

**DATE:** April 18, 2018

**LOCATION:** NEEA – 421 SW 6<sup>th</sup> Ave, 6<sup>th</sup> Floor (Cedar Conference Room)

**TIME:** 10:00 am – 4:15 pm Pacific

**WEBINAR:** <http://neea.adobeconnect.com/cacapr2018/> (includes phone option)

**DIAL-IN:** 1-877-890-9502, Participant Code: 8267790855 (for those dialing in directly)

<b>AGENDA</b>			<b>Packet Page #</b>
10:00-10:30 am	Welcome, Introductions, Housekeeping, Packet Review  <i>Desired Outcome:</i> CAC alignment on preparation materials and meeting objectives.	Maria Alexandra Ramirez	1-3
10:30-11:30 am	High Performance HVAC Initiative Start (IS) Milestone Check-In <ul style="list-style-type: none"><li>Initiative Start (IS) Review of VHE DOAS Technology and Approach</li></ul> <i>Desired Outcome:</i> CAC understanding and support for RPAC Initiative Start vote at May 14 <sup>th</sup> RPAC meeting.	Maria Murphy	4-18
11:30-12:15 pm	CAC Member Share Out/Round Robin  <i>Desired Outcome:</i> Awareness of current activities and issues in the region.	All	--
12:15-1:00 pm	Lunch (provided)	All	--
1:00-1:45 pm	C+I Lighting Regional Strategic Marketing Plan (RSMP) <ul style="list-style-type: none"><li>Update on Recent Progress</li><li>Proposed Approach &amp; Focused Areas 2018</li><li>Discussion</li></ul> <i>Desired Outcome:</i> Inform and solicit feedback and support for the next plan.	Steering Committee Members	19
1:45-2:35 pm	CAC Panel Discussion: Pay-for-Performance  <i>Desired Outcome:</i> CAC member sharing & collaborative discussion on pay for performance program models.	Commercial Advisory Committee Members: SCL, ETO & PSE	20
2:35-2:50 pm	Break	All	--

2:50-4:00 pm	<p>Market Opportunities:</p> <p><i>Desired Outcome: CAC member sharing &amp; collaborative discussion to help inform planning activities within all organizations.</i></p>	Emily Moore Debbie Driscoll	21
4:00-4:15 pm	Opportunity for public comment and adjourn	Maria Alexandra Ramirez	--

# Memorandum – *Agenda Item (Tier 1)*



April 18, 2018

TO: Commercial Advisory Committee (CAC)  
FROM: Maria Alexandra Ramirez, Stakeholder Relations Manager  
SUBJECT: Meeting Packet, Informational Updates, Additional Details

---

## **MEETING PACKET APPROACH**

This packet continues the “tiered” approach:

- Tier-1 memos for active agenda items;
- Tier-2 memos for informational updates on items not currently requiring agenda time;
- Tier-3 materials provided as additional detail for those interested, accessible via links in the Tier-1 and Tier-2 memos.

This approach helps keep packets concise and digestible. Any input for improvement is appreciated.

## **INFORMATIONAL UPDATES**

Enclosed please find Tier-2 informational updates on the following:

- Pages 22-23: Commercial Portfolio Updates
- Page 24: Commercial Code Enhancement Update
- Page 25: CAC Conference Coordination
- Page 26: Summary of Emerging Technologies

## **ADDITIONAL DETAILS (Tier 3)**

Tier-3 materials related to the agenda items and informational updates listed above will be accessible through links in those memos. Additional Tier-3 details are available here:

- Q1 2018 [CAC Meeting Notes](#)
- Q2 2018 [Emerging Technology Newsletter](#)
- Q2 2018 [Market Research & Evaluation Newsletter](#)
- Q1 2018 [Marketing Newsletter](#)

# Memorandum – Agenda item (Tier 1)

April 18, 2018

TO: Commercial Advisory Committee (CAC)  
FROM: Maria Murphy, Sr. Program Manager- High Performance HVAC Program  
SUBJECT: High-Performance HVAC Initiative Start (IS) Milestone Document Context

.....

**Our Ask:**

Please review the attached Initiative Start (IS) milestone document and come prepared to discuss any questions, comments, concerns that you have in more detail.

**Overview:**

The Initiative Start milestone focuses on the first technology in the High-Performance HVAC Program, Very High Efficiency Dedicated Outside Air Systems (VHE DOAS). Please note that the discussion, and ultimate RPAC vote, is to proceed with research, assessment and development of an initiative around VHE DOAS only.

We appreciate the time that everyone has taken to meet with us individually or in small groups over the last month and have included your feedback as applicable in this document. Keep in mind that the milestone document is meant to provide a succinct overview of VHE DOAS concept, status and proposed direction. We had an opportunity to get thoughtful, in-depth feedback during our meetings, but not all of it will translate into this high-level communication.

We will, however, use the upcoming CAC meeting to not only address any feedback on the document, but also to allow time for discussion on the more in-depth topics we discussed with you each individually. A few of those key highlights include:

- Updates on NEEA pilot projects and prototype modeling work, including energy savings and peak demand reduction
- Why take an integrated system approach?
- Competing products to the VHE DOAS system
- Questions/concerns regarding market opportunity

We look forward to the continued conversation to help inform the High-Performance HVAC Program development.

**PROGRAM LIFECYCLE STATUS**



# Initiative Lifecycle (ILC) Milestone Document

## Business Case



**Purpose:** The ILC Milestone Document is a tool that supports milestone decisions. The document summarizes and serves as the definitive source of key information about our Market Transformation effort. This document also serves as the Initiative Business Case for our funders.

**Audience:** Directors, Program Team, Portfolio Management Team, Advisory Committee Members

PROGRAM NAME: High Performance HVAC

DATE: **May 14, 2018- RPAC Vote**

SECTOR: **Commercial**

PROGRAM MGR: **Maria Murphy**

MILESTONE FOR WHICH TEAM IS SEEKING APPROVAL: **Initiative Start**

TYPE OF PROGRAM:

Initiative  Infrastructure

PROGRAM VISION of a Transformed Market

The High-Performance HVAC program aims to transform the HVAC market in the Northwest by accelerating the adoption of high efficiency HVAC systems and components, resulting in substantial energy and non-energy benefits throughout the region. At the onset, the High-Performance HVAC program will focus on the design and installation of Very High Efficiency Dedicated Outside Air Systems (VHE DOAS) in the commercial sector. VHE DOAS is a high efficiency specification based on the DOAS concept that separates the heating and cooling system from the ventilation system. Through NEEA’s work in driving 1) product availability and quality; 2) increased supply chain expertise in design, specification, and installation; and 3) data to support market progress tracking and savings validation, NEEA’s funders will derive energy savings and improved customer satisfaction due to increased comfort and better air quality from an industry that has long avoided change. The program is envisioned as a way for the region to first capture energy savings from the market adoption of VHE DOAS as it becomes common practice in both existing small and medium commercial buildings and new construction applications, while at the same time laying the foundation and relationships for future HVAC technologies identified by NEEA’s Scanning work to build upon the VHE DOAS work, with approval from NEEA funders.

PROGRAM TIMELINE:



# Executive Summary

---

## Introduction: High Performance HVAC

The High-Performance HVAC program will provide a comprehensive approach to HVAC systems that allows for related technologies with similar applications, leverageable distribution channels and market interventions to be grouped together under one program. This will enable additional variations (i.e. evolution) of products, or future technologies to be added to the program portfolio. Furthermore, it will allow for an increase in efficiencies in program design, management, and execution compared to separate stand-alone programs. The first technology to be included under the High-Performance HVAC program is Very High Efficiency Dedicated Outside Air Systems (VHE DOAS), and it will be the focus of this document.

## Context: Commercial HVAC Landscape

Commercial HVAC equipment is complex and nuanced. Even so-called ‘simple systems’, like roof top units (RTUs), furnaces and boilers include myriad configurations to meet the needs of each specific building and occupancy type. More complex systems, such as central plants, involve additional equipment, controls and expertise. And 90% of commercial HVAC systems in the region include both gas and electric components. Every building is unique. Beyond the equipment is the market itself, which is predominantly relationship-based and is monopolized by a few dominant players who hold the majority of the market share.

There are significant barriers to change in commercial HVAC, and it will not happen quickly; but NEEA has demonstrated success with disruptive technologies and approaches in the residential HVAC space with ductless heat pumps and heat pump water heaters. We believe that similar intervention strategies could be leveraged to influence the commercial market to accelerate adoption of VHE DOAS.

## VHE DOAS Summary

In response to scanning emerging technologies in the commercial building sector, NEEA identified Dedicated Outside Air Systems (DOAS) as an HVAC systems practice for significant new energy savings potential in our region. Building upon the DOAS concept of separating heating and cooling from ventilation, NEEA identified an innovative enabling technology that helps DOAS configurations achieve substantially higher energy savings above conventional DOAS systems. The key is coupling a high efficiency heating and cooling system with a very high efficiency heat recovery ventilator (HRV). The HRV preconditions incoming supply air with outgoing exhaust air, enabling a temperature differential so small between the two that it generally obviates the need for the heating and cooling system to condition the air coming into the space, except in extreme climates. It also allows for ‘right sizing’ (or down-sizing) of the heating and cooling system.

Because the efficiency of the ventilation function is critical to the success of this system, both to enhance energy savings and to lower project costs, NEEA assisted Ventacity Systems in bringing a very high efficiency HRV product line to the North American market. While high efficiency HRVs and VHE DOAS systems are commonplace in Europe and some parts of Asia, this technology has never been available here as manufacturers have never seen a market for it. This HRV, coupled with a high efficiency heating and cooling system, provides a great opportunity for the Northwest to achieve substantial energy savings and non-energy benefits.

## MT Goal

VHE DOAS systems are common practice for energy efficiency and indoor air quality performance in existing and new small and medium commercial buildings in the Northwest.

## MT Theory

The program will leverage opportunities resulting from an aging equipment stock, a growing demand for improved indoor air quality (IAQ), reduced carbon emissions and enhanced performance, to present the VHE DOAS solution to the market. By overcoming key barriers (see Section 4) through demonstration of best practices, education, and dissemination of effective design tools, coupled with early stage incentives, overall awareness and interest will increase. Furthermore, promotion of successful projects combined with a compelling business case and competitive pressures will help bring in additional suppliers (manufacturers, distributors, and installers) to accelerate adoption.

## What We Know:

- Heating and cooling systems, including fans, are typically oversized. VHE DOAS systems significantly reduce the size and associated energy consumption of both of these in comparison to conventional RTUs.
- While there is currently one manufacturer selling an HRV that meets the VHE DOAS specification in North America, three others have demonstrated capabilities to meet the VHE DOAS specification.
- Currently, virtually no gas-heated HVAC systems meet the heating/cooling system requirements in the VHE DOAS specification<sup>1</sup>, though the NEEA gas team is exploring gas-driven Variable Refrigerant Flow (VRF) systems as an emerging technology and believes that substantial gas savings could be achieved once this equipment becomes available for small to medium-sized customers.
- Based on preliminary analysis, NEEA pilot projects achieved an average of **41% whole building savings** and **63% HVAC savings** over a code minimum heat pump RTU. For electrically heated modeled prototypes using the same base case, **whole building savings averaged 22%** with **HVAC savings averaging 53%**. Savings over existing conditions were significantly higher.
- There is significant potential for peak demand reduction based on based on real-world pilots and prototype model results<sup>2</sup>
- There are approximately twelve (12) systems installed in the region that meet VHE DOAS specifications (eight of these have been NEEA pilots) and approximately twenty (20) in North America
- Some utilities offer custom incentives for VHE DOAS, though the approach varies significantly by utility

## What We Don't Know:

- VHE DOAS cost and performance data for different occupancy types and geographic areas beyond the 8 pilot projects currently being completed

<sup>1</sup> The only gas system configuration available for small to medium sized buildings that would currently meet the VHE DOAS specification is a condensing gas boiler with a hydronic radiant ceiling system, a separate chiller and high efficiency HRV, a rarely executed installation in small to medium sized buildings.

<sup>2</sup> Peak demand reduction varies greatly depending on building type, location, season and base case. For example, NEEA has found that for an electrically heated office in Seattle, compared to the existing system the peak reduction ranges from a low of 39% in summer to a high of 55% in winter. In prototype models with a code minimum heat pump RTU the summer peak reduction ranges from 1 W/sf to 2W/sf (20%-40%) in small offices, 0 W/sf to 1 W/sf (0%-20%) in strip retail and hovers around 1 W/sf (25%) in primary schools. Winter peak reduction was as high as 6 W/sf in a school in Helena to a low of 1 w/sf in strip retail in all locations.

- When a gas-heated (or driven) HVAC system will be available for small to medium buildings that will meet the VHE DOAS specification, and how NEEA would address the gas and electric technologies from a program management standpoint
- Which market interventions will be most effective to accelerate market adoption
- The decision-making process and criteria among market actors from manufacturers to end-use customers

Initiative Start Request:

NEEA is requesting approval to begin research, design and development of a program around the VHE DOAS specification explained above<sup>3</sup>. The next phase, Market and Product Assessment is expected to require approximately 12 months and \$650,000 to complete. A work group will be formed to engage funders in core program-development activities, including:

- Further validate savings estimates, costs, and other key assumptions through additional data collection and analysis
- Encourage additional high efficiency HRV manufacturers to enter North American market
- Raise awareness and educate key market actors, particularly within the supply chain
- Explore adaptation and/or development of software tools to better address design and increase sales
- Research and characterize market structure to assess barriers and opportunities and inform design

## 1. Progress, Findings, and Adjustments

---

### 1.1 Summary of Progress

- Completed system installation in eight (8) pilot projects, four (4) of which include analysis using twelve (12) months of performance data and four (4) are still collecting data through June 2018 or later.
- Generated energy model estimates on electric-to-electric conversions for three (3) prototypes (small office, strip retail, primary school) in three (3) climates.
- NEEA funder engagement and coordination including:
  - Pre-IS presentation to Commercial Advisory Committee (CAC) on Oct 18<sup>th</sup> 2017 to revisit concept, build interest and support, inform initiative development, and set expectations
  - 1x1 meetings with majority of direct and some indirect funders to reaffirm understanding/acceptance of VHE DOAS concept, discuss potential challenges and opportunities and gather feedback
  - Collaboration with Energy Trust of Oregon on new construction approach, modeling software and calculation tools
- Internal NEEA coordination to leverage existing programs including:
  - Commercial Real Estate (CRE) and Strategic Energy Management (SEM) relationships with end - users
  - Ductless Heat Pump (DHP) relationships with manufacturers/distributors
  - Condensing Rooftop Unit (C-RTU) relationships with manufacturers/distributors/end-users
  - Preparing/Planning for activities that VHE DOAS will complete which will inform NEEA's Commercial Code Enhancement (CCE) initiative to influence future codes.

<sup>3</sup> Please note that any additional technologies or expansion to the High-Performance HVAC program would be subject to RPAC approval.



## 1.2 Key Issues, Lessons Learned and Adjustments

	Key Issues and Lessons Learned	Adjustments
1	Vast majority of packaged RTUs in region are gas-fired	Taken into account when estimating savings, market potential and will be in future program marketing design. Continued assumption that customer preference will dictate system and fuel selection decisions
2	Due to wide applicability of product, target market(s) must be prioritized	Defined initial target building types (small and medium-sized schools, office, retail) with most potential based on large quantity of square footage, simple HVAC systems, high ventilation air requirements, etc.
3	New construction market may offer leverageable market actor relationships that can then influence installations in existing buildings. New construction also provides an attractive opportunity due to lower costs, larger design teams and fuel choice flexibility	Leverage existing research and potentially perform additional research activities to verify assumptions and work with funders to explore pilot projects in new construction applications
4	NEEA's funders will likely take a variety of approaches to VHE DOAS project support, including energy savings and incentive calculation as well as promotion	Continue gathering feedback from funders on their respective approach, data collection, marketing and other support needs to integrate into program design.
5	Growing resistance to some qualifying heating and cooling systems due to concerns around refrigerant leakage for some qualifying heating and cooling systems	Continued monitoring of market and policy surrounding refrigerants to inform program design and activities and identifying other qualifying systems.
6	Current modeling and design tools are inadequate in addressing systems with separated ventilation and heating and cooling systems	Explore upgrading and/or development of better project design and analysis tools as part of program strategy
7	Some NEEA funders have requested analysis on gas HVAC systems as well as electric systems	NEEA Program Manager will coordinate with NEEA's gas team on planned research and determine scope and timing of meeting the requested analysis needs
8	NEEA's funders are interested in peak demand reduction	Perform additional analysis to better quantify reduction and illustrate value

## 1.3 Plans

	Upcoming Activities (and Purpose)	Estimated Timeline
1	Develop <b>market characterization and baseline</b> to define market and inform program strategy and development	Q2 2018- Q4 2018
2	Identify and update and/or develop <b>tool(s) to facilitate design and sales</b> of VHE DOAS	Q2 2018- Q1 2019
3	Develop <b>market partner value proposition</b> to encourage additional high efficiency HRV manufacturers to develop and/or bring qualifying product to North American market	Q2 2018- ongoing
4	Work with funders to <b>better understand data &amp; support needs</b> for potential utility incentives	Q2 2018- Q2 2019
5	Finalize <b>data collection and analysis</b> on existing pilot projects to validate savings assumptions	Q4 2018
6	Partner with funders and/or market actors to 1) <b>identify and engage additional pilots</b> in key occupancy types to gather more data on potential target buildings and climates and 2) <b>refine cost and savings assumptions</b> around systems at varying levels of efficiency <sup>4</sup>	Q3 2018- Q4 2019
7	Create <b>technical design guides and case studies</b> based on pilot project learnings	Q3 2018- Q4 2018
8	Develop curriculum for and implement <b>targeted training to key market actors</b> on overall benefits, specification, design, and sales based on market characterization findings	Q4 2018- Q2 2019
9	Develop and implement <b>Market Channel Development Plan</b> to better understand and foster key relationships, garner support for program activities and ultimately inform market strategy test plan for next phase	Q4 2018- Q2 2019

<sup>4</sup> During NEEA's funder meetings held in March and early April, many requested additional detail around comparisons of VHE DOAS to standard and less-efficient system options, such as coupling high efficiency heating and cooling system with a standard efficiency HRV, or visa-versa. NEEA will further validate and refine our current assumptions around costs and savings.

## 2. Investment Rationale

<p><b>Market Situation/ Opportunity</b> <i>(Why Now?)</i></p>	<ul style="list-style-type: none"> <li>• Close to half of the small and medium sized buildings in the Northwest, which comprise close to 50% of the square footage in the region, are heated, cooled, and ventilated with packaged rooftop units (RTUs). Many of which are more than 10-15 years old and should be replaced in the next 5-10 years</li> <li>• One of the largest energy-saving opportunities available comes from separating the ventilation system from the heating and cooling system for a building; the concept is referred to generally as Dedicated Outside Air Systems (DOAS). However, maximum savings are derived from coupling a high efficiency heating and cooling system with a very high efficiency HRV. The latter of these, and the key to the equation, only became available in North America within the last 3 years</li> <li>• DOAS are gaining traction in the market due to the growth of heat pumps, specifically VRFs, and the resulting need for ventilation delivery. Many major players in the commercial HVAC market debuted their new DOAS systems at the 2018 American Heating and Refrigeration Institute (AHRI) trade show in January of 2018</li> <li>• On July 1, 2017, DOAS systems became a requirement for specific building types in the Washington state code. While VHE DOAS requires much higher system efficiency than what is currently in code, now is a key time to influence how the HVAC industry evolves</li> <li>• There is currently one high efficiency HRV manufacturer in North America, Ventacity Systems. Ventacity has partnered with Fujitsu, a VRF manufacturer, to promote and sell a combined system that could meet NEEA's VHE DOAS specification, if designed properly. While the High-Performance HVAC program has yet to be fully designed and launched, NEEA has an opportunity to influence this partnership and the overall HVAC market by providing strategic support to their efforts</li> </ul>
<p><b>Linkage to Market Strategy?</b> <i>(Why NEEA)</i></p>	<ul style="list-style-type: none"> <li>• Ability to leverage existing relationships with the supply chain, end-users, and utilities to demonstrate the business case for, and accelerate the adoption of, VHE DOAS</li> <li>• Proven success in bringing the initial high efficiency HRV manufacturer to North America, making the VHE DOAS system viable. NEEA will continue efforts to bring additional qualifying HRVs into the market</li> <li>• Expertise on VHE DOAS makes NEEA the best resource for 1) specifying and adapting/developing tools to assist the supply chain in design and sales of this system and 2) our funder partners as they develop incentives around the technology</li> <li>• Ability to leverage institutional knowledge and relationships from other internal programs:             <ul style="list-style-type: none"> <li>○ Commercial Real Estate (CRE) and Strategic Energy Management (SEM), which both uniquely position us to engage key end-user decision-makers</li> <li>○ Ductless Heat Pumps (DHP) and gas Condensing Rooftop (C-RTU) programs for supply chain relationships</li> <li>○ Commercial Codes Enhancement (CCE) to influence DOAS requirements in future code cycles</li> </ul> </li> <li>• Influence on changes to state and national energy codes, which are being impacted by more aggressive national, state, and city policies around building energy performance and savings</li> </ul>

### Proposed Investment for Next Phase (Q2 2018-Q2 2019)

Activities	Cost Center	Amount (Direct Costs)	
Data collection and assessment	C&I	\$120,000	
Technical support and training	C&I	\$240,000	
Market characterization, research, and baseline	C&I/MRE	\$100,000	
Market channel development	C&I	\$35,000	
Marketing	C&I	\$85,000	
Upstream manufacturer incentives	C&I	\$40,000	
Program Management	C&I	\$30,000	
<b>Total</b>		<b>\$650,000</b>	
Job Title of Required NEEA Personnel	Avg. Hours per Week	Total Hours (Q2 2018 – Q2 2019)	Total FTE
Program Manager	30	1560	.75
Program Coordinator	7	364	.2
Product Manager	15	780	.4
Market Research & Evaluation	8	416	.2
Planning	3	156	.08
Stakeholder Engagement	2	104	.05
Marketing	6	312	.15

Codes and Standards	1	52	.03		
<b>Total Estimated Hours and FTE</b>		<b>3,744</b>	<b>1.86</b>		
<b>Total Proposed Program Investment – Direct Costs Only</b> <i>(to achieve Market Transformation)</i>					
<b>Phase (Estimate time frame per phase: ~ 1 year)</b>		<b>Proposed Total Investment per Phase</b>			
Scanning & Concept Identification (Completed phase)		\$660,000			
Concept Opportunity Assessment (Current phase)		\$225,000			
Market & Product Assessment (Next phase)		\$650,000			
Strategy Testing & Finalization		TBD- Est. \$1,000,000			
Market Development (multi-year)		TBD- Est. \$2,500,000			
Long-Term Monitoring		TBD			
<b>Total</b>		<b>\$5,035,000</b>			
<b>Return on Investment (ROI)/Outcomes</b>					
<b>Market Change Goals</b> <i>(short-term goals, within 1-3 years)</i>					
<b>Market Change Goal #1</b>	Support existing and foster new manufacturers with qualifying HRV product lines				
<b>Market Change Goal #2</b>	Increase specifier and contractor awareness and capability				
<b>Market Change Goal #3</b>	Motivate early adopter end-users and contractors through demonstration of value proposition				
<b>Energy Efficiency/Savings</b>					
<b>Savings Forecast</b>	<b>2018 - 2019</b>	<b>2020 - 2024</b>	<b>2025 - 2029</b>	<b>2030 - 2034</b>	<b>20 - Year Total 2018-2037</b>
Total Regional Savings – Estimated Range <i>(see Sensitivity Analysis Appendix for more detail on high and low scenarios)</i>	0-0.2 aMW	0.3-3 aMW	2-20 aMW	7-59 aMW	15-130 aMW <sup>5</sup>
Co-Created Savings	Not applicable at this phase of the initiative lifecycle. Baseline to be developed and reviewed after initiative start.				
Net Market Effects					
Current Power Plan Baseline Regional Savings	Unknown at this stage, it is likely that the vast majority of these savings will be above both the 7 <sup>th</sup> and 8 <sup>th</sup> power plan baselines.				
<b>Cost Effectiveness: Total Resource Cost Perspective</b>	<b>Value</b>	<b>Additional Information</b> <i>(please include source of information)</i>			
<b>Levelized Cost (w/o ACT Credit)</b>	TBD	This program is in an early stage of product/program development. Final cost data and calculations will be available prior to full scale market entry			
<b>Benefit Cost Ratio</b>					

## 3. Product and Market Definition

### 3.1 Product or Service Definition

*The product and practice is Very High Efficiency Dedicated Outside Air Systems (VHE DOAS) that use a very high efficiency heat recovery ventilator coupled with a ‘right-sized’ (or down-sized) high efficiency heating and cooling system to deliver heating and cooling separately from ventilation air so that the control and energy impacts of each can be managed optimally to significantly reduce whole building energy consumption.*

In existing applications, the VHE DOAS “product” replaces conventional HVAC equipment (predominantly RTUs), through a system conversion. In new construction applications, it is included in the planning and design process. Reductions in fan energy for heating and cooling delivery and reduced conditioning of ventilation air could result in

<sup>5</sup> NEEA has more to discover to fine tune this forecast and we will be focusing on defining the savings rate per square foot for various building types, the size of the market, the maximum market adoption, and the expected trajectory of that adoption.

energy savings from simply separating these two functions; however, substantial savings are achieved by coupling high efficiency heating and cooling equipment with very high efficiency heat recovery ventilation. The reduced volume of air running through the heating and cooling equipment requires less energy to meet the reduced load of the ventilation air delivered at approximately room temperature, resulting in less run time of the heating/cooling system and allowing for right-sizing. Efficient fans further reduce total energy consumption. There are also significant potential peak demand reductions, for both heating and cooling, depending on the existing system type and climate.

The system replacement in existing small and medium commercial buildings could result in substantial energy savings over existing conditions. It is important to note that energy savings from a VHE DOAS conversion depend substantially on right-sizing the heating and cooling system once the ventilation has been provided separately.

## 4. Market Transformation Theory

<b>Market Drivers and Barriers</b>	<u>DEMAND Drivers</u>	
	<ol style="list-style-type: none"> <li>1. Large, aging stock of existing packaged HVAC systems that will need replacement in the next 5-10 years</li> <li>2. Concept applicability in both existing buildings and new construction</li> <li>3. Reduced energy costs and potential for ROI comparable to standard HVAC options</li> <li>4. Non-energy benefits such as significantly improved indoor air quality, reduced tenant absenteeism and greater occupant comfort</li> <li>5. Reducing maintenance costs and requirements</li> <li>6. Potential for automated performance reporting and data collection</li> <li>7. Simplified controls</li> <li>8. Much higher system reliability</li> <li>9. Utility DR interests and capability</li> </ol>	
	<u>SUPPLY Drivers</u>	
	<ol style="list-style-type: none"> <li>1. More new equipment to sell (Very high efficiency HRVs, heat pumps, hydronic systems)</li> <li>2. Reliability from simple but sophisticated controls</li> <li>3. Opportunities to partner to provide packages (HRV with heating/cooling)</li> <li>4. Competition among multiple HVAC system manufacturers</li> <li>5. Potential utility and other incentive offerings</li> </ol>	
<b>Barriers</b> <i>(supply, demand, and utility sides)</i>	<b>Intervention Strategies</b>	<b>Desired Outcome</b>
<ul style="list-style-type: none"> <li>• Limited product availability: There is currently only one high efficiency HRV manufacturer in North America</li> </ul>	<ul style="list-style-type: none"> <li>• Continue efforts to bring other qualifying HRVs into North American market through demonstration of growing market demand, stimulating competition, marketing support, and financial incentives if needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of qualified systems expands to at least two and eventually numerous manufacturers in a more mature market.</li> </ul>
<ul style="list-style-type: none"> <li>• Entrenched status quo/Business as usual: The HVAC industry has changed little in the last 100+ years, and operates using a ‘bigger is better’ rule of thumb to meet occupant needs</li> </ul>	<ul style="list-style-type: none"> <li>• Support innovators who embrace the technology and demonstrate successful installations</li> <li>• Work with funders and other market partners to support and promote VHE DOAS- increasing awareness, providing training to the supply chain on design and installation practices and educating owners so they request qualifying systems</li> <li>• Leverage city benchmarking and disclosure efforts</li> <li>• Work with NEEA’s Commercial Code Enhancement program (CCE) and Codes and Standards team to ensure that this effort develops the market for upcoming code cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Heating and cooling equipment is commonly right-sized with dedicated ducting for each function (Heating/cooling and ventilation).</li> </ul>

<ul style="list-style-type: none"> <li>High costs: <ul style="list-style-type: none"> <li>Early stage higher install cost of proposed system due to lack of familiarity.</li> <li>Premium HVAC system will likely have higher first cost than standard RTU due to better components &amp; functionality, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Obtain and publish actual installed cost data.</li> <li>Educate installers and owners, addressing perceptions of risk for former and promoting non-energy benefits (NEBs) and savings to latter</li> <li>Partner with and support early innovators.</li> <li>Provide value proposition to encourage looking beyond first cost</li> </ul>	<ul style="list-style-type: none"> <li>Education reduces perceived risks for installers and owners know what reasonable costs should be.</li> <li>Better experience and competition bring costs down.</li> <li>Owners take into account non-energy benefits and minimal incremental cost (as system becomes more common)</li> </ul>
<ul style="list-style-type: none"> <li>Lack of experience: HVAC design and contracting market actors are unaware of or inexperienced in designing and specifying DOAS-based systems, and lack effective tools with which to do so.</li> </ul>	<ul style="list-style-type: none"> <li>Develop an effective project assessment software package and train HVAC contractors in its use. Train architects and mechanical engineers in the most effective system combinations that result in VHE DOAS installations that maximize savings at minimum cost.</li> </ul>	<ul style="list-style-type: none"> <li>All design and specification market actors understand how to implement concept optimally and have the tools with which to do so. VHE DOAS becomes design norm for both existing and new small commercial buildings.</li> </ul>
<ul style="list-style-type: none"> <li>Lack of market awareness: Key stakeholders are unaware of the existence and benefits of DOAS-based HVAC systems, let alone VHE DOAS. Confusion around definition and system applications.</li> </ul>	<ul style="list-style-type: none"> <li>Outreach and education to owners, designers, engineers, and installers in the small commercial buildings sector. Development of the business case for VHE DOAS. Increase awareness of utility incentives to offset incremental costs.</li> </ul>	<ul style="list-style-type: none"> <li>VHE DOAS systems are a seriously considered option at the time when older HVAC systems are being replaced or major building remodels are occurring. VHE DOAS is the norm for new construction in this sector.</li> </ul>

#### 4.1 Competing Products or Services (SWOT Analysis)

	Strengths	Weaknesses	Opportunities	Threats
<b>The Product:</b> <b>VHE DOAS</b> (DHP/HP/VRF + VHE HRV)	<ul style="list-style-type: none"> <li>Very large energy and demand savings</li> <li>Simpler maintenance &amp; lower maintenance costs</li> <li>Higher reliability</li> <li>Marked improvement in indoor air quality</li> <li>Utilizes existing technologies, flexible approaches</li> <li>May be used for heating/cooling DR</li> </ul>	<ul style="list-style-type: none"> <li>Limited product availability</li> <li>Lack of contractor awareness of concept and principles of proper execution</li> <li>lack of industry experience with HRVs</li> <li>initially higher first cost</li> <li>requires system redesign w/ new controls</li> <li>lack of accurate project assessment tools could diminish savings</li> </ul>	<ul style="list-style-type: none"> <li>Very large target market in both existing and new construction segments</li> <li>Potential expansion of concept for leveraging other technologies (e.g. CO<sub>2</sub> heat pumps)</li> <li>Applications to additional market segments</li> <li>Impetus for future code requirements</li> <li>Growing interest in indoor air quality and comfort</li> </ul>	<ul style="list-style-type: none"> <li>Partial implementation (w/ less efficient systems or oversizing of heating/cooling systems)</li> <li>Competing packaged system price reductions</li> <li>Poor contractor or engineering execution of the concept</li> <li>Threatens HVAC industry bread-and-butter product lines</li> </ul>
<b>Competing Alternative #1</b> Split System or Packaged Rooftop Unit one-for-one replacement w/o HRV (status quo)	<ul style="list-style-type: none"> <li>Easiest and least expensive first cost option for replacing an existing split system or RTU</li> </ul>	<ul style="list-style-type: none"> <li>Minimal improvement in energy efficiency</li> <li>Little reduction in demand or load</li> <li>Minimal or temporary improvement in ventilation</li> <li>No ventilation zoning</li> </ul>	<ul style="list-style-type: none"> <li>Fastest, easiest choice</li> <li>Minimal changes to controls or tenant-system interaction</li> </ul>	<ul style="list-style-type: none"> <li>Energy codes may soon outlaw the combining of space conditioning and ventilation air flows</li> </ul>
<b>Competing Alternative #2</b> Implementation w/less efficient electric system choices, i.e. VAV or electric boiler with air handlers	<ul style="list-style-type: none"> <li>Lower first cost component systems than with preferred option, more conventional installation practice</li> </ul>	<ul style="list-style-type: none"> <li>Significantly lower energy and demand savings</li> <li>Added equipment, installation, and operating cost for conditioning ventilation air</li> </ul>	<ul style="list-style-type: none"> <li>May be easier to sell to reluctant or unknowledgeable building owners</li> <li>Would advantage a different set of manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>Poorer performance relative to full implementation of the proposed Product</li> </ul>
<b>Competing Alternative #3</b>	<ul style="list-style-type: none"> <li>Lower first cost components</li> <li>Contractor familiarity</li> <li>Numerous products available</li> </ul>	<ul style="list-style-type: none"> <li>Lower energy and demand savings</li> </ul>	<ul style="list-style-type: none"> <li>Meets 2016 WA Energy Code requirements</li> </ul>	<ul style="list-style-type: none"> <li>Less efficient systems and/or oversizing of heating/cooling systems</li> </ul>

Using lower efficiency H/C equipment and lower efficiency HRV (e.g. WA Code requirement)		<ul style="list-style-type: none"> <li>requires supplemental heat or cool for ventilation air. Larger H/C system size required</li> </ul>		
--	--	---	--	--

## 4.2 Market Definition

Target Market		
<b>Who are the End Users?</b>	<ul style="list-style-type: none"> <li>Tenants and owners of existing and new small commercial buildings that use split or packaged HVAC systems that combine heating, cooling and ventilation air streams.</li> </ul>	
<b>Who Influences the Decision?</b>	<ul style="list-style-type: none"> <li>HVAC contractors</li> <li>Property managers</li> <li>Building owners</li> <li>Architects/Engineers, consultants</li> <li>HVAC distributors</li> <li>HVAC manufacturers</li> <li>Professional and Trade organizations</li> </ul>	
Market Size		Data Source
<b>Minimum Potential Market Size</b>	272,704,133 Square Feet <sup>6</sup>	CBSA
<b>Maximum Potential Market Size</b>	1,400,000,000 Square Feet <sup>7</sup>	CBSA

## 5. NEEA and Stakeholder Roles

NEEA'S ROLE:		
<p>In the upcoming phase, NEEA will work predominantly up- and mid-stream to ready the market for product adoption, collaborating with manufacturers to accelerate product development and/or launch in the Northwest and increasing awareness and capability of specifiers and installers. NEEA will support manufacturer and distributor marketing efforts where promotion meet VHE DOAS specification. We'll also continue research and data collection efforts to broaden the data set on building types, climates, costs and energy savings through pilots, modeling, etc. and will work with funders to assist in any data collection and other support needs they may have as they explore incentives around VHE DOAS.</p>		
MARKET CONTRIBUTORS	WHAT ARE THEY CURRENTLY DOING TO PARTICIPATE IN THE EFFORT?	HOW ARE WE ENGAGING WITH THEM CURRENTLY?
Manufacturers with qualifying HRV systems	<ul style="list-style-type: none"> <li>Sole manufacturer in North America producing and promoting qualifying HRVs. Doing so in concert with qualifying heating and cooling systems to meet VHE DOAS specification and educating distributors and end-users about HE HRV</li> <li>Additional manufacturer with qualifying HRV not yet distributing in North America, but planning to bring product here in 4-5 years. NEEA is working to shorten that timeframe.</li> </ul>	<ul style="list-style-type: none"> <li>Regular meetings, aiding of education and awareness campaign(s), collaborating on software design and sales tool, utilizing their expertise to provide technical support for pilot projects, providing small incentives to buy down cost of HRV equipment in pilot projects</li> <li>Meeting at recent trade show and exploratory next steps call to encourage bringing their product to North America sooner</li> </ul>

<sup>6</sup> This represents 10% of all existing commercial building square footage in the region. The minimum potential market size estimate includes only buildings with characteristics that can most naturally accommodate our product system. Those characteristics include: electric-only heating present in the building; buildings under four stories; floor space of 50K or less; and only three building types - office, retail, and schools.

<sup>7</sup> We believe the "product" system can be installed into buildings with a broader range of characteristics than those found in the minimum potential market size estimate. The maximum potential market size estimate is 1.4 billion square feet or around 50% of the region's commercial square footage. This expands the potential market to reflect the possibility that, with a well-designed/executed program, we will be able to penetrate both gas and electrically heated buildings of any size, and with more than four stories in office, retail and school segments.

Manufacturers without qualifying HRV systems	<ul style="list-style-type: none"> <li>Nothing yet in terms of production of HRV that would meet VHE DOAS specification</li> </ul>	<ul style="list-style-type: none"> <li>Meetings at recent trade show and exploratory next-step calls with select manufacturers who could be open to design changes to meet VHE DOAS specification</li> </ul>
Manufacturers with qualifying heating and cooling systems (mainly VRF)	<ul style="list-style-type: none"> <li>One manufacturer has partnered with the sole current qualifying HRV manufacturer</li> </ul>	<ul style="list-style-type: none"> <li>Meetings at recent trade show and exploratory next-step calls with manufacturers who may be interested coupling their product with qualifying HRV to meet VHE DOAS specification</li> </ul>
Extra-Regional Utilities	<ul style="list-style-type: none"> <li>Pacific Gas &amp; Electric is conducting VHE DOAS pilot projects for their Codes and Standards work</li> </ul>	<ul style="list-style-type: none"> <li>Regular communication, attending relevant coordination meetings and providing expertise on the system specification and installation</li> </ul>
Regional Professional and Industry Organizations (BOMA, ASHRAE, etc.)	<ul style="list-style-type: none"> <li>Education and training for their members</li> </ul>	<ul style="list-style-type: none"> <li>Attending chapter meetings and providing training and information on VHE DOAS specification</li> </ul>

**UTILITY ROLE:** *(What is needed from the alliance to ensure the success of this program?)*

- Contribute to program/intervention design through participation in program work group.
- Consider offering custom incentives for VHE DOAS system upgrades
- Partnership with NEEA to encourage additional VHE DOAS installations
- Leverage existing relationships with market actors including key trade allies and end-use customers to communicate value of VHE DOAS
- Assistance with additional performance and end-use data collection on common base cases
- Partnership on additional market research, where applicable

## 6. Funder Coordination Plan

Who	What	When	
<b>Sector Advisory Committee</b>	<b>ILC Milestone Doc (Business Case)</b> <ul style="list-style-type: none"> <li>Review of program concept pre-Initiative Start milestone</li> <li>Consult members in 1x1 meetings to inform Initiative Start milestone development</li> <li>Deep-dive review and pre- RPAC vote on Initiative Start milestone</li> <li>Consult as appropriate via quarterly meeting</li> </ul>	Q4 2017 Q4 2017- Q2 2018 Q2 2018 Ongoing following successful IS vote	
	<b>Evaluation</b> <ul style="list-style-type: none"> <li>Consult on initial Market Characterization and research findings</li> </ul>	Q4 2018	
	<b>Other</b> <ul style="list-style-type: none"> <li>Consult on Annual Marketing Plan as appropriate via quarterly CAC meeting and via annual Marketing team visit</li> </ul>	Ongoing following successful IS vote	
<b>WORK GROUP (WG)</b>	<b>ILC Milestone Doc (Business Case)</b> <ul style="list-style-type: none"> <li>Form Work Group to help inform program design and coordinate on support for utility programs</li> </ul>	Q2/Q3 2018	
<b>RPAC</b>	<b>ILC Milestone Doc (Business Case)</b> <ul style="list-style-type: none"> <li>Review of program concept and consult with CAC and/or RPAC members as part of 'road show' pre-Initiative Start milestone</li> <li>Deep-dive review and vote on Initiative Start milestone</li> <li>Consult as appropriate via quarterly meeting</li> </ul>	Q1/Q2 2018 Q2 2018 Ongoing following successful IS vote	
	<b>Individual Funder Needs</b>	<b>ILC Milestone Doc (Business Case)</b> <ul style="list-style-type: none"> <li>Engage in 1:1s to ensure funder awareness and understanding of VHE DOAS</li> </ul>	Ongoing following successful IS vote
	<b>Regional Groups</b>	<b>ILC Milestone Doc (Business Case)</b> <ul style="list-style-type: none"> <li>Engage ODOE, NWPPC and other key stakeholders to ensure alignment</li> </ul>	Q1 2018

## 7. Program Risk Summary

Program Risk Assessment					
Risk No.	Risk and Potential Consequences <i>"IF" this happens, "THEN" this will occur (impact)</i>	Level	Response Type	Response Plan	Owner
1	If only electrically heated HVAC systems meet VHE DOAS specification, then there could be perception of insufficient energy savings potential and/or lack of value proposition for funders	H	Mitigate	<ul style="list-style-type: none"> <li>Provide evidence that electric energy savings is substantial, even on limited amount of systems</li> <li>Work with funders individually to better understand their requirements and illustrate value for them</li> </ul>	NEEA Program Manager (PM)
2	If funders perceive VHE DOAS as too far to push the market in the near term and pursue a lower-efficiency system approach (e.g. coupling high efficiency heating/cooling system with standard efficiency HRV or high efficiency HRV with standard efficiency heating/cooling system), then there could be confusion in the market	M	Accept	<ul style="list-style-type: none"> <li>Work with funders to better understand their cost-effectiveness criteria and how to illustrate VHE DOAS argument</li> <li>If funders choose to pursue a custom measure/incentive around lower efficiency system, encourage and support their including VHE DOAS as higher tier or level for incentives</li> <li>Work with funders and coordinate on collateral development where possible to ensure alignment and minimize market confusion</li> <li>NEEA will devise a system to track efforts and sales of lower-efficiency systems where possible</li> </ul>	NEEA PM
3	If no gas heating systems are developed that meet specification, then predominance of less efficient gas-heated systems will remain a key MT barrier	M	Mitigate	<ul style="list-style-type: none"> <li>NEEA gas team to explore gas-fired technologies, such as gas-driven VRF, that would meet VHE DOAS specification</li> </ul>	NEEA Gas Team in Coordination with NEEA PM
4	If no additional manufacturers come to North American market with qualifying HRVs, then there could be issues around product availability, lack of product diversity and cost, as well as discouragement of overall adoption and innovation	M	Mitigate	<ul style="list-style-type: none"> <li>Develop attractive value proposition for 1) manufacturers with qualifying equipment being sold elsewhere in the world and 2) manufacturers with near-qualifying equipment to enhance their products to meet specification</li> <li>Develop incentive plan (if needed)</li> </ul>	NEEA Program Manager/NEEA Product Manager
5	If the currently inadequate energy calculation tools and industry sizing practices for these systems are not improved, there will be significant challenges in determining accurate energy savings	M	Mitigate	<ul style="list-style-type: none"> <li>Work with energy modeling and design community, funders and other key stakeholders to enhance tools/calculators based on installation best practices and lessons learned from pilots</li> </ul>	NEEA Product Manager, Contractors
6	If current costs do not come down, there may be some markets and situations that are not	L	Mitigate	<ul style="list-style-type: none"> <li>Use specifications, contractor training, and new, more effective project assessment tools to bring forth cost-effective conversion proposals, and stimulate competition</li> </ul>	NEEA Product Manager, NEEA



cost-effective, particularly among smaller buildings			<ul style="list-style-type: none"> <li>Coordinate with Cost Effectiveness Advisory Committee to quantify non-energy benefits</li> </ul>	Program Manager	
<b>Risk Levels:</b>					
<i>H - Serious Situation, insufficient information about the situation, potential solution(s) being evaluated</i>					
<i>M - No serious situation, some information exists about the situation, in wait mode for more comprehensive data</i>					
<i>L - Most (i.e. critical mass) information about the situation exists to support no serious/negative impact</i>					
<i>On a scale of 1 to 6 (1 = Low Risk, 6 = High Risk)</i>					
<b>Overall Risk</b>	<b>Cost Effectiveness</b>	<b>Measurability</b>	<b>Unproven Technology</b>	<b>Unproven Market Approach</b>	<b>Late Life Savings Delivery</b>
3.8	3	4	3	5	4

## Equity Metrics

These metrics are intended to be a measure of how equitably NEEA will facilitate access to and generate benefits for an initiative offering across a dimension of equity. It ultimately answers the question “What is the potential for a) each state or b) rural vs. urban markets to benefit from this program over the long term (20 year) transformation horizon as compared to their share of NEEA funding?”

<b>Regional Equity-</b>				
<i>This is assigned by determining the efficiency opportunity in the target market split between rural vs. urban and comparing that to NEEA’s funding mix. The result should then be adjusted by the initiative team based on the expectation of the long-term impacts of our intervention in that market.</i>				
<b>Regional Equity</b>	<b>Index value of 1 means opportunity matches NEEA funding from that state</b>			
	<b>ID</b>	<b>MT</b>	<b>OR</b>	<b>WA</b>
	1	1	1	1
Comments	NEEA believes that the potential to benefit from the proposed transformation will be equitable as defined above. The code in Washington that requires DOAS might spur adoption but it also likely means a lower incremental savings rate from installations of high efficiency DOAS systems in that state. NEEA will review data sources as they become available and update these equity metrics when we have more information.			
<b>Rural Equity</b>				
<b>Rural Equity</b>	<b>Index value of 1 means opportunity matches NEEA funding from rural or urban</b>			
	<b>Urban</b>		<b>Rural</b>	
	1		1	
Comments	This system applies well to buildings commonly in rural areas, especially in areas with a low presence of gas. NEEA will review data sources as they become available and update these equity metrics when we have more information.			

## 8. Appendices

<b>Deliverable Name and Link</b>	<b>Owner</b>	<b>Approved by:</b>	<b>Status</b>	<b>Notes/Link to the deliverable</b>
Milestone Checklist	Maria Murphy	Emily Moore	N/A	<a href="#">Milestone Checklist</a>
Program Plan	Maria Murphy	Emily Moore	In Development	
Implementation Plan (deep dive) - Optional	Maria Murphy	Emily Moore	N/A	N/A
MT Theory Table	Maria Murphy	Emily Moore	Approved	<a href="#">MT Theory Table</a>
Transition Strategy	Maria Murphy	Emily Moore	Approved	Included in ILC Doc
Communication Plan	Maria Murphy	Emily Moore	Approved	Included in ILC Doc
Risk Assessment & Management Plan	Maria Murphy	Emily Moore	Approved	Included in ILC Doc
Resource Allocation Plan	Maria Murphy	Emily Moore	Approved	Included in ILC Doc
MS Project Schedule	Maria Murphy	Emily Moore	In Development	<a href="#">MS Project Schedule</a>
Product Readiness Plan	Maria Murphy	Emily Moore	Approved	Included in ILC Doc
Program Strikezone	Maria Murphy	Emily Moore	In Development	<a href="#">Strike Zone</a>
Updated Product Definition	John Jennings	Mark Rehley	Approved	Included in ILC Doc
Product Specification	John Jennings	Mark Rehley	Approved	<a href="#">VHE DOAS Spec</a>
Logic Model	John Jennings	Mark Rehley	Approved	<a href="#">Conceptual Logic Model</a>
Research and Evaluation Plan	Steve Phoutrides	Corinne McCarthy	Approved	<a href="#">MRE Plan</a>
Program Assessment Template	Ryan Brown	Stephanie Rider	Approved	<a href="#">Program Assessment Template</a>
Stakeholder Engagement Plan	Maria Alexandra Ramirez	BJ Moghadam	Approved	Included in ILC Doc
Advisory Committee Feedback Report	Maria Alexandra Ramirez	BJ Moghadam	Not Started	Will be completed post CAC mtg.
Marketing Strategic Plan	Natalie Fish	Stacy Blumberg	Approved	<a href="#">Marketing Plan</a>
Operational Considerations Checklist	Maria Murphy	Emily Moore	N/A	<a href="#">Operational Considerations Checklist</a>

# Memorandum – *Agenda item (Tier 1)*

April 18, 2018

TO: Commercial Advisory Committee (CAC)

FROM: Debbie Driscoll, Commercial Strategic Market Manager, on behalf of the Commercial + Industrial Lighting Regional Strategic Market Plan Steering Committee (Charlie Grist, NW Power and Conservation Council; Fred Gordon, Energy Trust of Oregon; Lori Moen, Seattle City Light; Michael Lane, Puget Sound Energy; Peter Meyer, Tacoma Power)

SUBJECT: 2018 Update to the Commercial + Industrial Lighting Regional Strategic Market Plan

.....

In this agenda item we will:

- 1) Share a progress update on 2017 priority strategies
- 2) Provide an overview of 2018 priorities and planned approach
- 3) Discuss your feedback on the 2018 Plan and how you'd like your organization to be involved

## **Ask of CAC:**

Please review the [2018 Plan Update](#) in preparation for a discussion of:

- Your questions and feedback on the 2018 plan
- Actions in which you would like to see your organization participate or lead

## **Additional Context for Discussion:**

### Progress on 2017 Priority Strategies

The collaborative made significant progress in the past quarter. Highlights include:

1. Completed second prototype of [lamp and fixture pricing data dashboard](#), which uses webscraping technology to collect LED lamp prices from three major distributors/retailers.
2. Toward our goal of "better informed customers," a regional work group completed [Good-Better-Best LED retrofit guidance](#) for customers and trade allies that may be leveraged by all funders.

Updates on each strategy can be found in our [quarterly newsletter](#).

### 2018 Updates to Plan

In early 2018, the C+I Lighting RSMP Steering Committee, with input from regional stakeholders, led a process to update the plan and set priorities for the coming year. While the strategies and actions identified in previous iterations of the plan will continue to be monitored, the Steering Committee and Lighting Program Manager Work Group see greatest value in focusing our 2018 efforts on the following two priority strategies:

- 1) Increase adoption of advanced lighting control systems
- 2) Inform program planning for commodity lamps (TLED, HID-LED, CFL-LED, etc.)

Please take a moment to review the 2018 actions identified for each strategy and the proposed approach for our collaboration in the 2018 Plan Update (link in "Ask of CAC" above).

For any questions about the proposed discussion, please contact Debbie Driscoll at [ddriscoll@neea.org](mailto:ddriscoll@neea.org) or 503-688-5487.

# Memorandum – *Agenda item (Tier 1)*

April 11, 2018

TO: Commercial Advisory Committee (CAC)  
FROM: Emily Moore, Sr. Manager, Commercial and Industrial  
SUBJECT: Pay for Performance Discussion

---

## **Overview:**

In the Q1 CAC meeting, members expressed interest in a peer-to-peer exchange on pay for performance program experience and models. Some members have direct experience now with pay for performance implementation, while others are beginning to explore the opportunity. Seattle City Light, Energy Trust and Puget Sound Energy will each share a bit about their experiences, specifically their delivery approach, outcomes to-date, challenges and lessons learned.

The objective is for CAC members to share and learn from each other, and identify where there may be other opportunities for learning and collaboration.

# Memorandum – *Agenda item (Tier 1)*

April 18, 2018

TO: Commercial Advisory Committee (CAC)

FROM: Debbie Driscoll, Commercial Strategic Market Manager, and  
Emily Moore, Sr. Manager, Commercial and Industrial

SUBJECT: Commercial Market Opportunities Discussion

---

## **Overview:**

Many CAC members are in the midst of planning for 2019 and even 2020. Likewise, NEEA is beginning to draft its 2020-2024 business plan. The “Market Opportunity” agenda time will be reserved entirely for member discussion, with a focus on what you are seeing on the road ahead, and how you and your organizations are preparing for the coming changes and opportunities.

The purpose of the discussion is for CAC members to share perspectives and ideas to help inform planning activities within our organizations.

## **Our Ask of You:**

Before the meeting, please consider your responses to the following discussion questions:

- What are changes or challenges you see coming in commercial energy use in the coming years? What changes/challenges do you think will be of concern for building owners and managers?
- How are you preparing (or hoping to prepare) in your organization?
- What is the most important challenge for us as a region to get ahead of or work more collaboratively to solve?

For any questions about the proposed discussion, please contact Debbie Driscoll at [ddriscoll@neea.org](mailto:ddriscoll@neea.org) or 503-688-5487.

# Memorandum – *Informational (Tier 2)*

April 18, 2018

TO: Commercial Advisory Committee (CAC)

FROM: Emily Moore, Senior Manager, Commercial/Industrial

SUBJECT: Commercial Portfolio Updates

---

Below is a summary of the Q1 2018 program highlights as reference for CAC members.

## **Lighting**

### **Reduced Wattage Lamp Replacement (RWLR)**

- LW market penetration: 2018 has seen a steady increase in low wattage market penetration from 29% cumulative in 2017 to 41% in Q1 2018. With most of the March data in, the program has reached a record high of a monthly market penetration of **50.3%**. This is largely driven by the two largest partners, Platt and CED, exceeding their targets for the program.
- RWLR enrollment: We enrolled the last CED division in the program, CED Puget Sound, and we expect them to follow the other CED divisions in switching their stock and reaching over 50% LW penetration by the end of 2018.
- Program touch: As of Q4 2018 a total of 14 distributors are enrolled in RWLR Program touching 264 branches across the region. We estimate that this represents roughly 43% of all linear lamp sales in the region.

### **Luminaire Level Lighting Controls (LLLC)**

- BPA's new lighting calculator provides bonus incentives for LLLC projects which will help offset the initial incremental cost for customers considering LLLC and drive additional projects in the region.
- As part of the effort to bolster market delivery capabilities, the program continued its rollout of installer focused training. In Q1, Idaho Power hosted two of these Advanced Lighting Controls Trainings, and Energy Trust hosted one.
- A new training format incorporating hands on product demonstrations by lighting manufacturers was debuted at the Energy Trust hosted training. The LLLC program is using feedback from that event to develop a plan for rollout of this enhanced version.
- A case study (in both video and written format) on the LLLC installation at Pacific Tower in Seattle was distributed on Better Bricks to help increase market awareness of LLLC.

### **Top Tier Trade Ally (TTTA)**

- In Q1, 18 individuals and 3 companies had earned the NXT Level designation, for a total program to date of 133 individual and 40 companies.
- The program rolled out a new recruiting tool in Q1 – in person Jump Start sessions – designed to be co-hosted by a utility for their trade allies. In Q1, the program received 77 new applications. The program team is focusing on marketing and outreach turning these applications in to Level 1 designees.
- A new toolkit for NXT Level designees to bring awareness to their designation and to market it to their customers and prospects was developed in Q1 and will be rolled out in early Q2.

## **Lighting Resources**

- Northwest Lighting Network featured the Good, Better, Best Guide that was developed through a Regional Strategic Market Planning effort. Utility customizable version to embed on websites was also made available.

## **C+I Lighting Regional Strategic Market Plan Implementation**

- See C+I Lighting Quarterly Newsletter (on page of packet) and Tier 1 memo (on page 19 of packet) for update.

## **Building Envelope**

### **Window Attachments**

- In Q1, AERC began accepting applications from product manufacturers for certification and labeling of low-e storm windows. Enrollment will continue through Spring 2018 with testing and certification of products occurring throughout Summer 2018. Pending approval of the Environmental Protection Agency's 2019 budget, ENERGY STAR labeling will occur simultaneously. It is estimated that Low-e Storm Windows displaying both the AERC and ENERGY STAR label will begin to show-up in stores throughout the US in Fall 2018.

## **Pumps**

### **Extended Motor Products**

- XMP initiative was added to the portfolio in the Q1 RPAC meeting on February 28<sup>th</sup>.
- Formed the XMP Technical Workgroup which will begin meeting in April and which will help guide the pumps research plan.

## **Commercial New Construction**

### **Commercial Code Enhancement (CCE)**

- See Tier 2 memo for update (on page 24 of packet).

## **Cross-cutting Infrastructure**

### **Distributor Platform**

- Continuing to work with Seattle City Light on helping them leverage the distributor platform in their area to launch a "Lighting to Go" like midstream program in Q3 2018. We also continue to help Snohomish PUD on acquiring data for their region as well on a possible TLED pilot to be launched in their territory in Q4 2018.

## **Commercial Real Estate (CRE)**

- In collaboration with Energy Trust, the CRE program is working to identify 5-20 commercial buildings that participated in City of Portland's required benchmarking ordinance with a desire to feature their actions around energy benchmarking and improving building performance. The result of the "storytelling" collection will be a resource for other building owners and managers who are benchmarking and looking for ways to improve their energy performance.

## **Strategic Energy Management (SEM)**

- Rebuilt Northwest Energy Management Assessment Tool onto a NEEA-owned platform integrated with the SEM Hub.
- Launched a PSE-branded customized learning branch of the SEM Hub, which PSE has rolled-out to its Commercial SEM customers.
- Contracted with US DOE, and kicked-off work on two projects that DOE and the National Labs funded in support of NEEA's SEM work (50001 Ready research pilots, and Community SEM with Idaho Power).

# Memorandum – Informational (Tier 2)

April 11, 2018

TO: Commercial Advisory Committee (CAC)  
FROM: Neil Grigsby, Portfolio Program Manager  
SUBJECT: Commercial Code Enhancement Q2 update

The Commercial Code Enhancement (CCE) Q2 memo provides an update on:

- State Coordination Plan development
- Road Mapping Tool development
- Next steps for each state

**Our Ask of You:** Please review the CCE Q2 CAC memo with your CCE member and contact [Neil Grigsby](#) with any questions or feedback.

**State Coordination Plans:** In Q1, NEEA held meetings with utilities and code stakeholders in Washington, Oregon and Idaho. Agendas focused on establishing code and utility goals in each state, gathering input on utility program alignment, and discussing future measures for code. State Coordination Plans for Idaho, Oregon and Washington will be completed in mid-April.

**Next Steps:** CCE is developing an interactive online Road Map Tool to track code timelines, long term goals, short/mid-term milestones, market influencers, utility programs, and future code measures. The road mapping tool will provide a consistent template for the four states and can be used to facilitate ongoing conversations that help inform CCE activities and utility programs and prepare the market for upcoming code changes.

**Oregon** – meeting scheduled for 4/11 with CCE team and Energy Trust to discuss information exchanges between Energy Trust Commercial New Construction programs and CCE. Also will explore opportunities for CCE to inform Energy Trust programs through Washington outcomes and other regional and national code learnings.

**Washington** – meeting in late April (TBD) with CCE team and Washington utilities to finalize goals/milestones, code and utility program planning timelines and introduce the Road Map Tool.

**Idaho** – work one-on-one with Idaho Power to identify measures from the 2018 Washington and 2021 IECC code process and assess their viability for inclusion in Idaho Power’s Commercial New Construction Program.

**Montana** – coordinate schedules with Northwestern Energy and NCAT to explore collaborative opportunities with CCE, the Montana code process, and utility programs.

## PROGRAM LIFECYCLE STATUS





# Memorandum – *Agenda item (Tier 2)*

April 18, 2018

TO: Commercial Advisory Committee (CAC)  
FROM: Maria Alexandra Ramirez, Stakeholder Relations Manager  
SUBJECT: Conference Coordination

---

## **Overview:**

In response to a NEEA Board discussion last year about conference/event attendance, NEEA developed a (1) Tracking system to improve its management of who's going to what, and (2) Criteria that improves NEEA's ability to manage to its annual operations plan and budget.

There is a coordination opportunity here to ensure that we're connecting as appropriate in advance and sharing out key relevant takeaways afterwards with the region. This will be a standing housekeeping item for this Advisory Committee moving forward.

## **Our Ask of You:**

Please review the Upcoming Event agenda(s) linked below and email me ([maramirez@neea.org](mailto:maramirez@neea.org)) if you'd like to coordinate with NEEA staff in advance of the event, and/or if there are specific topics/breakouts you'd like to hear about at our next CAC meeting.

## **Upcoming Events:**

Date	Conference	Report
4/17/2018	<a href="#">Getting to Net Zero</a>	Brown Bag (Internal)
4/25/2018	<a href="#">38th Annual Utility Energy Forum</a>	Conduit Posting
5/6/2018	<a href="#">LightFair 2018</a>	Conduit Posting
7/9/2018	<a href="#">Design Lights Consortium Stakeholder Meeting</a>	Conduit Posting
8/8/2018	<a href="#">Illuminating Engineering Society</a>	Conduit Posting
8/12/2018	<a href="#">ACEEE Summer Study</a>	Brown Bag (Internal)

# Memorandum — *Informational (Tier 2)*

April 11, 2018

**TO:** Commercial Advisory Committee (CAC)

**FROM:** Mark Rehley, Senior Manager, Product Management & Emerging Technology

**SUBJECT:** Summary of Emerging Technologies – Q2 2018

---

**Our Ask of You:**

Review our emerging technology report and let us know if you have any questions or suggestions for new technologies. The report format continues to evolve as we explore ways to display this information. We welcome any ideas or questions you have. Thank you!

Click [here](#) for a copy of the full Q2 2018 Emerging Technology Report posted on NEEA.org (all sectors).