

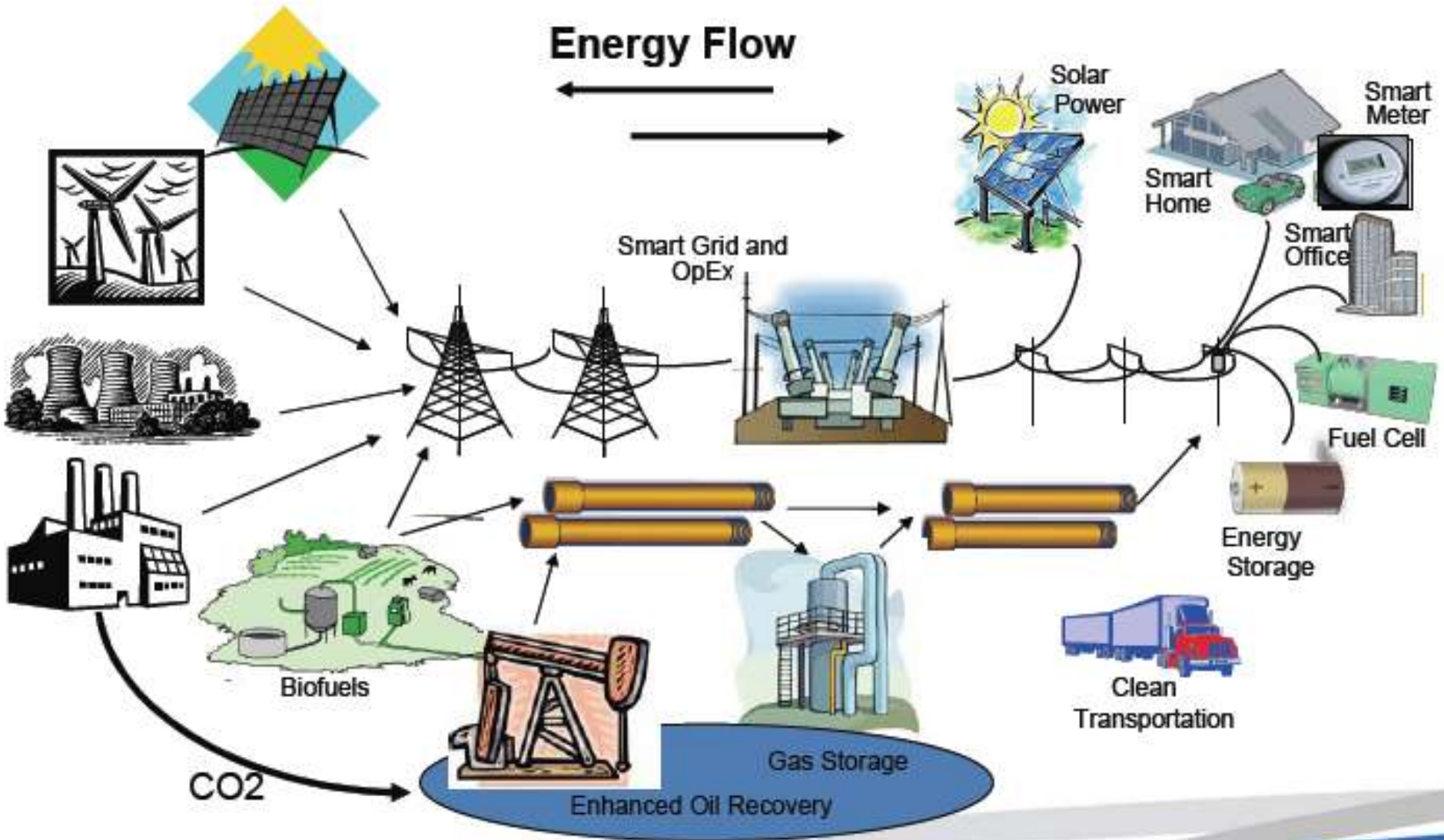
Knowledge2010 Executive Summit



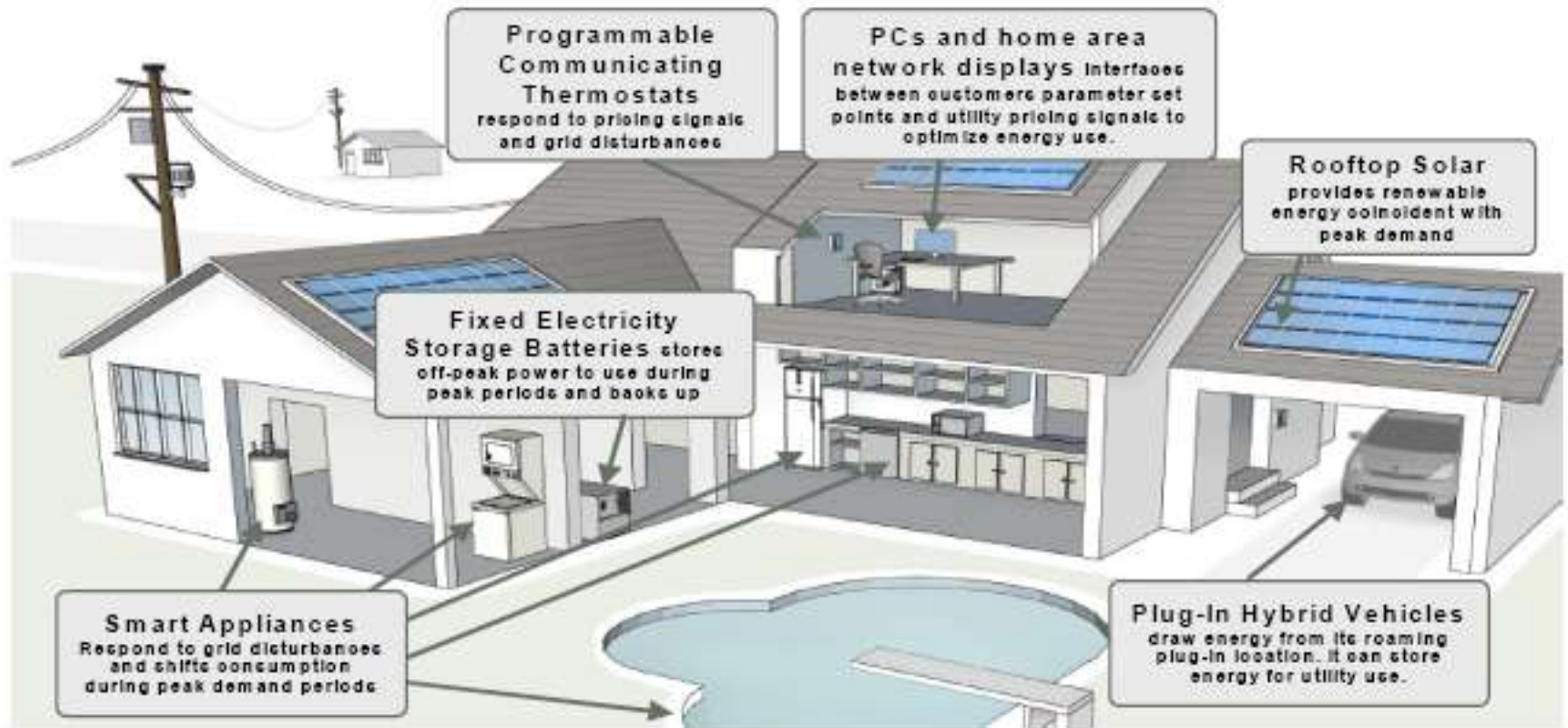
THE SMART GRID IMPACT: HOME AREA NETWORKS AND INTELLIGENT BUILDINGS

Ronald J. Zimmer, CAE
President & CEO
Continental Automated Buildings
Association (CABA)

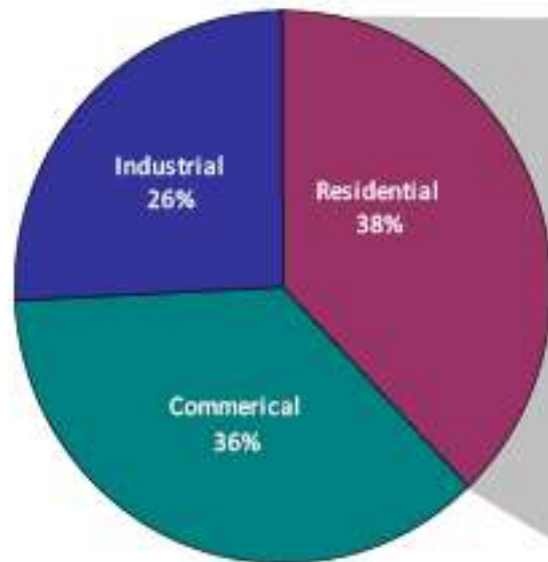
The Utility World Tomorrow



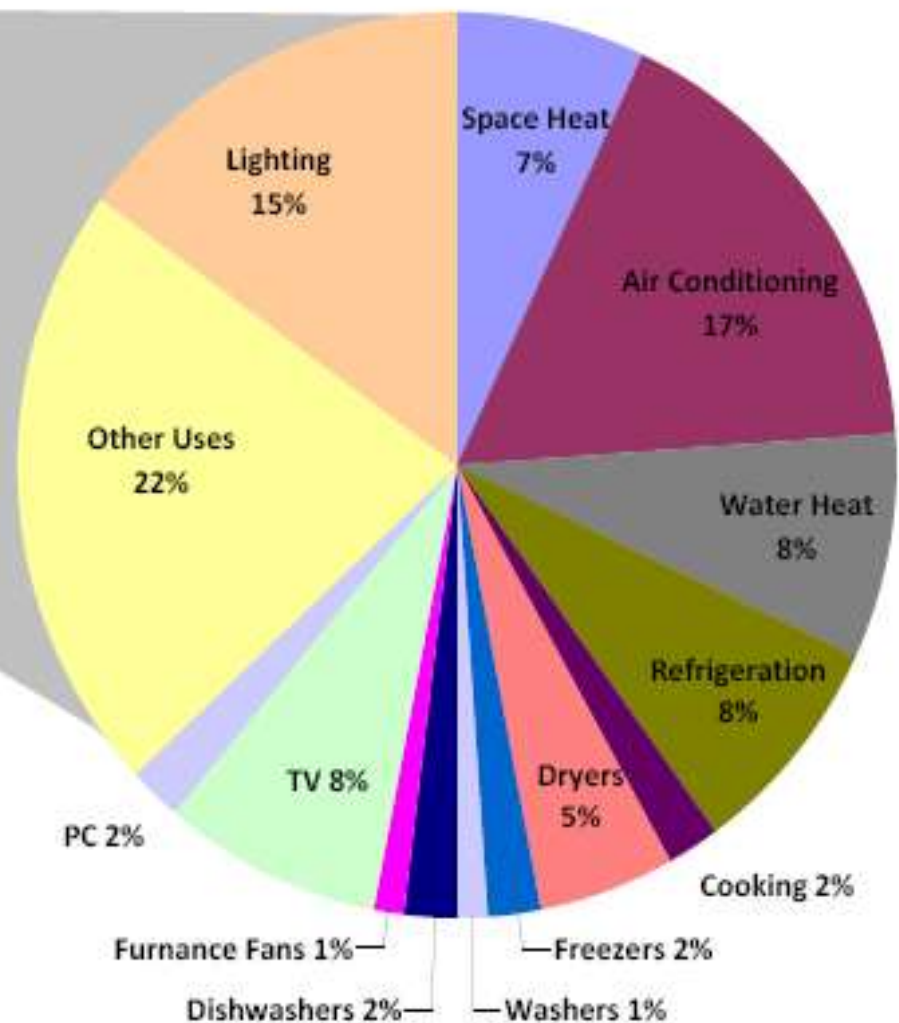
The Smart Home



WHY ARE APPLIANCES RELEVANT?



- Appliances, space conditioning & water heating account for 53% of total residential energy use or 20.1% of total electricity consumption in the U.S.
- Whirlpool's Suite of Information-connected appliances includes process-oriented appliances as well as HVAC and water heater.



Source: ERPI Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the US (2010-2030)

2008 TOTAL US RESIDENTIAL ELECTRICITY CONSUMPTION: 1,403 TWh

Growing Demand for Smart Energy

- \$3.4 billion in US stimulus funds awarded for the Smart Grid.
- \$1 billion awarded to support Demand/Response.

SITUATION OVERVIEW






THE PROBLEM

- We have to reduce energy use while meeting or exceeding consumer expectations.
- We have to use the energy we do produce more efficiently / effectively.
- Smart appliances are NOT waiting for technology; they are waiting for aligned economic drivers so that manufacturers incorporate connectivity into their products

SOLUTIONS

- Lowering residential energy use
 - Energy efficient appliances
 - Coordinating Communities of "Information-Connected" appliances
 - Shift energy to off-peak times
 - Manage loads to lower energy consumption when the grid is under stress
- Establish widespread connectivity
 - Increase incentives for consumers to purchase connected appliances
 - Establish connectivity incentives between utilities and manufacturers
 - Cause governments to incent connectivity for benefit of all

ENVIRONMENTAL IMPACT – REDUCTION IN CO₂ EMISSIONS

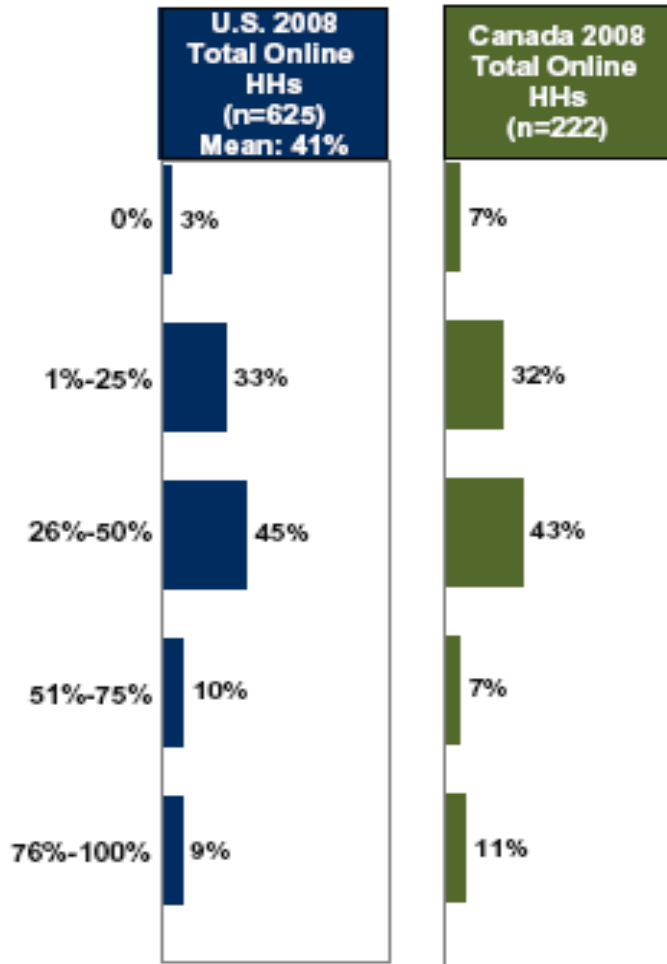
Appliance Category	Percent of Peak Demand Move to Off Peak Hrs	Annual Reduction in CO ₂ Emitted ¹	Equivalent # of Car Years of Emission ²
 DISHWASHER	80%	49.5 Mil Lb	4,200
 REFRIGERATOR	95%	6.8 Mil Lb	560
 ELECTRIC DRYER	80%	52.1 Mil Lb	4,300

¹ Reduction in emissions from off-peak consumption: 209lb CO₂ / MWhr – eGrid 2007 Summary, Dec 2008

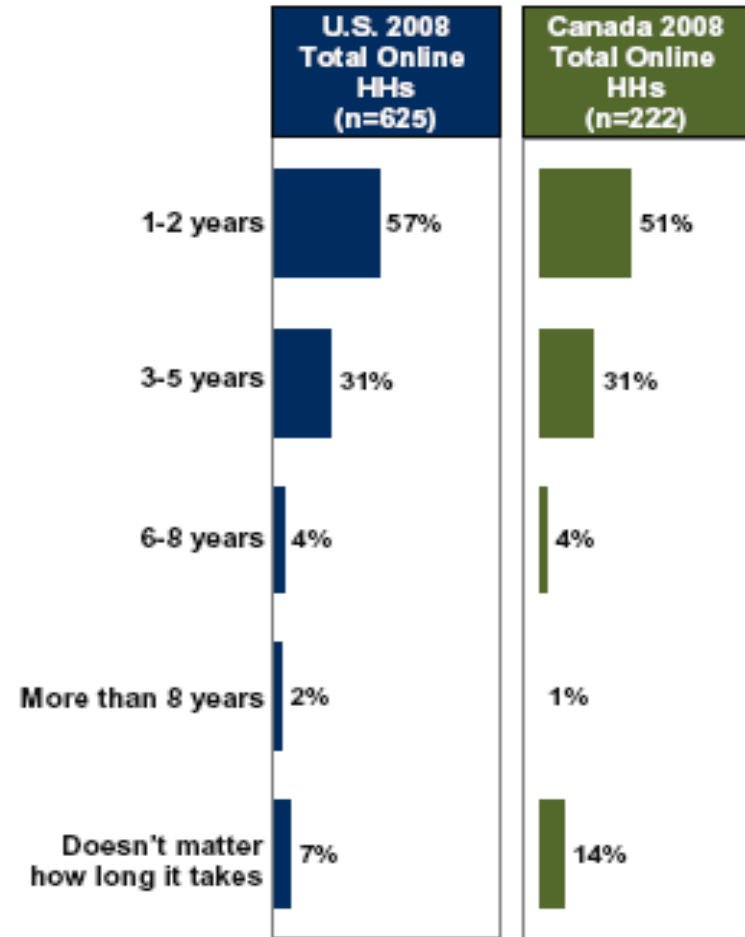
² Annual emissions of a personal car: 5.46 metric tons CO₂ / vehicle / yr. US EPA; Feb 2009

HOME ENERGY MANAGEMENT ADOPTION SURVEY

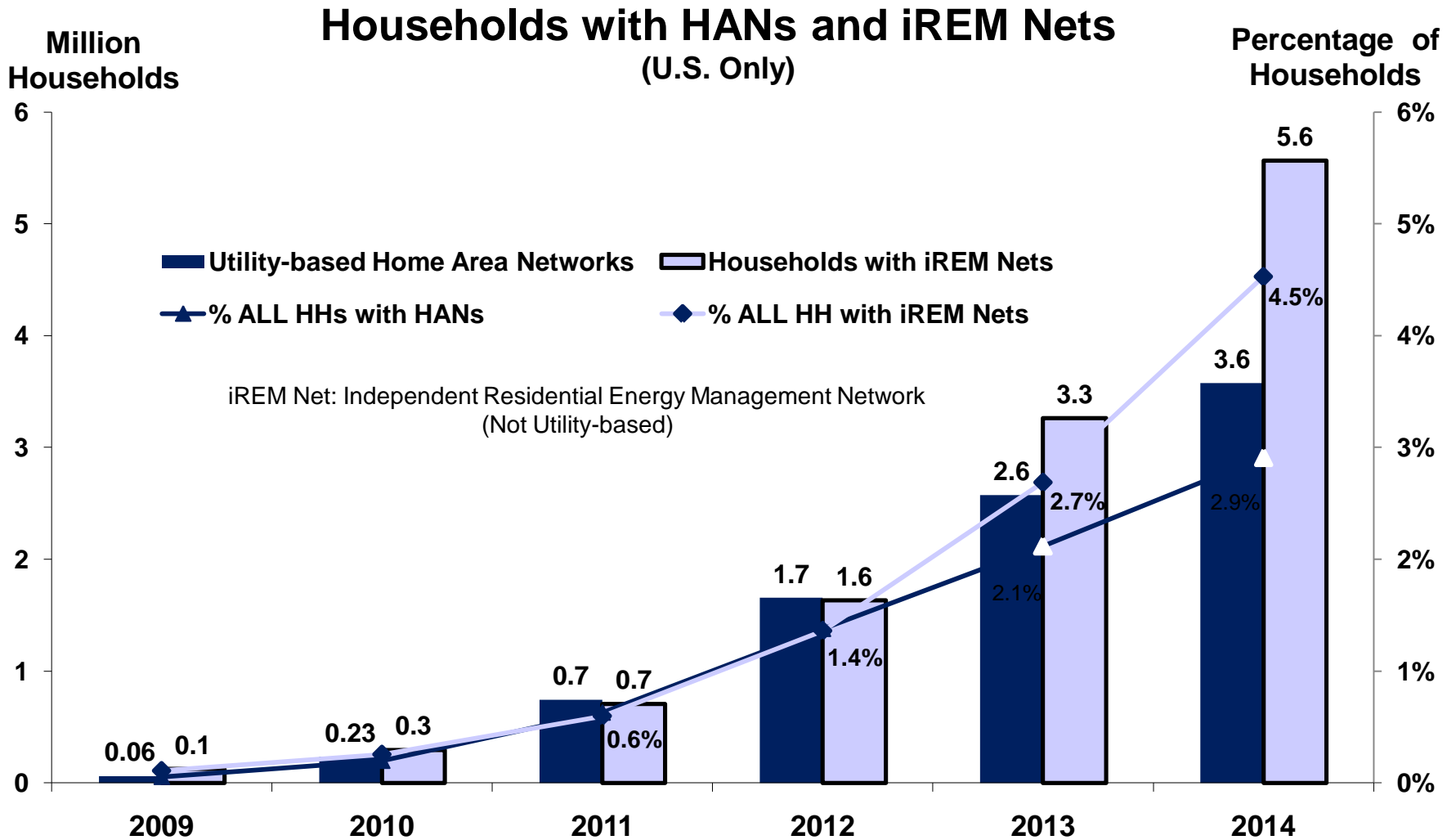
**% Savings on Annual Home Energy Bill
Required to Consider Buying a
Home Energy Management System**



**Home Energy Management System
Expected Payback Period**



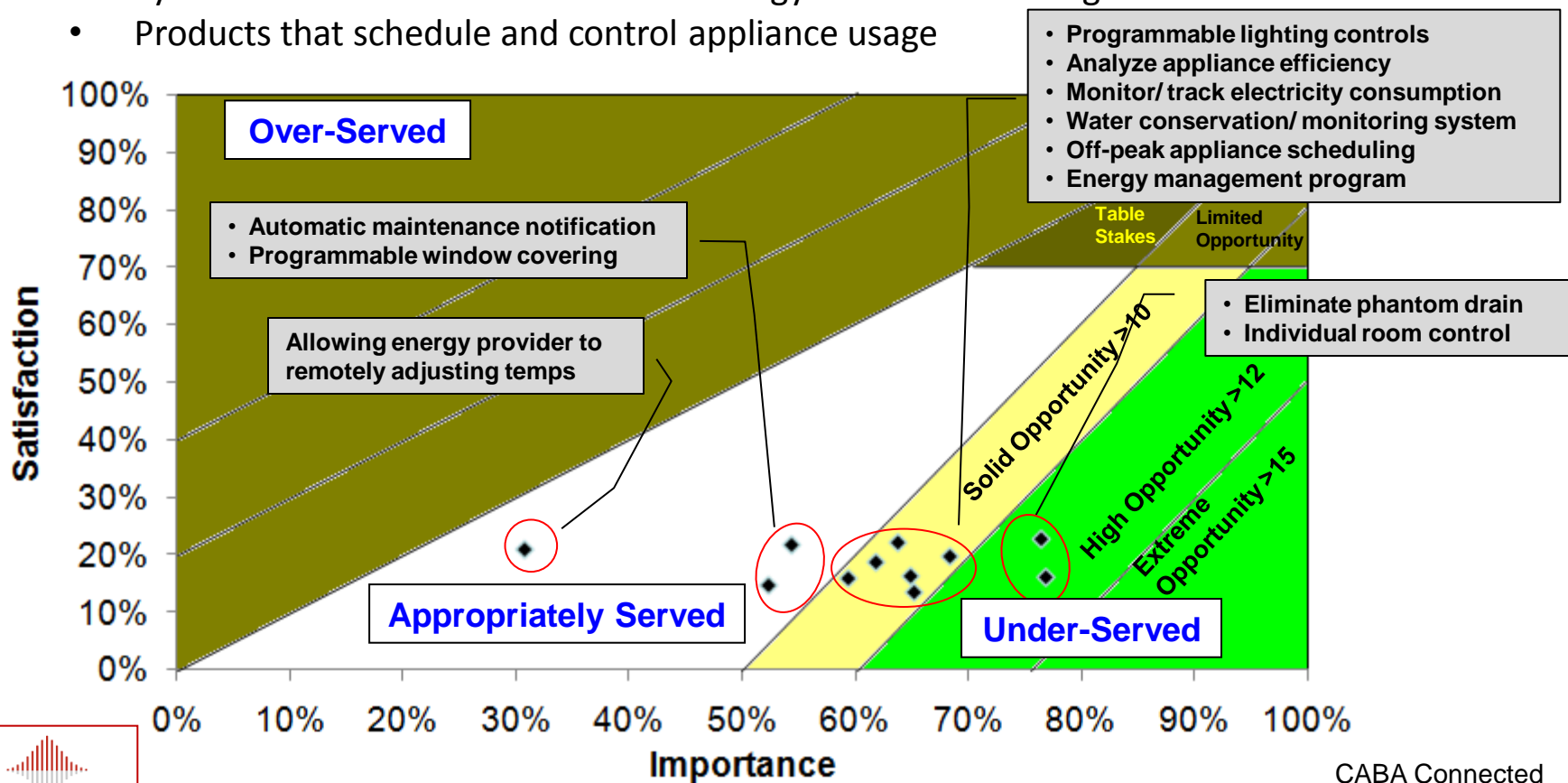
U.S. Households with HANS and iREM Nets



US: Energy & Green Living Opportunity Landscape

There is a substantial market opportunity for energy reduction products/services:

- Systems that track where and when energy and water is being consumed
- Products that schedule and control appliance usage



Percent top 2 box Satisfaction and Importance scores

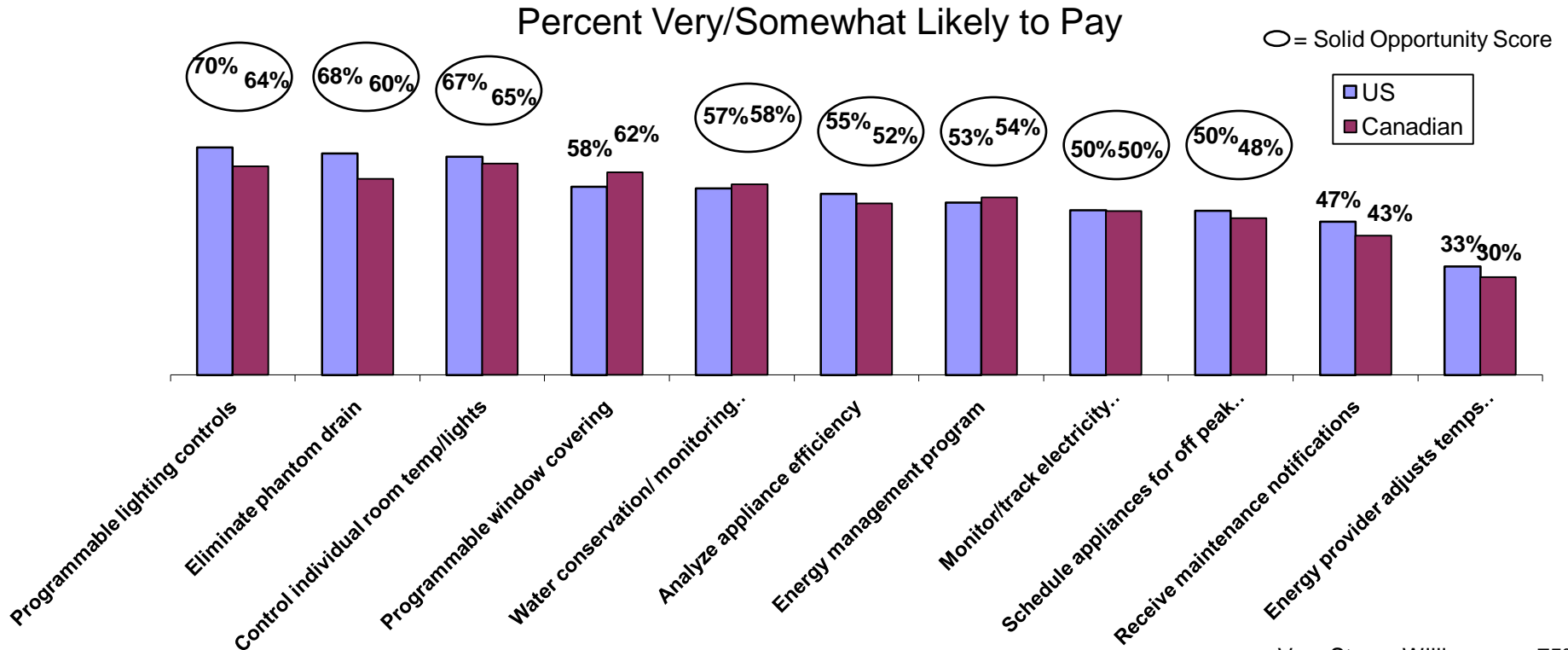
CABA Connected Home Roadmap 2010

JLA Strategic Research

Willingness To Pay



- For several high opportunity areas, many of those dissatisfied with their current situation are willing to pay for improved capabilities
 - Programmable lighting controls
 - Eliminating phantom energy drain
 - Individual room temperature and lighting control

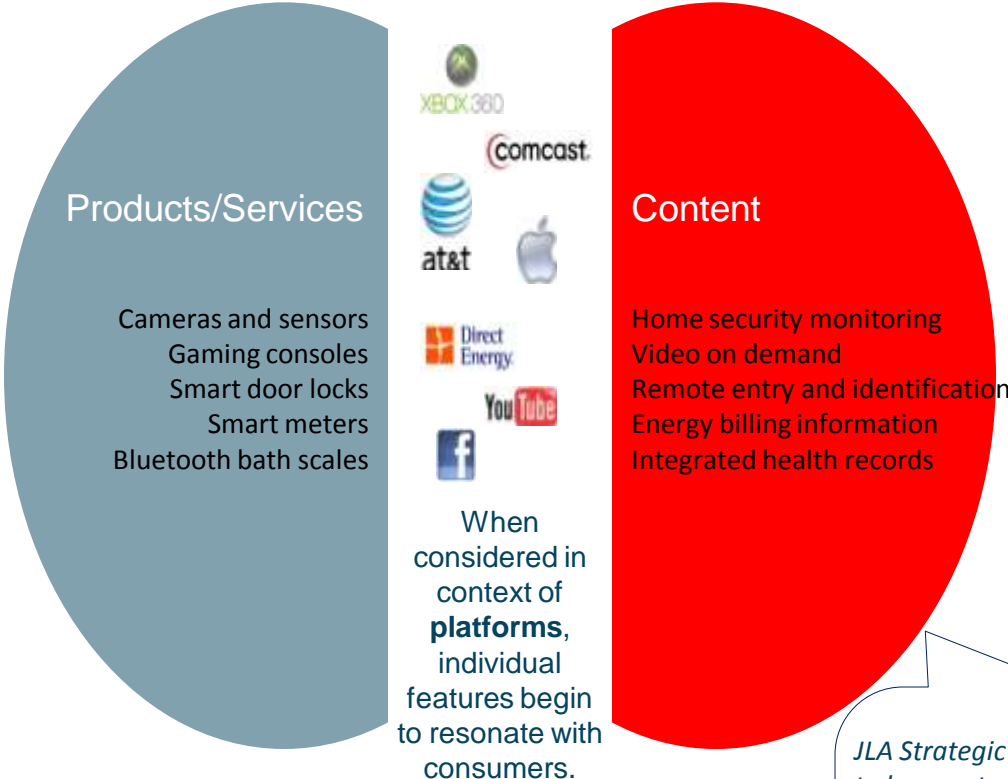


You appear to be most dissatisfied with your ability to perform the following activities. How willing would you be to pay for a better solution to each?
Base are those very/somewhat dissatisfied with their current ability to perform each capability

Very Strong Willingness >75%
Strong Willingness >65%
Mild Willingness >50%
Weak Willingness <50%

Ecosystem Development

The ecosystem for connected home solutions has evolved beyond feature development, and requires new thinking around how to bundle products, services and content .



JLA Strategic Research "...Opportunities tend to be greater among those younger...demand for remote, one touch control of home security capabilities increase as age decreases..."

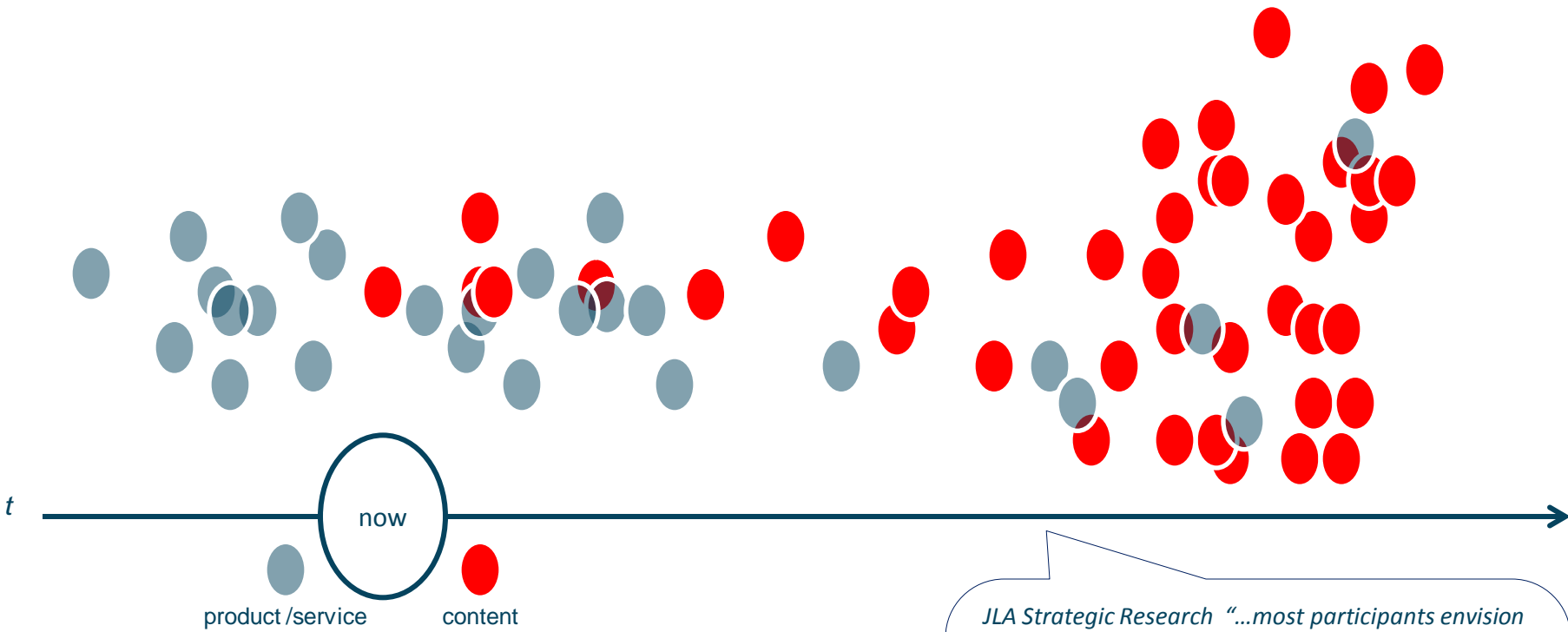
- monitoring/tracking electricity consumption
- One touch alarm control
- Remote notification of power loss and basement flooding
- Connection of lighting to security systems



CABA Connected Home Roadmap 2010

Opportunity: Turning Applications into Solutions

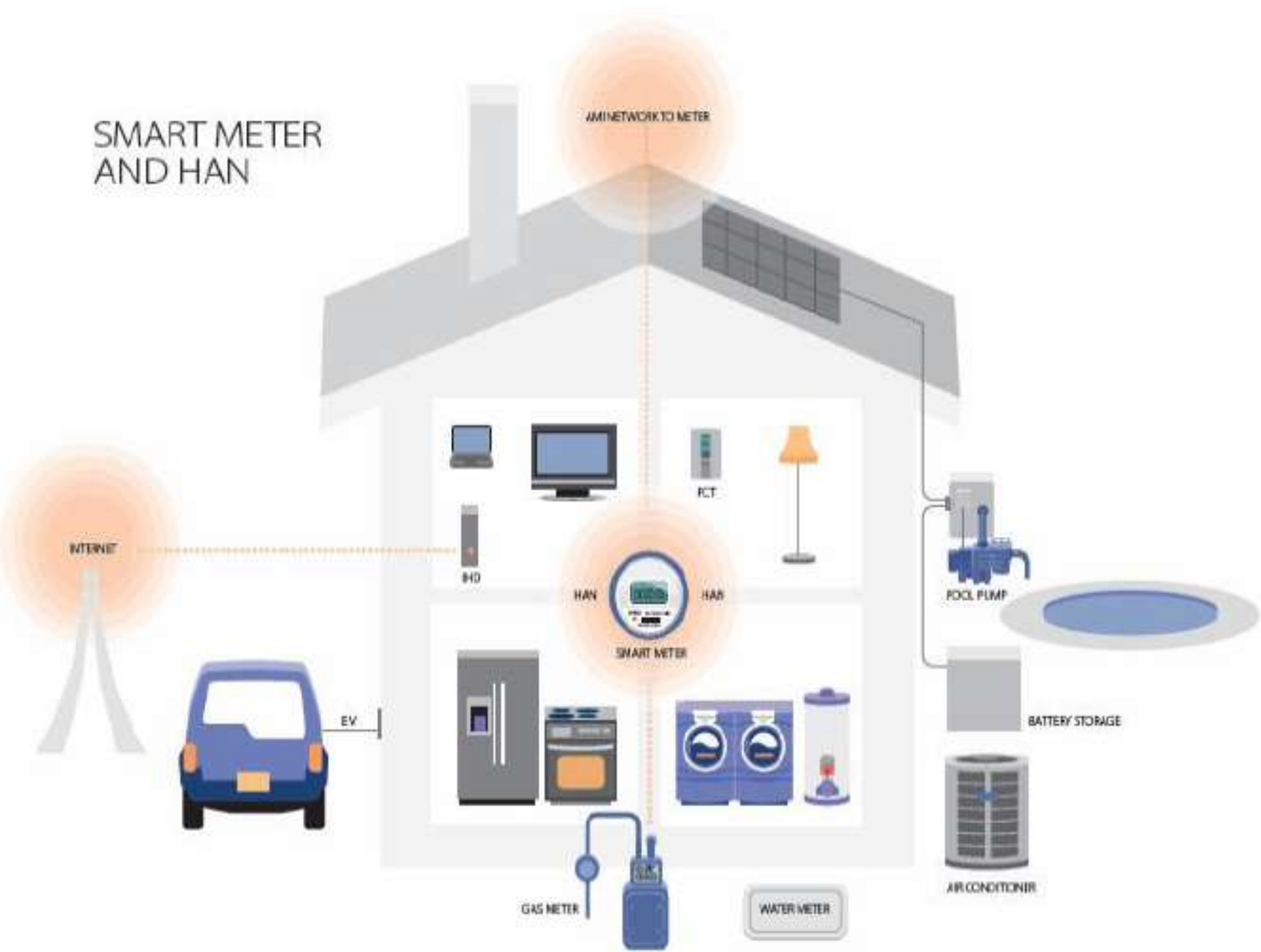
Addressing the consumer's pain in sorting through the upcoming proliferation of content, capabilities and features.



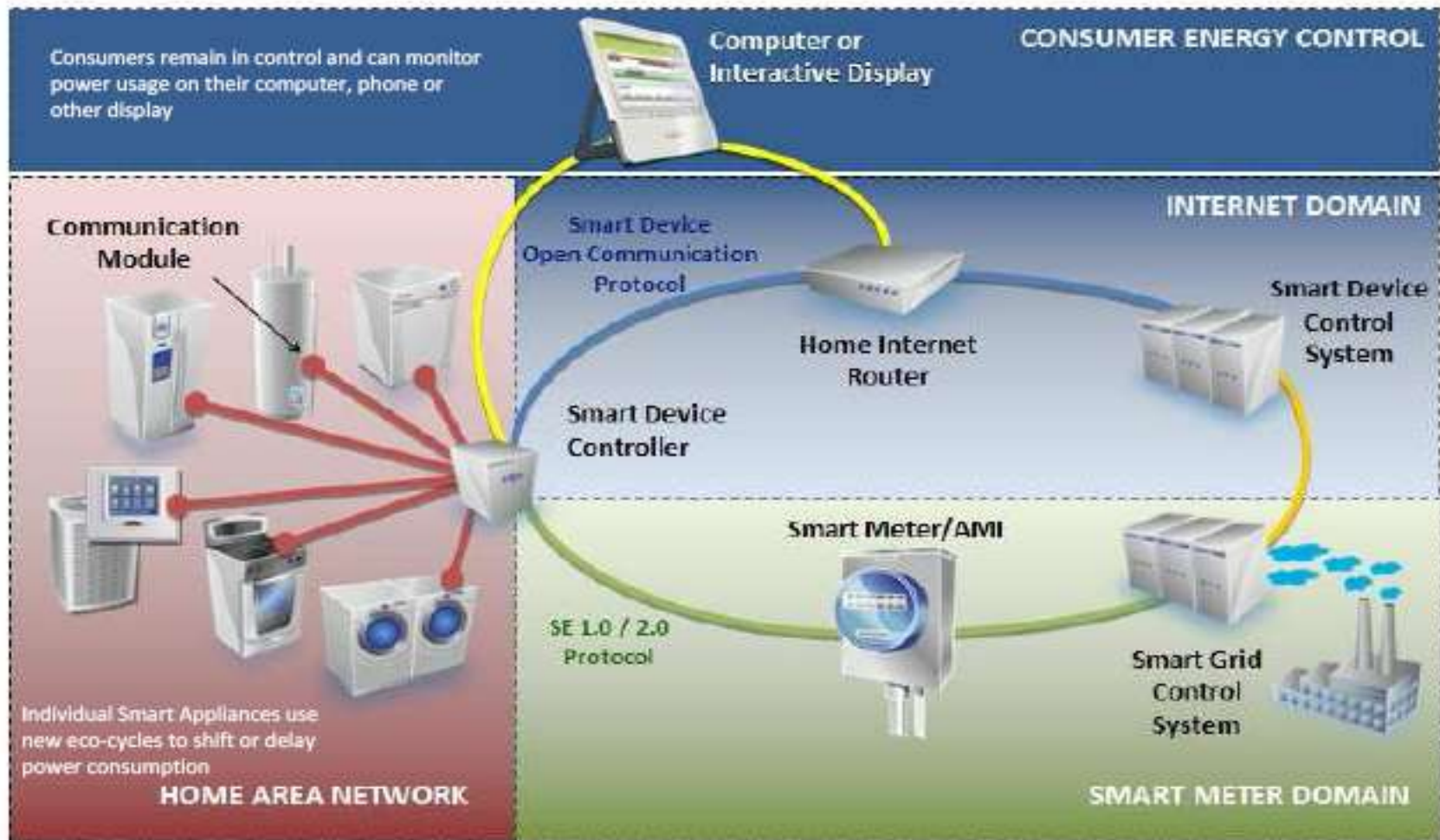
JLA Strategic Research "...most participants envision a central 'engine' or 'CPU' in their home providing capability to meet all of their 'home connection' needs..."

- They see their entertainment/computer systems as well as their heating/cooling, lights/water and major appliances connected to this central unit.*
- Furthermore, they want the ability to start with a rather basic system and add on either additional capabilities or new appliance/electronic components.*

SMART METER AND HAN



WHIRLPOOL SMART DEVICE NETWORK ARCHITECTURE



Smart Devices are linked to each other in an intelligent HAN that manages power usage and information

Two paths to the home: the Internet and/or the Advanced Metering Infrastructure

Smarter Metering & Smarter Grids

Benefits for Consumers

- Information portal
- Taking ownership of usage trends
- Pro-active advice from suppliers
- Optimise tariffs
- Self-service
- Budget visibility
- New home services
- Ease of supplier switching
- Carbon footprint tracking

Benefits for Network Managers

- Theft detection
- Technical losses identification & reduction
- Distributed/micro- generation integration
- Advanced mobile workforce
- Advanced outage management
- Asset maintenance & optimisation
- Quality of Service reporting
- Network planning

Benefits for Suppliers

- No more 'Estimates'
- Improved customer relations and lower cost to serve
- Innovative tariffs – DR/DP – custom pricing
- Improved customer enrolment
- New services
- Improved energy sourcing operations (including Settlements)
- Enhanced Self- Service
- New generation prepayment



The Home and Beyond from a Telecom perspective

Courtesy: ZigBee Alliance

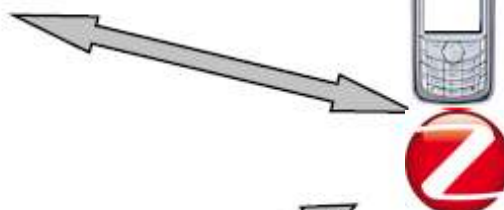
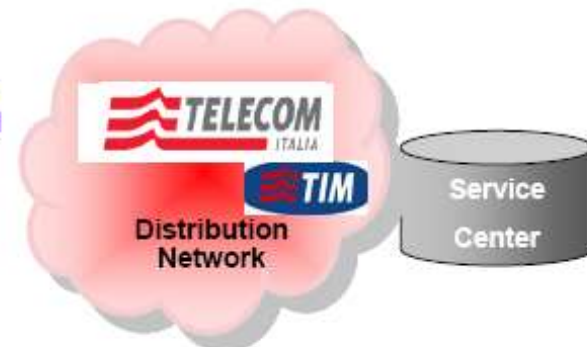
Handset is the hub of the interaction between user and objects



Home Automation & Control

- Lights, HVAC, Domestic appliances
- Entertainment (e.g. DTT)
- Healthcare, Tele-assistance
- Monitoring & Security (e.g. temperature, gas)

Mobile Terminal



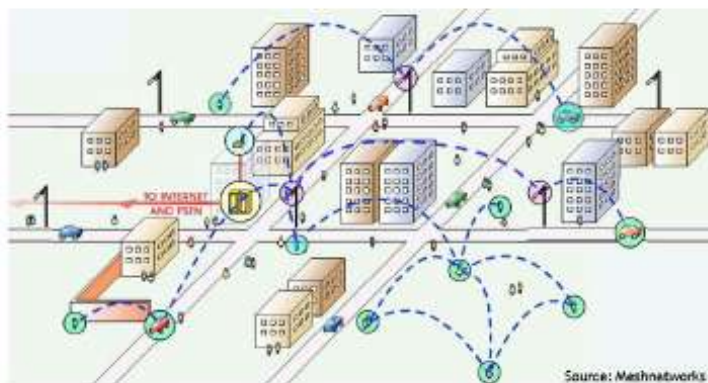
M-Commerce Services

- m-payments (bar, shops, supermarkets)
- m-ticketing (cinema, train, bus)



Digital Smart City

- Access Control
- Parking payment system
- Infomobility services (e.g. traffic control)
- Environmental Monitoring
- Localization



Source: Meshnetworks

TXU Energy iThermostat Website



TXU Energy iThermostat™

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Learn how to install your iThermostat and gateway device.

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Take the
Virtual Tour



See a demonstration of the powerful capabilities of the TXU Energy iThermostat.

iThermostat Log In

Already participating in the Energy Conservation Program at TXU Energy?

Login below to access your energy management console:

Email Address:

Password:

[Log In](#)



CABA's Energy as a Managed Service Study

Member Participants

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2. Bell Canada
3. Best Buy
4. Direct Energy
5. Freescale Semiconductor
6. Honeywell International
7. Ingersoll Rand/Trane/Schlage
8. Intel Corporation
9. Landis+Gyr
10. Microsoft Corporation
11. TELUS
12. Tyco Electronics
13. Whirlpool Corporation

Research Supplier: POCO Labs

Project Manager: Direct Energy



BRIGHT GREEN BUILDINGS

Convergence of Green and Intelligent Buildings

Complimentary Research Report: www.caba.org/brightgreen



CABA Intelligent & Integrated Buildings Council



Continental Automated Buildings Association

FROST & SULLIVAN

www.caba.org/brightgreen



CABA's Intelligent Buildings Roadmap Study: 2011

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2. Consolidated Edison Company of New York
3. Distech Controls Inc.
4. Echelon Corporation
5. Electric Power Research Institute
6. Honeywell International Inc.
7. Ingersoll Rand/Trane/Schlage
8. Johnson Controls Ltd.
9. Lawrence Berkeley National Laboratory
10. Natural Resources Canada
11. Optimum Energy, LLC
12. Philips Electronics
13. Pacific Northwest National Laboratory
14. Schneider Electric
15. Siemens Industry, Inc.
16. Sloan Monitored Systems
17. Wattstopper/Legrand/Ortronics

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