



**Better Buildings Residential Network Peer
Exchange Call Series: *You Are My
Sunshine – Integrating Residential Solar
and Energy Efficiency (301)***

October 15, 2015

Call Slides and Discussion Summary

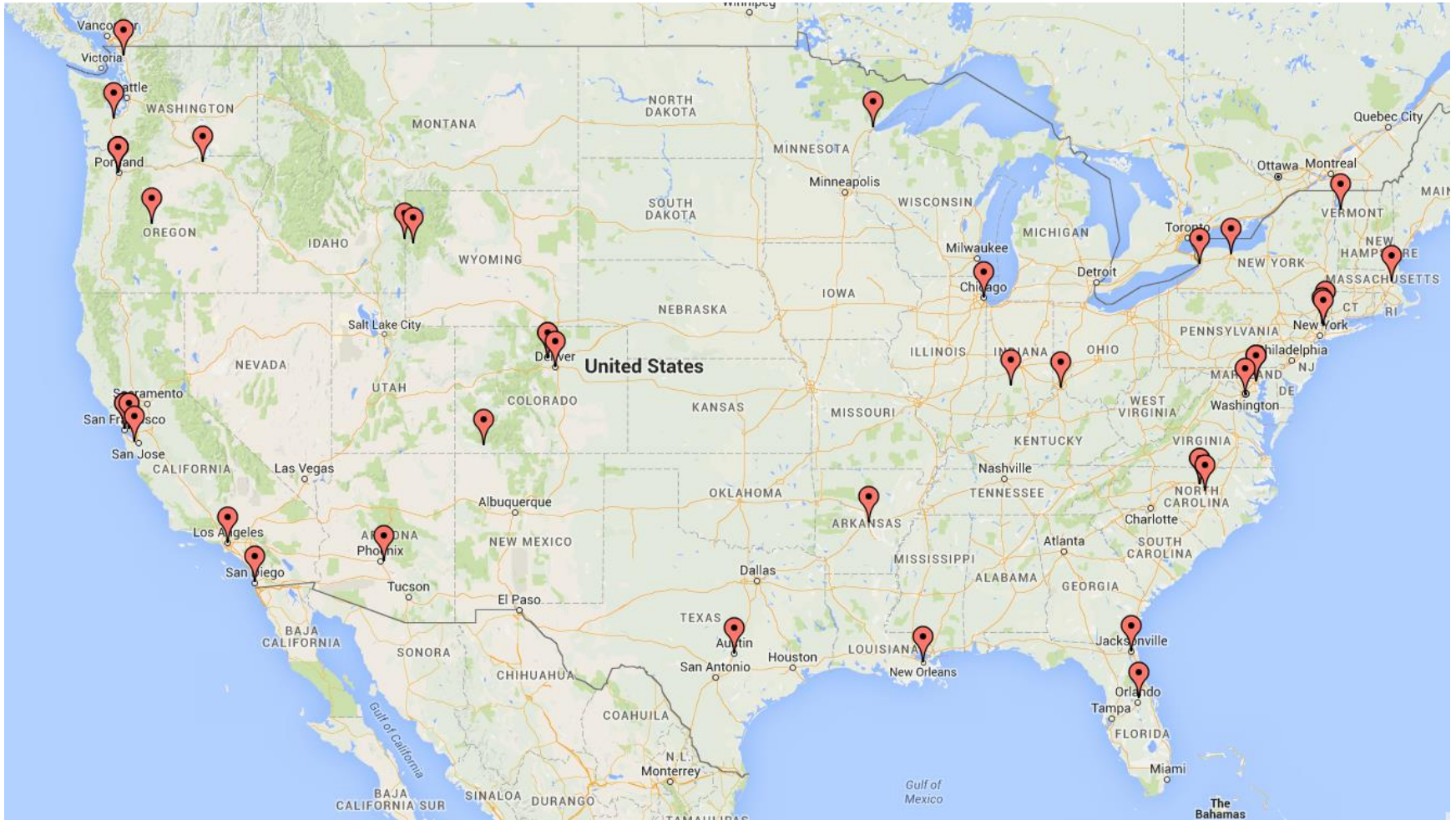
Call Participants: Residential Network Members

- Boulder County, CO
- Building Doctors
- California Center for Sustainable Energy
- City of Sunnyvale, California
- Civic Works
- Duke Carbon Offsets Initiative
- Ecolibrium3
- Elevate Energy
- Energize NY
- Energy Conservation Works
- Energy Efficiency Specialists, LLC
- EnergySmart
- Enhabit
- The Environmental Center
- Fuel Fund of Maryland
- Greater Cincinnati Energy Alliance
- GRID Alternatives
- Institute for Market Transformation
- Monroe County Energy Challenge
- North Carolina Building Performance Association
- People United for Sustainable Housing (PUSH) Buffalo
- Spirit Foundation

Call Participants: Non-Network Members

- Abundant Efficiency
- Arizona State University
- Bonneville Power Administration
- Cambridge Energy Alliance
- Cascade Natural Gas
- City & County of Denver
- CLEAResult
- Clinton Climate Initiative
- Energy Programs Consortium
- Environmental Design / Build
- Fruitfull Energy
- Jacksonville Electric Authority
- La Plata Electrical Association
- MPower Oregon
- Pacific Gas & Electric Company
- PosiGen Solar
- Resource Efficient Solutions LLC
- San Francisco Department of Environment
- Solar Habitats, LLC.
- Umatilla Electric Cooperative
- UNC Environmental Finance Center
- Washington Department of Commerce

Call Participant Locations



Agenda

- Agenda Review and Ground Rules
- Opening Poll
- Brief Residential Network Overview
- Featured Speakers
 - Jon Fortune, Director of Regulatory and Energy Services, Sunverge Energy, Inc. (*Residential Network Member*)
 - Shayna Lee, Utility Services Specialist Senior - Solar Energy Services, Austin Energy (*Residential Network Member*)
- Discussion
 - What are the benefits of pursuing solar and home performance goals simultaneously?
 - What strategies are used for building relationships between solar and energy efficiency partners?
 - Are there unique challenges of integrating solar and home performance in your local area?
 - How are outreach and marketing mechanisms different for an integrated program?
 - Are there other questions, best practices, or lessons learned related to integrating residential solar and energy efficiency you would like to share?
- Closing Poll and Upcoming Call Schedule

Opening Poll

- Which of the following best describes your organization's experience with the call topic?
 - Some experience/familiarity – **64%**
 - Limited experience/familiarity – **18%**
 - Very experienced/familiar – **13%**
 - No experience/familiarity – **5%**
 - Not applicable – **0%**

Better Buildings Residential Network

Better Buildings Residential Network: Connects energy efficiency programs and partners to share best practices and learn from one another to increase the number of homes that are energy efficient.

Membership: Open to organizations committed to accelerating the pace of home energy upgrades.

Benefits:

- Peer Exchange Calls 4x/month
- Tools, templates, & resources
- Recognition in media, materials
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- Residential Program Solution Center guided tours

Commitment: Provide DOE with annual number of residential upgrades, and information about associated benefits.

For more information or to join, email bbresidentialnetwork@ee.doe.gov

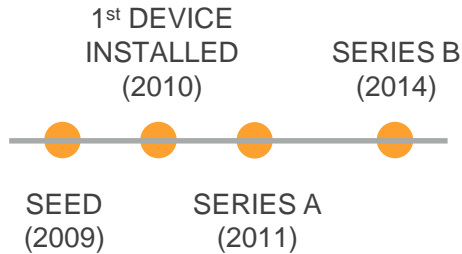
Lessons Learned: Sunverge Energy
(Residential Network Member)

DOE PEER Exchange

Jon Fortune, Director Regulatory and Energy Services

FOUNDED
2009

HEADQUARTERED IN
SAN FRANCISCO



EMPLOYEES

45




CUSTOMERS

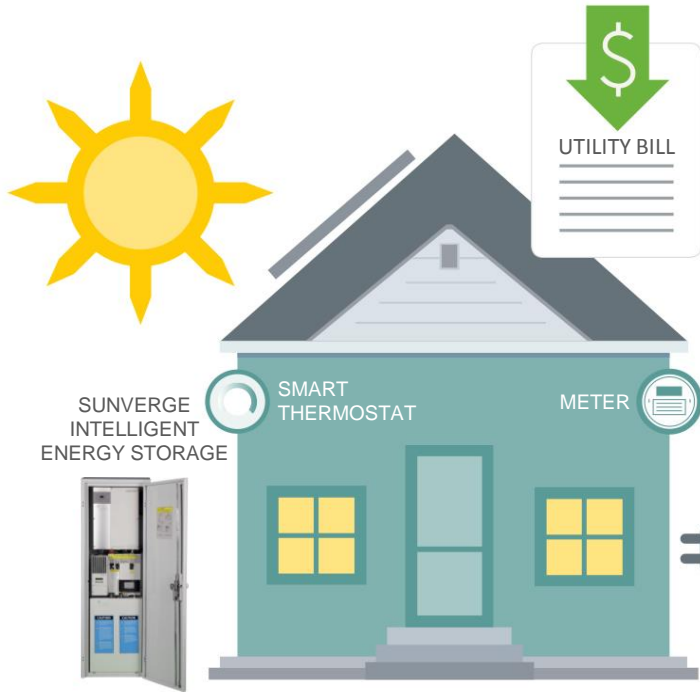
North America
(AZ, CA, HI, KY,
NY, NV &
Canada)
New Zealand
Australia
South Korea
Germany

450+

UNITS IN
PRODUCTION
AROUND THE
WORLD



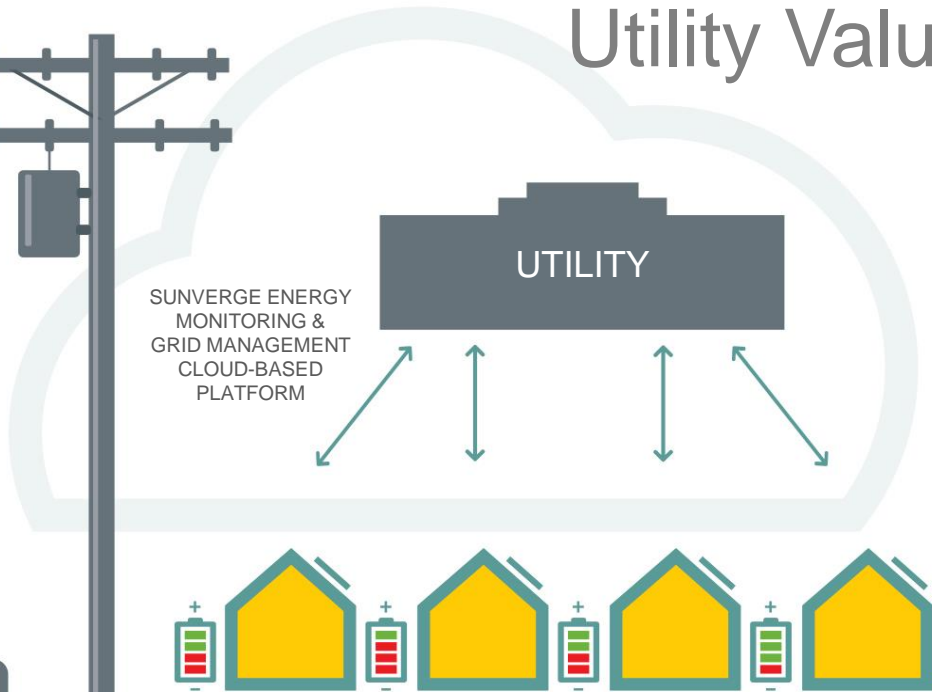
Consumer Value



BRINGING THE SMARTGRID INTO THE HOME



Utility Value



VIRTUAL POWER PLANT

AGGREGATE & ORCHESTRATE FLEET OF RESOURCES

Measuring Our Impact

4.5
MWh

MWh of distributed storage under management

1.7
MW

MW of distributed solar under management

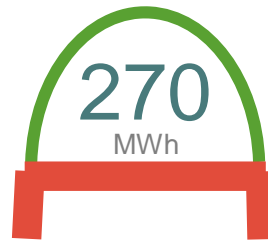


Customers enrolled in storage programs



15,340

Hours of backup power delivered



MWh of peak load reduction (5pm–8pm)



Average production uptime (last 30 days)

Affordable Housing Project & Sacramento Municipal Utility District (SMUD)

PROJECT DESCRIPTION

34 new homes in downtown Sacramento, Calif. outfitted with a solar panel system integrated with Sunverge energy storage hardware and control software in the cloud.

PROJECT GOAL

- Cost effectively design and build affordable, zero-net-energy homes in advance of tough new state energy efficiency standards.
- Evaluate how high penetrations of renewables could yield maximum value through customer-sited storage solutions.
 - Simulate demand response signals, peak load shifting, PV firming and model benefits of integration with home energy management systems.
 - Phase II is looking at benefits of aggregating fleets for Virtual Power Plant.

SMUD



Affordable Housing Project & Sacramento Municipal Utility District (SMUD)



RESULTS

Homeowners:

Electric bills 85% lower than comparable homes.

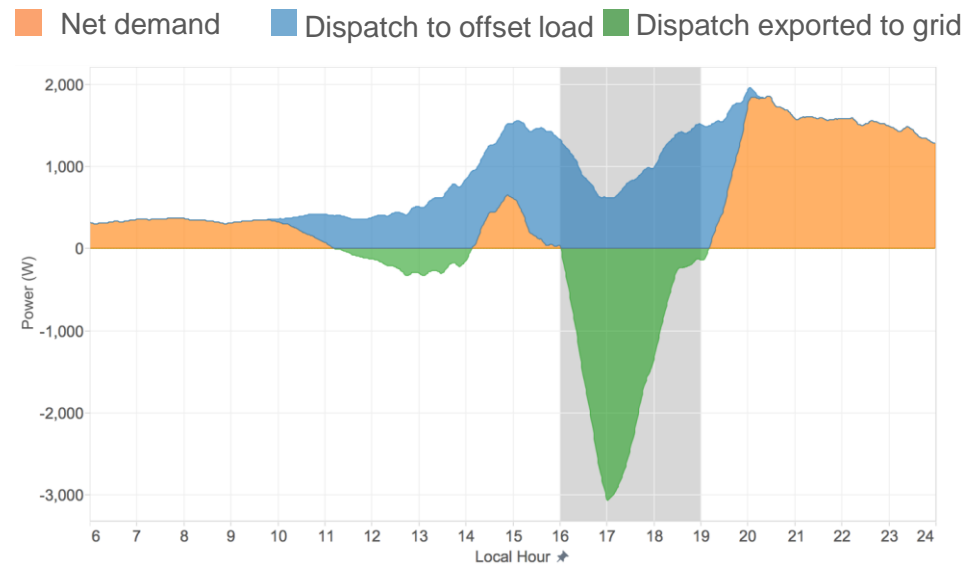
Utility:

- Improved energy supply reliability during outages and demand reduction events.
- Provide tangible bill-reduction benefits and backup power.

Builder:

Homes sold out in less than a year (Prices: US\$350,000 to US\$450,000 for 1,250 to 1,700 sq. ft. homes).

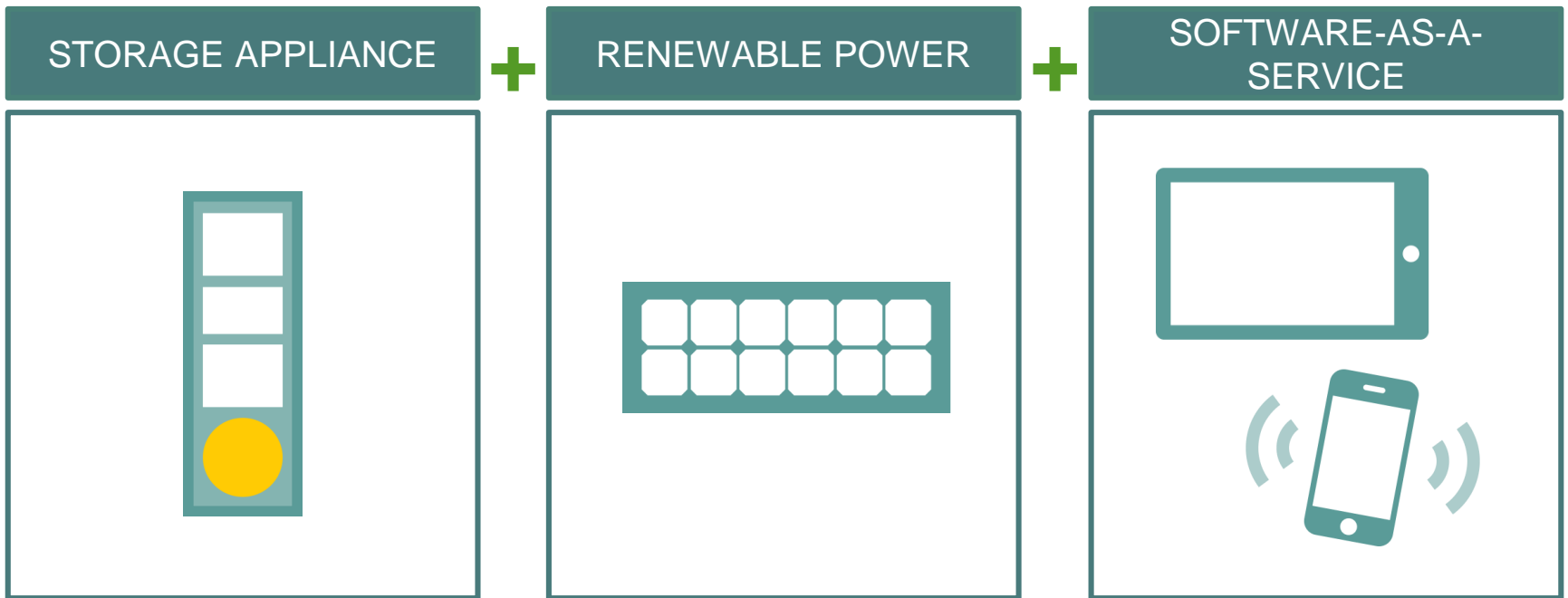
DEMAND RESPONSE PERFORMANCE



SIS dispatches to offset load in homes and export maximum additional energy to utility grid during DR events

Note: Height of graph shows total energy used in the home
Graph shows average demand response performance, July - September 2014

Sunverge Solar Integration System (SIS)



SIS Platform



Hybrid Inverter
Scaleable to 6 kW

Balance of System

Application Gateway

Lithium-ion Battery
Scaleable to 19.4 kWh

NEMA 3R Enclosure

THANK YOU



Discussion Highlights: Technical Details

- Solar storage in existing homes can be more complicated than in new construction. Typically homeowners must identify energy efficiency (EE) measures before considering solar storage; efficient homes will require less solar storage.
- The system fully charges the solar battery before sending excess electricity to the grid, with some load shifting to accommodate demand peaks.
- Eventually, electric vehicles will be able to connect to the system.

Program Experience: Austin Energy
(Residential Network Member)

Presentation Highlights: Austin Energy

- Originally, Austin Energy's solar program required that homes older than 10 years complete EE upgrades, as well as install solar water heating, before participating.
- As of May 2015, homeowners simply must get an actionable cost estimate from an approved contractor to participate.
- These new participation requirements relax the timeline (i.e. pressure to do upgrades before the federal tax credit ends) and empower customers while still ensuring that they are informed.

Presentation Highlights: Austin Energy

- Program adaptations:
 - When the utility switched from a two-tier to a five-tier billing structure, they introduced a new solar rate, which fluctuates annually (¢11.3/Kwh this year), to help provide a quick payback.
 - The solar program and the energy efficiency program have to continually coordinate to ensure that they function together. For example, if a customer designs a solar system and later completed efficiency upgrades, they will have credits they cannot cash out due to the rate structure.

Discussion Highlights: Program Details

- From FY 2004-2015, the Austin Energy solar program has completed 4,333 projects.
- Customers who installed efficiency upgrades outside the program were allowed to provide verification of those upgrades to participate.
- The overall energy goal for local solar is 200 MW, 70 MW of which is local distributed generation. Current distributed generation is 30 MW.
- Homeowners have two meters (net meter and solar meter).

Discussion Highlights: Challenges

- When the rebate ended, the timeline for solar installation became an issue for some due to the EE requirement.
- In the summer, solar water can run into overheating issues.
- Water conservation efforts sometimes meant that a home was not using enough hot water to save energy using solar.
- The banks held homeowners to a 60-day timeline for financing upgrades, which was extremely challenging for contractors.
- HPwES contractors are unhappy about providing estimates for homeowners who only want solar. This creates a difficult relationship with the program. Some contractors are now charging for bids.
- Solar and EE require very different skill sets, so not many contractors do both. Alliances between the two types of contractors have not emerged as much as was hoped.

Residential Program Solution Center Resources

- Energy Efficiency and Conservation Loan Program (EECLP) [Webinar: Solar Program Overview](#)
- Home Performance Resource Center Best Practices for Energy Retrofit Design Program [Case Study: Palm Desert, California](#)
- Peer Exchange Call: [Combining Solar and Home Performance Services](#)
- While you are there, see the latest Proven Practices post on [Tiered Financing](#)



<https://bbnp.pnnl.gov/>

The Solution Center is continually updated to support residential energy efficiency programs—[member ideas are wanted!](#)

Discussion Questions

- What are the benefits of pursuing solar and home performance goals simultaneously?
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Discussion Highlights: Additional Program Experiences

- Energize Phoenix conducted a multifamily EE/solar pilot through homeowners associations, negotiating a bulk rate with a contractor based on the number of participants. Homeowners were incentivized to market to their neighbors.
- The nonprofit Ecolibrium3 in Duluth, Minnesota found an opportunity for integrating EE and solar through financing by bundling them together. Integrating solar into an overall EE package helps normalize solar for customers.
- California customers have financed solar and EE projects together using PACE financing.

Closing Poll

- After today's call, what will you do?
 - Seek out additional information on one or more of the ideas – **48%**
 - Consider implementing one or more of the ideas discussed – **24%**
 - Make no changes to your current approach – **16%**
 - Other (please explain) – **12%**

Peer Exchange Call Series

Beginning in October, we will hold one Peer Exchange call every Thursday from 1:00-2:30 pm ET.

This is a change from the past call schedule.

Calls cover a range of topics, including financing & revenue, data & evaluation, business partners, multifamily housing, and marketing & outreach for all stages of program development and implementation

Upcoming calls:

- **November 12:** Driving Accountability for Program Performance Using Measured Energy Savings (101)
- **November 18:** Staged Upgrades: Combining and Sequencing HVAC Upgrades
- **December 3:** Shark Tank: Residential Energy Efficiency Edition – Episode #2 (301)
- **December 10:** Capitalizing on Multi-benefits for Multi-family Housing (301)

Send call topic ideas to peerexchange@rossstrategic.com

Thank you!

Please send any follow-up questions or future call topic ideas to:
peerexchange@rossstrategic.com