

We Are Connected...

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In the past, technology drove for one goal...

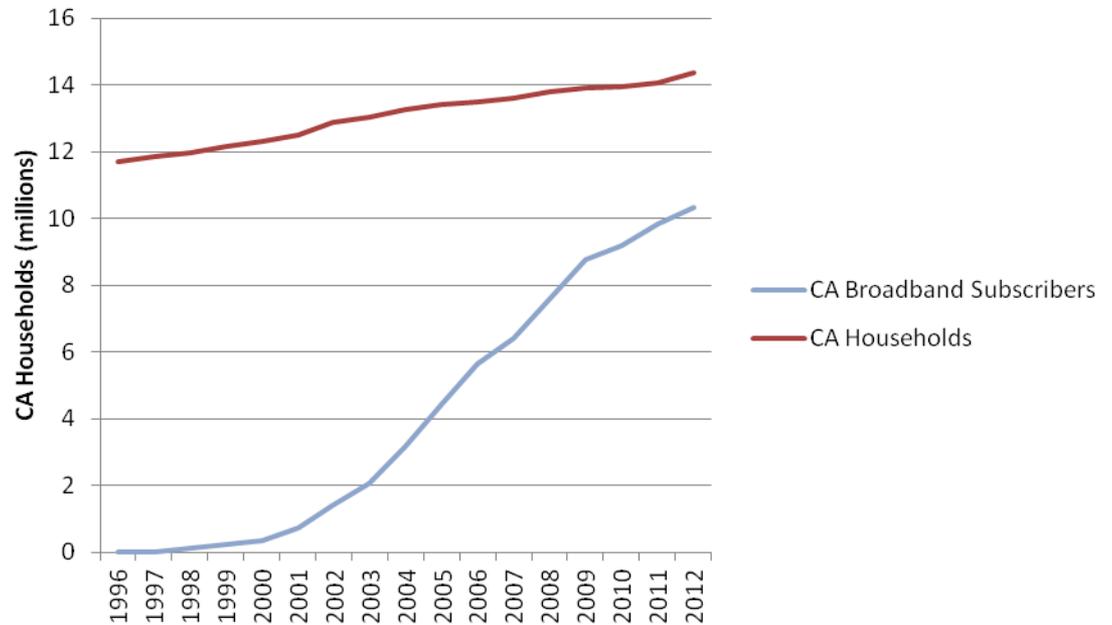
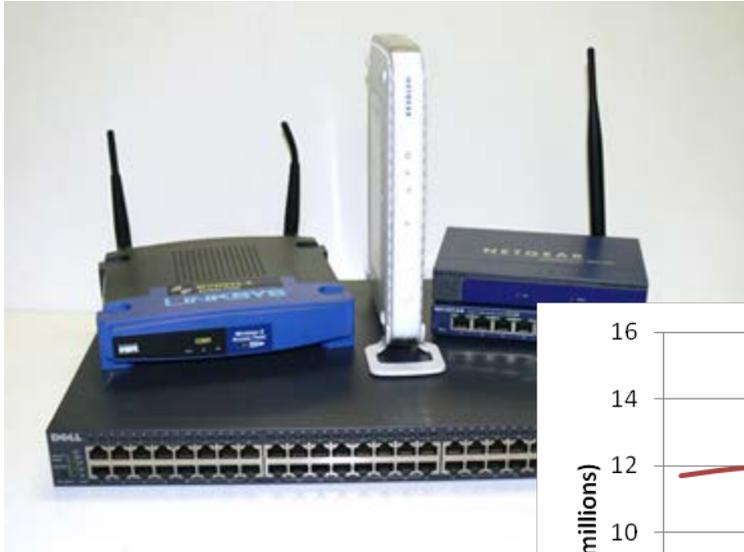


Today, technology drives for endless possibilities... Internet of **Everything**



Source: IEEE.org

Network Equipment Connects IOEs



Intersection of IOE and Environmental Regulations

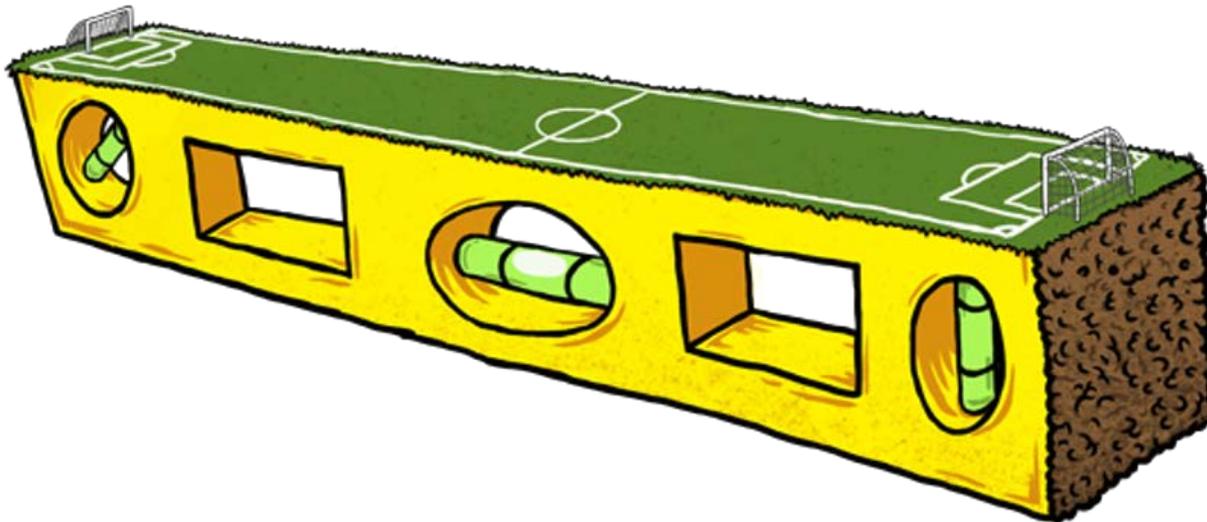


CA Environmental Policy



- California has been a nationwide leader of energy and environmental initiatives:
 - Green House Gas emission reduction: Assembly Bill 32, 2005 Executive Order:
 - 1990 levels by 2020 (approximately 30% reduction)
 - 80% reduction below 1990 level by 2050
 - California Governor Calls for (by 2030):
 - Increase renewable energy generation to 50 percent
 - Reducing the petroleum used in cars and trucks by up to 50 percent,
 - Doubling the efficiency of existing buildings
 - Zero Net Energy Homes by 2020
 - ZNE Buildings by 2030

Why Codes and Standards?



IT Can Provide Solutions to CA Environmental Policies and Goals



Example: Small Network Equipment

Small network equipment is network equipment that is intended to serve users in either small networks or a subset of a large network (EPA 2013a).



In California

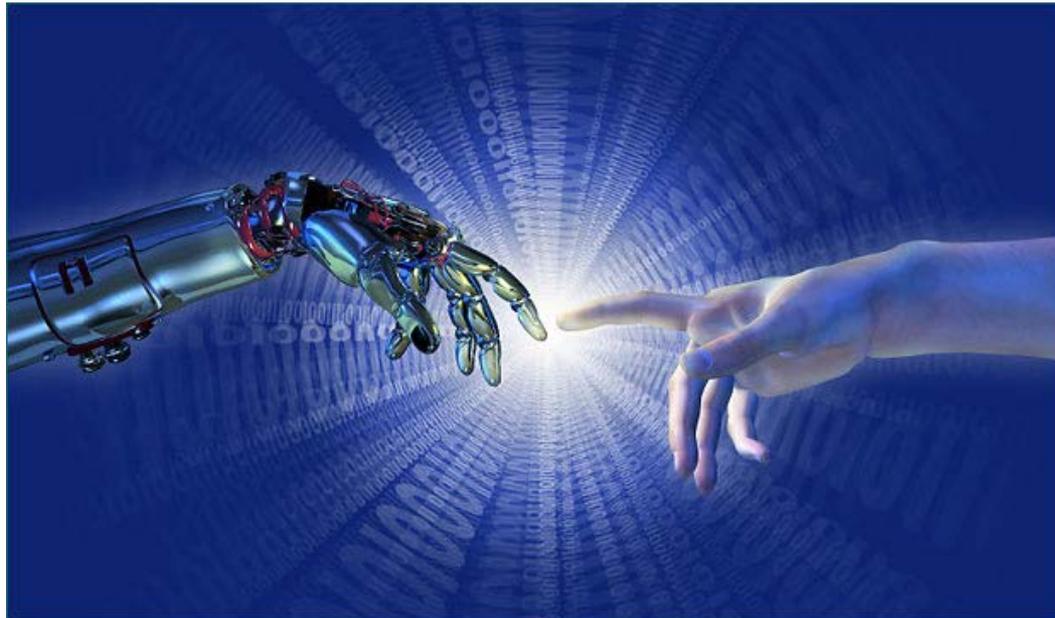
- About 27 million small network devices in use in California today
- Consuming a combined 1,700 gigawatt-hours per year (GWh/yr).
- Most small network equipment today draw the same amount of power when sitting idle as they do when transmitting large amounts of data at high rates.

Our Challenge...



Human Behavior and Technology

- Technology can help human behavior



IT Solutions to Manage the Switch...

Software Solutions

Hardware Solutions



Technological opportunities for improving small network equipment power use

Product Class		Core silicon improvements and power supply	Power scaling of wired LAN functionality (EEE)	Power Scaling of Wi-Fi LAN functionality	Power scaling of broadband access functionality
Broadband Access Equipment	Broadband Modem, Cable	Yes	Yes		Yes
	Broadband Modem, ADSL	Yes	Yes		Yes
	ONT	Yes	Yes	Maybe, depending on function	
	IAD Cable	Yes	Yes	Maybe, depending on function	Yes
	IAD ADSL	Yes	Yes	Maybe, depending on function	Yes
	IAD VDSL	Yes	Yes	Maybe, depending on function	Yes
Local Network Equipment	Access Point	Yes	Yes	Yes	
	Router	Yes	Yes	Maybe, depending on function	
	Switch	Yes	Yes		

Let's Work Together

- We are connected through IOE
- Once we are connected, we become real in IOE
- IOE, therefore, can enable us to overcome many challenges... together: that challenges include our overarching goals of building a “green society.”

Thank You!

