Better Buildings®
U.S. DEPARTMENT OF ENERGY

Pioneering Strategies to Achieve Audacious Energy Goals: Part II

Better Buildings Summit 2017,
Tuesday, May 16th,
3.45p,-5.00pm

U.S. DEPARTMENT OF ENERGY

Session Speakers

- Holly Carr, US Department of Energy, Moderator
- Sarah Olexsak, US Department of Energy
- Eric Wilson, National Renewable Energy Laboratory
- Ryan Moya, University of Michigan

Sarah Olexsak, US Department of Energy

U.S. DEPARTMENT OF ENERGY

Cost-Effective Considerations for Electric Vehicle Charging Stations

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Better Buildings Summit

Pioneering Strategies to Achieve Audacious Energy Goals

Sarah Olexsak

May 16, 2017

U.S. EV Sales are Rising … & now ~50k Charging Stations!

Source: Argonne National Laboratory for US Department of Energy

More Charging Stations Coming to a Community Near You

VW Consent Decree: $2bn ZEV Investment over 10 years

- National ZEV Investment ($1.2bn); CA ZEV Investment ($800M)
- VW administered through Electrify America
- Includes (among other topics) charging station deployment at multi-unit dwellings, workplaces and public sites

VW Consent Decree: $2.7bn Environmental Mitigation Trust Fund

- Goal: Achieve reductions of U.S. NOx emissions
- Funds Allocated by Beneficiaries: States, Indian Tribes, D.C., Puerto Rico
- Includes (among other topics) up to 15% of allocation investment in charging station deployment

How do Green Building Programs Consider Charging Stations?

https://energy.gov/eere/vehicles/workplace-charging-credit-green-building-certification

Charging at Leased Facilities: CBRE Atlantic Station

Spotlight: Atlantic Station managed by CBRE, Inc.
Mixed-use development, Atlanta, GA

CBRE has collaborated with automakers, charging station companies, the local DOE Clean Cities coalition, and utility to offer tenants and the public 28 Level 1, Level 2, and DC fast charging stations.

Plug-In Electric Vehicle (PEV) Charging Station Types

Photo from GM

Photo from WSDOT

Charging Level	Vehicle Range Added per Charging Time and Power	Supply Power	EVSE Unit* Cost Range (single port)
AC Level 1	4 mi/hour @ 1.4kW 6 mi/hour @ 1.9kW	120VAC/20A *(12-16A continuous)*	$300-$1,800
AC Level 2	10 mi/hour @ 3.4kW 20 mi/hour @ 6.6kW 60 mi/hour @ 19.2 kW	208/240VAC/20-100A *(16-80A continuous)*	$400-$6,500
DC Fast Charging	24 mi/20min. @24kW 50 mi/20min. @50kW 90 mi/20min. @90kW	208/480VAC 3-phase *(input current proportional to output power; ~20-400A AC)*	$10,000-$40,000

*EVSE unit costs are based on units commercially available in 2015.

EVSE Unit Cost Factors

EVSE unit cost primarily depends on the:

- Charging Level and Amperage Rating
- # of Charging Ports
- Mounting system (wall/pedestal)
- Networked/Non-networked
- Additional Features

Photo from Utildata

Photo from New York Power Authority

EVSE Installation Cost Factors

Installation costs are influenced by:

- Required electrical work
- Trenching or boring,
- Permitting/inspection,
- Labor rates, and
- ADA requirements.

Photo from NYSERDA

Simple/lower cost – run conduit along the wall a short distance

Complex/higher cost – trench or bore through concrete to run conduit a long distance

Example trenching costs:

- $100-$150/ft for asphalt or concrete
- $10-$20/ft for soil

EVSE installation costs vary significantly based on site specific factors. **A site evaluation is critical** for estimating EVSE installation costs.

Installation Costs – New Electrical Service or Upgrades

Photo from Don Karner

Photo from NYSERDA

Photo from NYSERDA

3 Fundamental EVSE Electrical Needs

1. Sufficient electrical capacity from the utility connection to the electrical panel.
2. Sufficient electrical capacity at the panel.
3. A dedicated circuit for each EVSE unit on the electrical panel (in most cases).

Consult with electrician and utility to determine if electrical work is needed and estimate cost.

Service upgrade –*$10,000-$25,000 (WCEH)*

New electrical service – *$3,500-$9,500 (EV Project)*

Electrical panel work – Cost is very site specific. *About 72% of Level 2 commercial installations required panel work (EPRI)*

O&M Costs – Electricity & Network Fees

- **Electricity Consumption**
  - Commercial electricity rates: $0.08-$0.15 per kWh
  - Avg. workplace charging station uses 10kWh per day
- **Demand Charges**
  - Utility threshold (20-50kW)
  - $0-$2,000+ per month for EVSE
  - Energy management systems
- **Charging Network Fees**
  - Charging station visibility and availability for drivers
  - Energy monitoring
  - Station usage analysis
  - Automated diagnostics
  - Access control
  - Payment system
  - Customer support

Tips for Minimizing Costs – EVSE Unit Selection

EVSE Unit Selection

- Minimum level of features needed
- Wall mounted EVSE unit (if possible)
- Dual port EVSE minimizes installation costs per charge port.
- Choose the quantity and level of EVSE units to fit within that available electrical capacity

Location

Long Term Planning

Tips for Minimizing Costs – Location

EVSE Unit Selection

Long Term Planning

Location

- Minimize the trenching/boring distance
- Place the EVSE unit close to the electrical service
- Use signage to direct PEV drivers to the EVSE unit
- Choose a location that already has space on the electrical panel with a dedicated circuit

Tips for Minimizing Costs – Long Term Planning

EVSE Unit Selection

Location

Long Term Planning

- Discuss electrical service needs and charges with utility
- Avoid demand charges
- Upgrade electrical service for anticipated long term EVSE load and run conduit to anticipated future EVSE locations.
- Consider the electricity infrastructure for EVSE when building a new facility

Eric Wilson, National Renewable Energy Laboratory

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Using **ResStock** to prioritize energy efficiency upgrade opportunities

Eric Wilson, National Renewable Energy Laboratory

May 16, 2017

Pioneering Strategies to Achieve Audacious Energy Goals
Part 2 of 2: How Commercial and Residential Building Owners Contribute to Local Success

Using **Res**Stock to prioritize energy efficiency upgrade opportunities

Outline

- Context & Motivation
- Solution
- Example Results
- Application

Context & Motivation

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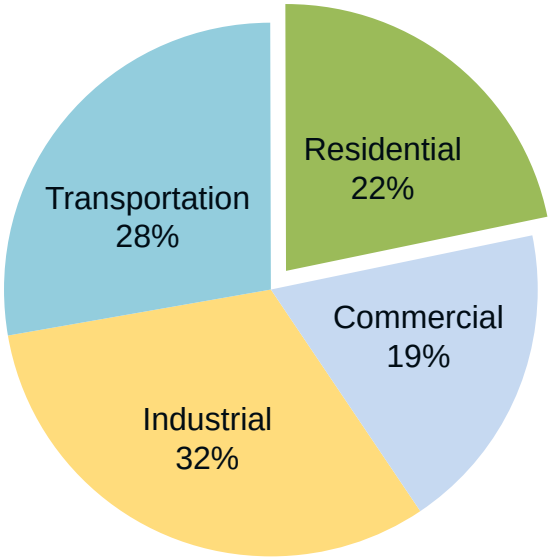
Context & Motivation

Homes use 22% of primary energy in U.S.

Primary energy consumption by sector, 2014

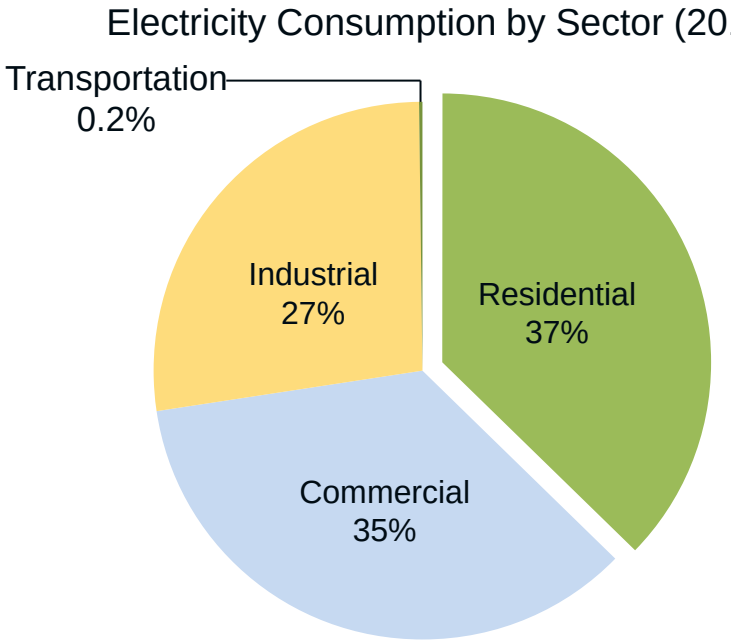


Source: U.S. Energy Information Administration, *Monthly Energy Review,* Table 2.1 (March 2015). Preliminary data for 2014

Note: Sum of individual percentages may not equal 100 because of independent rounding

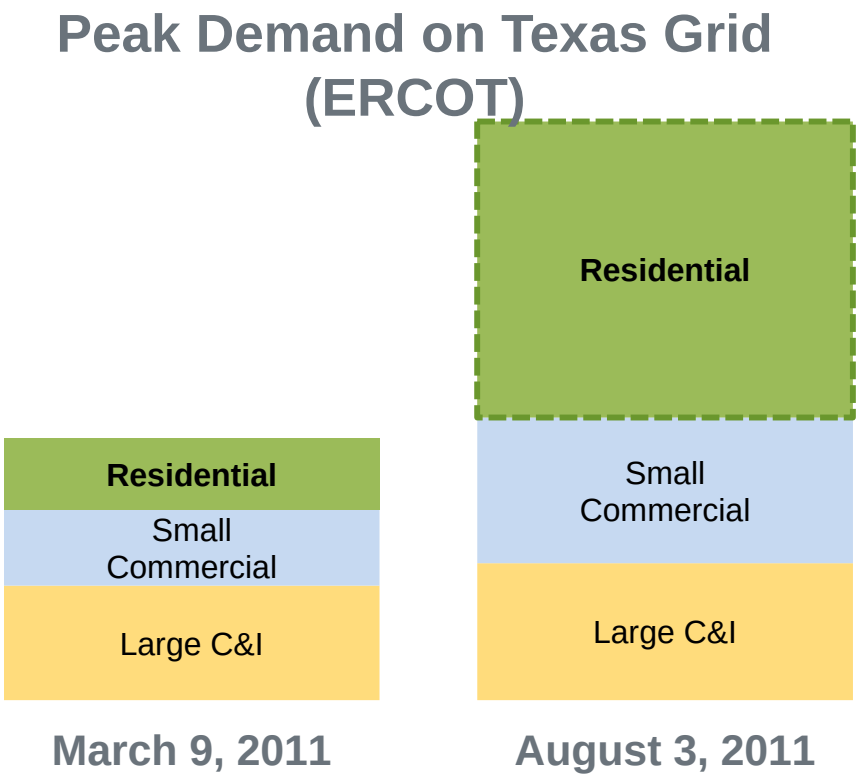
Context & Motivation

Homes use 37% of electricity in U.S.



Context & Motivation

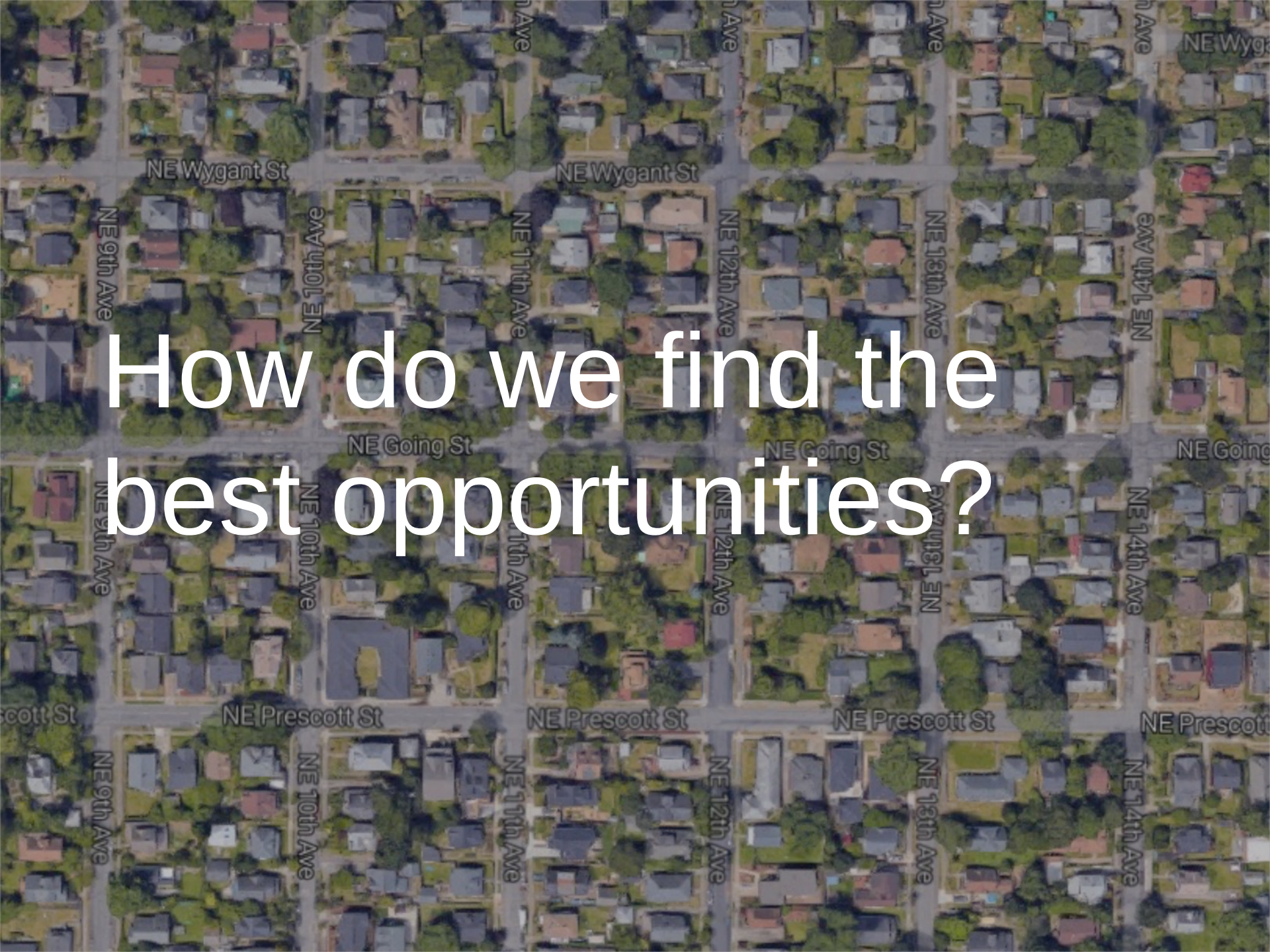
Homes contribute to roughly
50% of peak electric demand



Context & Motivation

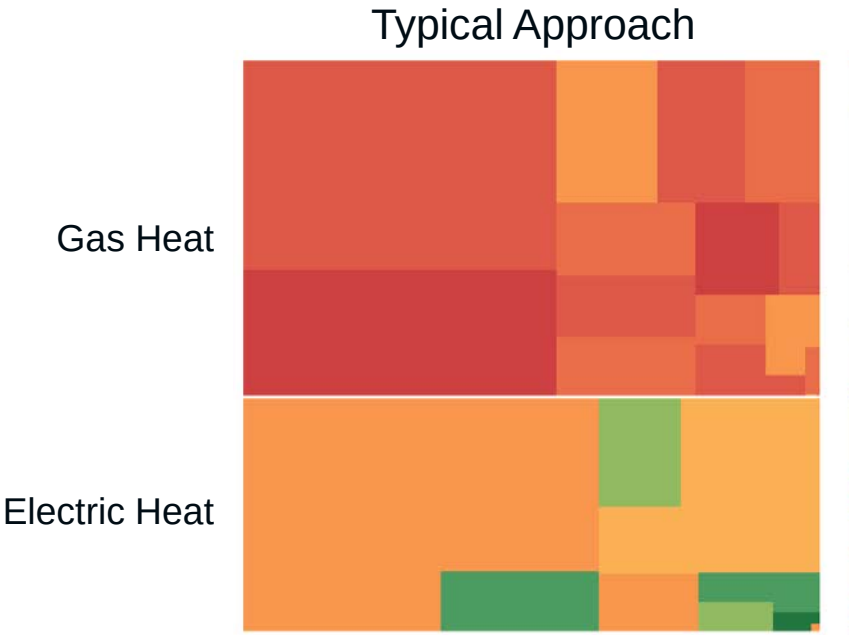
If just one of every 10 U.S. homes cut its energy use by 25%, Americans could save a total of more than **$5 billion per year** on their energy bills.

— U.S. DOE Building Technologies Office's
Multi-Year Program Plan for Fiscal Years 2016 through 2020



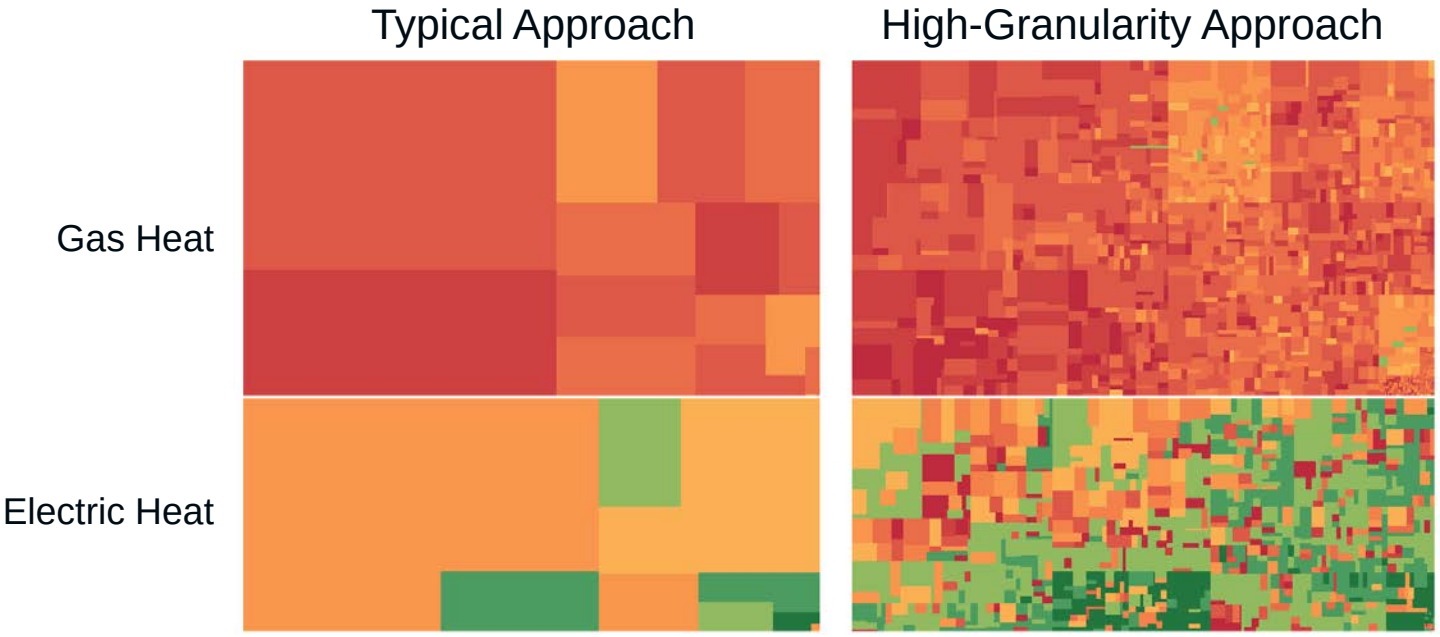
How do we find the best opportunities?

Context & Motivation



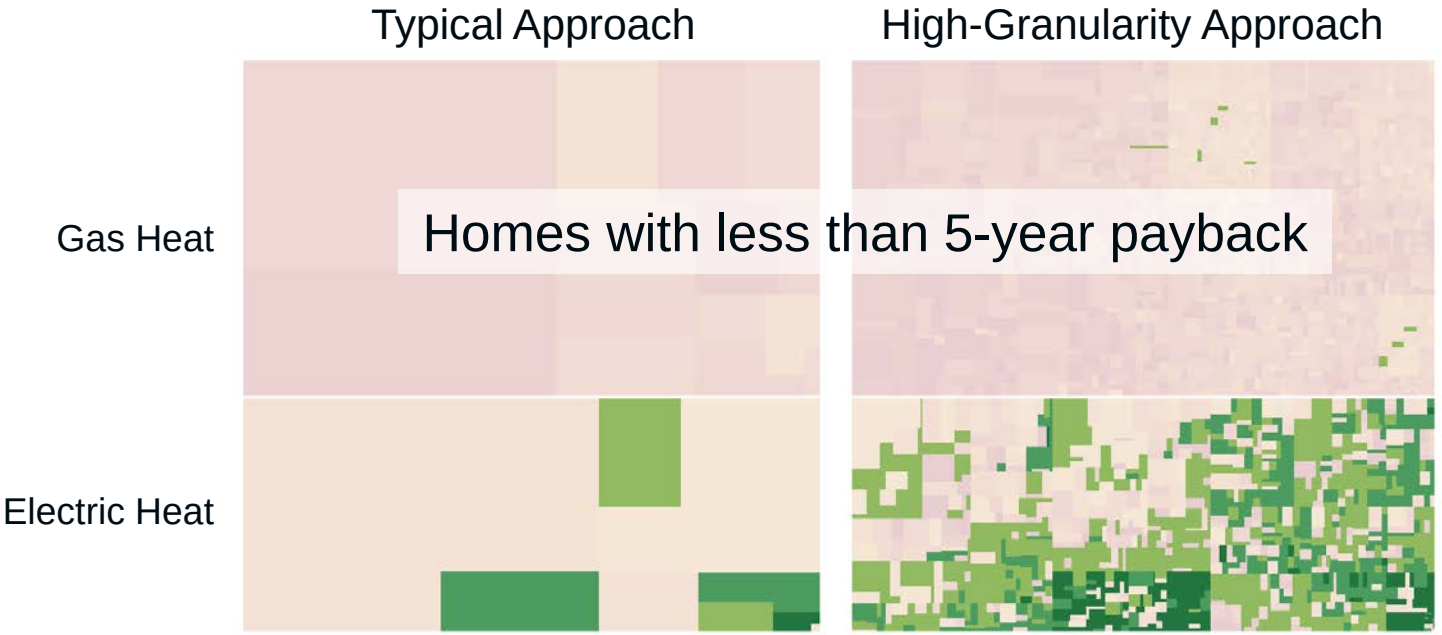
Payback, in years, for drill-and-fill wall insulation in Washington and Oregon single-family homes

Context & Motivation



Payback, in years, for drill-and-fill wall insulation in Washington and Oregon single-family homes

Context & Motivation



Payback, in years, for drill-and-fill wall insulation in Washington and Oregon single-family homes

Solution

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ResStock + **Com**Stock

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Data-driven, physics-based simulation of the U.S. Residential and Commercial building stocks

ResStock + **Com**Stock

Data-driven, physics-based simulation of the U.S. Residential and Commercial building stocks

using **large public and private datasets** and **modern computing resources**


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to achieve unprecedented granularity in modeling building energy use and demand

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Example Results

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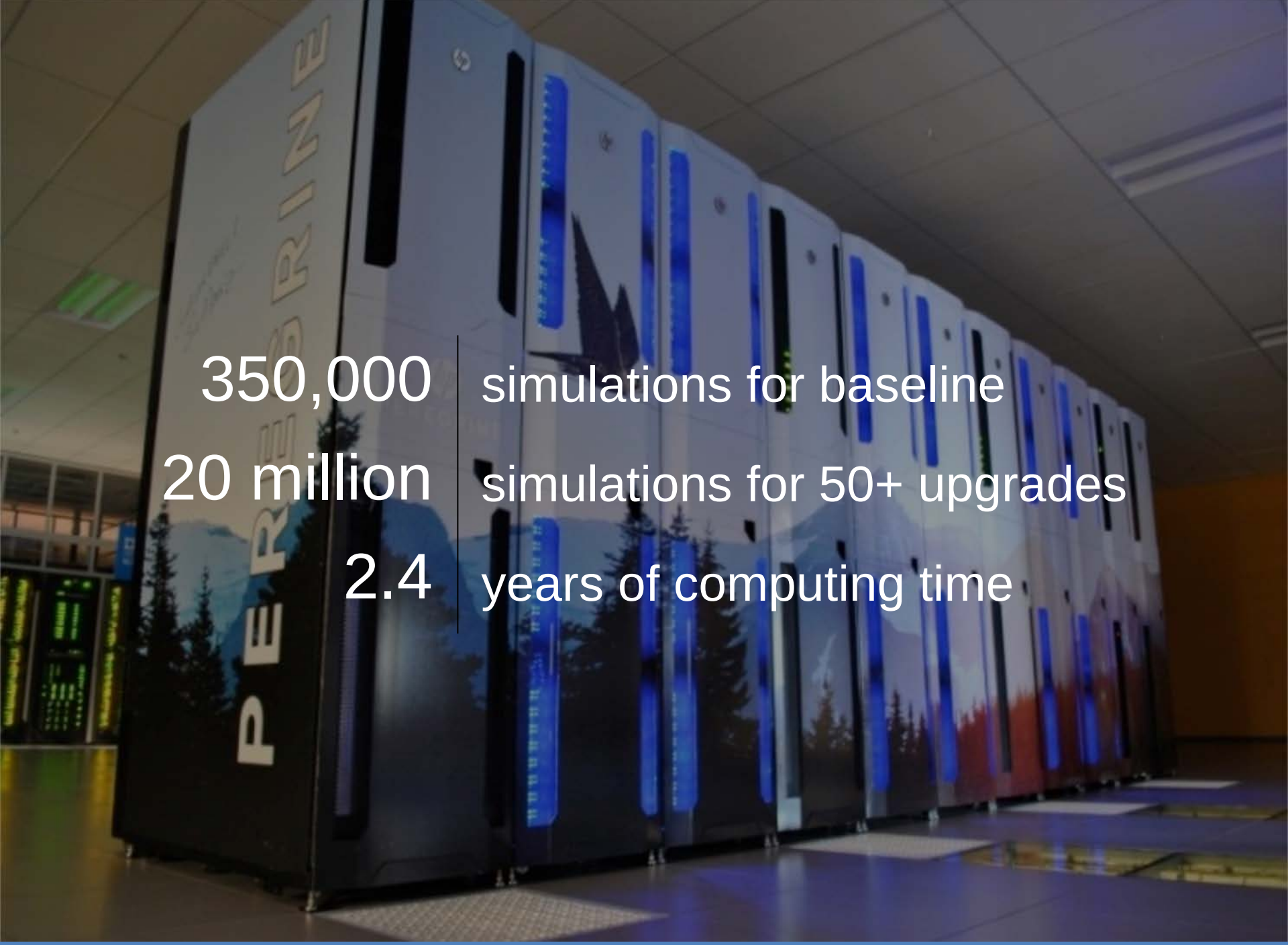
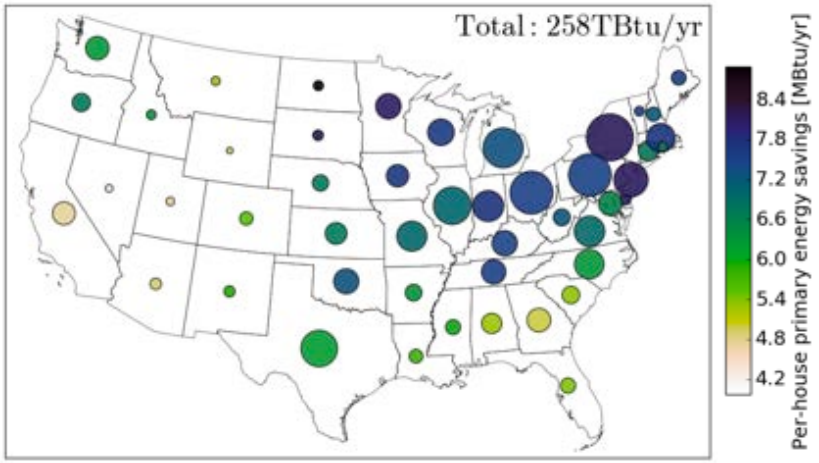


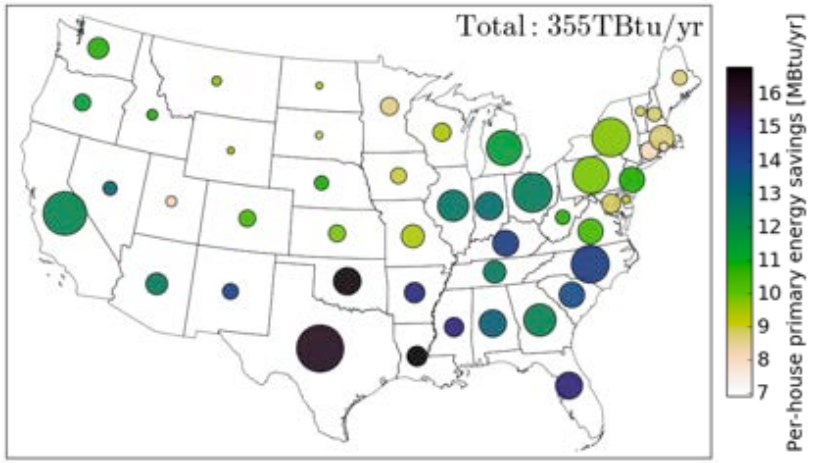
350,000	simulations for baseline
20 million	simulations for 50+ upgrades
2.4	years of computing time

Example Results – Economic Potential (NPV > 0)

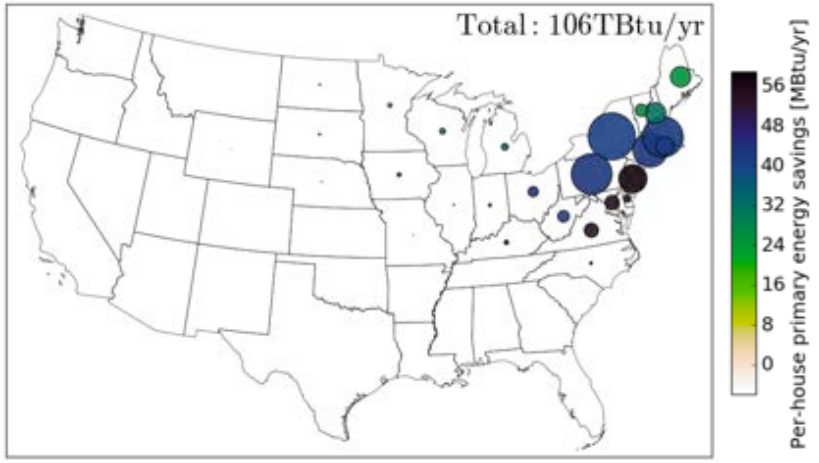
Air Sealing



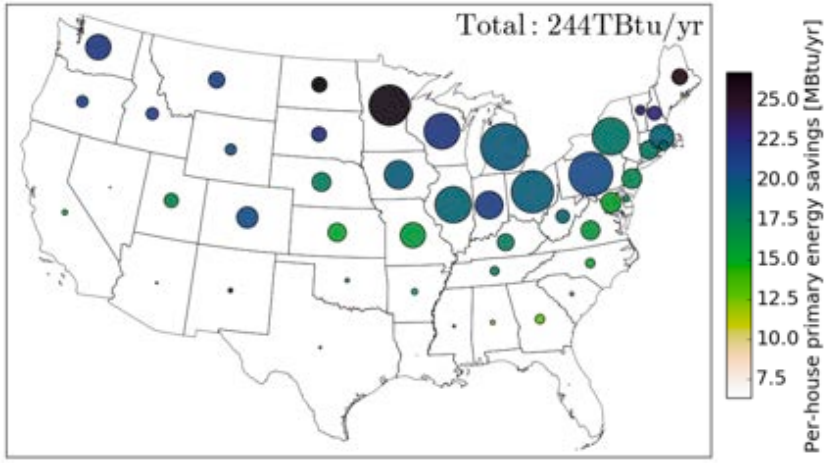
Attic Insulation (R-49)



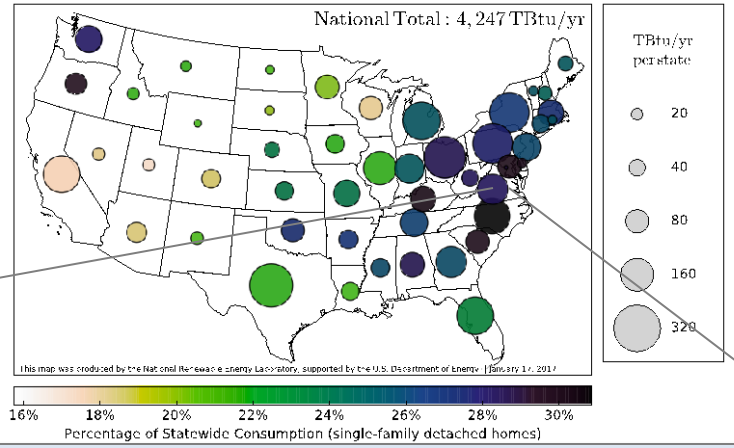
Replacing Oil Boilers with Ductless Heat Pumps



Basement Wall Insulation (R-10)

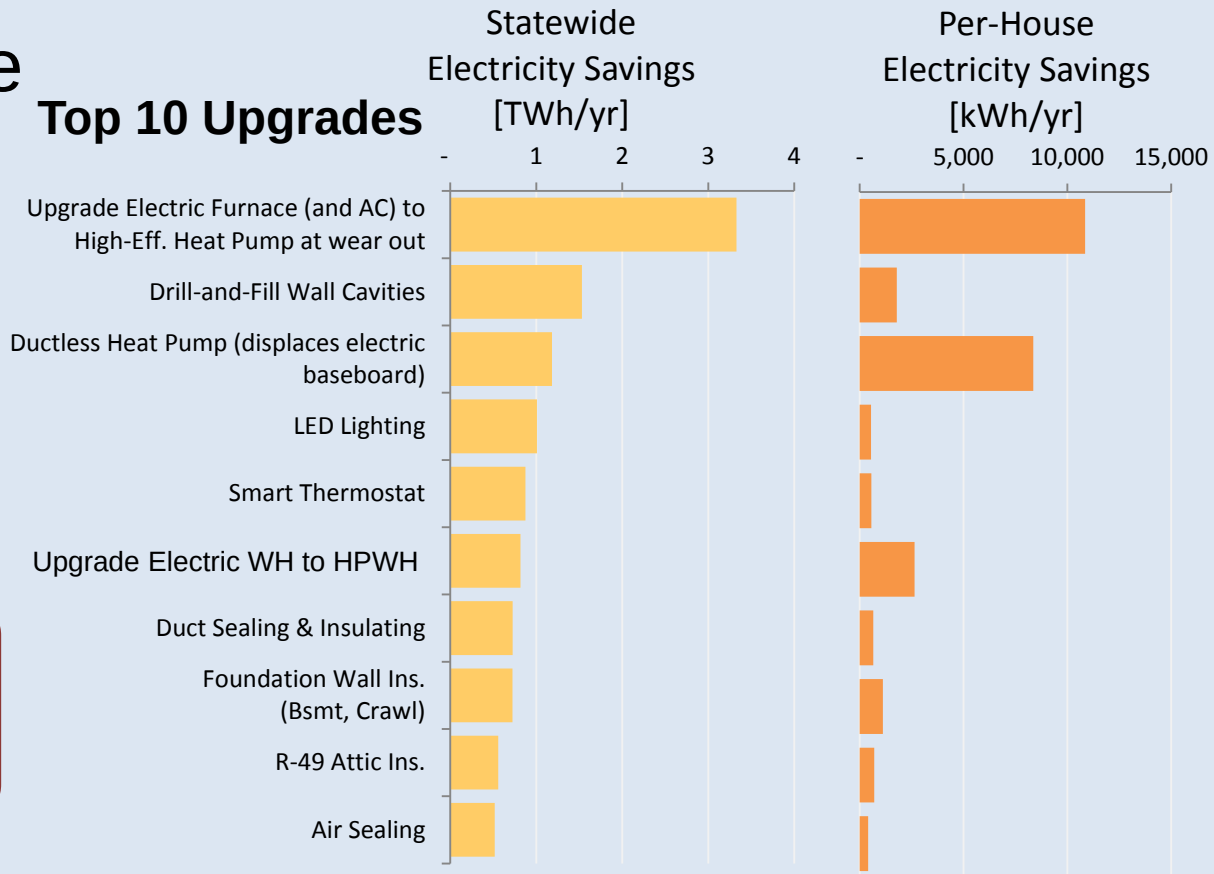


Actionable results for states and cities



Cost-effective savings for **Virginia**

Top 10 Upgrades



Utility bills
1.5
billion dollars per year

Looking Ahead: State-Specific Results

48 state fact sheets

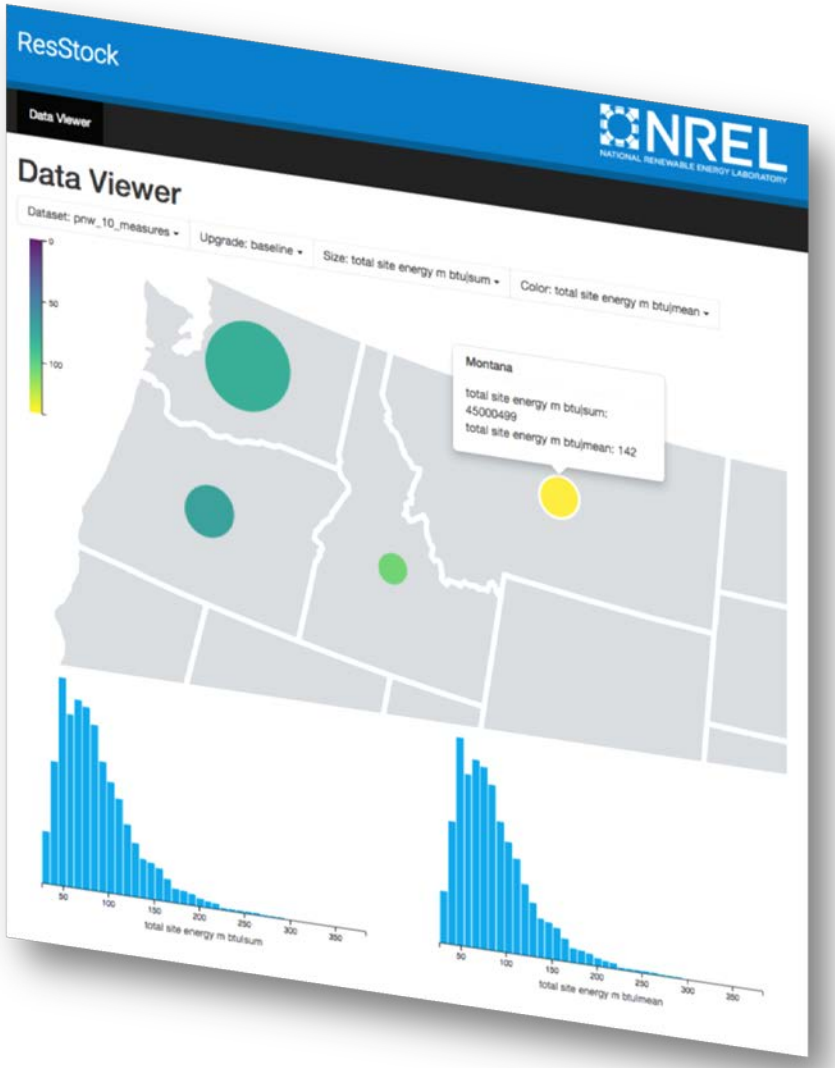
Based on analysis for DOE Quadrennial Energy Review

- High-level results
- Top priority upgrades

Looking Ahead: ResStock Website

Interactive web visualizations

- Housing characteristics
- Baseline consumption by end-use, fuel
- Savings and cost-effectiveness for upgrades



Application

Grid impacts of audacious energy goals

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City of Boulder

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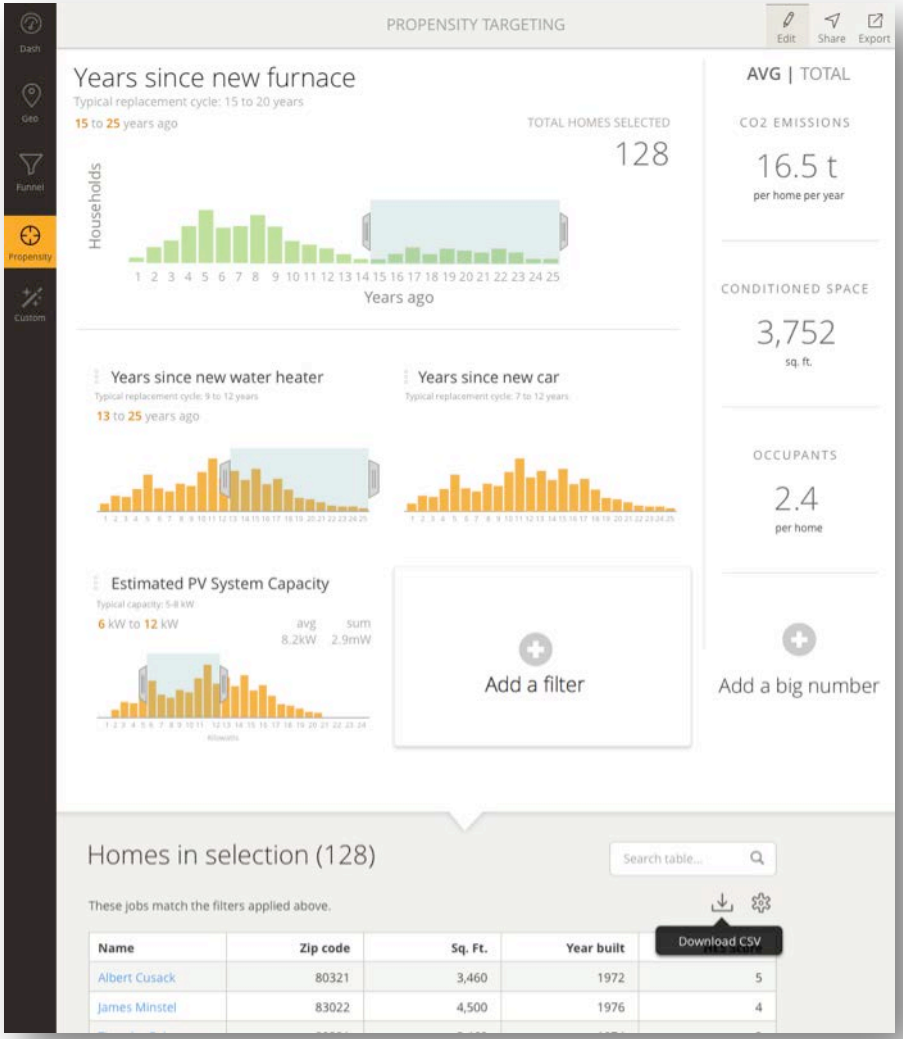
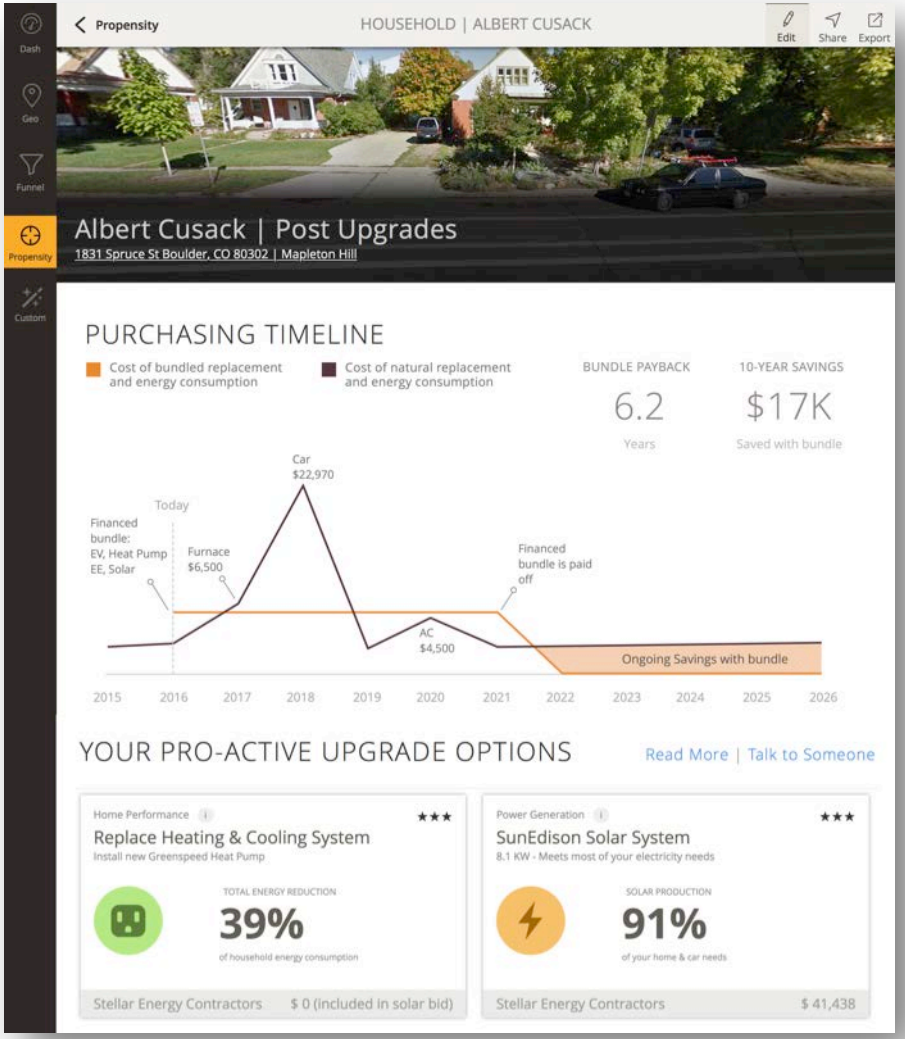
Targeting and Analytics Platform



Homeowner Dashboard and Roadmap



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City of Boulder

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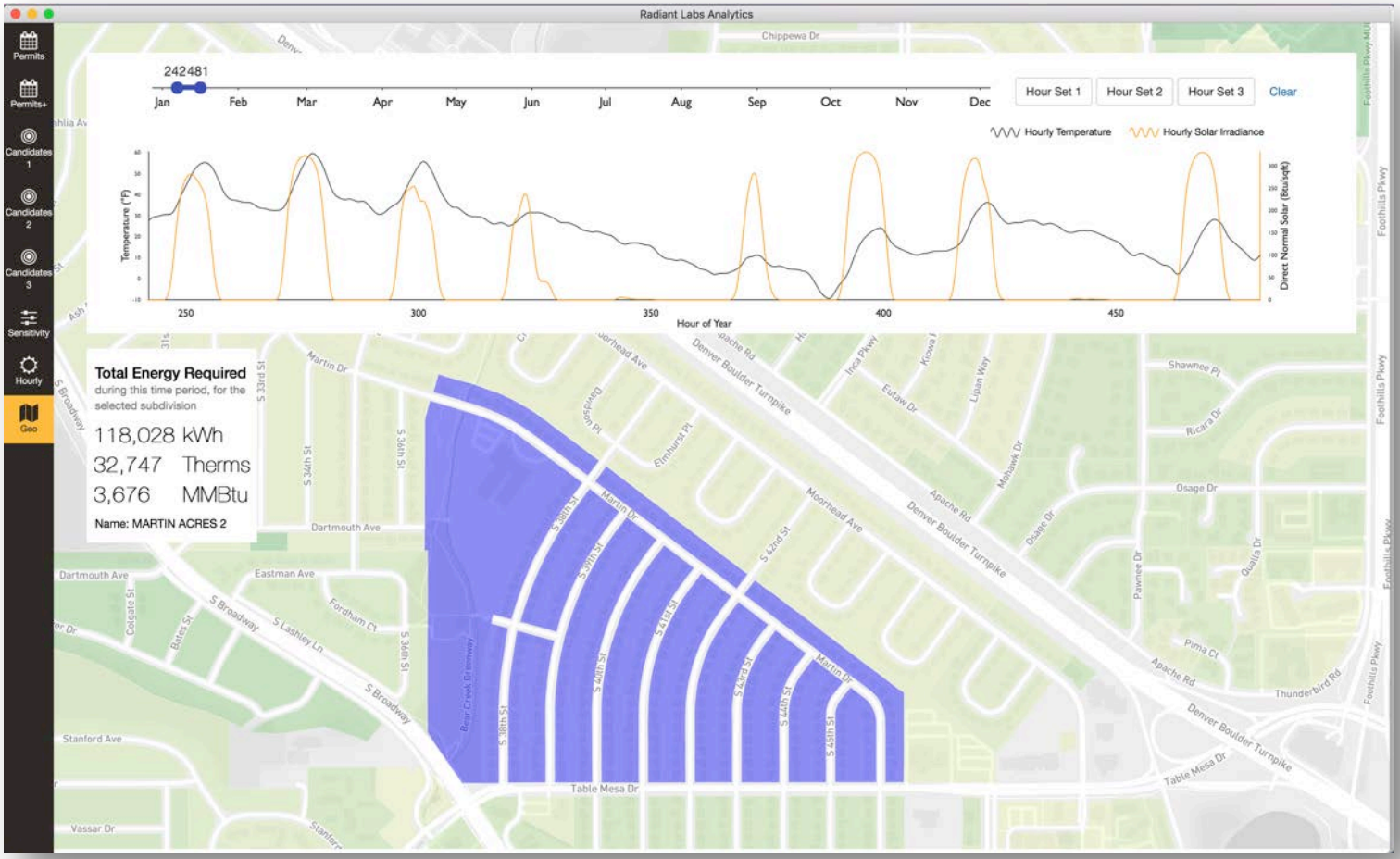
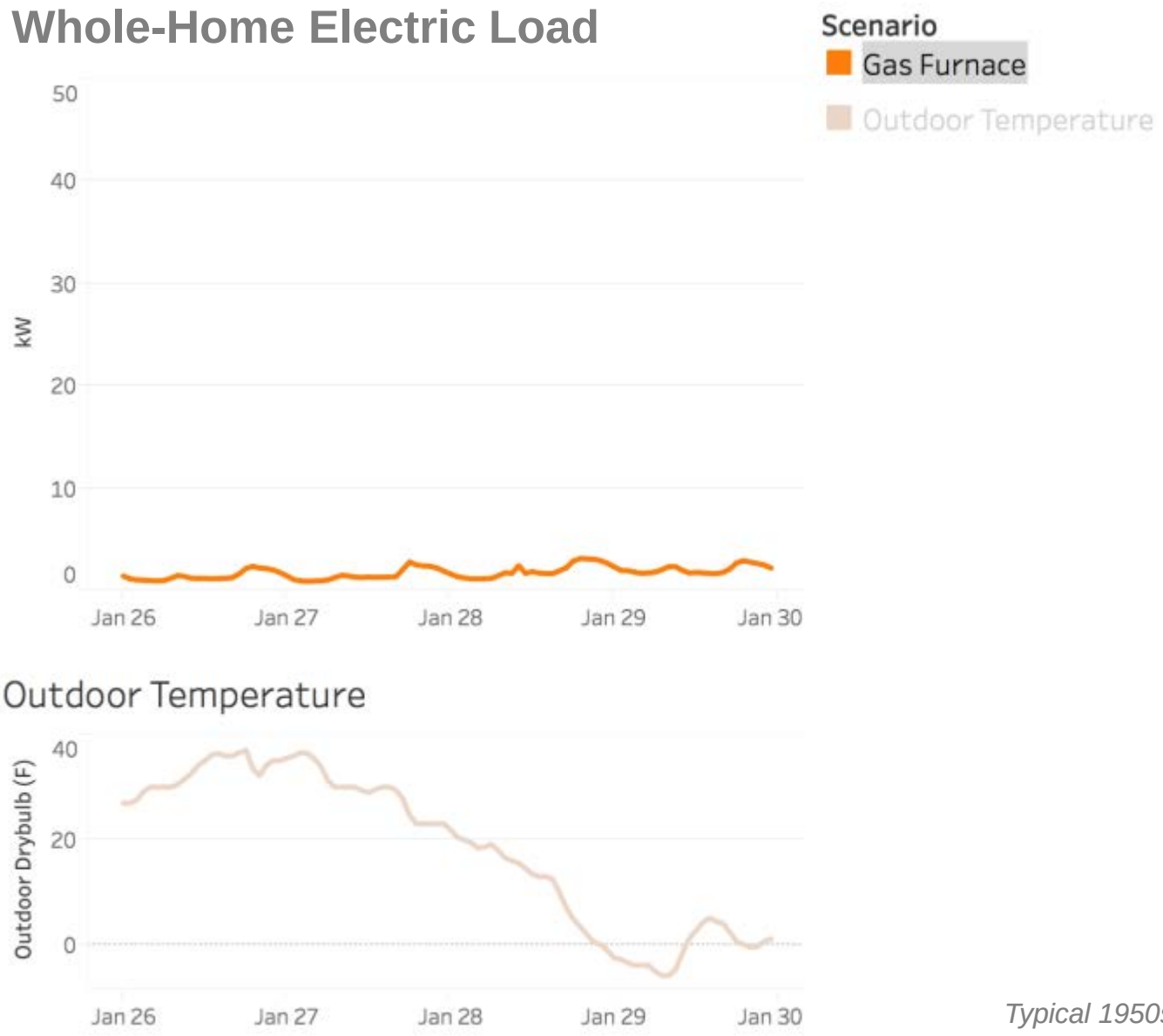
Answer what-if questions about the impact of EE and DERs on hourly load

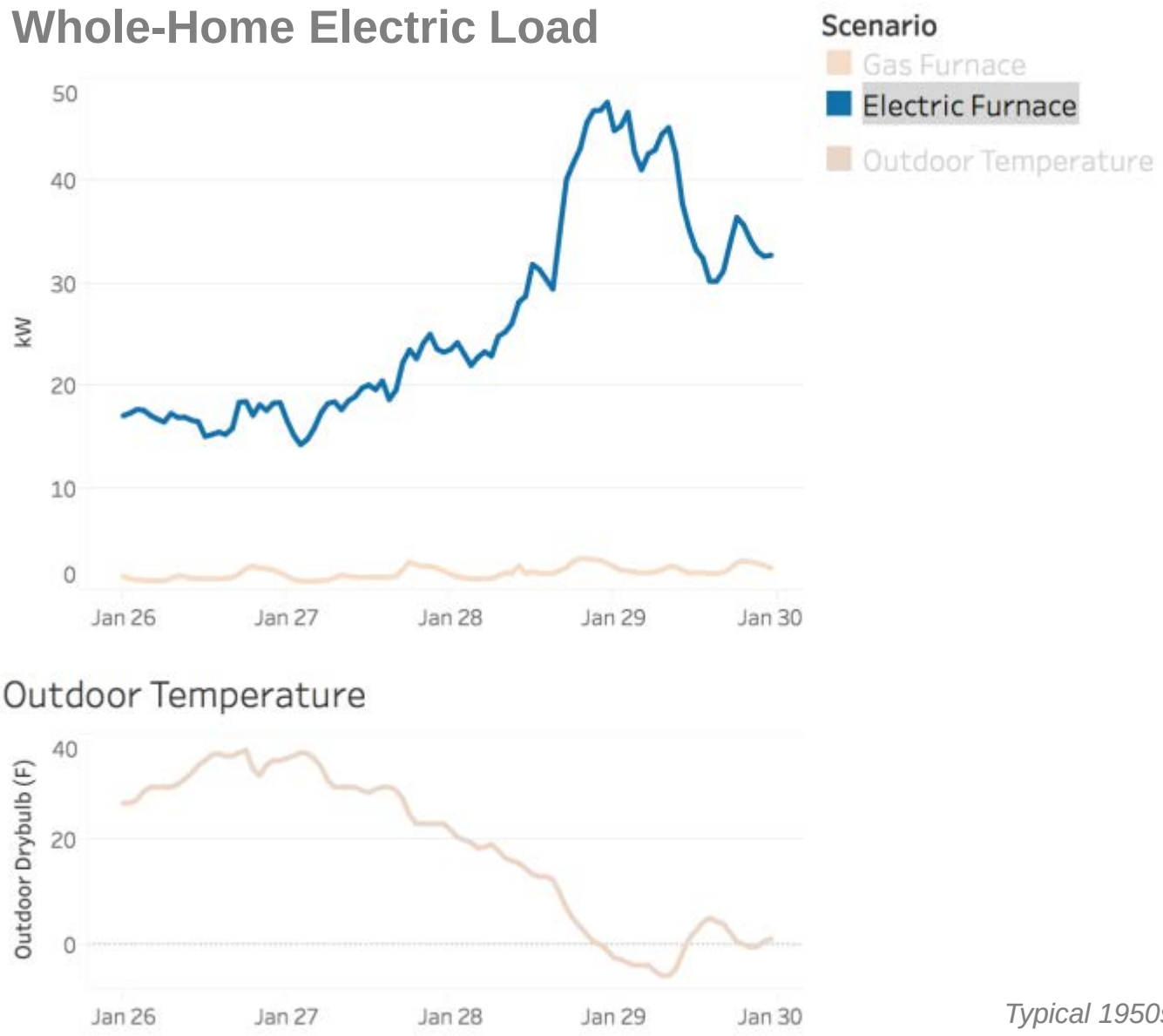


Grid impacts of audacious energy goals



Typical 1950s ranch in Chicago

Grid impacts of audacious energy goals



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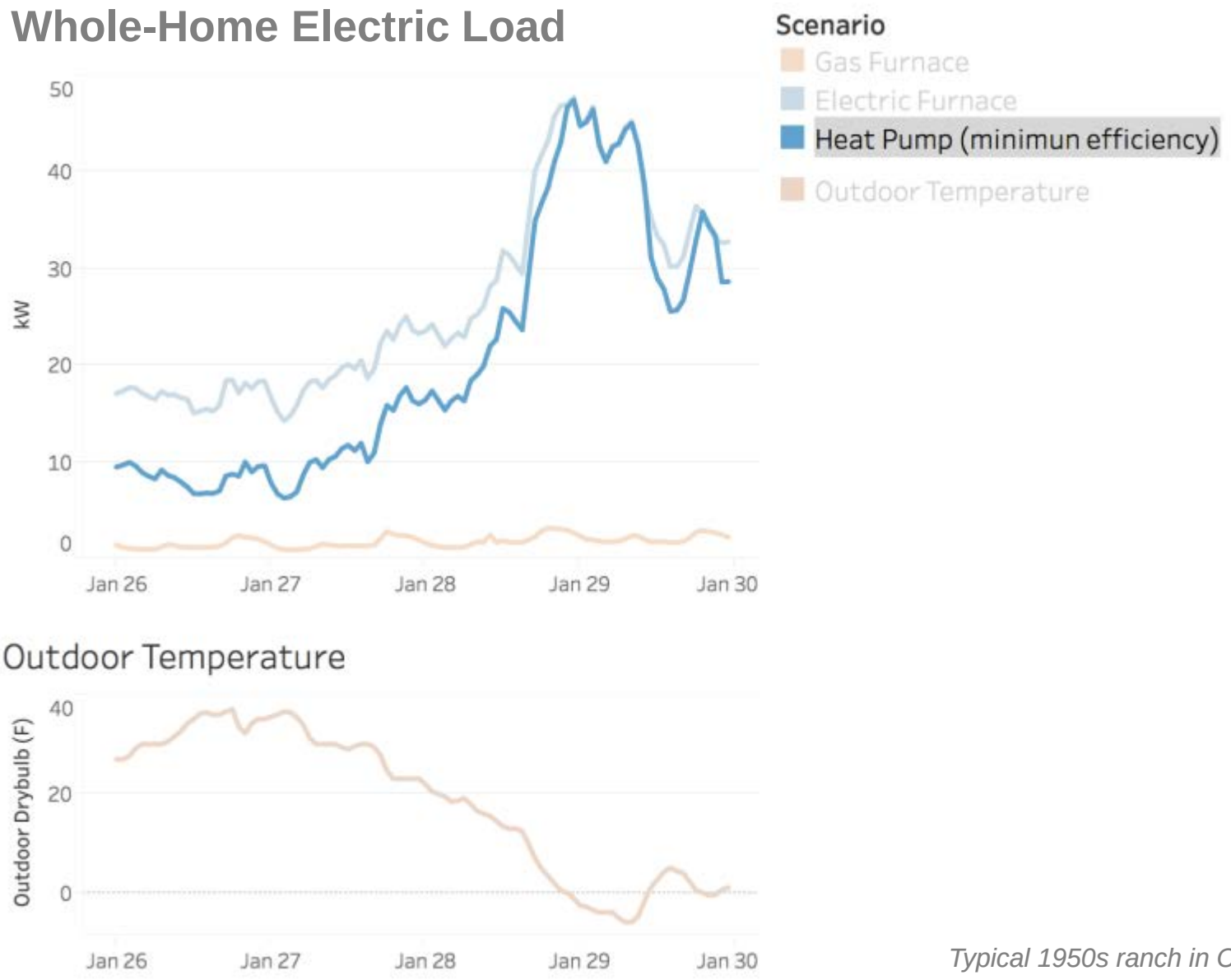

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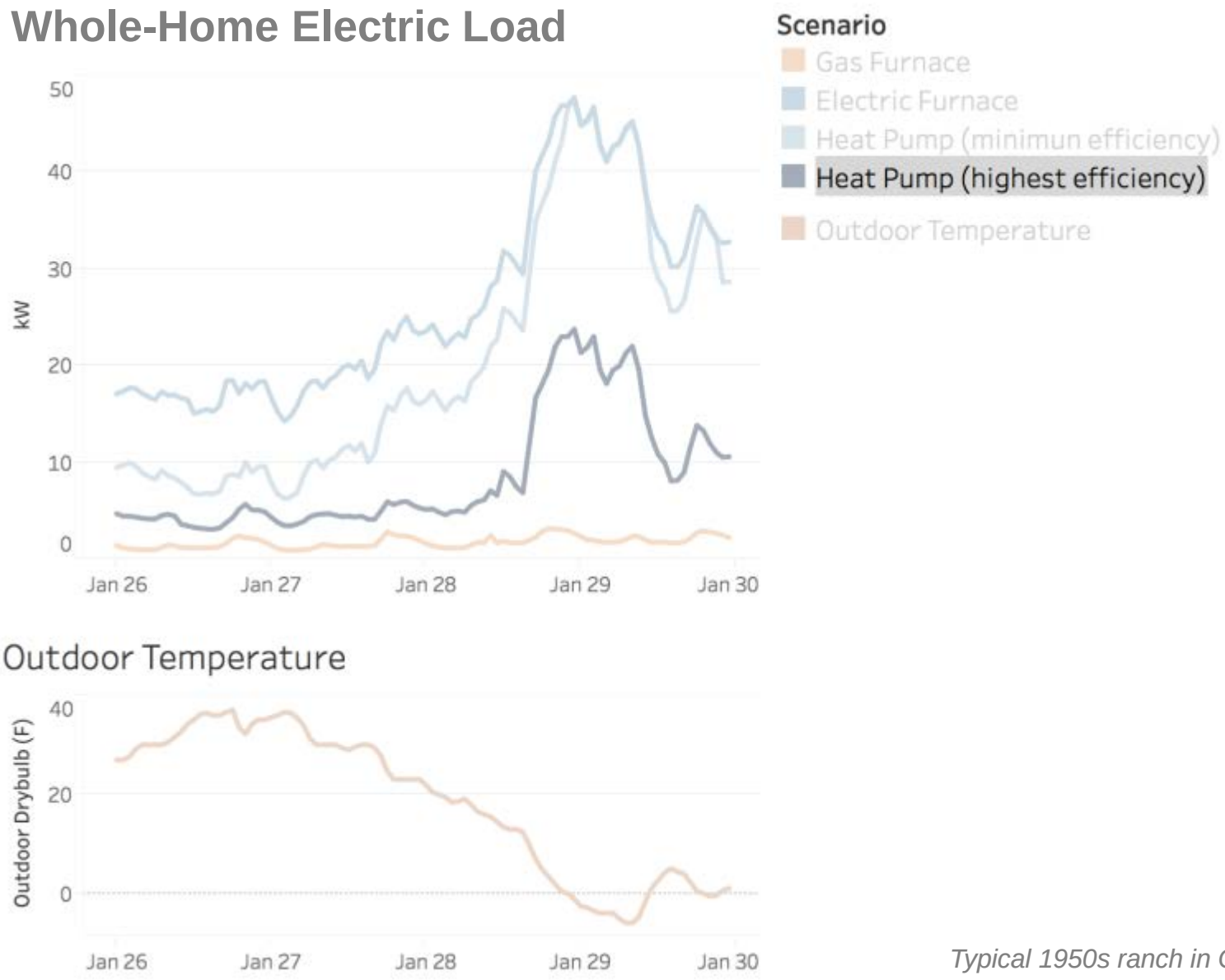

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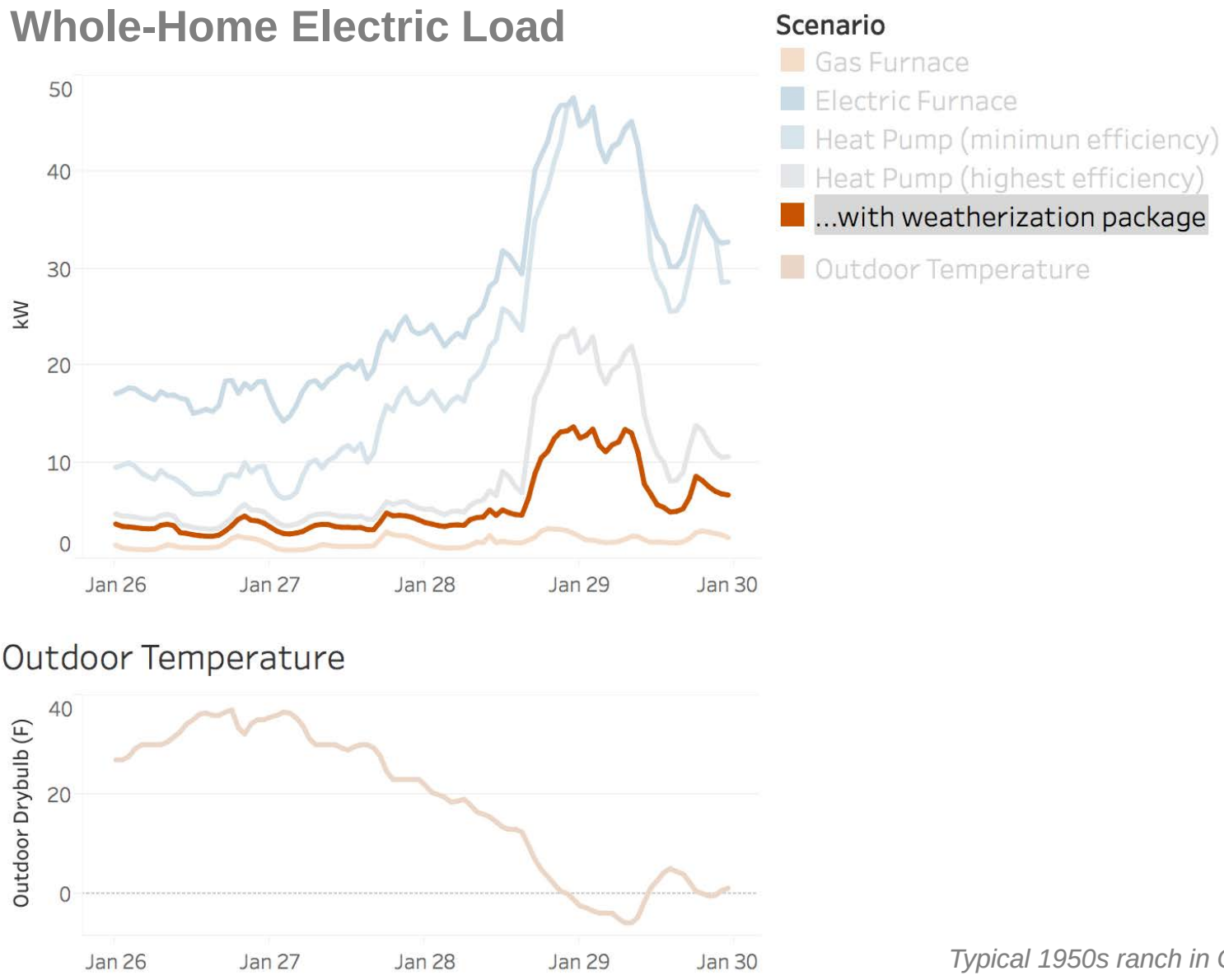


Typical 1950s ranch in Chicago

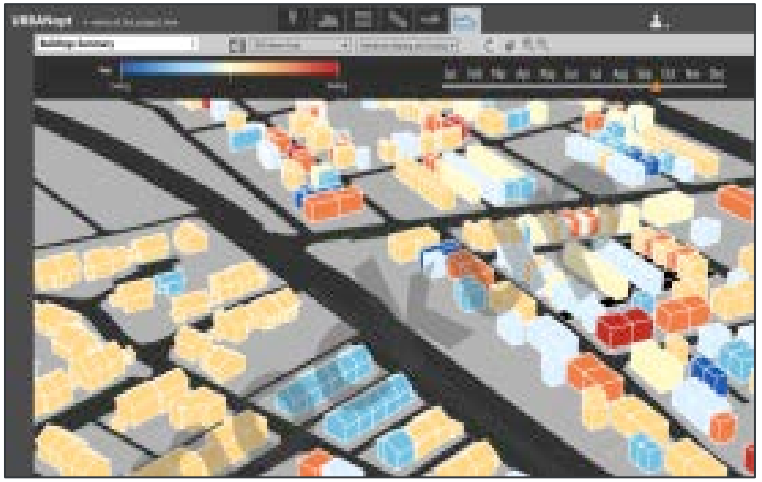
Under development

BuildStock

(ResStock+ComStock) modeling residential, commercial, and multifamily sectors

URBANopt

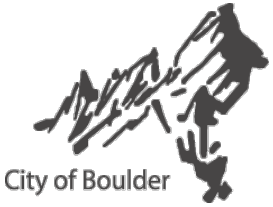
master planning tool for zero energy districts or (re)developments



Acknowledgements

EERE Building Technologies Office
EERE Office of Strategic Programs
Office of Energy Policy and Systems Analysis

United States
Environmental Protection
Agency
Regions 8 & 10



Interested in partnering?

Contact Eric.Wilson@nrel.gov

Ryan Moya, University of Michigan

U.S. DEPARTMENT OF ENERGY

SHORENSTEIN

EDF ENVIRONMENTAL DEFENSE FUND | CLIMATE CORPS

Ryan Moya, LEED AP
2016 EDF Climate Corps Fellow
University of Michigan
MPA/MS Dual Degree Candidate, 2018

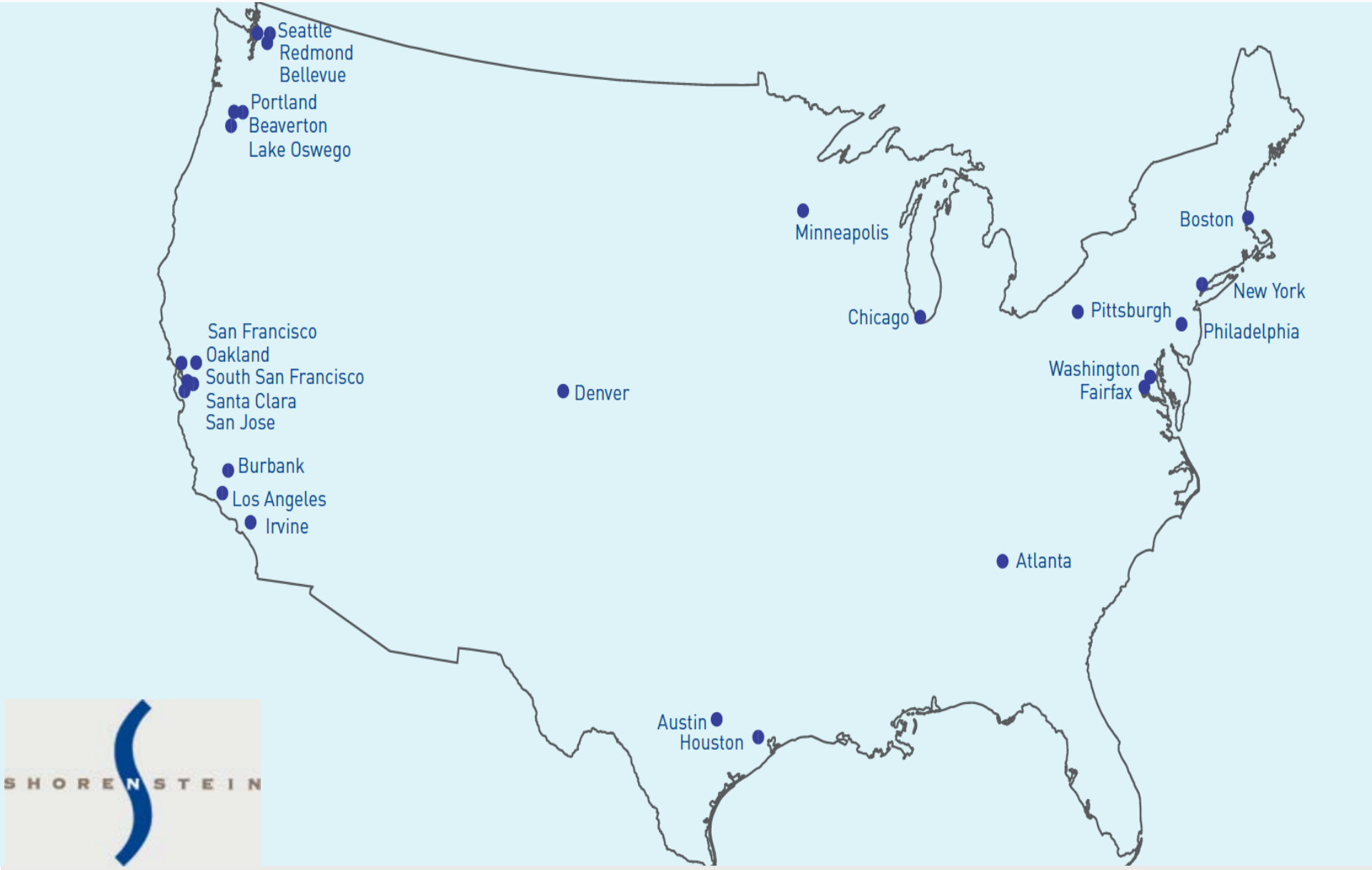
- **2017 Better Buildings Summit** May 16th, 2017

The Russ Building

Presentation Overview

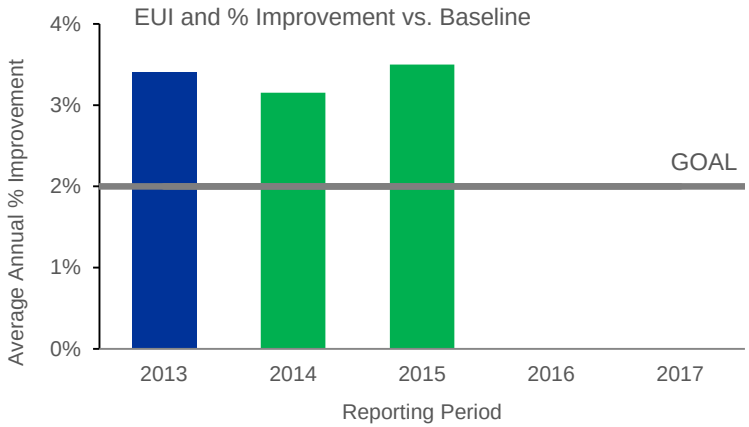
1. Company Overview & Goal Status
2. Shorenstein's Post-2020 Goal: Is 2°C Feasible?
   - Findings/Challenges & Off-Site Renewables Procurement
3. Transitioning to 2°C: On-Site Renewables
   - Solar Awning at Champion Station (PACE)
4. Meeting 2°C: Using Data To Manage Its Portfolio of Buildings
   - Measurabl- Utility Data Automation
   - Internal Template for ASHRAE II Audits
   - Water Analysis Tool
   - LEED Dynamic Plaque vs. EBOM business case
   - Tenant Engagement /Additional Projects

Overview of Shorenstein



Company Overview and Goal Status

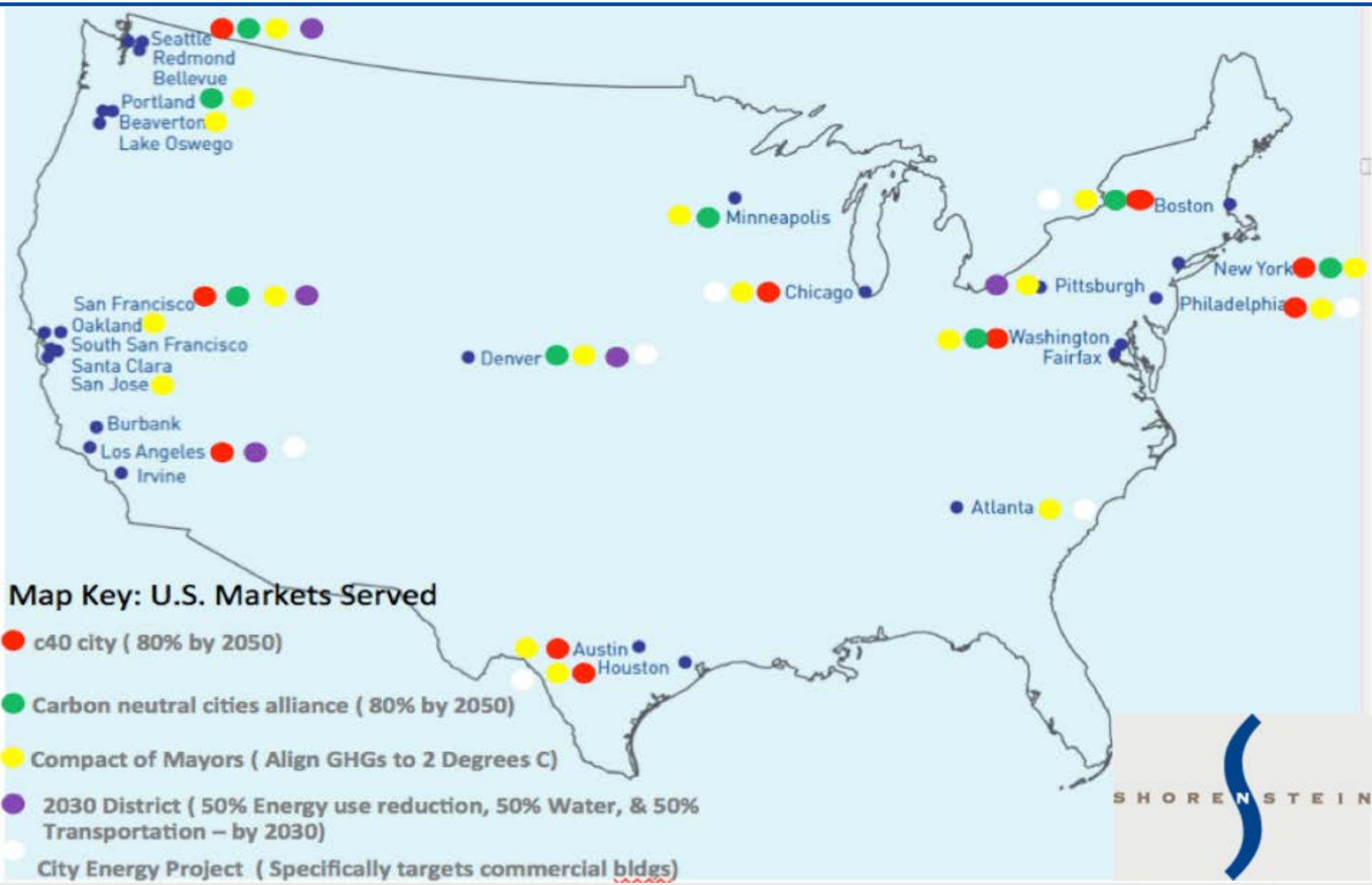
- Sustainability Targets & Status:
  - 20% Reduction in Energy Use by 2020
    - Q4 2015 Status: 19.5%
  - 20% Reduction in GHG Emissions Intensity by 2020
    - Q4 2015 Status: 19%
  - 6% Reduction in Water Use by 2016
  - 60% Waste Diversion by 2016
    - YTD Status- 52%
- Current Emphasis: Efficiency! :



Source: ENERGY STAR Portfolio Manager

What's Next?:

18 out of 25 SRS markets hold 2°C commitments (80+% GHG reduction by 2050)



How c40 Cities Plan to Achieve 80% by 2050

Published c40 reports encourage mayors to adopt policies within their authority[1]:

- Minimum Energy Efficiency Standards
- Regional Carbon Markets
- Green Building Codes
- 100% Renewable Energy Targets

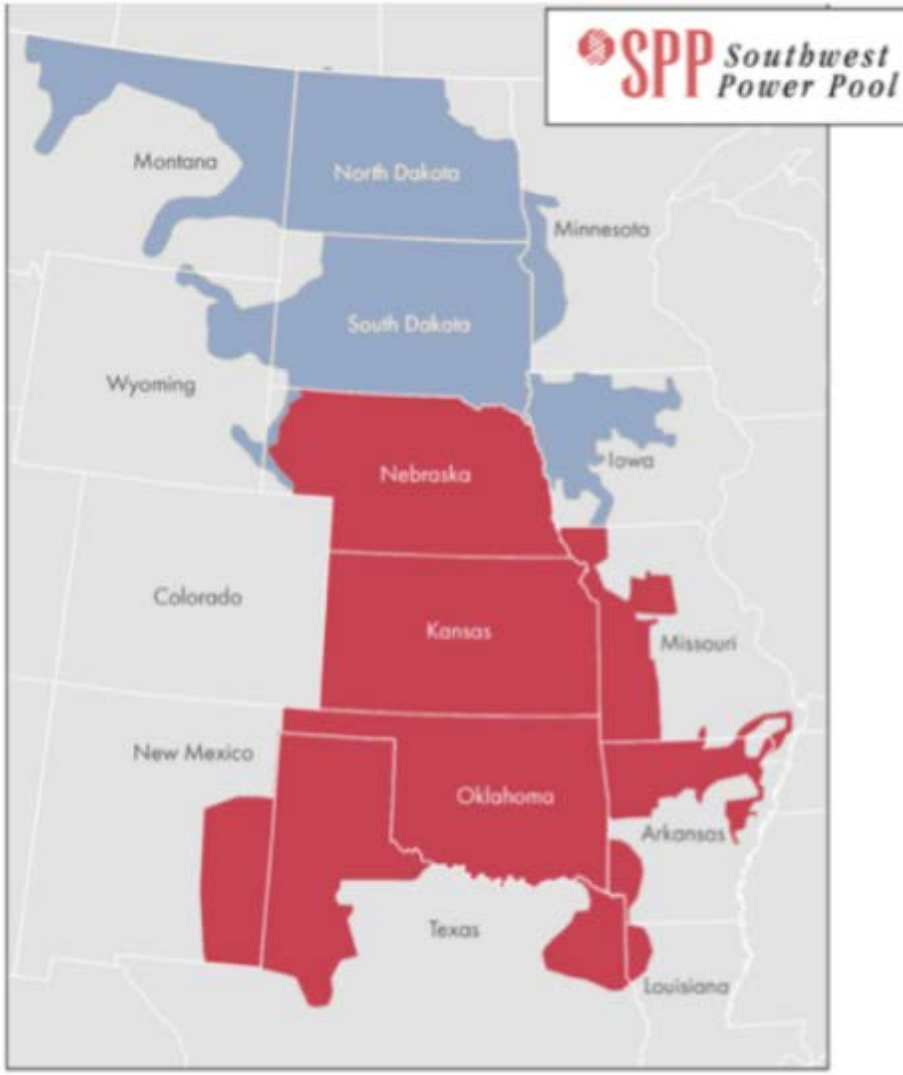
- *"If climate change is a war, buildings are the enemy, and cities are where the battle must be won."* –Michael Bloomberg, c40 President

Source: Bloomberg News

Market Competitiveness: The Case for 80% by 2050

Business Case for 2°C:

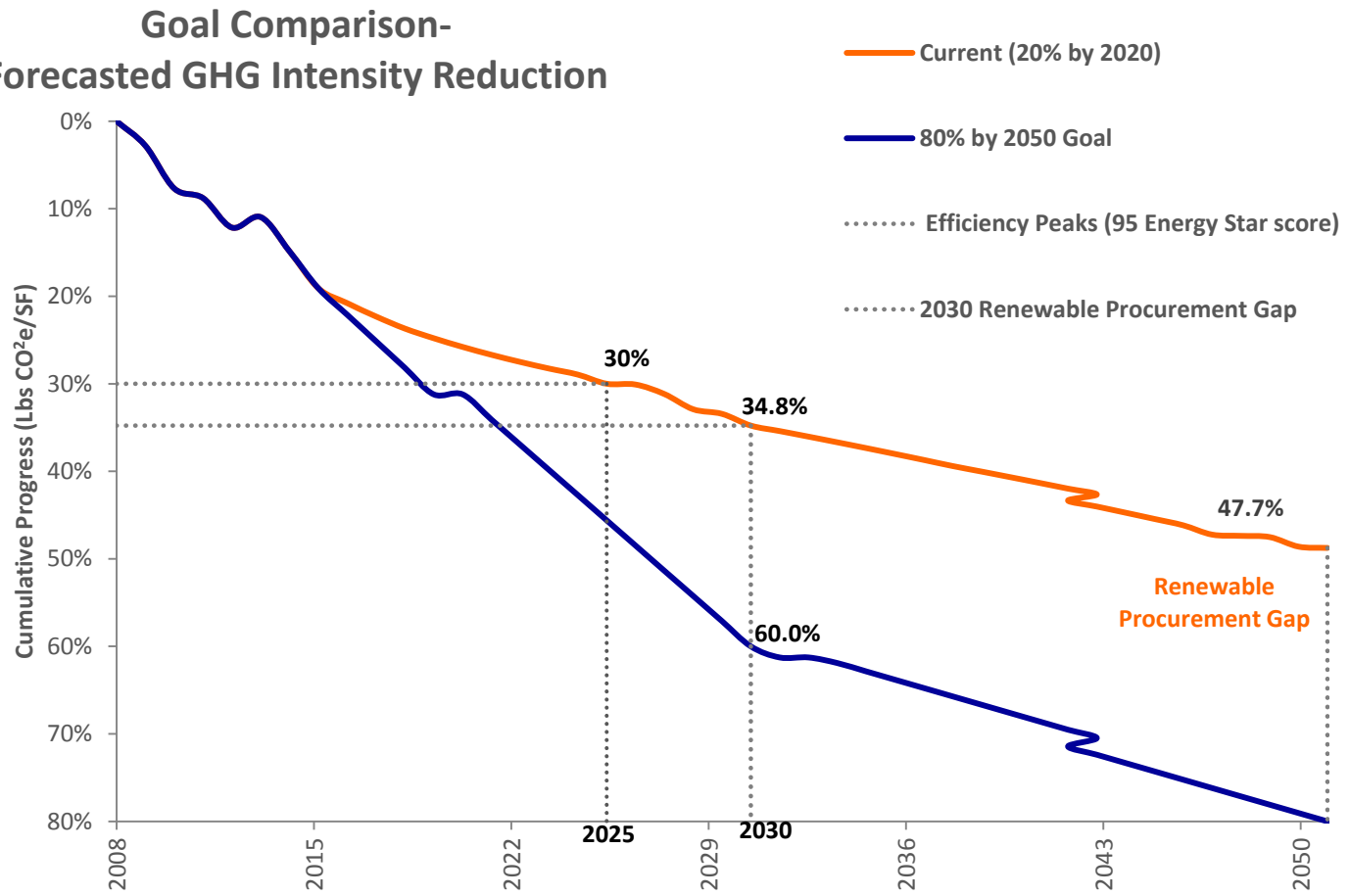
- Institutional Investors & underwriters expecting CRE managers to lower financial exposure / volatility.
- Rise of off-site corporate purchasing, internal price on carbon, etc.
- *Goals must be ambitious:* Reputational benefits & market differentiation becomes increasingly difficult as 2°C expectation becomes norm.



(Source: SPP)

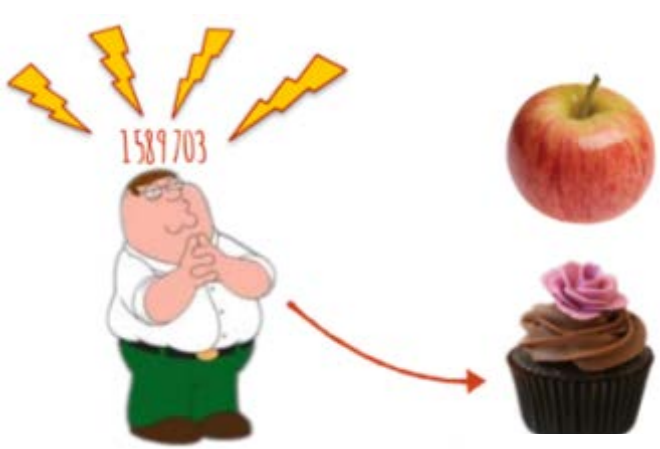
Key Findings

- Energy Efficiency Peaks at 2025
  - Diminishing Returns
- By 2030, 25% gap (delta) needed to be filled via renewable energy procurement



Barriers to Achieving 2°C & Areas of Opportunity:

- Science-Based Goals Target Initiative in its infancy:
  1. No pledges from CRE operators due to lacking a “Like-for-Like” basis that accounts for the fluidity of portfolio wide assets.
- Renewable Energy Procurement
  1. *On-Site*: Issues arise in leasing structures (split incentive) & large SF properties unable to offset full energy load
  2. *Off Site:* Bandwidth issues to understand wholesale retail electricity markets & economic risks (i.e. curtailment, transmission, capacity constraints)
  3. *Regulatory Consistency:* Operators wish to plan ahead & know status of ENERGYSTAR / BBC as well as state energy planning to expand VPPA market
- 2nd tier of SRS’ existing goals enhaces need for ***ACTIONABLE DATA***



Key Findings

- Unbundled RECs currently cost competitive option *(price –Renewable Energy Choice)*.

- However, initial research found risks tied to unbundled RECs, which could have price impacts:
  - Clean Power Plan Implications
  - Green-e (price impacts)
  - Carbon Accounting (GRESB)
  - Additionality (reputational risk)
  - CA's 2030 Net Zero Energy Goal

Figure 2: Unbundled vs. Bundled RECs Cost Comparison (Future)

Annual Portfolio Cost Analysis - Bundled vs. Unbundled RECs		
	Unbundled RECs	Bundled RECs
Price Per MWh	$ 0.99	$ 1.24
Annual Offset Cost (Portfolio)	$ 780,506	$ 2,765,423
Price/ SF	$ 401,889	$ 494,082
Price/ SF	$ 0.02	$ 0.02

Price per SF Comparison	
Electricity Costs (BOMA)	$ 1.75
ENERGY STAR	$ 0.01
LEED Certification (Annualized)	$ 0.03
Unbundled	$ 0.01
Bundled RECs	$ 0.03

Initial Recommendation(s)

1. Initial analysis found 80% by 2050 is likely to become a regulatory requirement in SRS markets. Consideration should be made towards a target that would equally provide reputational benefits:
    - *(i.e., Announcement emphasizing offsetting emissions through renewable electricity procurement & additionality risks associated w/unbundled RECs)*

1. Risks provide reasoning to restructure Sustainability Governance at SRS

1. Logical next step is to stay in-line with Better Buildings Challenge's next target. Prior to formally announcing post-2020 goal, stay in contact with members of the BBC.

2. Consider internal price on carbon, PACE markets, enhancing SRS' data capabilities to accelerate renewables & meet 25% GHG gap by 2030.

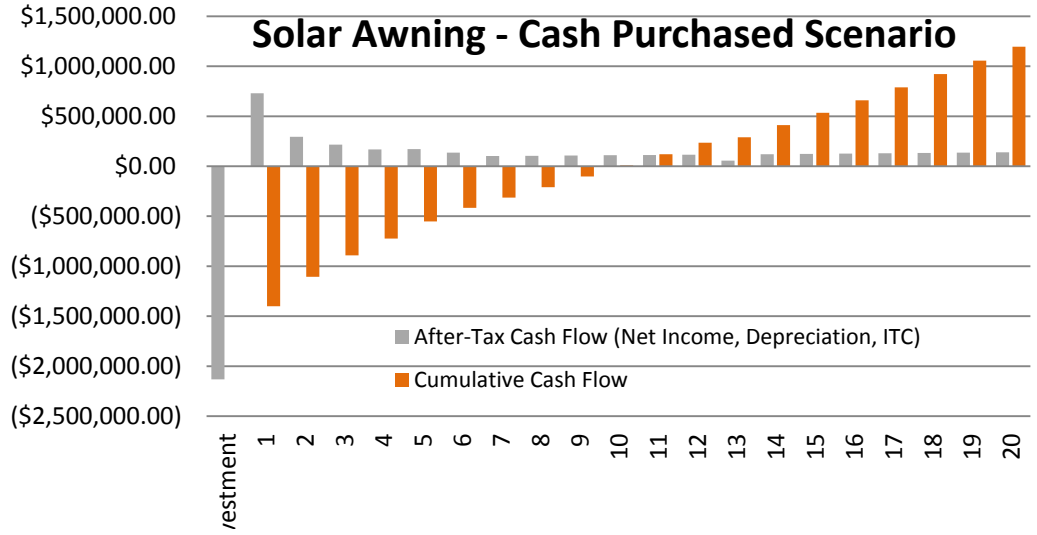
3. Logical next step is to stay in-line with Better Buildings Challenge's next target. Prior to formally announcing post-2020 goal, stay in contact with members of the BBC.

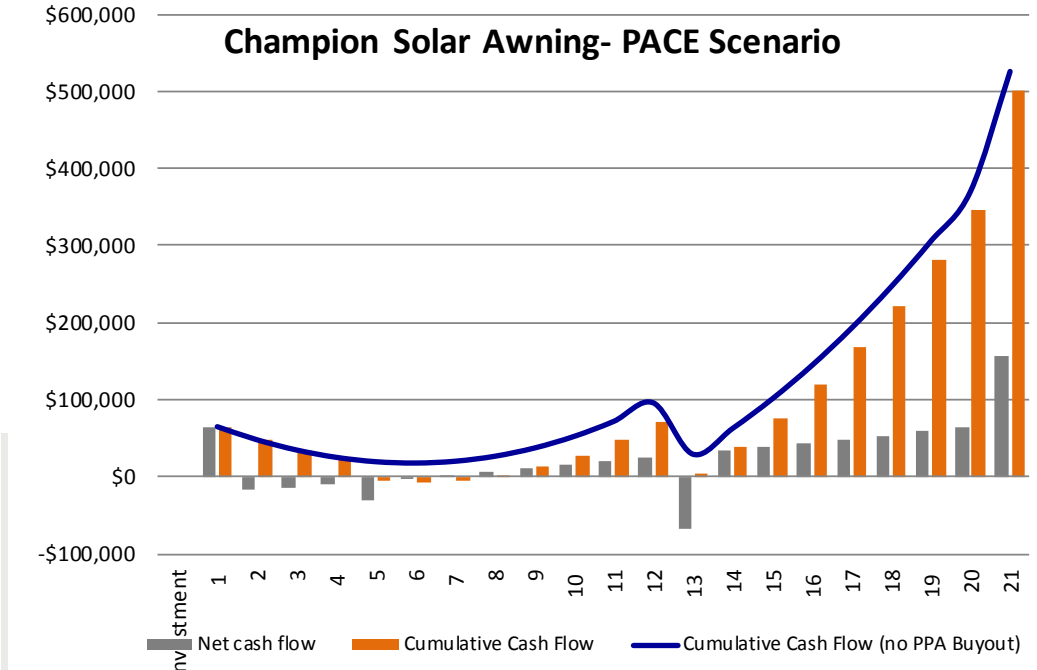
Solar Awning – Silicon Valley Case Study

- Project Description:
  - Revised 794 kW System Size
  - Current Electricity Rate: $0.12 (Escalates 2.9% a year)

- Project Benefits:
  - Leasing Driver (Silicon Valley)
  - Lease Structure (Favorable to PACE Financing)
  - Site Selection: (Minimal Transmission Run)
  - Cash-flow
  - Ancillary Benefits (Shading)

Solar Awning – PACE vs Self Financed





- Shorenstein Financed:
  - Break Even: Year 9
  - Property is not profitable by the time Shorenstein is likely to sell

vs.

- PACE Model:
  - Zero Capital Outlay
  - Break Even: Year 6
  - When SRS sells property in the future, asset is already profitable
  - Potential Buyer is not reluctant to take on Asset

Solar Awning – Silicon Valley Case Study

When would this project makes sense:

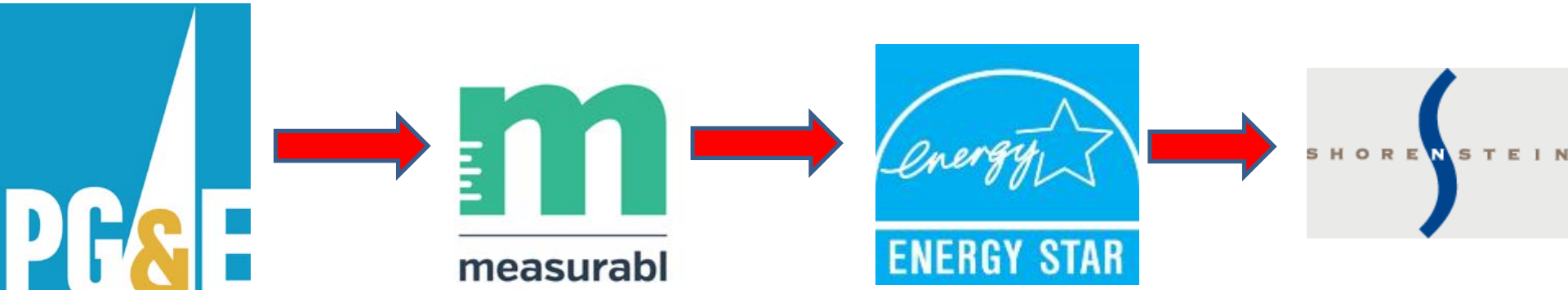
- If/When a key tenant requests it prior to leasing
- Triple Net Lease Scenarios
- Cumulative Cash Flow is profitable fro year one.

- Where is PACE(solar) feasible:
  - Favorable Sunshine, PACE market & parking lot availability
    - Main Plaza
    - Domain

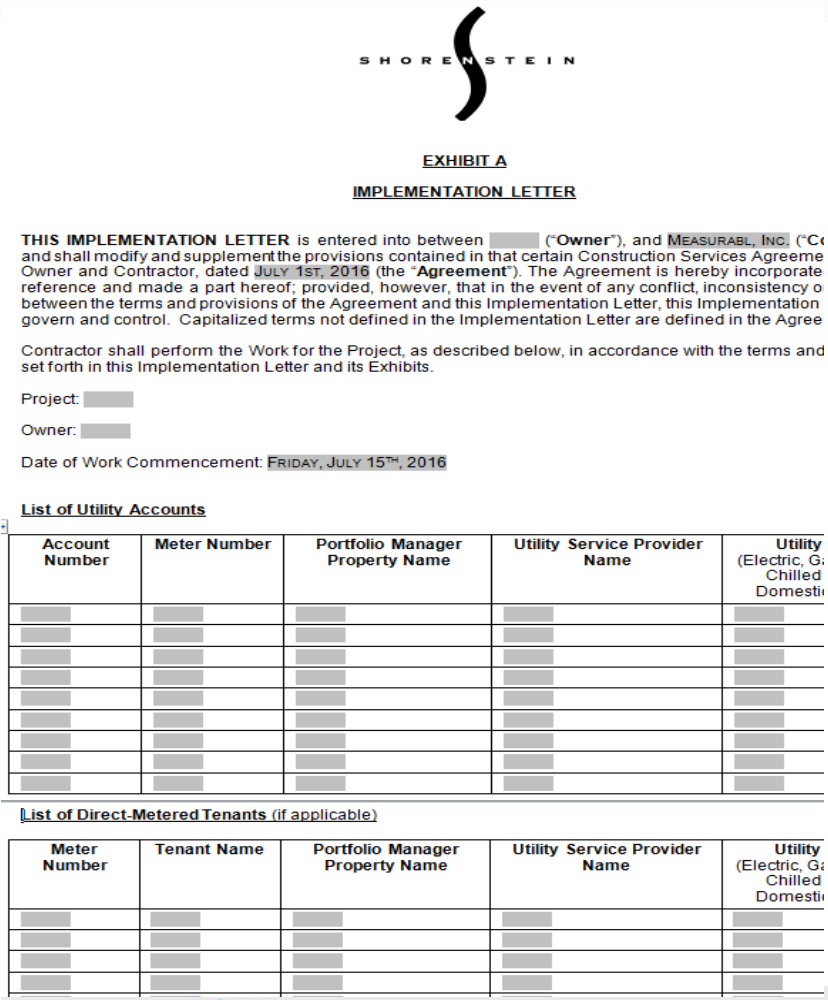
MEASURABL – UTILITY DATA AUTOMATION

Why Automation is Valuable?

- Field: Reduces time spent on manual meter data entry in ENERGY STAR
- Corporate Level: Reduces time required to validate data is accurate, current, and troubleshoot when issues arise.
- Reporting: Streamline Environmental Performance Reporting



MEASURABL – UTILITY DATA AUTOMATION



SHORENSTEIN

EXHIBIT A

IMPLEMENTATION LETTER

THIS IMPLEMENTATION LETTER is entered into between [redacted] ("**Owner**"), and MEASURABL, INC. ("C
and shall modify and supplement the provisions contained in that certain Construction Services Agreeme
Owner and Contractor, dated JULY 1ST, 2016 (the "**Agreement**"). The Agreement is hereby incorporate
reference and made a part hereof; provided, however, that in the event of any conflict, inconsistency o
between the terms and provisions of the Agreement and this Implementation Letter, this Implementation
govern and control. Capitalized terms not defined in the Implementation Letter are defined in the Agree

Contractor shall perform the Work for the Project, as described below, in accordance with the terms and
set forth in this Implementation Letter and its Exhibits.

Project: [redacted]

Owner: [redacted]

Date of Work Commencement: FRIDAY, JULY 15TH, 2016

List of Utility Accounts

Account Number	Meter Number	Portfolio Manager Property Name	Utility Service Provider Name	Utility (Electric, G Chilled Domesti
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

List of Direct-Metered Tenants (if applicable)

Meter Number	Tenant Name	Portfolio Manager Property Name	Utility Service Provider Name	Utility (Electric, G Chilled Domesti
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Roles Provided:

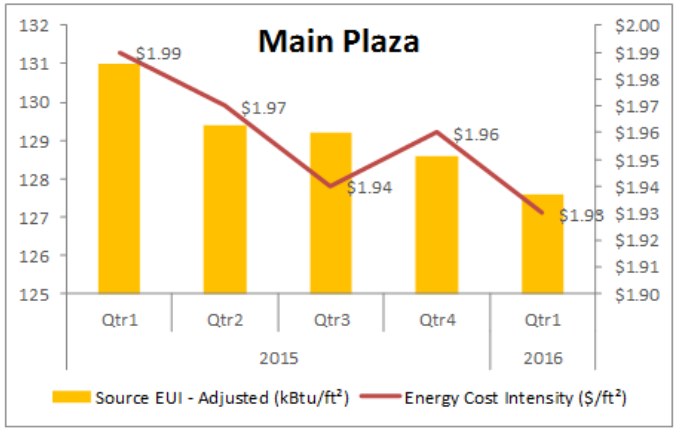
- Field Implementation
  - Communicated reasoning & special cases per property (48 properties)
- Data Validation
  - Collected applicable utility account information (Over 400 Utility Accounts, 24 direct metered tenants)
- Contract administration
  - Implementation Letters
- Corporate & Field-Level Training
  - Field Level QRG
  - Corporate Utility Data Automation HTG
  - Tenant Request Letter(s)

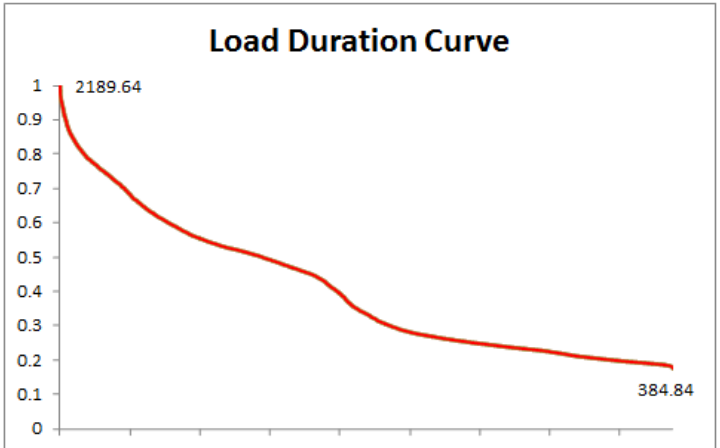
Internal ASHRAE Level II Audits

2.3 Historical Energy Consumption and Costs

The chart below illustrates how effective the engineering team has operated the building over the last year showing relatively steady improvement of cost intensity shown in $/ ft². A $0.06/ft² for the property represents approximately a $38,000 reduction in energy costs over the last year.

Tables 5&6: **Historical Energy Metrics at Main Plaza**





- Project Description:
- Internal Template for ASHRAE II analysis
  - Streamlined existing (ENERNOC/ENERGYSTAR) data to create template that would internalize the ASHRAE audit process
  - Excel Inputs auto-populate into Word template
- Project Need:
- 3rd Party Providers:
  - Costly & Unfamiliar with SRS audited property
  - Result: Recommendations do not translate to immediate action items
- Internally well suited to conduct ASHRAE II analysis

Internal ASHRAE Level II Audits

ASHRAE II AUDITS	3rd Party Costs	Savings: In-House (2 per year)	Savings: In House (4 per Year)
Totals	**($60,000)**	**$30,000**	**$60,000**
Main Plaza	($15,000)	$15,000	$15,000
Santa Clara Tower I	($15,000)	$15,000	$15,000
2000 West Loop	($15,000)	-	$15,000
Bank of America Plaza	($15,000)	-	$15,000

Projected Savings:

- 2 Internal ASHRAE II Audits a year = $30,000
- 4 Internal Audits per year = $60,000

Recommendation (Timeline):

1. Conduct audits internally when new properties are acquired
2. Additional Audit in Year 5

Water Analysis Tool

Purpose: Identify unaccounted for water use across the portfolio, enhance data capabilities, maximize efficiency, and identify opportunities to meet goal through reducing water/energy nexus consumption

Project Description:

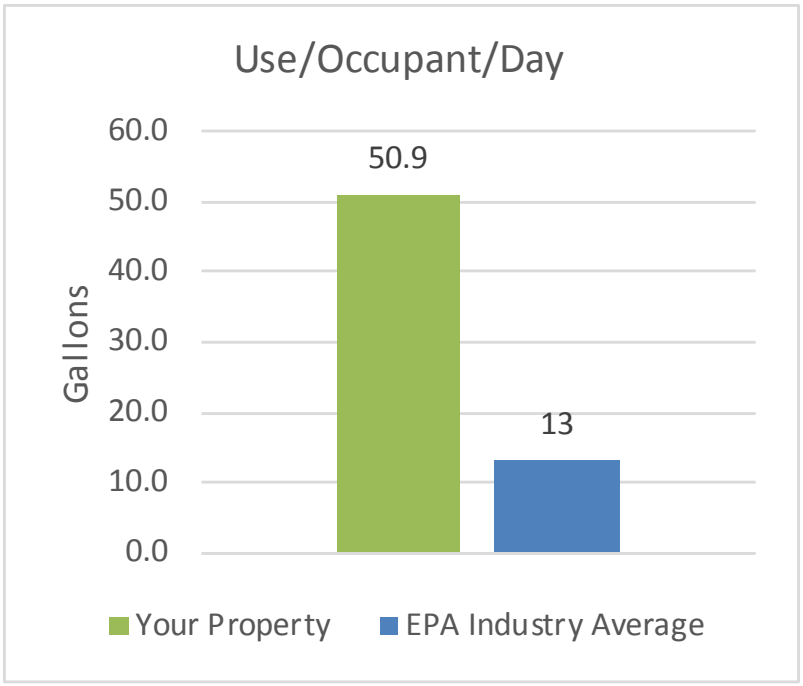
- Develop tool to standardize process of tracking submetering & provide initial analysis on which properties to target WE investment
- Ran Q1 & Q2 Analysis for 36 comp. properties w/in same market to seek investment opportunities

Key Takeaway: Standardized process of monitoring and tracking real-time use still essential to SRS' next water target.

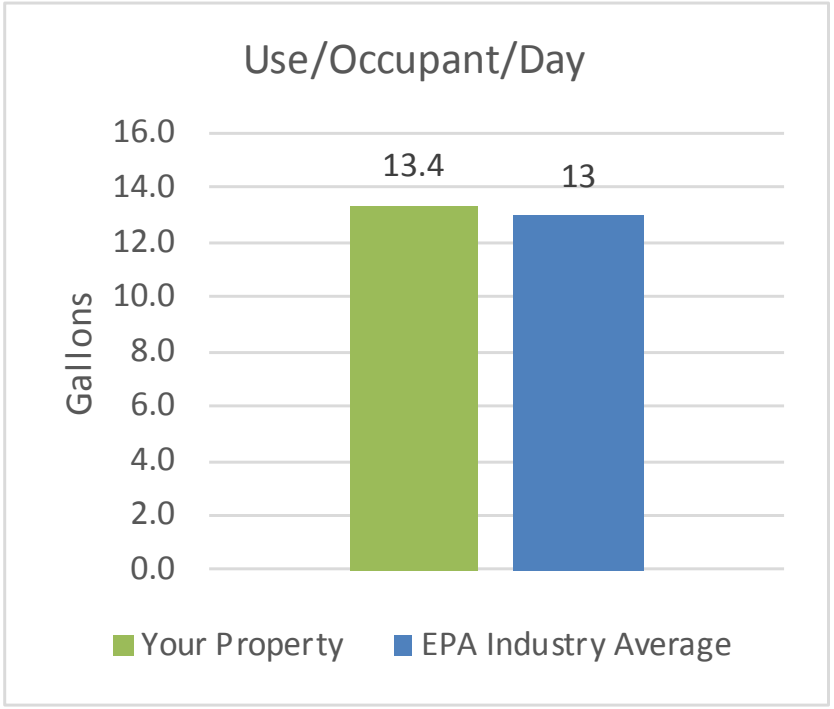
Water Analysis Tool

- Comparable Markets:(Philadelphia Example)

Philadelphia Property #1



Philadelphia Property #2



LEED DYNAMIC PLAQUE vs. EBOM

LEED Progression at Shorenstein

- When LEED was first implemented (2008), it was largely a trend in the industry.
- Now, LEED certification is an industry standard for class A office buildings

The Case for LEED Dynamic Plaque

- Continuous LEED certification now holds rationale to become operational throughout the company.
- Subscription price is significantly less compared to EBOM properties in need of recertification.
- Enhances data capabilities & can largely be done internally

LEED Dynamic Plaque– Recommendation

5-Year Cost Comparison: LEED Dynamic Plaque vs EBOM Recertification Budget - 2017-2021		
Annual Costs	**EBOM**	**LEED DP-In House**
2016	$ 377,720	$ 150,000
Current Year Totals	**$ 377,720**	**$ 150,000**
2017	$ 269,073	$ 100,000
2018	$ 156,090	$ 50,000
2019	-	-
2020	$ 177,500	$ 75,000
2021	$ 377,720	$ 150,000
Grand Totals	**$980,383**	**$ 375,000**
Savings, Over 5 Years	-	**$ 605,383**
Annual Savings	-	**$ 121,077**

Benefits over LEED EBOM:

- LEED dynamic plaque is significantly more streamlined than EBOM
- Annual Savings of $121,077 if Dynamic Plaque certification is done In-House.

Recommendation:

- Standardize Recertification Process
- Onboard Recently Recertified Projects (2016) to LEED Dynamic Plaque
  - (45 Fremont, 33 South Sixth, etc.)

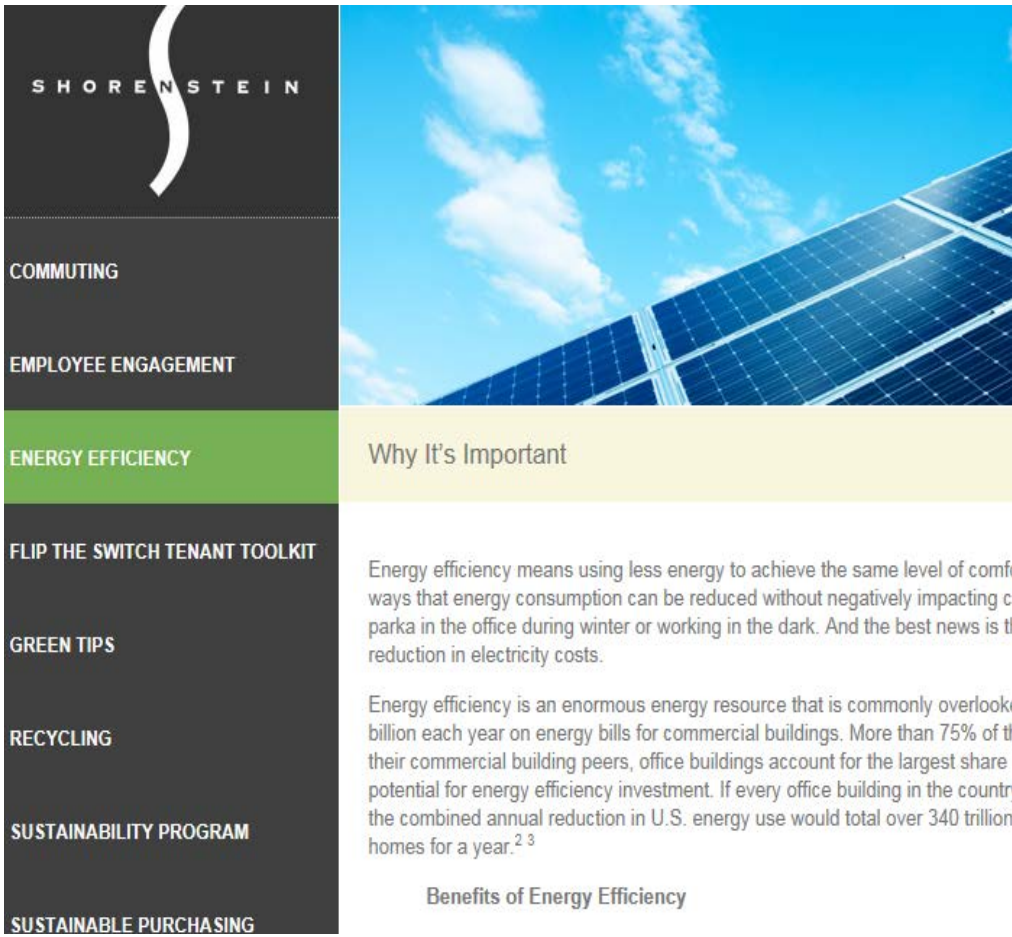
Tenant Engagement: ‘Flip The Switch’ Initiative

Why Tenant Engagement?:

- Tenant usage accounts for 40-60% in many NYC buildings.
- Necessary in 2nd tier of existing goal as EEM projects become increasingly difficult
- Gaps in data availability contribute to high demand rates (up to 50%).

SRS Projects:

- Greenshorenstein.info tenant website
- ‘Flip The Switch’ Tenant Toolkit
    - Provided new content & design layout for each



Tenant Engagement: 'Flip The Switch' Initiative

Fli the Switch

or a greener tomorrow

SHORENSTEIN

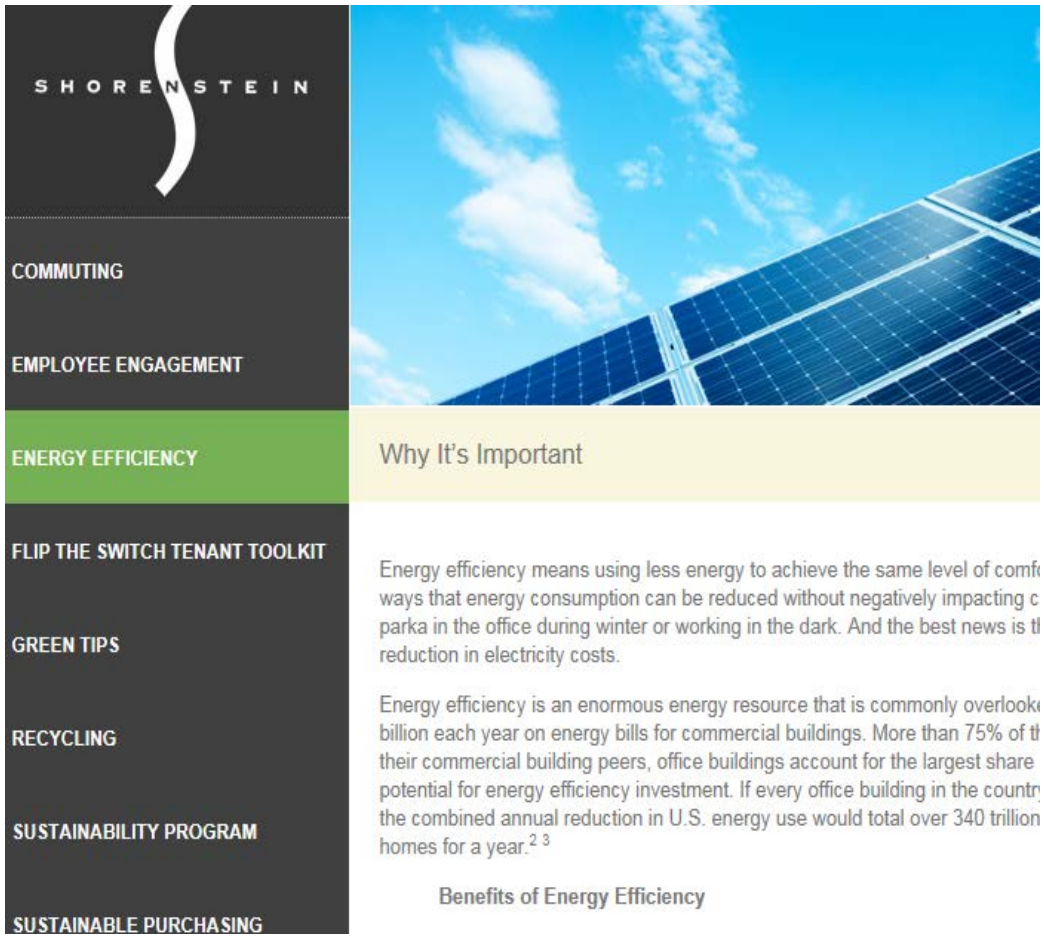
DEEP GREEN: TOP LEVEL CHANGES

Category	Strategy	Rationale	Getting Started	Cost Savings
LIGHTING CONTROLS	Controls - Install automatic dimming controls throughout the suite to allow use of less light over a broader range.	On average, lighting consumes 21% of the energy used by commercial buildings in the U.S. Controls typically hold a payback of 1-2 years before rebate(ii) and require minimal behaviour modification.	LC/EC/Arch	Cost Depends of scope of project Savings Depends on Scope
DAYLIGHTING	Daylight Harvesting - Install daylight sensors and dimmable ballasts in all light fixtures within 12-20 feet of windows	Harvesting allows even greater use of daylight and dims interior light to further reduce electric consumption.	LC/EC/Arch	$140-$180 per fixture + $200-$500 for controls Up to 50%
LAMP & FIXTURE REPLACEMENTS	Replace Tube fixtures- Use T5 flourescent fixtures in lieu of T12 or T8 fixtures	T5 fixtures are more efficient than T12 and T8 fixtures. Compared to T12 fixtures, they typically hold a one to two year payback.	EC/ LC/Arch	$150-$500 per fixture Up to 50%
	LED Exit Signs - Use LED Exit Signs	LED Exit Signs pay back in less than one year. (iii)	EC/LC/Arch	$100-$300/sign 90%

Getting Started Key:						
Arch = Architect	EPA = Environmental Protection Agency	EC = Electrical Contractor	IT = Tenant's IT Department/Purchasing	LC = Lighting Consultant	MC = Mechanical Contractor	SRS Site = Sustainability Site

Additional Projects

- ENERGYSTAR
  - Portfolio-wide Waste Mgmt tracking
- Greenshorenstein.info
  - New Design Layout
  - New Website Content
- Corporate HTGs
  - Environmental Performance Review



Thank You

Thank You

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