

Program will start at 10:00 am



ETCC QUARTERLY MEETING:
*SMART POLICY, NEW TECHNOLOGY,
AND THE RIGHT APPROACH FOR MORE
EFFICIENT HOMES*

September 8, 2016
Energy Innovation Center, San Diego
HOSTED BY: San Diego Gas & Electric

Wifi: SE-Visitor WIFI code: xekx5199

Welcome, Safety and ETCC Updates

Kate Zeng

Technology Planning & Analysis Manager | San Diego
Gas & Electric

WELCOME!

Before we get started....
housekeeping and safety

FOR OUR ONLINE MEETING PARTICIPANTS

- Quick logistics
 - Phone lines are muted
 - Speaker check: select “raise” hand in the control panel to confirm you are able to hear
 - Please use question field to ask questions during Q&A or if any technical issues

HOUSEKEEPING FOR ALL PARTICIPANTS

- Please **turn off** or **silence** your phone, and **step outside** for any non-program conversations
- Audio recording today's session
 - Will be posted on www.etcc-ca.com
- Slides will be posted to www.etcc-ca.com
- Don't forget to fill out evaluations!

SAFETY MESSAGE

- In the event of an emergency:
 - Earthquake
 - Fire
 - Other evacuation
- Meeting point
- 911
- CPR

TODAY'S AGENDA

10:00 AM	Welcome, Safety & ETCC Updates
10:20 AM	Solid Foundations: The Big Picture Behind Smart Homes
11:30 PM	LUNCH (provided)
12:45 PM	Brick and Mortar: Insight into Specific Technologies Revolutionizing the Residential Space
1:55 PM	BREAK
2:15 PM	For Sale: Buying Into Energy Efficiency
3:30 PM	WRAP UP

EMERGING TECHNOLOGIES COORDINATING COUNCIL (ETCC)

The ETCC supports ETP efforts in the advancement of energy efficiency and demand response initiatives through its leadership, impact and influence in the emerging technology domain. It pursues this objective by strategically engaging with a wide range of external ET stakeholders and effectively and efficiently managing coordination among ETCC members.

Members include:



EMERGING TECHNOLOGIES PROGRAM MISSION

“...to increase energy efficiency market demand and technology supply through evaluation of *emerging* and *underutilized* advanced technologies to increase customer savings...”



Zero Net Energy



LED Lighting



EE Rebates



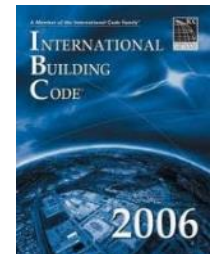
Retail and Manufacturer Strategy



Appliance Standards



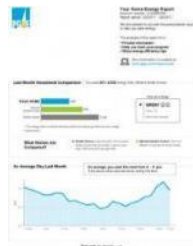
Building Codes



HVAC



Home Energy Report



Contractor Training and outreach

ET PROGRAM DESIGN

Technology Development Support

- Provide resources to transform early-stage technologies / concepts into saleable products
- Develop forward-looking product specifications
- Provide outreach to early-stage entrepreneurs, investors, and analysts (TRIO)

Technology Assessment

- Evaluate performance claims
- Generate energy savings and cost data required for regulatory approval of a new EE measures

Technology Introduction Support

- Conduct scaled field placements to foster market traction
- Build demonstration showcases to create visibility / market awareness
- Conduct third-party solicitations using competitive bidding (TRIP solicitation)

UPCOMING ETCC EVENTS

Date	Event	Location & Host
December 7, 2016	Q4 Meeting: Industrial	Sacramento (SMUD)
April 19-21, 2017	Emerging Technologies Summit	Ontario Convention Center, Ontario, California

To sign up for the ETCC Insight newsletter, check the box on the sign-in / registration sheet or sign up online at: www.etcc-ca.com/subscribe

Check the ETCC website for updates: <http://www.etcc-ca.com/events>

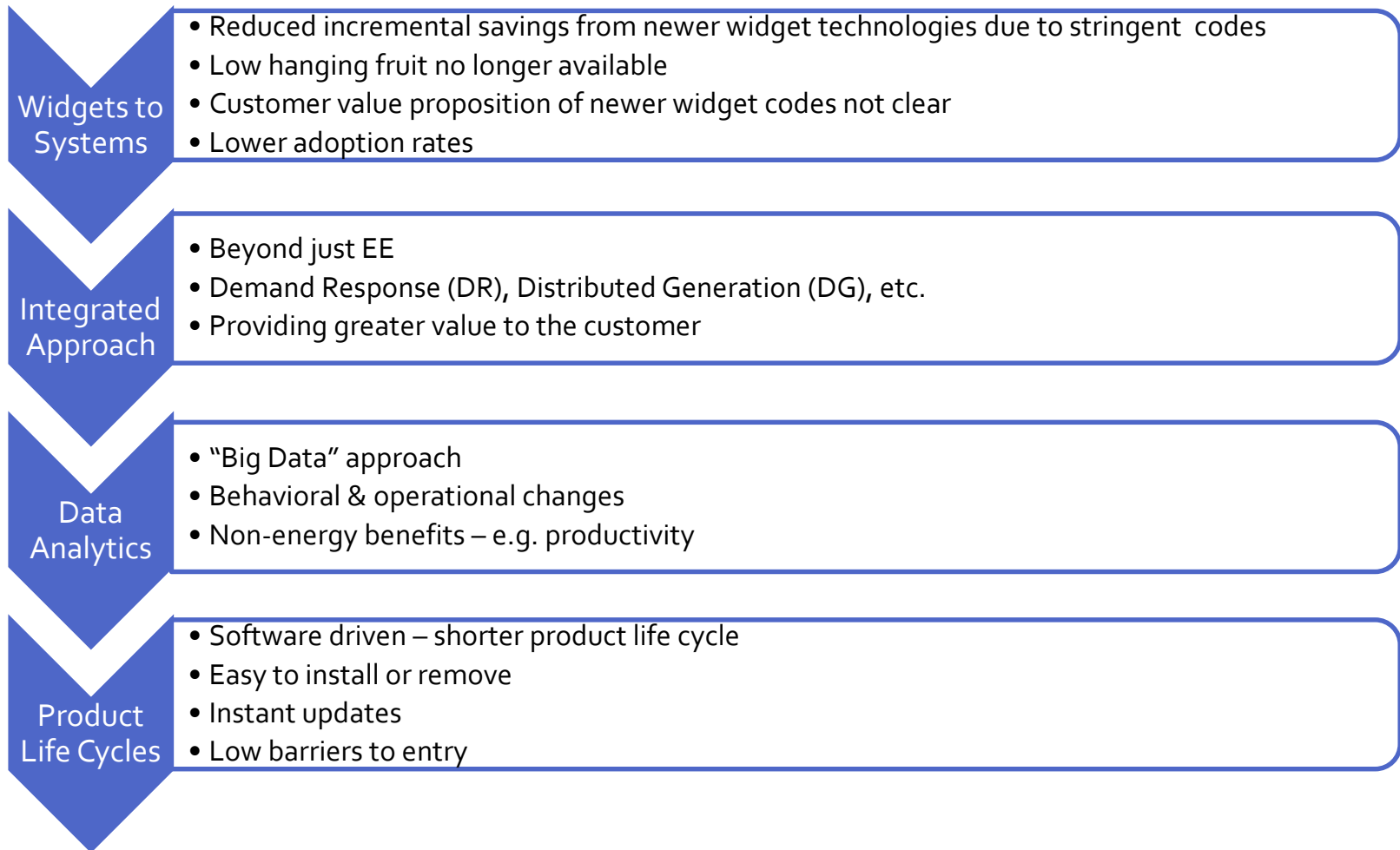
RESIDENTIAL ET – A YEAR IN REVIEW

GOALS & DRIVERS

- Continue to align with key CA EE goals and policies
 - AB 32 - GHG reduction target
 - Reduce to 1990 levels by 2020
 - 80% below 1990 levels by 2050
 - AB 758 and CEC Existing Buildings EE Action Plan
 - SB 350
 - Double efficiency savings goals in electricity & gas by 2030
 - Increase the Renewable Portfolio Standard (RPS) to 50% by 2030
 - AB 802
 - Access to energy use data, leverage meter-based savings
 - Count to-code improvements for underperforming buildings
 - Include operational, behavioral, and retro-commissioning savings
 - Increase transportation electrification
 - AB 793
 - Enable smart energy management through new pricing mechanism and advanced technologies
 - CA ZNE Goals
 - All new residential construction to be ZNE by 2020
 - CA EE Rolling Portfolio

EE TRENDS

- Adapt to market & technology trends to meet customer needs



HIGH LEVEL INITIATIVES & PROJECTS

- Examine and demonstrate multiple pathways to ZNE
- Understand the utility's role in the evolution of Home Energy Management (HEM) solutions
 - Connected homes and whole-house DR assessments
- Continue to evaluate and promote high potential individual technologies in advanced lighting & controls, HVAC, Plug loads and appliances (PLA), Water Heating, etc.
 - Advanced Tier 2 Power Strips workpaper approved (SDG&E)
 - Retail Products Platform (RPP) launch with multiple utilities (PG&E and SDG&E)
- Explore opportunities in behavior management with targeted marketing
 - Launched BYOT pilots for both EE & DR benefits
- Support integrated efforts in water-energy nexus, EV and smart charging
- Coordinate with the Energy Commission's RD&D Programs



SOLID FOUNDATIONS: THE BIG PICTURE BEHIND SMART HOMES

Jonathan Livingston, President | Livingston Energy Innovations - *moderator*

Carlos Ruiz, Supervisor of Residential Portfolio | SoCalGas

Derek Okada, Policy & Planning Senior Manager, Customer Programs & Services
| Southern California Edison

Mayda Bandy, Manager for Residential Customer Programs | San Diego Gas & Electric

Dave Ashuckian, Deputy Director, Efficiency Division | California Energy Commission

David Thayer, Manager, Energy Efficiency Product Management, Pacific Gas and Electric Company | Pacific Gas & Electric

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Management, Pacific Gas and Electric
Company | Pacific Gas & Electric



DISCUSSION / Q&A

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Dave Ashuckian, Deputy Director, Efficiency Division | California Energy Commission

David Thayer, Manager, Energy Efficiency Product Management, Pacific Gas and Electric Company | Pacific Gas & Electric

LUNCH

Program will resume at 12:35 pm

PLEASE FILL OUT EVALUATIONS!



BRICK AND MORTAR: INSIGHT INTO SPECIFIC TECHNOLOGIES REVOLUTIONIZING THE RESIDENTIAL SPACE

Ram Narayanamurthy, Principal Technical Leader | EPRI - *moderator*

Ryan Kerr, Emerging Technologies Manager of End Use Solutions |
Gas Technology Institute

Chris Tumpach, President | Rainforest Automation

Essie Snell, Research Manager | E-Source

Ram Narayanamurthy
Principal Technical Leader | EPRI

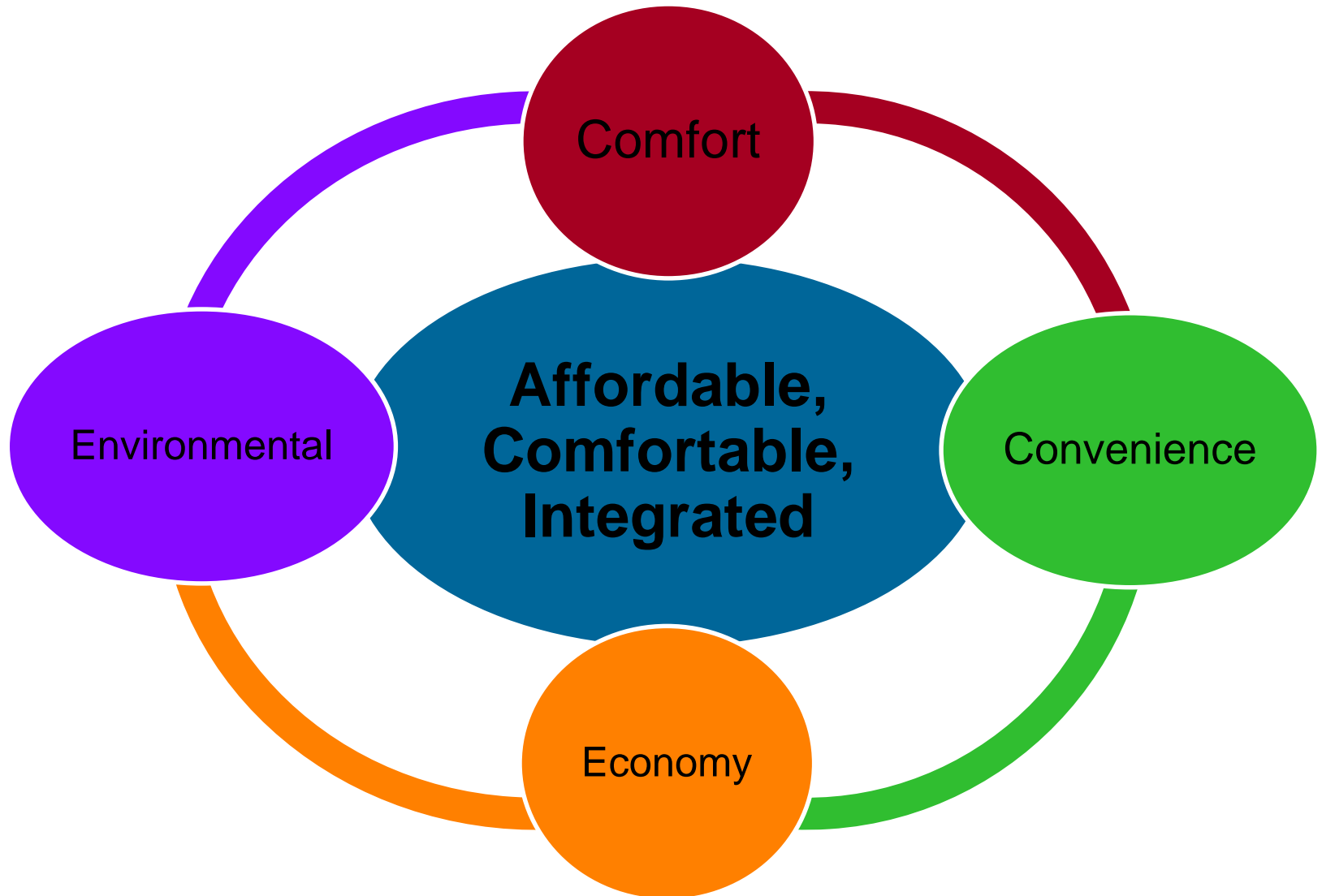
Q3 ETCC Meeting

September 8, 2016

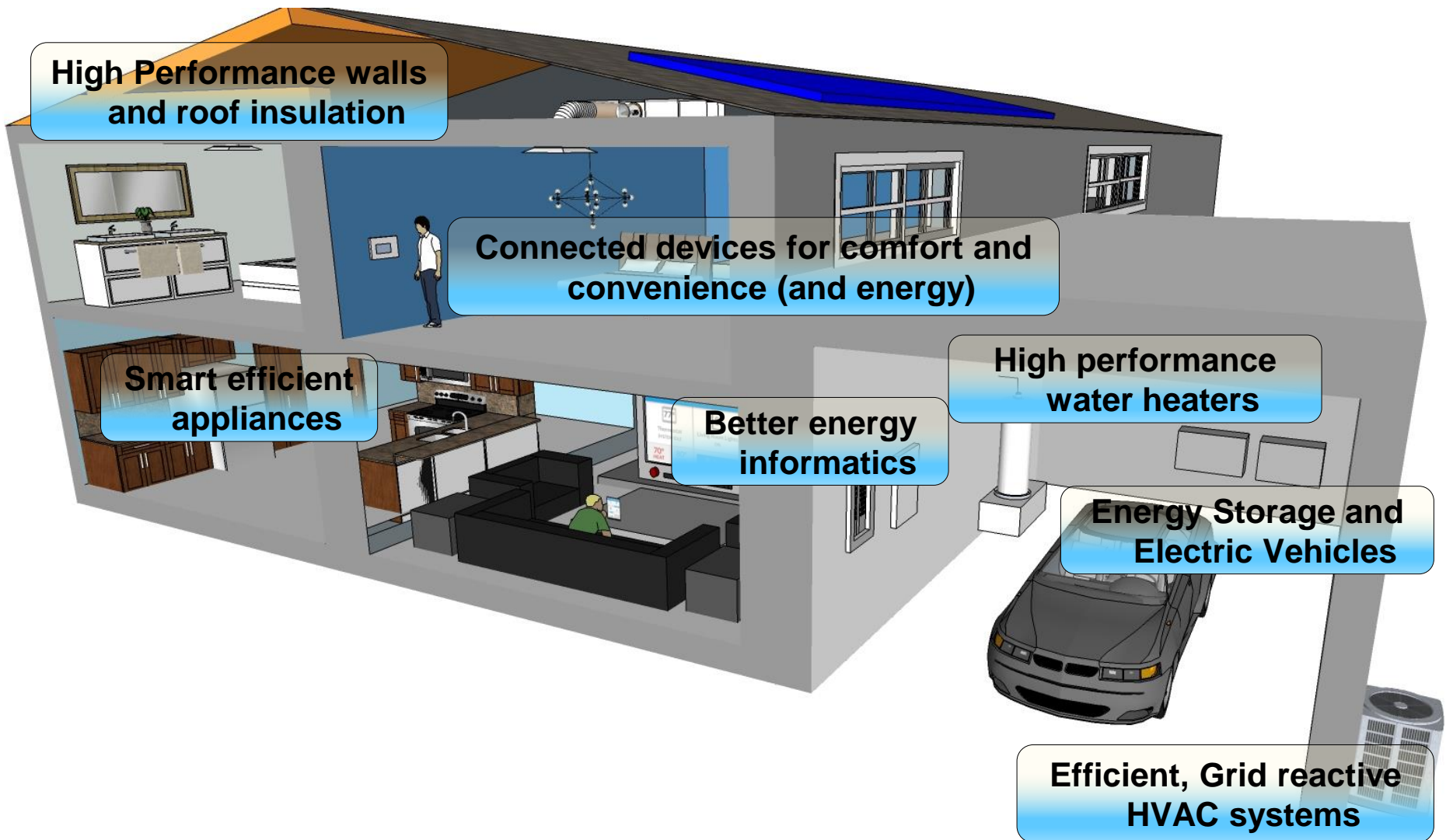
Ram Narayanamurthy
Electric Power Research Institute



Residential Customers want “Thoughtlessness”



Serving the customer of the future





Together...Shaping the Future of Electricity

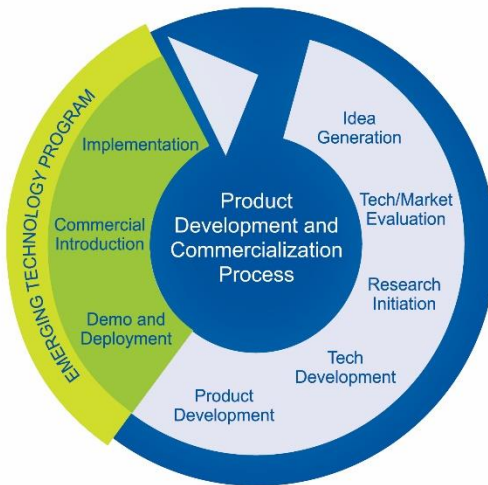
Ryan Kerr
Emerging Technologies Manager of End
Use Solutions | Gas Technology Institute

the Energy to Lead

California Residential 'Smart' Zoning Control

September 8, 2016

ETCC Quarterly Meeting



Ryan Kerr

Gas Technology Institute

Phone: 847.768.0941

ryan.kerr@gastechnology.org

Residential Zoning: What's Old is New Again



Background and Issue

- > The majority of single-family home use single or two zone forced air distribution HVAC systems
- > Traditional HVAC system design and operation can be inefficient, causing energy and comfort issues
 - ‘Over cooling’ home to meet desired temperature in a single zone
 - Cooling rooms without regular use

A Brief History

- > **Past:** Title 24 included credit for zoning
- > **Recent Past:** CEC project demonstrates energy penalty with zoned systems. In 2013, the CEC adopts code change that penalizes systems that include bypass dampers, and requires HERS verification of airflow (>350 cfm/ton) and watt draw (<0.58 W/cfm) in every zonal control mode
- > **Present:** New ‘smart’ zoning technologies gaining traction in marketplace, what now?

Residential Zoning 2.0



Thermostat



Smart Vent



The App



Future of Smart HVAC?

- > Consumers want more connected devices, home automation, and thermal comfort
- > EE programs want reduced HVAC system energy use and demand

Does consumer interest + 'smart' HVAC tech = a new EE solution?

- > Phase 1 (underway): PG&E's ETP is supporting a DEG/GTI lab home study to determine if new 'smart' zoning technologies operate as promised while meeting T24 requirements
- > Phase 2 (TBD): California ETP field assessment to evaluate energy and comfort benefits while investigating HVAC system interoperability

Chris Tumpach
President | Rainforest Automation



rainforestTM

a u t o m a t i o n

Chris Tumpach

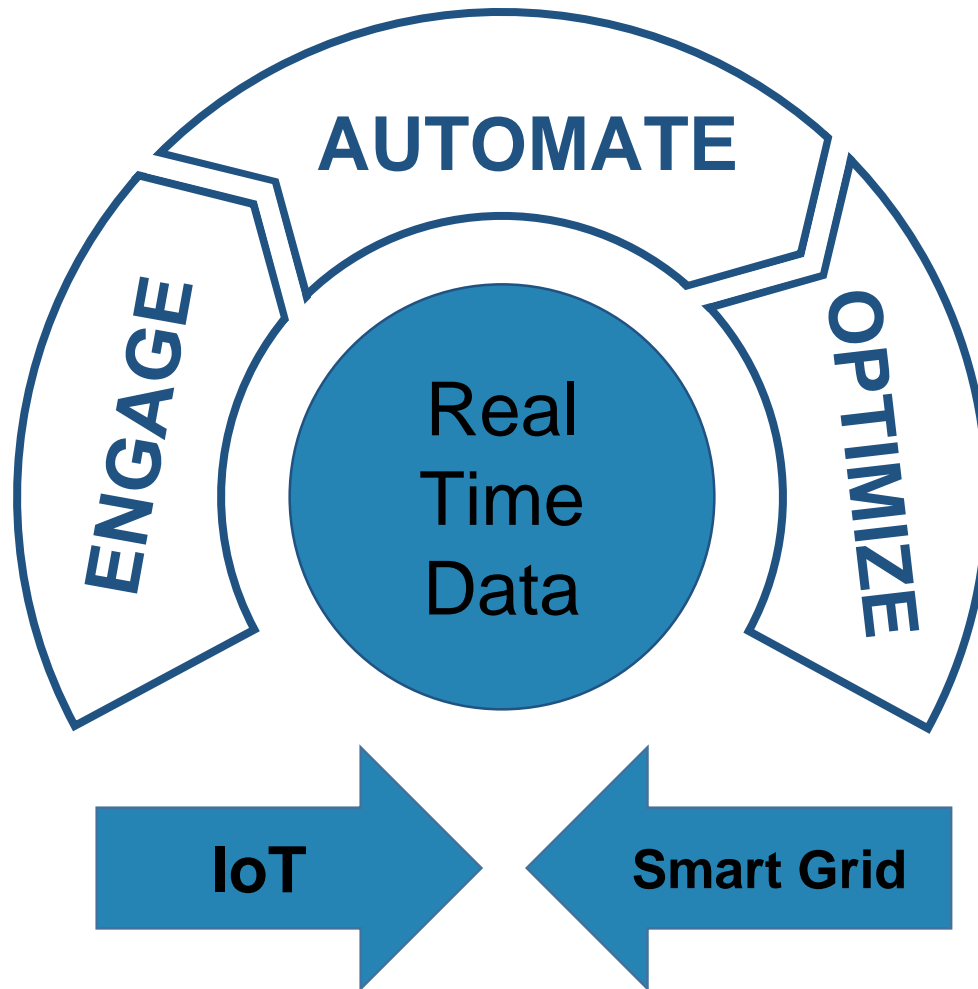
President

Rainforest Automation, Inc.

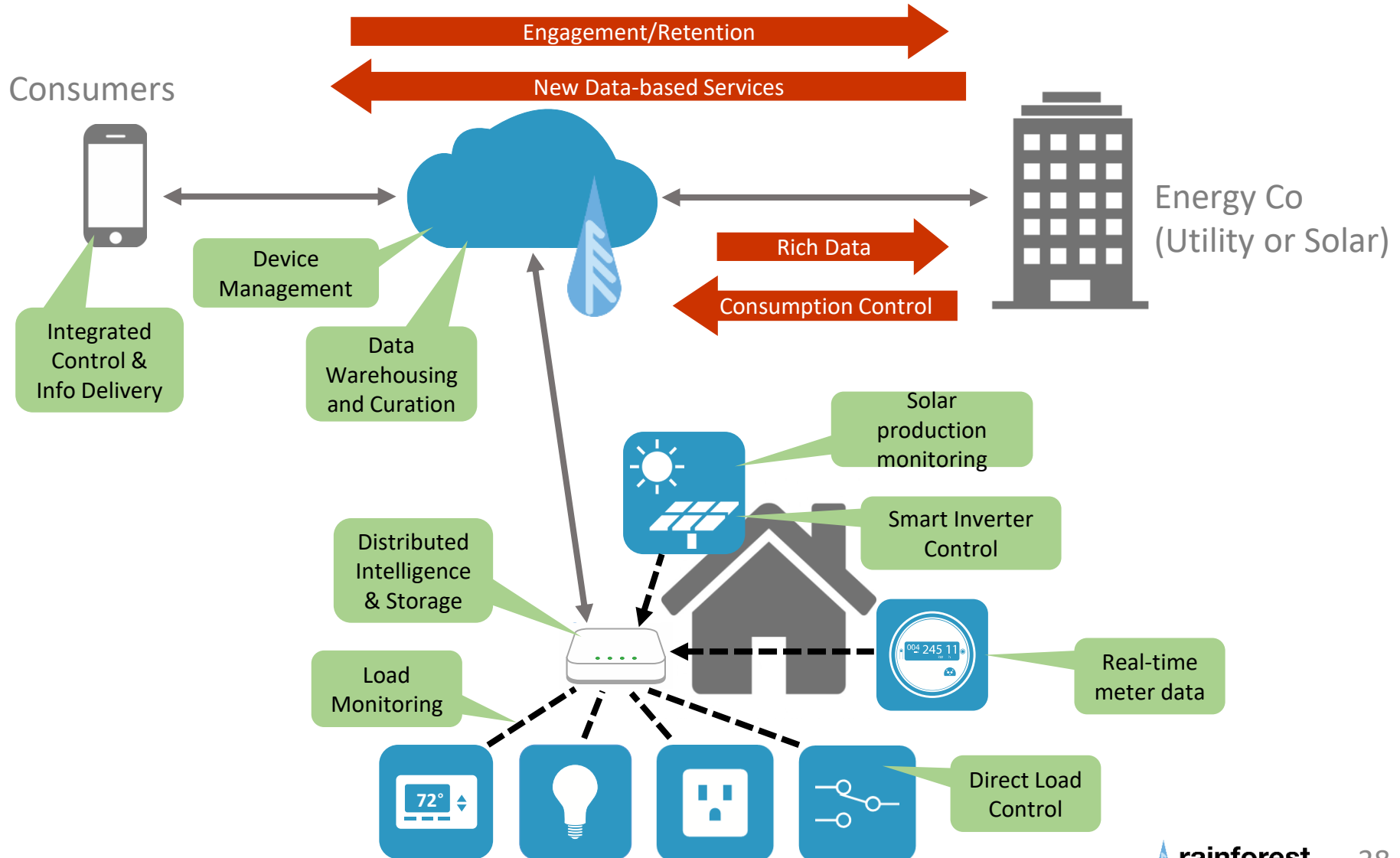
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Rainforest Automation



Our Energy-Focused IoT Solution



Essie Snell
Research Manager | E-Source

Essie Snell



Research Manager, E Source

303-345-9140, essie_snell@esource.com

Essie Snell, research manager with the Technology Assessment team at E Source, researches, writes, and presents on a wide range of established and cutting-edge energy-efficiency technologies spanning multiple sectors, and responds to hundreds of technical inquiries annually. Some of his core areas of expertise include home energy management systems, Internet of Things devices, water heating, and black-box technology evaluation. Essie also serves as the product manager of the E Source Business Energy Advisor tool. He holds a BS in engineering physics from the University of Colorado at Boulder.

A Handful of Smart Devices



Sources: iStock, ThinkEco, ecobee, US EPA





DISCUSSION / Q&A

BRICK AND MORTAR: INSIGHT INTO SPECIFIC TECHNOLOGIES REVOLUTIONIZING THE RESIDENTIAL SPACE

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Ryan Kerr, Emerging Technologies Manager of End Use Solutions | Gas Technology Institute

Chris Tumpach, President | Rainforest Automation

Essie Snell, Research Manager | E-Source

BREAK

Program will resume at 2:15 pm

PLEASE FILL OUT EVALUATIONS!



FOR SALE: BUYING INTO ENERGY EFFICIENCY

Spencer Sator, Principal Project Manager | Livingston Energy Innovations - *moderator*

Ram Dhanekula, Product Manager | San Diego Gas & Electric

Kari Binley, Sr. Industry Relations Manager – Retail | Pacific Gas & Electric

Stephen Bickel, Vice President, Product and Market Innovation | D+R International

Brandon De Young, Executive Vice President | De Young Properties

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Principal Project Manager | Livingston
Energy Innovations

Ram Dhanekula
Product Manager | San Diego Gas &
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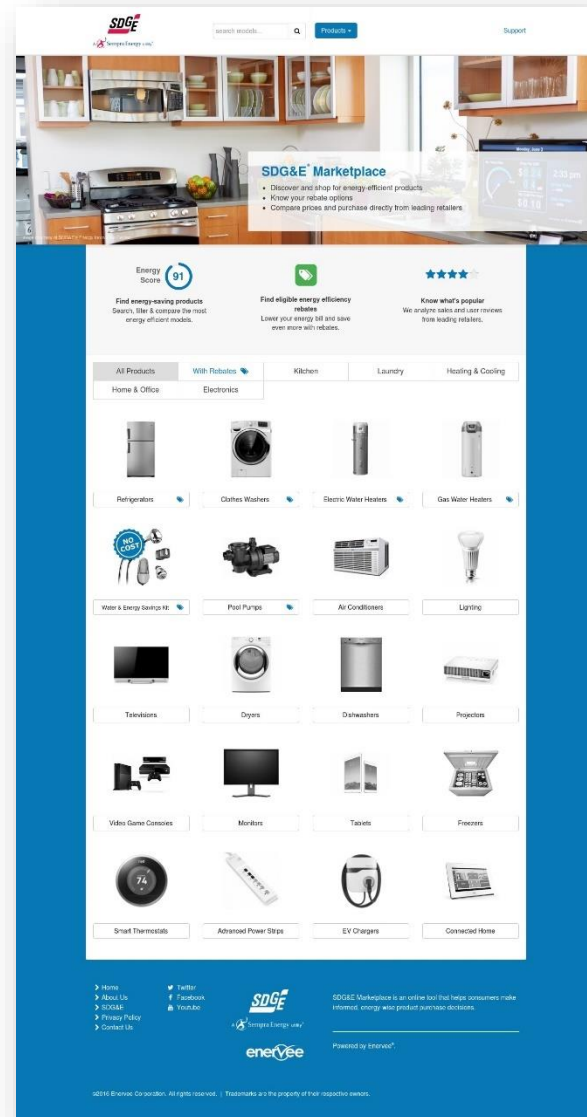


Ram Dhanekula

Product Manager, SDG&E Marketplace
Customer Programs & Services
RDhanekula@semprautilities.com

“Help SDG&E go beyond being an utility and become a trusted partner for customer’s energy solutions and services” – Marketplace Vision

<https://marketplace.sdge.com/>

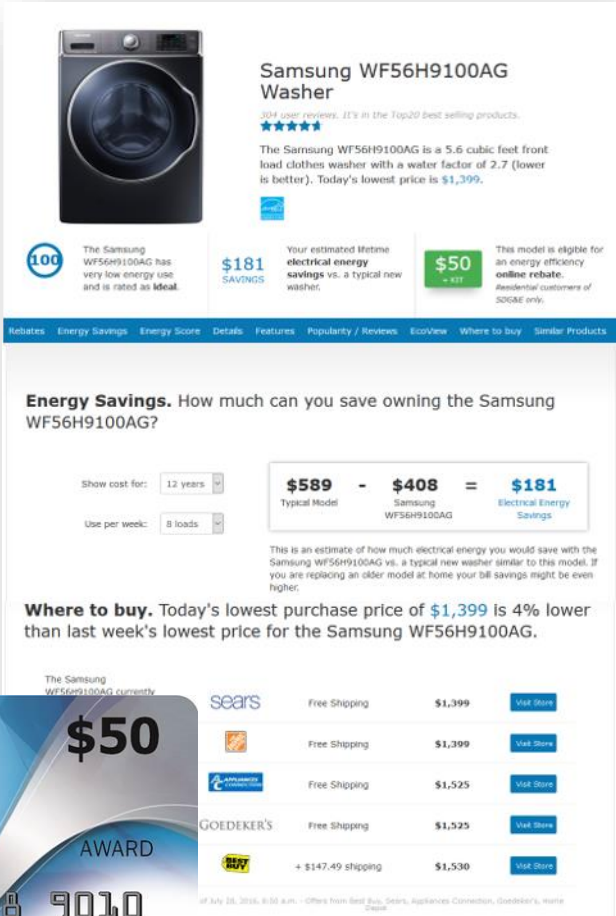


SDG&E Marketplace

- Robust shopping tool for customer engagement
- Launched in January 2016
- Over 200,000 site visits in 2016
- 20 product categories with over 7,800 products in catalog
- Products include Energy Efficiency Appliances, Connected Home Products, EV Chargers, etc.
- 3-5 day rebate processing
- Energy savings calculators

Marketplace Video

<https://youtu.be/1c1WW3D2-Ds>



Samsung WF56H9100AG Washer
 304 user reviews. It's in the Top20 best selling products.
 ★★★★★

The Samsung WF56H9100AG is a 5.6 cubic feet front load clothes washer with a water factor of 2.7 (lower is better). Today's lowest price is \$1,399.

100 The Samsung WF56H9100AG has very low energy use and is rated as **Ideal**.

\$181 SAVINGS Your estimated lifetime electrical energy savings vs. a typical new washer.

\$50 This model is eligible for an energy efficiency rebate. Residential customers of SDG&E only.

Rebates Energy Savings Energy Score Details Features Popularity / Reviews EcoView Where to buy Similar Products

Energy Savings. How much can you save owning the Samsung WF56H9100AG?

Show cost for: 12 years

Use per week: 8 loads

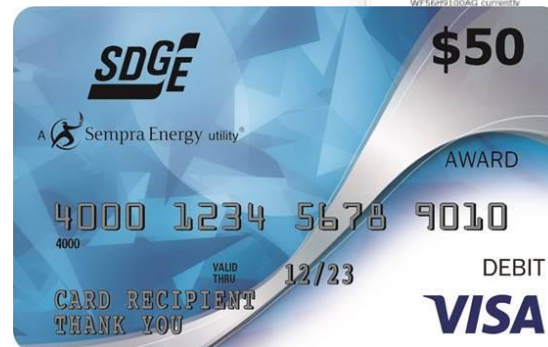
\$589 - **\$408** = **\$181**
 Typical Model Samsung WF56H9100AG Electrical Energy Savings

This is an estimate of how much electrical energy you would save with the Samsung WF56H9100AG vs. a typical new washer similar to this model. If you are replacing an older model at home your bill savings might be even higher.

Where to buy. Today's lowest purchase price of \$1,399 is 4% lower than last week's lowest price for the Samsung WF56H9100AG.

Retailer	Shipping	Price	Action
sears	Free Shipping	\$1,399	Visit Store
Amazon	Free Shipping	\$1,399	Visit Store
AMERICAN CONNECTION	Free Shipping	\$1,525	Visit Store
GOEDEKER'S	Free Shipping	\$1,525	Visit Store
BEY	+ \$147.49 shipping	\$1,530	Visit Store

of July 28, 2016, 9:50 a.m. - Offers from Best Buy, Sears, Appliances Connection, GoDecker's, more



Kari Binley
Sr. Industry Relations Manager - Retail |
Pacific Gas & Electric



Kari Binley

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Together, Building
a Better California





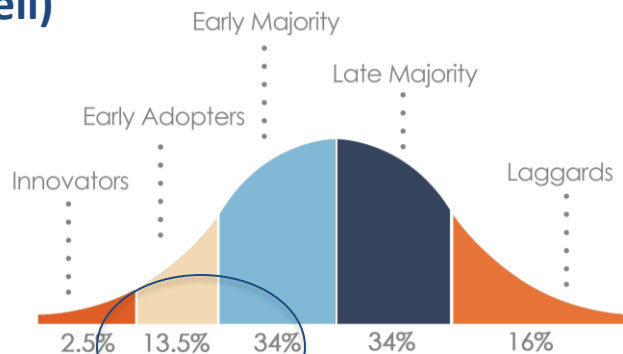
Top 3 Smart Home Products

(pre-Echo)

- Smart Locks (Ring Doorbell)
- Connected Lights
- Thermostats

Barriers to Adoption

- Interoperability
- Perceived Lack of Benefit
- Reliability
- Product Stability



Support Adoption

- Gather Data
 - Purchases
 - Use Cases
 - Usage Data
 - Usage Behavior

Beyond the Widget!

Fully behavioral
(e.g. DR prompts)

User controls
(e.g. remote via app)

User automates
(e.g. schedules)

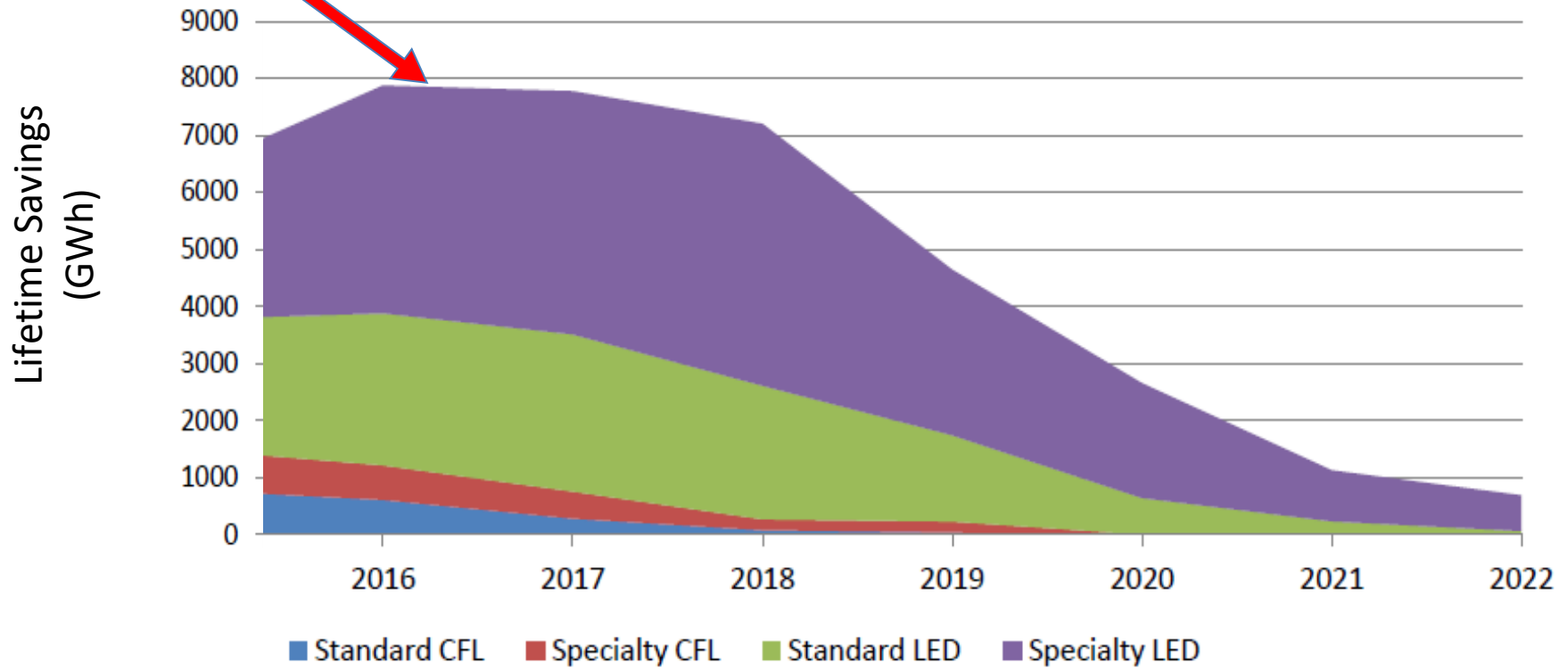
User sets rules
(e.g. via IFTTT)

Fully automated

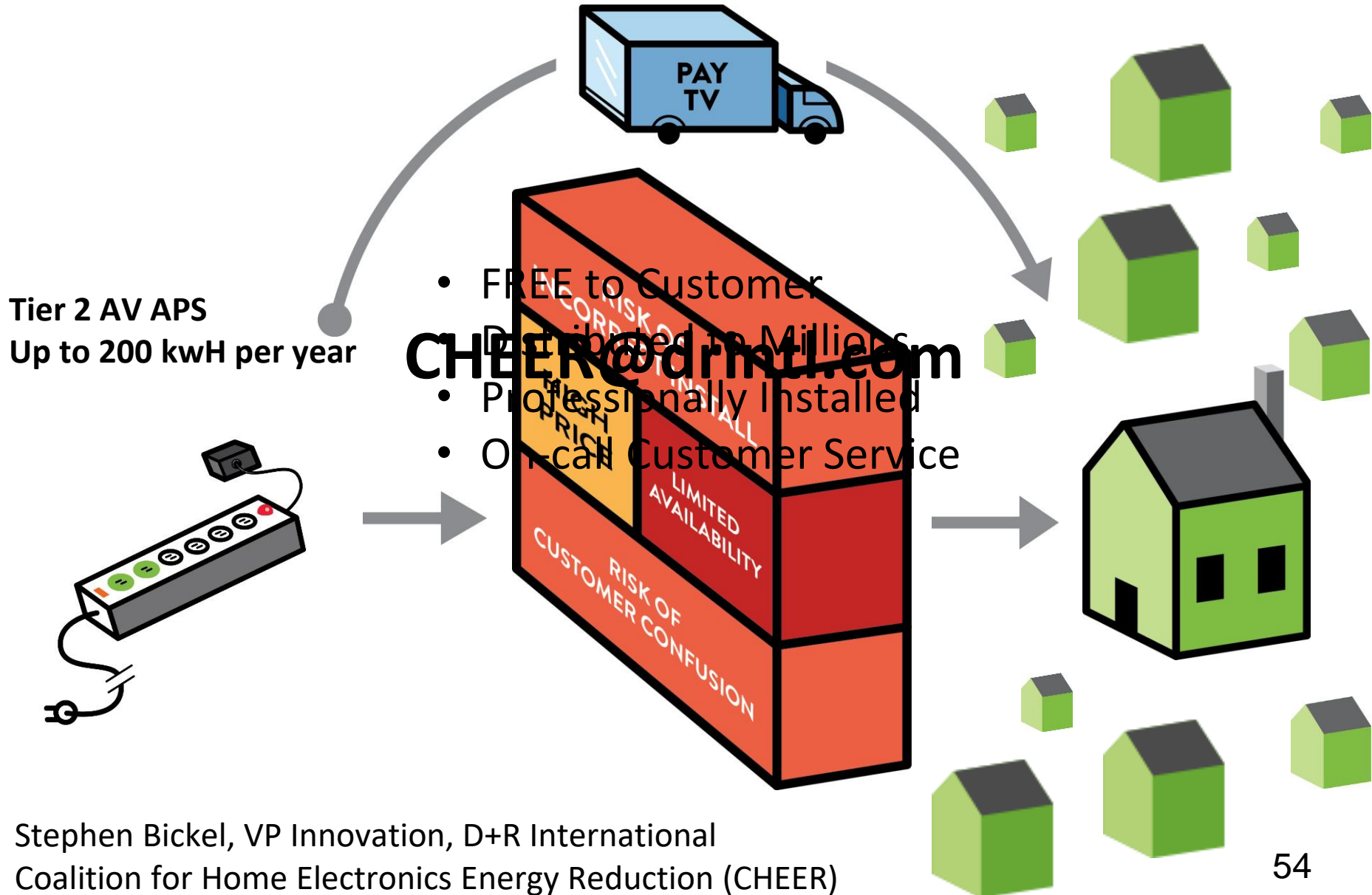
Stephen Bickel
Vice President, Product and Market
Innovation | D+R International

We are Here

Projected Lifetime Savings from Energy Efficient Residential Lighting in the Northeast (Model B)



Source: Northeast Energy Efficiency Partnership (NEEP), 2014



Brandon De Young
Executive Vice President | De Young
Properties



de young properties.



Brandon De Young

Executive Vice President

De Young Properties

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EnergySmart™ Features

ControlSmart Features

Zero Net Electric

Zero Net Energy

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Residence 205 Italianate

Zero Net Energy Home QUESTIONS & ANSWERS

- 1 What are the particulars of the Residence 205 home?**
This 2,064 square foot home includes three bedrooms, two baths, two car garage, dining room and den. It is available in five elevations: Italianate, Provence, Tuscan, Traditional and our newest, Cottage. The Residence 205 floorplan is currently being offered but the Zero Net Energy package is not available.
- 2 What exactly does it mean for a home to be considered Zero Net Energy?**
This Zero Net Energy (ZNE) Home is designed to be exceptionally energy efficient, and also produce its own electricity from a renewable source using a rooftop mounted photovoltaic (PV) solar system. The electricity produced should offset all energy consumed annually by the home, which is accounted for at the "source", meaning the power plant. This also means the home is designed to achieve zero net carbon. In saying that, homeowners are the key to a home actually being Zero Net Energy/Carbon, because the energy used annually depends on the homeowner's energy-use behaviors and habits.
- 3 Does that take into account natural gas consumption, as well?**
Zeroing "source" energy allows us to offset the home's natural gas use indirectly by producing more electricity with the solar system than is needed to offset the home's electricity use. The solar system is purposely sized to overproduce electricity, such that the surplus is equivalent to the amount of energy in the natural gas sent from the source to the home. Ultimately, the excess electricity the ZNE home produces will then be sent back through the grid to be used by other homes or nearby commercial buildings.
- 4 Will this home still receive energy bills?**
Yes, the home is still connected to PG&E's energy grid. Therefore, the normal fees charged to every customer, regardless of how much energy is used, will apply. Also, because this home is designed to zero its natural gas indirectly, it will still be charged for any natural gas used like every PG&E customer.
- 5 Why did De Young Properties decide to build this home?**
We are committed to leading-edge energy-efficient building science technology. This concept home will set the standard of new home construction for years to come. The De Young Zero Net Energy Home supports the California Long Term Energy Efficiency Strategic Plan that will require all new residential homes in California to be Zero Net Energy by 2020.
- 6 Is this the first Zero Net Energy Home in the Fresno area?**
We are not aware of any other ZNE homes like this in our area at this time.
- 7 Can the Zero Net Energy Home be toured?**
Yes, the ZNE Home is open to the public for tours daily at the De Young Armstrong Welcome Center located on Armstrong, just south of Gettysburg. Please call for hours.



www.deyoungproperties.com • 559.407.0335

Print Date: June 2016. Cal. Contractors Lic. 824208. Offered by De Young Realty, Inc. CA Bureau of Real Estate, Real Estate Broker Lic. 01254160. The De Young Zero Net Energy Home will be evaluated as a concept home and is not currently offered for sale. © 2013-2016. All rights reserved.



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SESSION WRAP-UP

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