

Program will start at 10:00 am



ETCC QUARTERLY MEETING: *WHOLE HOME ENERGY MANAGEMENT*

December 6, 2017
Energy Innovation Center
HOSTED BY: San Diego Gas & Electric

Wifi: SE-Visitor WIFI code: xekx5199

Welcome, Safety and ETCC Updates

Kate Zeng

Technology Innovation Strategies & Programs
Manager | San Diego Gas & Electric

WELCOME!

Before we get started....
housekeeping and safety

FOR OUR ONLINE MEETING PARTICIPANTS

- Quick logistics
 - Phone lines are muted
 - 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 of 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
10:15 AM	Understanding the Policy and Technology Landscape of Residential Efficiency in California
11:15 AM	Working Together to Decode the Marketplace and Drive Innovation
12:20 PM	LUNCH (provided)
1:15 PM	What's the Next BIG Thing? Promising Technologies and Advanced Approaches
2:15 PM	BREAK
2:30 PM	Where the Rubber Meets the Road: Converting Opportunities into Success Stories
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...”

Emerging Technologies

Programs

Codes and Standards

Zero Net Energy



LED Lighting



EE Rebates



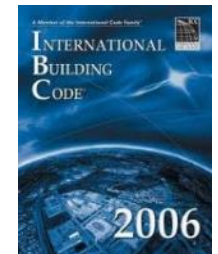
Retail and Manufacturer Strategy



Appliance Standards



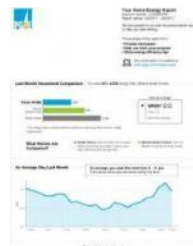
Building Codes



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)

ETCC CHANGES IN 2018

- California IOUs are transitioning to a 10-year rolling portfolio
- Some core ET activities will be consolidated with 2 statewide lead administrators: SCE and SoCalGas
- To adapt to the evolving landscape ETCC events will undergo an evolution as well
 - ET Summit and Quarterly Meetings will transition into twice-annual ET events that include both workshops and sessions
- Other important changes to look forward to in 2018 include Business and Implementation Plans, Technology Priority Maps, and Technology-Focused Pilots



UNDERSTANDING THE POLICY AND TECHNOLOGY LANDSCAPE OF RESIDENTIAL EFFICIENCY IN CALIFORNIA

Carol Yin, Evaluation Consultant | Yinsight - *moderator*

Mazi Shirakh, ZNE Lead | CEC

Sasha Alexander, Analyst | CPUC

Edwin Hornquist, Emerging Technologies Program Manager | SCE

Jeff Horn, Emerging Technologies Manager | Southern California Gas Company

Carol Yin
Evaluation Consultant | Yinsight

Mazi Shirakh
ZNE Lead | CEC



Building Energy Efficiency Standards

Proposed 2019 Building Energy Efficiency Standards ZNE Strategy

Building Standards Office:

Mazi Shirakh, PE

ZNE Lead and Advisor for Building Energy
Efficiency Standards (BEES)

Christopher Meyer

Manager, Building Standards Office

Bill Pennington

Senior Technical and Program Advisor to the
Energy Efficiency Division

Payam Bozogchami, PE

Project Manager, BEES

Danny Tam

Mechanical Engineer

Countdown to 2020

December 5, 2017

2019 Standards Goals – Path to the Future



1. Increase building energy efficiency cost effectively
2. For Part 6, make **progress toward the ZNE** goal as possible within the **confines of NEM and life cycle costing rules**, while recognizing that Part 6 is an important but not the only tool for achieving ZNE
3. Contribute to the State's GHG reduction goals
4. **Promote self-utilization of the PV generation** by encouraging or requiring **demand flexibility and grid harmonization strategies**
5. Provide **independent compliance path** for both mixed-fuel and all electric homes
6. Achieve the above goals while ensuring real benefits for the building occupants with **positive benefit to cost ratios** for all efficiency and generation measures
7. Provide the tools for local governments to adopt **ordinances to achieve ZNE through Part 11 Reach Codes**, and other beyond code practices

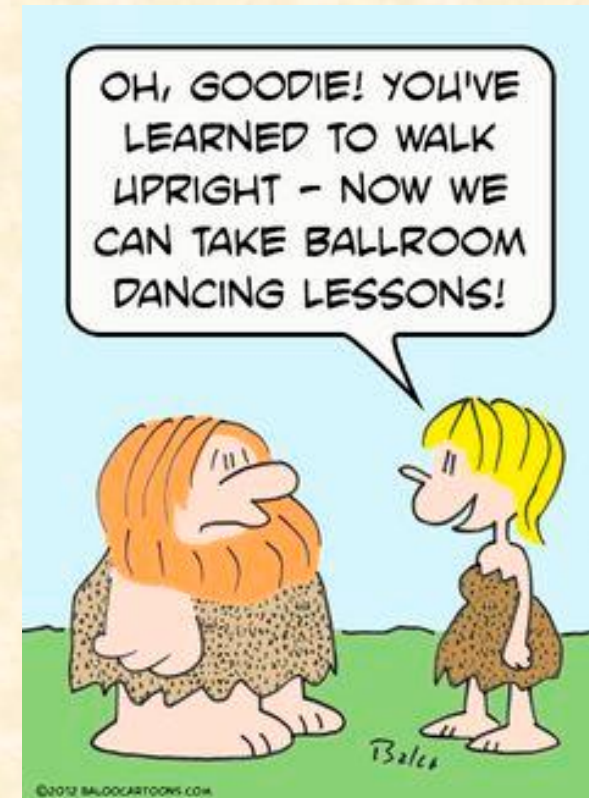
The proposed 2019 Standards strategy will accomplish all seven goals listed above



Lessons Learned – Grid Harmonization

Grid harmonization strategies (GHS) must be coupled with customer owned PV systems to bring maximum benefits to the grid, environment, and the home owner

GHSs are strategies that maximize self-utilization of the PV array output and minimize exports back to the grid; examples of GHS include but are not limited to battery storage, demand response, thermal storage, and for some homeowners, EV grid integration.



Proposed 2019 Standards Approach



1. Maximize envelope efficiency as allowed by LCC and calculate EE EDR
 - i. HPA to R19 in severe CZs – Currently R13
 - ii. HPW to 0.043 ~ 0.046 U-factor in severe CZs – Currently 0.051
 - iii. Windows U-factor of 0.30 and SHGC of 0.23 – Currently 0.32 and 0.25
 - iv. QII as a prescriptive requirement

Establish an Energy Design Rating (EDR) for energy efficiency in each CZ **that can only be met with efficiency measures (no PV tradeoff against EE)**

2. Calculate EDR of PV system as follows:
 - i. Calculate the PV size required to displace the kWh in each CZ
 - ii. Calculate the EDR contribution of the PV array
3. Subtract the PV EDR contribution from the EE EDR contribution to **establish the final EDR that the building must meet to comply in each CZ**

Note: Examples on slide 20

Questions?



Target EDR Examples by Climate Zone

Here are examples of how Target EDRs might look for different scenarios in different CZs for the 2,700 sf **Mixed Fuel Homes**:

Note: At this time these numbers are examples only and may change as our tools evolve

NEM = Net Energy Metering; GH = Grid Harmonization; Dumb PV = No Battery Storage

1	2	3	4	5	6	7	8	9	10	11
CZ	Efficiency EDR without PV, based on 2019 Efficiency Measures	Target Design Rating Score for Displacing kWh Elect with PV from Col 4	PV Sized to Displace Annual kWh Electric – Cool with NEM, not so Cool with GH	Dumb PV Sized to Zero EDR – Violates NEM, Not Cool with GH	PV Size for Zero EDR with Basic Battery Controls – May Violate NEM, OK with GH	PV Size for Zero EDR with Optimum Battery Controls – Cool with NEM and GH	Similar to Col 7 But With 95 Furn, 0.95 WH – Real Cool with NEM and GH	Col 6 to 4 Ratio	Col 7 to 4 Ratio	Col 8 to 4 Ratio
1	48.0	26.5	3.4	7.7	6.9	4.6	4.1	2.0	1.4	1.2
2	41.2	18.0	2.9	6.1	5.5	3.1	2.8	1.9	1.1	1.0
3	46.9	22.7	2.8	5.8	5.3	3.2	2.9	1.9	1.1	1.0
6	48.0	20.9	2.9	5.3	4.5	2.9	2.8	1.6	1.0	1.0
7	48.0	14.9	2.7	4.6	3.9	2.4	2.3	1.4	0.9	0.9
8	43.0	14.6	2.9	5.3	4.3	2.7	2.6	1.5	0.9	0.9
11	43.3	23.4	3.8	8.5	6.5	4.4	4.2	1.7	1.2	1.1
12	43.1	24.5	3.1	7.0	5.8	3.8	3.5	1.9	1.2	1.1
13	44.8	22.1	4.0	9.0	6.2	4.9	4.6	1.6	1.2	1.2
14	44.6	21.3	3.4	7.4	5.4	4.4	4.1	1.6	1.3	1.2
15	48.0	17.9	5.7	10.5	8.1	6.9	6.8	1.4	1.2	1.2
16	46.3	27.5	3.0	7.6	6.5	4.8	4.3	2.2	1.6	1.4

Sasha Merigan
Analyst | CPUC



Emerging Technology Program: Residential



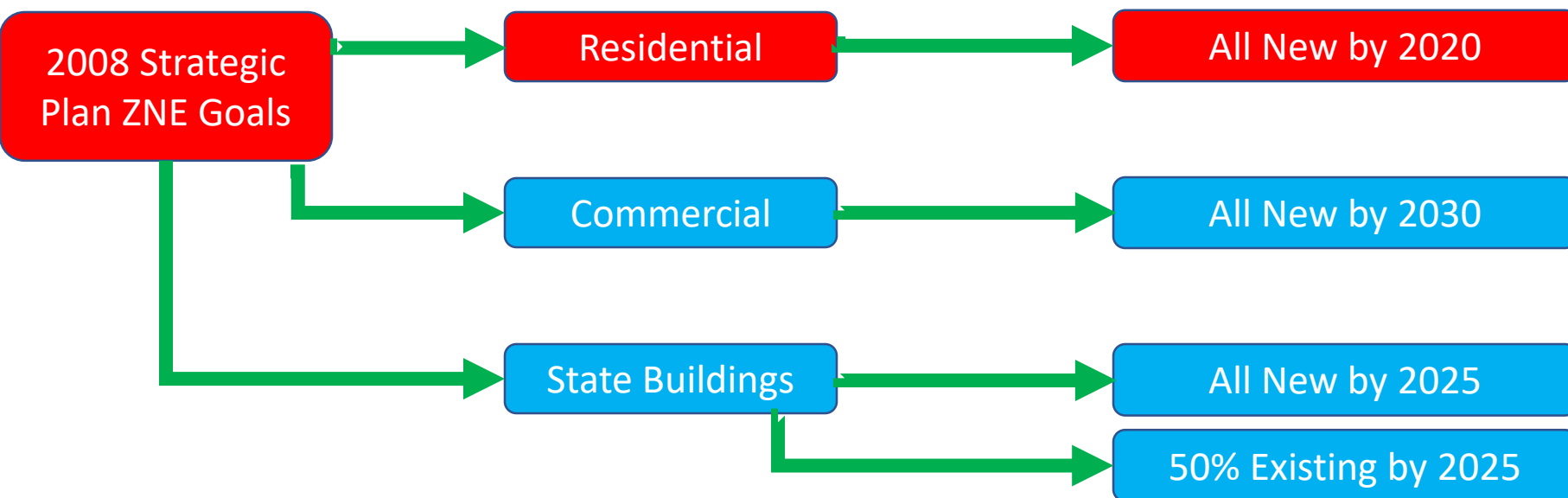
December 6, 2017

Sasha Merigan
CPUC Analyst

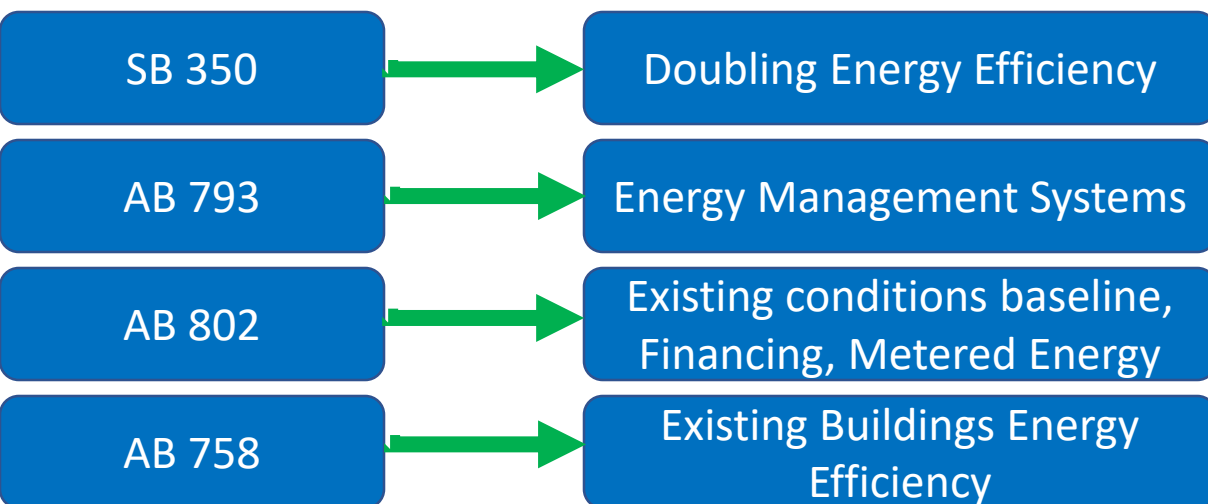
Emerging Technology Program lead
ZNE, Metered Energy, Market Transformation



Residential Zero Net Energy Policy Background

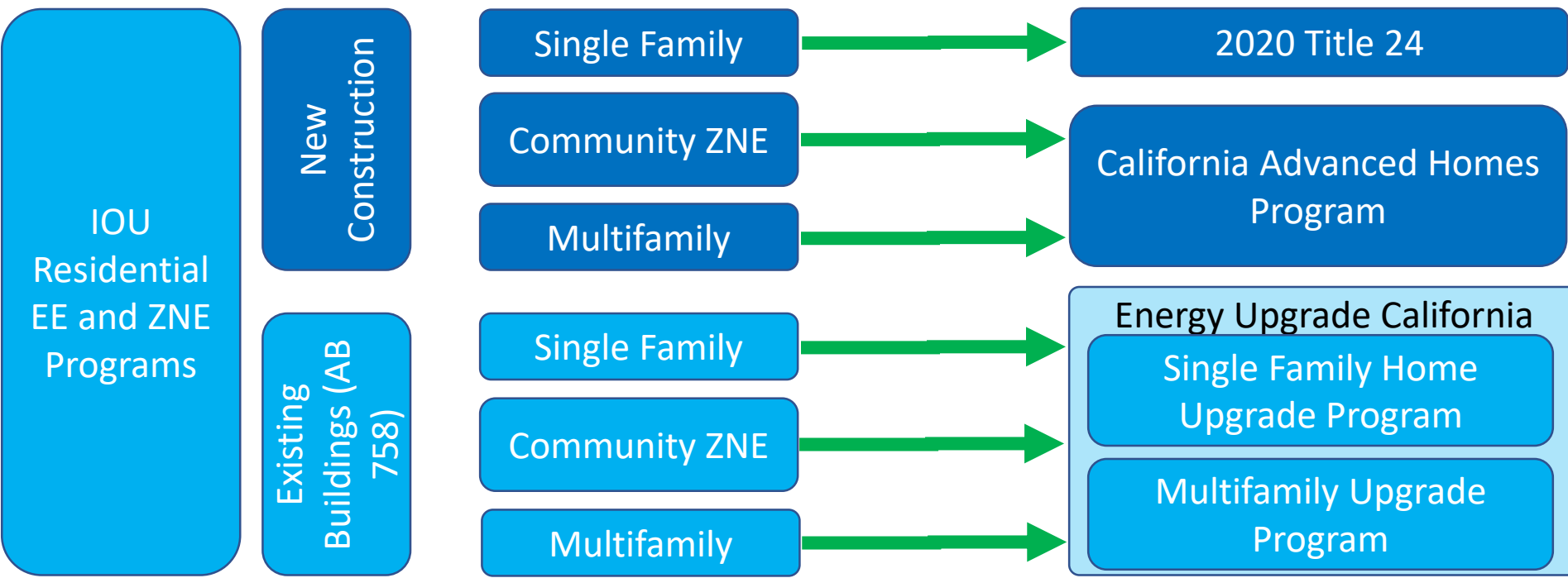
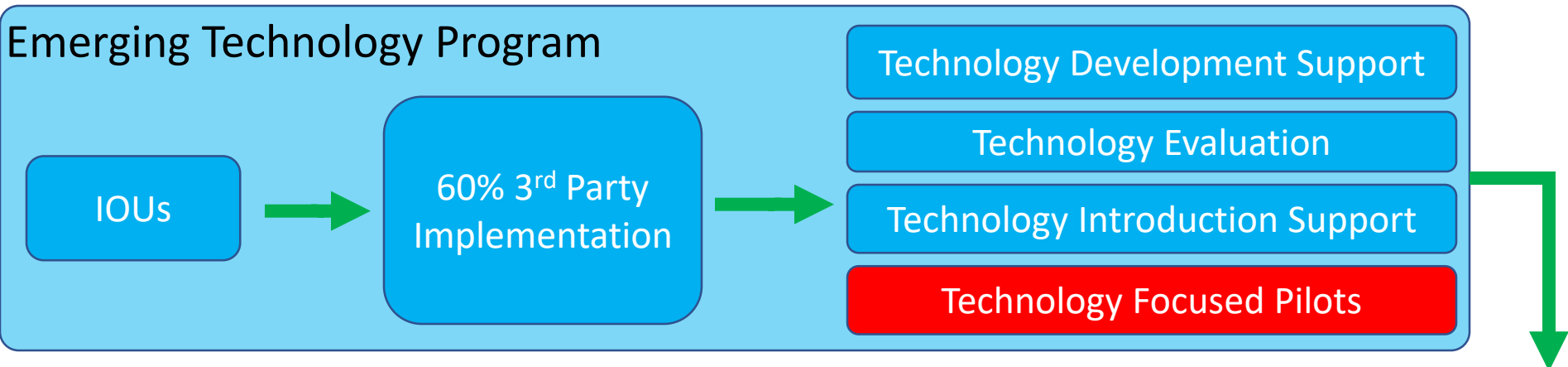


State Legislation



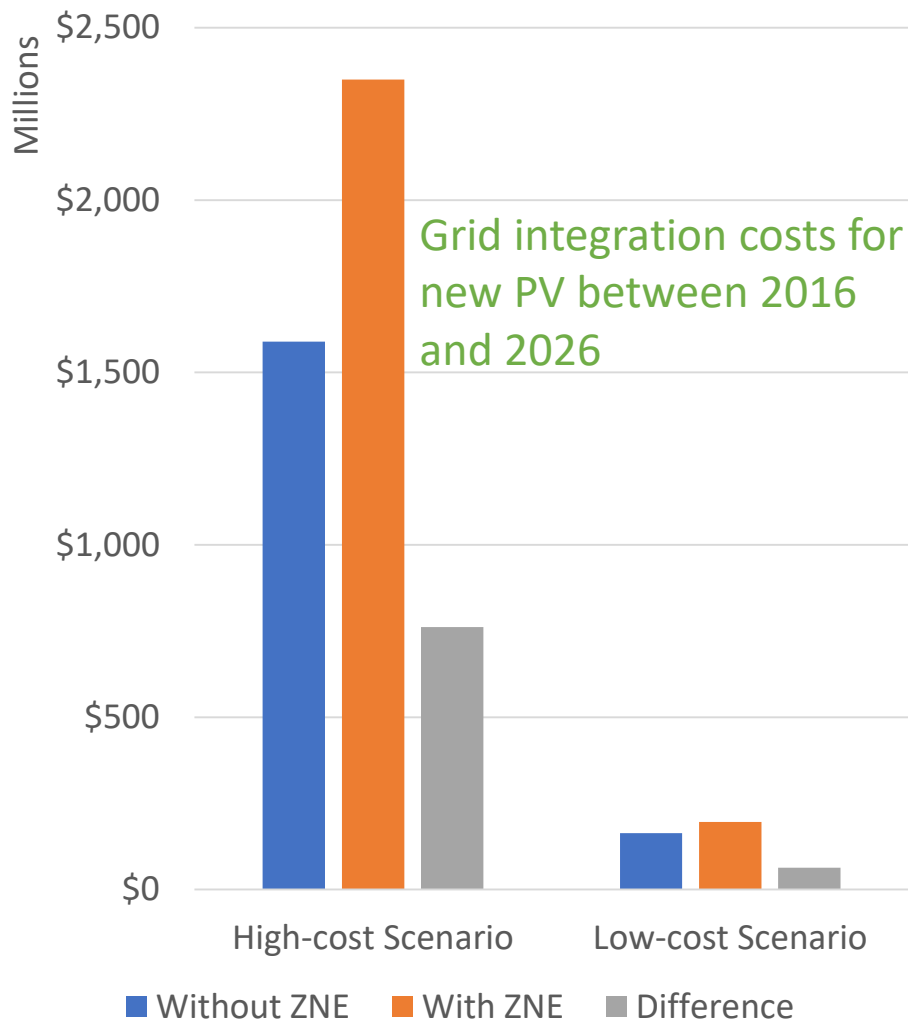


ETP and Residential Programs

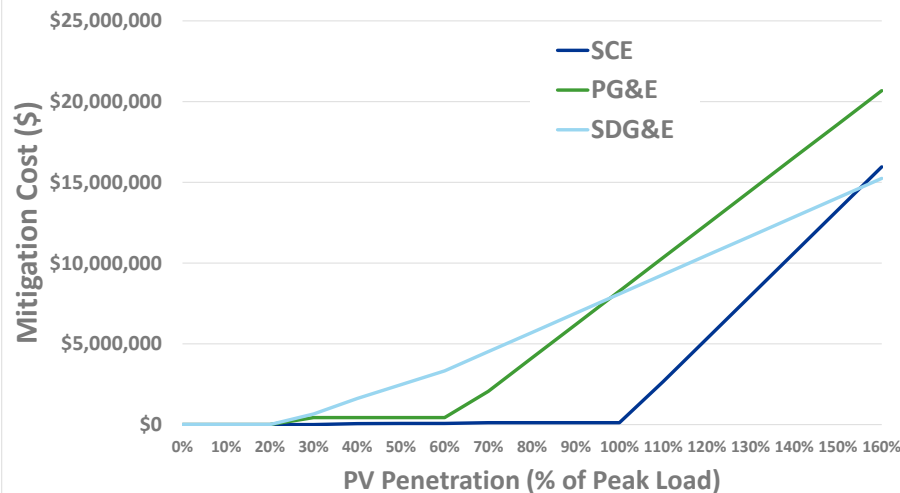




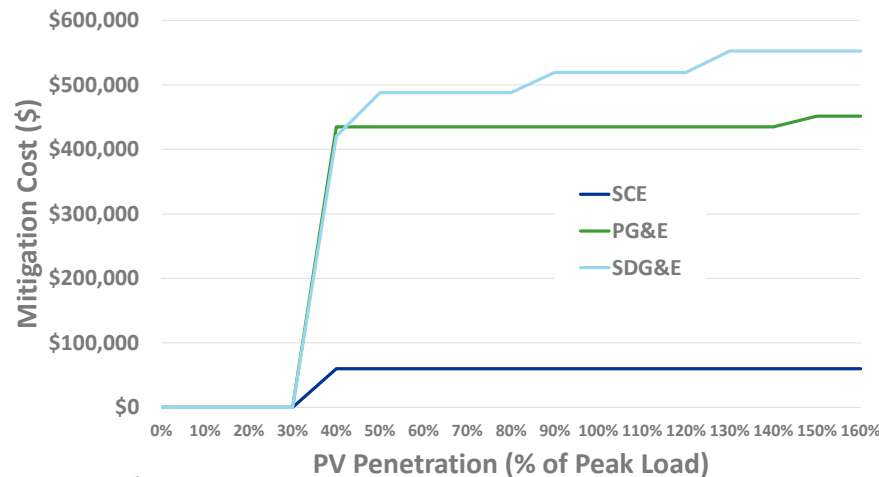
CPUC's Grid Integration Study Results



Illustrative Results - High Cost Case



Illustrative Results - Low Cost Case



High Cost case - all ZNE homes lumped together in one place

Low Cost case – ZNE homes distributed throughout feeder

Edwin Hornquist
Emerging Technologies Program
Manager | SCE

The Future for Statewide ET Program Administration and Technology Priority Maps (TPMs)

Edwin Hornquist
Sr. Program Manager, ETP



ET Business Plan Proposal - Key Features

- Business Plans files by IOUs in January 2017
 - PUC Decision Expected Early 2018
- Transition to two ET statewide administrators in 2018:
 - Electric – Southern California Edison
 - Gas: Southern California Gas Company
- Statewide program implementation to be directed through Technology Priority Maps (TPMs)
 - Strategic Planning function
- SW Program Design
 - Implementers to play a central role in “designing and implementation” of key program areas leveraging TPMs
- 3 Key Program Objectives
 - Provide PAs a comprehensive set of suitable technology options for new measures.
 - Provide PAs actionable market information to inform program design.
 - Confirm that technology development partners understand what measures programs need
- Continue leveraging current program core competencies
 - Assessment and validation of technologies and solutions
 - Demonstrations, Scaled Field Placements, Showcases of potential new solutions
 - Other

Technology Priority Maps (TPMs)

Energy for What's AheadSM



TPM Development Process

A comprehensive vision for 6 technology areas:

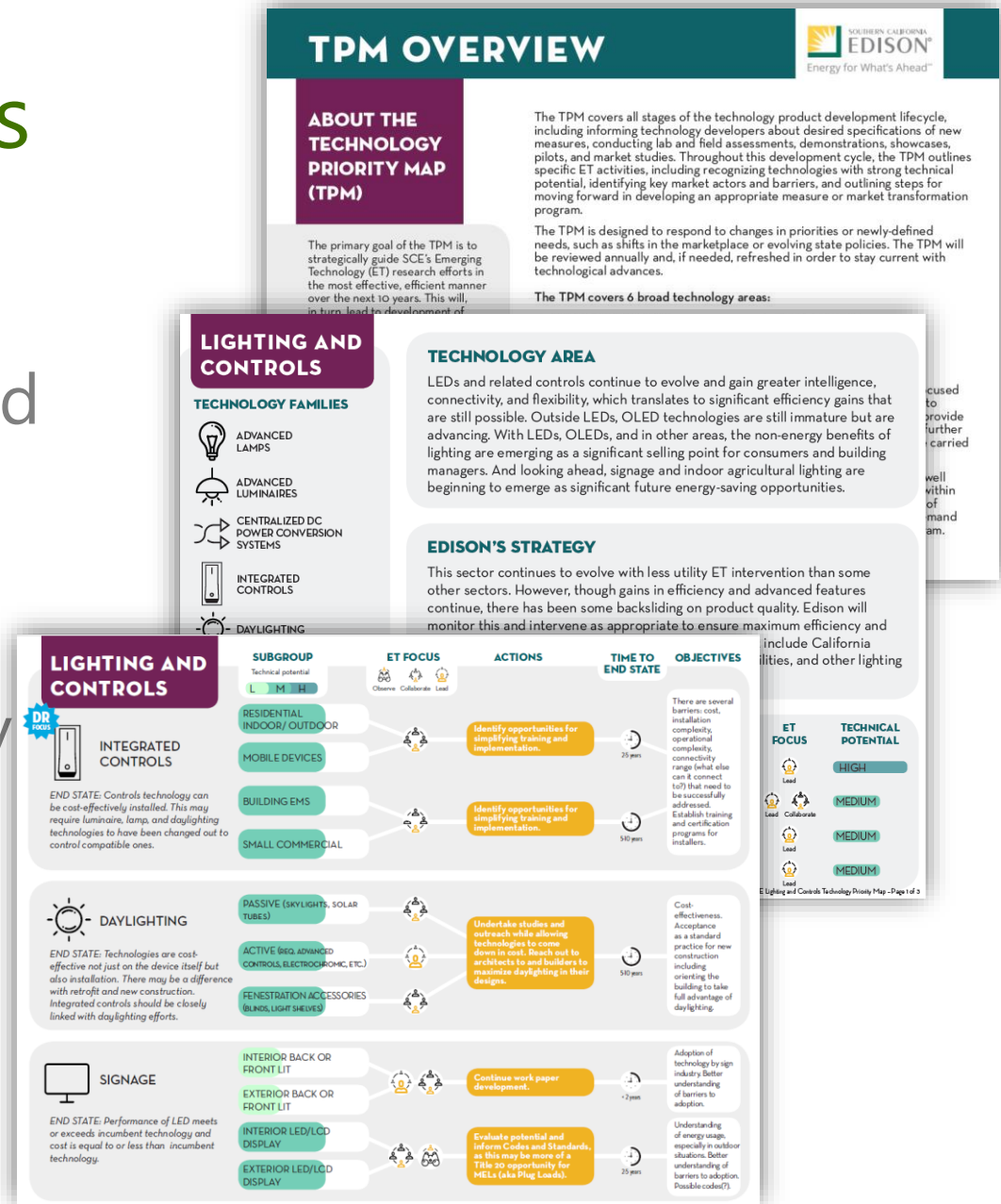
- Lighting and Controls
- HVAC
- Water and Agriculture
- Process Loads
- Whole Buildings
- Plug Loads



- These were further broken down into 45 technology families and 200+ individual technology types or areas of focus

The data from the interactive tool was further simplified and streamlined into a pair of deliverables:

- A high-level executive summary
- A more in-depth, visually-focused technology guide



The Future of the TPM as Statewide Tool

- The TPM was designed to be updated as needed
 - TPM is a living resource that will evolve Statewide needs and the technology landscape evolve
- Designed as a template for statewide implementation of IOU ET Programs for both setting strategy and aligning efforts
 - Approach has been adopted by IOUs
 - Currently incorporating IOU feedback before seeking broader input (e.g. ETCC Advisory Council and broader post Business Plan decision)
 - Part of the review to include a Technology Focused Pilots (TFP) prioritization

Thank you!



Jeff Horn
Emerging Technologies Manager |
Southern California Gas Company

Innovation

EMERGING TECHNOLOGIES – RESIDENTIAL

JEFF HORN
TECHNOLOGY DEVELOPMENT MANAGER
213-244-2677
JHORN@SEMPRAUTILITIES.COM

Selected SoCalGas Residential Efficiency ET

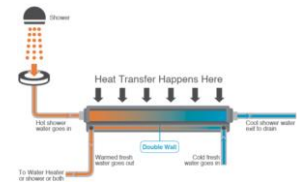
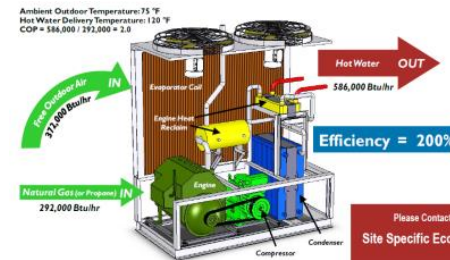
Home Heating -
Compact gas furnace
for tight or ZNE homes



Hot Water—connected
showerheads, dw heat
recovery, GAHPWH



Connectivity –
compact gas meter



ZNE and Low Income -
Solutions and integration



DISCUSSION AND Q&A

Carol Yin, Evaluation Consultant | Yinsight - *moderator*

Mazi Shirakh, ZNE Lead | CEC

Sasha Alexander, Analyst | CPUC

Edwin Hornquist, Emerging Technologies Program Manager | SCE

Jeff Horn, Emerging Technologies Manager | Southern California Gas Company

WORKING TOGETHER TO DECODE THE MARKETPLACE AND DRIVE INNOVATION

Tyler Sybert, ZNE Lead | SDG&E - *moderator*

Chris Carradine, Executive Vice President, Business Development |
ecobee

Stephan Barsun, Sr. Principal Energy Consultant | Itron

Steve Slayzak, Vice President of Technology | Seeley International

James Jackson, Business Development Manager | Emerson – Comfort
Guard

Tyler Sybert
ZNE Lead | SDG&E

Chris Carradine
Executive Vice President, Business
Development | ecobee

Stephan Barsun
Sr. Principal Energy Consultant | Itron

ITRON CAPABILITIES



MEASUREMENT

- » Sensors
- » Meters
- » Controls
- » Communications Modules



MANAGEMENT

- » Enterprise Meter Data Management
- » Fixed, Mobile & Hybrid Networks
- » Multi-protocol Deployment (RF, Cellular, PLC)



ANALYSIS

- » Forecasting
- » Analytics
 - Distributed Intelligence
 - Centralized

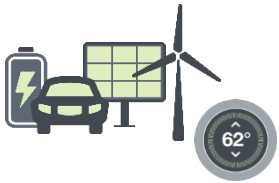


OUTCOMES

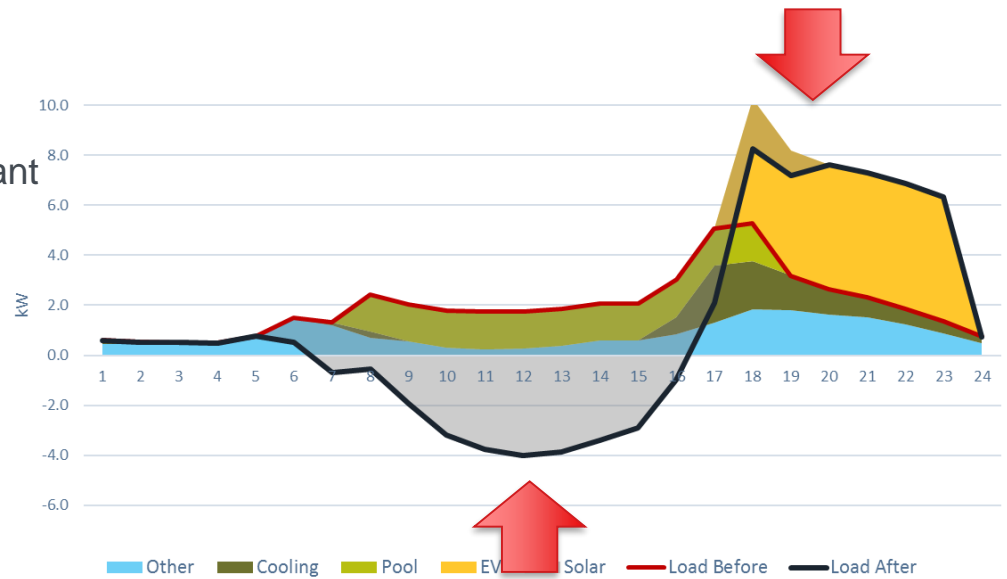
- » Outcomes as a Service
- » Managed Services
- » Software as a Service
- » Consulting
- » Efficiency & Demand Response Program Evaluation
- » System & Solution Integration

STEPHAN BARSUN

Distributed Energy Resource (DER) Consultant

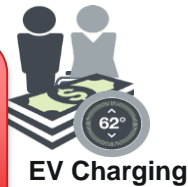


Evaluating and
Integrating DER's

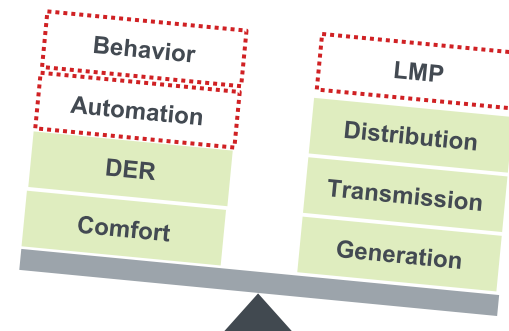


Integrated DER Optimization

CUSTOMER



EV Charging



BALANCING MUTUAL BENEFIT

GRID



Itron Barsun ETCC |

Steve Slayzak
Vice President of Technology | Seeley
International

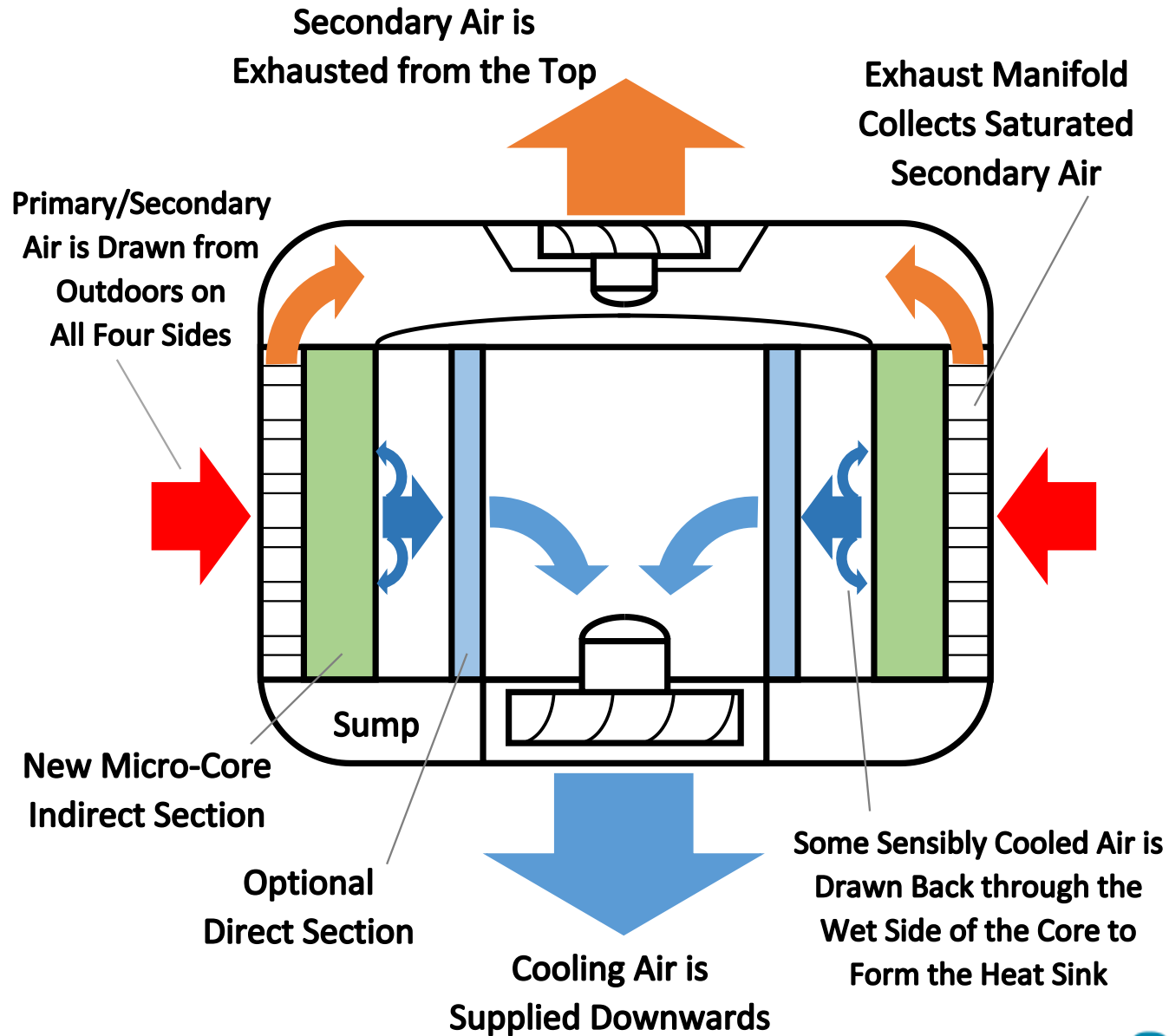


Title 24 Compliance for New Technologies

sslayzak@seeleyinternational.com



CW3 Micro-core Innovation



CW3 Micro-Core Innovation

- 3,000cfm of Indirect or Indirect-Direct Displacement Cooling
- Sub-wetbulb Supply Temperature
 - 110% Nominal All-Indirect Wetbulb Effectiveness
- 4ton (15kW) Nominal Capacity @100F/70wb
- 1.5kW Peak Power Draw
- 50+ Annual EER



Indirect Evaporative Cooling in Title 24

- Title 24 compliance is documented through CEC's CBEC-Com and CBEC-Res based on custom hourly energy simulation
 - Energy Plus for Commercial
 - California Simulation Engine for Residential
- Simulation models for advanced, sub-wetbulb IEC and hybrids are not available
- Development Status: Stakeholder team is completing a Hybrid Black Box module to accommodate multiple technologies
 - CEC, LBNL, NREL, WCEC, Seeley, Munters, and Integrated Comfort
- New CW3 residential IEC demonstration underway with SDGE
- Development and release cycles are far too long to support rapid innovation



Coolerado
4430 Glencoe St.
Denver, CO 80216

Phone 303.375.0878
Coolerado.com



Seeley International Pty Ltd
112 O'Sullivan Beach Road
Lonsdale SA 5160
Australia

Phone +61 8 8328 3850
seeleyinternational.com

Big Picture Savings by Application

California Energy and Peak Demand Reductions

	Retail	QSR	Data Centers
Size (sqft)	20,000	2,000	1,000
Capacity tons	50	20	60
Current Peak kW	80	32	96
Nominal Coolerado #units	4	4	25
Aggressive Coolerado #units	12	8	35

Peak Savings

Coolerado Peak kW Savings	13 (17%)	5 (16%)	48 (50%)
Aggressive Coolerado Peak kW Savings	40 (50%)	10 (33%)	86 (90%)

Energy Savings

Current kWh Usage	120,000	220,000	1,800,000
Coolerado kWh Savings	40,000 (33%)	120,000 (55%)	1,620,000 (90%)
Aggressive Coolerado kWh Savings	80,000 (67%)	180,000 (82%)	1,710,000 (95%)

Big Picture Economics by Application

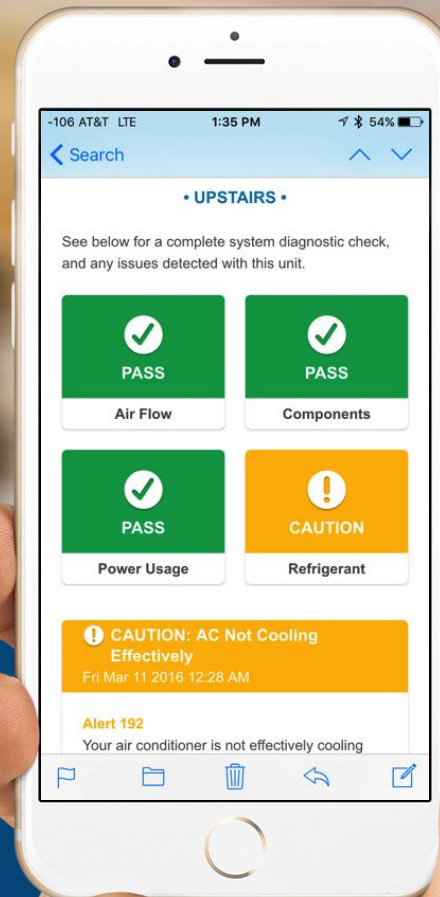
California Energy and Peak Demand Reductions

	Retail	QSR	Data Centers
Size (sqft)	20,000	2,000	1,000
Capacity tons	50	20	60
Current Peak kW	80	32	96
Nominal Coolerado #units	4	4	25
Aggressive Coolerado #units	12	8	35
Payback			
Coolerado installed cost	\$ 40,000	\$ 40,000	\$ 250,000
Aggressive Coolerado installed cost	\$ 120,000	\$ 80,000	\$ 350,000
Net Installed cost	\$ 25,000	\$ 32,500	\$ 205,000
Aggressive Net Installed cost	\$ 75,000	\$ 65,000	\$ 260,000
Simple payback yr	6	3	1
Aggressive payback yr	9	4	2

James Jackson
Business Development Manager |
Emerson – Comfort Guard



SMART INSTALL
SMART MAINTENANCE



What is the Problem?

The industry today.



HVAC TECH SHORTAGE

Conservative estimates put the industry HVAC tech shortage at 20,000



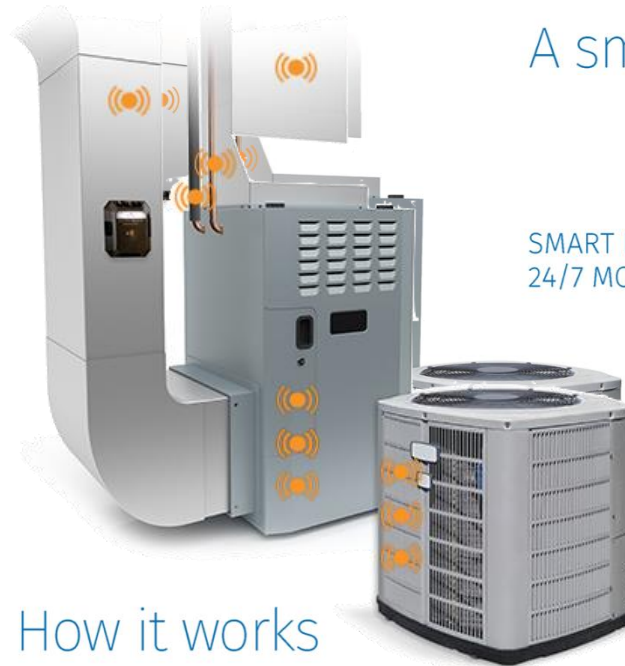
OVER 40% of newly installed residential systems are not installed correctly



OVER 70% of home systems are inefficient or heading for a breakdown



UNDER 10% of maintenance agreement systems are properly serviced



A smarter solution.

SMART HVAC WITH 24/7 MONITORING.

How it works



SMART SENSORS OFFER A TOTAL SENSE OF COMFORT.

Custom sensors gather vital, never before seen information every time a system runs. The data is sent to our monitoring center's secure cloud over your customer's home Wi-Fi network.



24/7 MONITORING FOR UNPRECEDENTED INSIGHT.

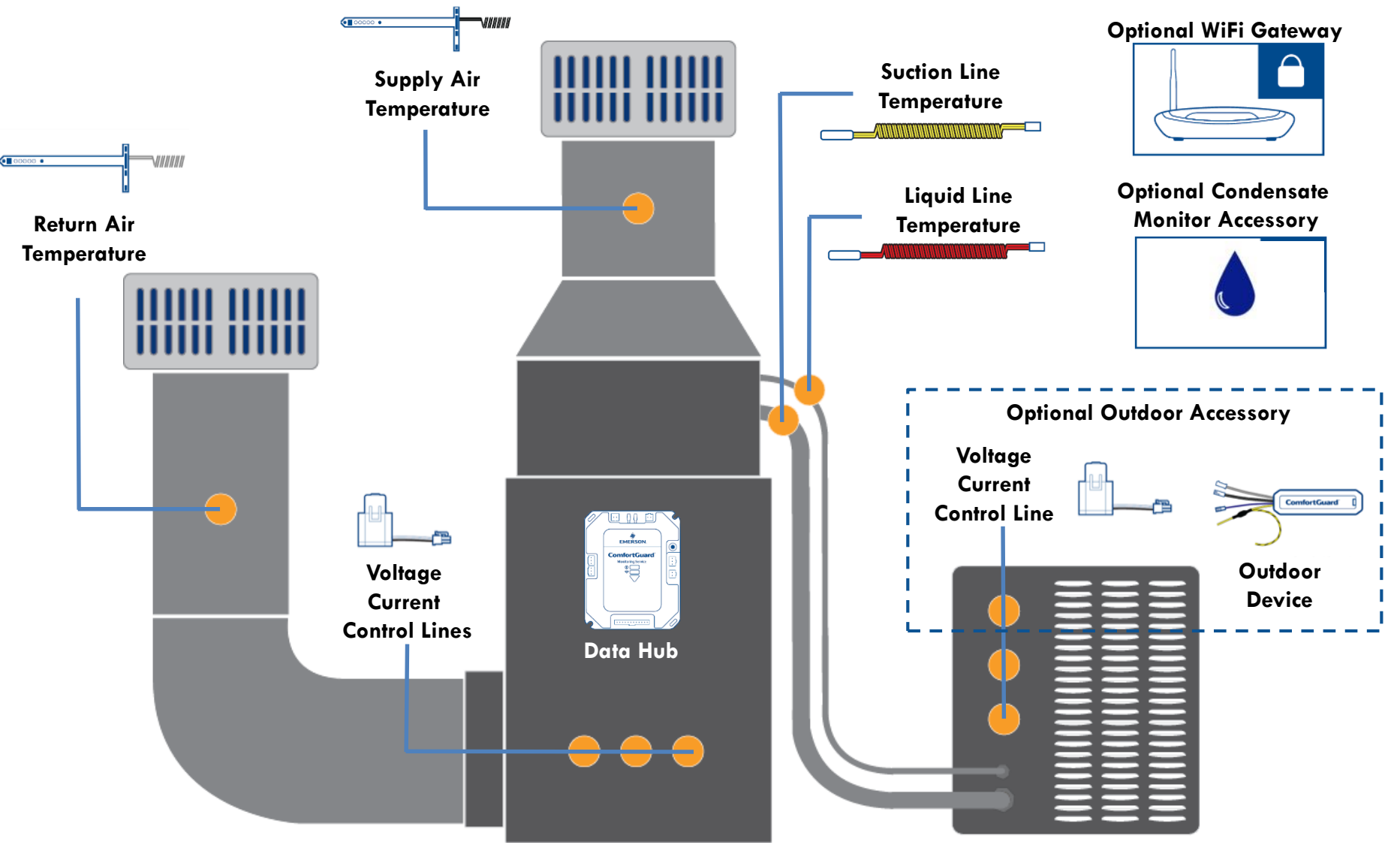
Our team carefully monitors data every time a system runs. In most cases, we detect an issue before it becomes a problem.



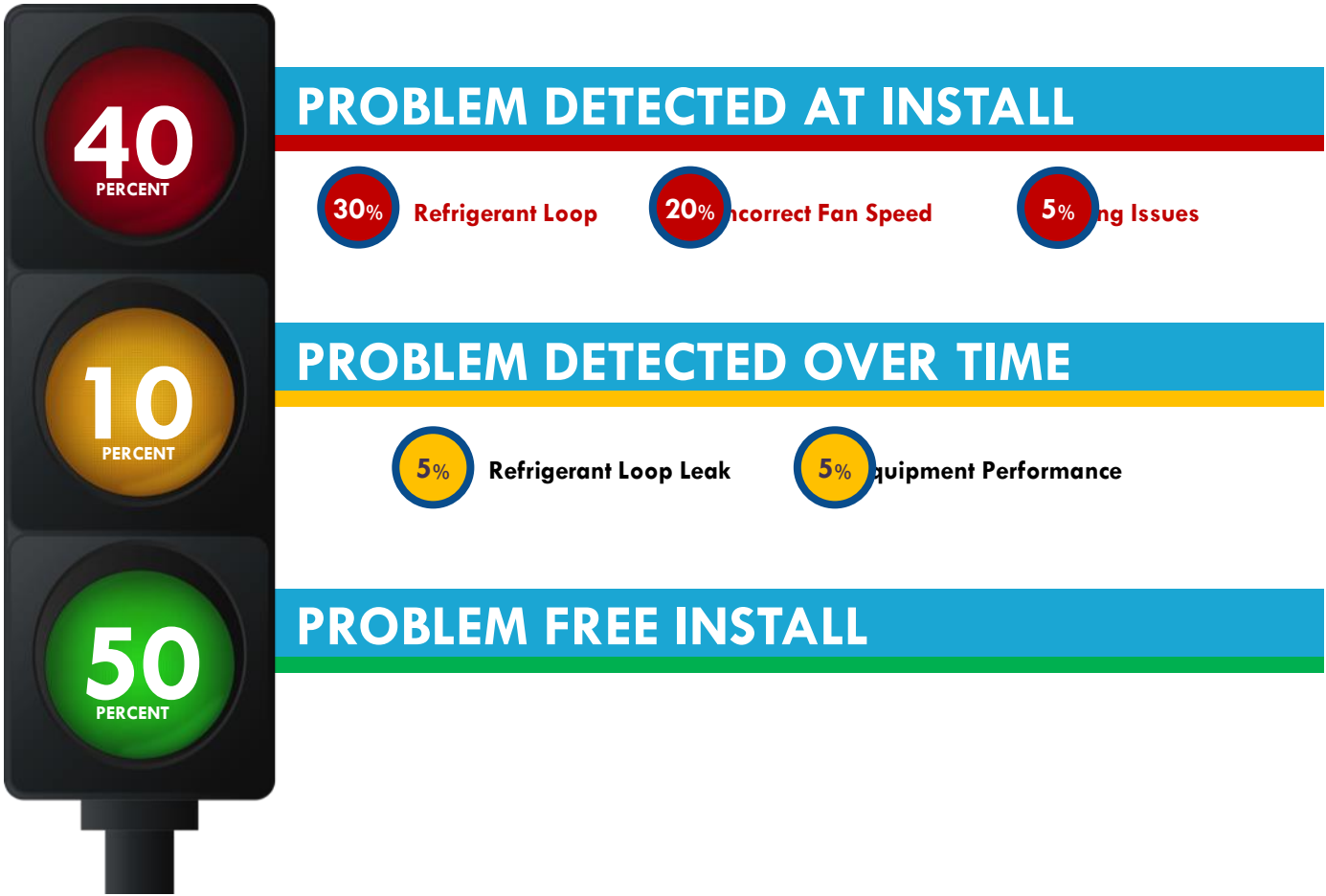
STAY IN THE KNOW AND KNOW WHAT TO DO.

By sending you and your customers timely communications including system reports, actionable alerts and repair verifications, you differentiate yourself from your competition.

ComfortGuard Hardware Consists of 10 Sensors Plus Data Hub and Optional Gateway



ComfortGuard Helps Detect And Resolve Installation Issues To Prevent Callbacks



DISCUSSION AND Q&A

Tyler Sybert, ZNE Lead | SDG&E - *moderator*

Chris Carradine, Executive Vice President, Business Development | ecobee

Stephan Barsun, Sr. Principal Energy Consultant | Itron

Steve Slayzak, Vice President of Technology | Seeley International

James Jackson, Business Development Manager | Emerson – Comfort Guard

Cleantech San Diego Announcement

Marty Turock

Strategic Projects | Cleantech San Diego

San Diego Regional **ENERGY INNOVATION** NETWORK



Supporting entrepreneurs developing solutions to the region's **energy** needs.

Providing an accelerated path to **commercialization**.

Get Energized.
Apply Now.

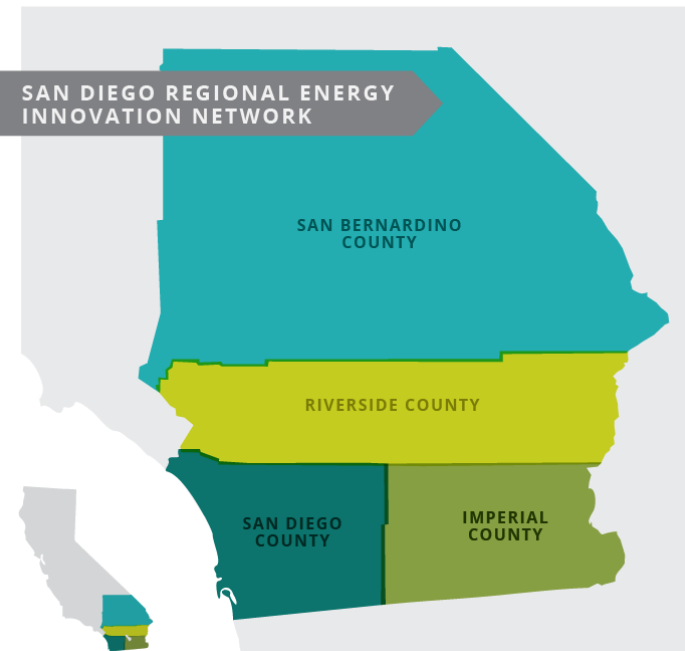
Entrepreneurs interested in applying and **volunteers** interested in supporting the program are may visit the website or contact us to learn more.

- Industry Connections
- Research and Testing Facilities
- Pilot Project Opportunities
- Regulatory and Policy Guidance
- Market Intelligence
- Mentoring
- Workshops/Training
- Marketing Support
- Access to Capital Providers
- IP and Export Assistance



WEB:
EMAIL:

cleantechsandiego.org/SDREIN
alyssagd@cleantechsandiego.org



LUNCH

Program will resume at 1:15 pm

SLIDES WILL BE POSTED AT ETCC-CA.COM

PLEASE FILL OUT EVALUATIONS!

WHAT'S THE NEXT BIG THING? PROMISING TECHNOLOGIES AND ADVANCED APPROACHES

Mark Martinez, Manager of Emerging Markets and Technology | SCE -
moderator

Omar Siddiqui, Senior Technical Executive | EPRI

Ryan Kerr, Emerging Technologies Manager | GTI

Essie Snell, Senior Manager | E Source

Jay Luboff, Associate Director | Navigant

Mark Martinez
Manager of Emerging Markets and
Technology | SCE

Omar Siddiqui
Senior Technical Executive | EPRI

Connected Devices: Scaling with Energy Management

ETCC Quarterly Meeting

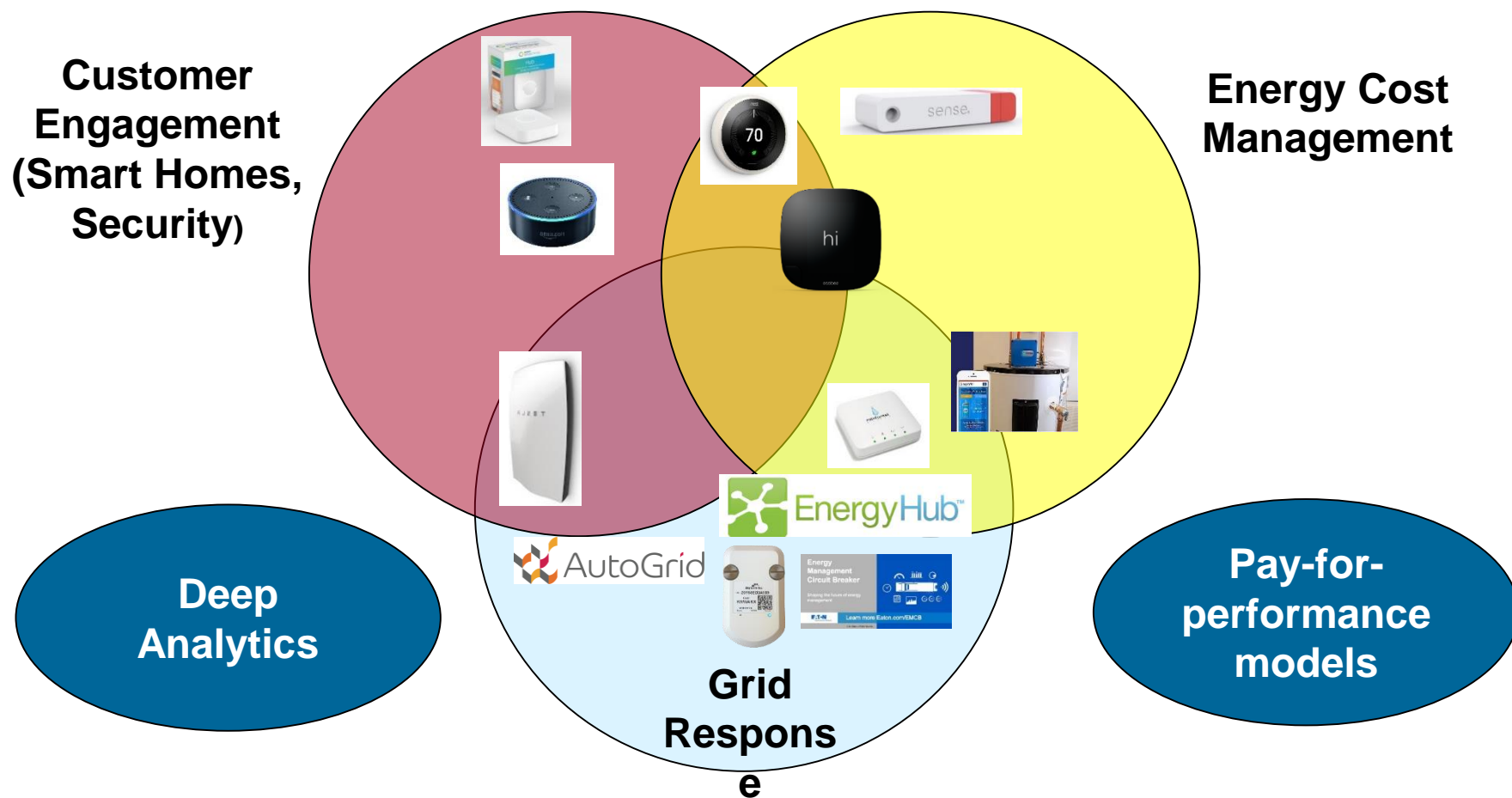
Omar Siddiqui
Senior Technical Executive

December 6, 2017

SDG&E Energy Innovation Center
San Diego, CA



Value Streams around Energy Management



Smart Thermostats: Extending Impacts from Pilots into EE Programs

Impact Evaluation Findings

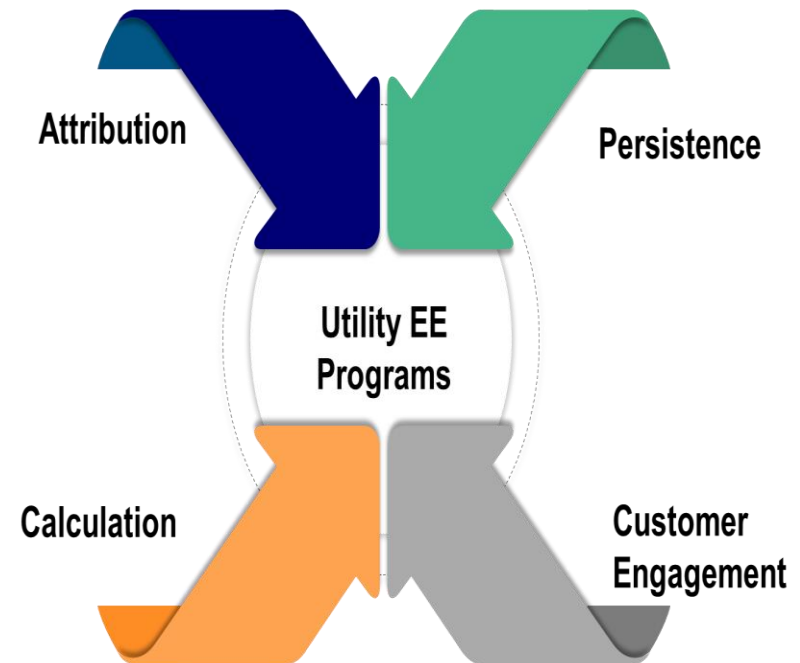
- Energy savings ~ 3-6%
- Peak load reduction ~ 0.5 – 1.2 kW per home

Gaps and Opportunities

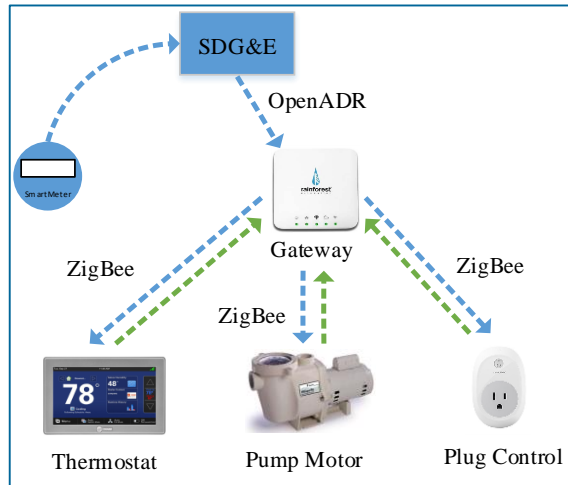
- Limited data on two key questions
 - Attribution: *Why?*
 - Persistence: *For how long?*
- Regulatory: measure categorization (consumer device vs. control) impacts EUL and cost-effectiveness
- Industry recognizes opportunities for customer engagement

Looking Forward

- Sustain pilots to measure long-run impacts
- Utility/product provider data partnerships
- Affordable smart thermostats to bridge “digital divide”

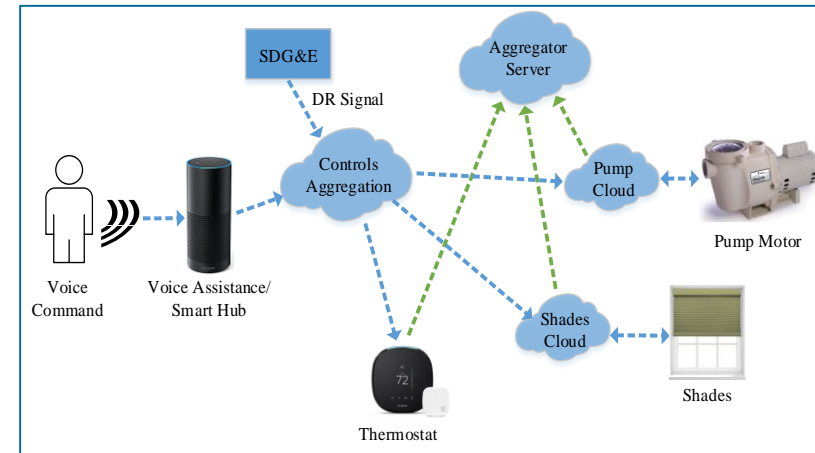
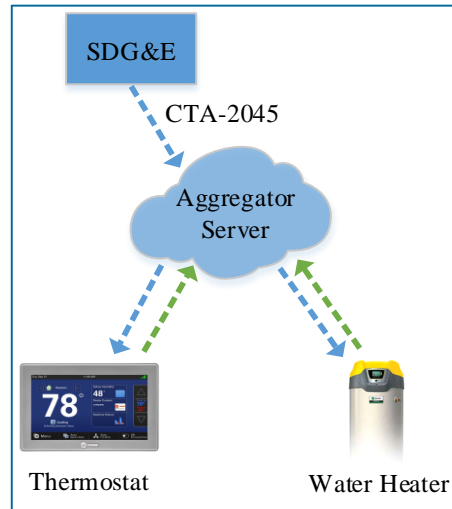


HEMS Control System for Grid Benefits



Utility HAN Network

Orchestration Optimization Aggregation



IoT API Integration
(Voice Assistants)

CTA 2045 Standards
Based integration

Customer Connected Devices Working Council

Facilitated by EPRI

Mission

Bring together utilities, technology providers, and stakeholders to address challenges and enable opportunities related to energy for **our shared connected customers**

Key Activity

Developing “Prices-to-Devices” proof-of-concept:

Standardized data format for IoT devices (e.g. ecosystem hubs) to retrieve location-specific utility pricing (actual or indicative) to optimize device scheduling and transactive energy management





Ryan Kerr
Emerging Technologies Manager | GTI



Whole Home Energy Management

ETCC Quarterly Meeting
December 6, 2017
San Diego

Ryan Kerr

Emerging Technologies, GTI

ryan.kerr@gastechnology.org

224.735.0264

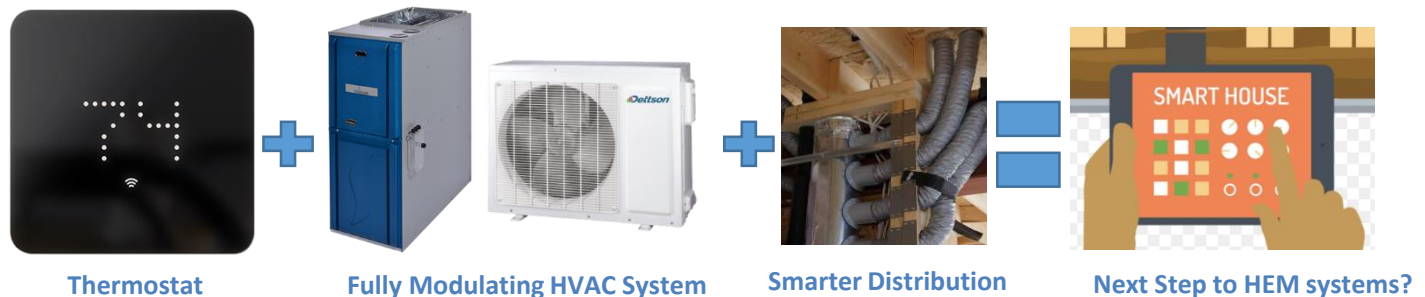


Smart Thermostats: The first step to HEM systems?

Does Consumer Interest + 'Smart' HVAC Tech = A New EE Solution?



Are Smart Thermostats Making Our Smart HVAC Systems Dumb?



Essie Snell
Senior Manager | E Source

What's the Next BIG Thing?

Promising Technologies and Advanced Approaches

Essie Snell

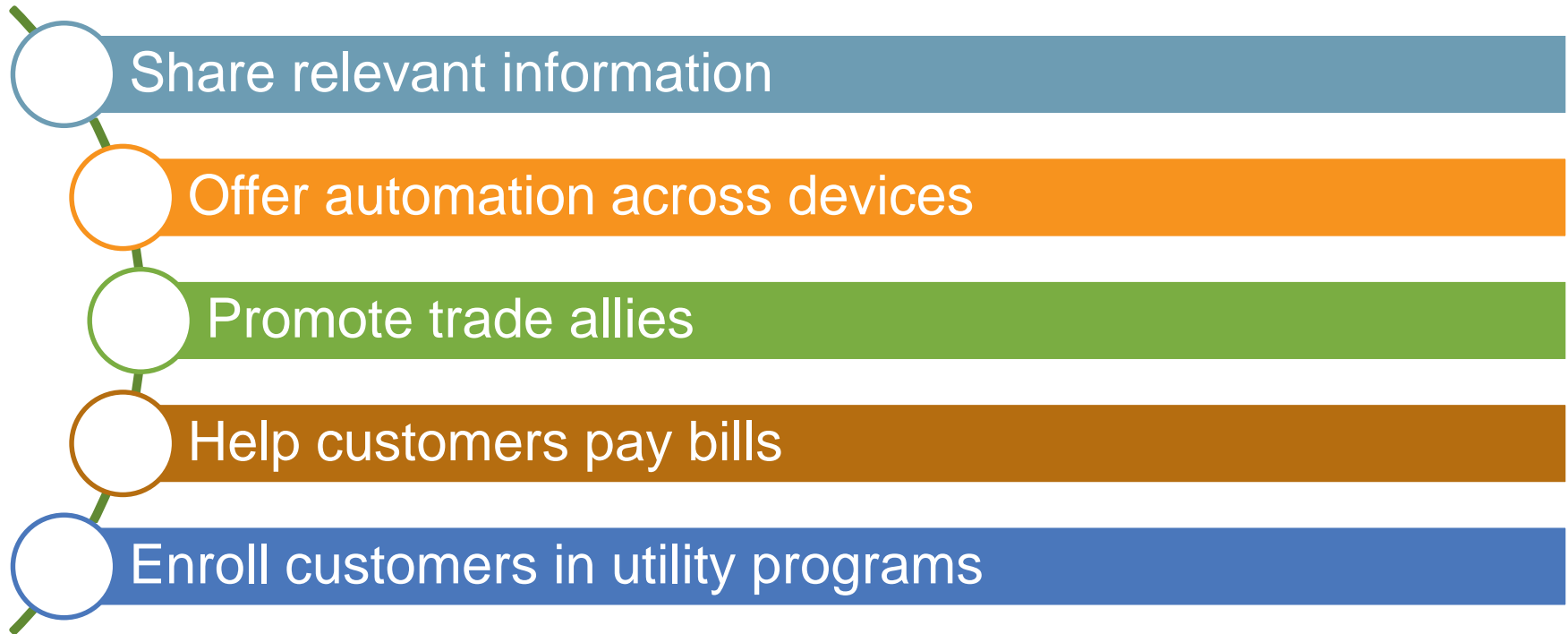
Senior Manager, Technology
Assessment

ETCC Quarterly Meeting: Whole
Home Energy Management



E Source

Voice Control Opens New Doors



Moving To More Integrated Systems



The Coming Convergence of Smart Homes, Solar, Batteries, and AI



Thank You!



Essie Snell

Senior Manager, Technology Assessment, E Source

303-345-9140 essie_snell@esource.com

Jay Luboff
Associate Director | Navigant

NAVIGANT ETCC PANEL

JAY LUBOFF – NAVIGANT CONSULTING

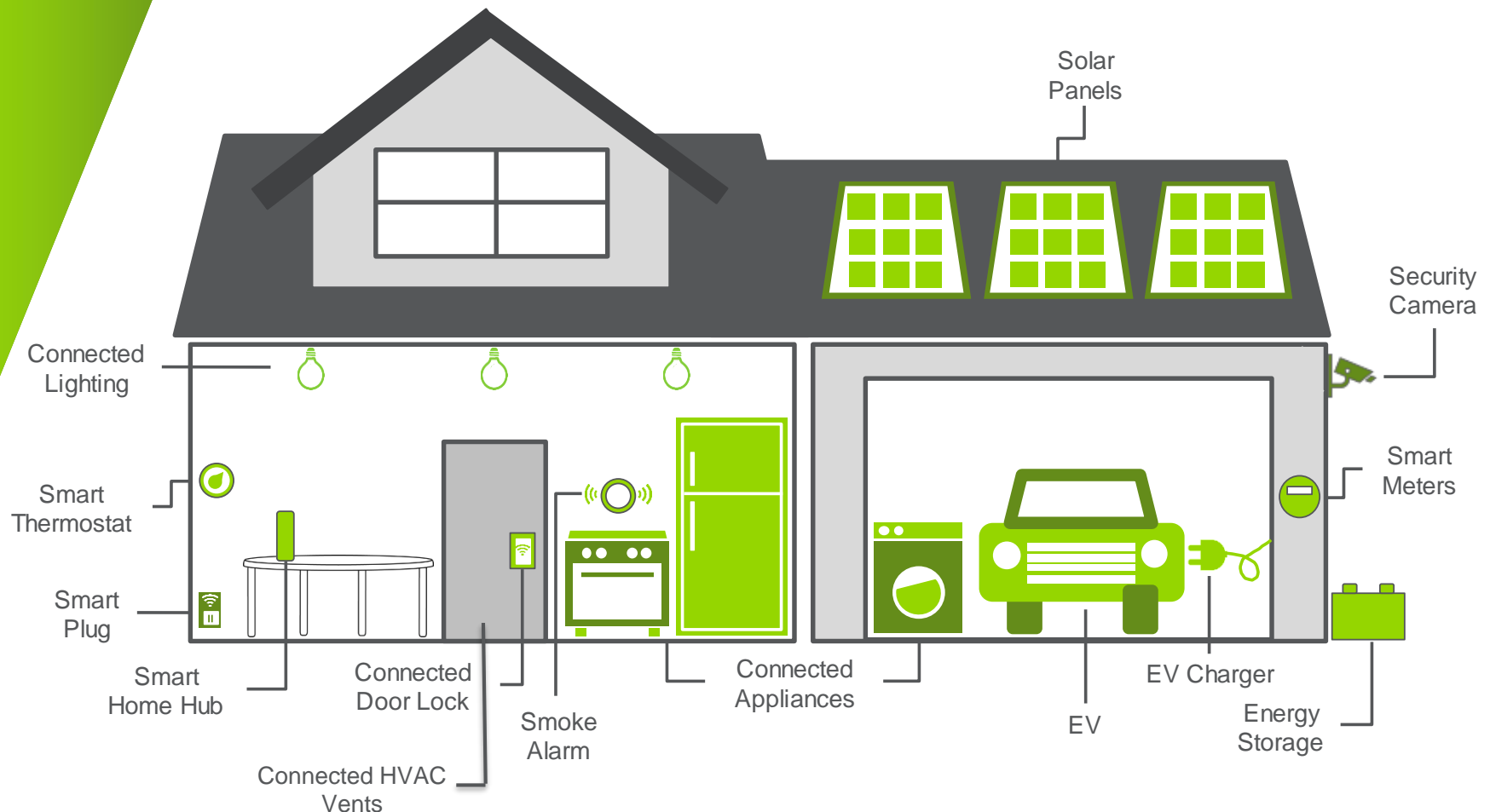
NAVIGANT EMERGING TECHNOLOGY SUPPORT

Navigant supports emerging technologies assessments in a number of Key ways:

- ❖ **Utility DSM ET Portfolio Support and Strategy** -- ETP support for natural gas and electric ETs, includes scans/screening, technology and market assessments, pilots, and market ready analysis
- ❖ **Utility DER and iCloud Advanced Technology ET Analysis and Support** – includes identification and analysis and of key technology components at the “grid edge” -- including electric vehicle, energy storage, microgrids, transactive energy, EE, demand response, PV solar, digitalization using IoT, etc.
- ❖ **Utility ETP Programs Evaluation around the Country** – including past evaluation of the California ETP efforts
- ❖ **DOE Appliance Standards Support and Technology Analysis** – including due-diligence lab testing of specific products
- ❖ **Navigant Research** (NavResearch Reports) – Energy Technologies, Transportation Efficiency, Building Innovation, and Utility Transformation

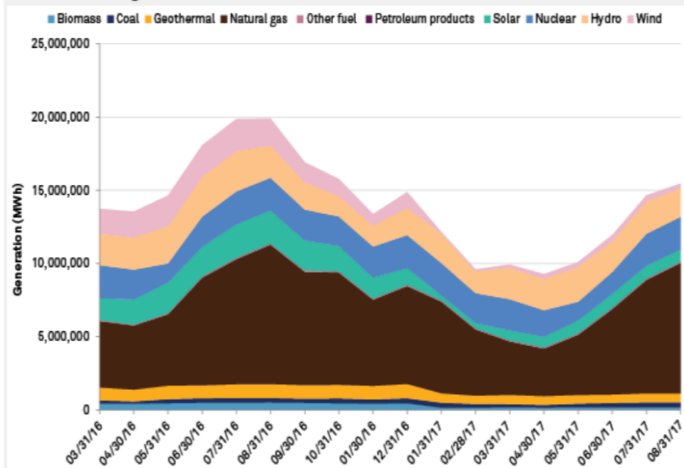
RESIDENTIAL WHOLE HOUSE FOCUS

A Plethora of Connected Devices and Disparate Data



EMERGING TECHNOLOGY FOCUS FOR THE FUTURE

CAISO monthly generation by fuel type



Future ETP Focus will Depend upon:

- Future Grid Needs
- Customer Needs
- GHG Reduction Needs

Four Key Priority Issues and Trends:

- *Individual Widgets Are Being Replaced by Integrated Technology Approaches*
- *Crossover from Traditional ET Approaches and Analyses to Grid Connected DER Related ET Efforts, including Transactive Energy Approaches*
- *Natural Gas Continued ET Role*
- *Transportation Efficiency will Increasingly Play a Larger Role in Residential ET Work of the Future*

CONTACT

Jay Luboff

213-67-2724

jay.luboff@navigant.com

navigant.com

NAVRESEARCH



ENERGY TECHNOLOGIES

Wind Energy
Grid-Tied Energy Storage
Distributed Energy Storage
Advanced Battery Innovations
Microgrids
Distributed Natural Gas
Distributed Renewables



TRANSPORTATION EFFICIENCIES

Electric Vehicles
Fuel Efficiency and Emerging Technologies
Mobility
Transportation Forecast



UTILITY TRANSFORMATIONS

Internet of Things
Connected Grid
Digital Grid
Dynamic Grid
Demand-Side Management
Digital Utility Strategies
DER Strategies



BUILDING INNOVATIONS

Intelligent Building Management Systems
Residential Energy Innovations
Energy Efficient Buildings
Lighting Innovations
Smart Cities

DISCUSSION AND Q&A

Mark Martinez, Manager of Emerging Markets and Technology | SCE -
moderator

Omar Siddiqui, Senior Technical Executive | EPRI

Ryan Kerr, Emerging Technologies Manager | GTI

Essie Snell, Senior Manager | E Source

Jay Luboff, Associate Director | Navigant

BREAK

Program will resume at 2:30 pm

SLIDES WILL BE POSTED AT ETCC-CA.COM

PLEASE FILL OUT EVALUATIONS!



WHERE THE RUBBER MEETS THE ROAD: CONVERTING OPPORTUNITIES INTO SUCCESS STORIES

Matt Smith, Program Manager for Emerging Technologies Energy Efficiency Program | SDG&E - *moderator*

Steve Schallenberger, President | Synergy Companies

Paul Kylo, Director | CLEAResult

Ram Dhanekula, Product Manager, Market Place Lead | SDG&E

Kari Binley, Sr. Program Manager-Energy Efficiency Product Innovation
| PG&E

SESSION WRAP-UP

PLEASE FILL OUT EVALUATIONS!

SLIDES WILL BE POSTED AT ETCC-CA.COM
WITHIN 48 HOURS