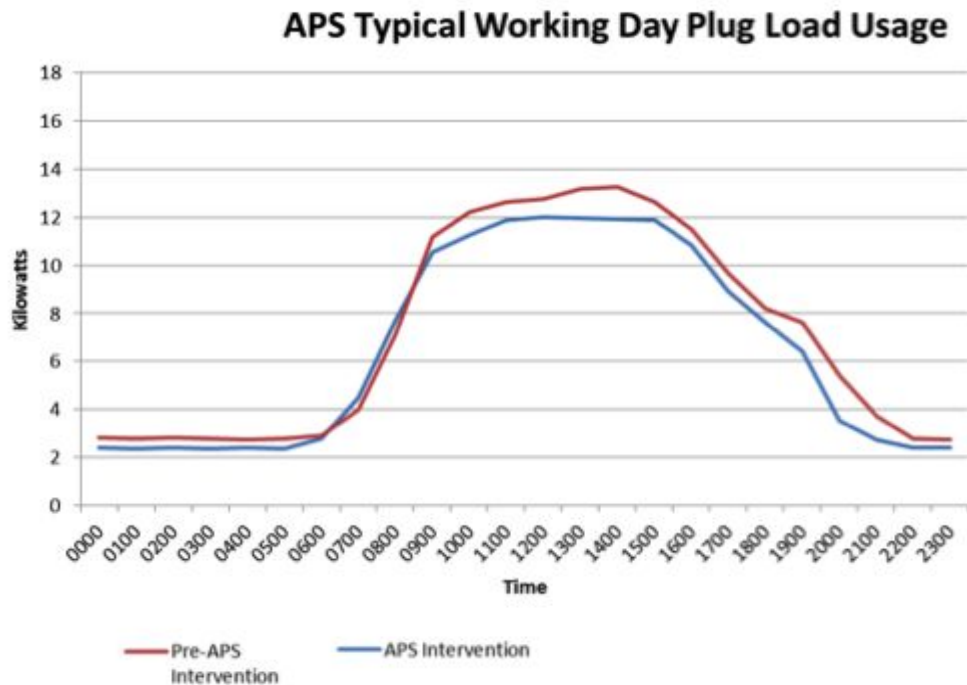
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Results

Results: Technology Experiment



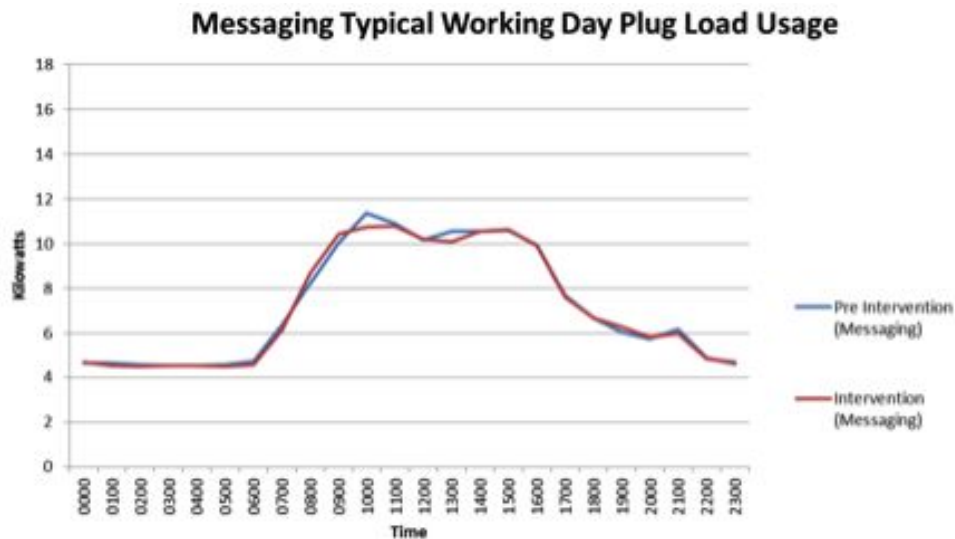
Majority of savings achieved during after-work hours and weekends

- ❑ 29% reduction evenings on workdays
- ❑ 17% reduction weekends

Average Daily Savings

- ❑ 11kwh/day reduction
- ❑ 9% reduction in PPL energy consumption

Results: Behavioral Experiment



Nominal energy reduction

- ❑ Messaging results mirror control group results

Notable change

- ❑ 8% reduction in weekend PPL usage after first round of messaging

Conclusions & Recommendations

Conclusions

Owners of multi-tenant buildings can achieve PPL energy savings, just like landlords with a single tenant.

APS show most success, although results fell well short of other studies.

Behavioral change through messaging and education as conducted is insignificant.

Messaging results are unpredictable and rely on dedication of tenant employees.

Key for multi-tenant buildings: gain buy-in and interest through engagement.

Recommendations

Educate staff (property management, engineering) on PPL reduction measures.

Gain tenant interest and dedication through providing incentives.

Competition, expense sharing (rebate upon success)

Transfer ownership - put responsibility for success on tenants rather than holding it at property management level.

Work with one PPL champion per tenant in an advisory role, providing data and guidance.

**Thank
You!**

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Appendix

APS One-Pager (Motion)

HOW TO USE YOUR ADVANCED POWER STRIP (APS)

Motion

Each Advanced Power Strip (APS) has three outlet types for equipment with various electricity needs:

1. Control Outlet: Computer/Laptop



- Acts as the “control,” or “master,” outlet.
- Turns off the power to secondary outlets when the device connected to it is turned off/put to sleep and/or no motion is detected for 30 minutes, but it will NOT shut down your computer.
- Typically powers your computer’s central processing unit because most other devices connected to the power strip at an office desk depend on your computer for their functionality.

2. Switched Outlets: Monitor/Printer/Phone Charger/Lamp/Speakers



- Act as the outlets “controlled” by the device plugged in to the control outlet and/or the motion sensor.
- When the device connected to the primary outlet is turned off, goes to sleep, or no motion is detected for 30 minutes, the power will automatically be shut off to the devices connected to the secondary outlets.

3. Always-On Outlet: Landline Phone/Clock-Radio

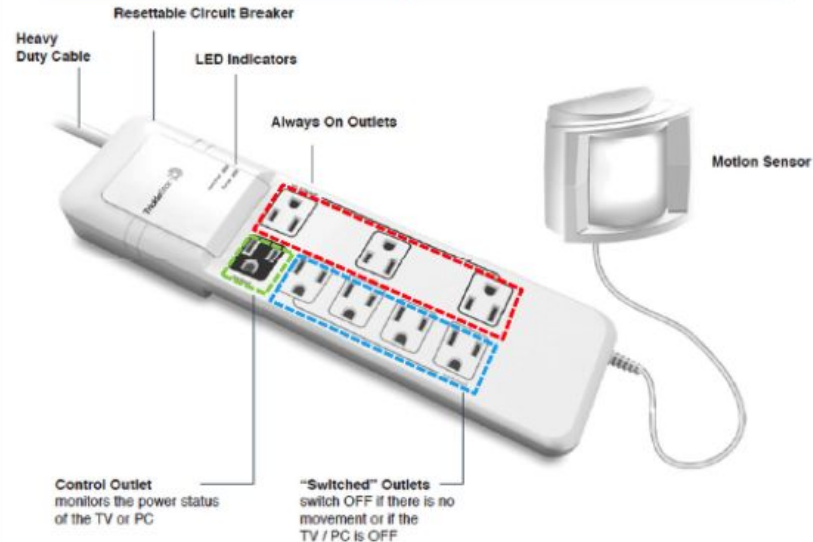


- Remains on all the time
- Not affected by the control outlet or the motion sensor.



Do's and Don'ts for your motion sensor APS

Do	Don't
✓ Plug all your electrical devices into the APS!	✗ Unplug or disconnect your APS from the power outlet!
✓ Let your APS do the work for you! Simply walk away and the motion sensor will turn off your peripheral devices.	✗ Turn off your APS via the circuit breaker.
✓ Ensure that the motion sensor is placed so that it can detect your movement.	✗ “Daisy Chain” – i.e. don't plug one APS into another.



Overview: Your 8-Outlet Timer Controlled Power Strip

This surge-protected power strip is perfect for the office – simply set the timer to turn off appliances and equipment that is not needed during working hours! Ideal items to plug into this power strip include, but are certainly not limited to: printers and copiers, automatic pencil sharpeners, coffee machines, microwaves, common-space lighting, and much more.

Time-Controlled Outlets – Printers/Copiers/Coffee Machines/Microwaves/Toasters



- Appliances plugged into the time-controlled outlets will turn off automatically within the set time period.
- There is no weekend setting for these outlets. Devices must therefore be turned off before leaving for the weekend!

Always-On Outlets – Landline Phones/Fax Machines/Refrigerator/Vending Machine



- Appliances plugged into the time-controlled outlets will turn off automatically within the set time period.

Do's and Don'ts for your timer APS

Do	Don't
✓ Plug common-use electrical appliances into the APS!	✗ Unplug or disconnect your APS from the power outlet!
✓ <u>Before leaving for the weekend</u> , turn off all devices plugged into the time-controlled outlets.	✗ Plug all devices into the always-on outlets.
✓ <u>On Mondays</u> , turn the devices back on and the power strip will take over again for the week!	✗ "Daisy Chain" – i.e. don't plug one APS into another.

