California Plug Load Research Center Workshop

(i) Set-Top Box Progression

(ii) Future of Plug Load Energy Efficiency Management in a ZNE World

November 5, 2013

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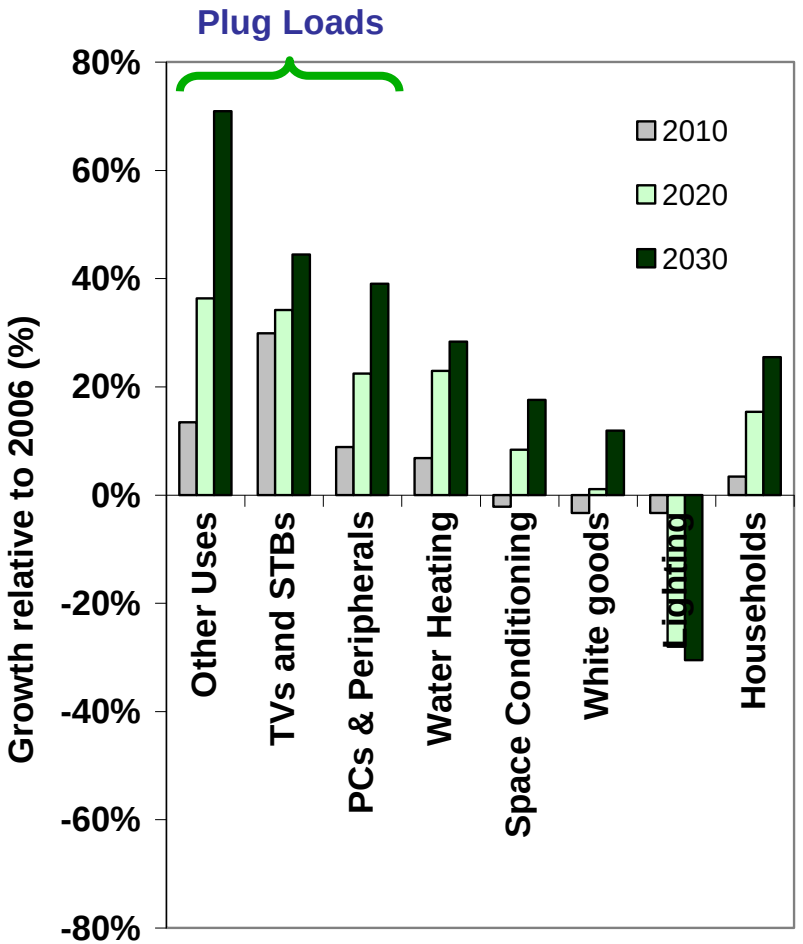
California Plug Load Research Center

California Institute for Telecommunications and Information Technology

CalPlug Purpose

- **Help California and U.S. improve energy efficiency in appliances and electronic devices**
- **In the residential and commercial sectors**
- **Through research, demonstration, education**
- **About engineering, incentives, codes and standards, and user behavior**



Set-Top Box Workshop

- **Goal:**

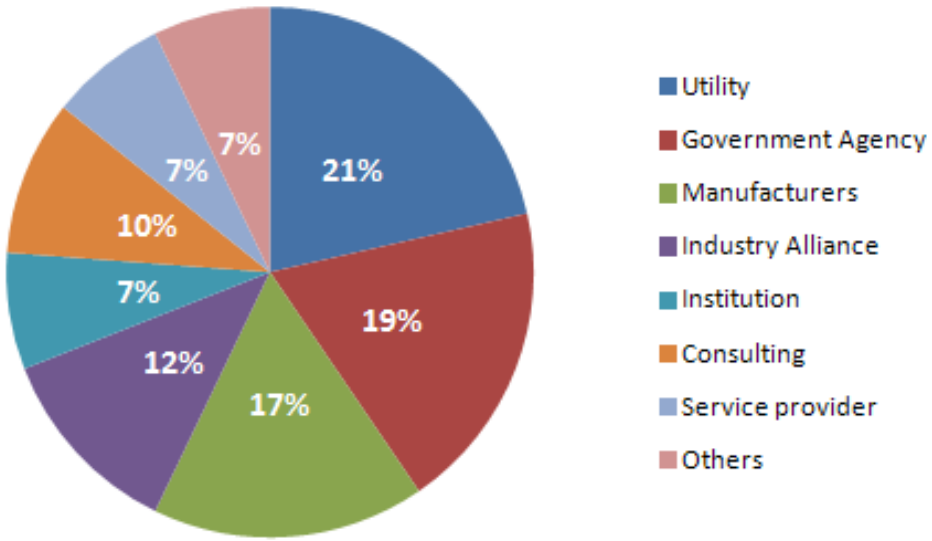
  To accelerate energy efficiency in STBs (box and network) by all means including innovation in STB hardware and software, codes and standards, and incentives and rebates

- **Anticipated outcome:**

  To create an energy efficiency working group for strong collaborations among players including research centers, manufacturers, service/content providers, utilities and government agencies

STB Workshop Series

- **Established a collaborative forum for all STB stake-holders to make concerted efforts.**
- **Identified top-priority research areas for STB energy efficiency and alternative business model.**
- **Received wide support from participants and STB project champions taking actions.**



Workshop participants

CalPlug STB Research Focuses

1. **Standard terminologies for STB power modes**

2. **STB power testing and analysis**

3. **Sleep function with fast recovery**

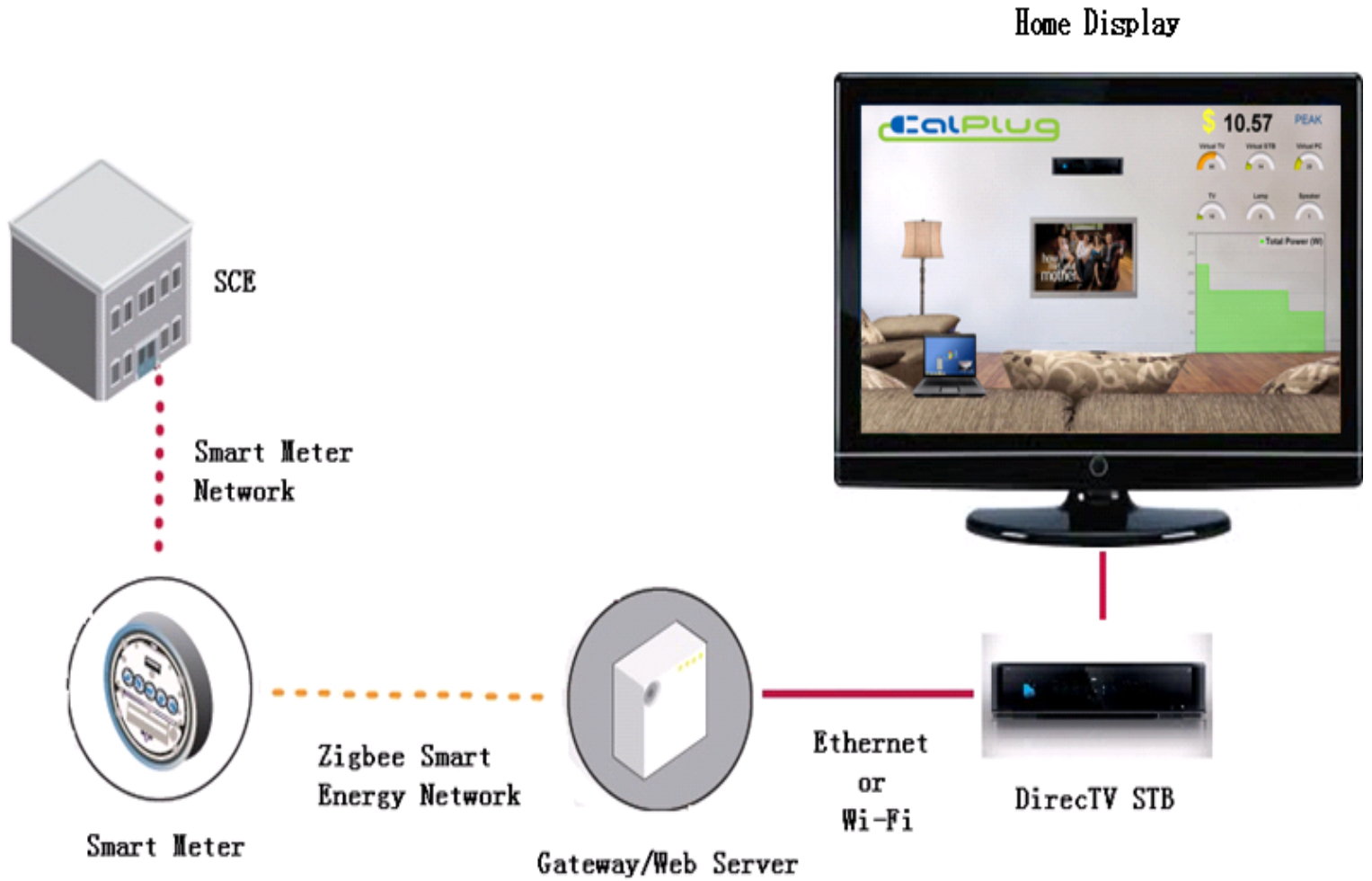
4. **Incentive programs and consumer education**

5. **Beyond STBs: additional functions**

CalPlug STB Project Champions

- Michael Cook (Comcast), (Beyond STB)
- Stephen Dulac (DirecTV), (Energy Efficiency STB)
- Olya Singer (PG&E) , (Incentive program)
- Joseph Kuriacose (DirecTV), (Beyond STB)
- Gary Langille (EchoStar), (Energy Efficiency STB)
- Derek Okada (SCE), (Incentive program)
- Neha Arora (SCE), (Design and Engineering Services)
- Paul Delaney (SCE), (Energy report via STB)
- Kevin Strong (FutureDash), (Beyond STB)
- Jay Yang (ARRIS), (Power mode terminology and testin

CalPlug STB Project Champions



Acknowledgements

- **STB Champions**
- **CEC – support for STB research at CalPlug**
- **CalPlug member companies and sponsors**
- **Speakers and panel members**
- **CalPlug staff and students**

CalPlug Workshop

- **Morning** is to update trend of EE in STB, and to report STB research progresses in CalPlug.
- **Afternoon** is to discuss opportunities and challenges in plug loads for ZNE smart home and building, and to highlight some current practice of networked plug loads for EE.
- **Afternoon networking reception** including lab demos by students.

We welcome opportunities for collaboration.

Thank you!