Better Buildings Residential Network Peer Exchange Call Series: *Driving Change in Residential Energy Efficiency: Electric Vehicles (301)*

April 28, 2016

Call Slides and Discussion Summary

Call Attendee Locations

Call Participants – Network Members

- Austin Energy
- Boulder County
- Brooklyn Green Home Solutions
- City of Aspen Utilities and Environmental Initiatives
- City of Kansas City
- Drive Oregon
- Energy Efficiency Specialists
- Enhabit
- Fresh Energy
- Home Performance Guild of Oregon
- National Grid (Massachusetts)
- Rhode Island Department of Energy Resources

Call Participants – Non-Members

- Alliant Energy
- Arlington County, VA
- Blue Ridge EMC
- Cambridge Energy Alliance
- Canadian Home Builders' Association
- CLEAResult
- Community Office for Resource Efficiency
- EnergySmart Colorado
- Environmental Design / Build
- Facility Management Consultores
- Franklin Energy
- Fruitfull Energy
- Holy Cross Energy
- Home Office Training & Technology
- United States Department of Housing and Urban Development
- ICF International
- Impact Marketing / Holy Cross Energy
- Local Government Commission

Call Participants – Non-Members

- Madison Gas and Electric Co.
- Michigan Energy Office
- Nexant
- Northeast Energy Efficiency Partnerships (NEEP)
- Northwest Energy Coalition
- OptiMiser LLC
- Parker Interests Unlimited
- Rocky Mountain Institute
- Seattle City Light
- Smith Enterprises
- Sonoma Clean Power
- Sustainable Hudson Valley
- Texas State University
- UpGrade Athens County
- USDA Rural Development
- WECC
- Wendy Smith Consulting LLC
- WSP Canada
- WV Division of Energy
- XLR8SUN

Agenda

- Agenda Review and Ground Rules
- Opening Poll
- Brief Residential Network Overview
- Featured Speakers
  - **April Bolduc,** Program Manager, San Diego Gas & Electric
  - **Mike Salisbury,** Program Associate, Southwest Energy Efficiency Project
  - **Zach Henkin,** Program Manager, Drive Oregon ***(Network Member)***
- Discussion questions:
  - How can home energy efficiency upgrades dovetail with supporting electric vehicle adoption?
  - How can homes be made electric-vehicle ready through efficiency upgrades?
  - What experiences do you or your program have with home charging stations for EVs and using vehicles to store electricity, whether for emergencies or to sell back to the grid?
  - What other questions do you have about the nexus between electric vehicles and home energy efficiency?
- Closing Poll(s) and Upcoming Call Schedule

Opening Poll

- Which of the following best describes your organization's experience with the call topic?
  - Some experience/familiarity **– *46%***
  - Limited experience/familiarity **– *27%***
  - Very experienced/familiar **– *16%***
  - No experience/familiarity **– *5%***
  - Not applicable **– *5%***

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, energy.gov/eere/better-buildings-residential-network/join

Lessons Learned:
April Bolduc
Program Manager
San Diego Gas & Electric

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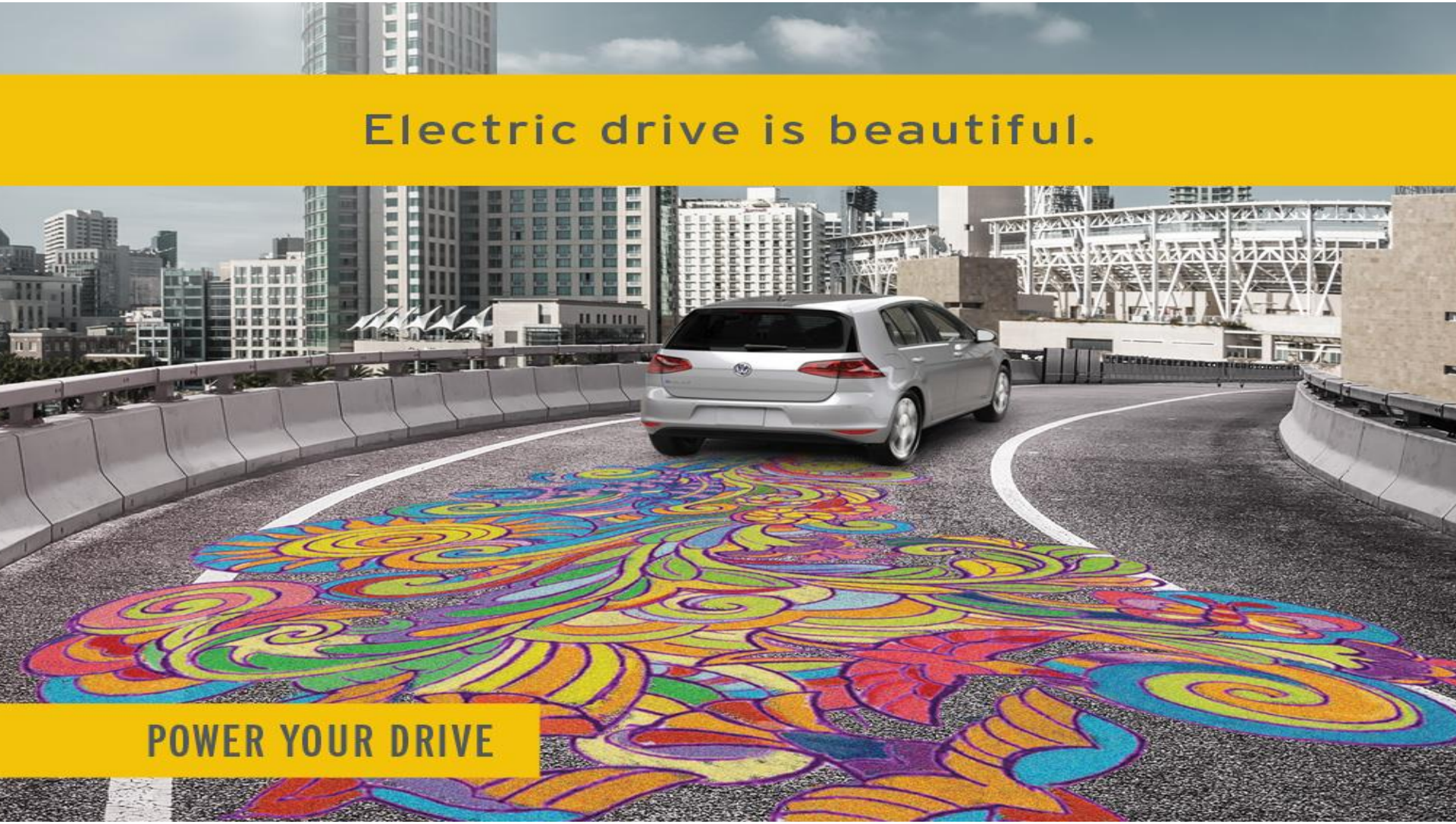
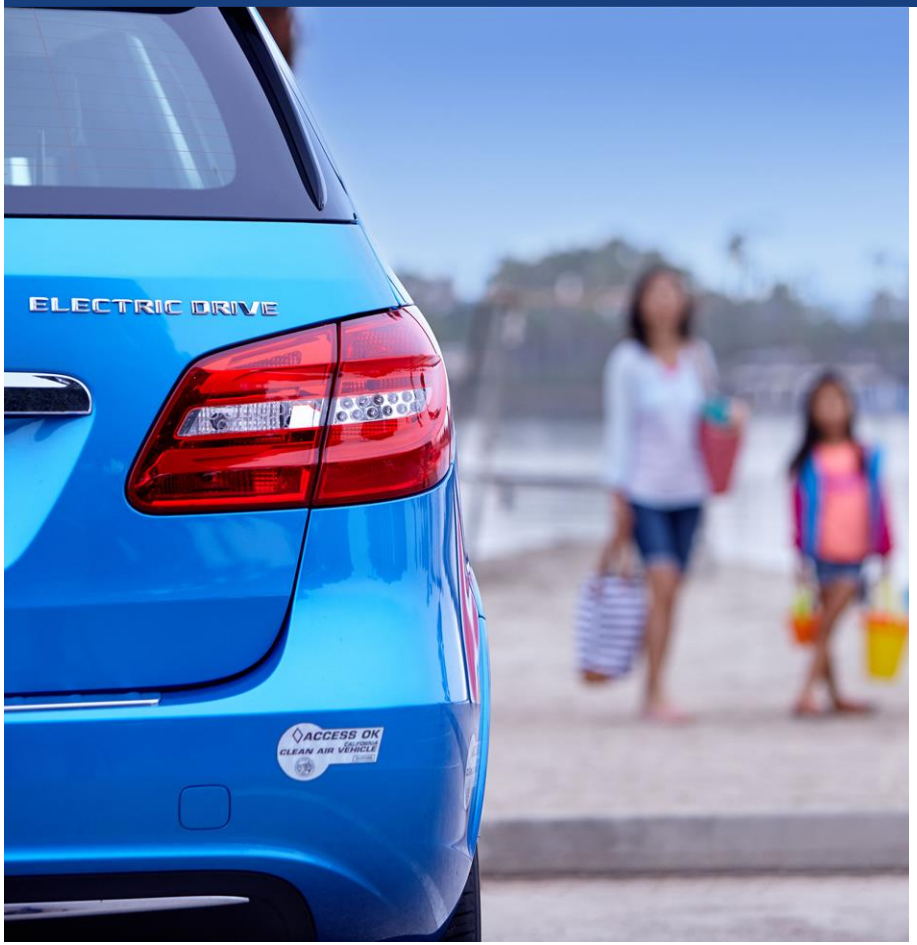

Electric drive is beautiful.
POWER YOUR DRIVE

No doubt if we approve this proposed decision this will represent the biggest utility program investment in transportation electrification in the country and in the history of this country, but I think it's appropriate to do this with San Diego Gas & Electric and San Diego, in general, because both have been leaders in the electric vehicle sector.

Commissioner Carla Peterman
Jan. 28 CPUC SDG&E Vehicle-Grid Integration Vote

California's EV and Renewable Goals



- Almost **40%** of CA's greenhouse gas emissions come from transportation
- AB32 restores greenhouse gas emissions **to 1990 levels by 2020**
- More than **1/3** of SDG&E's energy portfolio comes from renewable resources – no coal.

SDGE
A Sempra Energy utility

Responsive to Governor Brown's Clean Transportation Goals

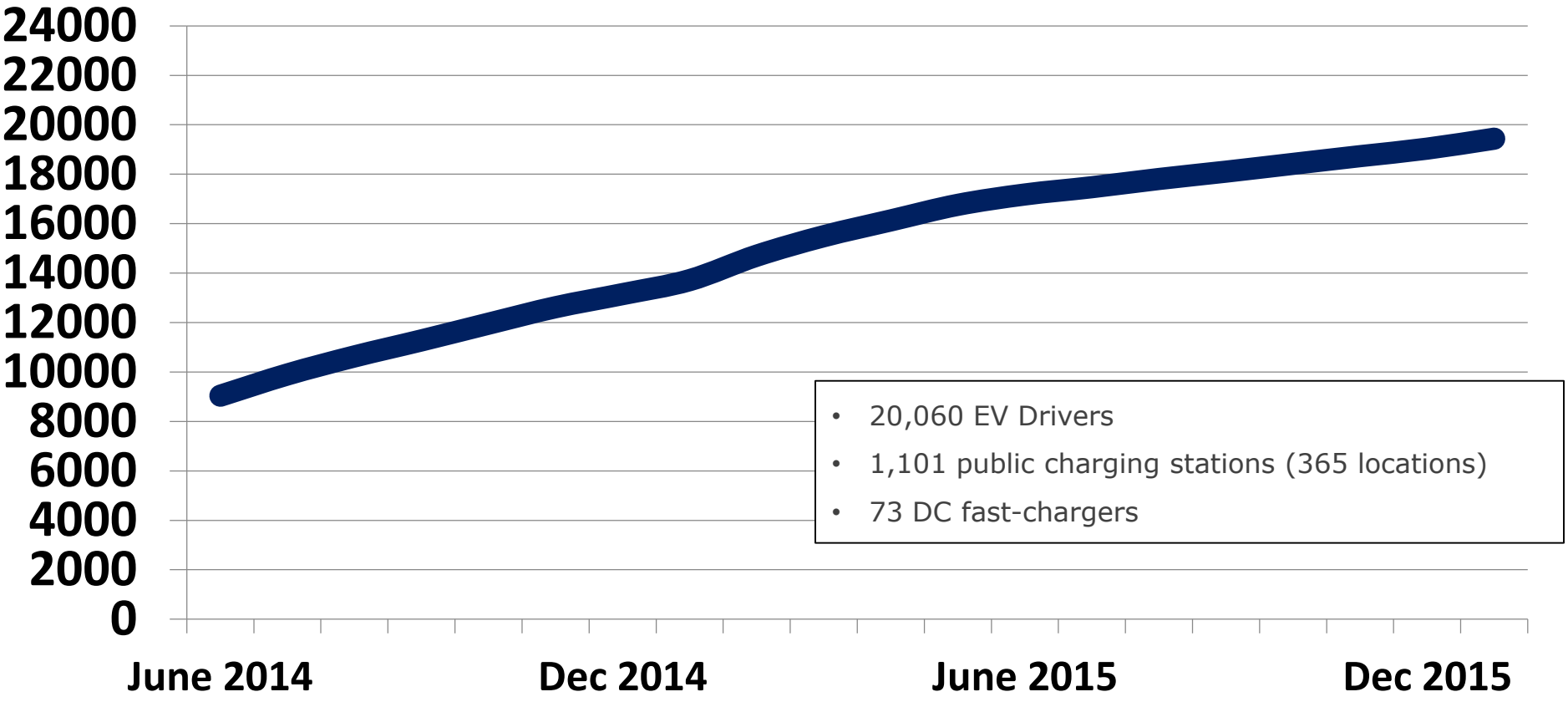
2013 ZEV Action Plan

Workplace Charging Challenge

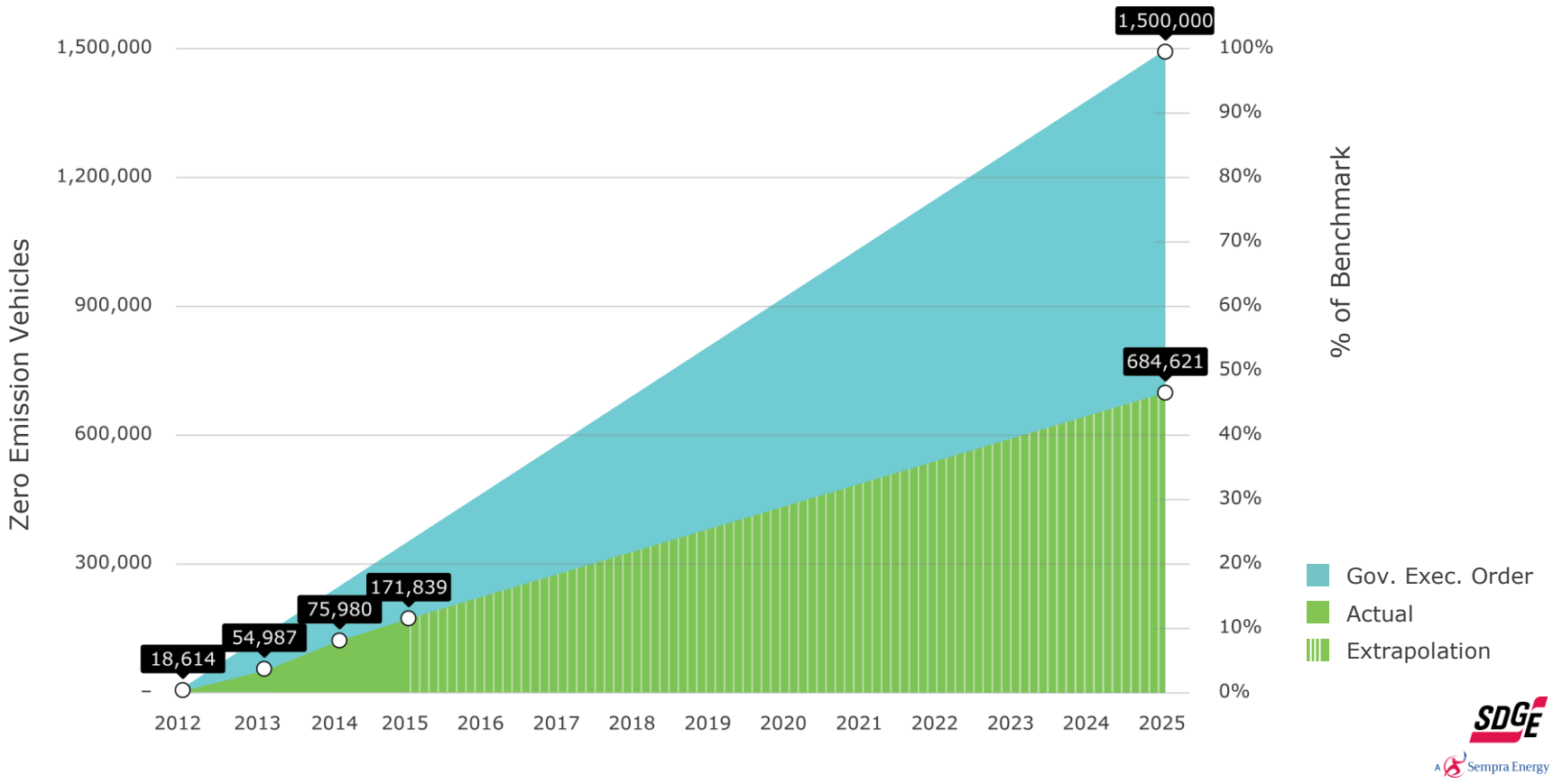
Drive The Dream

SDGE
A Sempra Energy utility

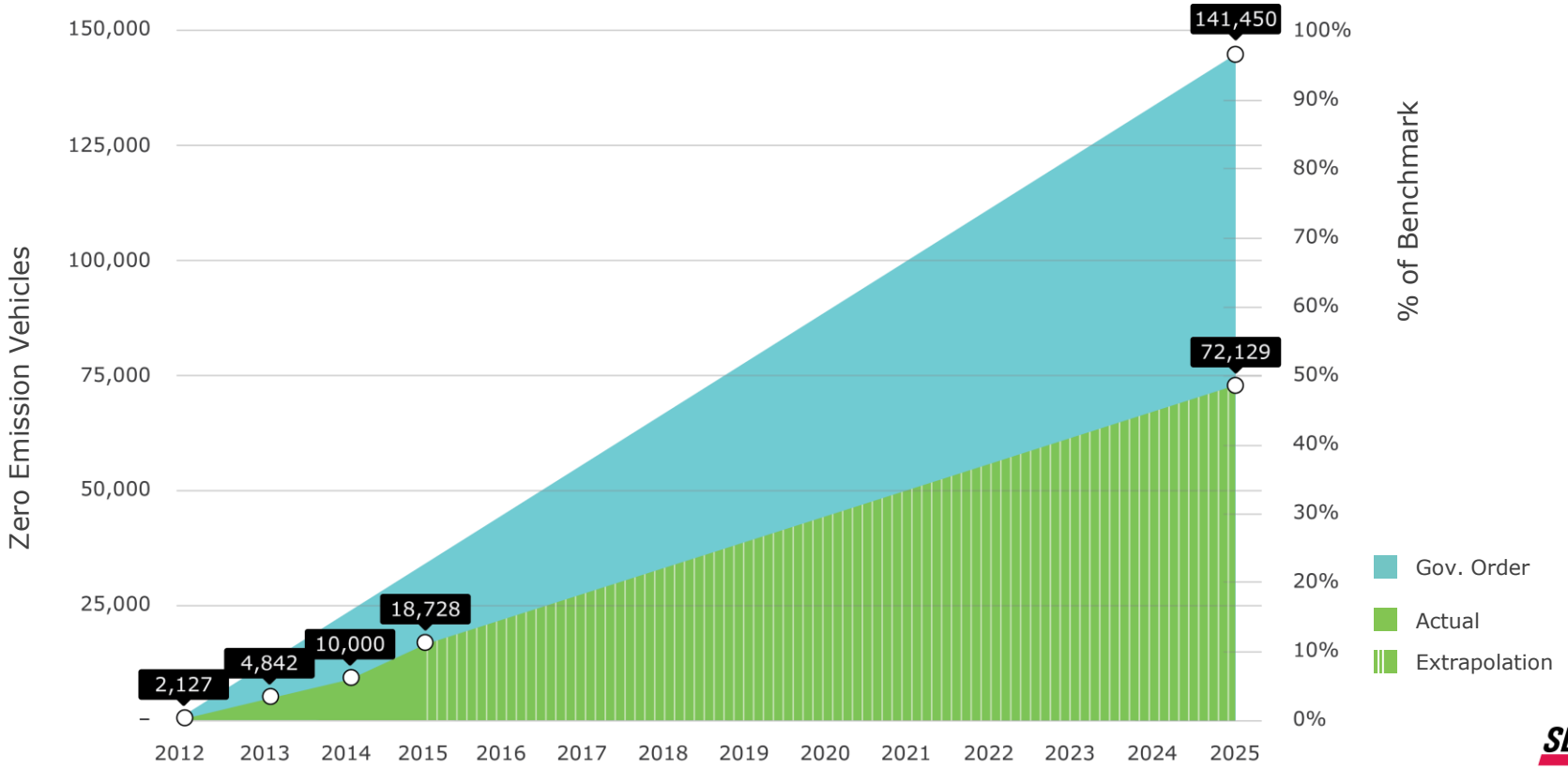
San Diego Regional EV Growth



California EV Adoption Projections

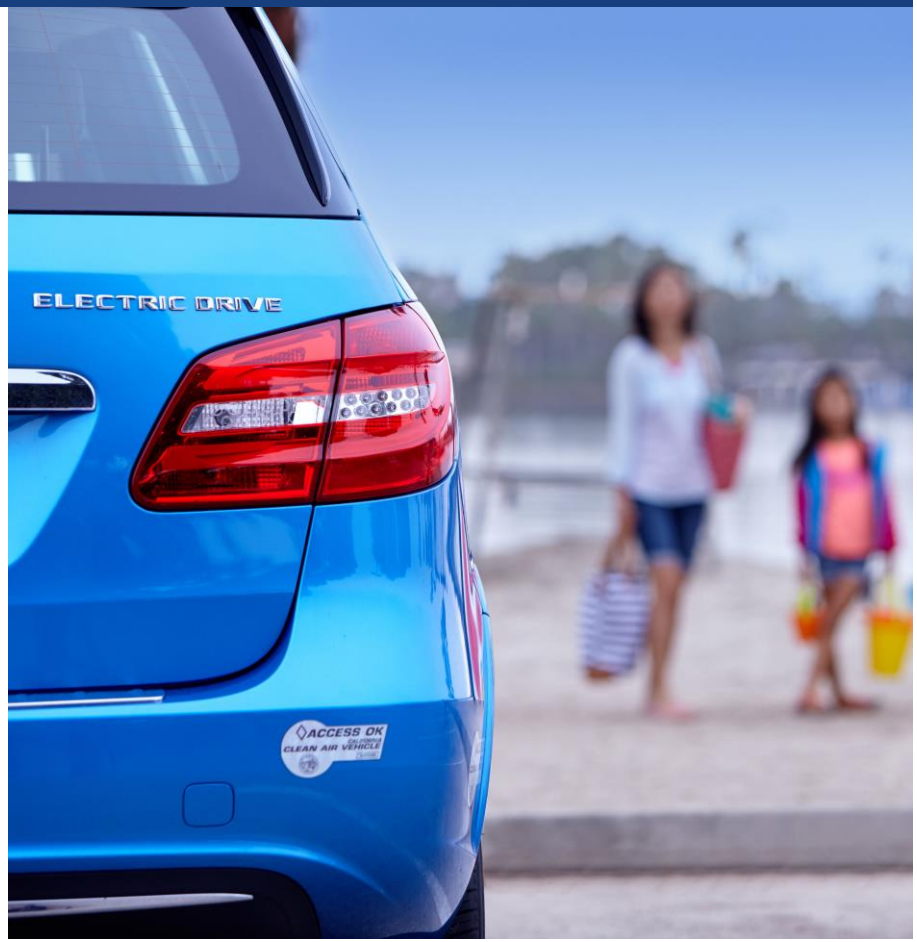


SDG&E's Share of CA EV Projections

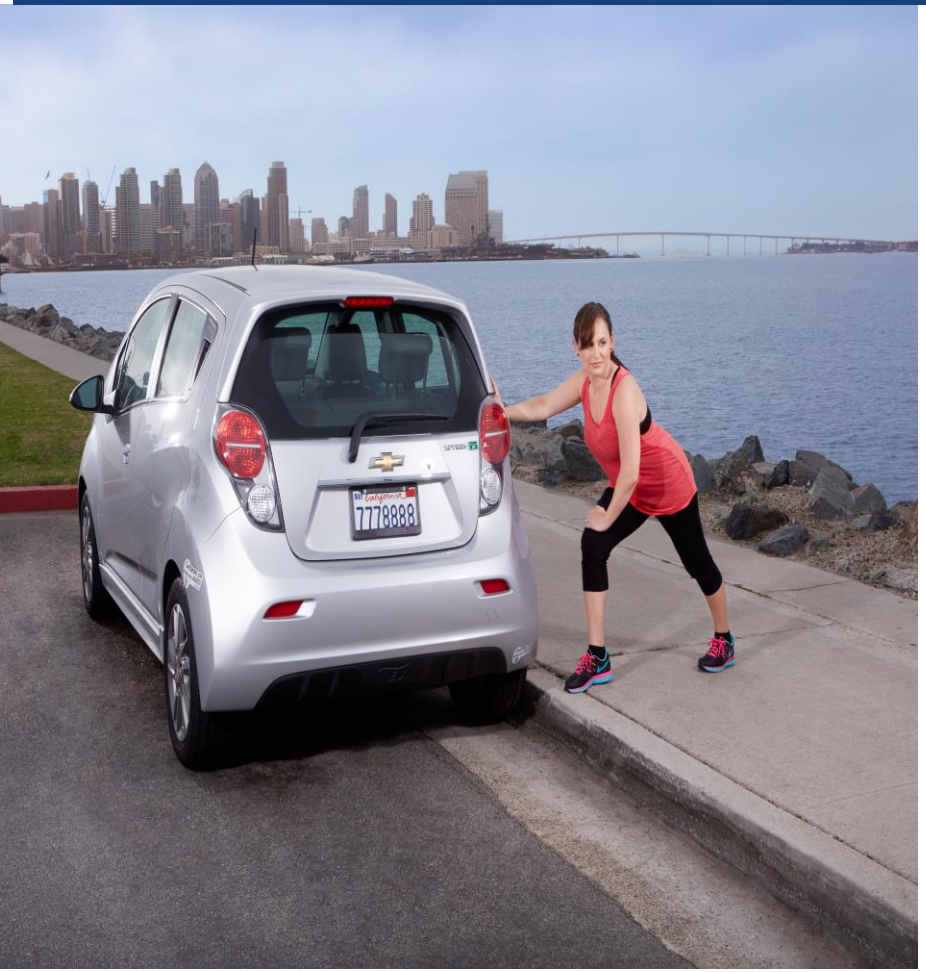


SDG&E Goal: Grid-Integrated EV Charging

- Create an excellent customer experience
- Accelerate the growth of electric transportation
- Ensure the safe, reliable and efficient integration of EV loads with the grid
- Accomplish with technology, pricing, innovation, education



Power Your Drive



- 3,500 charging stations in 350 locations
- Apartments, condos and work places
- Hourly rate encourages off-peak charging
  - Integrates renewable energy with the grid
  - Reduces need for more power plants
- Two billing options to SDG&E bill
  - Property pays
  - Driver pays

Information

- Participation Payment
- At least 10% in Disadvantaged Communities
- Third parties to operate and maintain charging system
- Work performed by skilled labor
- 40% of spend to Diverse Business Enterprises
- 3-year sign up, $45M implementation budget
- Program ensures equipment in good working order


POWER YOUR DRIVE
Electric drive is beautiful.


8330
Electric drive is beautiful.
SDGE
A Sempra Energy utility
San Diego Gas & Electric
Buildings 1-3
Buildings 4-6
DRIVE SAFELY
5 MPH SPEED LIMIT

Presentation Highlights: San Diego Gas & Electric (SDG&E)

- 50% of San Diego's electric vehicles (EVs) are **pure electric,** not hybrid vehicles:
  - **Readily available charging stations** are crucial to move beyond current range constraints of EVs.
- During the design of the program, SDG&E will:
  - Provide both **property owner and driver rate-pay options** for drivers and property owners to fit the needs of the community.
  - Focus on **education for disadvantaged communities** that may not be aware of the financial savings of EVs.
- Multifamily homes often lack **easy access** to charging stations.
  - SDG&E will provide **charging stations that will be owned, built, and maintained by SDG&E** to remove this barrier.

Program Experience:
Mike Salisbury
Program Associate
Southwest Energy Efficiency Project

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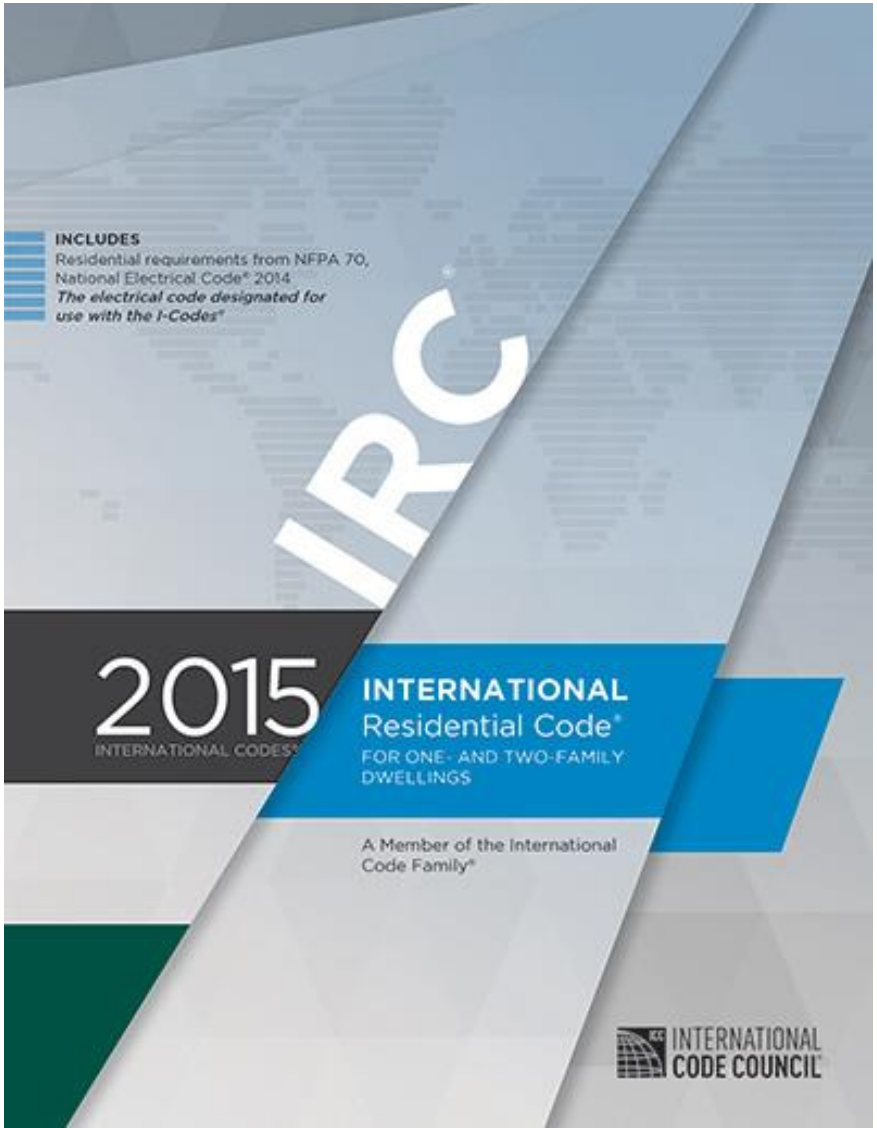
Driving Change in Residential Energy Efficiency: Electric Vehicles and Building Codes

Mike Salisbury

Southwest Energy Efficiency Project

Building Codes



Electric Vehicle Ready Building Codes

- At a basic level, the idea is to require new construction to have either:
  - Conduit or wiring from panel to parking area
  - Panel capacity to handle future EV load
- This makes it incredibly easy and inexpensive to install a charging station at a future date

Three Areas to Target

Single Family

Multi Family

Commercial

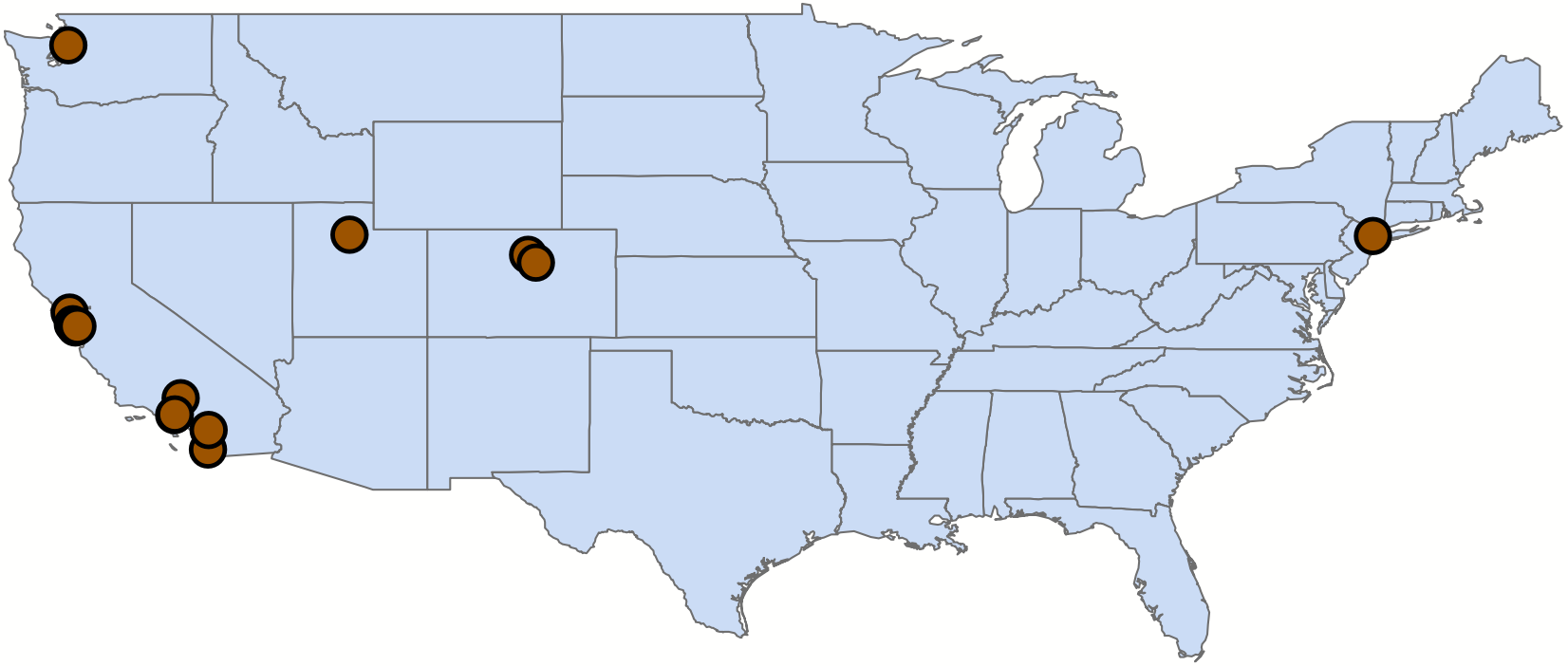
Single Family

Trenching=$$$

Multi-Family Housing

Commercial

Municipalities with EV Ready Building Codes



Thanks!

http://www.swenergy.org/

Presentation Highlights: SWEEP

- **Single Family Housing** can be made EV-ready with easy, affordable upgrades.
  - However, new wiring and trenching can be expensive if needed.
- **Charging stations in multifamily housing** are crucial for increasing the adoption of EVs:
  - Building codes can require **new construction** to have a percentage of parking with charging stations.
  - An increase in new construction with charging stations will put pressure on **existing buildings** to provide this amenity as well.
- **Municipalities** are beginning to require a percentage of parking be EV-ready, but this varies widely by region.

Lessons Learned:
Zach Henkin
Program Manager
Drive Oregon

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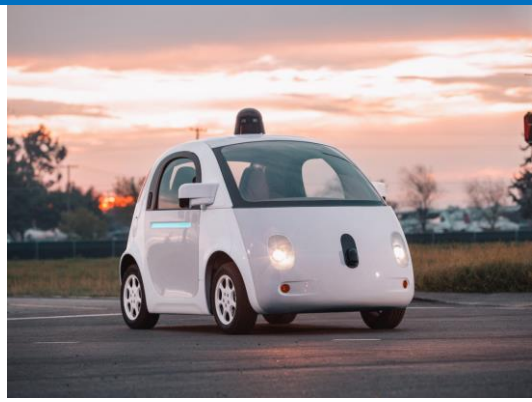
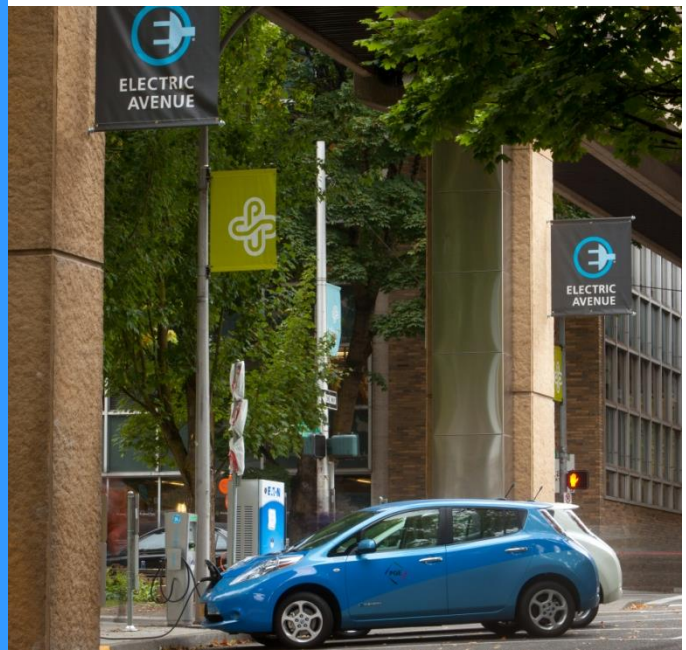
Driving Change in Residential Energy Efficiency: Electric Vehicles





Better Buildings

April 2016

Drive Oregon

Nonprofit (501c6 & 501c3)

Established: 2011

Mission is to grow the electric vehicle industry and promote electric transportation in Oregon

Funded by Oregon Innovation Council (state lottery) and member companies

Membership 100+ companies, utilities, local governments, other stakeholders

www.driveoregon.org

business oregon

The Early Majority

Old car

$/mile $0.17

~24 MPG

$260+ per mos. in gas

New car

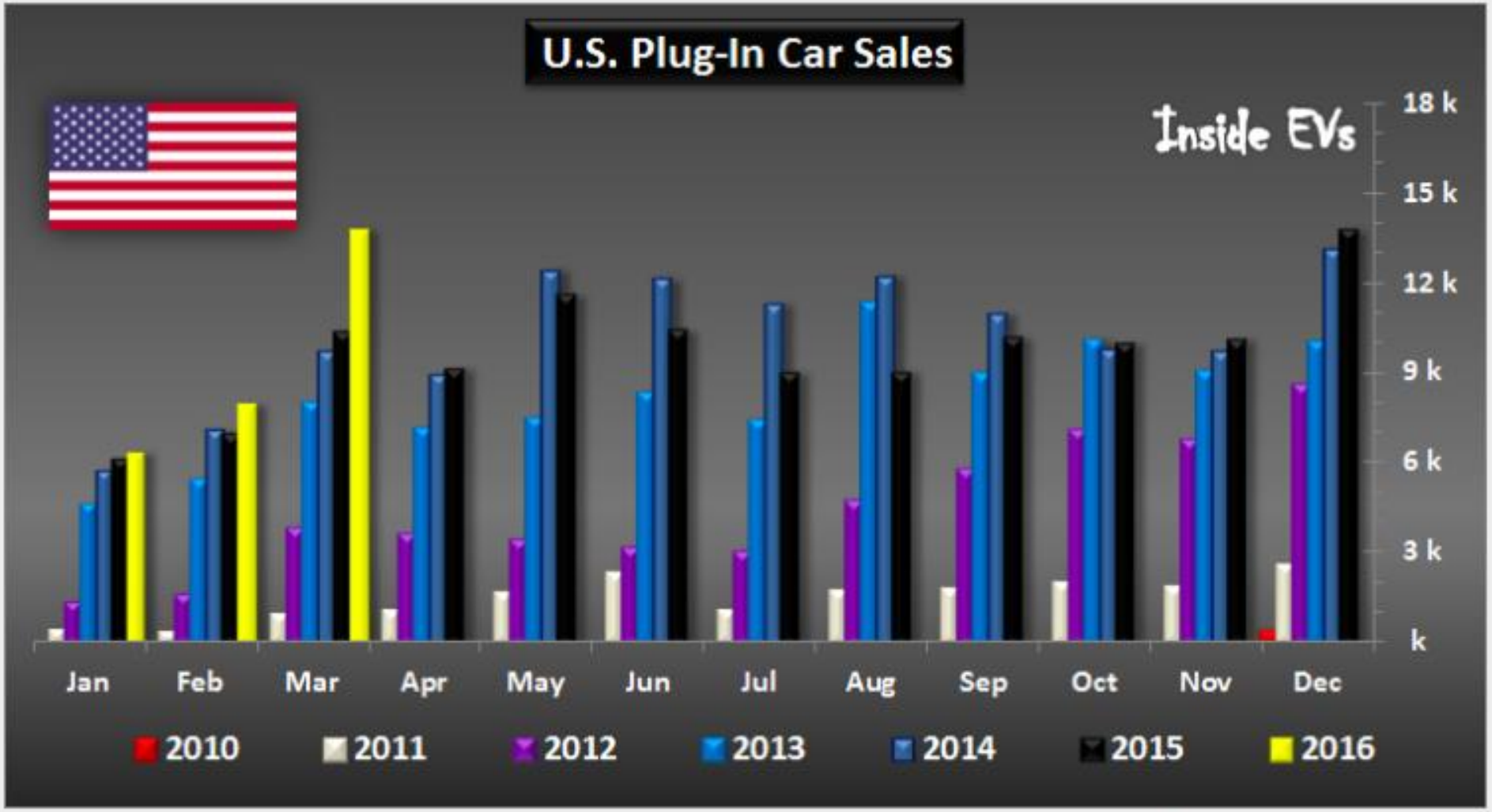
$/mile $0.03

~128 MPGe

$10-20 per mos. in kWh

Electric Vehicles are Great Cars!

Tesla's 400k of Model 3 Reservations in Context



U.S. Plug-In Car Sales Currently On 4th Consecutive Monthly Record (Data Through February 2016)

Electric Vehicles are Here (Really!)

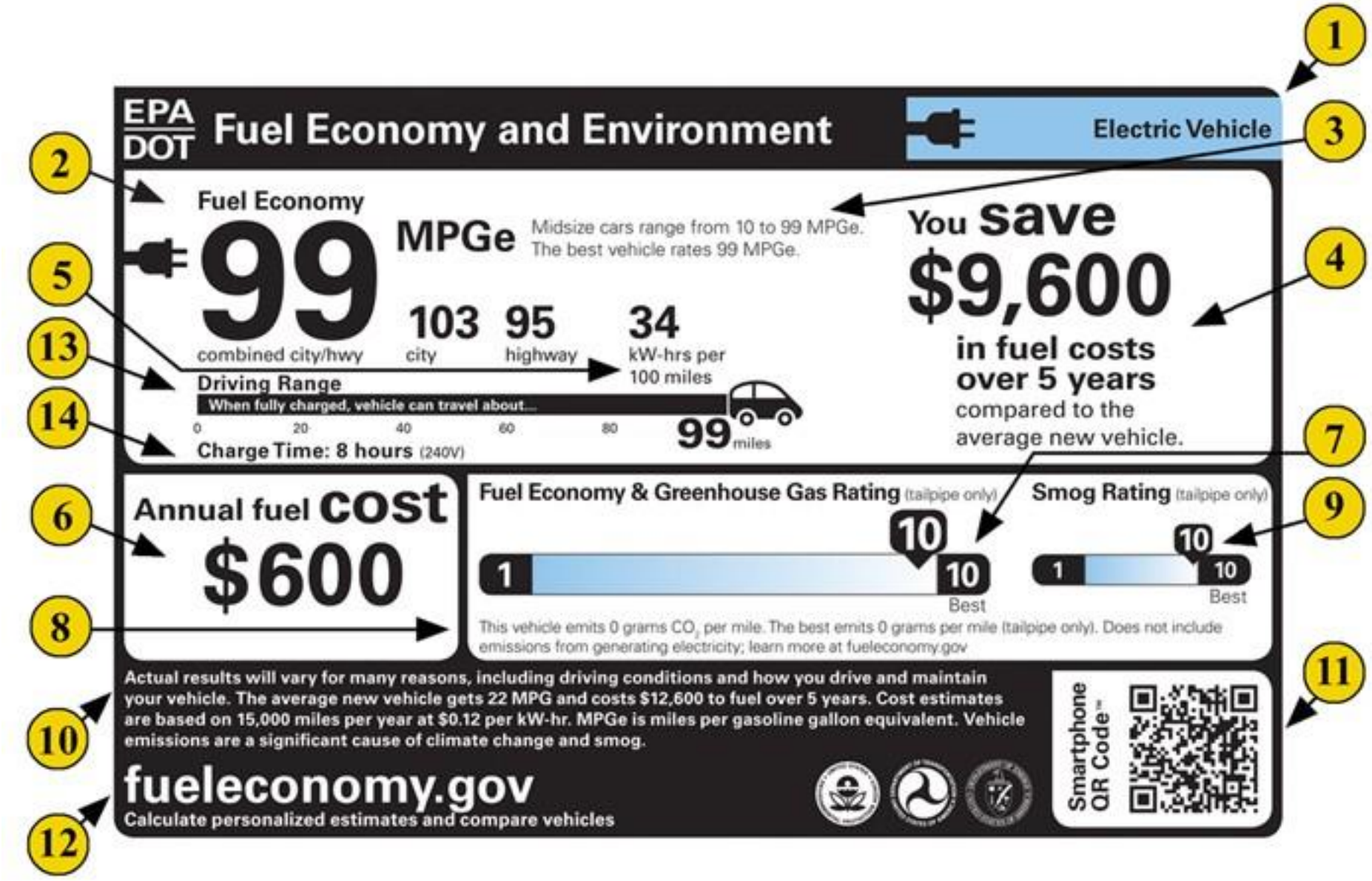








33.70 kWh = 1 MPG_{ge}



Cost to Charge an Electric Car

If a car uses 34 kWh to travel 100 miles

$.11 x 34 / 100 = $.0374 or 4 ¢ per mile

Price of electricity X kWh per 100mi / 100 = cost-per-mile

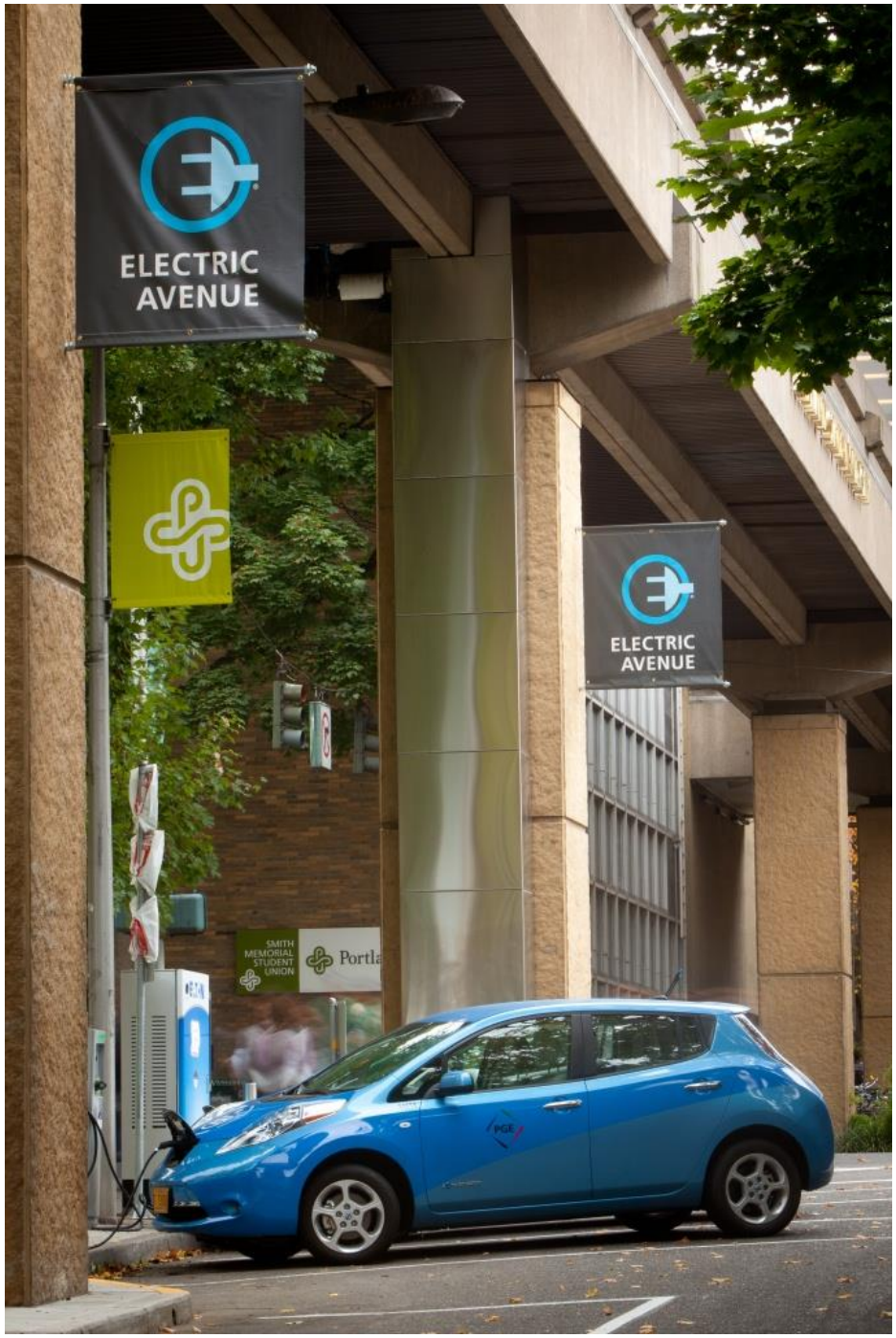
To fully charge the battery

$.11 x 24 = $2.64

Price of electricity X battery size = cost to fully charge

Solar PV Generating kWh to Offset Driving

3400 kWh for 10,000 miles of electricity



Drive Oregon

Innovation in Electric Mobility

business oregon

Questions?

www.driveoregon.org

Twitter: @DriveOregon

Presentation Highlights: Drive Oregon

- With new models such as Tesla, **EVs are quickly becoming quality transportation options** that can compete with gas vehicles.
- In planning your home energy cost, **look at the fuel economy label** of an EV to determine how an EV may fit into your budget.
- People who plug-in their cars at home **generally use less energy!**
  - This may be due to a heightened energy use awareness.
- The U.S. car industry is currently **built around gas vehicles**.
  - A shift to thinking about kWh, instead of MPG, is an important shift to increase the rate of adoption of EVs.
- Many single family homes are easily made EV-ready.
  - An EV will require roughly 240 volts and 30-40 amps, roughly **the same amount as an electric dryer.**

Explore planning, implementation, & evaluation strategies in the Residential Program Solution Center

- Handbooks - explain *why* and *how* to implement specific stages of a residential program.
- Quick Links - provide easy access to resources on the key issues that many programs face.
- Proven Practices posts - include lessons learned, examples, and helpful tips from successful programs.
  - See the latest post **Help Contractors Sell Home Upgrades**.

www.energy.gov/rpsc

➢ The Solution Center is continually updated to support residential energy efficiency programs—**member ideas are wanted!**

Solution Center Resource Slide Poll

- How have you used the information from the Solution Center slides after Peer Exchange calls?
  - I have not done anything based on the slide **– *38%***
  - It caused me to explore the Solution Center **– *23%***
  - I have explored one of the resources in depth **– *15%***
  - N/A (this is my first Peer Exchange call) **– *15%***
  - I have clicked on 1+ resource URLs on the slide **– *8%***

Discussion Highlights

- As charging stations become readily available, apps and online directories **can provide hourly charging rates in advance.**
  - This will help EV owners **make informed decisions about time of day charging.**
  - Utilities can avoid the need for additional power plant construction by **charging more during peak electric use hours.**
- EV ready stations in new construction is crucial to meeting local and federal energy efficiency goals:
  - This is an opportunity to **pair EV charging stations with renewable energy**, like solar panels, to further decrease the carbon footprint of vehicles.
  - Planning for EV charging in new construction can **avoid costly retrofits in the future.**

Closing Poll

- After today's call, what will you do?
  - Seek out additional information on one or more of the ideas **– *76%***
  - Consider implementing one or more of the ideas discussed **– *14%***
  - Other (please explain) **– *10%***

Peer Exchange Call Series

We hold one Peer Exchange call every Thursday from 1:00-2:30 pm ET

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:

- May 5 – No call
- May 12: Bullseye: Top Strategies for Targeted Marketing (101)
- May 19: Walking the Talk: Employer Assisted Programs (301)
- May 26: Spring Forward: Top Strategies for Growing and Scaling Your Program (301)

Send call topic ideas to peerexchange@rossstrategic.com

See the Better Buildings Residential Network Program website to register

LET'S ALL MEET IN MAY!

REGISTER TODAY for the

BETTER BUILDINGS SUMMIT

Washington, DC · May 9-11, 2016

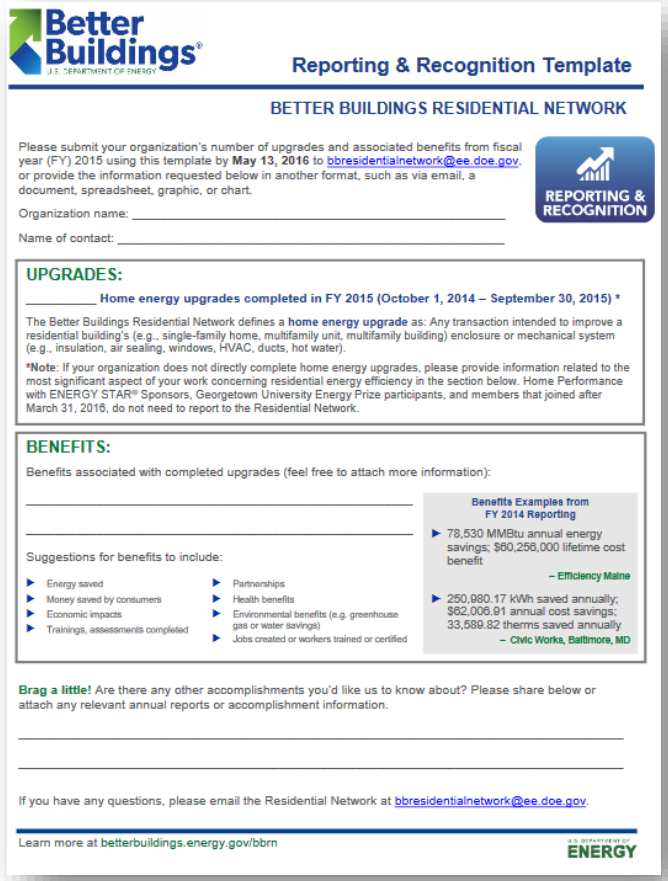
This Summit will bring together Better Buildings partners and stakeholders to exchange best practices and discuss future opportunities for greater energy efficiency in America's homes and buildings.

There will be time set aside for a specific Residential Network discussion and meet-up! See the draft agenda here.

Annual Member Reporting and Recognition

We are eager to hear about and recognize your accomplishments from 2015!

- Share your number of upgrades, and any related benefits
- New template makes it easier



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Reporting & Recognition Template

BETTER BUILDINGS RESIDENTIAL NETWORK

Please submit your organization's number of upgrades and associated benefits from fiscal year (FY) 2015 using this template by **May 13, 2016** to bbresidentialnetwork@ee.doe.gov, or provide the information requested below in another format, such as via email, a document, spreadsheet, graphic, or chart.

REPORTING & RECOGNITION

Organization name: _____

Name of contact: _____

UPGRADES:

_____ **Home energy upgrades completed in FY 2015 (October 1, 2014 – September 30, 2015) ***

The Better Buildings Residential Network defines a **home energy upgrade** as: Any transaction intended to improve a residential building's (e.g., single-family home, multifamily unit, multifamily building) enclosure or mechanical system (e.g., insulation, air sealing, windows, HVAC, ducts, hot water).

***Note**: If your organization does not directly complete home energy upgrades, please provide information related to the most significant aspect of your work concerning residential energy efficiency in the section below. Home Performance with ENERGY STAR® Sponsors, Georgetown University Energy Prize participants, and members that joined after March 31, 2016, do not need to report to the Residential Network.

BENEFITS:

Benefits associated with completed upgrades (feel free to attach more information):

_____

_____

Suggestions for benefits to include:

- Energy saved
- Money saved by consumers
- Economic impacts
- Trainings, assessments completed
- Partnerships
- Health benefits
- Environmental benefits (e.g. greenhouse gas or water savings)
- Jobs created or workers trained or certified

Benefits Examples from FY 2014 Reporting

- 78,530 MMBtu annual energy savings; $60,256,000 lifetime cost benefit
  – Efficiency Maine
- 250,980.17 kWh saved annually; $62,006.91 annual cost savings; 33,589.82 therms saved annually
  – Civic Works, Baltimore, MD

Brag a little! Are there any other accomplishments you'd like us to know about? Please share below or attach any relevant annual reports or accomplishment information.

_____

_____

If you have any questions, please email the Residential Network at bbresidentialnetwork@ee.doe.gov.

Learn more at betterbuildings.energy.gov/bbrn

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