Occupant Behavior Change Gamification

StopWaste.Org Device Power Conservation Pilot Project

The Pilot Project uses gamification methods to help accomplish occupant behavior change, in this case encouraging staff to reduce plug load device electrical energy consumption in their office personal workspaces.

Gamification will in future be applied to conserving other resources, such as water, paper or food.

This slideshow was presented to StopWaste.Org staff on 5th March 2014 as a part of the staff orientation and training activities for the Device Power Conservation Pilot Project.

This pdf version of the Power Point slideshow lacks the verbal audio narrative given by the presenter. It has therefore been revised to add supplementary explanatory text for some slides. Slide embedded videos have been replaced by hyperlinks to online versions of the embedded videos.

Device Power Conservation Pilot Project

Commercial Office Plug Loads
and Energy Chickens

Presentation by James Kalin – Virtually Green

For StopWaste.Org

What are “plug loads”?

Anything that uses one of these…

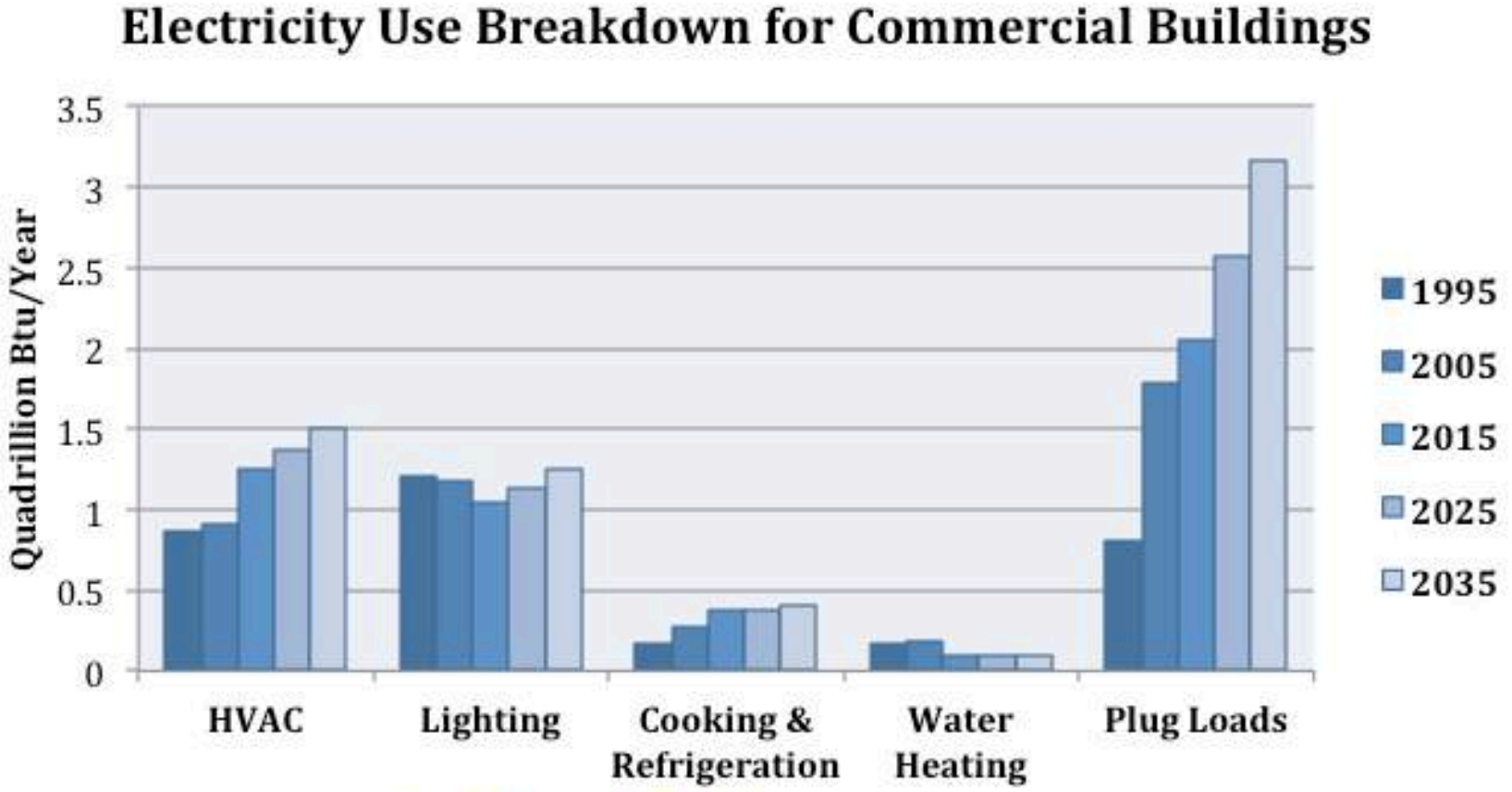
To plug into one of these…

Typical plug load devices

Office Spaces

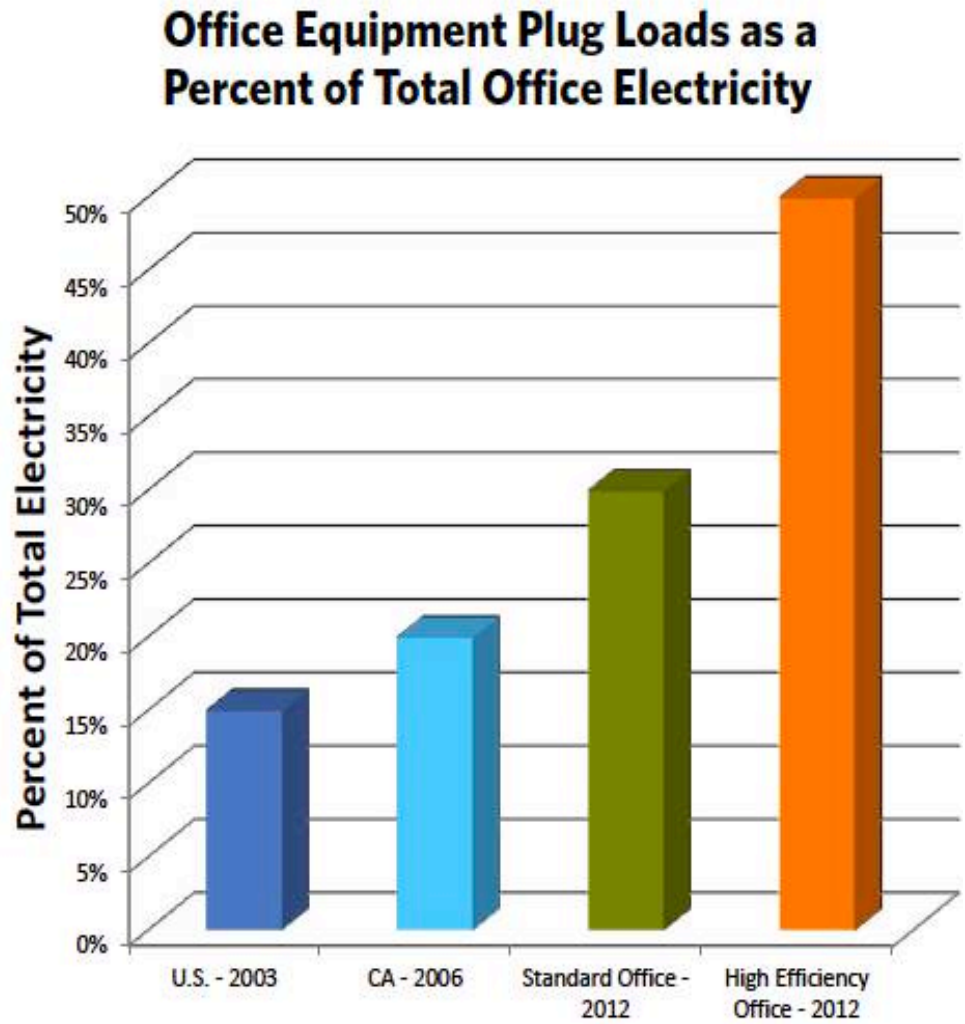
Common Areas

Plug load energy use is growing



(Graph was created from Annual Energy Outlook data)

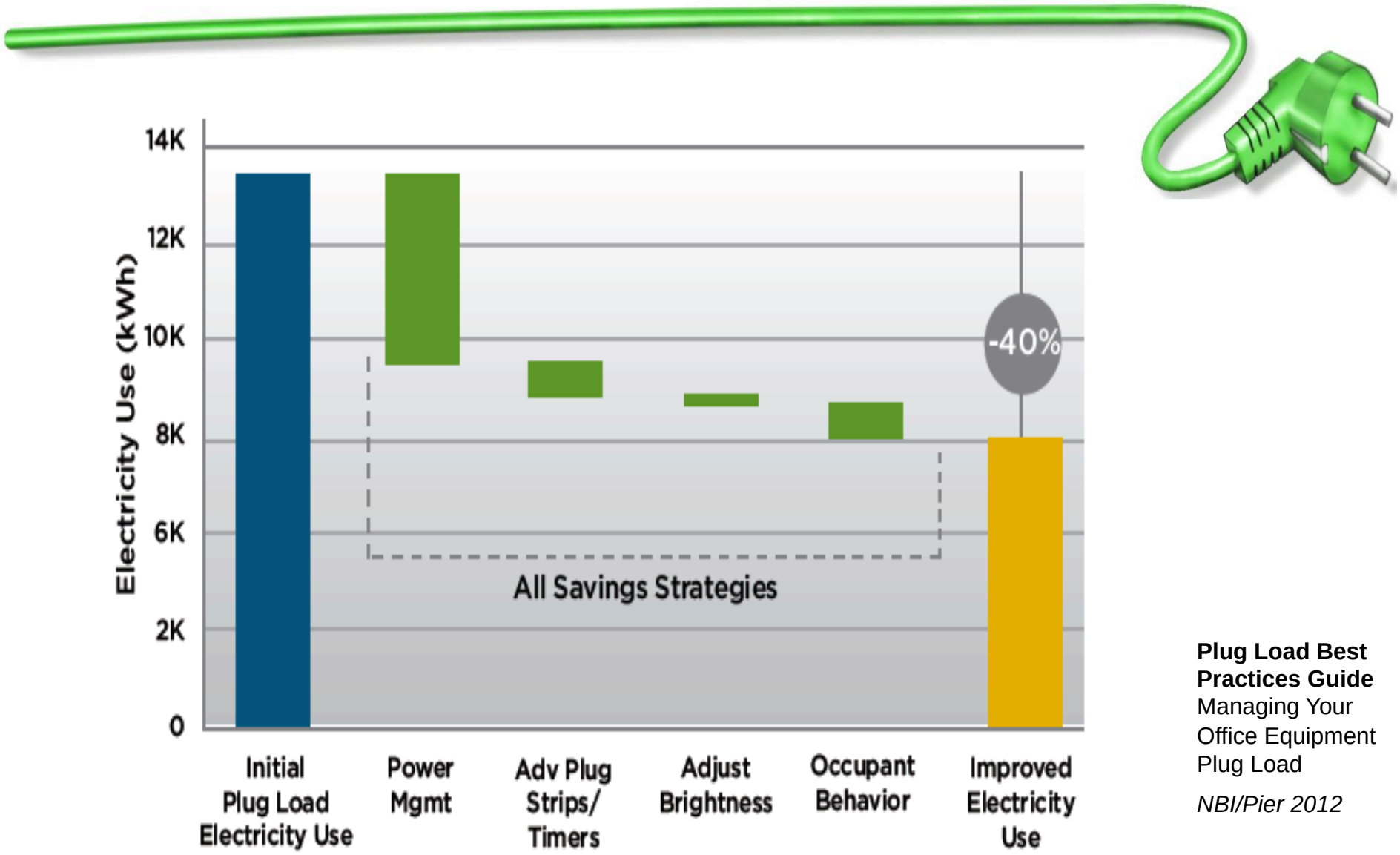
Plug loads as % of office electricity use



Plug Load Best Practices Guide

Managing Your Office Equipment Plug Load *NBI/Pier 2012*

Energy savings – 40%



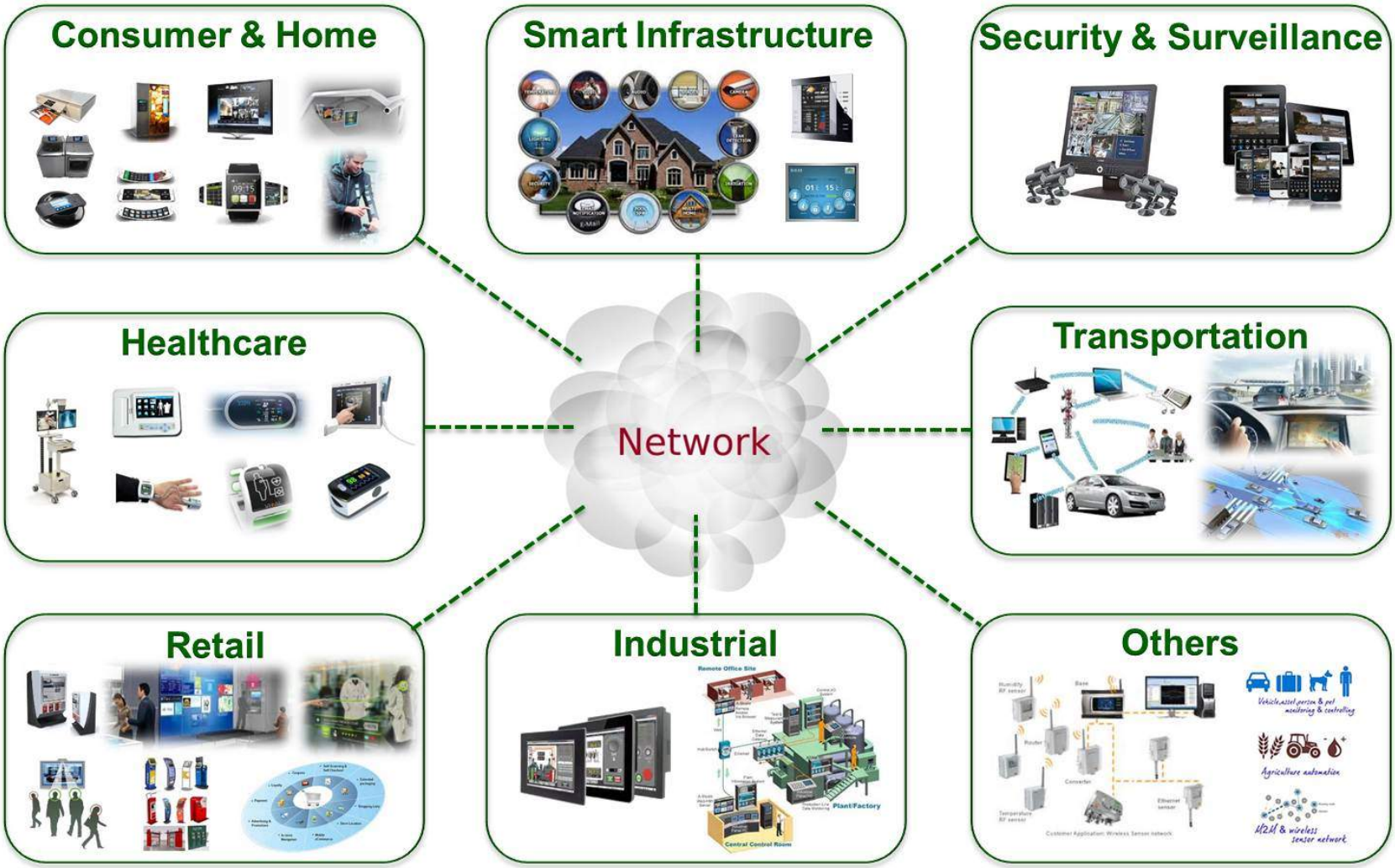
Plug Load Best Practices Guide
Managing Your Office Equipment Plug Load

NBI/Pier 2012

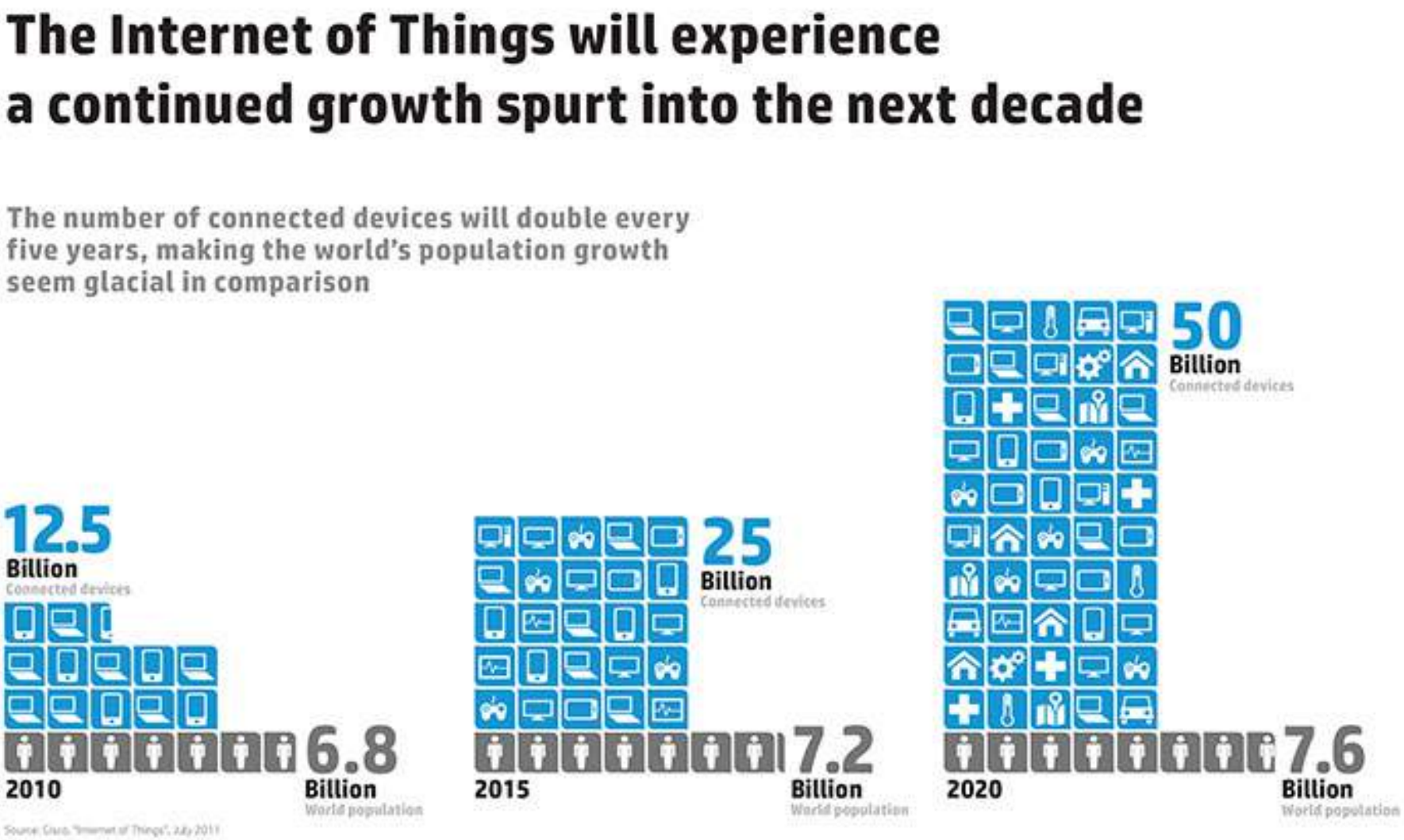
Introducing the Internet of Things (IoT)

and what does it have to do with plug loads?

Internet of Things (IoT)
will put every device on the Internet



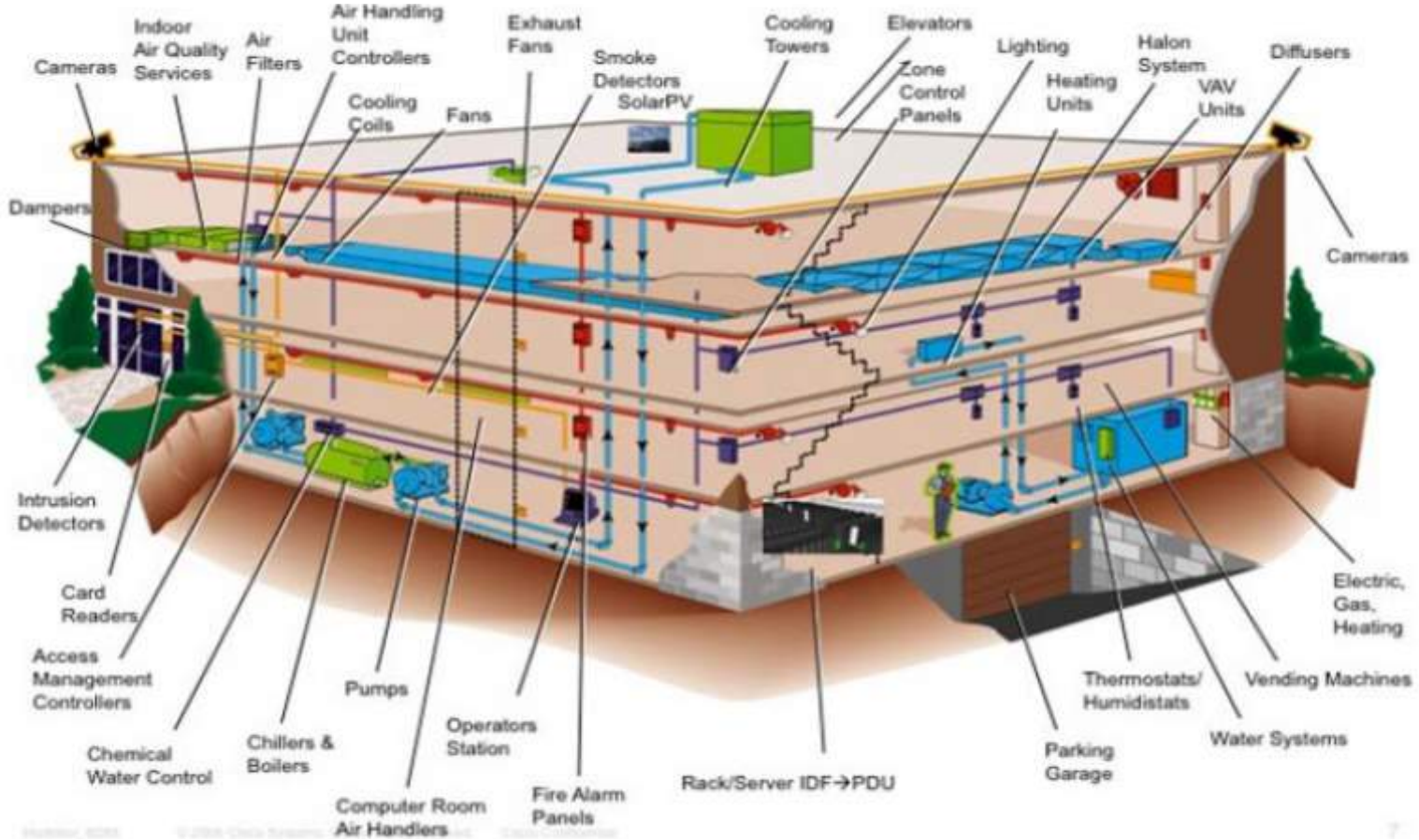
IoT growth


The Internet of Things will experience
a continued growth spurt into the next decade
The number of connected devices will double every
five years, making the world's population growth
seem glacial in comparison
12.5
Billion
Connected devices
2010
6.8
Billion
World population
25
Billion
Connected devices
2015
7.2
Billion
World population
50
Billion
Connected devices
2020
7.6
Billion
World population

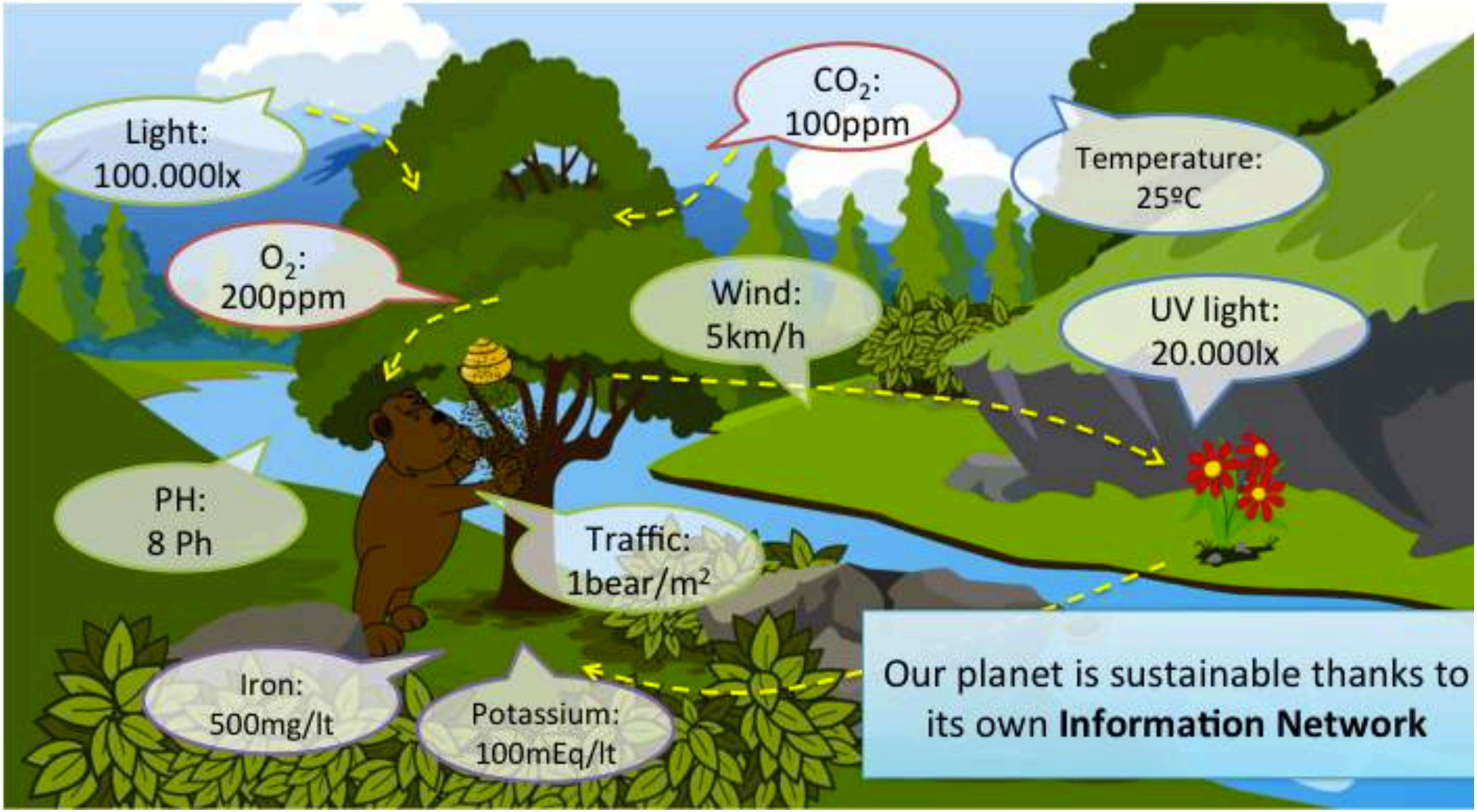
Internet of Things (IoT)

IoT devices in buildings

IoT devices can automatically gather and share real-time data about building energy use, thermal comfort, indoor air quality, tenant health and happiness, and other factors that affect building performance and occupant's well being and productivity.

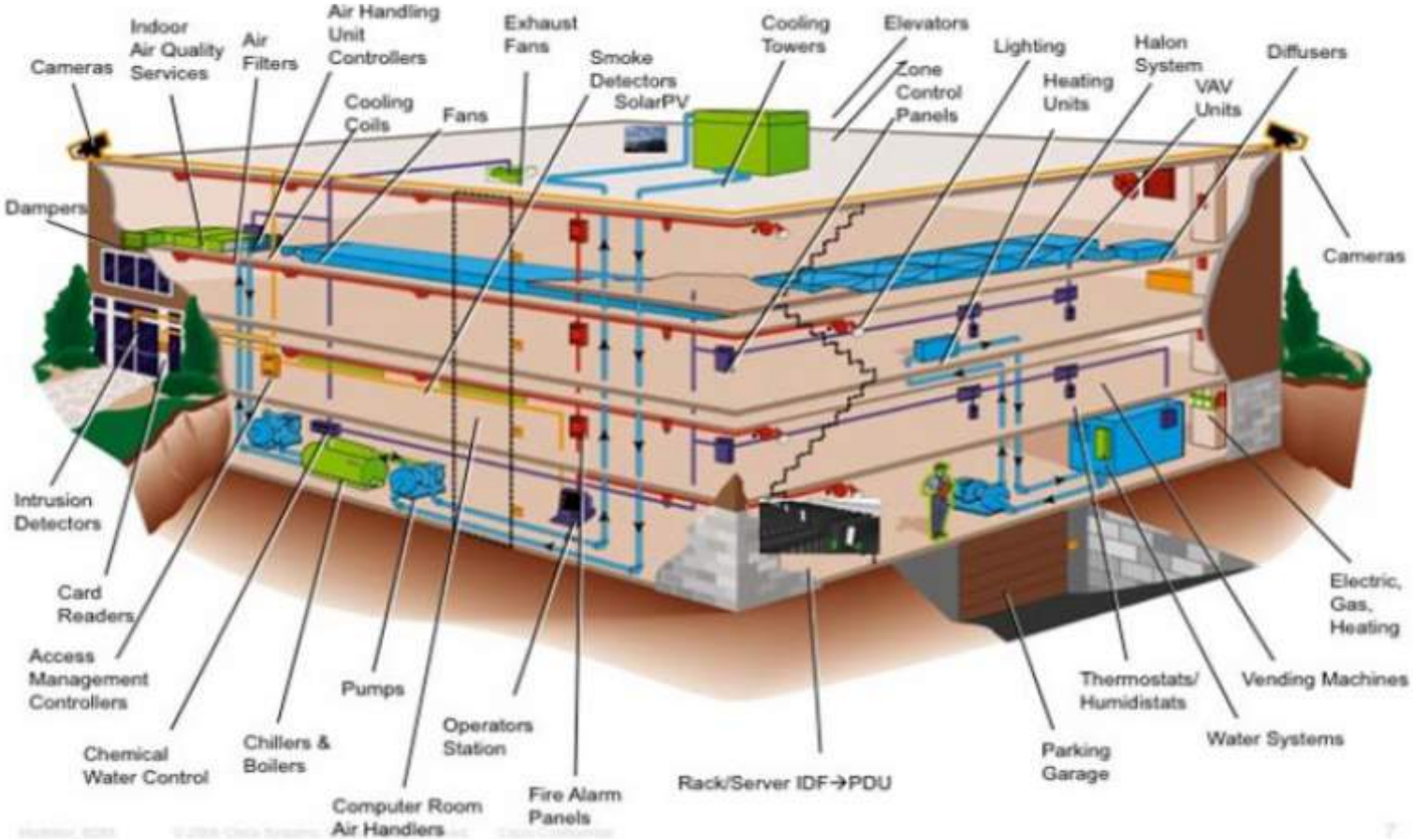


Nature is a self-regulating IoT system



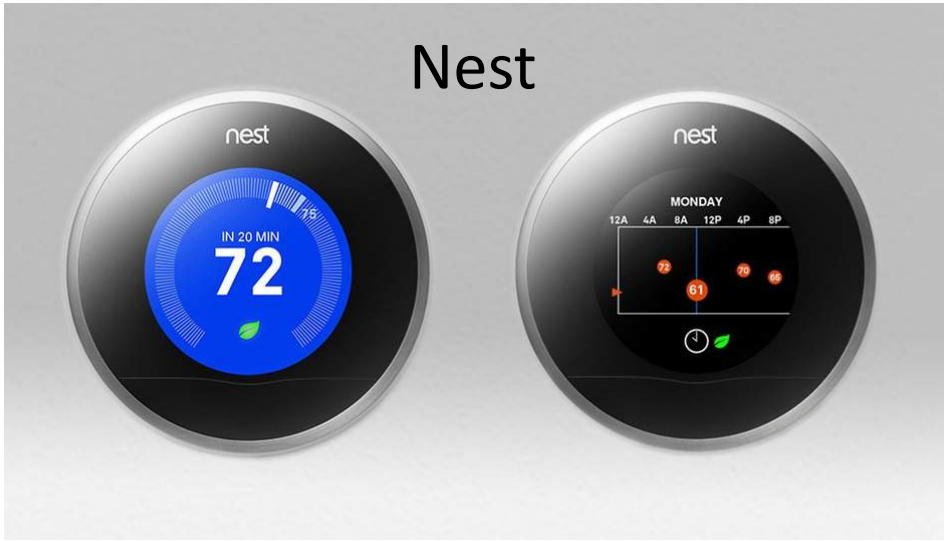
Self-regulating building system

IoT devices can merge the devices and people of a building into a self-regulating system that automatically learns, adapts and optimizes resource utilization, building performance and tenant well being, health and productivity.



IoT Devices

Nest



Nest senses you left and adjusts HVAC to avoid heating or cooling empty space. Nest learns and adapts to you. Nest's built-in sensors include temp, humidity, light and motion. Google recently bought Nest for $3.2 billion.

Power Port monitors electricity usage at each of its four outlets. Usage data is reviewable via online software that can also turn outlet power on or off either manually, on a schedule, or in response to your power usage habits.

Power Port

Power Port

The Power Port is an IoT “smart power strip” that monitors the electricity used by individual electrical devices plugged into each of the four Power Port outlets.

The energy usage data for each electrical device is stored in an online database accessible via Internet browser.

19 Power Ports are installed at StopWaste.Org in 9 cubicles and one office space.

Plug Load Manager online database

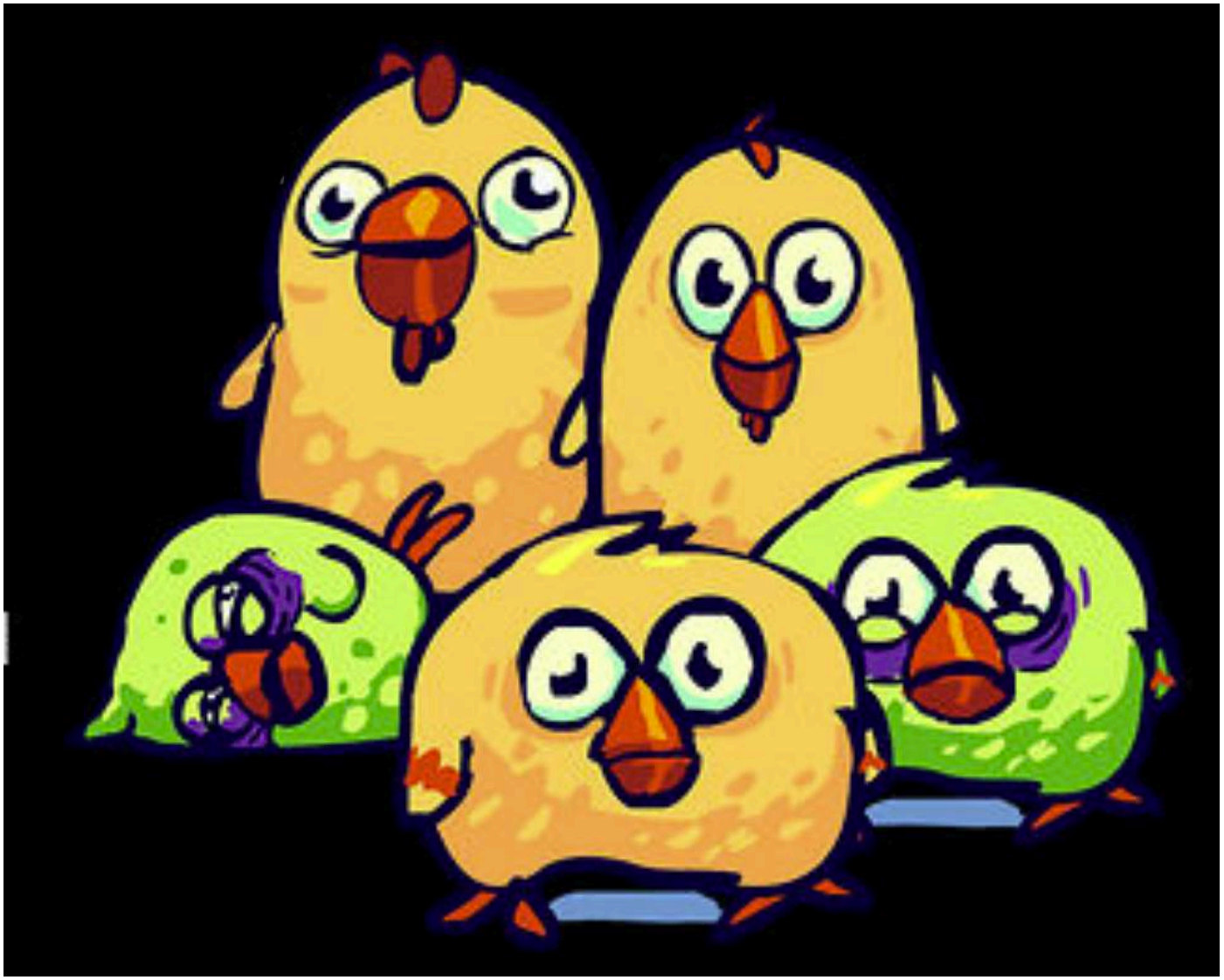
Use online dashboards to change office staff plug load energy behavior?

"Almost all respondents indicated that behavior was not changed as a result of this research. Those who had access to the online dashboard indicate that they rarely or never checked the real-time energy performance of the plug-loads, which reduces the value of the submetering capabilities."

Plug-Load Control and Behavioral Change Research in GSA Office Buildings

GSA/NREL 2012

Introducing Energy Chickens…



What is Energy Chickens?

The video that was embedded in this slide in the original PowerPoint slideshow presentation is not viewable in this pdf version of the presentation.

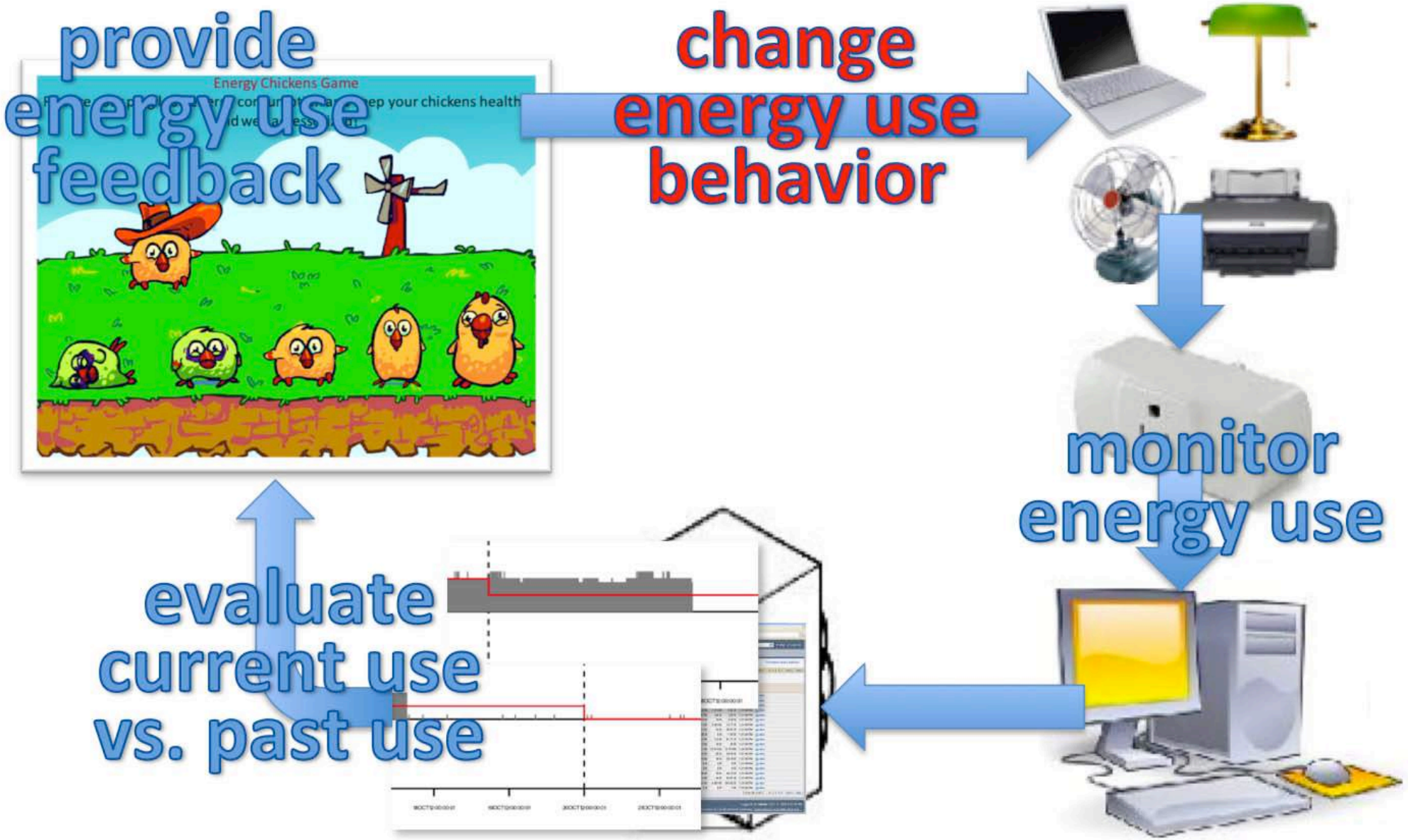
The video is the Energy_Chickens_Video_One.mp4 file in the "EBOM Innovation Credit 2 - Behavior Change Gamification" folder in the 7-Innovation submittals folder.

The video can also be accessed online using the following web link: https://vimeo.com/40791007

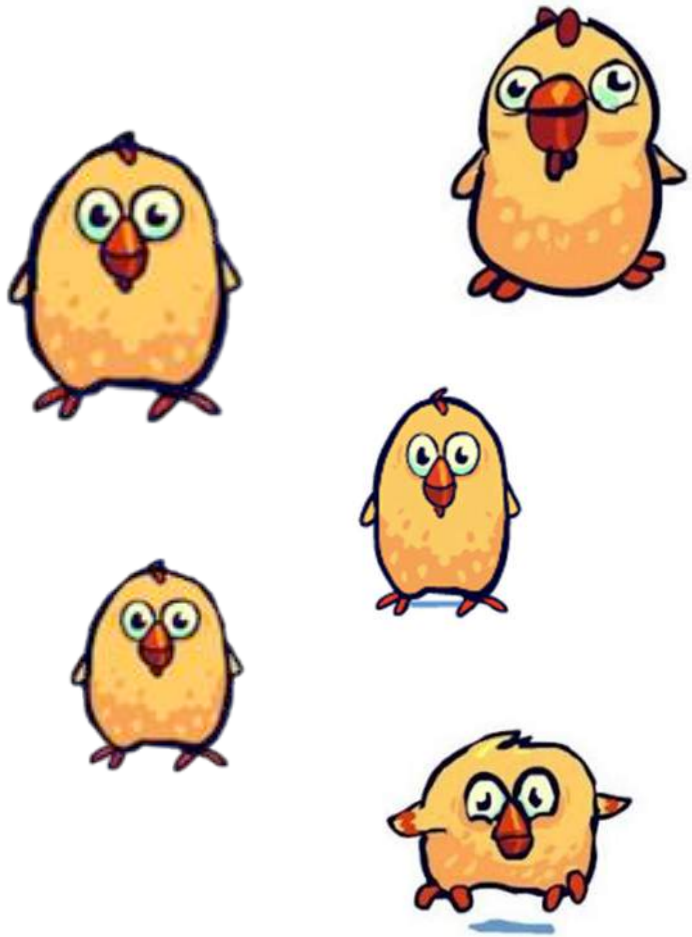
Take care of your energy chickens!

Level -2	Level -1	Baseline 0	Level +1	Level +2
				

Behavior change feedback loop



Energy Chickens may improve your office work productivity



“This study shows that viewing cute things improves subsequent performance in tasks that require behavioral carefulness… which is beneficial in specific situations, such as driving and office work.”

Viewing Cute Images Promotes Careful Behavior and Narrows Attentional Focus.
2012
Hiroshi Nittono, Graduate School of Integrated Arts and Sciences, Hiroshima University, Hiroshima, Japan

Energy Chickens and Power Ports

Energy Chickens will be up and running this Spring for the 10 StopWaste.Org staffers who have Power Ports installed in their workspaces.

With your help we can …

Install more Power Ports and Energy Chickens for more StopWaste.Org workspaces, common areas and utility rooms.

Promote deployment of Power Ports and Energy Chickens in other buildings in Alameda County (and beyond) to conserve energy.

Secure funding to develop new versions for other purposes.

Water Hogs?

Paper Pups?

Carbon Sheep?