



Emerging Technologies Summit

MAKING THE CONNECTION:
From Energy Efficiency Innovation to Delivery

April 19 – 21, 2017

Making the Connection: What's the Role of the Connected Home in Utility Programs?

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Making the Connection

What's the Role of the Connected Home in Utility Programs?

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E Source

Emerging Technologies Summit



E Source



Empowering You

with Essential

Data and Analysis



Headquartered
in Boulder, Colorado



EST.

1986

**“61% of people in the US and
Canada think smart homes are a
good investment.”**

—*E Source*

Tons of Opportunities for Utilities!

-  Demand-response capabilities
-  Data on home energy use
-  Energy Star programs
-  Measurement and verification 2.0
-  Communication channels
-  Efficiency potential
-  Revenue-generating services

“Nearly half of surveyed utility executives believe the smart home will revolutionize the utility industry.”

—*Antenna*

Time to Think Outside the Box



Sources: iStock, ecobee, ThinkEco

Four Approaches to Utility Smart Home Initiatives (So Far)



Focus only on specific individual smart home technologies



Install and study smart home technologies in new-construction projects



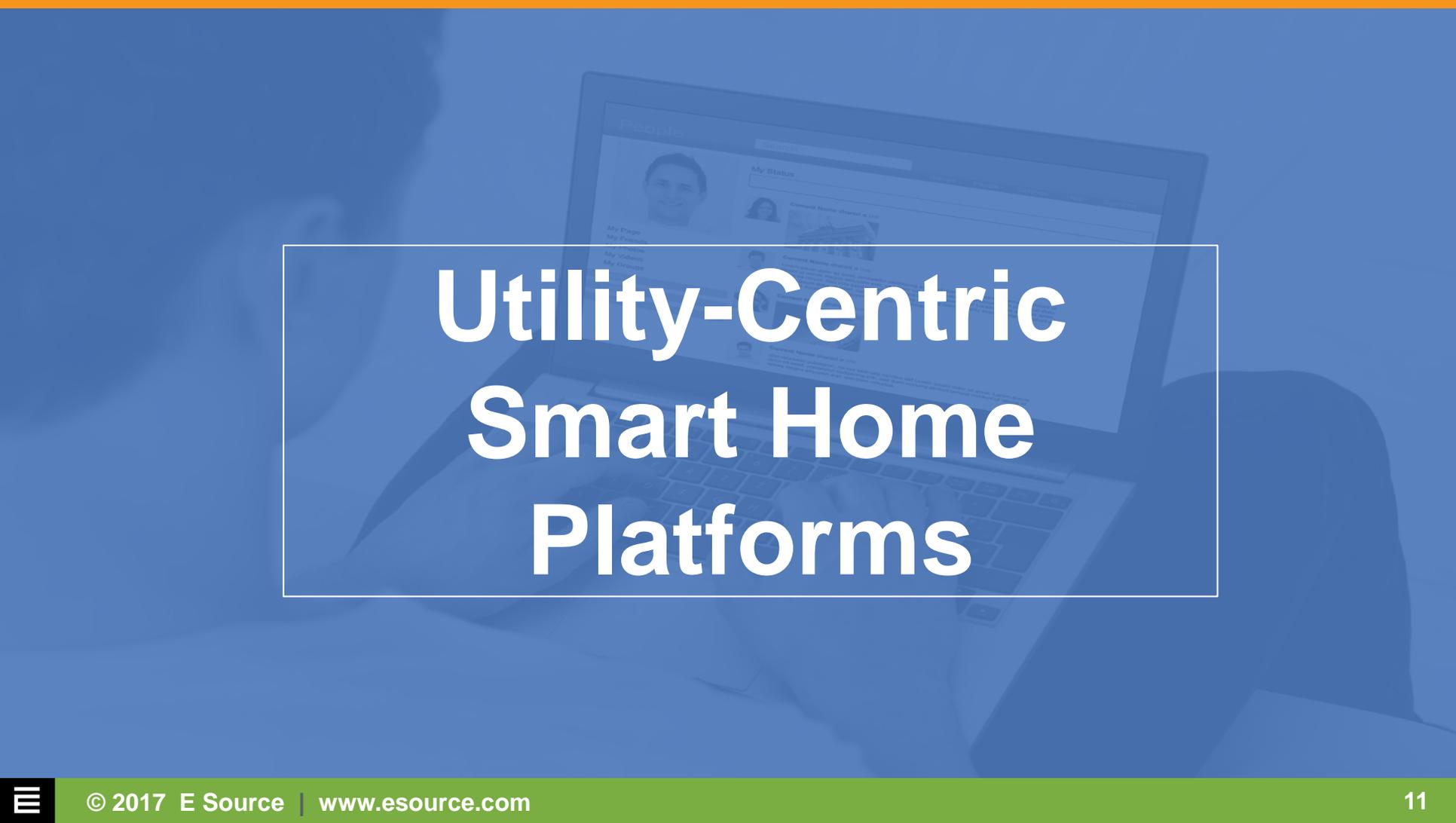
Create a custom smart home system from the ground up



Partner with third-party smart home vendors for utility programs

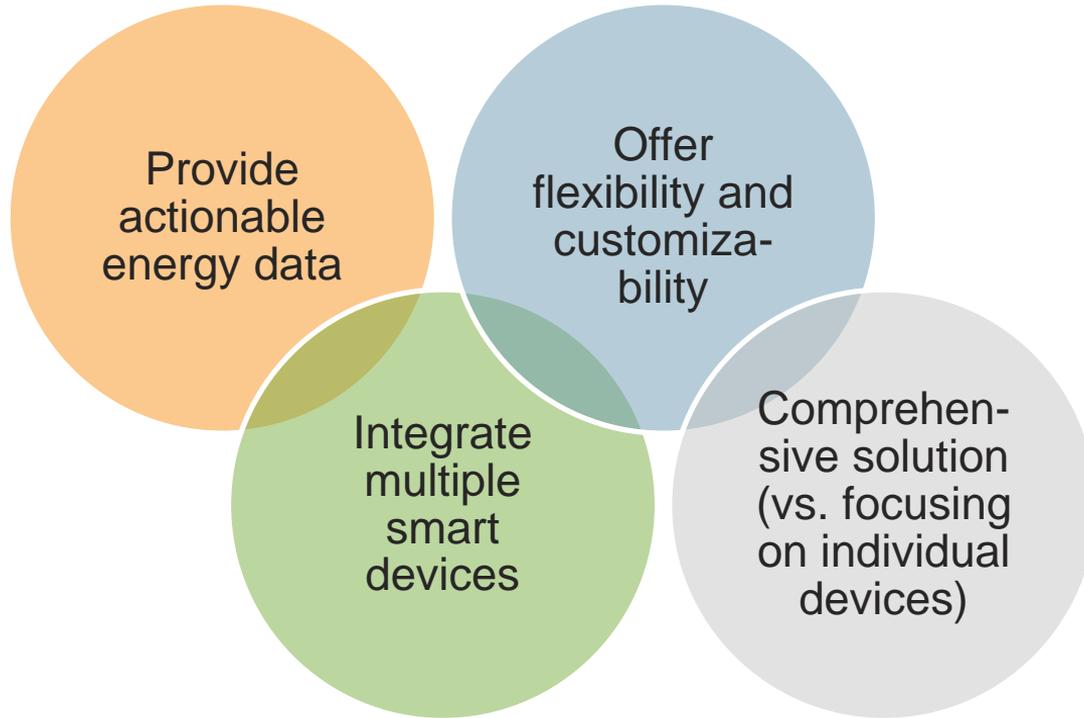
A black and white photograph showing two hands holding two interlocking puzzle pieces. The puzzle pieces are dark and have a glossy finish. The hands are positioned at the top and bottom edges of the puzzle pieces, with fingers gripping them. The background is a plain, light color. Overlaid on the puzzle pieces is the text "Partnership Opportunities Are Emerging" in a bold, orange, serif font.

**Partnership
Opportunities
Are Emerging**

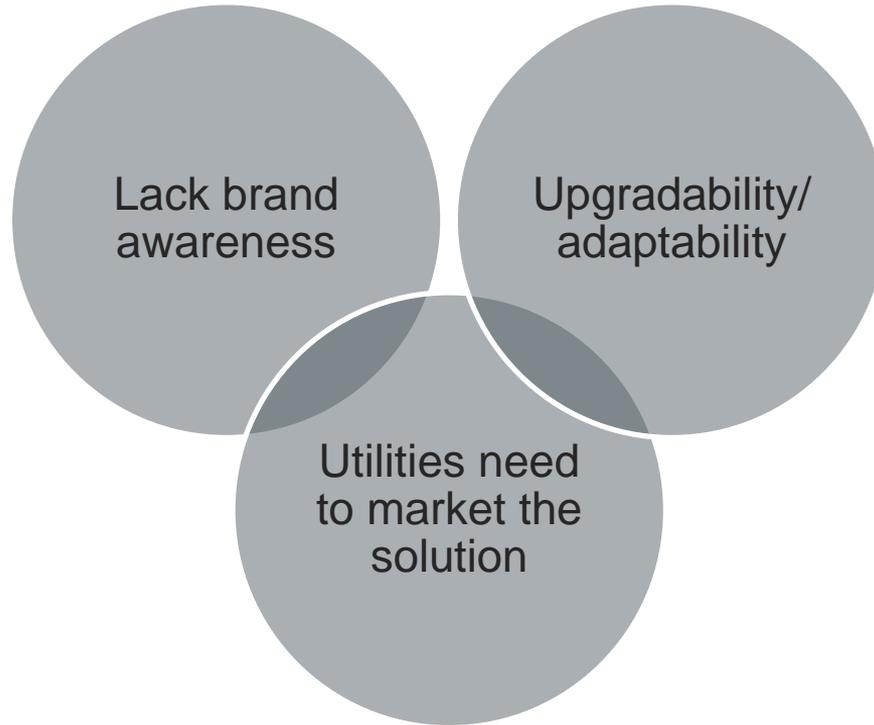


Utility-Centric Smart Home Platforms

Platforms — Opportunities



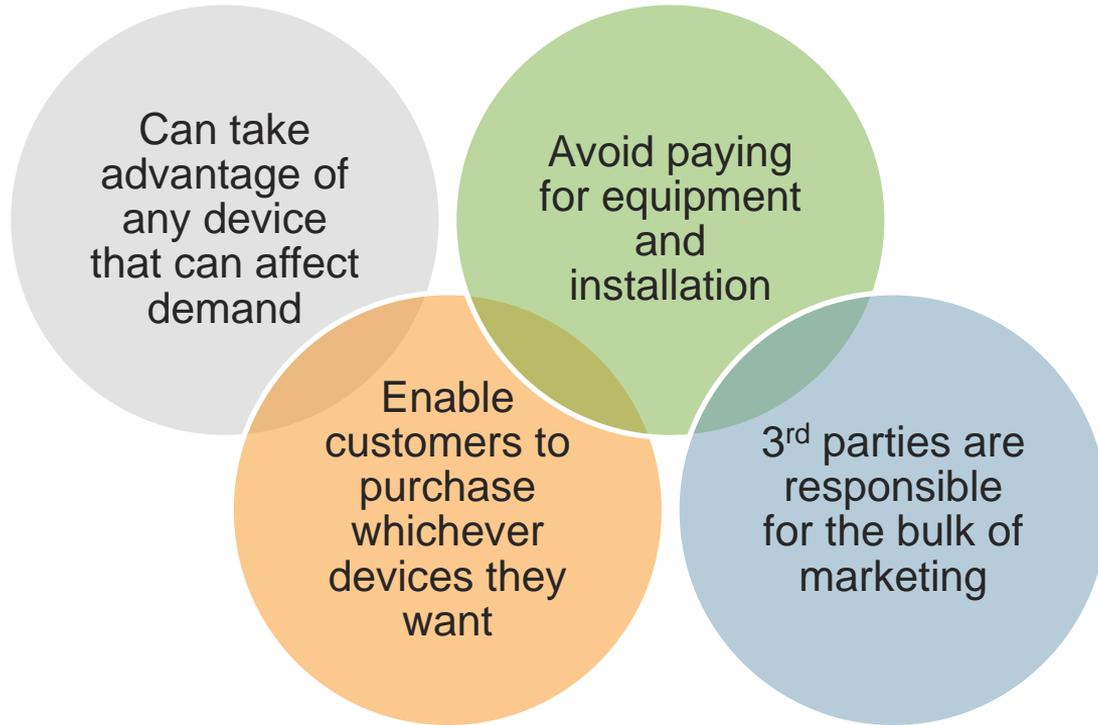
Platforms — Challenges



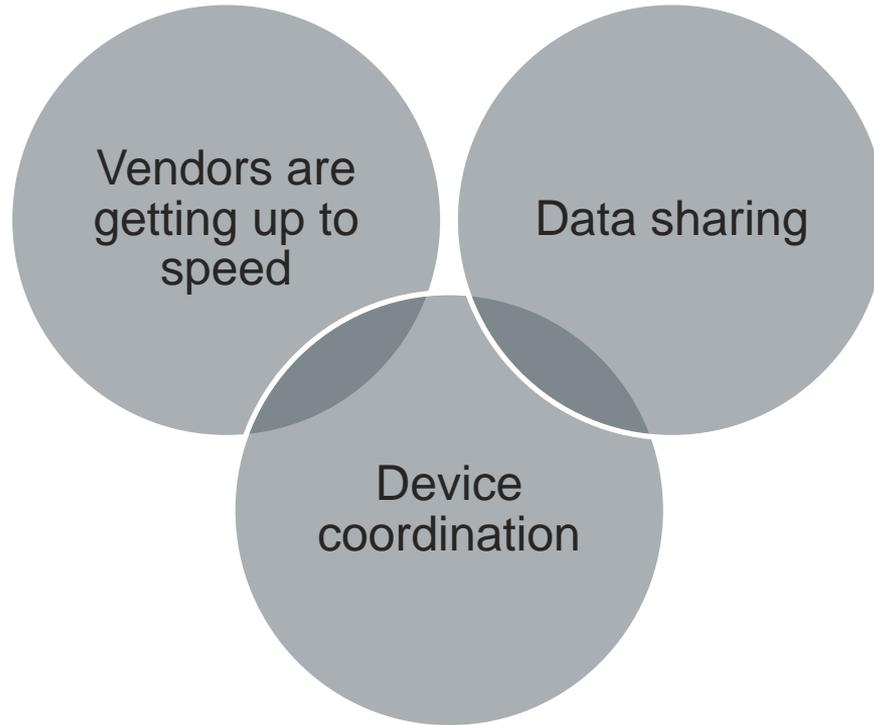
A person is shown from the side, using a laptop. The laptop screen displays a social media profile page with a search bar, a profile picture, and various sections like 'My Status', 'My Photos', 'My Videos', and 'My Groups'. The background is a solid blue color.

Bring-Your-Own-Device Implementers

BYOD — Opportunities



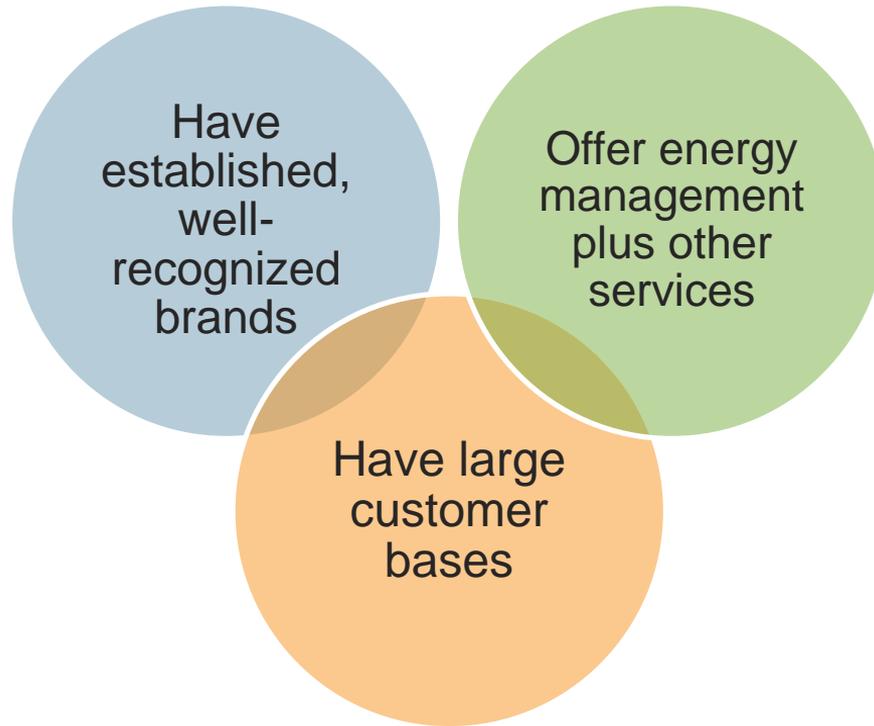
BYOD — Challenges



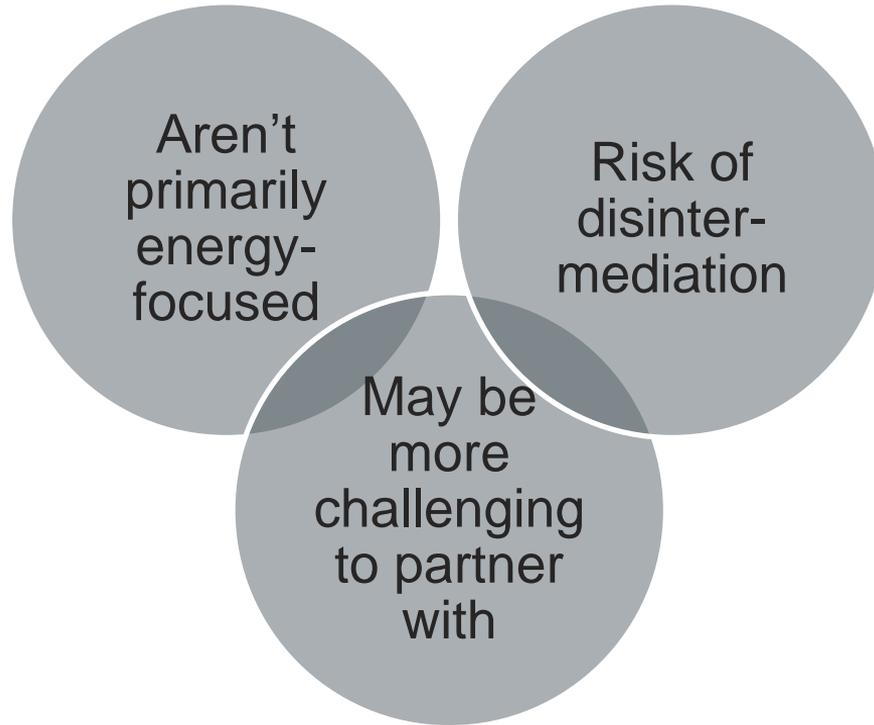
A person is shown from the side, using a laptop. The laptop screen displays a social media profile page with a search bar, a profile picture, and a 'My Status' section. The background is a solid blue color.

Service Companies

Service Companies — Opportunities



Service Companies — Challenges





Energy Star

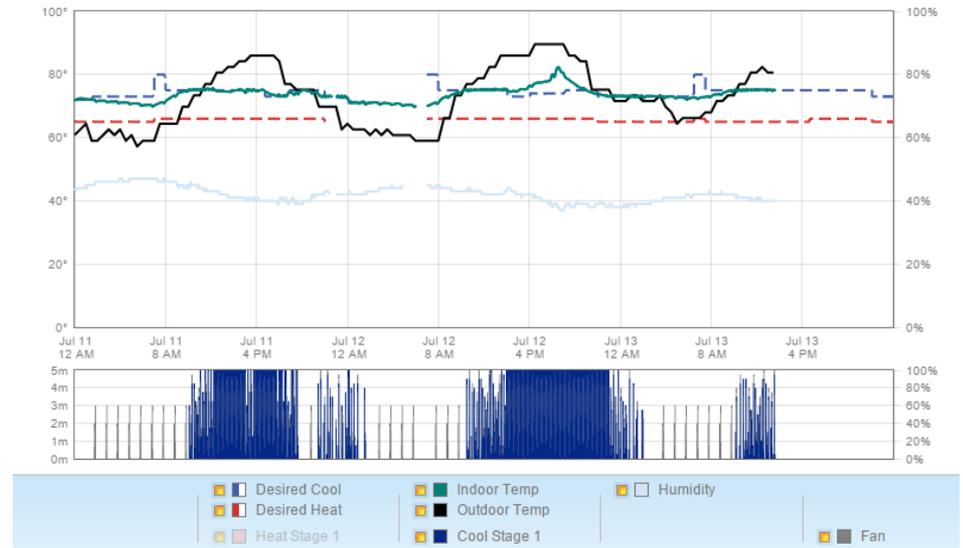
Energy Star Is Helping Too!

- New specification criteria for smart thermostats has been released
- Also evaluating specs for connected appliances
- Working on standardized approaches to data collection and management



Devices Provide EM&V

- Energy Star–connected thermostats spec relies on site-level thermostat data
 - Combines local weather data with HVAC data from the thermostat
 - Largely agnostic about the method used to save energy
 - Uniform data privacy standards



Source: Ecobee



Voice Control

**“Roughly 60% of millennial
customers are now aware of the
Amazon Echo”**

—*E Source*

The Smart Home Interface of the Future?



Sources: Amazon, Google

A person is shown from the side, using a laptop. The laptop screen displays a social media profile page with a search bar, a profile picture, and a 'My Status' section. The background is a solid blue color.

What Do Your Customers Think ?

E Source Residential Utility Customer Survey

- Fielded in July 2016
- We surveyed 1,029 residential utility customers in the US and Canada on a number of topics:
 - Smart homes
 - General thoughts and preferences
 - Device-specific feedback
 - Lighting
 - Home battery storage

Customers See Value in Smart Homes

- People agree that smart homes:
 - Increase efficiency
 - Provide convenience
 - Add security
 - Save money
 - Increase comfort
- High level of familiarity with a variety of smart devices



Utility Data Can Provide Value

- Customers would really value getting notifications when they're close to exceeding their average monthly consumption
- Some of the most valued attributes of the smart home include:
 - Being alerted to malfunctioning devices
 - Setting up devices to automatically save energy
 - Monitoring energy use



The Role of Utilities

- Nearly 20 percent of customers would prefer to buy a smart home system from their energy utility
- Utilities can help with some of the major barriers:
 - Expense
 - Lack of knowledge



Strategies for Success



For More Information



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The Evolution of H.E.M.

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Home Energy Management



HOME ENERGY MANAGEMENT

REAL-TIME ENERGY

DISTRIBUTED ENERGY
RESOURCES

ENERGY STORAGE
AND SOLAR

HVAC
OPTIMIZATION

LOAD MONITORING

HOME AUTOMATION

SMART THERMOSTATS

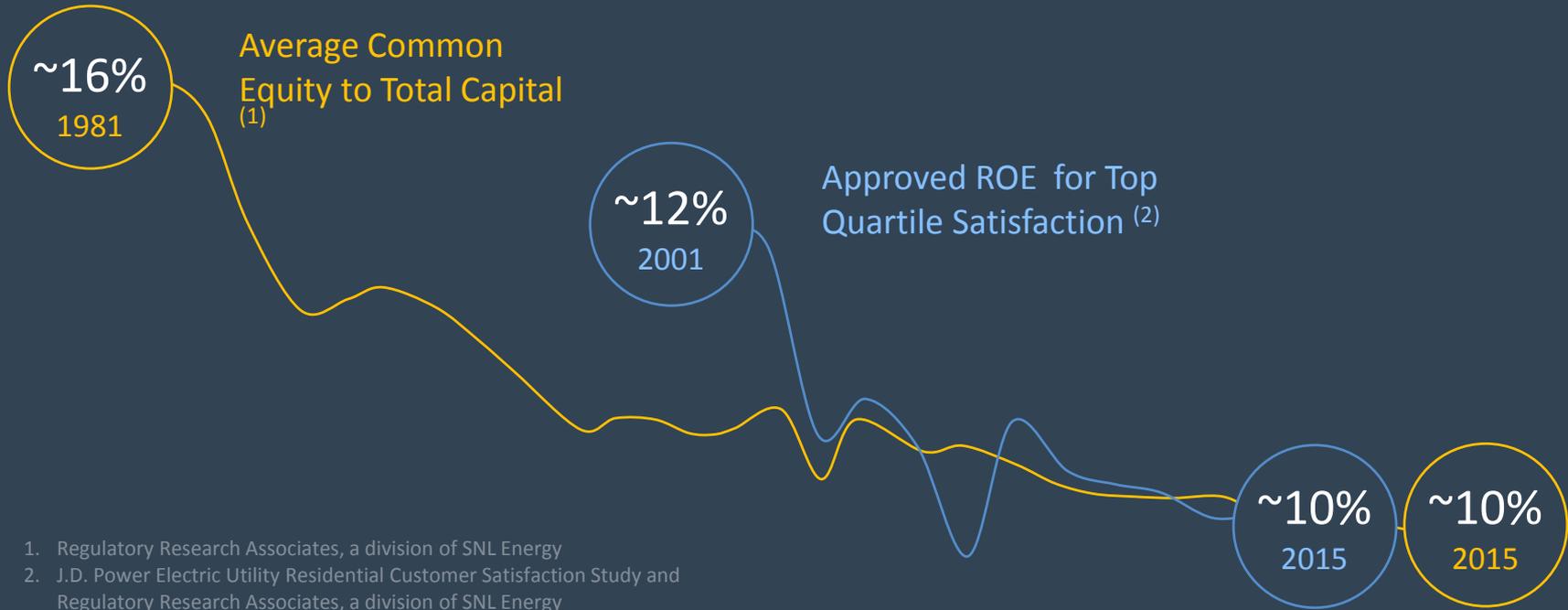
ELECTRIC VEHICLE

DISAGGREGATION

DEMAND RESPONSE



GREATER ENGAGEMENT, SATISFACTION, AND RETURN



1. Regulatory Research Associates, a division of SNL Energy
2. J.D. Power Electric Utility Residential Customer Satisfaction Study and Regulatory Research Associates, a division of SNL Energy





The Battle Ahead



THE BATTLE AHEAD

Strengthen customer relationships

Protect core business

Grow new revenues

EXPERIMENTAL STAGE

SURVIVAL OF THE FITTEST

ERA OF DISRUPTION



● Leading Utilities

● Lagging Utilities

● Industry Outsiders



INNOVATE FASTER, TOGETHER



Traditional Program

5 Years



DTE Energy 1st Gen

3 Years



DTE Energy 2nd Gen

1 Year



Pilot Program

8 Weeks





The Numbers



DTE INSIGHT GROWTH CONTINUES TO ACCELERATE

	Dec 2014 6 Months	Dec 2015 18 Months	Dec 2016 30 Months	Feb 2017 31.5 Months
App Downloads	36,000	120,000	245,000	262,000
Households	19,000	59,000	116,000	124,000
Energy Bridge Requests	7,000	25,000	52,000	56,000
Total Sessions	534,000	2,971,000	7,550,000	8,096,000



BENEFITTING BOTH USERS AND UTILITIES

CUSTOMER

Savings

Peace of mind

Knowledge

Experience



UTILITIES

Energy efficiency

Demand response

Strategy

Revenue



DTE H.E.M. PILOT RESULTS

PILOT USERS

110

HOUSEHOLDS LIVE

500

HOUSEHOLDS TARGETED

ENGAGEMENT

36

MINUTES PER USER/ WEEK

18

SESSIONS PER USER/ WEEK

104

EVENTS PER USER/ WEEK

RETENTION

72%

AVERAGE/ WEEK



PROGRAM BENCHMARKS

MOBILE BANKING

18

SESSIONS/ MONTH

1.5

MINUTES/ SESSION

Source: Malauzai 2015 - 375K banking customers

GEN 1 - REAL TIME

16

SESSIONS/ MONTH

.78

MINUTES/ SESSION

Source: DTE Insight 2014 - present

GEN. 2 - H.E.M.

72

SESSIONS/ MONTH

2

MINUTES/ SESSION

Source: DTE Pilot/ 110 users





Customers are opening the door
to a new relationship with energy



CONNECT THE SMART GRID TO THE SMART HOME

ENERGY
MANAGEMENT



2014

 DTE Energy

 powerley

HOME
AUTOMATION



2017



Questions?

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Internet of Things

Leveraging the Connected Home

Southern California Edison

Serves a population of more than 14 million people in a 50,000 square mile area of Central, Coastal and Southern California



The Connected Home, is not just at home any more....

New technologies are more affordable and readily available..



More devices are now able to work together.

Advances in the industry are creating more interoperability between products - bridging the gaps between different communication protocols, technologies and standards

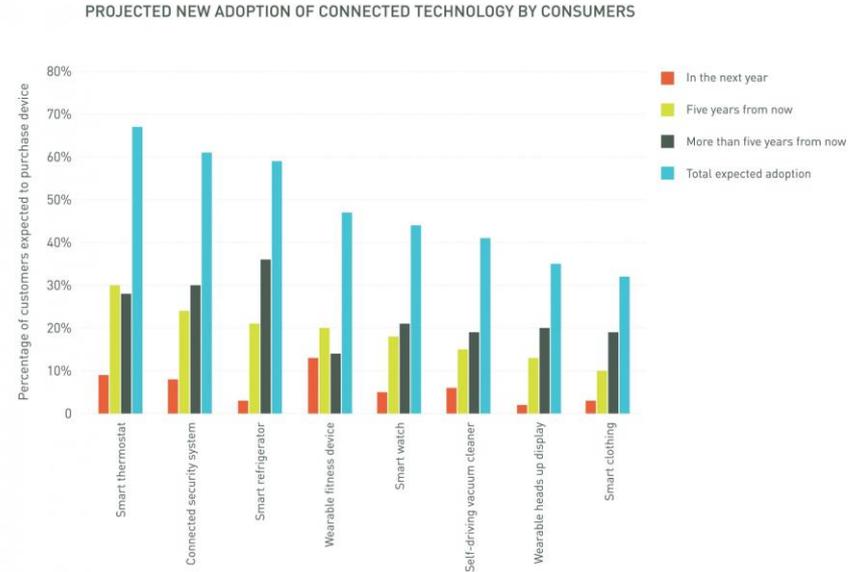
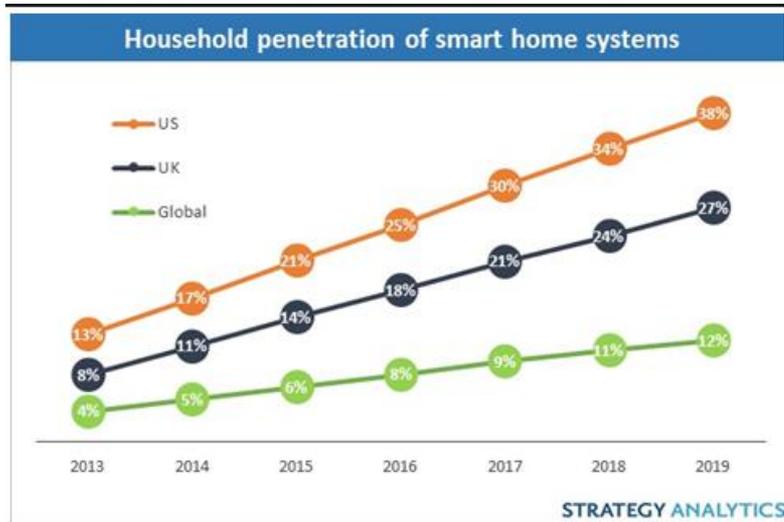


The Cloud has changed the connected world.

The cloud has transformed how customers connect to and use smart energy efficient devices

Market Growth

In 2020, the smart homes market revenue in the Americas is projected to grow to 22.4 billion U.S. dollars up from 7.19 billion U.S. dollars in 2013.



Customers have many options for products and services

Appliance and Device Manufacturers

- Do-it-Yourself (DIY)
- Plug and play
- Limited or no fees
- Device / product specific
- Optional connectivity
- Knowledge of compatibility will be important for integration or automation



Service Providers

- Professional installation
- Service / subscription fees
- Often an enhancement of existing offering or service
- Provides guidance for additional products and devices that work with system



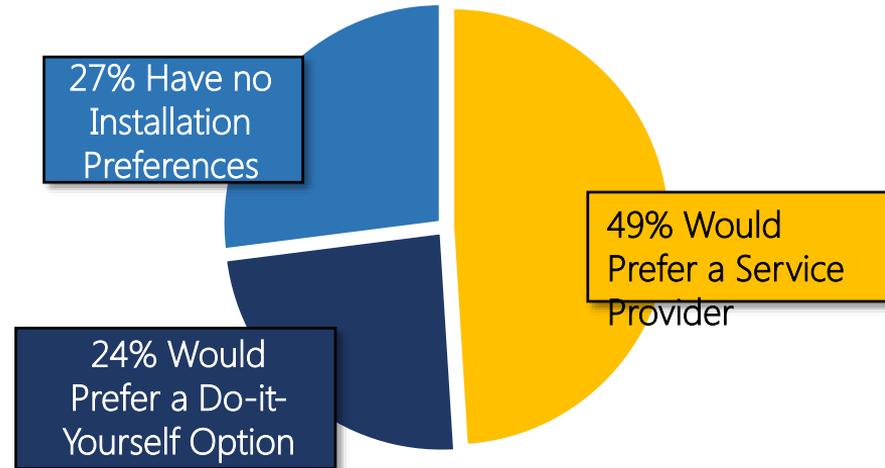
Big Box Stores / Retailer Solutions

- Do-it-Yourself (DIY)
- Plug and play
- Hubs and /or device families
- Limited or low service fees depending on functionality desired



And these options translates well to delivery choices

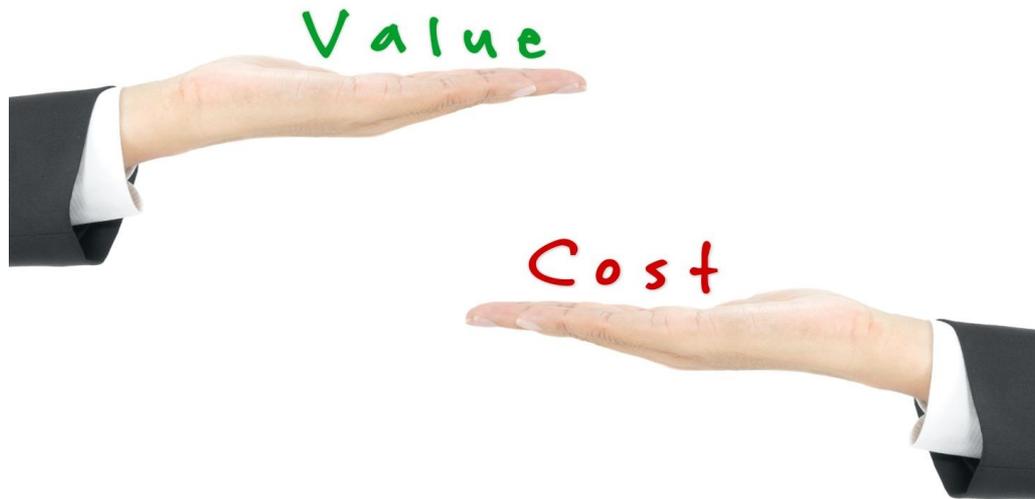
Customers are purchasing devices and are willing to install them



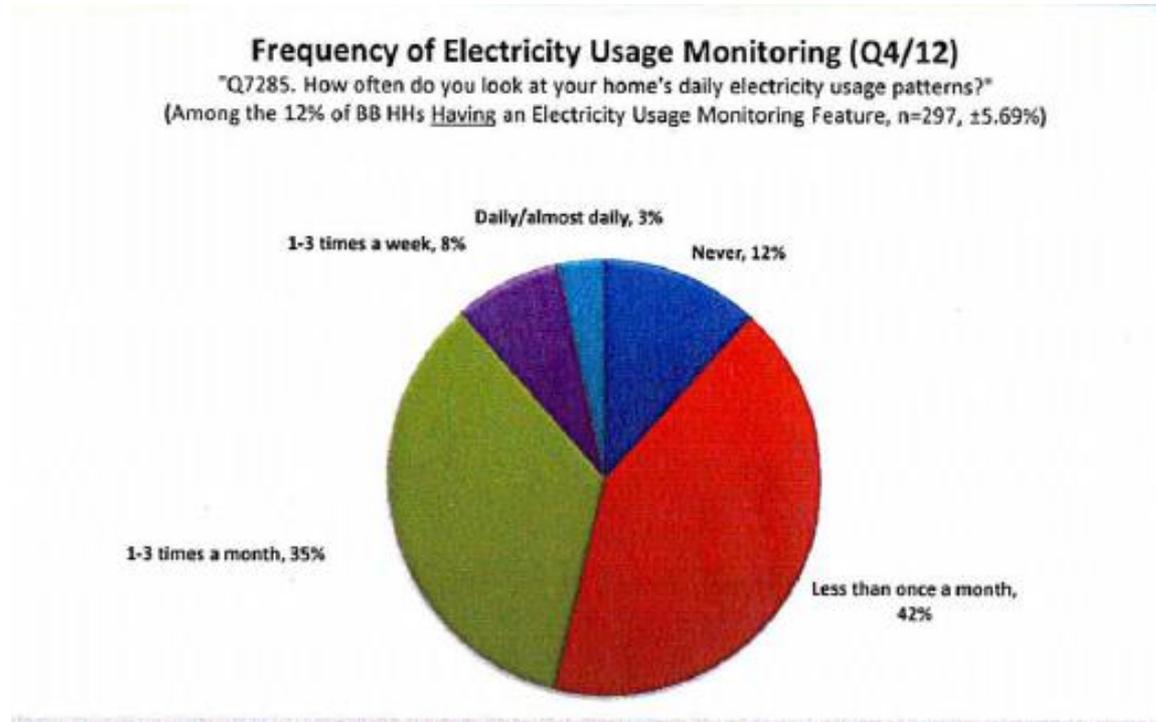
Research: Parks & Associates

Developing new customer offerings

New customer products, programs and services should help save energy and costs and embrace customer choice and improve satisfaction.



Access to Home Energy Usage Isn't Enough



Creating partnerships to add value

By adding “**energy services**” that enhance products which customers want to buy preserves customer choice and allows the utility to leverage market trends

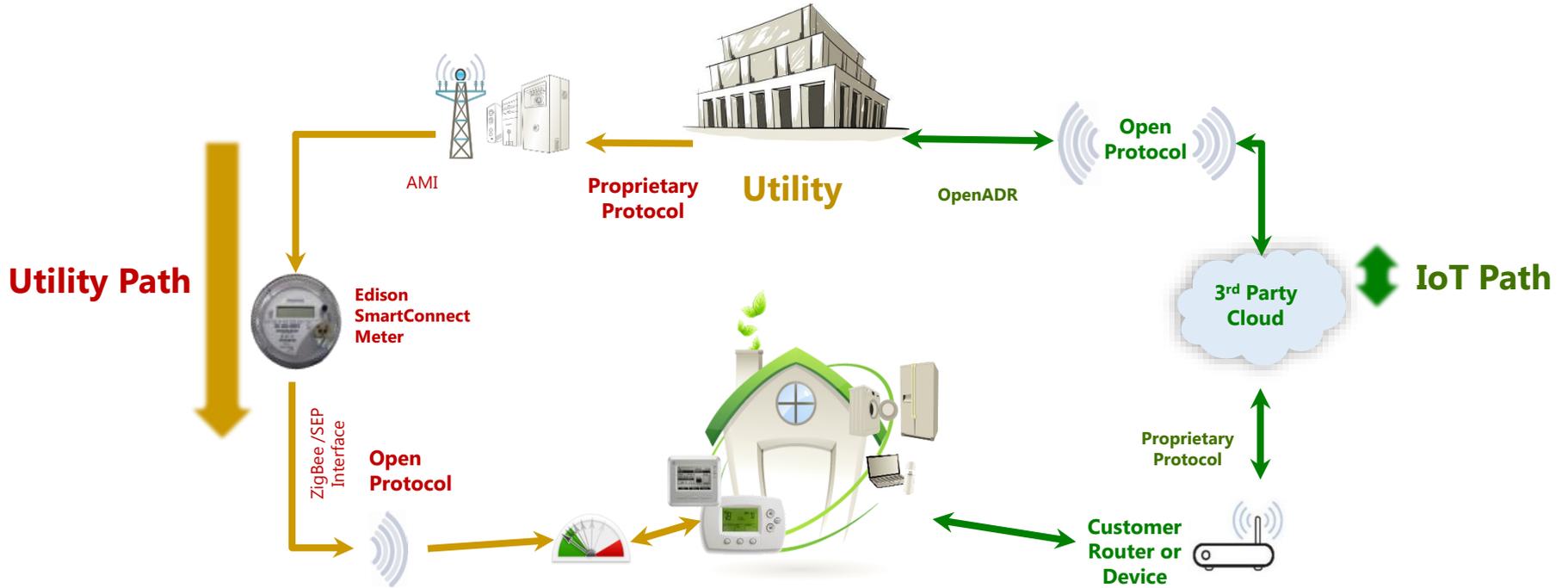
- **Partnerships** will allow utilities to achieve efficiency and grid reliability goals
- Attain utility **goals** while preserving affordability
- Enables **innovative** customer solutions
- Enhances **customer engagement** and preserves the **customer relationship**

Creating partnerships: important considerations

- Balancing information sharing and customer privacy
 - Data governance, strategy, ownership
 - Compliance
- Open communication standards enables the marketplace
 - OpenADR
 - ESPI / Green Button Connect My Data
- Embrace partnership
 - Co-branding and co-marketing
 - Improve business development
 - Measured risk taking



Reaching the customer

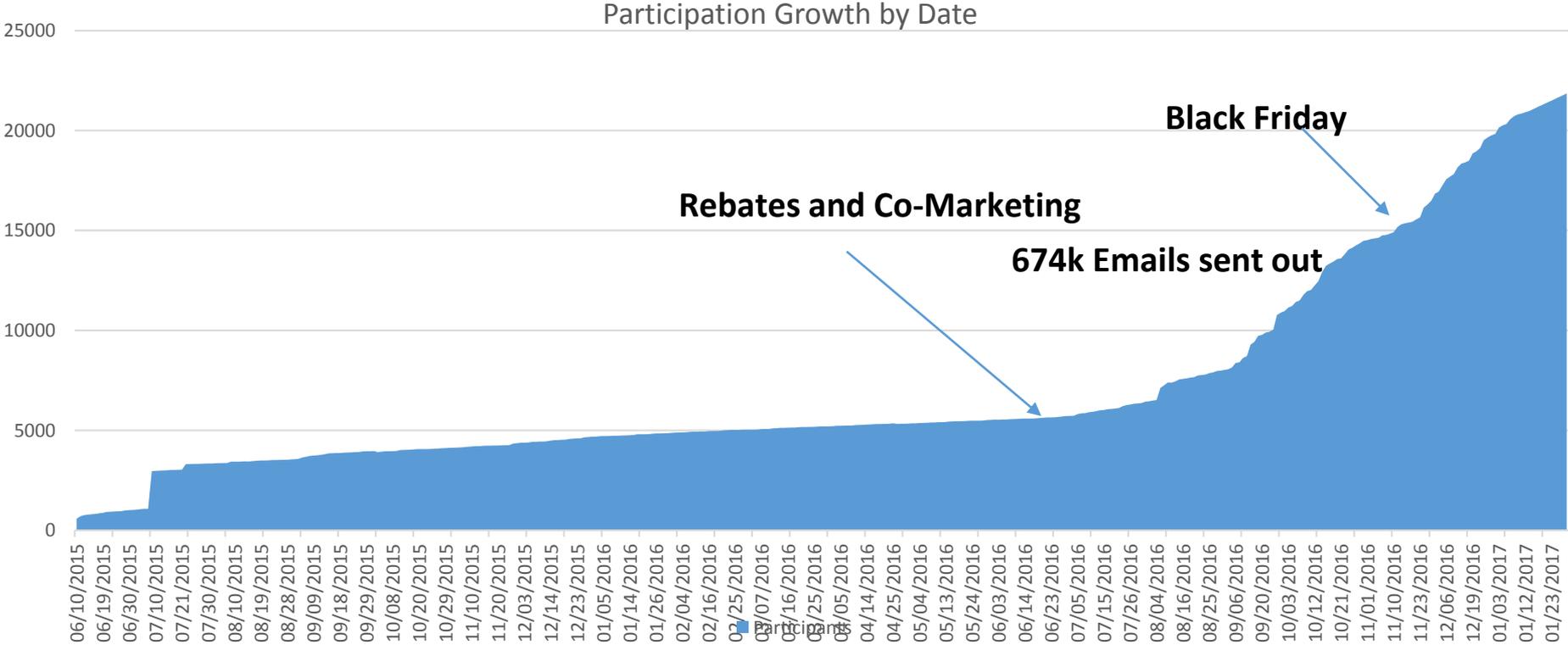


Leverage the Connected Home to save energy

Bring Your Own Thermostat (SCE Marketing Name: Save Power Days Incentive Plus)

- Partners perform marketing and provisioning for an annual management fee per customer
- \$125 Save Power Day Incentive Plus enrollment SCE bill credit for end customers sponsored by both SCE and The Southern California Gas Company
- SCE provides a pay-for-performance credit of \$1.25 per kWh reduction through the SPD program
- Utilize OpenADR 2.0 cloud platform to communicate events to partners and utilizes the Advance Metering Infrastructure to determine performance
- Partners must deliver an average of > 500 watts of load reduction per household

Co-Marketing Lift



Third Party Smart Thermostat Program Results

Smart Communicating Thermostats

- Over 20,000 customers enrolled through Nest, EnergyHub and Whisker Labs with 15,000 joining just between July and December of 2016.



Customers participated in 8 Save Power Day events with an average 750 watts of load reduction per participant.

Benefits

- Additional revenue on existing and new installed base for partners
- Provides customer choice and differentiates their products
- Co-marketing opportunities with SCE for participation in SCE programs
- OpenADR cloud platform enables scalable and domestic market model
- Reduces energy use and carbon production

“Energy Collective”

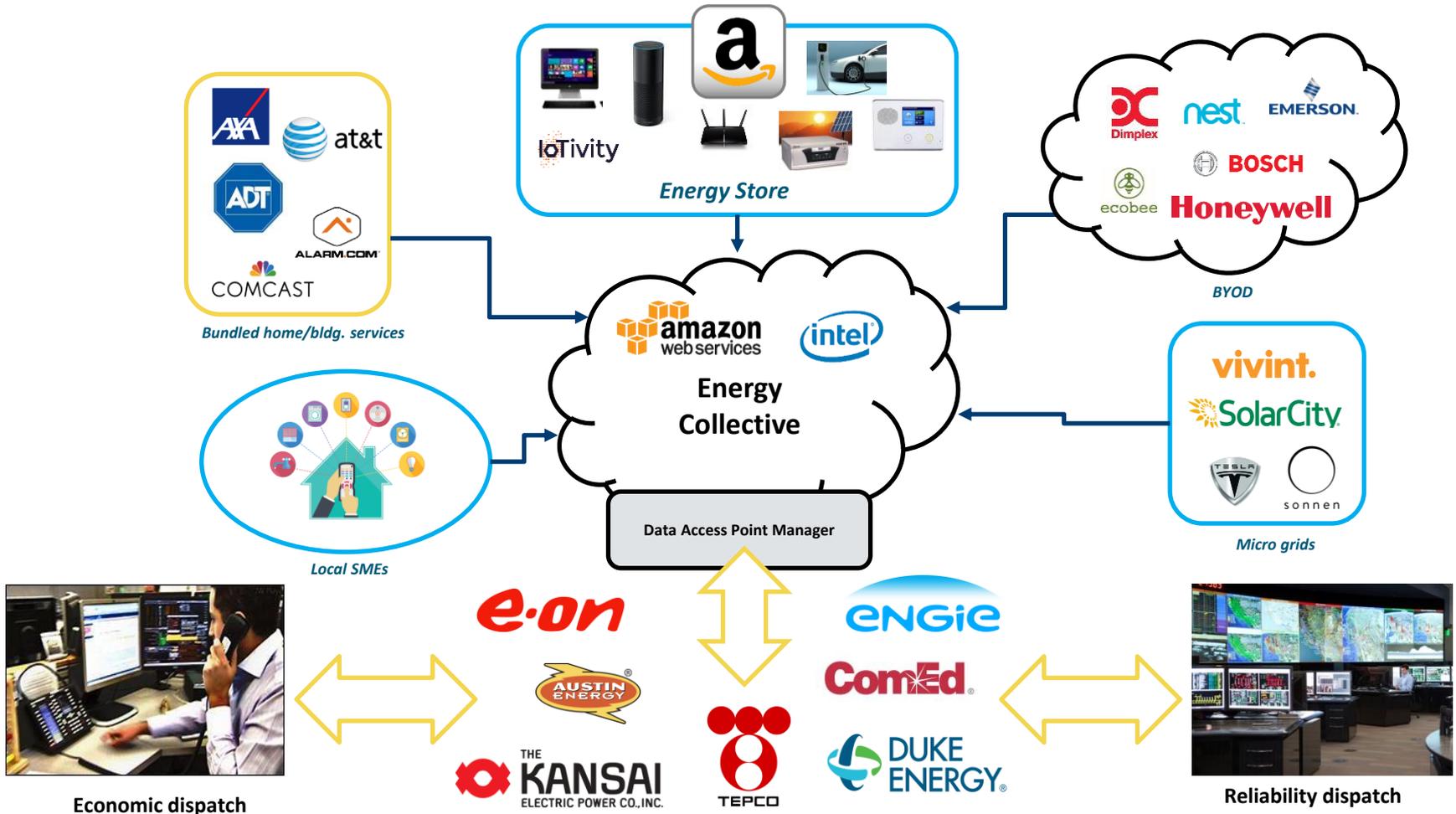


'Connected Home' is the Solution!

- Deploy a simplified “sticky” smart home offering
- Offer complementary devices from your marketplace
- Data for segmentation and program management
- Create energy value by growing EE & DR programs
- Optimizing the timing of loads behind the scenes
- Harvest minuscule measurement and verification
- Generate incremental revenue from other services
- Reduced call center overhead with digital interaction
- Leverage your brand to become ‘energy advisor’

Is that all there is to it?





BENEFITS

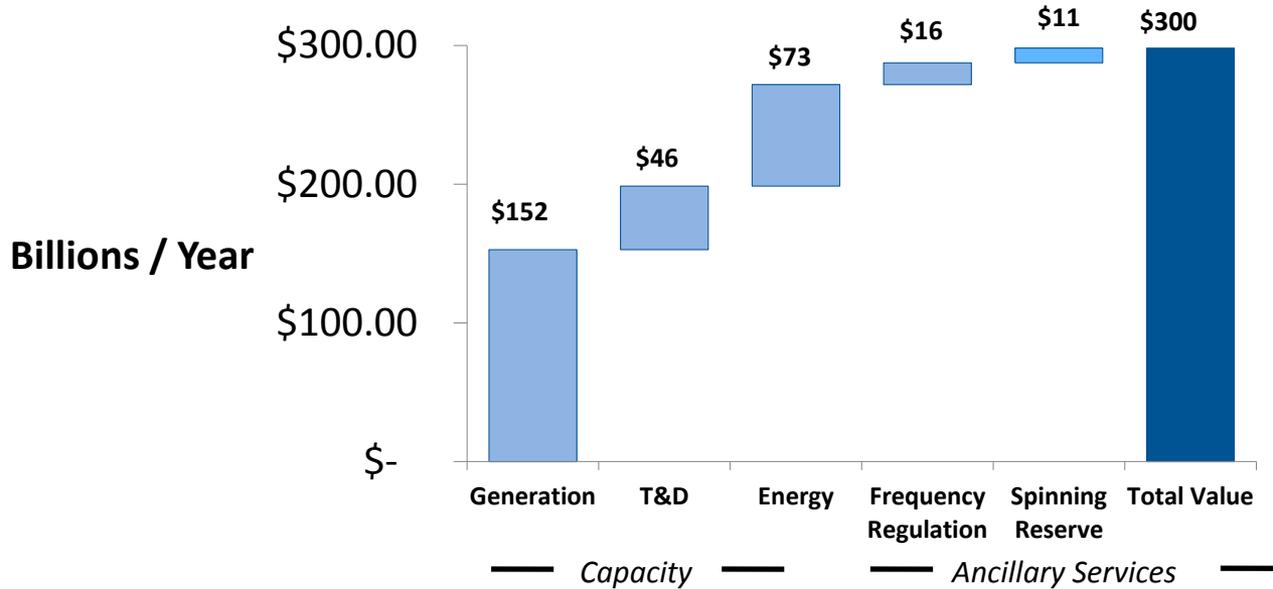
- Avoided T&D associated costs; potentially defer capital and operational costs
- Improved customer experience through increased reliability and customer focused programs
- Reduction in labor managing DER applications
- O&M Savings in Capacity Planning and Customer Operations
- EE Savings through demand reduction; consumer savings through lower electric bill
- Societal benefits such as Greenhouse gas reduction

COSTS

- Cost of the DERMS platform along with associated support costs (IT, OT, Labor) – CapEx, OpEx, AFUDC
- Data collection, processing of interconnection applications and end use technologies
- Protection Upgrades, Anti Islanding systems, Energy storage associated costs
- Lost generation and distribution revenue due to DER
- Upgrade of CRM, SCADA and other engineering systems
- Refresh costs associated with any new systems installed based on 10-20 year life

How big is the market?

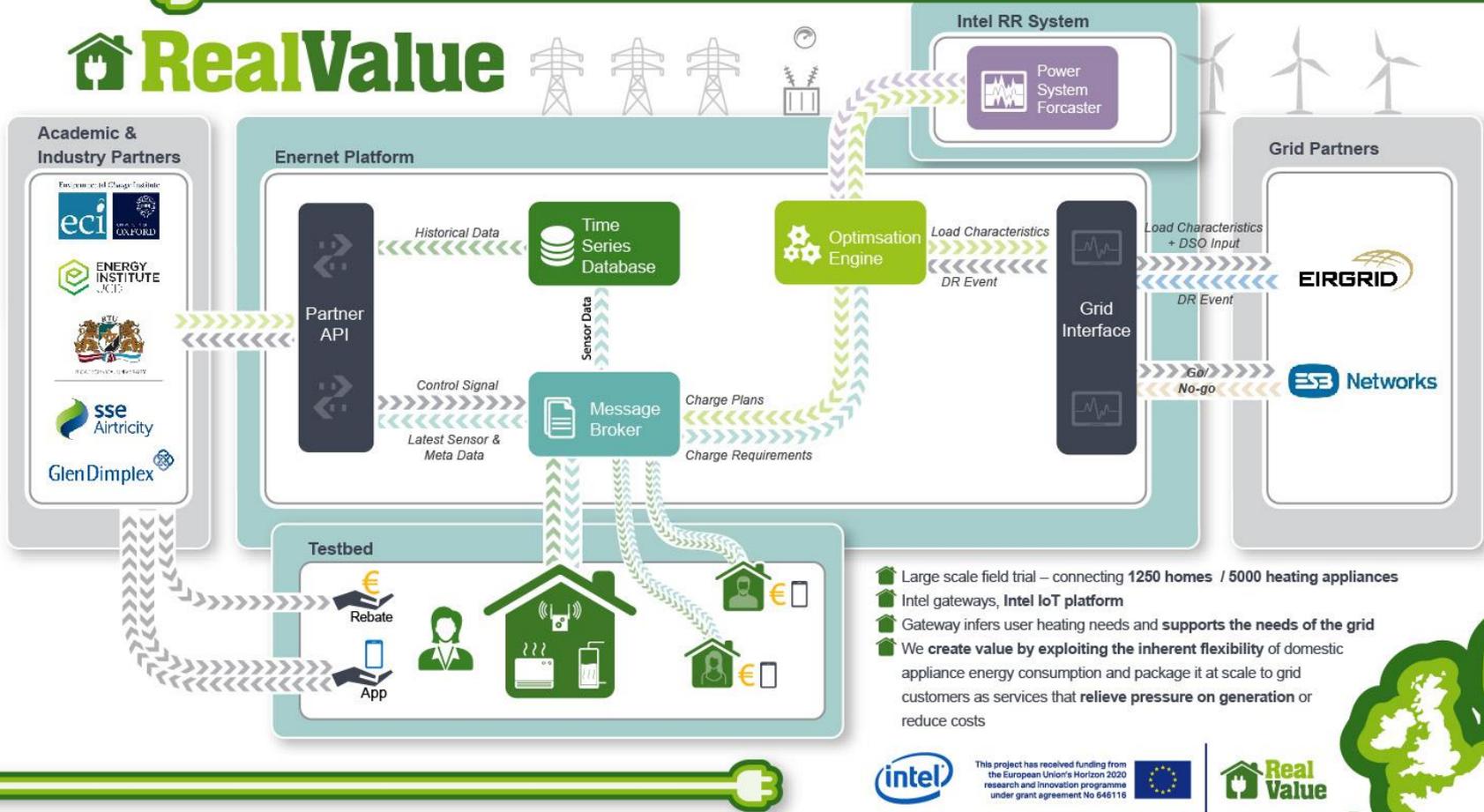
Global Annual Grid Value of IoT Platform Energy Use Cases



Connecting devices / loads across residential and C&I buildings is worth \$300 billion in annual value to the electricity system



RealValue



- Large scale field trial – connecting 1250 homes / 5000 heating appliances
- Intel gateways, Intel IoT platform
- Gateway infers user heating needs and supports the needs of the grid
- We create value by exploiting the inherent flexibility of domestic appliance energy consumption and package it at scale to grid customers as services that relieve pressure on generation or reduce costs



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646116



Thank you!