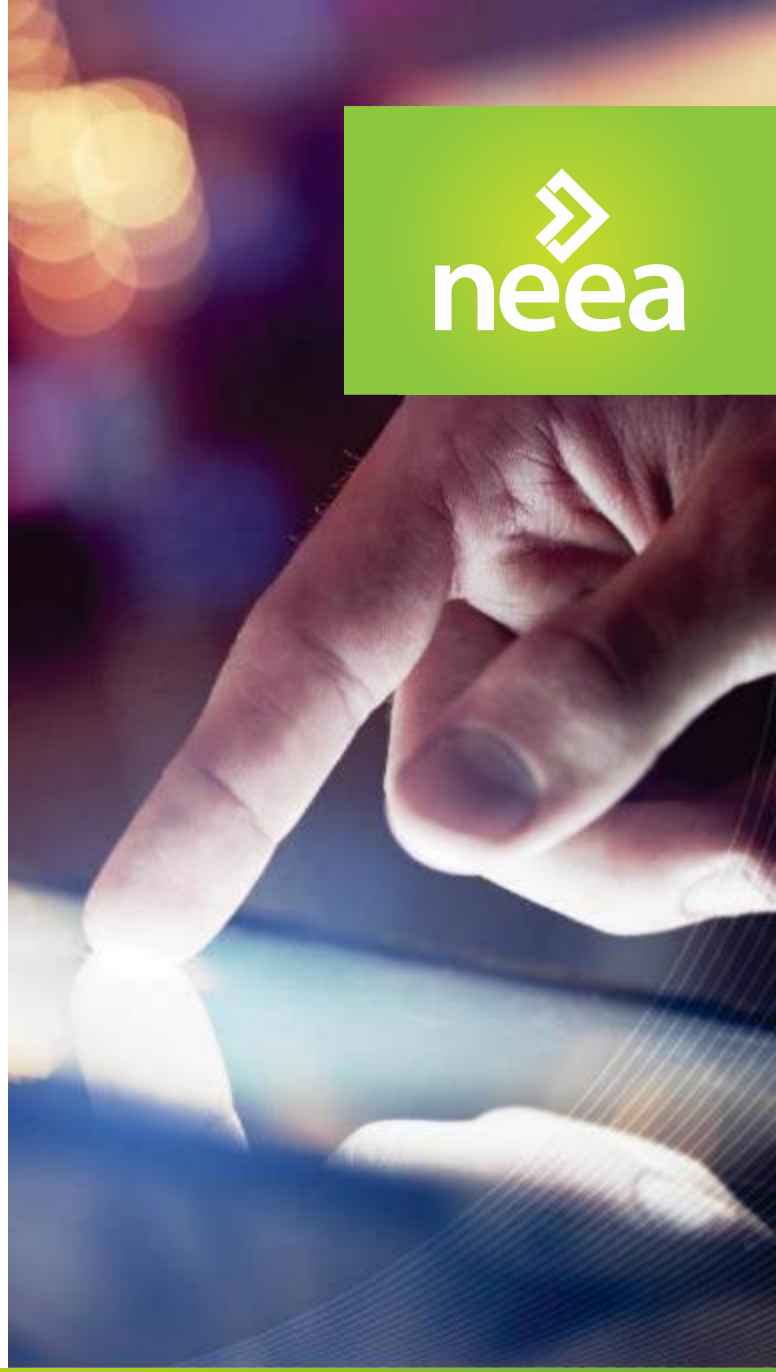
November 5, 2019

Commercial Advisory Committee Q4 2019 Meeting



Agenda

- Welcome, Intros, Packet Review, Info Updates
- Update on Commercial Portfolio
- Luminaire Level Lighting Controls Program Update
- *Lunch!*
- CAC Member Share Out/Round Robin
- *Break!*
- Check-in on Coordinating Committees
- Guest Speakers: City of Seattle Tune-Up Accelerator Program – Overview and Learnings
- Opportunity for Public Comment & Feedback
- *Adjourn!*

Informational Updates

- Integrated Design Lab (IDL) Capabilities p.12
- C+I Regional Strategic Market Plan Update p.13
- CAC Conference Coordination p.14

Quarterly Newsletters & Reports

- Q4 Emerging Technology Report
- Q4 Market Research & Evaluation (MRE) Newsletter

Housekeeping

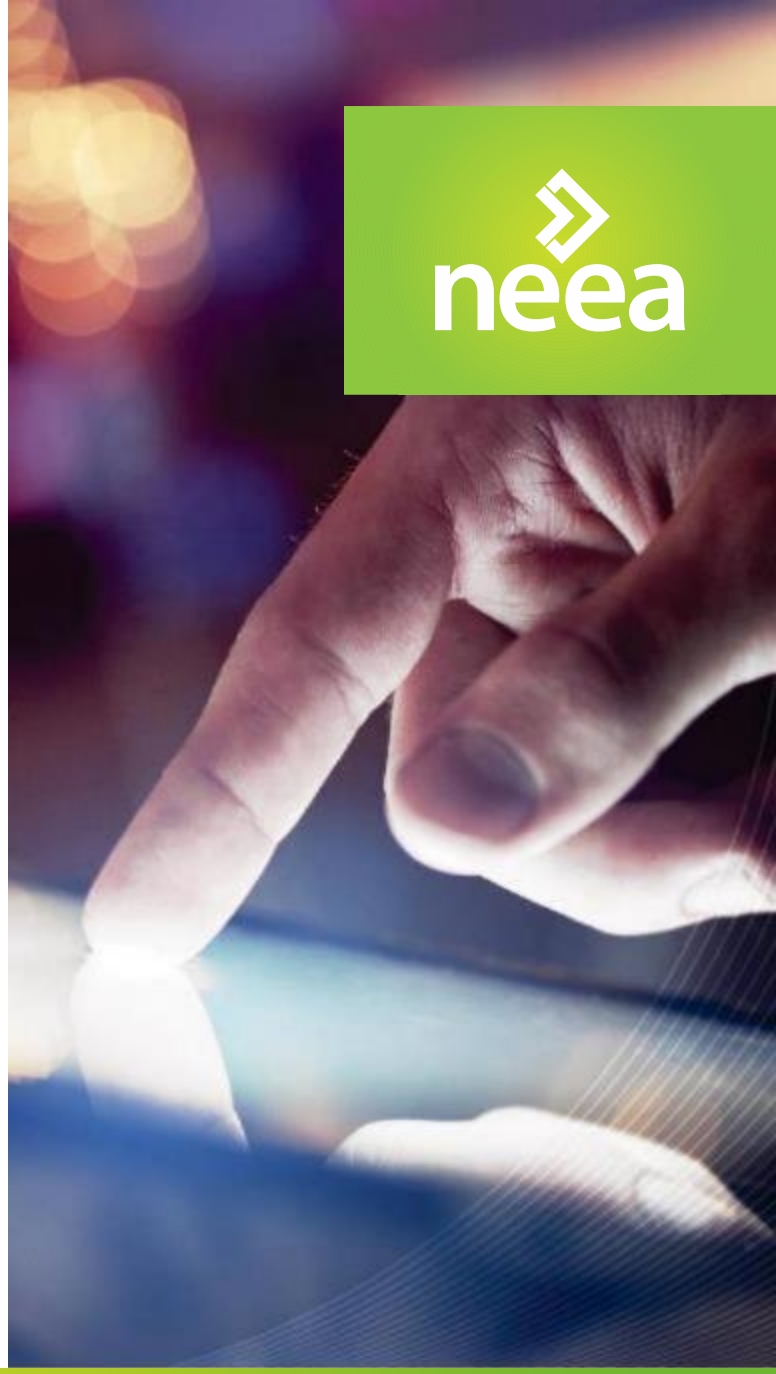
- Leadership in Energy Efficiency Awards on 12/4 at 5:30p at the Vestas Building
- Please RSVP page for the event this year: https://neea.org/leadership-awards-rsvp
- Link to the winners and nominees article posted on Conduit: https://conduitnw.org/Pages/Article.aspx?rid=3640

November 5, 2019

Commercial Portfolio Update

Emily Moore





2020 Ops Plan Timeline

Commercial Portfolio

MT Initiatives

- Window Attachments
- Extended Motor Products
- High Performance HVAC
- Luminaire Level Lighting Controls

Enabling Infrastructure

- Top-Tier Trade Ally
- Commercial Lighting Regional Resources
- Commercial Real Estate
- Strategic Energy Management
- Distributor Platform

Initiative Lifecyle View: 2019

LONG-TERM MONITORING

Commodity LEDs / Midstream Lighting

Window Attachments

Extended Motor Products

High Perf HVAC

Luminaire Level Lighting Controls

Reduced Wattage Lamp Replacement

Program Concept | *Program Development* | *Market Development*

neea

Top 5
Commercial Program Highlights

1. Lighting training participation
2. Pumps distributor engagement – data is beginning to flow
3. 1st agreement with window attachments manufacturer
4. Continued outreach to HRV manufacturers
5. Expanding reach of lighting distributor engagement and full category data

Looking Ahead to 2020

1. Market development for LLLC
2. Completion of midstream lighting pilots
3. Revision of VHE DOAS system requirements and recruitment for additional HRV product lines
4. Launch of AERC commercial certification program
5. Pumps and circulators – data, data, data!
6. Leverage of BetterBricks for reaching target audiences

Areas for Collaboration

1. Marketing case studies for LLLC
2. Continued training coordination
3. Technical assistance for VHE DOAS projects
4. Field tests for Window Attachments program
5. Leverage commodity lighting data and learnings from midstream pilots

Discussion

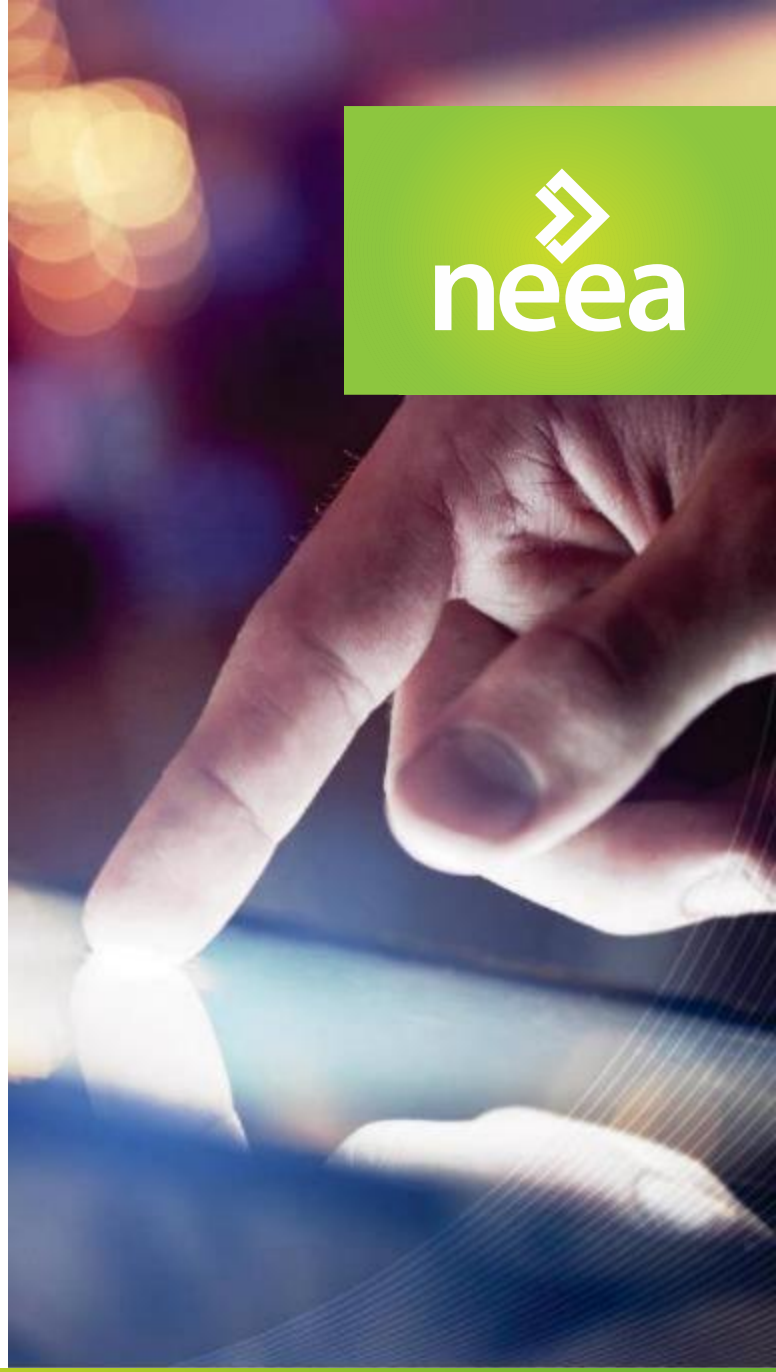
- What questions do you have?
- Which programs do you feel you need more information or follow-up on?
- What programs do you feel require more coordination? In what ways?

November 5, 2019

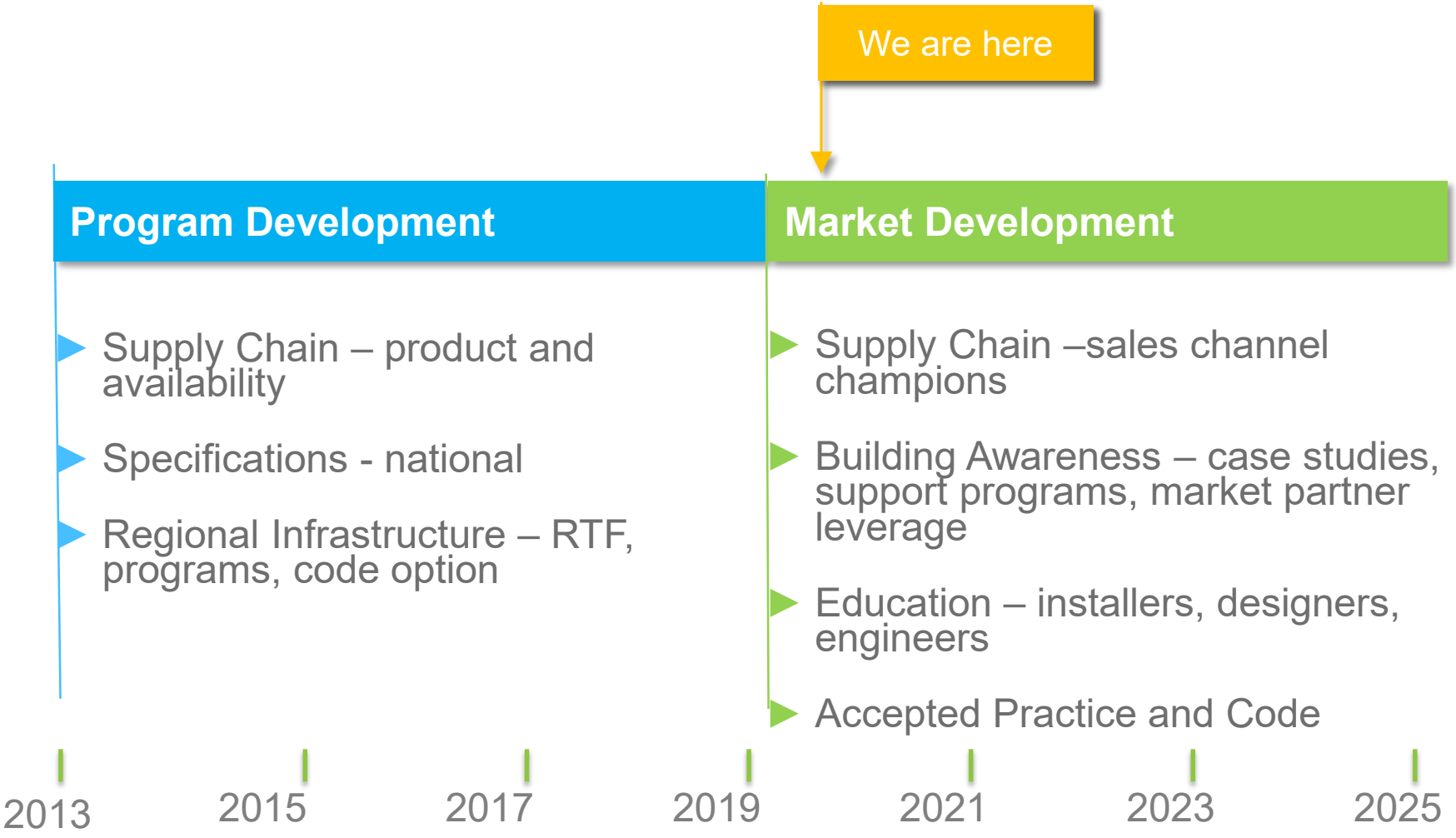
Luminaire Level Lighting Controls

Anne Curran





When We Last Checked In…



Topics for Today

- Update and Next Steps
  - Education
  - Market Awareness
  - Supply & Sales Chain Engagement
- Opportunities for Collaboration

Education

Rolling Out 1 day Training

- Utility hosted with LDL delivery
- Reached trade allies throughout region

Building Upon That Foundation

- Focused topical sessions
- New resources rolling out in Q4
- DLC online training available
- Planning for 2020

Market Awareness

Strengthening Awareness Through Credible Examples

- Two marketing case studies underway
  - Much thanks to Seattle City Light!
- Savings study on school retrofit

Resources to Help You Drive Awareness

- LLLC Toolkit
  - utility brandable marketing materials

Leveraging Influencers to Bolster Awareness

- Earned media
- Leverage Better Bricks partners for forums
- Planning for 2020

Supply & Sales Chain Engagement

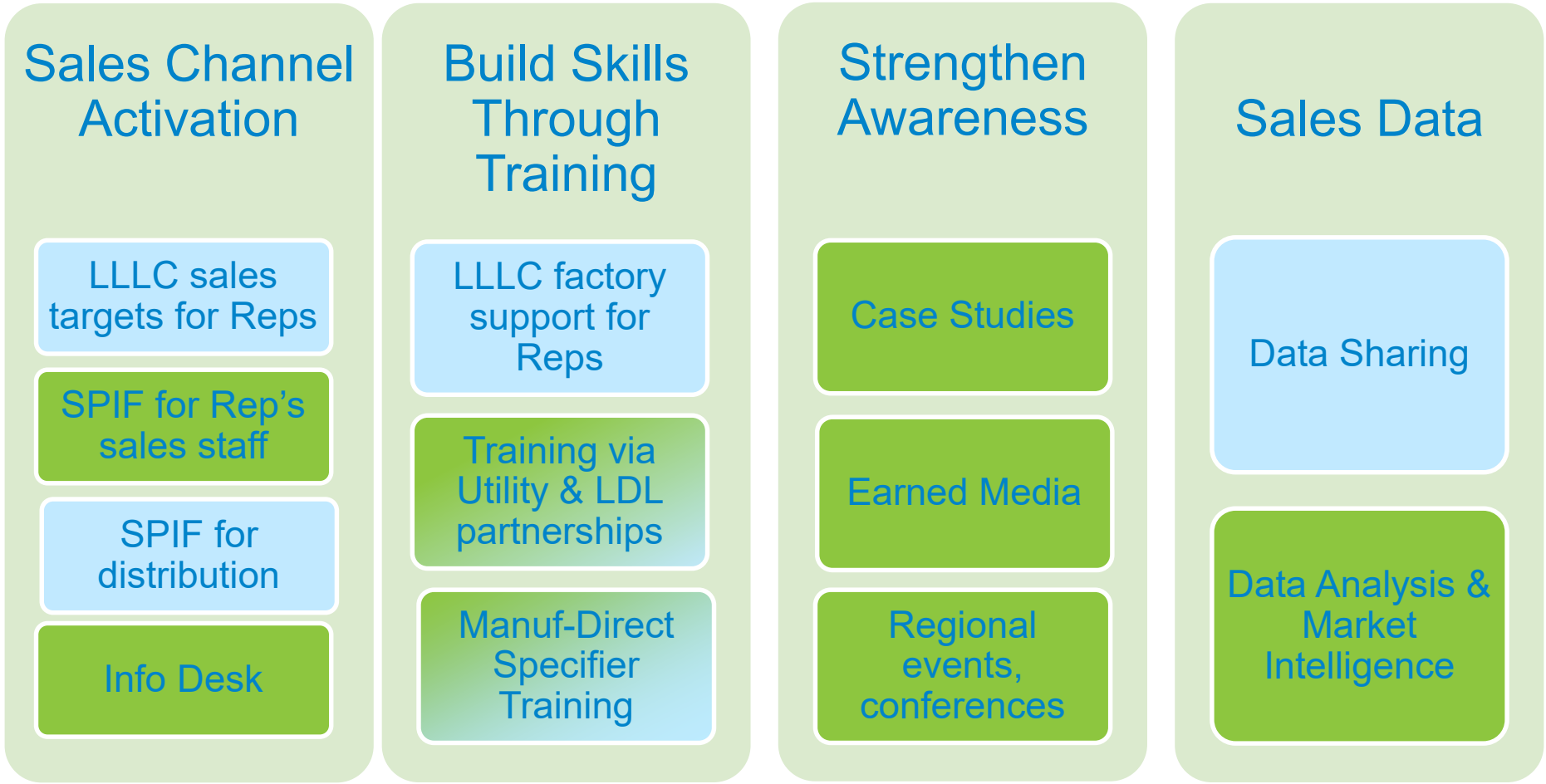
Supply & Sales Chain Engagement

- Learning about sales and decision making process
- Rolling out engagement plan

Activate Sales Chain

- Partner with select manufacturers
  - Top down engagement of key local agencies and distributors
  - Increase promotional focus in region
- Targeting action plans with 4 manufacturers

Collaborative Action Plan Framework



Working Together

Continued Collaboration

- Training
  - Share plans and perspectives
  - Continue to host
- Market Awareness
  - Leverage resources
  - Identify case studies
- Insights
  - Share project takeaways
  - Year end savings reporting
  - Today's round robin

Lunch

CAC Member Share-out

November 5, 2019

Coordinating Committees Check-In

Maria Alexandra Ramirez
Stakeholder Relations Manager



Objectives

- AC Streamlining Update
- Next Steps
- Feedback/ideas on best tools & practices to help NEEA design most successful Coordinating Committees (CCs)
  - Most effective engagement practices
  - Most efficient communication channels
  - Most productive structure/format

Streamlining Update

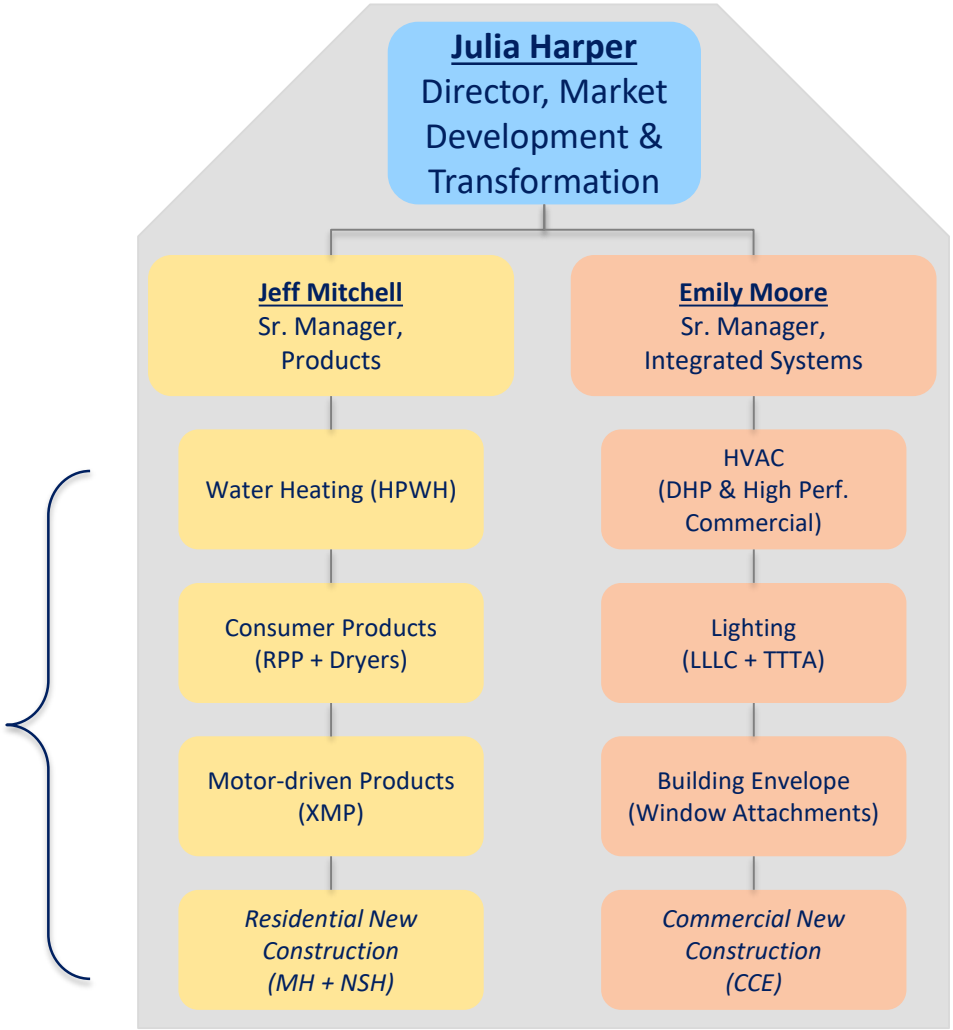
AC Streamlining Update

- RPAC proposed AC structure to NEEA Board on 9/9-9/10
- Board *informally* approved proposed structure and will reconvene on 12/4-12/5, for final approval
- RPAC is on task to review RPAC Charter edits, streamlining other NEEA ACs, and metrics to evaluate effectiveness of this effort
- Once Board gives final approval, RPAC will determine who will represent their organizations in the CCs

Proposed Streamlined Committee Structure

RPAC	Coordinating Committees (CCs)	Work Groups (WGs)
• Portfolio Optimization & Program Advancement • Downstream Marketing Coordination (RPAC+) • Monitor Outcomes of all Advisory Committees • Oversee CCs and WGs • Advises NEEA's Executive Director	• Coordination & optimization of NEEA programs and activities • Identify & manage potential implementation challenges between NEEA and utilities • Identify & seize leveraging opportunities to amplify market influence • Reports to RPAC	• Limited term with specific purpose, as needed • Reports to RPAC, with dotted line to CCs, if necessary

Two Coordinating Committees



Products *Coordinating Committee*

Integrated Systems *Coordinating Committee*

Next Steps

What's Next

- NEEA staff is on task to design the operational details of CCs
- RAC, CAC, IAC and WGs will sunset this year
- NEEA launching new CC structure in 2020 with a *tentative* Introductory meeting in late January
- New WGs with a limited term and specific purpose, will go thru RPAC for approval

Design of Operational Details of CCs

- Adhere to RPAC's intent and guiding principles,
- Address Alliance members' concerns, wherever possible
- Design meetings to be efficient, productive and engaging

Questions for You

Exercise

- Take about 5 minutes to write your top 2-3 answers to each question in a prioritized way
- Come back, go around table/phone and share your top one answer/ your *must have*, for each question, and we'll capture it here
- Collecting all the answers:
  - In the room – we'll collect your answer sheets
  - On the phone – please email me your answers

Questions

1) a) What have you found ***most* valuable** about advisory committee meetings in general? b) What has been ***least* valuable**?

2) a) What **communication channels** have you found ***most* helpful / effective**? b) What has been ***least* helpful / effective**? Eg. *topic specific memos, portfolio updates, slides, notes, recordings, newsletters, reports, etc..*

3) a) What **meeting structure** have you found ***most* productive**? b) What has been ***least* productive**? Eg. *1:1 meetings, calls, webinars, timing, cadence, discussion, presentations, etc..*

Any other ideas you'd like to share?

Break !

August 6, 2019

City of Seattle Tune-Up Accelerator

Nicole Ballinger, City of Seattle
Chris Meek, UW IDL
Ted Brown, SCL



Building Tune-Up Accelerator Program

NEEA COMMERCIAL ADVISORY COMMITTEE PRESENTATION

November 5, 2019

Nicole Ballinger, Seattle Office of Sustainability & Environment
Chris Meek, UW Integrated Design Lab
Ted Brown, Seattle City Light

Seattle Office of Sustainability & Environment

INTEGRATED DESIGN LAB UNIVERSITY of WASHINGTON

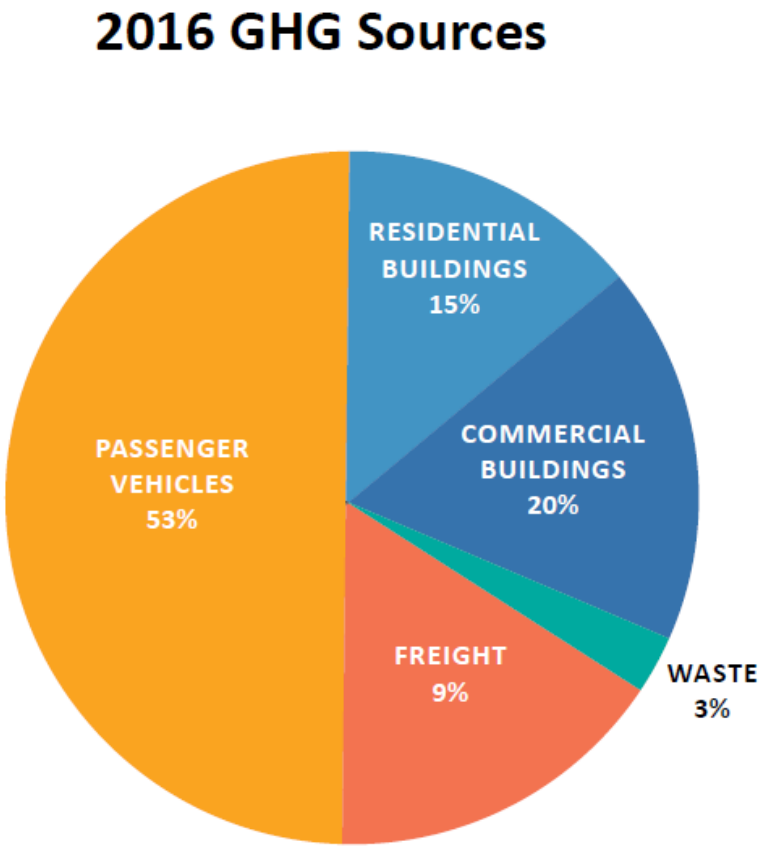
Seattle City Light

Today's Agenda

- Seattle Office of Sustainability & Environment (Nicole)
  - Seattle Climate Action background
  - Tune Accelerator Approach
  - Program status, early outcomes & learning
- UW Integrated Design Lab (Chris)
  - Deep energy retrofit project path & Spark engagements
  - Project highlights
  - Key learnings & takeaways
- Seattle City Light (Ted)
  - SCL's goals
  - Programmatic approach for TUA - logistics and mechanics of incentives for tune-ups
  - Utility benefits; e.g., leads to other opportunities
  - Key learnings/takeaways
- Looking Forward (Nicole & All)
  - What's next for City of Seattle
  - Opportunities to build on this work to address array of policy and market drivers
  - Planning for a 'retrofit accelerator' pilot

Seattle Climate Action Plan

- Buildings make up over 1/3 of Seattle's core emissions
- Goal: Carbon neutral city by 2050
- 2030 Target: Buildings must reduce emissions by 39% from a 2008 baseline



Source: 2016 Seattle Community GHG Inventory

SEATTLE
building tune-ups

An energy efficiency mandate that helps building owners identify smart, responsible ways to reduce energy and water costs.

Like cars and bikes, all buildings need to be tuned regularly to keep them running as efficiently as possible.

Seattle
Office of Sustainability
& Environment

Tune-Up Requirements

Operating Protocols

- HVAC systems
- Lighting
- Water heating
- Water usage

Maintenance & Repair

- HVAC systems
- Lighting
- Water heating
- Water usage
- Envelope

Examples of Operating elements

"Review HVAC equipment schedules."

"Set schedules to optimize operations for actual building occupancy patterns."

Examples of Maintenance, Cleaning, and Repair elements

"Verify HVAC equipment is clean and adequately maintained."

"Clean where adversely impacting system performance."

SEATTLE building tune-ups

Elements of a Tune-Up

- **Conduct a Building Assessment**
  - of building systems to identify operational or maintenance issues
  - review benchmarking data and water bills
- **Identify Corrective Actions**
  - identify required operational and maintenance improvements
- **Implement Required Actions**
  - address all required corrective actions identified in the building assessment
- **Verify Changes & Report to City of Seattle**
  - confirm all corrected equipment and systems are functioning as intended

SEATTLE building tune-ups

TUNE-UP SCHEDULE

Ongoing, every five years

BUILDING SIZE*	WAIVER AND EXTENSION DUE DATE	TUNE-UP SUMMARY REPORT DUE DATE
200,000+ SF	September 4, 2018	March 1, 2019
100,000-199,999 SF	April 1, 2019	October 1, 2019
70,000-99,999 SF	April 1, 2020	October 1, 2020
50,000-69,999 SF	April 1, 2021	October 1, 2021

** Excluding parking*

SEATTLE building tune-ups

What is the Tune-Up Accelerator?

- Mid-Size buildings (approx. 100,000 SF or smaller) due 2020 or 2021
- Tune-up now to meet Seattle Building Tune-Ups requirements
- Financial incentives & enhanced technical support – offer sunseted after 2018
- Goal of 20% average energy savings across at least 100 buildings or tenant spaces and 99.7 Million kBtu/year (~$1.5 million annual cost savings)

Program Partners

Seattle
Office of Sustainability
& Environment

Seattle City Light

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

Program Approach

1. **Advance market expertise** to support building tune-ups
   >> Tune-Up Trainings
2. **Accelerate tune-ups** in mid-size buildings
   >> Incentives & Owner Engagement
3. **Generate voluntary** market action towards greater savings
   >> Building Assessments & Implementation – 20% Savings Goal
4. **Ensure the mandate** is effective for this market sector
   >> Evaluation & Refinement

Tune-Up Specialist Trainings

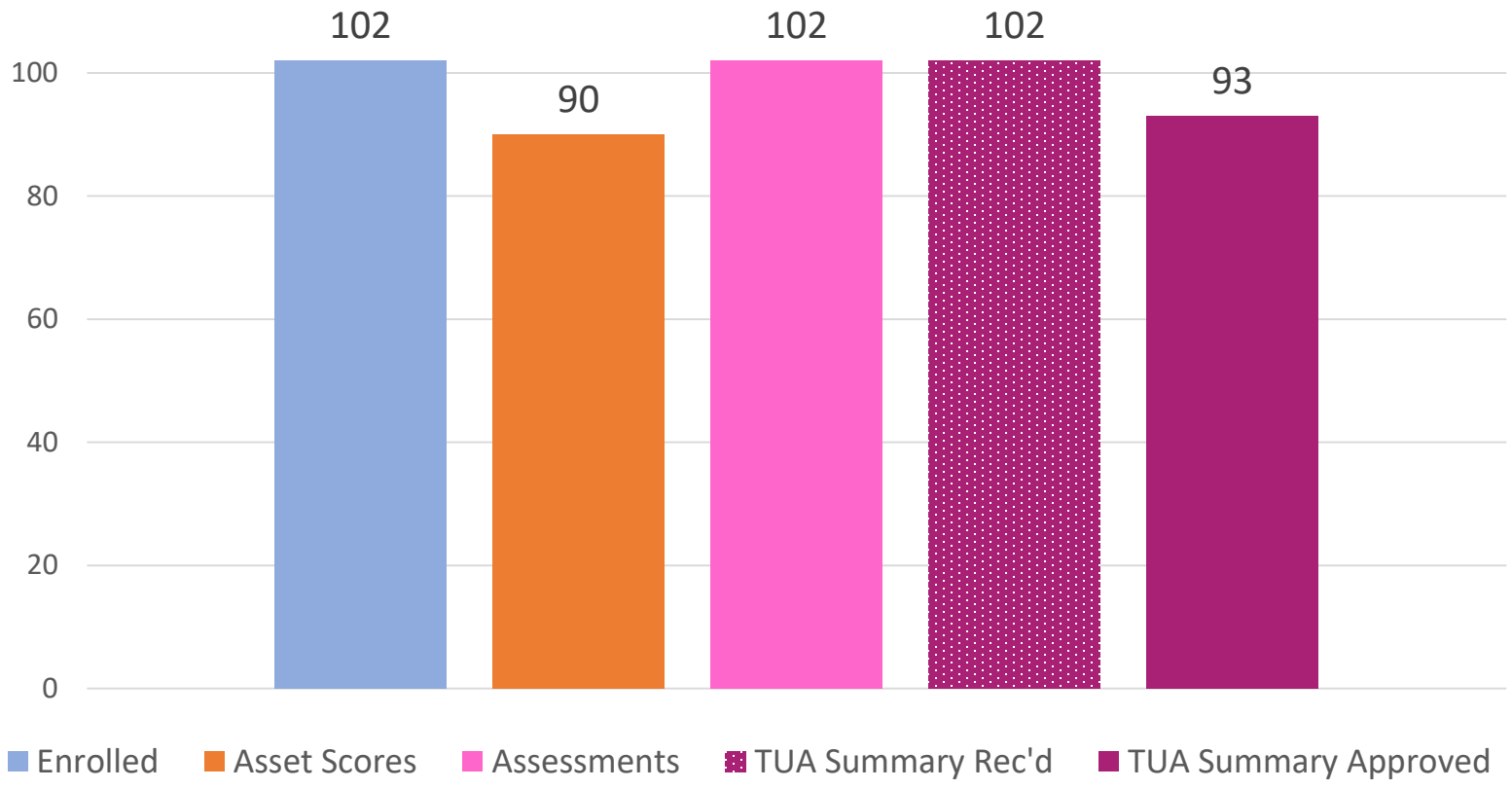
- ✓ 85 service providers attended “tune-up” trainings
  - ✓ 30 firms participated in the “TUA” provider list
    - ✓ 16 firms participated in projects
    - ✓ Seattle Public Schools RCx and RCM staff
    - ✓ King County RCM staff

Incentives & Program Paths

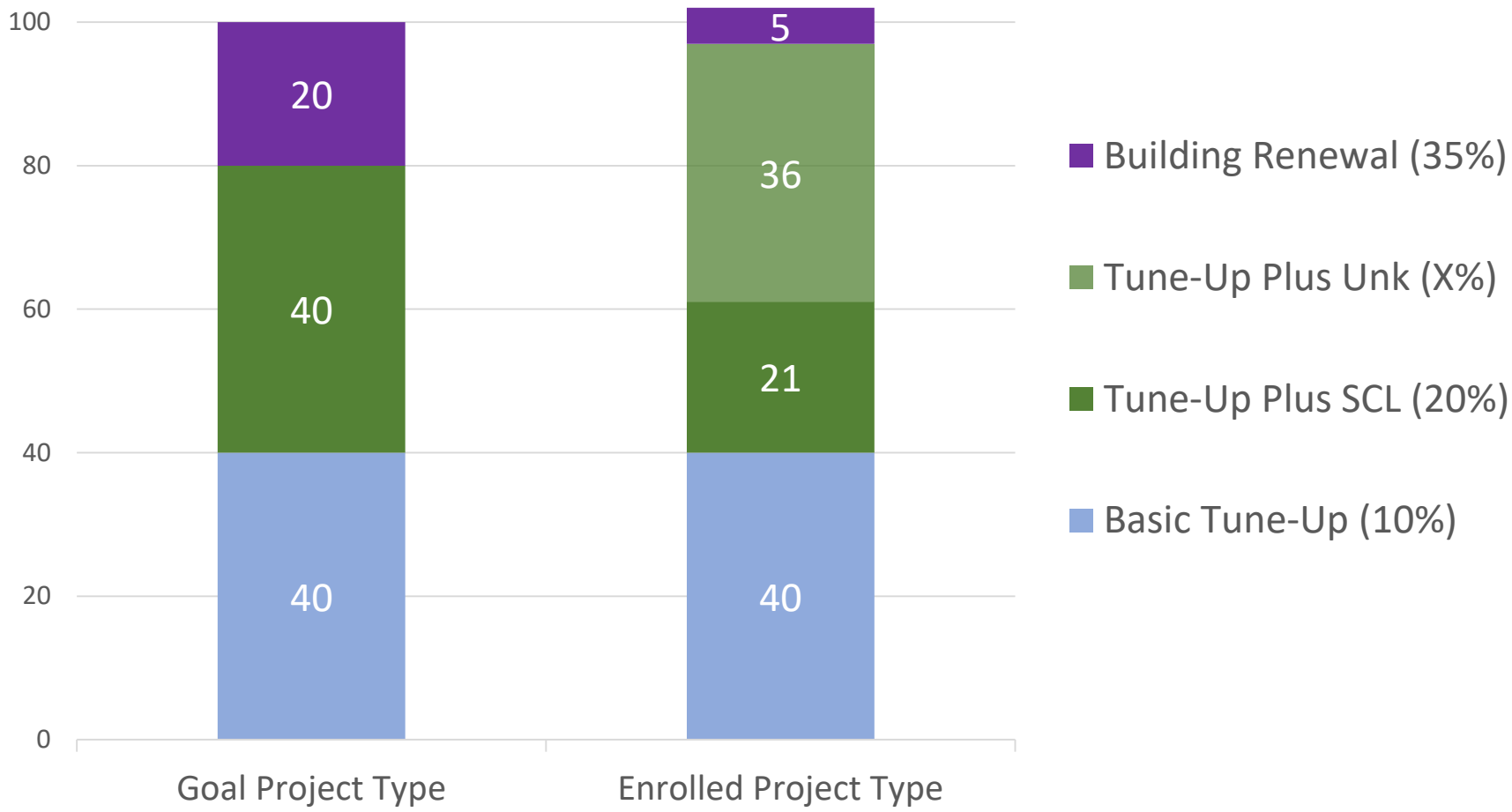
A. BASIC TUNE-UP	City Light incentive of up to **$0.12 per SF** for a tune-up that meets requirements
B. TUNE-UP PLUS	Plus incentives for energy-saving improvements like lighting, HVAC
C. BUILDING RENEWAL	Support for deeper investments like renovations or tenant improvements

2017 — **Q4 2019**

Tune-Up Accelerator Project Status



Current & Goal Project Types



Top 5 Tune-Up Deficiencies

Required Implementation

Tune-Up Measure	Percent Deficient
G1 – Review **HVAC equipment schedules**	58%
G2 – Review **HVAC set points**	45%
G5 - Verify that **HVAC sensors** are functioning, calibrated, and in appropriate locations	38%
G6 - Verify **HVAC controls** are functioning as intended	37%
G11 – Verify **HVAC equipment maintenance**	38%

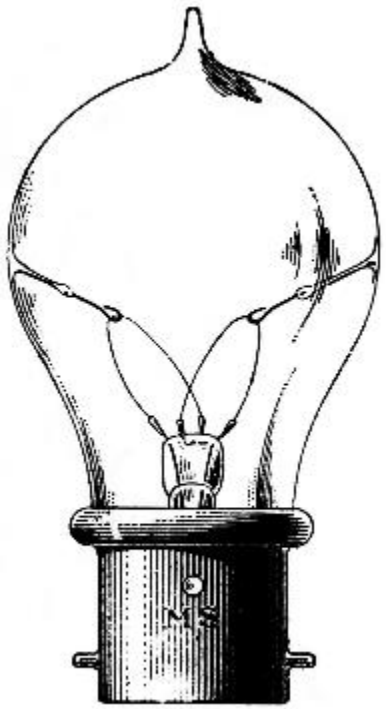
In 92 TUA buildings assessed.

Top 5 Tune-Up Deficiencies

Voluntary Implementation

Tune-Up Measure	Percent Deficient
H4 – Identify **inefficient lighting**	66%
G18 - Identify **equipment approaching the end of its service life**, per ASHRAE	46%
H2 – Verify **lighting sensors are working** and located appropriately	37%
G9 – Identify areas with indications that **ventilation rates** may vary significantly from ASHRAE 62.1	29%
G15 – Verify that **(HVAC) equipment observed** during the assessment is in good working condition (such as motors, fans, pumps)	26%

In 92 TUA buildings assessed.



Building Renewal

Chris Meek, UW IDL

What is Building Renewal?

Key Components

- EEMs beyond the required Tune-Up actions
- An integrated holistic approach
- Strategic building investments
- A structured package of synergistic energy-efficiency measures
- Improved energy savings
- Non-energy benefits

IDL Technical Implementation

- **Level 1** (+/- 25 Buildings) – IDL will provide best-practices recommendations, and where appropriate, SPARK Tool-derived measure packages
- **Level 2** (+/- 15 Buildings) – Level 1 activities and **walk-through with Vendor/Building Owner and technical recommendations**. In collaboration with OSE and project Vendors, UW IDL will provide, supplemental technical assistance
- **Level 3** (+/- 5 Buildings) – Level 2 activities plus Technical Assistance including **custom simulation-based analysis and recommendations**

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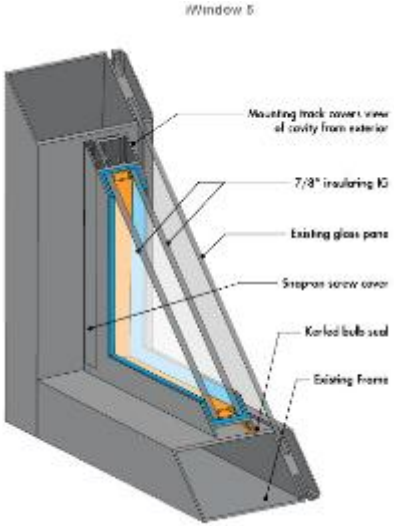
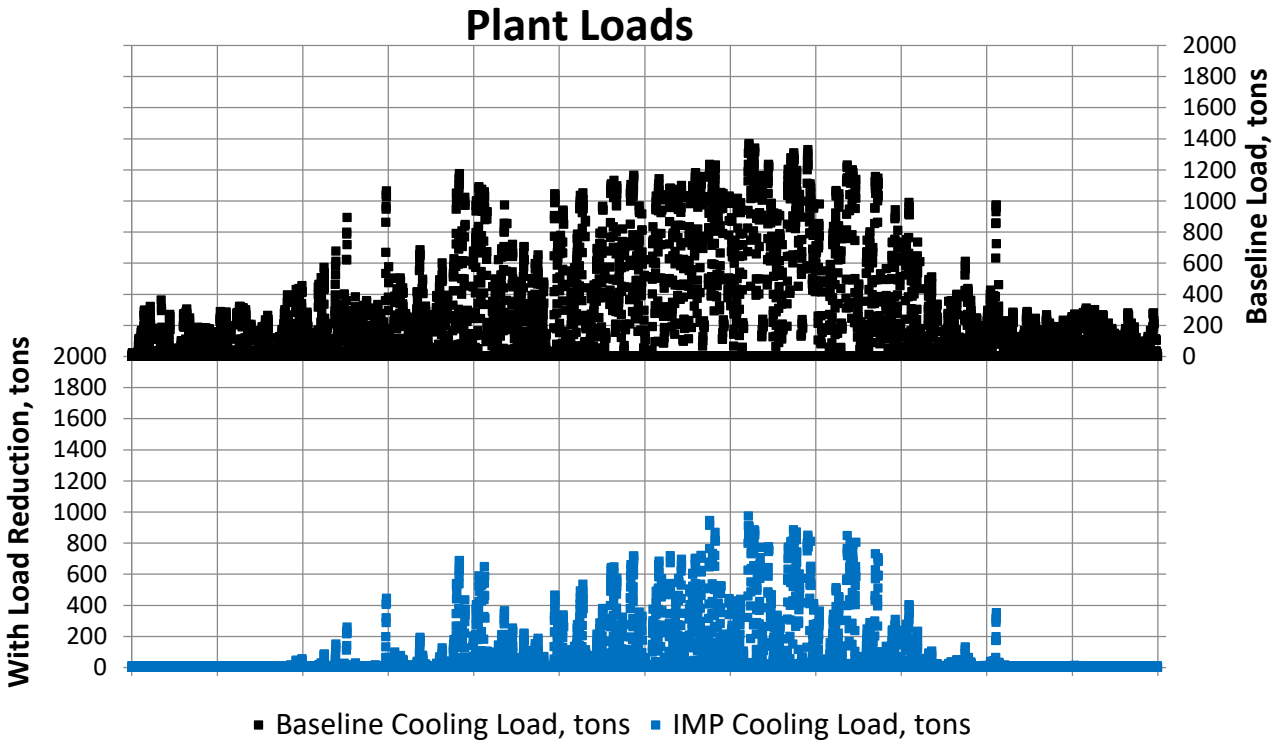
Building Renewal Measures: Load Reduction

- Envelope/Glazing
- Lighting Systems
- Plug load management
- Tenant Engagement



Building Renewal Measures: Efficient Systems

- Central Plant HVAC
- Building HVAC



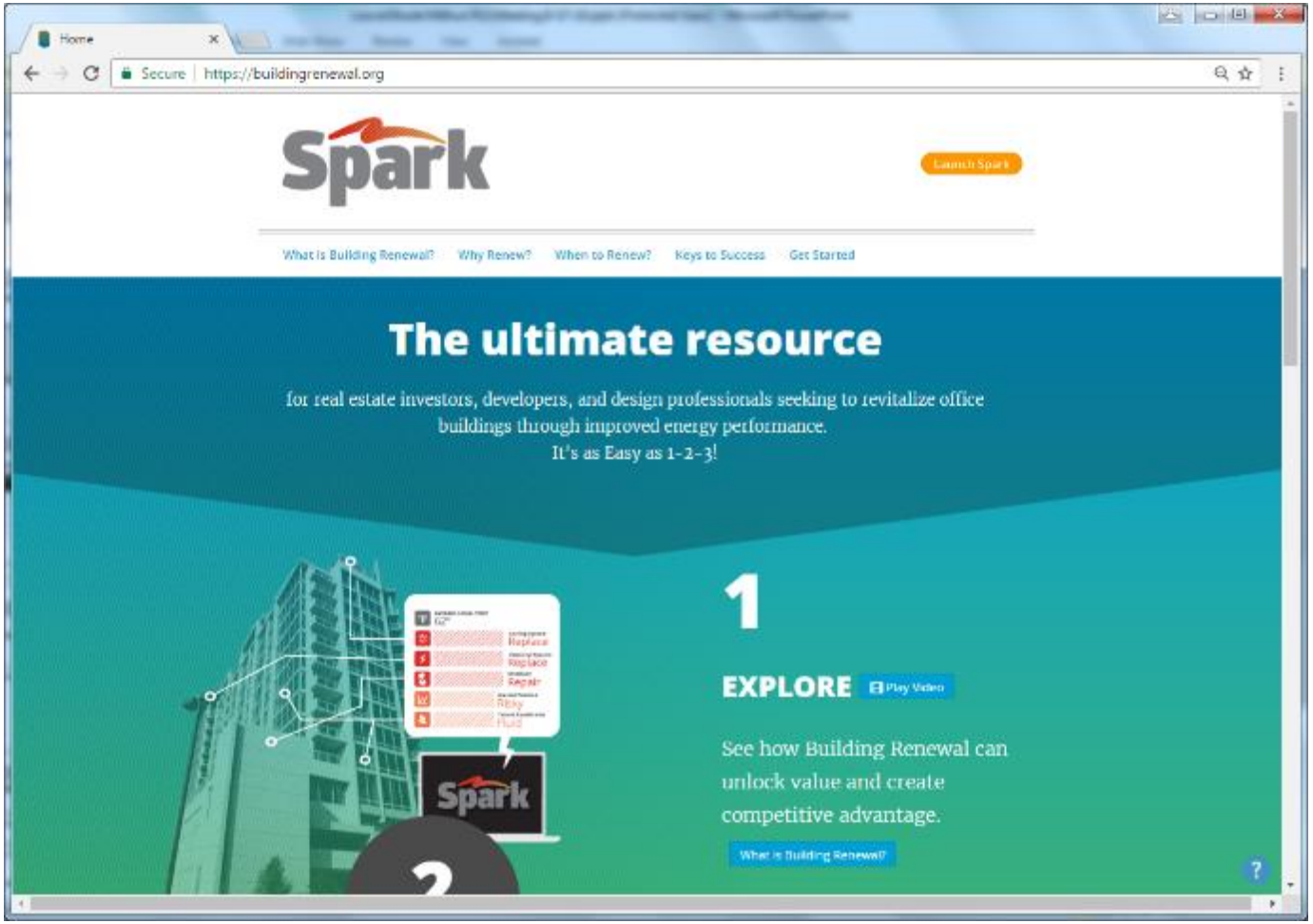
Level 1 Building Renewal – Least Detailed

Selection Criteria – (35 Buildings To-Date)

- Owner/Service Provider Request
- Office use at 50% or Greater
- EUI greater than 55 kBTU/ft^2-yr
- Building has office and known/disaggregated non-office load

  (e.g. restaurant, data center, warehouse,)
- Built 1996 or before
- Asset Score submitted and reasonably accurate

Level 1: SPARK Tool



www.buildingrenewal.org

Level 1: SPARK Tool

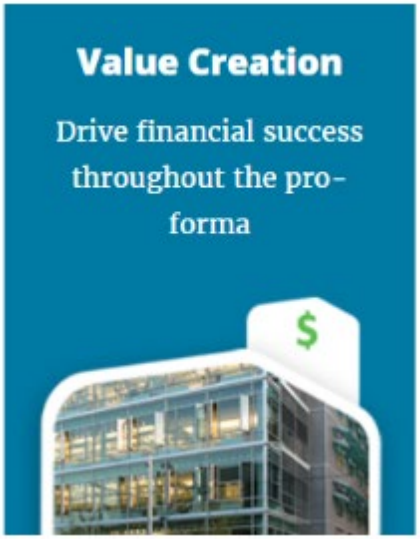
Tool Objectives

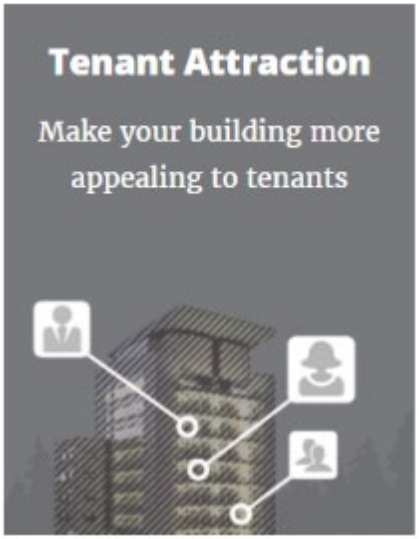
1. Inform and inspire investigation of building renewal

2. Assess technical project potential for a specific building

3. Estimate the total value of the investment

SPARK Tool: Non-Energy Benefits



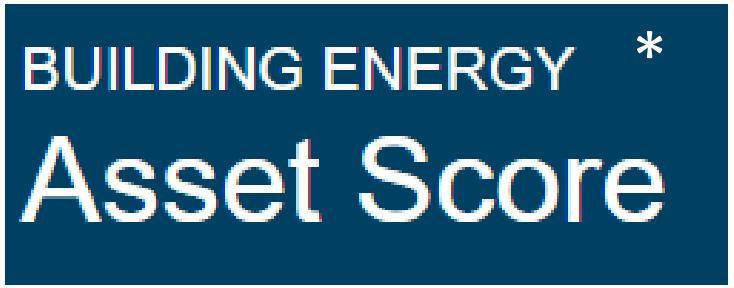


Data Exchange

https://buildingrenewal.org/

Developed by BetterBricks

- Uses EnergyPlus seed models to simulate energy performance
- Incorporates business case
- Exports report and technical appendix



https://buildingenergyscore.energy.gov/buildings

Developed by Dept. of Energy

- Uses simplified EnergyPlus models to simulate energy performance
- Requires detailed building geometric information

SPARK Tool: Quick Screen Report

Result: STRONG Candidate

Your building is a strong candidate for a successful Building Renewal – a whole-building energy savings project that reduces the building's energy use by over 35%.

BR Index Score

15/20

Market Position:	3	Risky
Tenant Conditions:	3	Fluid
Financial Flexibility:	5	Unleveraged
Systems + Structures	4	Aging

Market Position

3
Risky

The building is at risk of losing market appeal from tenants and/or investors, shows signs of decreasing asset value, and may need to incur additional costs to comply with codes. Risky buildings are good candidates for an BR project because the energy efficiency focus can anchor a repositioning strategy and deliver reduced operating costs and improved tenant comfort.

Tenant Conditions

3
Fluid

Significant opportunity exists to implement major construction projects within the building, either through current or future vacancies, the ability to relocate tenants, or tenant willingness and desire to improve environmental performance.

Financial Flexibility

5
Unleveraged

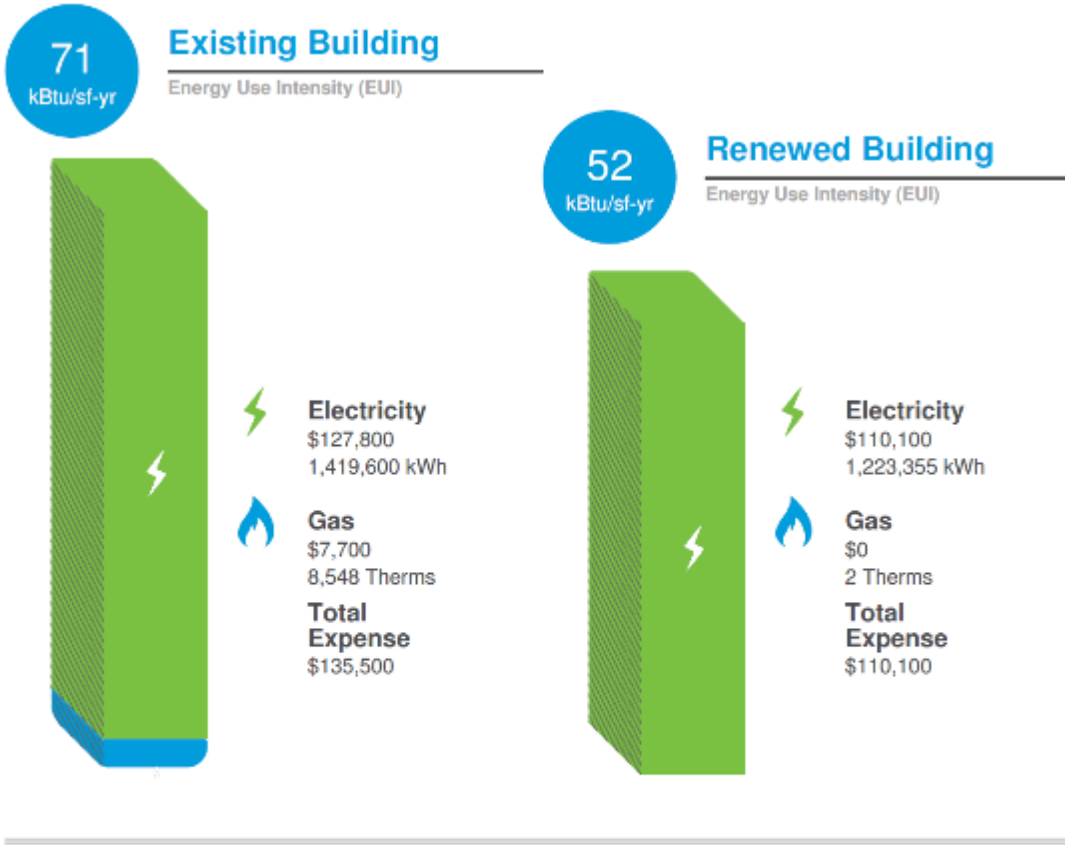
The building's financial situation is such that a variety of options are available to fund the BR project, including a willingness to explore additional debt, energy services agreements, equity infusions, or other unique financial resources. Furthermore, planned capital projects offer an ideal window of to facilitate an BR project, integrating systems and envelope upgrades with other building enhancements.

Systems + Structures

4
Aging

The building has systems or structures in need of repair or replacement, such as the envelope or central plant. Aging buildings are good candidates for BR projects, where necessary investments in equipment and upgrades can be integrated to deliver deep energy savings.

Energy Performance



Energy Use: 27%

Energy Cost: 18%

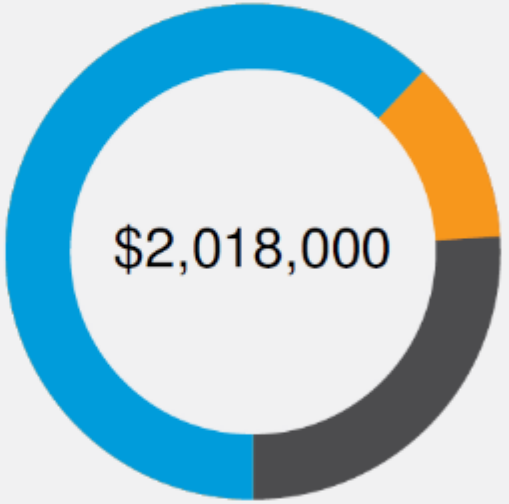
Annual Energy Savings: $25,400

Business Case

Internal Rate Of Return (IRR): **10%**

Net Present Value (NPV): **$430,500**

Present Value(PV) Of Value Creation Components	
Asset Appreciation	$1,256,900
Rent Differential	$0
Energy Savings	$234,500
Reduced O&M Expense	$526,600
	$2,018,000



Estimated Project Costs		$/rsf	$/gsf
Total Project Cost	$1,587,500	$20	$20
Project Incentives *(est)*	$55,000	$1	$1
Net Project Cost	$1,532,500	$19	$19

Energy Efficiency Measures

PROJECT SCOPE

The following energy effciency measures have been envisioned as an integrated, bundled solution, to achieve approximately 18% energy savings. In addition to energy savings, it is also extremely important to evaluate the full range of non-energy benefits that might accrue from the measures included in a building renewal project. As described earlier in this report, these benefits include increased market position and competitiveness, broader tenant appeal, tenant retention, and asset appreciation.

PACKAGE OF MEASURES

ENVELOPE

Envelope Sealing

Reduce air leakage through the building enclosure, reduce the risk of moisture damage in walls, and improve durability. Reduced air infiltration will also reduce the amount of unwanted substances such as dust, auto exhaust, and other pollutants enhancing occupant comfort and health.

LIGHTING

Lighting Power Density (LPD) Reduction

Reduce lighting load by delivering lower ambient lighting and high quality task lighting at each workstation. This will increase visual comfort and increase capabilities for individual occupant control of lighting.

Perimeter Daylighting

Combine integrated perimeter daylighting with a reduction of lighting power density. Tenants prefer spaces with abundant natural light.

Occupancy Sensor Lighting Controls

Reduce and/or turn off electric lights when unnecessary due to lack of occupancy. Energy saving controls such as these are especially valued in markets where environmentally sound practices enhance market position.

PLUG LOADS

LED Task Lighting

Replace existing task lighting incandescent lamps with 6 watt or 9 watt LED lamps, or provide new task lighting with dedicated LED fixtures. Incorporate integrated vacancy sensing into task lighting. Task lighting may enable reduced ambient lighting requirements through a task/ambient lighting strategy. User control of the individual work place brings high marks from tenant employees.

Occupancy Sensor Control of Plug Loads

Reduce plug load energy use by de-energizing or reducing the power draw of office equipment during times that it is not in active use. Carefree energy saving techniques are a win-win for tenants focused on the bottom line and those with environmental concerns.

PLANT

Variable Flow Pumping Retrofit - Chiller Plant

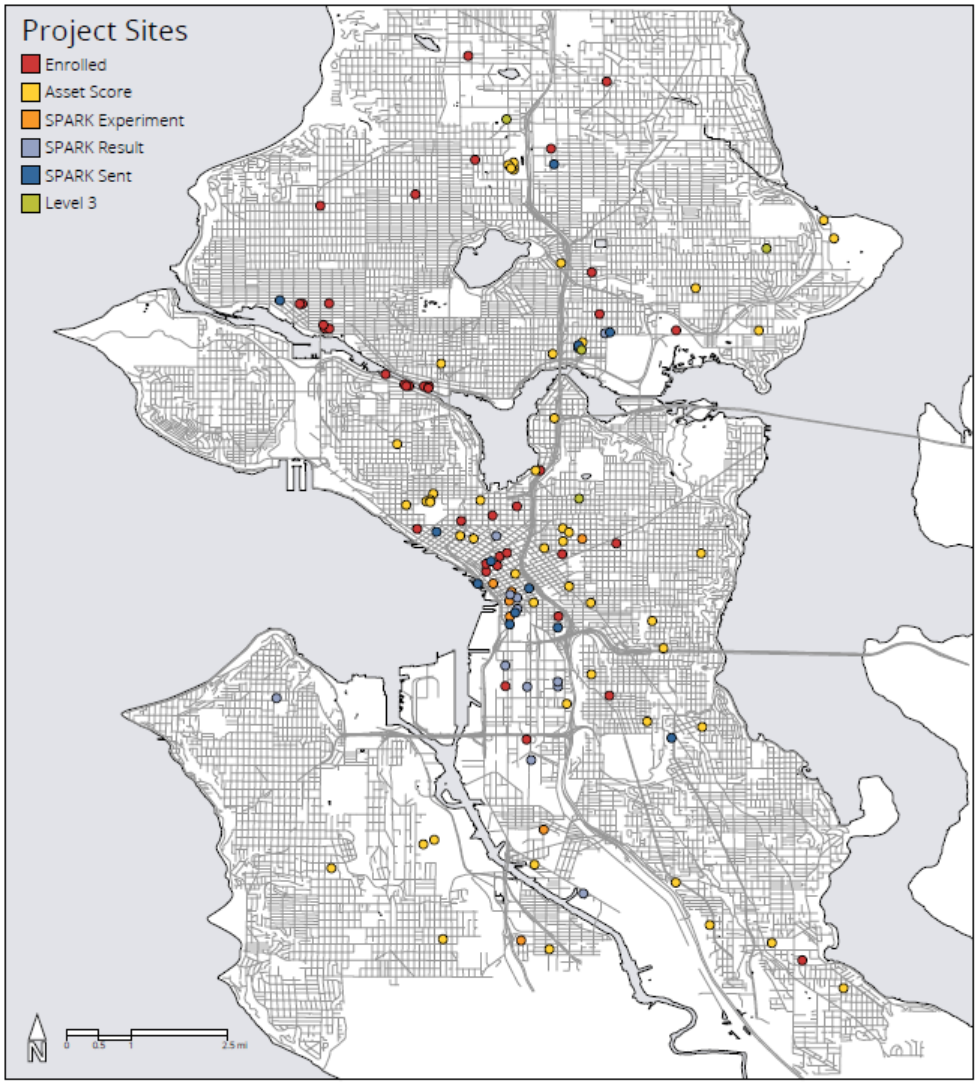
Pump replacement offers the opportunity to improve the mechanical efficiency and capacity control of the pumps. This involves installation of variable frequency drives (VFDs) and conversion of the pumping system to variable flow capability. This measure applies primarily to chilled water pumping systems but can also be applied to condenser water systems in some plants.

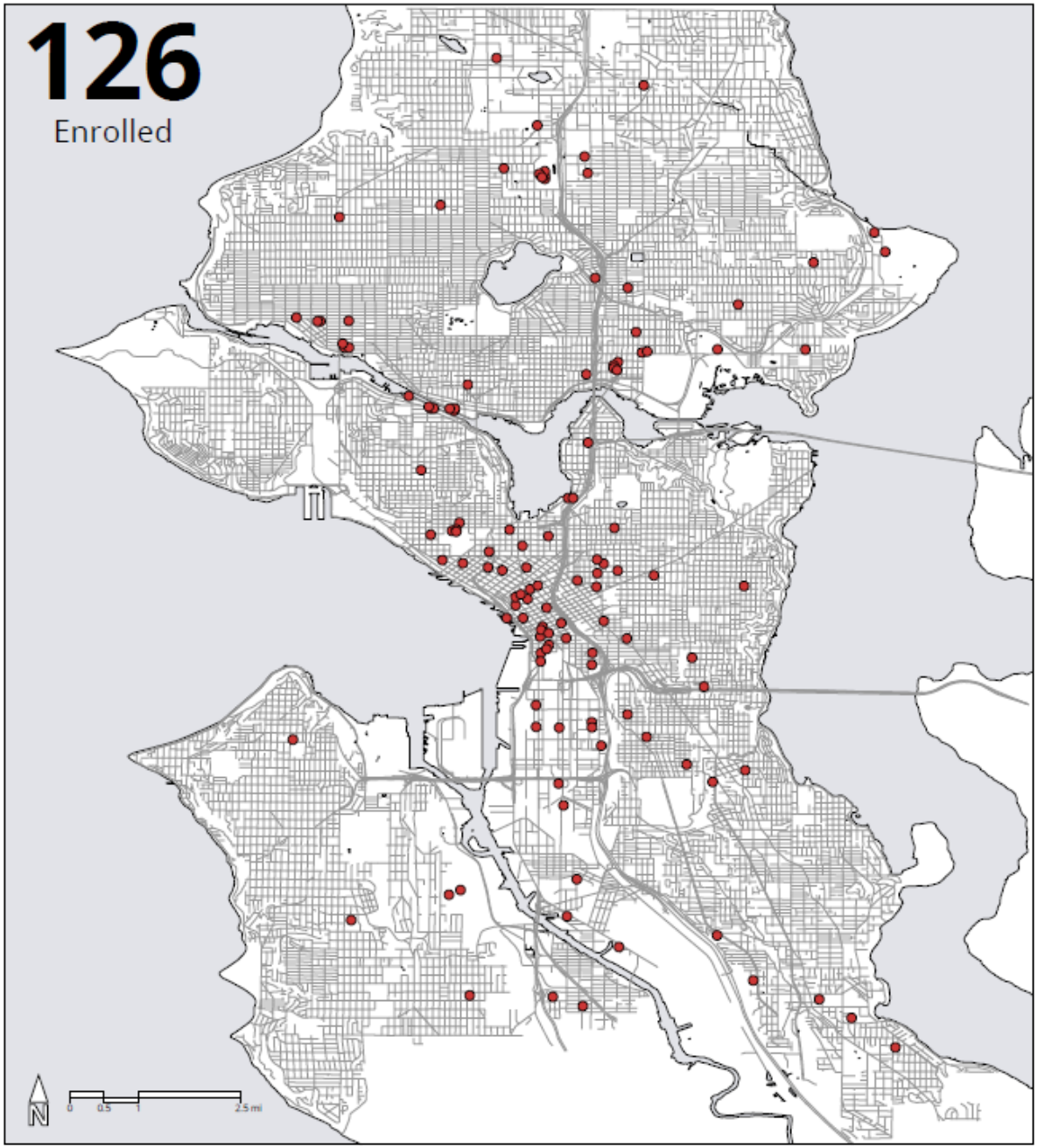
CONTROLS

Optimized VAV-Central Plant DDC Package

Optimize existing controls, or Install a direct digital control system that controls all elements of the HVAC system and is tightly scheduled for building occupancy and other exterior influences. The system should not only execute control functions, but also collect and archive relevant building performance data for use in M&V activities. Modern DDC will more readily meet unique tenant scheduling needs (of building systems). In addition to delivering energy efficiency, a controls upgrade will help position the building as a modern Class A office.

Project Engagement - Results

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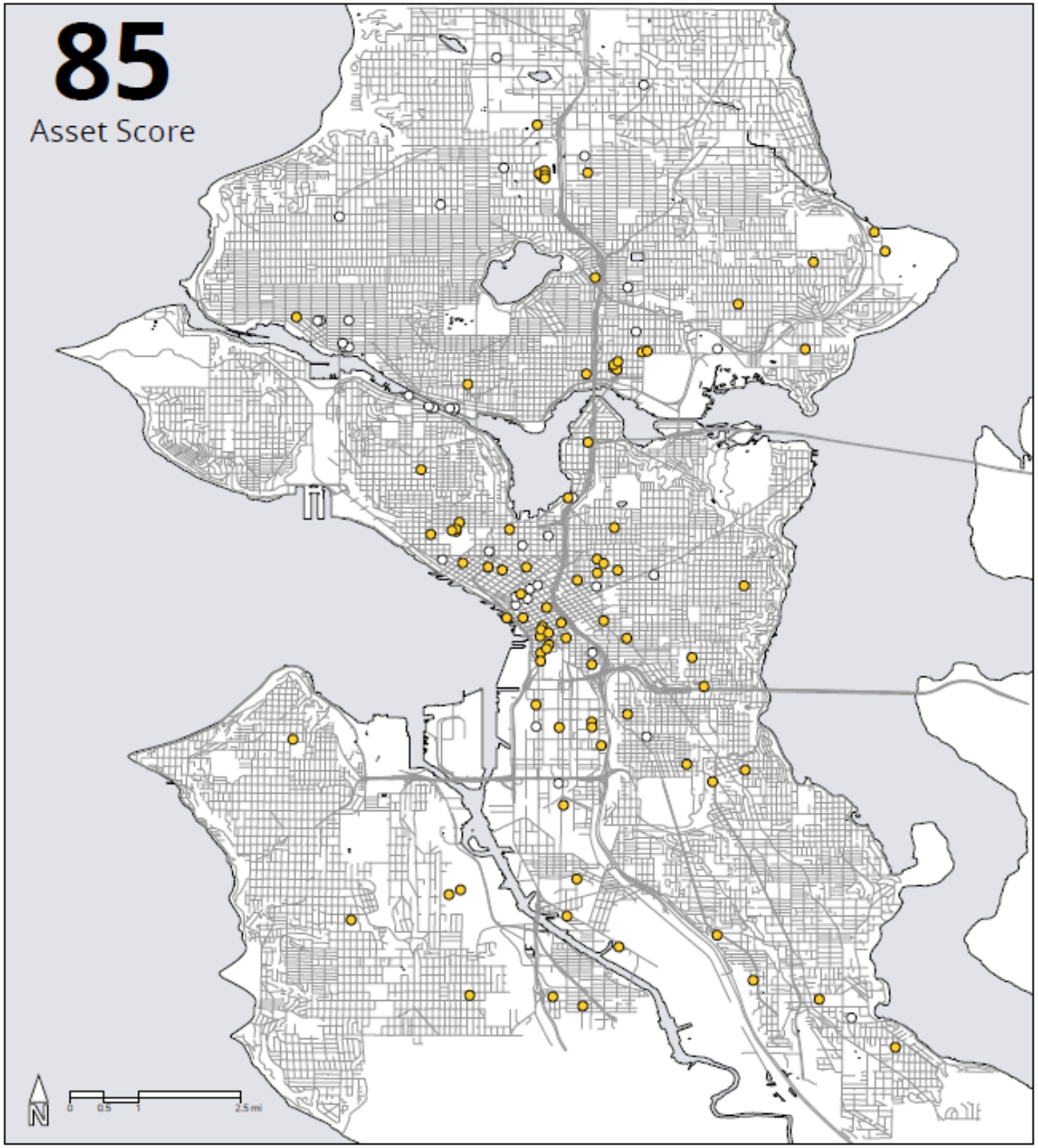
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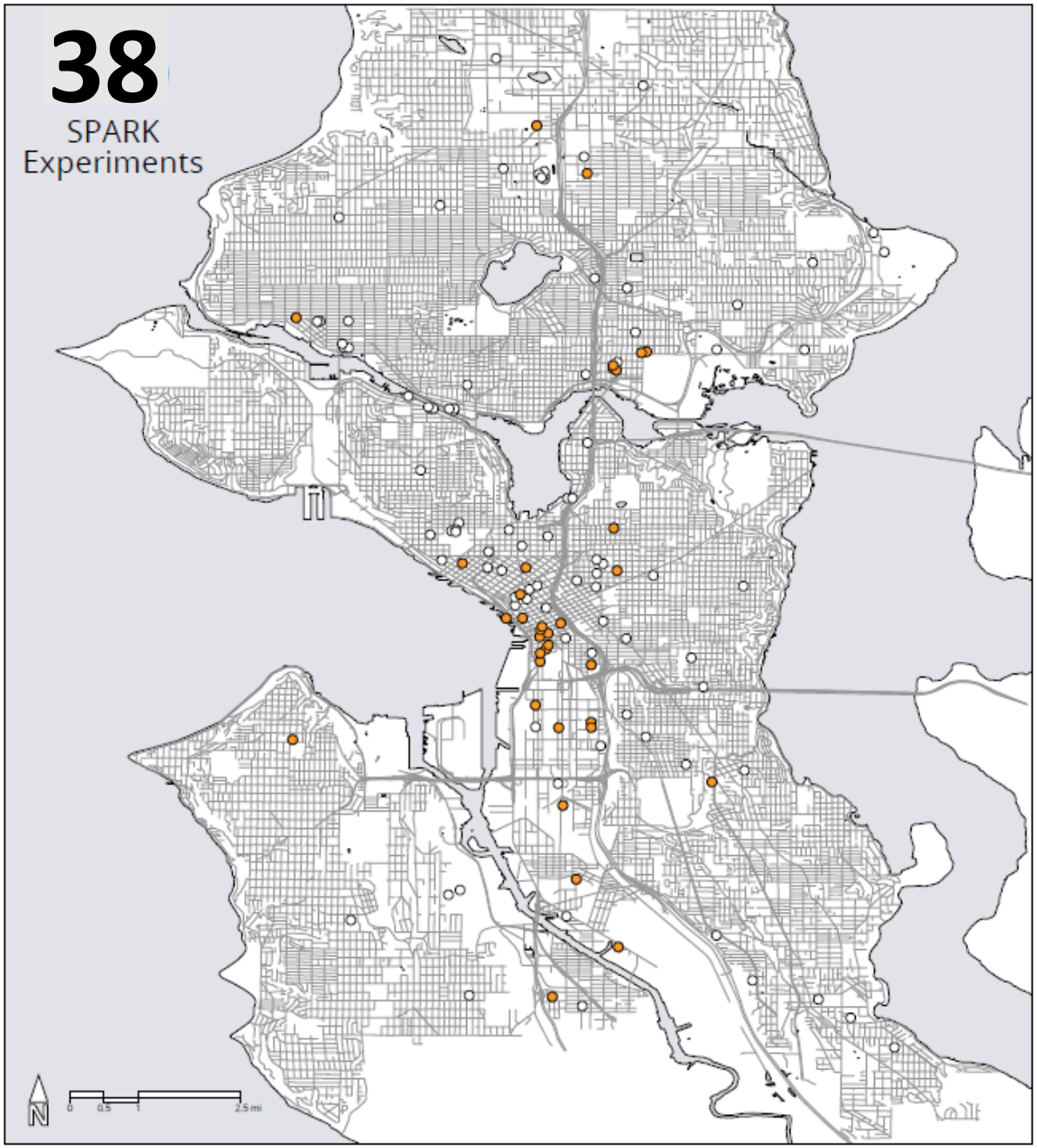
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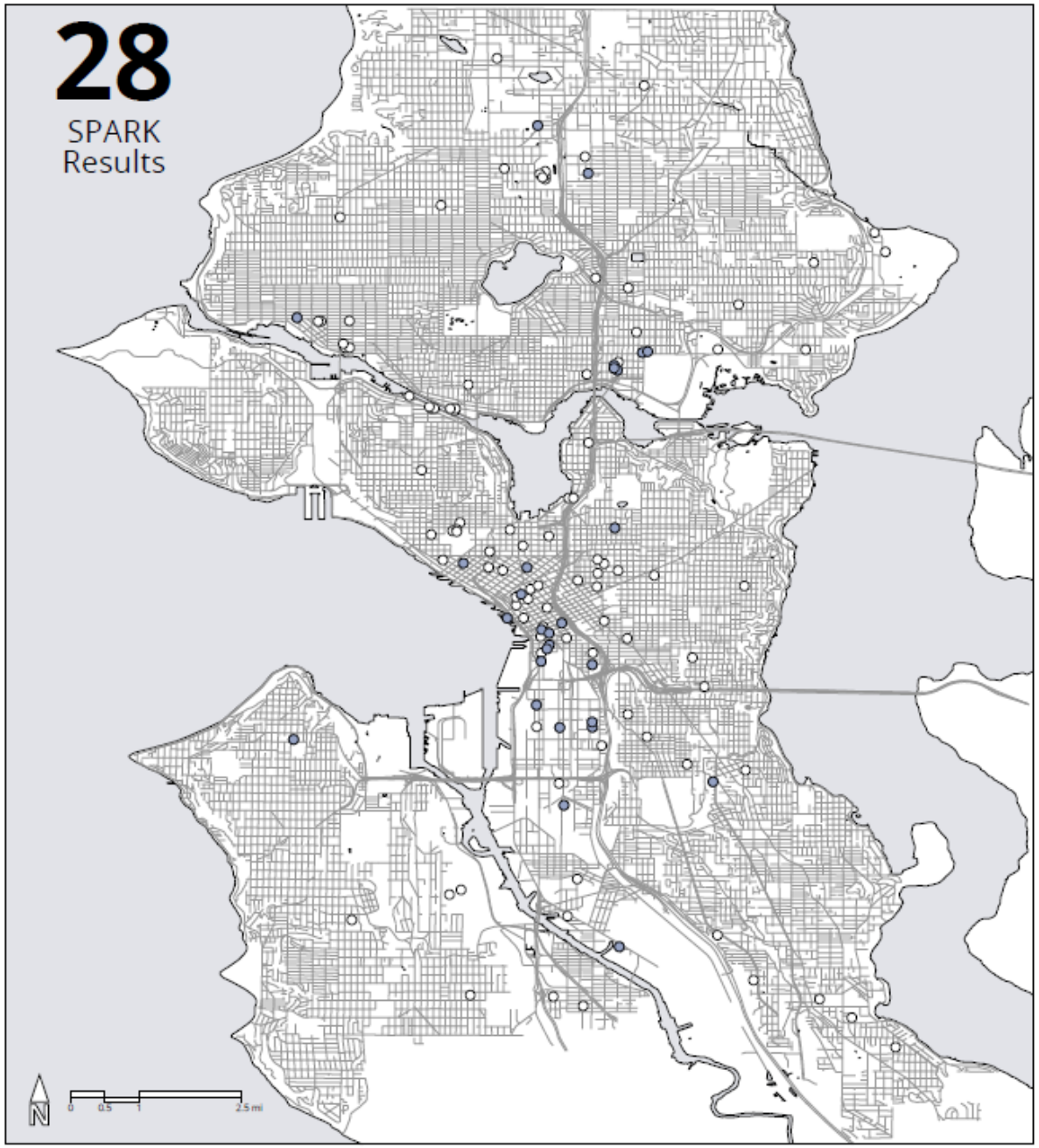
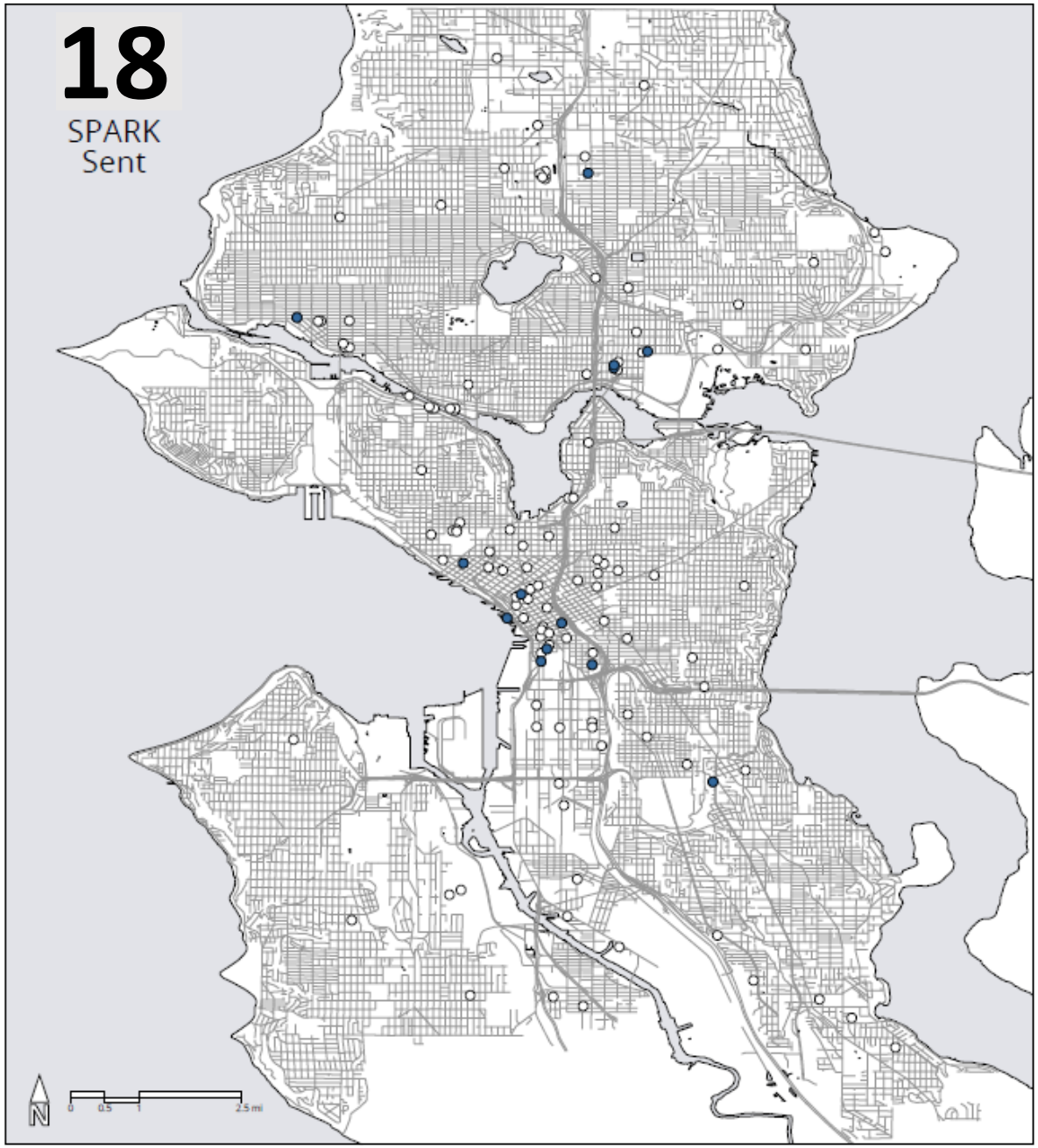
28

SPARK
Results

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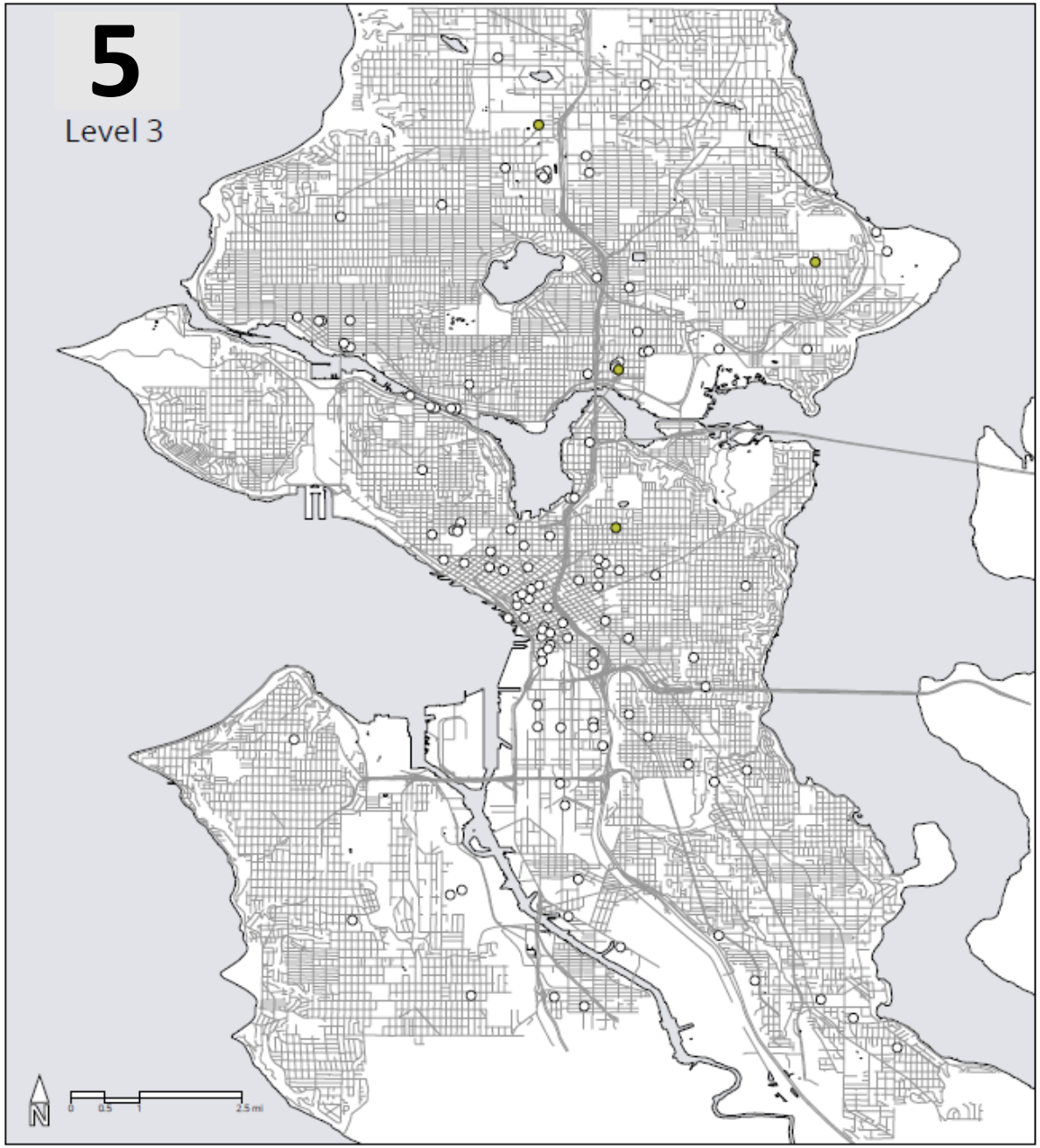
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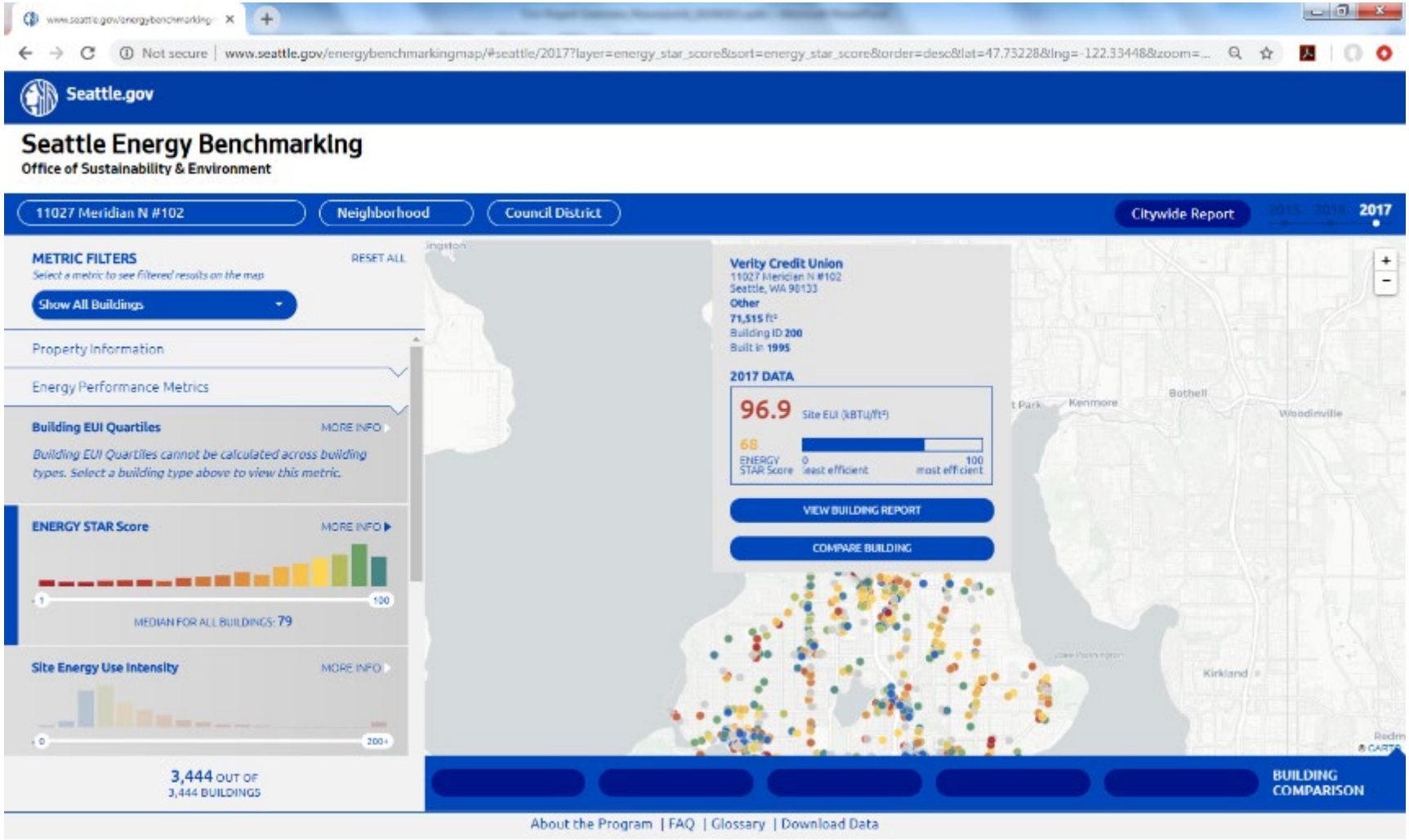
Level 3 Building Renewal – Most Detailed

Selection Criteria – (5 Projects Total)

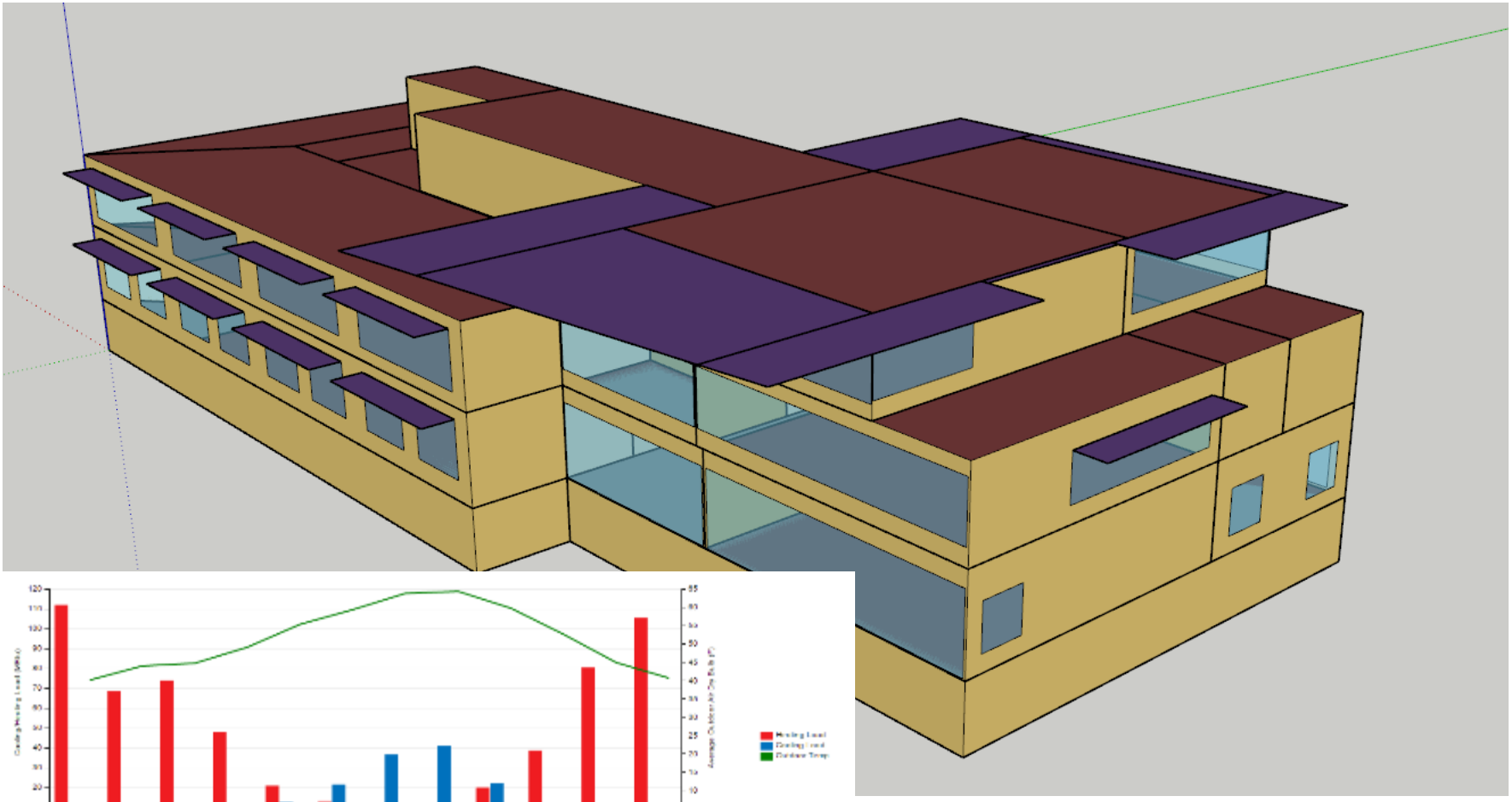
- Owner/Service Provider Request
- Building Typology Representative of Seattle Building Stock
- SPARK Analysis shows promise
- Broad Applicability/Translatable Lessons
- Serves Under-Resourced Communities
- Long-term Hold
- Access to Capital/Capital Likely

Level 3 - Example

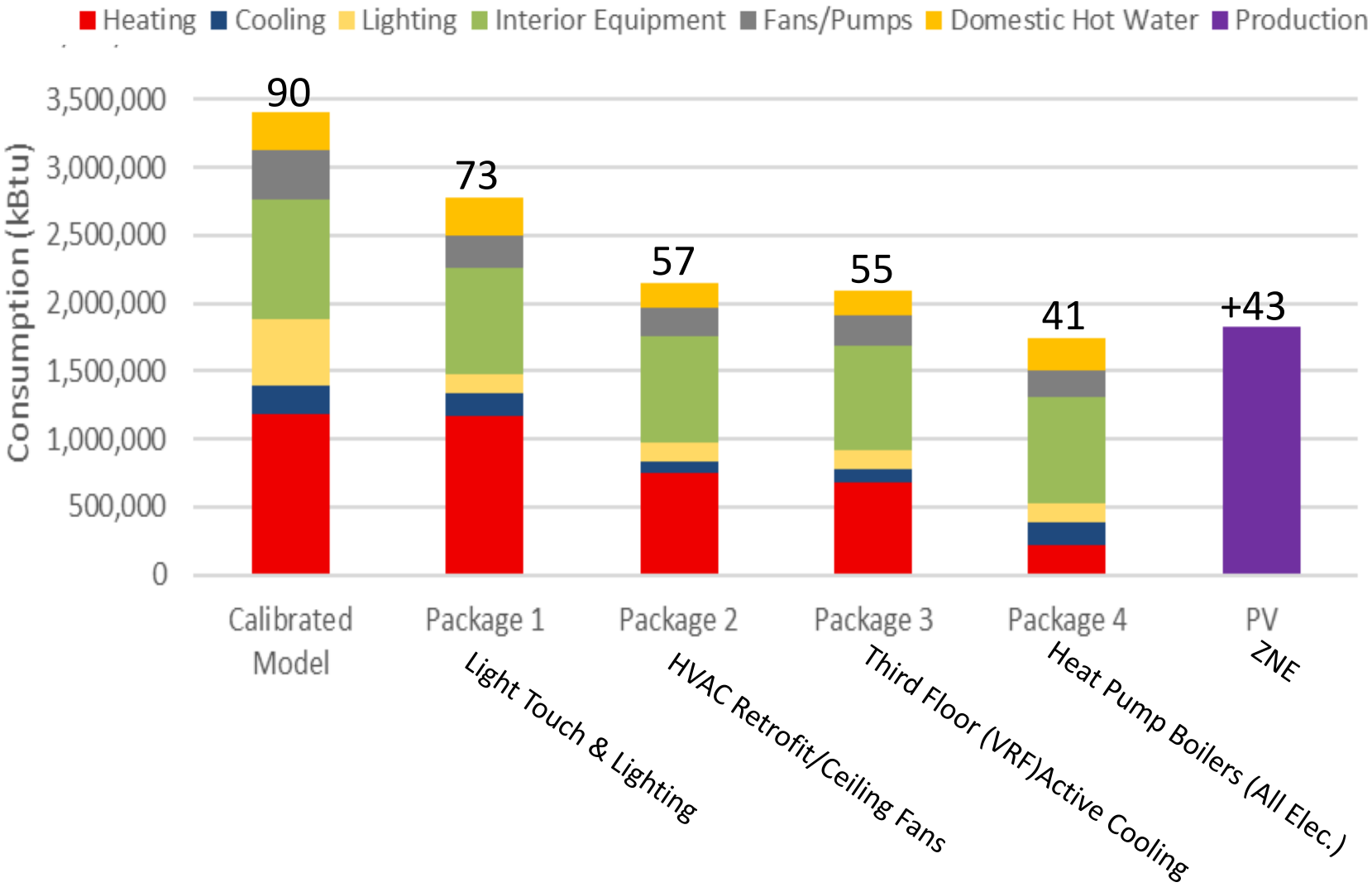
Data Gathering – Disclosure Data



Calibrated Energy Model



Measure Package Results



4225 Roosevelt: Big Opportunity

4225 ROOSEVELT 2ROS4225

Building Comparison View >

4225 Roosevelt Way NE, Seattle WA 98105
196,749 ft²
Medical Office
OSF Building ID: 494
Built: 1988

TOGGLE VIEW:
● EUI ● ENERGY STAR Score

2017 EUI
172.9
KBTU/FT²

Energy Use Intensity is your building's annual energy use per square foot.

COST OF ENERGY

This building currently spends an estimated $1.54/ft² annually on energy or **$303,430**

$1.54/FT²

SAVINGS OPPORTUNITIES

By reducing energy use by 10%, this building could save up to **$30,343** annually on energy costs.

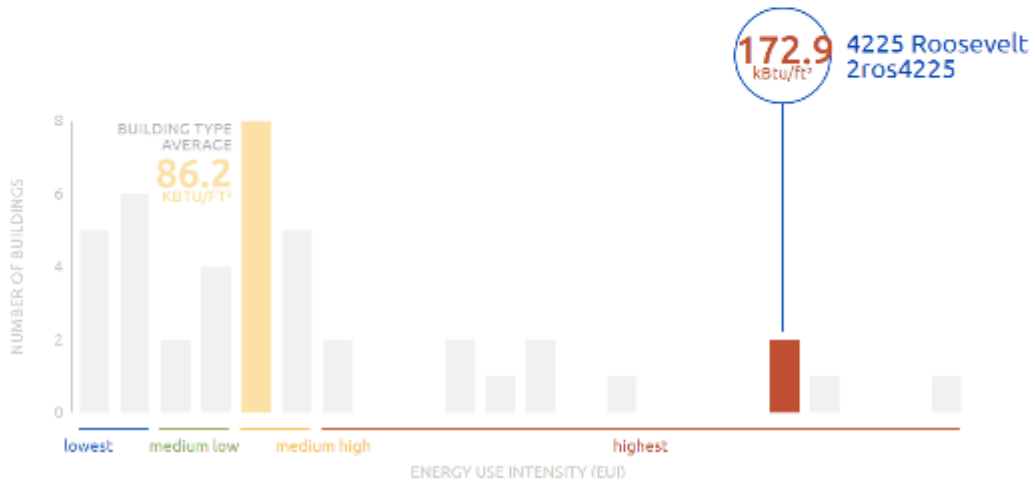
$30,343

ENERGY USE COMPARED TO AVERAGE

See how this building measures up against other buildings of the same primary use:

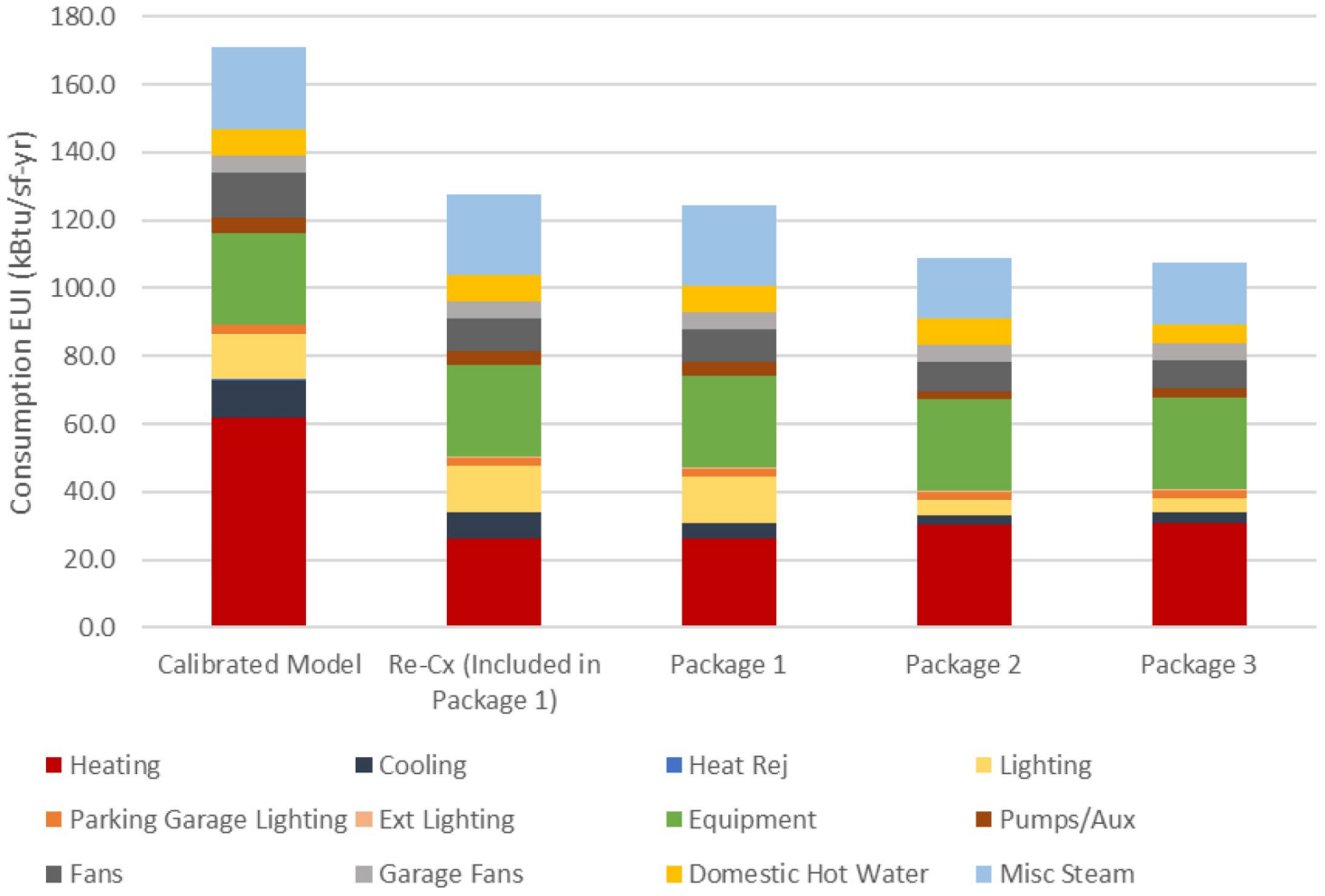
101%

This building's energy use per square foot (EUI) is **101% higher** than the average Medical Office in Seattle.



4225 Roosevelt: Evaluation

4225 Roosevelt: Measure Packages



Incentives, Structure, Timeline

	Cost	Energy Savings %	Utility Cost Savings ($/yr)	EUI (kBtu/sf-yr)	Total Utility Incentives ($)	Implementation Timeframe
Baseline Energy Use (2016/2017)	N/A	0%	$ 0	173	$ 0	N/A
Business as Usual Chiller and CT -1 Replacement	$690,000	4%	$9,546	166	$28,600	Currently Planned/Pending
RE-Cx (Included in Package 1)	$ 80,000	25%	$ 78,371	128	$ 205,139	Immediately
Package 1 (incl. RE-Cx)	$ 930,000	27%	$ 87,917	124	$ 233,822	Year 1 and 2
Package 2	$ 2,863,152	36%	$ 85,671	109	$ 289,091 + PSE Gas Incentives	Phased @ $500K/yr +Energy Cost Savings and Utility Incentives
Package 3	$ 25,000 + End of life window replacement	37%	$ 91,723	107	$ 364,708 + PSE Gas Incentives	TBD

Building Renewal Case

Adding recommissioning (estimated at $80K) and the new chilled water pumps ($160K) ***unlocks an additional $165,139 Seattle City Light Utility Incentive and $40,000 in PSE incentives****. On an incremental cost of $240,000 (RE-Cx + VFD chilled water pumps), the University adds $205,177 in utility incentives.*

Including incentives, the payback for this additional improvements is 28 days. ***Excluding incentives, the simple payback for the incremental additions proposed in Package 1 is 3.1 years***

Next Steps, Refinement, and Scalability

- UW IDL will document implementation of Building Renewal progress though December 2019
- Our aim is to better understand opportunities and barriers for implementation of deeper savings and building renewal concepts
- Reporting to US DOE / Publications
- Ongoing technical assistance on 4225 Roosevelt
- OSE and IDL developing Pilot Retrofit Accelerator in 2020

SCL

Ted Brown, Seattle City Light

City Light Goals for TUA

- Improve reach into the medium business segment
- Acquire kWh savings
- Support City of Seattle Climate Action Plan
- Vehicle to test “Virtual Energy Assessments”

Seattle City Light

Program Development

- Streamlined Approach to incentives needed
  - Support milestone requirements in USDOE grant timeline
  - Enroll 100 buildings in 90 days
- Required simple process for:
  - OSE & City Light staff
  - Service providers
  - Building Owners
- Developed an incentive based on size of building

Seattle City Light

Program Development

- Leveraged Energy Benchmark data
- Utilized PNNL Building Re-Tuning research
- Required simple reporting on scheduling changes
- Impact evaluation to be conducted as program concludes to finalize kWh savings achieved

Seattle City Light

TUA kWh Savings Potential

"Typical" eligible building had higher than average electric consumption

TUA Building Base line statistics	
Buildings 50 - 100K SqFt*	395
Total SqFt (NoParking, Res)	27,818,075
Total Reported kWh (2015)	417,773,683
Avg. SqFt	70,426
Average Annual kWh	1,076,344
Avg. kWh SqFt, Yr.	15.0
Avg. CBECS Bldg. kWh/ sqFt	13.2
kWh / SqFt above Avg.	1.8
% Elec. Consumption above Avg.	13.8%
Average Energy Star Score	63.4

Seattle City Light

Incentive / Savings Estimate

- $ per Ft^2 incentive determined by:
  - Average electric use of “TUA eligible buildings”
  - Range of expected kWh savings * $/ kWh incentive rate

Tune - Up Accelerator Example Building Incentive Opportunity

Avg. SqFt	70,426									
Base Line Annual kWh	1,076,344							**Yrs. Simple Payback**		
Annual kWh Savings. Avg. Bldg	% kWh Saved	$/ SqFt Incentive	Kwh Saved	Elec. Cost Red.	Measure Cost	Total TUPA Incentive	Actual $/ kWh Incentive	No Incentive	W/ Incentive	Calculated SCL Incentive
3 Year Measure Life- TUPA	7%	$0.12	75,344	$5,199	$16,198	$8,451	$0.11	3.1	1.5	$6,781
3 Year Measure Life- TUPA	8%	$0.12	86,108	$5,941	$16,198	$8,451	$0.10	2.7	1.3	$7,750
3 Year Measure Life- TUPA	9%	$0.12	96,871	$6,684	$16,198	$8,451	$0.09	2.4	1.2	$8,718
O & M Incentive Funding Factor	$ 0.09			$2,113	**Incentive for completed audit /assessment**				$ 0.03	SqFt
Cost per kWh (2017 Med. Rate)	$ 0.069			$6,338	**Incentive for completed Tune-up**				$ 0.09	SqFt
Total Tune-Up Cost / SqFt.	$ 0.23			**$8,451**	**TUPA Only**				**$ 0.12**	**SqFt**

Seattle City Light

PNNL Re-Tuning Estimates

- Electric energy savings estimates based on Seattle building tune-up requirements
  - Specific to building type
  - Categorized by “Efficient, Typical, Inefficient”

Table A.2. Packages: Electricity Savings as a Percent of Total Electricity Consumption

	Large Hotel	Large Office, College University, Hospital (Administrative)	Medium Office, Outpatient Healthcare	Small Office	Primary School	Secondary School	StandAlone Retail, Retail Dealership	Stripmall Retail	Supermarket, other Food Sales
Savings (Inefficient)	15.6%	13.8%	34.2%	26.3%	16.5%	15.2%	17.4%	9.3%	5.3%
Savings (Typical)	13.4%	6.9%	18.1%	18.1%	12.6%	14.2%	14.8%	9.1%	5.3%
Savings (Efficient)	14.4%	4.3%	8.2%	7.3%	1.3%	2.5%	0.0%	0.0%	0.0%
Savings (Percent, Overall)	14.1%	7.6%	19.5%	17.0%	10.4%	11.2%	11.4%	6.6%	3.8%

Energy Savings and Peak Load Reduction Benefits from Building Controls Measures in Seattle, Washington

May, 2017 Pacific Northwest National Laboratory PNNL-ACT-10055

Seattle City Light

Simple Incentive Calculator

1 Building Benchmark Data

Seattle Building benchmark ID #	Building Type	King County Parcel ID #
40447	Mixed Use Property	7666203010
Seattle Benchmark Building Name:	SPU OPERATIONS CONTROL CENTER (OCC) COMPLEX	

Year Ending 2016 kWh Consumption	EUI Rank (2016 Benchmark data)	EPA (Benchmark) Reported Floor Area- SqFt	Gross Floor Area (less Parking)
1,140,190	Medium High	87,459	87,458

Populated from Building Benchmark data

4. Incentive Funding Estimate

$ 0.03	/ SqFt Tune-Up Assessment Phase	Avg. Electricity Cost/ kWh	
$ 0.09	/ SqFT Required Tune-Up Actions	$ 0.08	
Incentive of up to a total of $0.12/ Square Foot of eligible floor area, or 70% of tune-up costs, whichever is less			
70%	Incentive Cost Cap		
		% of Assessment Cost	30%
$ 2,623.77	Basic Tune-Up Assessment Incentive (Estimate)	% of Actions Cost	54%
$ 7,871.31	Basic Tune-Up "Action" Incentive (Estimate)	% of Total Tune-Up	45%
$ 10,495.08	**Total Estimated Incentive**	Incentive per SqFt	$ 0.12

This incentive estimate is not a promise of funding. Actual incentive funding will be detailed in a program participation agreement

5. Energy Savings Estimate

Building Type	Base Line EUI Classification	Year Ending 2016 kWh Consumption	kWh/SqFt
Mixed Use Property	Medium High	1,140,190	13.0

Prior 12 Month Electric Use (start - end dates)	Prior 12 month kWh Consumption	Estimated Energy Savings Reduction %	**Estimated annual kWh savings**	kWh/SqFt
01/01/2017 - 12/31/2017	1,224,036	6.9%	**84,459**	14.0

Populated from PNNL Re-Tuning estimates

Seattle City Light

Estimated TUA Bldg Economics

- Incentive estimated to cover ~50% of tune-up costs
- Milestone payments for assessment & implementation

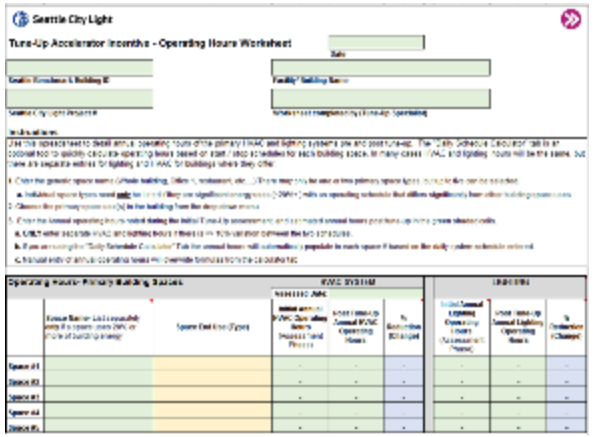
Accelerator Building Incentive Example	
Avg. Sized Accelerator eligible building (SqFt)	70,426
Base Line Average Annual kWh	1,076,344
Assessment Incentive ($0.03/SqFt)	$2,113
Completed Tune-Up Incentive ($0.09/Sqft)	$6,338
Total Incentive	**$8,451**
Estimated annual reduction (7%; 75,344 kWh)	$5,199/ Yr.
Estimated Tune-Up cost ($0.23/ SqFt)	$16,198
Estimated Simple Payback with incentive (Elec. Only)	**1.5 Yrs.**

Seattle City Light

Building Scheduling Changes

- Owners required to report changes to scheduled HVAC and lighting operating hours to receive City Light incentive
  - Weighted average by space type

Preliminary HVAC Scheduling Impacts	
Bldgs. reporting changed hours	63%
Avg. Reported Change in hours	-15%



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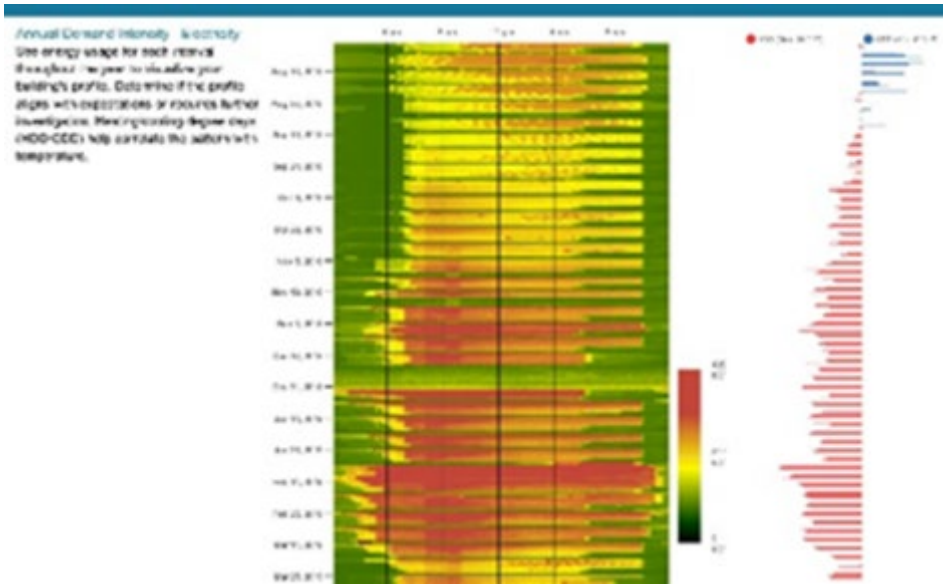
Virtual Energy Assessment

- Test how VEA's could support the Tune-Up process
  - FirstFuel (now Uplight) selected for pilot
  - Pilot currently in implementation



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What Have We Learned?

- Flexibility from concept to implementation essential
- Streamlined Process worked well
  - Combined TUA Program & utility incentive application appreciated by participants
  - Could also have incorporated operating hours in TUA Reporting workbook
- Incentive payments in two milestone not necessary
  - Significant effort went into two phase payment

Seattle City Light

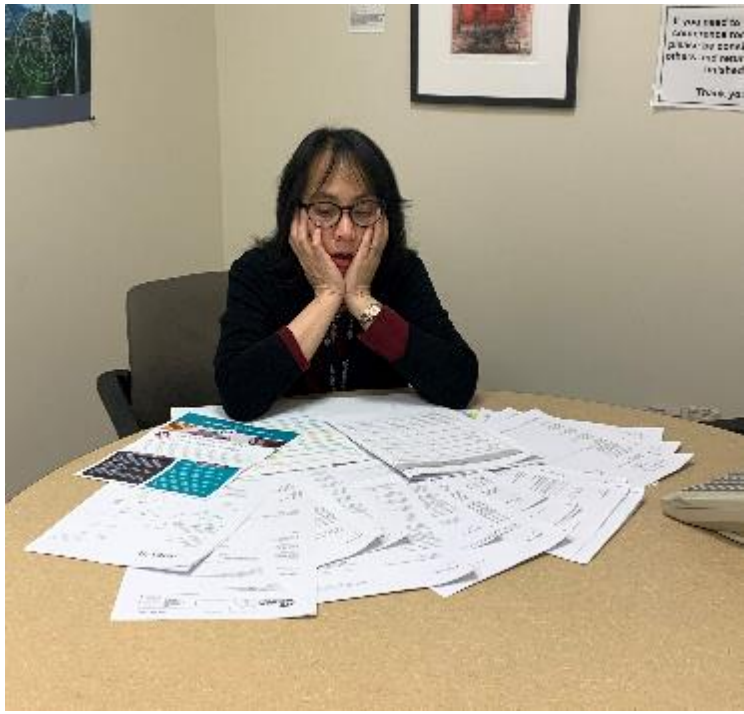
Next Steps

- Evaluate kWh savings
- Analyze changes to operating hours
  - Patterns by bldg. type?
- Tune-Up cost summaries
  - Preliminary cost of ~ $0.29/ Ft^2
- Conclude VEA Pilot

Seattle City Light

Next Steps

- Evaluate kWh savings
- Analyze changes to operating hours
  - Patterns by bldg. type?
- Tune-Up cost summaries
  - Preliminary cost of ~ $0.29/ Ft^2
- Conclude VEA Pilot



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Looking Ahead

What's next for this program…

- Wrapping up evaluation in 10 buildings this fall
- Final report to DOE
- Lessons learned to support Tune-Ups implementation in smaller buildings due 2020 and 2021
- Continue energy savings tracking of all buildings, using benchmarking data

Case studies

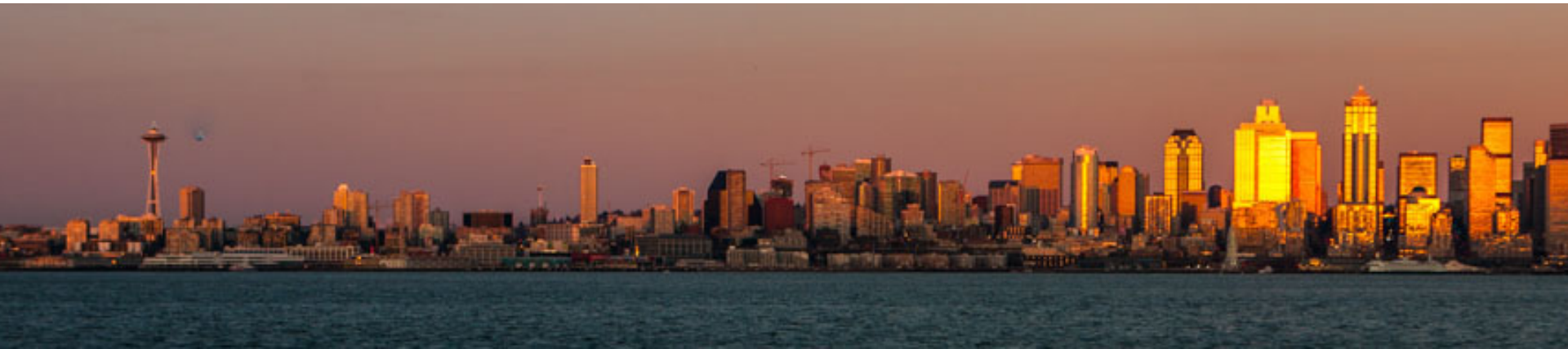
- Verity Credit Union – Building Renewal
- Hotel Five Tune-Up
- Concord Elementary School Tune-Up
- Office

“It was a win-win to participate in the Tune-Up Accelerator program’s Building Renewal path. It allowed us to create a great 5-year plan for energy improvements alongside our other capital improvements. Having more time for planning helps us optimize for long-range savings – which is best for the company, the building, and the community.”

- STEPHEN CHANDLER,
VERITY CREDIT UNION FACILITIES MANAGER

What's next for policies…

- WA State Building Performance standards in context of Seattle Building Tune-Ups and benchmarking
- Leveraging Accelerator lessons learned for future Seattle policies, such as Building Performance Standards
- Continue partnership with UW IDL to support deep retrofits with long-term goal of scoping a framework for a "Deep Retrofit Accelerator" at scale



Meeting Wrap-Up

- Any public comments?
- Any feedback on any of the following?
  - Agenda, pre-meeting packet materials, slides
  - Facilitation / Discussions ?
  - What worked? What was missing? What needs improvement?
  - Did you understand relevance to THIS committee?
  - Anything else?

Thank you!

TOGETHER We Are Transforming the Northwest