



Northeast Energy Efficiency Partnerships

Innovation in Business and Consumer Electronics Products and Policy

TUESDAY, JUNE 18TH, 2013

1:15pm-2:45pm

#summit13

2013 NORTHEAST ENERGY EFFICIENCY SUMMIT

June 18 - 19, 2013

Springfield Sheraton Hotel - Springfield, MA

Accelerating Innovation in Efficiency



SESSION GOALS AND OBJECTIVES

- Participants gain a deeper understanding of emerging trends and innovations in efficient products
- Participants gain a deeper understanding of the policies and opportunities that exist in BCE efficiency
- Opportunities and trends that are on the horizon are identified and next steps are established

Kris Bowring



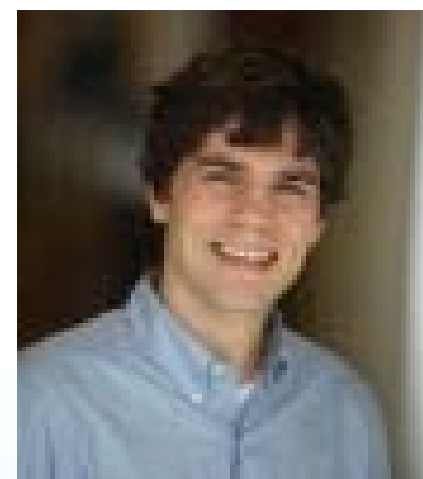
David Korn



SPEAKERS



Carl Uthe



David Lis

AGENDA

Introduction: Claire Miziolek, NEEP

Presentations:

- Smart and Connected Technologies
- Battery Chargers
- Plug Load
- Role of Policy

Moderated Questions: Dave Lis, NEEP

Audience Questions



BCE efficiency, Innovation and Regulation; Can we all get along?



- Regulatory Tools
 - Product testing and labeling
 - Appliance Efficiency Standards
 - Building Energy Codes
 - Grid Modernization Activities





Smart Technologies: How will the Connected Home effect Energy Efficiency Programs

Kris Bowring

Vice President

Navitas Partners, Inc.

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Navitas Partners: Profitable Sustainability

An Energy Efficiency Services Company focused on

- Executable strategy
- Innovative program development and implementation
- Account management
- Information and analytical services

Relevant Engagements

- With PG&E and NEEA created the BCE program
- Supporting the development of the “next big thing” in plug load
- ENERGY STAR – large retail account strategy – Best Buy, Home Depot, Lowes, Sears and Walmart.
- ENERGY STAR’s Retail Action Council
 - PEER Guidelines



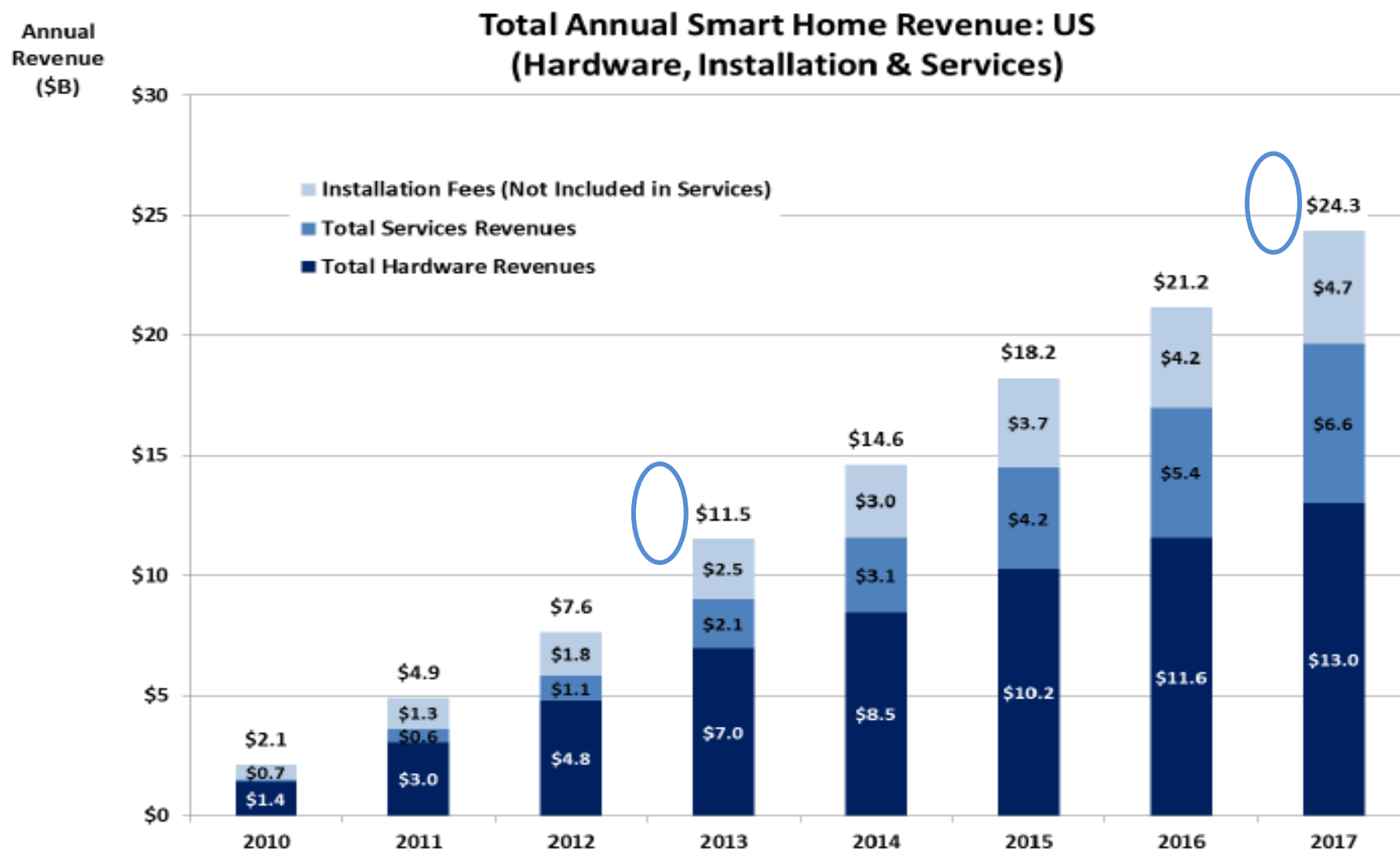
The Smart Connected Home Opportunity

Energy Efficiency Programs Evolution and Expansion



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The Opportunity is Significant



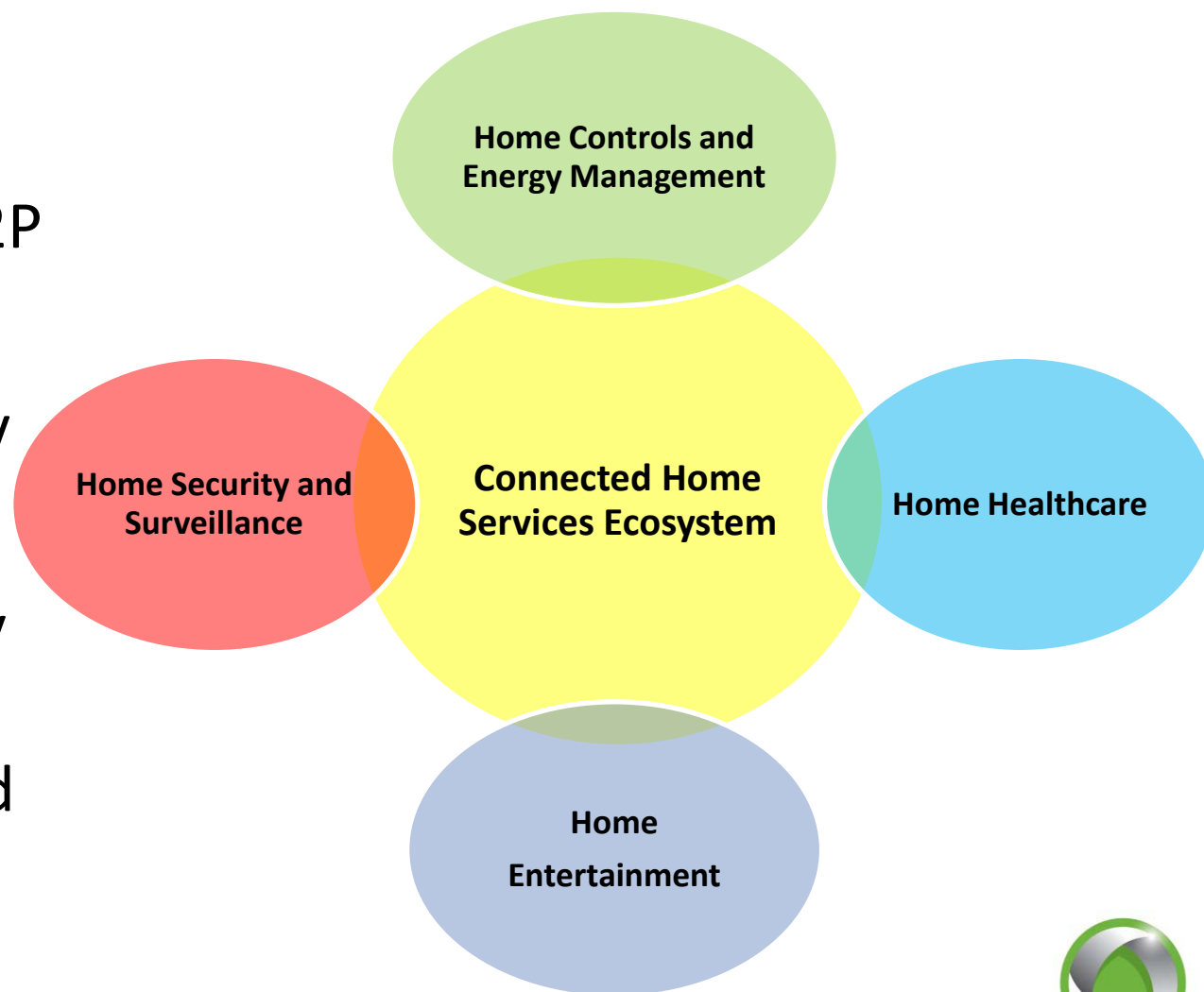
Strategy Analytics, Smart Home Strategies Forecast, 2012



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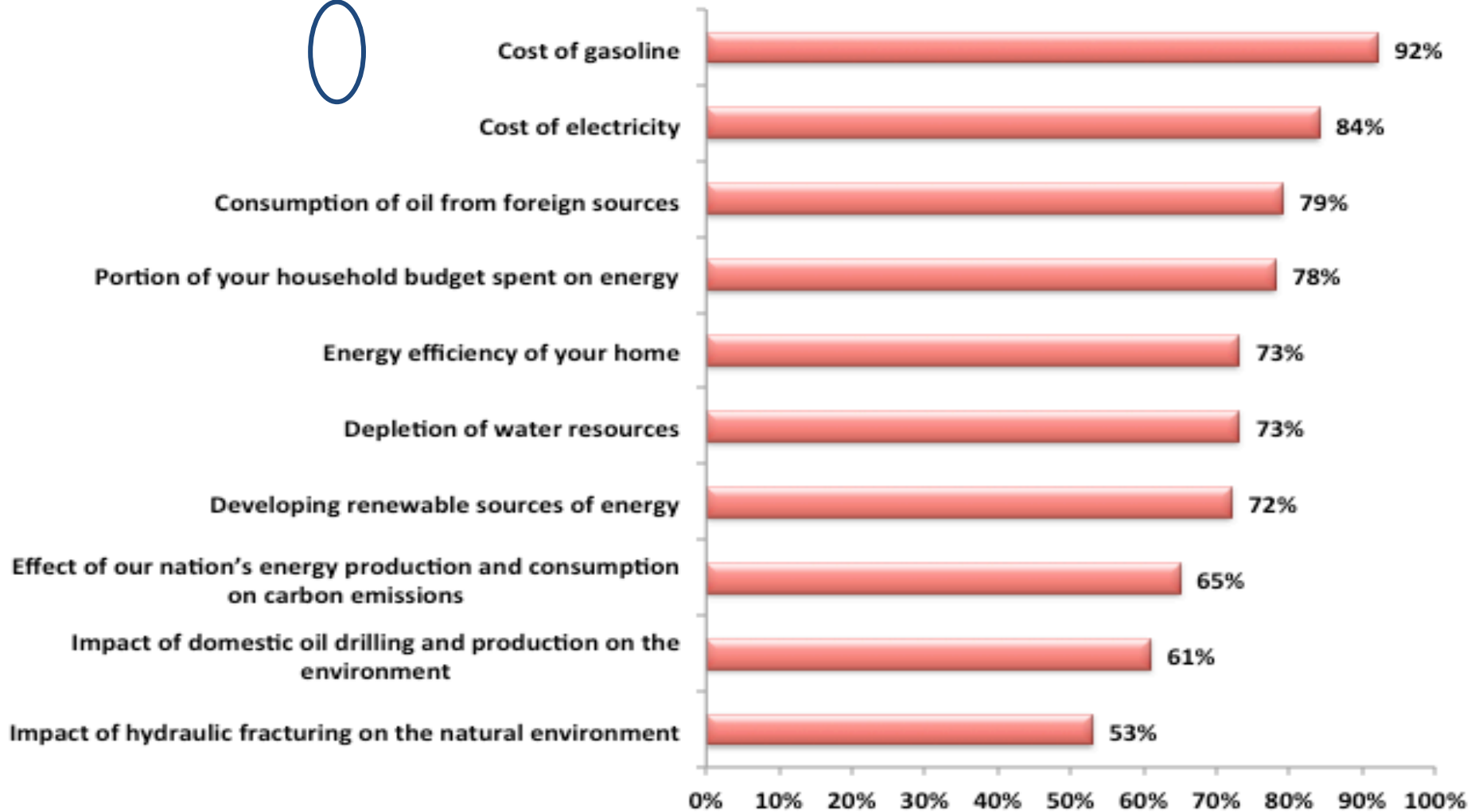
5 Industries Converging on the Connected Home

- The Intelligence of Things
- By 2020, P2P and M2P will dominate*
- By 2020, 50B globally connected devices*
- How will your Energy Efficiency programs evolve, innovate, and measure?



*Cisco, Embracing the Internet of Everything, 2013

Concern for Energy Prices is Activating



Energy Poll September 2012 Base: 2092.
All results based on weighted data

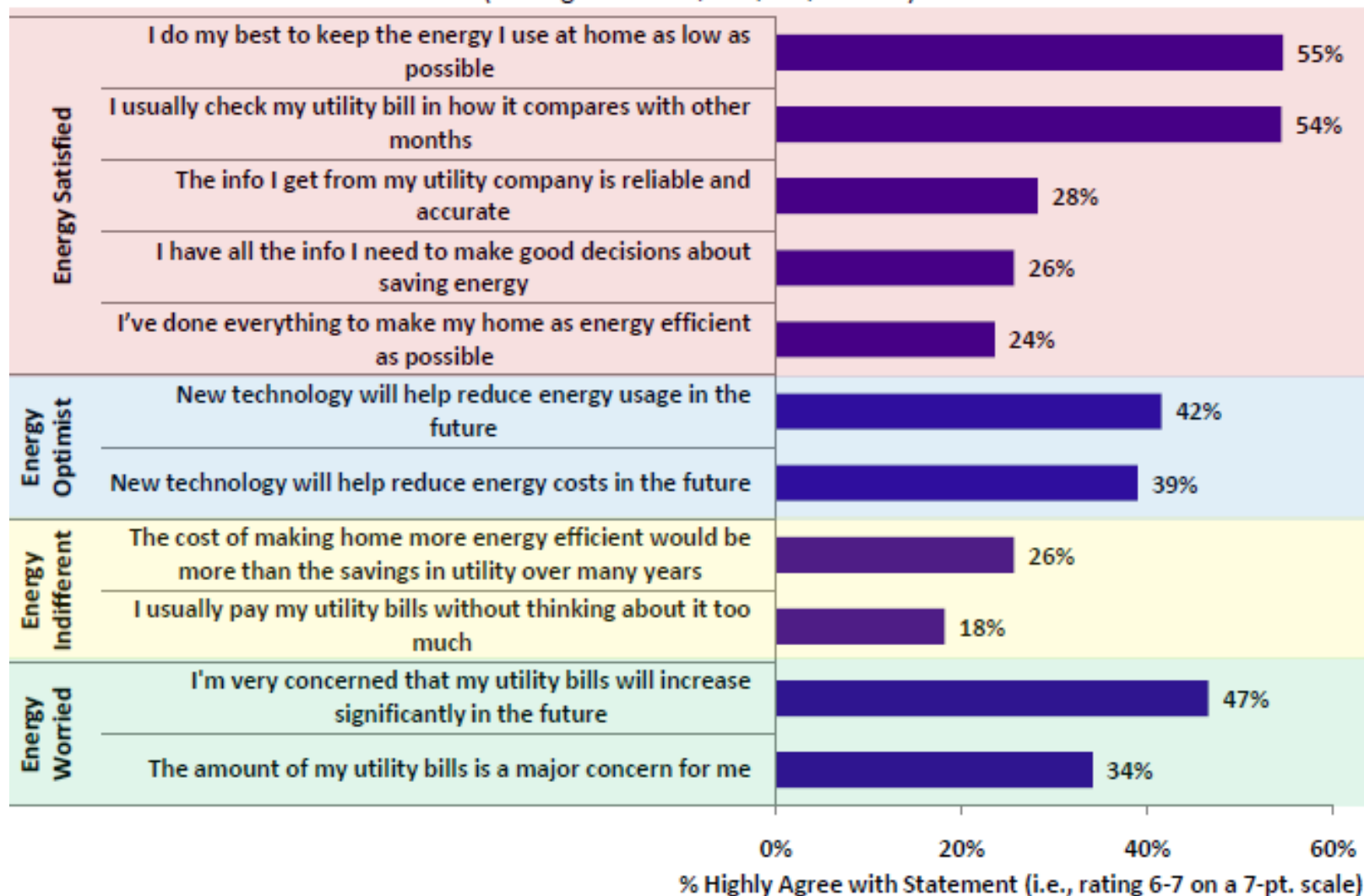


Consumer Attitudes About Energy Efficiency

Attitudes About Energy Efficiency and Management, by Group (Q3/10)

"Q3070. Do you agree or disagree with the following statements?"

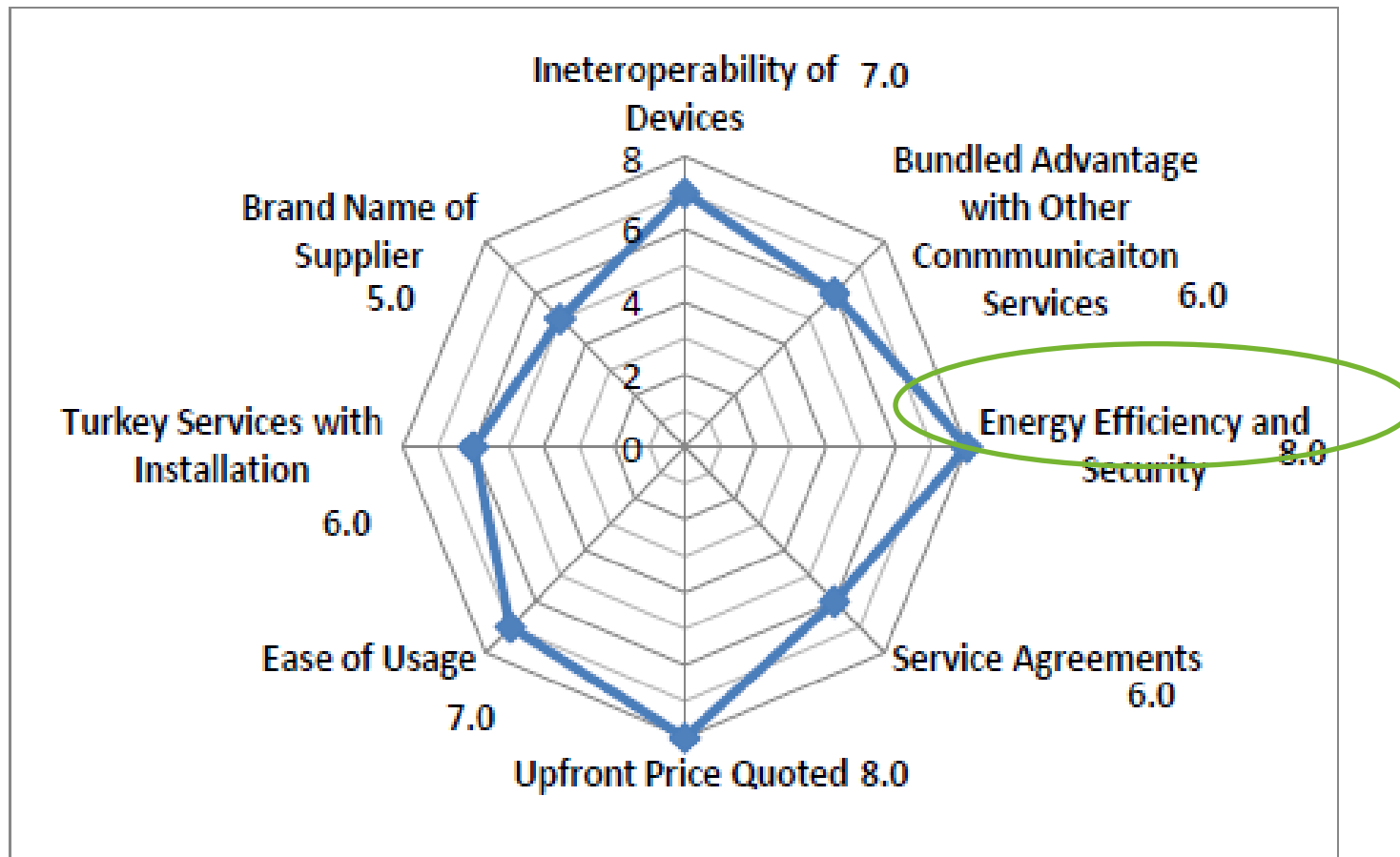
(Among all BB HHs, n=2,000, ±2.19%)



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Influence Factors for Consumers

Chart 2.23: Key Factors Influencing Consumer Demand

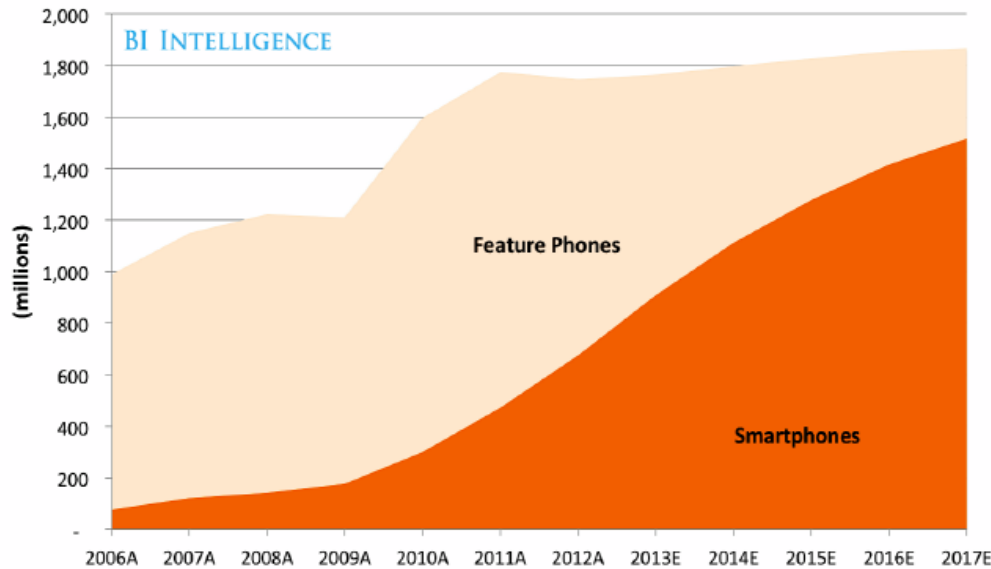


Source: Frost & Sullivan Analysis.

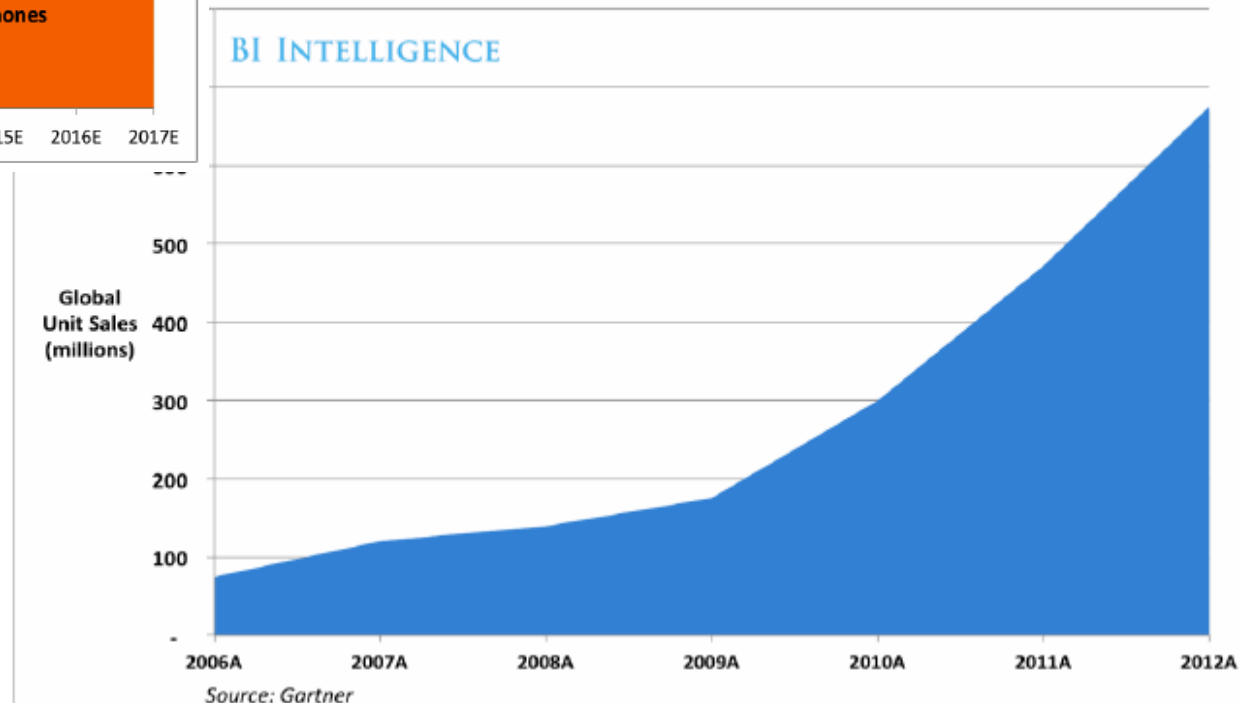
CABA, Smart Grid Impact on the Connected Home, 2012

Consumers Becoming more Technology Inclined?

Mobile Phone Sales Forecast



Global Smartphone Unit Sales



Smart Connected Technology will Influence...

Design

- Product (mfrs)
- Program (utility)
- Store (retail)
- Web (channels)

Experience

- Product (mfrs)
- Program (utility)
- Store (retail)
- Web (channels)

Consumers/Customers

- Web (channels)
- Store (retail)
- Program (utility)
- Segmentation
- Generational Differences

Knowledge Matters

- Play the Continuum (Stakeholders)
- Make it easy, *continuously* simplify
- Lifestyle orientation



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Thank You.

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CADMUS



Battery Chargers

David Korn



Primary Batteries are Pretty Amazing

- A set of 4 AA lithium batteries deliver lighting all night:
 - Weight: 2 oz.
 - Energy: $4 \times 1.5\text{V} \times 3\text{ Ah} = 18\text{ Wh}$ (iphone = 5 Wh)
- But,
 - They cost \$8/.018kWh or \$444/kWh!

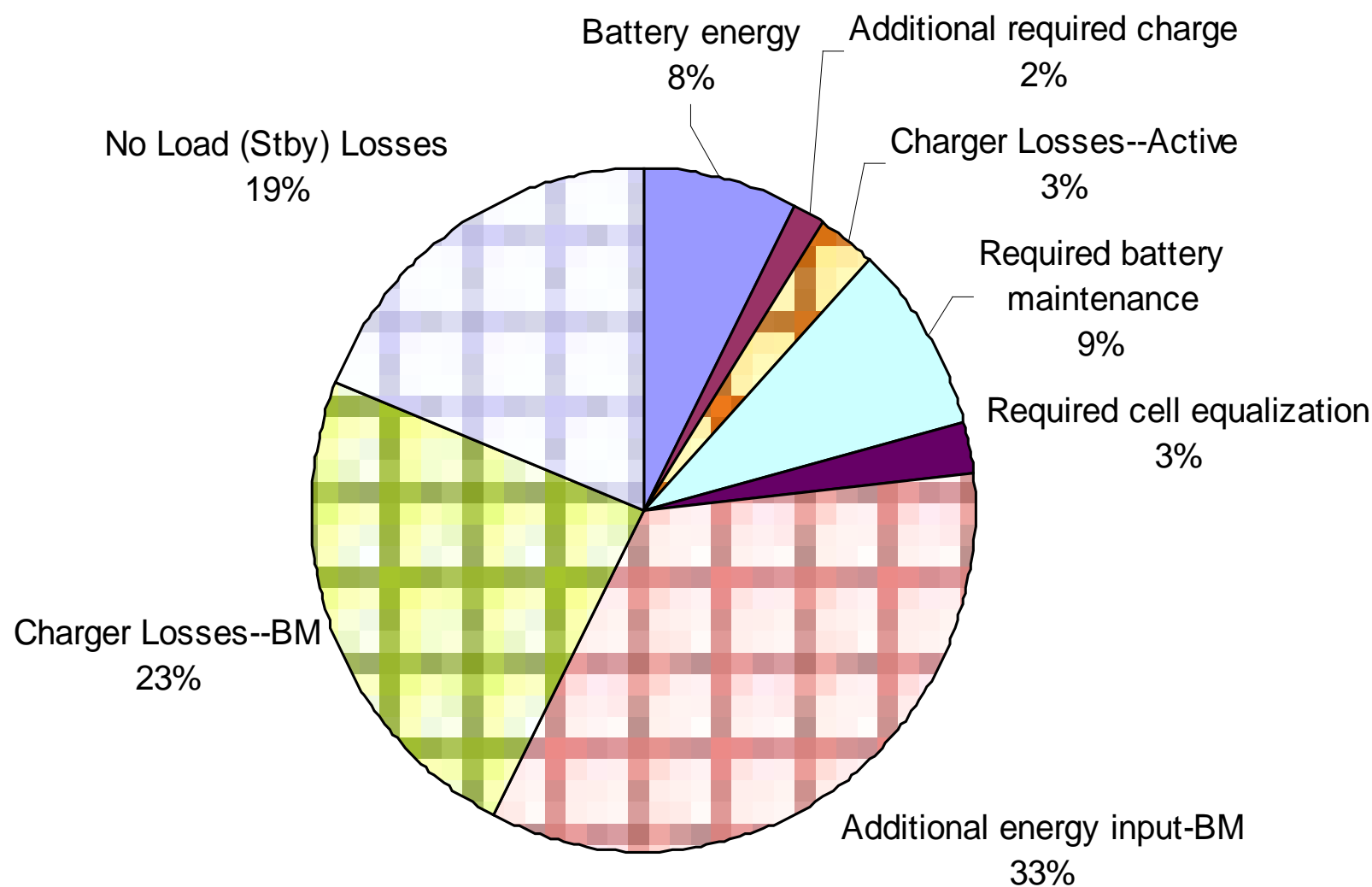


Less Expensive: Rechargeables

- Energy density is similar:
 - Energy: $4 \times 1.2\text{V} \times 2.2 \text{ Ah} = 11 \text{ Wh}$
 - At 500 uses = 5,500 Wh
- And,
 - They cost \$10, plus the AC energy
 - $5.5 \text{ kWh} \times \$0.15 \times 1/20\% = \4.12
 - $\$14.12/5.5 = \$2.57/\text{kWh}$ or 16 x socket power cost
 - Energy “waste” is \$2.50 for system life

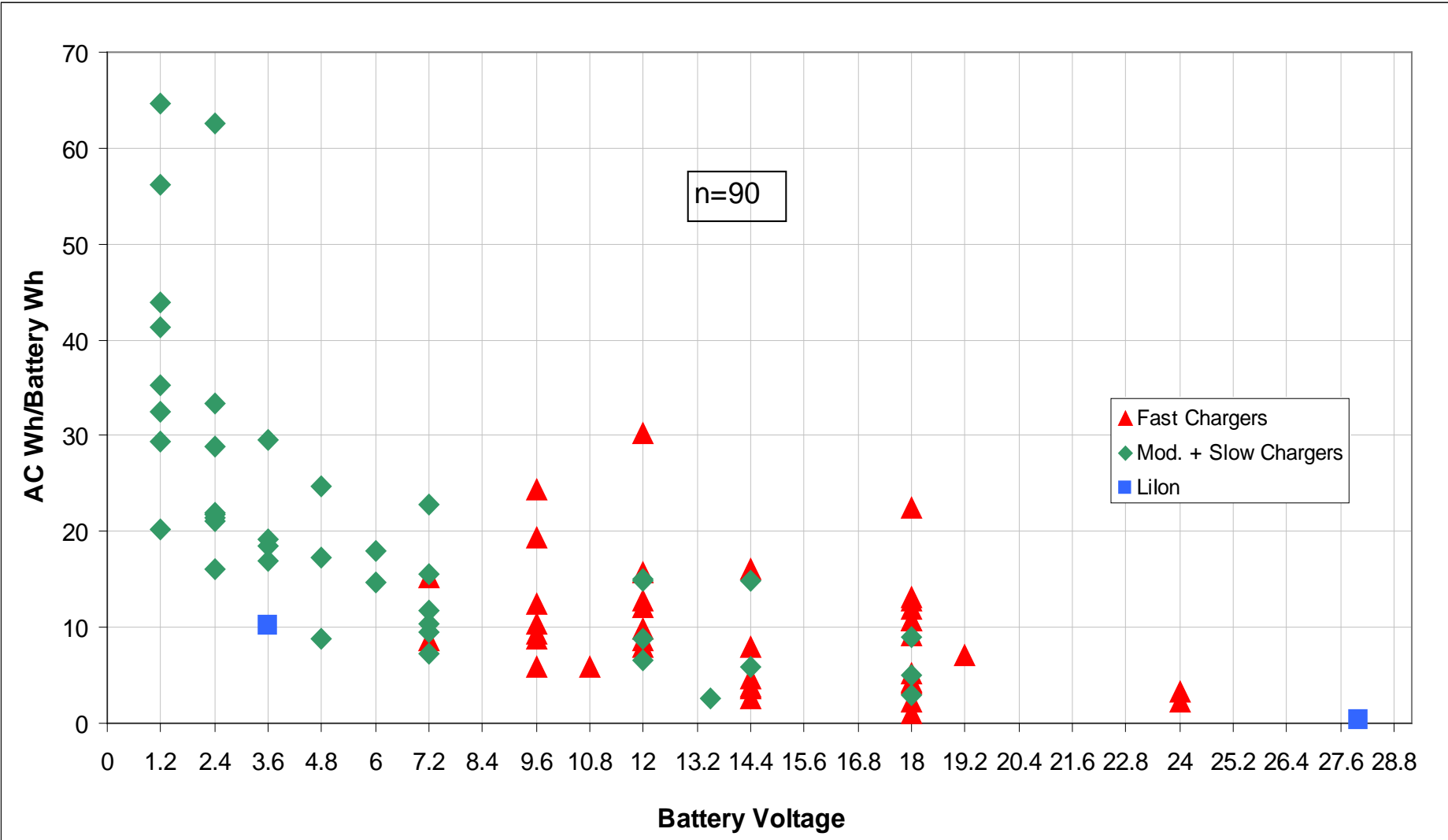


Battery Maintenance and Standby Dominant for a Fast Charger (2005)





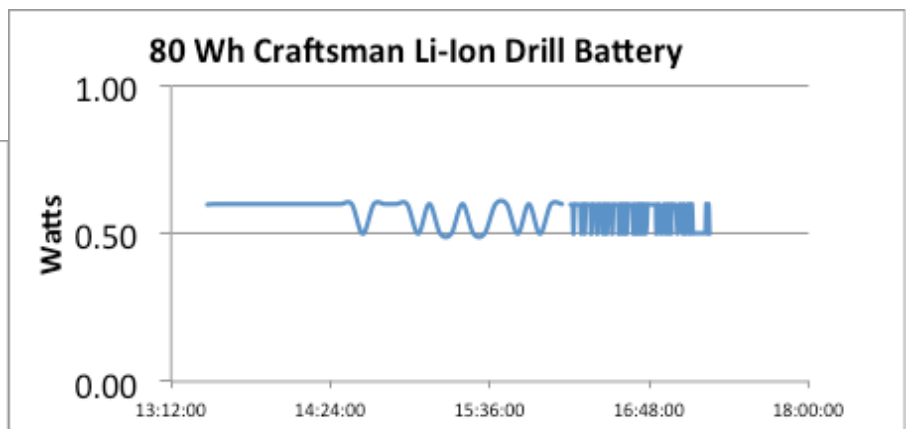
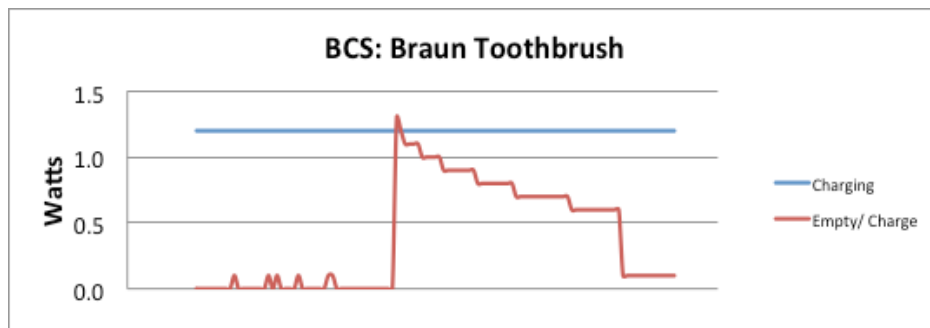
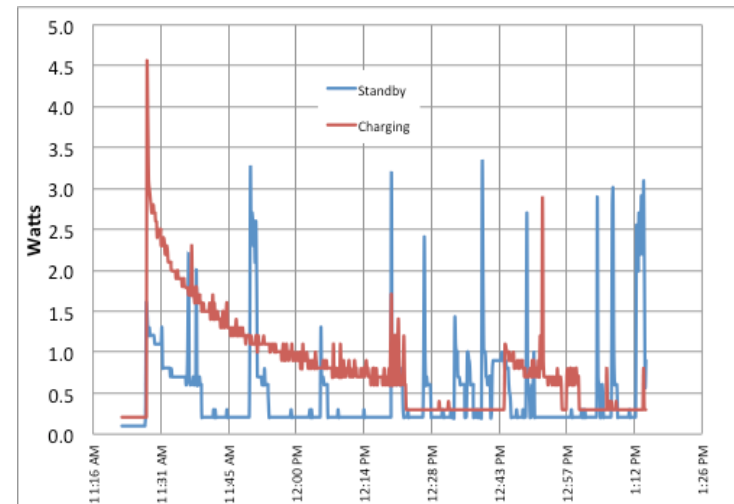
48-hour “non-active” Energy Use: 90 Products





Observations

- iPhone: 0.4W standby, 1.25W charge
- Toothbrush: 1.1W, 0.015W cradle
- 80Wh drill, 0.6W
- 1W costs \$1.35/yr





Where are We Now?

- Low standby chargers for mobile devices
- Switch mode power supplies much more prevalent
- Lithium batteries first dominated cell phones, now moving to personal care, power tools, and yard care

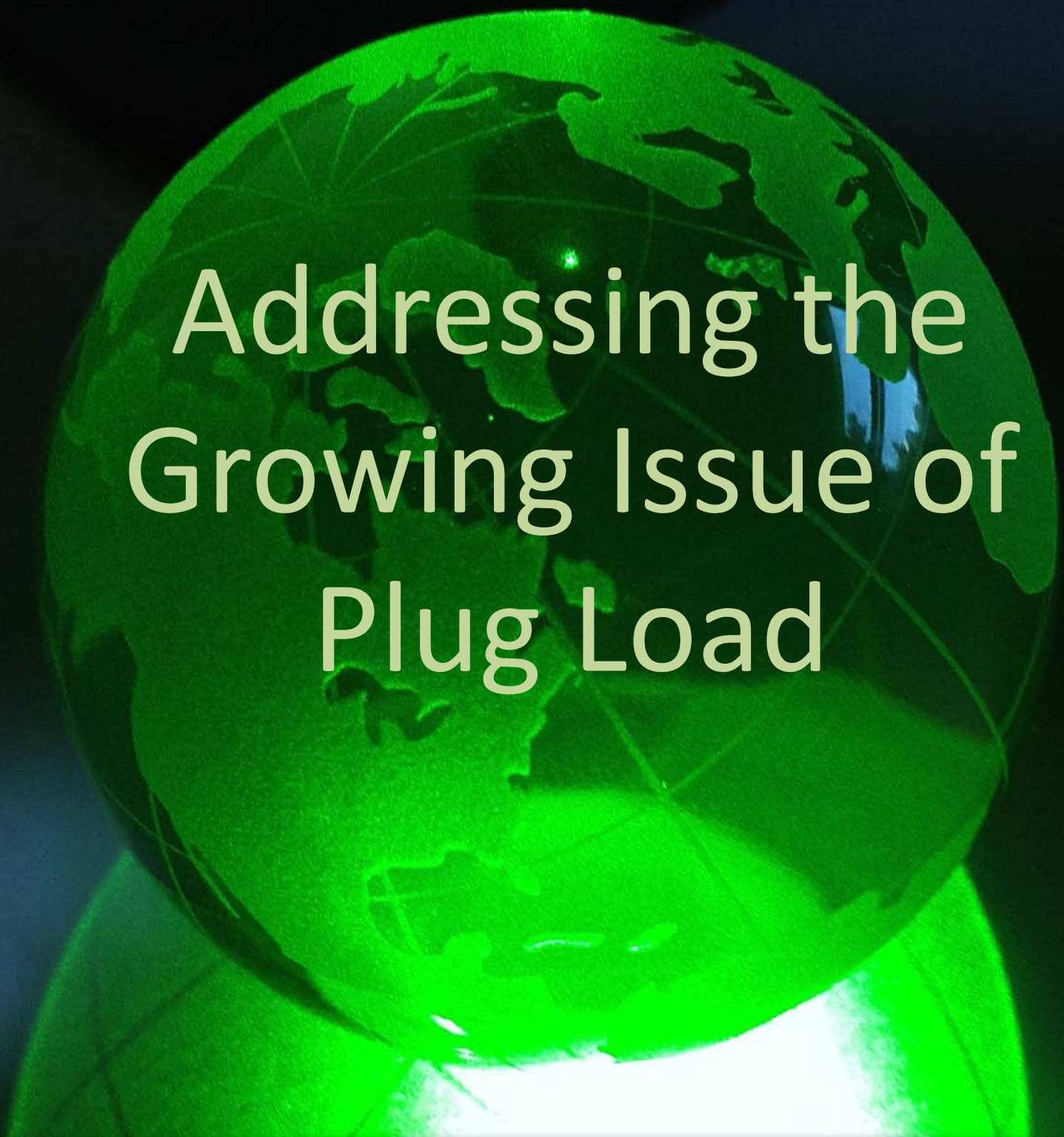




The Future?

- Solar
- Fuel cells
- Combustion
- New battery technology





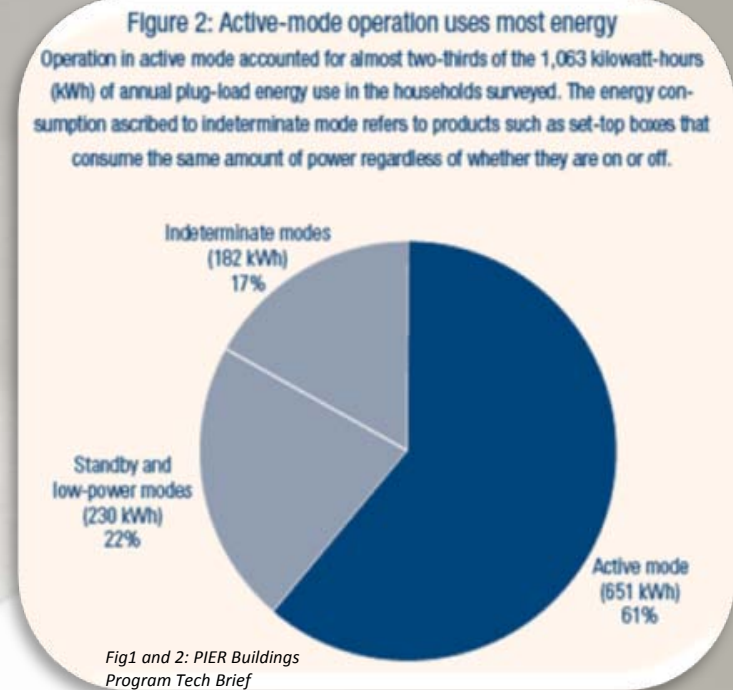
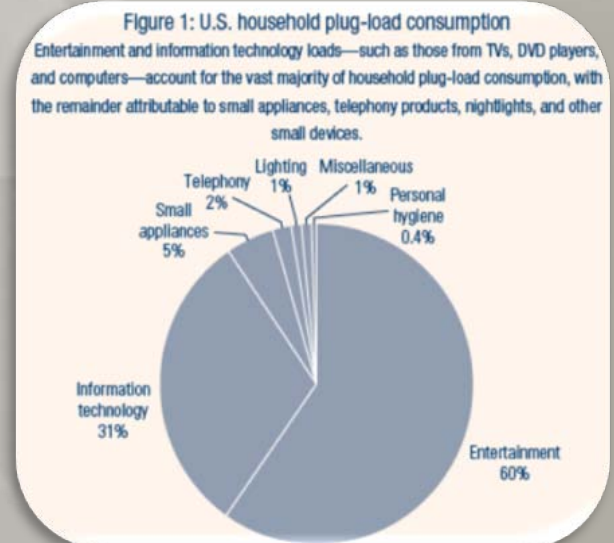
Addressing the Growing Issue of Plug Load

Carl Uthe

Increase in Plug Load Leading to New Opportunity

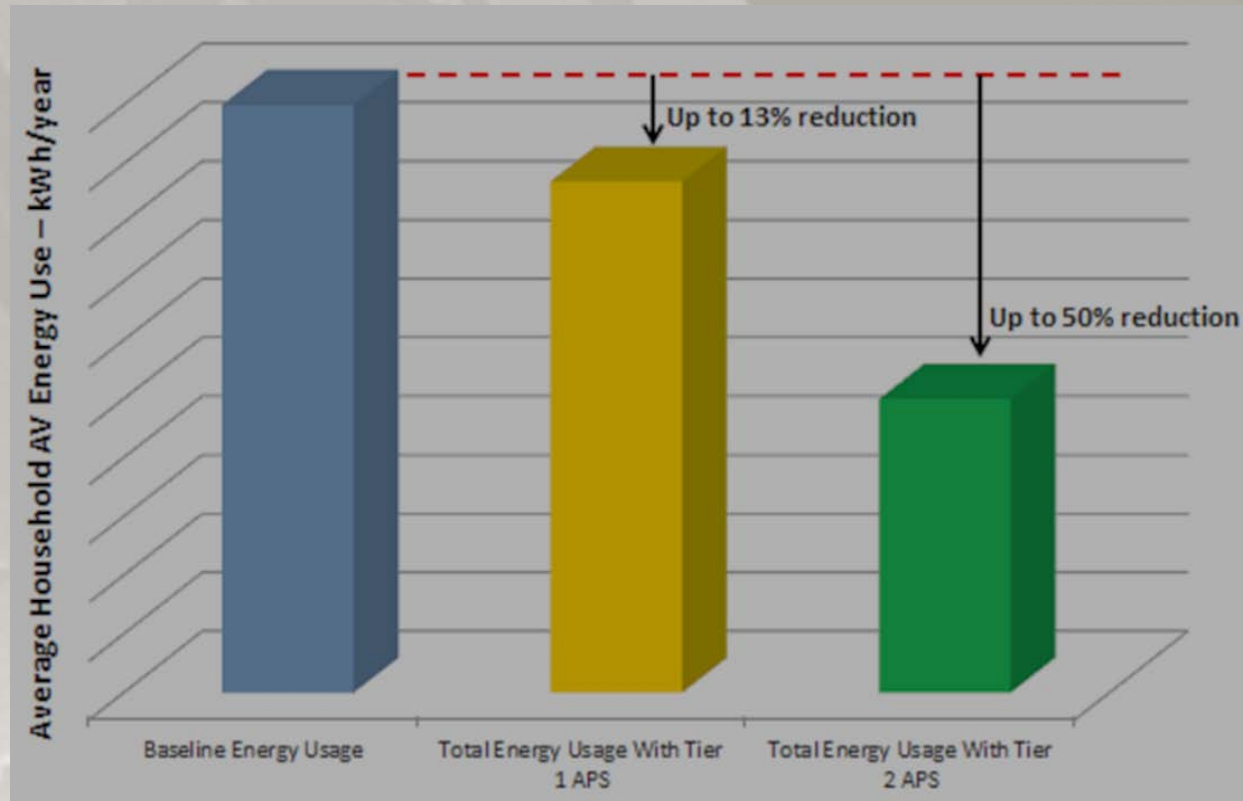
As the CFL savings values drop and becoming harder to capture, and LED in its infancy, plug load is another cost effective efficiency area to help reach demanding kWh reduction targets

- While Televisions become more efficient , they are becoming less expensive
- At the same time consumers are opting for larger TVs that consume more energy
- In addition TV manufacturers are marketing cool new technologies like Smart TV, 3D TV, thinner designs, higher tech like LED, Ultra HD, etc
- TV manufacturers are not alone, new PS4, Xbox 720, Wii, smart BluRay players, media streamers, etc
- This is creating “The Refrigerator Syndrome” where the existing units will get handed down, added to additional rooms, creating more overall plug load
- Adding more TVs to more rooms means more peripherals shuffled around as well



Properly Managing Plug Load Through Technology Residential

- Two problems exist, standby power waste and active power waste
- Standby power waste is the pesky power dribble when electronics are “off” accounting for 4-13%* consumption of the overall power profile of the TV viewing area
- Active Power Waste, when The TV and peripherals are on but nobody is watching, this accounts for up to 46-52%** consumption of overall TV viewing area



*NEEP Testing Group

**Energy Consult/EPRI studies in Santa Cruz, Australia,
Karebo Study in ZA

Ways Manage Plug Load Through Technology Residential

- **Manual power strip** to switch off the outlets as recommended by ENERGY STAR® and other green groups. Can utilities rely on consumer behavior? Not easily measured to help reach energy efficiency targets
- **Advanced power strip (Tier 1 master control)** to address standby power, in most cases easy to install (sometimes tricky to adjust) and this is good progress towards plug load, but still has many draw backs that could interfere with customers entertainment experience
- **Advanced Power Strips Tier 2 or Automatic Plug Load Management Devices**, addresses both active and passive waste; technologies such as motion sensor, timers, microprocessor devices, etc. but they have to be proven to not interfere with the customer habits, a frustrated customer is an uninstalled device
- **Devices for tomorrow**; Scalable Outlet Controls (SOCs), available today but manufacturers haven't pulled together the concept of automated savings for CE, full blown home automation, CE products with built in "smart" technology that powers down when not in use

Ways to Manage Plug Load Through Technology

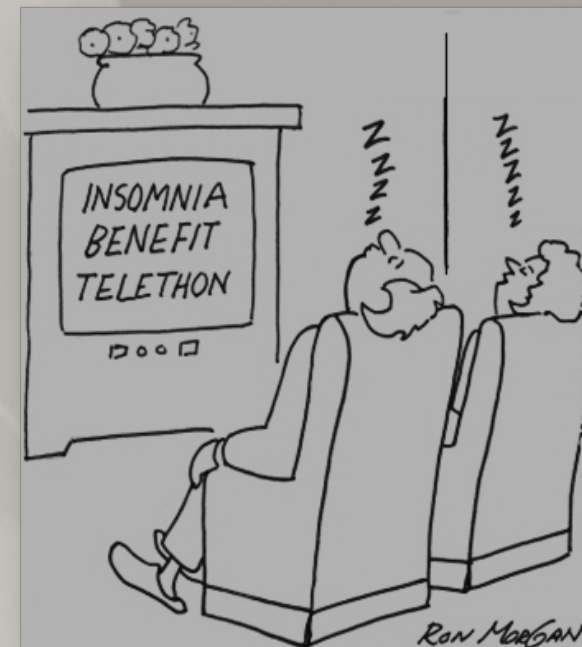
Commercial

- Like residential, there is an opportunity to address power saving beyond lighting in commercial office space
- And like residential, both active and passive energy waste in the commercial office setting is an opportunity
- Addressing only standby is not cost effective (very long paybacks, odd configuration issues, determining proper threshold)
- Trying to address the issue through broad IT management is a form of behavior change which will work with strong ongoing commitment from office workers
- Utilizing a hardware and software solution will take the behavior issue away from the individual
- Using APLMD in the office settings will allow for automated energy savings and remove the uncertainty of human behavior (issues with DR)

Suggestions

At the end of the day an ideal plug load management solution will be the combination of APS, APLMD, CE devices, home automation, smart metering. Individually these items exist today, but the silver bullet will be a cost effective “Super Plug Load Management Device”.

- Education on ACTIVE POWER WASTE
- Recycling, ongoing and great effort from utilities across the US
- Bounty programs to encourage proper recycling when a consumer upgrades to new high tech equipment, to encourage removing those “hand me down” devices
- Encourage the development of devices that manage plug load
- Understand before implantation the potential problems of low tech devices
- When reviewing new technology, look at products from the perspective of evaluation and consumer retention
- Focus on managing wasted “on” time not just stand by power





Carl Uthe

embertec
ENERGY EFFICIENCY TECHNOLOGIES



Northeast Energy Efficiency Partnerships

BCE efficiency, Innovation and Regulation Can we all get along?

David Lis

Northeast Energy Efficiency Partnerships

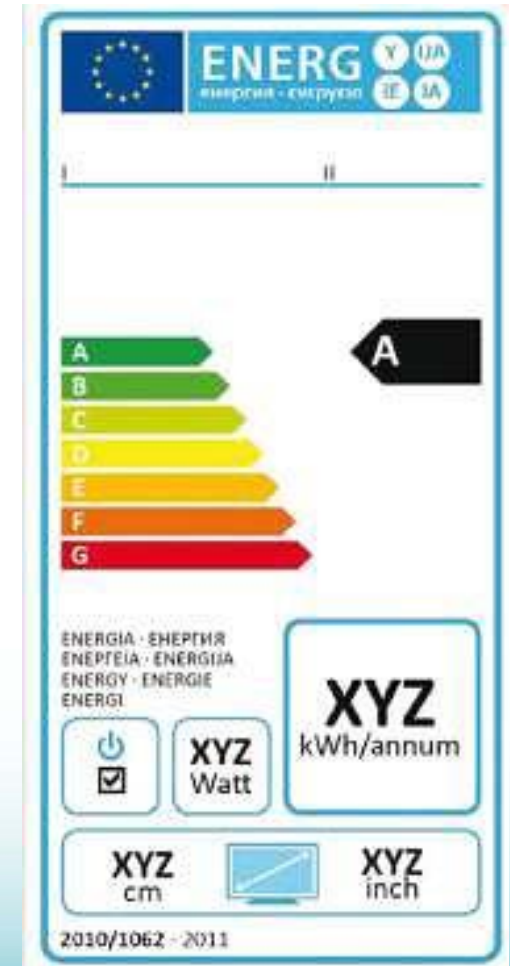
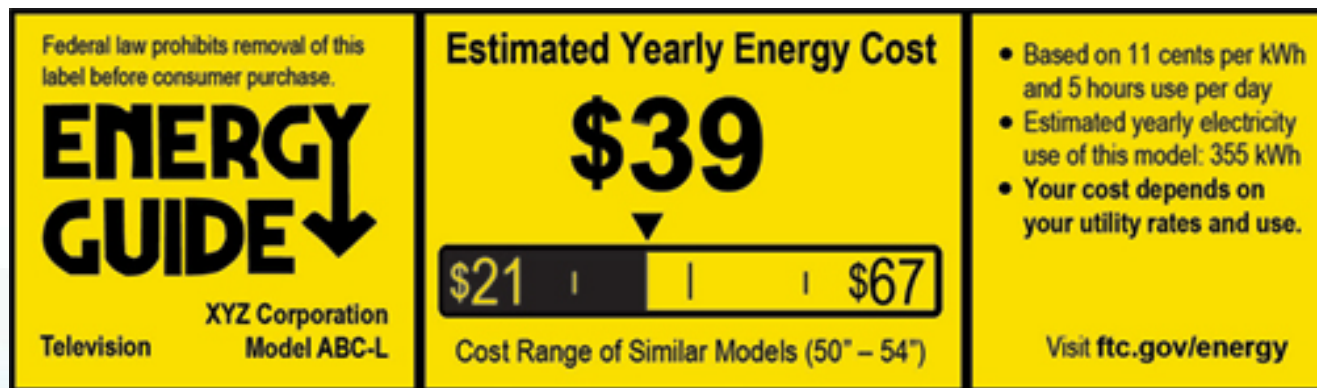
PRODUCT TESTING AND LABELING



- DOE Test Procedures



- FTC/EU Energy Guide Labels



APPLIANCE EFFICIENCY STANDARDS

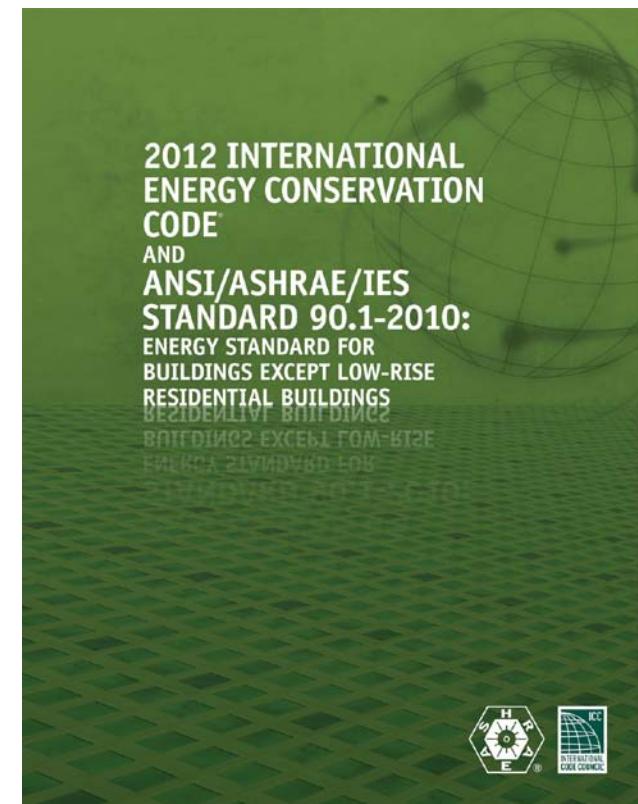
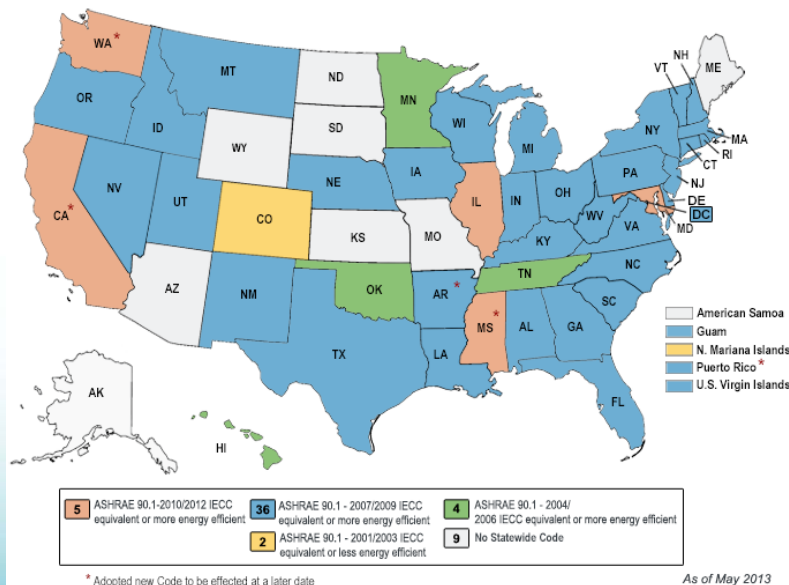


- Federal level
 - DOE develops through rulemaking or Congress adopts through legislation
 - Lengthy Rulemaking process, effective date windows
 - Fed. example; Ext. Power Supplies (EPS)
- State level
 - Some states develop through regulation, most adopt through legislation
 - Federal preemption
 - State examples; TVs, Battery Chargers
 - More flexibility to develop/implement quickly

PLUG LOADS AND BUILDING ENERGY CODES



- Residential- Plug loads not addressed in IECC 2012
 - Plug load management in 2015 IECC code?
- Commercial- ASHRAE 90.1 2010 includes provisions that portion of plug loads have auto shutoff control



GRID MODERNIZATION

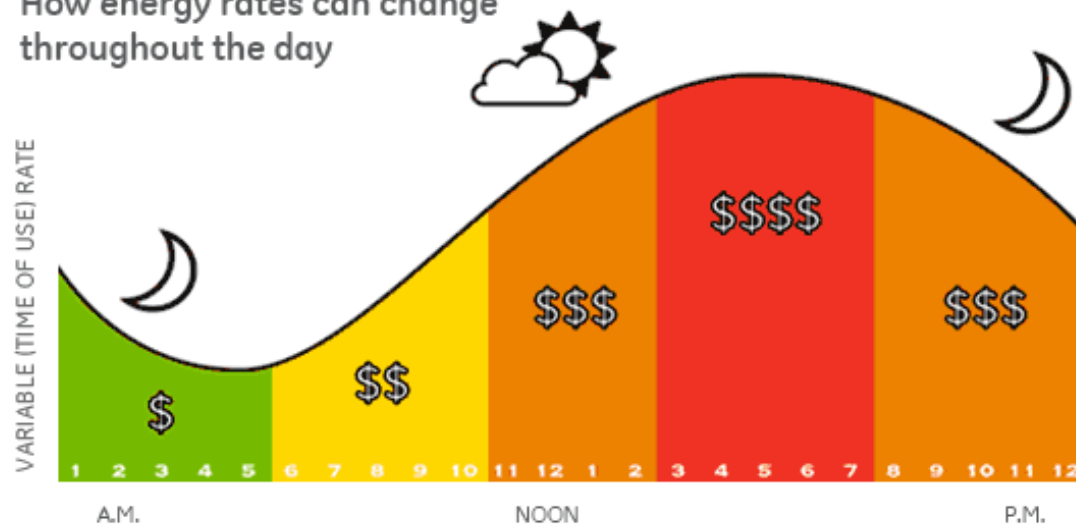


Smart meters



Connected Home/Appliances

How energy rates can change throughout the day



Time of Use Pricing

CONCLUSION

- Innovators need not fear. Efficiency regulations and product innovation can be mutually beneficial



INNOVATION IN POLICY “TOOLS”

- Labeling
 - FTC adopt more effective “categorical” labeling.
- Appliance Standards
 - Discourage Feds from covering products. Expand state authority.
- Building Energy Codes
 - Opportunities to expand plug load management in residential code
- Grid Modernization
 - Standardizing non-proprietary, common “language” will enable more players to participate, driving innovation.

MODERATED QUESTIONS

- Davis Lis, NEEP



AUDIENCE QUESTIONS



WRAP UP



- Identification of Next Steps and Opportunities
 - Logistics for NEEP Summit
 - Final Questions?
- Please complete your evaluations

Thank you!

ADJOURN

Thank you!



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