



## APPENDICES

### NEEA Board of Directors Meeting December 4 - 5, 2019

# NEEA Market Progress Report – Q3 2019

Energy Saving Metrics				
	1-year Co-Created Savings Forecast (aMW)		Long-term Co-Created Savings (Current Investments only) (aMW)	
	All Investments	Current Investments	5-Year (2015-2019)	10-year (2015-2024)
<b>Target</b>	28	18	75	180
<b>Forecast</b>	<b>29</b>	<b>18</b>	<b>65</b>	<b>180-210</b>

Co-Created Savings = Energy Savings resulting from regional Market Transformation activities, NEEA savings plus local program savings

aMW = Average Megawatt

Status: 90 - 100 percent = Green; 75 - 90 percent = Yellow; <75 percent = Red

Market Development & Transformation Programs						
Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
Super-Efficient Dryers (SEDs); Beth Littlehales	Influence the enactment of more stringent federal efficiency standards for clothes dryers	Expand to Laundry Initiative / Add Clothes Washers	Complete business case and workplan for expanding scope	Finalize recommendation to pursue / not pursue	On target or better	NO CHANGE FROM PREVIOUS: In May, the Portfolio Management Team approved moving Clothes Washers through the Concept Advancement stage gate of the Initiative Life Cycle.
		Increase Confidence & Demand for Super-Efficient Dryers (SEDs)	Sales increase by 50 percent	Sales increase by 25 percent	On target or better	With 240 units year to date, sales have doubled compared to last year due to spikes at Nationwide stores in Q2. In addition, rebate offerings that are currently live through Beko and Nationwide are expected to further drive sales by the end of the year.
		Increase Utility & Program Support of SEDs	Three new funders offer SED incentives	One new funder offers SED incentives	Heads up; corrective action in process	NO CHANGE FROM PREVIOUS: Energy Trust began offering a point-of-sale rebate on residential clothes dryers, which includes heat pump dryers.
		Refine Super-Efficient Dryer (SED) Technology Roadmap	Three new products added to Qualified Product List (QPL)	One new product added to QPL	On target or better	Met the target in August when the Samsung model was added to the QPL. This yields a total of three products for the year, with two new Whirlpool models added in Q1. NEEA staff do not anticipate any additional models to be released in 2019.
Heat Pump Water Heaters (HPWH); Jill Reynolds	Influence passage of a federal standard for all electric storage tanks > 45 gallons by 2025	Drive installer adoption of HPWHs through targeted Key Account activities including marketing support, training, sales support, etc.	15 Key Installer Accounts engaged in strategy by end of Q3	10 Key Installer Accounts engaged in strategy by end of Q4	On target or better	NEEA staff are working with 16 Key Installer Accounts throughout the region to bolster sales and installation of HPWHs. Each Key Account has undergone hands-on installation and sales training, and received various levels of marketing support and installer spiffs. While HPWH sales have varied by installer, NEEA staff have gleaned valuable information from this overall engagement, which will inform a more streamlined and effective Key Account strategy in 2020.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
		Increase national engagement efforts to strengthen federal standards case for HPWHs. This includes manufacturer engagement to develop products addressing challenging installation configurations; targeted installer training events; and engagement with national retailers.	120V product commercially available Q2 2020	120V product commercially available Q1 2021	On target or better	All three major electric water heater manufacturers are scheduled to show their 120V heat pump water heater products late January 2020.
		Keep manufacturers engaged/committed to HPWHs by increasing sales throughout region leveraging distributor relationships, key installer account support, consumer marketing opportunities, etc.	17,000 units sold into region by 12/31/19	15,000 units sold into region by 12/31/19	Heads up; corrective action in process	Forecasted 2019 HPWH sales indicate the region will reach 14,000 to 15,000 units.
		Update Advanced Water Heater Specification to drive additional product innovations and incorporate learnings related to customer satisfaction and demand response capability.	Updated AWHs version published by 3/15/19	Updated AWHs version published by 12/31/19	Heads up; corrective action in process	NEEA staff sent the final draft of the Advanced Water Heater Specification (AWHS) 7.0 to all interested parties in Q2. NEEA staff are incorporating final edits and the AWHs 7.0 is on track to be published by mid-Q4 of this year.
Ductless Heat Pumps (DHPs); Suzi Asmus	Accelerate the adoption of inverter-driven DHPs in electrically heated homes by building distribution channels, market	Advance adoption of new load-based performance testing & rating systems	Established qualified products list	Completed lab testing and established rating for 30 systems	Heads up; corrective action in process	The new testing and rating system was published by Canadian Standards Association in February. Testing has been slower and more expensive than originally anticipated. Results from the first round of testing are expected in Q4. NEEA staff will schedule a webinar, currently expected in November, to share results of these tests and status of the work.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
	capacity and consumer demand	Evaluate readiness to move into Long-Term Monitoring and Tracking and gain Funder Support	Q4 Operations Plan approval of resulting determination	Complete Market Progress Evaluation Report (MPER) with recommendations for timing	On target or better	Market Progress Evaluation Report (MPER) #8 was completed in Q3 and results were shared with funders via webinar in September. Informed by findings of the MPER, and input gathered from stakeholders, NEEA staff developed the 2020 Operations Plan, which includes plans to complete additional research on barriers in cold climates, collaborate with the region on utility program cost-effectiveness challenges, and develop a transition strategy to long-term monitoring and tracking (LTMT).
		Reach homes right for 1:1 displacement with education and tools for affordable purchase	Deliver digital consumer awareness campaign	N/A	Heads up; corrective action in process	In response to funder feedback earlier in the year, the plan for a digital awareness campaign was cancelled. Instead, the NEEA staff developed new consumer education content for GoingDuctless.com for funder use and dissemination. The website Buyer's Guide and the downloadable print versions were launched in April. Additional tools, such as blog posts and earned media, are being developed and delivered through the end of the year.
		Track Market Progress	20 percent increase year over year sales of single head DHPs (overall sales and in target markets)	15 percent Increase year over year sales of single head DHPs (overall sales and in target markets)	On target or better	According to 2018 year-end data: 16% year-over-year (YoY) increase in overall sales in target market single family electric zonally heated homes. 13% YoY increase in rebated installs in target market single family zonally heated homes, 25% YoY increase in single family electric forced air furnace heated homes, and 28% YoY for electrically heated manufactured homes.
Retail Product Portfolio (RPP); Beth Littlehailes	Leverage midstream incentives to influence retail stocking practices, ultimately driving	NEEA staff secure funder support for Scale-Up	Regional Portfolio Advisory Committee (RPAC) supports Scale-Up in 2019	Regional Portfolio Advisory Committee (RPAC) supports Scale-Up with conditions, and/or in 2020	On target or better	RPP was approved for Scale-Up on September 4.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
	manufacturing and standards for a portfolio of energy efficient products sold through the retail channel.	Other program sponsors have support for appropriate evaluation approach and regulatory backing	Program Guidelines approved and referenced for program sponsors; Other program sponsors receive regulatory / evaluation support to maintain participation	Program Guidelines reviewed by program sponsors and used to onboard new sponsors; NEEA continues collaboration with PG&E and provides evaluation support to 2 other sponsors	On target or better	NO CHANGE FROM PREVIOUS: NEEA staff have finalized both the Program Guidelines and an evaluation guidance document for use by other program sponsors and the ENERGY STAR Retail Portfolio Program (ESRPP) collaborative as a whole. Three other program sponsors have completed evaluations in recent months that are largely positive and can provide a roadmap for other program sponsors.
		Product / Portfolio Management supports appropriate product-level MT strategies	At least one additional program sponsor co-funds product strategy work; ENERGY STAR RPP influences specifications for at least two product categories (by 12/2019)	At least one additional program sponsor engages in and considers co-funding product strategy work; ENERGY STAR RPP influences specifications for at least one product category by 12/2019	On target or better	In September 2019, ENERGY STAR released the final criteria for version 2.0 of its air cleaner specification. In response to analysis and recommendations developed by NEEA and Pacific Gas & Electric (PG&E), ENERGY STAR adopted size bins requiring larger units meet a higher efficiency metric (in addition to increasing the overall efficiency requirements of larger units). The new specification takes effect July 2020.
Next Step Homes; Jonathon Belmont	Develop and increase market adoption of energy-efficient advanced building practices & accelerate advancement of building codes over next 3-4 code cycles	Establish pathways for data collected into Axis database to be used for code engagement	Three groups working with data provided by NEEA on code engagement activities, identify 3 additional pathways to provide value from data back to groups and region, and identification of additional energy savings from increased code	One group working with data provided by NEEA on code engagement activities, identify 1 additional pathway to provide value from data back to groups and region, and identification of additional energy savings from increased code	Heads up; corrective action in process	NEEA is currently analyzing existing datasets from the AXIS database to provide insights into above-code residential construction activity in Oregon. This analysis will inform development of code proposals intended to support efficiency goals outlined in Oregon Executive Order 17-20. This data analysis will be completed in Q4 2019 and will be publicly available.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
		Increase funder program participation in Performance Path	Five new funder programs, 200 new homes incented	Three new funder programs, 100 new homes incented	On target or better	Through the end of the Q3, there have been 384 homes certified in the Performance Path with an additional 246 certifications in process, which far exceeds the 2019 target of incenting 200 new homes. Inland Power and the City of Richland utilities have both configured their own programs to put in the Performance Path, and will both officially launch October 1, 2019. Additional funders have expressed interest in developing utility programs to place in the Performance Path thanks to recent round table discussions, along with the recently released funder resource, <i>Performance Path Utility Program Overview and Launch Guide</i> ,
		Increase market support for funder programs	Five new raters/verifiers in region, 10 new raters/Verifiers working in funder programs, three raters/Verifiers in areas that did not have raters/Verifiers previously	Three new raters/verifiers in region, seven new raters/Verifiers working in funder programs, one rater/Verifier in areas that did not have raters/Verifiers previously	On target or better	In Q3, two new raters, one based in Spokane, WA, and the other in central ID, started working with funder programs in the Performance Path. These raters were provided training and have started entering homes into these programs, bringing the number of new raters in the region up to five. The number of new raters working in funder programs is now up to twelve and the number of raters working in areas that did not have raters previously is now up to two.
Manufactured Homes; Neil Grigsby	Leverages the Northwest Energy-Efficient Manufactured Housing Program (NEEM) infrastructure to ensure a voluntary above-code manufacturing	100-200 NEEM+ homes completed	200 homes completed	100 homes completed	Threshold will be exceeded; management action required	13 NEEM+ homes were completed in Q3; two by Palm Harbor Homes and 11 by Kit Homes, bringing the total 2019 completed homes to 30.
		Identify champion retailers and demonstrate NEEM+ sales success	One major retailer selling NEEM+ from each participating manufacturer	Retailers selling NEEM+ in major markets	On target or better	Manufacturers Palm Harbor Homes (Detray's in Olympia, WA) and Kit Homes (United Family Homes, Nampa, ID) each have one key retailer actively selling NEEM+.

Market Development & Transformation Programs						
Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
	specification exists after the upcoming HUD code change, allowing for future energy savings to be captured by the region.	Leverage funder programs to increase incentive uptake and consumer demand	25 funders agree to offer NEEM+ incentives	15 funders agree to offer NEEM+ incentives	On target or better	23 funders are currently offering NEEM+ incentives. NEEA completed a Southwest Washington co-branded utility marketing piece in Q3 to help promote available utility incentives at local Southwest Washington Retailers. NEEA staff will present to RPAC in Q4 seeking Scale-Up approval, which will include a conversation about future NEEA and funder support for the program.
		Manufacturer Participation - mix of corporate vs independent	Four key manufacturers participating	Two key manufacturers participating	Heads up; corrective action in process	Kit Homes (Idaho) and Palm Harbor (Oregon) continue to be the only two Manufacturers currently producing NEEM+ homes. During Q3 retailer visits, retailers who buy homes from Valley Homes (Oregon) and Skyline Homes (Oregon) expressed interest in NEEM+. This demand from retailers will influence manufacturers to actively offer NEEM+. NEEA staff will continue to increase consumer and retailer awareness in Q4 to drive demand for NEEM+.
Luminaire Level Lighting Controls (LLLC); Anne Curran	Develop best practice specifications for luminaire level lighting controls, aiming to have the technology adopted as standard industry practice.	At least 150 regional market actors trained on LLLC via either in person or online training	150 trained	100 trained	On target or better	Networked Lighting Controls training rollout continued in Q3 with Tacoma Power hosting a session. NEEA staff are planning Q4 trainings with Northwestern, Idaho Power and Avista. Year-to-date, 154 trade allies have been trained, meeting the 2019 goal. The Lighting Design Lab is delivering this one-day class and continues to be available for funders to host future trainings.
		At least six manufacturer representative agencies actively engaged in program per engagement plan	Six agencies engaged	Three agencies engaged	Heads up; corrective action in process	This strategy has been revised to incorporate greater collaboration with manufacturers in engaging with local sales agencies. This will result in a delay into 2020, but will set the program on a path to successfully engage agencies in the most impactful way.
		Marketing toolkit for funders updated to include at least 3 recent case studies	Three case studies	Two case studies	Heads up; corrective action in process	One LLLC installation case study is in process. While it is likely that the program will meet the threshold of two case studies, it is uncertain if we will meet the target of three. The program will continue to work collaboratively with NEEA funders to identify and develop LLLC case studies and meet the target.



Market Development & Transformation Programs						
Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
Reduced Wattage Lamp Replacement (RWLR); Elaine Miller	Develop an upstream platform with distributors and manufacturers to influence the stocking and sales practices for efficient lighting products.	Successfully transition the program to long-term monitoring and tracking	15 Distributors engaged to continue linear lamp data collection	13 Distributors engaged to continue linear lamp data collection	On target or better	NO CHANGE FROM PREVIOUS: In Q2, the program completed the transition to long-term monitoring and tracking (LTMT) and, as of June, all RWLR distributor participants have entered LTMT and have agreements in place to continue provide regional linear lamp sales data. In addition, one target participant for the RWLR program (who did not ultimately enroll) is now working to enroll in the Seattle City Light midstream pilot, which provides full category data and supports the RWLR LTMT effort.
Commercial Code Enhancement (CCE); Neil Grigsby	Increase the Northwest's ability to propose, adopt and implement more efficient commercial building energy codes.	Future code measures are supported through CCE Market Intervention Strategies	One deliverable for each state (case study, technical analysis, education & awareness materials, technical training)	One deliverable each in Washington and Oregon (case study, technical analysis, education and awareness materials, technical training)	On target or better	<p>The following key deliverables have either been completed or are in progress for each state:</p> <p>Washington - Supported the adoption of the HVAC Total System Performance Ratio (TSPR) measure in the 2018 Washington Commercial Code process with modeling tool development, pilot testing, and educational resources.</p> <p>Oregon - Collaborated with the Energy Trust to finalize the training date and location (November 7, Portland OR) for an ASHRAE 90.1-2016 classroom training in anticipation of the new Oregon commercial code requirements that go into effect in October. Webinars will also be available.</p> <p>Idaho - Developing cases studies on high performance commercial new construction projects in local Idaho markets, which highlight how the project achieved above code performance; they will be finalized in Q4.</p> <p>Montana - Completed three technology briefs that highlight the benefits of Dedicated Outside Air Systems (DOAS), Luminaire Level Lighting Controls (LLLC), and Heat Pumps in new commercial buildings.</p>



## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
		Long-term code road map for each state informing long-term code and utility planning	Long-term code road maps developed for Washington (WA), Oregon (OR), & International Energy Conservation Code (IECC)	Long-term code road maps developed for WA & OR	On target or better	NEEA staff reviewed proposals and selected Noresco in response to a Washington State Commercial New Construction Technical Roadmap RFP in September. Held a kick-off in late September to begin the development process. Final deliverables for the Roadmap are anticipated in April 2020. A Q4 Washington CCE meeting will be held where a Roadmap update will be provided and stakeholders will have a chance to provide feedback. Oregon has moved into adoption of ASHRAE Standard 90.1. NEEA is collaborating with PNNL and other thought leaders to develop the whole-building performance-based compliance path and its practical application in the NW region.
		Technologies/Practices identified for Technology & Practice Assessments	3-5 identified per state	1-2 identified in Washington and Oregon	Heads up; corrective action in process	A case study was drafted highlighting high efficiency envelope, lighting, and HVAC strategies in Emergency Service Stations in Idaho. The case study provides construction details on a paramedic station in Ada County and a fire station in Meridian to showcase how the projects achieved above code performance. Once finalized, the technologies and practices identified in the case study could be chosen for deeper assessments to inform Idaho Power's commercial new construction program. The Washington State Commercial Code Roadmap will identify technologies and practices for CCE to support in the next code cycle, however, this deliverable will be achieved in Q1 2020.
		Funder programs align with CCE code roadmaps	Three Washington funders and Energy Trust plan TSPR programs	One funder in WA plans TSPR program	Heads up; corrective action in process	There are currently no commitments from utilities to offer a TSPR utility program. NEEA is currently working with Tacoma Power to pursue a utility incentive pilot project in 2019 or early 2020. A CCE Washington meeting is scheduled in Q4 to explore additional utility program opportunities.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
High-Performance HVAC; Maria Murphy	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 nonenergy benefits throughout the region.	Deliver awareness-building sessions with targeted professional organizations on Very High Efficiency Dedicated Outside Air Systems (VHE DOAS) system benefits	Five awareness-building sessions	Three awareness-building sessions	Heads up; corrective action in process	Held awareness-building presentation in partnership with Seattle 2030 District in Seattle on September for 17 attendees, including facility managers, designers, and energy service providers. Planning is underway for one more awareness-building session in Q4. Program is on track to hold four awareness-building sessions in 2019, which will exceed the threshold and is sufficient given traction on other program activities.
		Deliver trainings sessions to targeted supply chain innovators	Four trainings	Two trainings	On target or better	Held four lunch-and-learns in Q3 with targeted HVAC design firms, representing six firms and 35+ people.
		Engage Heat Recovery Ventilation (HRV) manufacturers in discussions around developing and/or bringing qualifying HRV product line to North America	Three manufacturers engaged	One manufacturer engaged	On target or better	Held initial meetings with seven manufacturers considered high and medium priority in Q3., Follow-up is planned in Q4 for at least half of those to continue conversations and move toward actionable engagement (e.g. field tests, equipment testing, etc.).
		Recruit VHE DOAS projects that result from alliance-assisted efforts	Three VHE DOAS projects	Two VHE DOAS projects	On target or better	Provided initial technical assistance on Energy Trust project currently undergoing technical study. Continued assistance on BPA-led project and two Tacoma-based projects to encourage meeting Very High Efficiency DOAS system requirements. Also started providing technical assistance to vet three new potential projects in Q3.
Window Attachments; Natalie Fish	Accelerate the adoption of high-performance window inserts in commercial buildings by increasing awareness and	Business case and market awareness plan developed for at least one target market	Business case and market awareness plan complete by Q3	Business case and market awareness plan complete by Q4	Heads up; corrective action in process	The program is leveraging recent audience research and developing the business case for two audiences, along with a messaging matrix for multiple audiences, including manufacturers, installers, architects, and building owners. NEEA staff plan to leverage BetterBricks relationships in 2020 to reach early adopters to increase awareness and gather feedback. A marketing plan will be completed in Q4.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
	demand among target audiences and working upstream with manufacturers and the Attachments Energy Rating Council (AERC) to differentiate products through testing and certification.	Increased manufacturer membership of AERC	Five new manufacturer members of AERC	Three new manufacturer members of AERC	Heads up; corrective action in process	Increasing membership is a primary focus of NEEA's AERC strategy for 2019, aiming to increase AERC's financial stability, influence and reach, and value proposition for manufacturers. No new manufacturers joined in Q3, but it is expected that two manufacturers will join this year, for a total of four, thus passing the threshold, but likely not the target of five.
		Manufacturer agreements established to secure access to sales data	Three signed agreements	Two signed agreements	On target or better	The first of three manufacturer Master Service Agreements (MSAs) has been signed. The remaining two MSAs are on track to be signed in early Q4. The program has continually engaged with AERC as well as manufacturers directly to explore ways to secure access to sales data. In addition, NEEA staff are working with AERC to secure sales data through the product certification process in the future, allowing a process to centralize the data collection from one source in the future.
		Test procedure established to support an AERC commercial products rating program	Test procedure established by Q4	Test procedure established by Q1 2020	Heads up; corrective action in process	The development of the AERC commercial products certification program is underway, and planned for launch in 2020. Development of the testing procedures to support the certification design and implementation is progressing and expected to be complete in Q1 2020.
Extended Motor Products (XMP); Warren Fish	Drive awareness, stocking and sales of efficient motor driven products, initially focusing on pumps, and influence Federal standards over time.	Agreements established with Northwest pump distributors to secure access to data	Four agreements	Three agreements	On target or better	Strong engagement with five Northwest pump distributors, enabling data collection on pumps sales, and testing and refining of intervention strategies to inform program design.
		Completed Pumps Research Study to validate energy savings estimates for C&I pumps and circulators	Research study complete by Q4	Research study complete by Q1 2020	On target or better	Final report supporting Regional Technical Forum (RTF) measure savings validation published to NEEA.org on October 2nd, 2019. RTF presentation is now planned for Q1 2020. Stakeholder assistance and guidance on the XMP Pumps Research Study was coordinated through the XMP Technical Workgroup, which held its sixth and final meeting in Q3 2019.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
		Gather necessary data to inform preliminary baseline for C&I pumps and circulators	Preliminary baseline by Q3	Preliminary baseline by Q4	Threshold will be exceeded; management action required	Determined that NEEA staff need additional time to establish a baseline for XMP to incorporate all of the market intelligence and sales data gathered from the work with pump distributors. This additional time will benefit the initiative by establishing more accurate and complete market baseline for pumps and circulators than we otherwise could. We now anticipate having these baselines established in Q2 2020.
		Market Characterization Study Complete	Study complete by Q3	Study complete by Q4	Heads up; corrective action in process	Missed the Q3 target date on the XMP pumps market characterization project conducted by Cadmus Group, but will complete it by the Q4 threshold. Anticipate publishing the report in November 2019. Delay was due to report formatting and review timing issues.
GAS: Combination Water & Heat (Combi); Aaron Winer	Create and leverage market partners to develop a combination space and water heating system at an efficiency exceeding current high-efficiency furnaces and stand-alone gas water heater technology to ultimately create market momentum in the new construction and retrofit market to influence code.	Diversify product portfolio for alliance's engagement	Commence lab and/or field testing of 2 new technologies	Commence lab and/or field testing of 1 new technology	On target or better	Lab testing of the boostHEAT product is contracted and expected to begin in Q4. Field testing of the ThermoLift product has been delayed until 2020 due to product development and certification. Both of these products are Sterling Cycle-based gas heat pumps. Field testing of two commercialized non-gas heat pump combi systems is contracted and will begin in Q4.
		Drive progress toward residential product commercialization	Two of two NEEA co-funded projects move forward	One of two NEEA co-funded projects move forward	Heads up; corrective action in process	One of two NEEA co-funded projects is concluding on schedule and shows a path forward for a commercialized product. The technology developer has partnered with NEEA and other co-funders to extend the current demonstration, begin projects to reduce cost and weight, and explore opportunities for integrating air conditioning into the system. NEEA staff have terminated the contract for the second co-funded project due to project delays.
		Evaluate opportunity – residential as compared to commercial application	Assessment complete Q1	Assessment complete Q2	On target or better	(COMPLETED Q2, 2019) Assessment comparing residential and commercial combi opportunities is complete; key recommendation is to continue focus on monitoring residential combi product development. NEEA staff will transition Combi work to Scanning in 2020, with an eye towards identifying opportunities to support product development, commercialization and/or launch for residential combi technology.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
		Expanding pool of major manufacturers collaborating with the alliance	Relationships established at 2 additional major manufacturers	Relationships established at 1 additional major manufacturer	On target or better	NEEA's contractor began outreach to major HVAC manufacturers, holding initial discussions with three organizations. Outreach will continue, with findings and recommendations on strongest relationships expected Q4, 2019.
GAS: Condensing Rooftop Units (CRTU); Christine Riegler	Increase market adoption of rooftop units with condensing gas-fired heating equipment in both new and retrofit markets, maximizing occupant health and comfort.	Increase capability of HVAC supply chain, funders and extra-regional utilities to promote and specify condensing RTUs for commercial buildings.	National entity commits to condensate management adoption by Q4	Pitch condensate management best practices adoption to at least 3 organizations	Threshold will be exceeded; management action required	NEEA staff have collected data and results from the field trial and additional market research to better understand the condensate management barrier. Updates to best practices guide and site selection criteria will begin in Q4. Pitching the condensate management guide is delayed until Q1/Q2 of 2020, as product development research will kick off in Q4 to address creative technical solutions to reduce or eliminate that incremental installation cost of condensate management.
		Complete multiunit field test validating measured product performance is in line with manufacturers stated performance.	Present field test results at 2 conferences by Q4 2019	Post final report to neea.org, distribute to 10-15 market partners, develop 3 case studies	Heads up; corrective action in process	The CRTU Field Trial final report will be published on neea.org and BetterBricks in late October, highlighting 90-95% energy savings and satisfactory reliability while also showcasing needs for reduced incremental cost and effort. The report will be distributed to over 15 market partners at that time. Field trial case studies are in development and will be completed by end of year. NEEA staff submitted and received approval to present on field trial results at two conferences: the AESP Annual Conference & Expo in February 2020 and the Energy Solution Center's Technology, Market and Assessment Forum in March 2020.
		Identify alternative commercial HVAC products / solutions for program consideration to mitigate condensing product risk	Contracted investigation into 1-2 product options (pilots, lab test, etc.)	Present recommendation to NGAC in Q2	Heads up; corrective action in process	Contractor completed initial development of the HVAC roadmap technology tool during Q1. NEEA staff presented findings and recommended next steps at the July 23rd NGAC meeting. NEEA staff are on track to contract one investigative project related to top priority technologies identified in the roadmap.
		Influence manufacturer(s) to develop an off-the-shelf CRTU that meets the alliance's specification.	Signed Letter of Intent by Q4, to develop CRTU product that meets NEEA's specification	Specification developed by Q2, targeted outreach completed with 4 manufacturers by Q4	Threshold will be exceeded; management action required	Draft specifications were developed in Q2. Manufacturer engagement strategy development kicked off in late Q3 and will be complete by end of year. The strategy will include company information, geographic presence, equipment lines, key barriers and path to market. Manufacturer engagement will kick off in Q1 2020.

## Market Development &amp; Transformation Programs

Product, Service or Practice	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Comments
GAS: Efficient Gas Water Heating (EGWH); Aaron Winer	Accelerate product development of gas-fired heat pump water heater technology and create market conditions to accelerate market adoption to influence a federal manufacturing standard.	Documented agreement of at least one major manufacturer to commercialize gas heat pump water heater (GHPWH) product	Agreement signed by 12/31/19	Final negotiations regarding agreement in process 12/31/19	On target or better	Met target in Q1 when work began on a project with a major manufacturer to accelerate gas heat pump water heater (GHPWH) commercialization. In Q3, NEEA staff maintained regular meetings with major manufacturer, accelerating commercialization and influencing launch date. Additionally, partnered with Nicor, SoCal Gas, Enbridge, Spire and FortisBC to drive development of a North American Field Demonstration. Next steps are to begin contracting and move into project plan development.
		GHPWH integrated into Advanced Water Heater Specification (AWHS)	Updated AWHS published on neea.net by 6/1/2019	Updated AWHS published on neea.net by 9/1/2019	Heads up; corrective action in process	Slight delay due to additional time required by market partners and funders for review. Final version complete and now being assessed by technical writer prior to publishing and distribution. Expected release in Q4 2019.
		Interim product opportunities are vetted to satisfaction of NEEA and funders, alignment on intervention recommendations (if any)	NGAC agreement with interim product recommendation at October meeting	NGAC agreement with interim product recommendation at December meeting	On target or better	Completed activities associated with interim product assessment, including tankless water heater lab testing, tankless water heater market research, installer engagement, and non-powered damper product monitoring. Synthesized results of these activities and developed strategy for path forward. Progress discussed at October NGAC meeting and final results will be shared at December NGAC meeting.
		NEEA engagement with multiple technology partners, reducing risk associated to current reliance on one technology manufacturer	Relationships established with 2 additional technology manufacturers	Relationships established with 1 additional technology manufacturer	Threshold will be exceeded; management action required	Efforts to identify additional gas heat pump technologies suitable for stand-alone water heaters have been unsuccessful so far. In 2020, staff will be developing and implementing a strategy to engage additional technology partners.

Infrastructure Programs						
Program Name	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Notes
Commercial Real Estate (CRE); Natalie Fish	Leverage strategic partnerships to deliver a broad range of energy efficiency best practices for commercial real estate and regional partners	CRE market relationships are leveraged on behalf of at least two alliance commercial programs	Two commercial programs leveraged by Q4	Two commercial programs leveraged by Q4	On target or better	NEEA staff continue to leverage relationships developed with Seattle 2030 and Building Owners and Managers Association (BOMA) Oregon, key channels for reaching financial decision makers such as owners and property managers, and coordinates engagement and sponsorships for these partners with Seattle City Light and Energy Trust of Oregon. NEEA staff leveraged BOMA Oregon in Q3 with a table at the BOMA Expo on behalf of three programs, and the High-Performance HVAC Program also leveraged the Seattle 2030 relationship to deliver a training on VHE DOAS to its members.
		Complete transition of CRE resources to BetterBricks platform	Transition complete in Q3	Transition complete in Q4	On target or better	The transition of the CRE Program to BetterBricks is on track; the program will conclude at the end of 2019 and continuation of key market relationships and resources will occur via the BetterBricks Platform. After the review of market research completed in Q2 and funder input from the CAC in Q3, the Spark Tool, a legacy CRE asset for deep energy retrofit business case development, has been transitioned to the BetterBricks Platform. With this decision, all tools, resources, and continuing relationships have been transitioned from CRE to the BetterBricks Platform.
		Increase awareness of BetterBricks resources and traffic to funder sites	10 percent above 2018 levels	5 percent above 2018 levels	On target or better	The BetterBricks Campaign, which was approved by RPAC+ in February, launched in Q2. Year-to-date (Q1-Q3), traffic to BetterBricks has increased 246% over the same time frame in 2018. Referrals from BetterBricks to utility websites has increased 214% year to date as compared to the same time frame last year.



Infrastructure Programs						
Program Name	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Notes
Top-Tier Trade Ally Advanced Training (TTTA); Rachel Zakrasek	Accelerate the market adoption of commercial and industrial advanced lighting retrofit practices by building connectivity between contractors, training resources and regional partner programs	An additional 65 trade allies and 15 companies achieve NXT Level 1 designation	65 trade allies and 15 companies	60 trade allies and 12 companies	Heads up; corrective action in process	In Q3, 19 additional trade allies and 2 companies achieved NXT Level 1 designation, for a total of 47 trade allies and 7 companies designated year-to-date. This Q3 performance was very high in comparison to previous years thanks to a successful summer completion campaign encouraging participants to complete their designation in Q3. NEEA staff expect that momentum to carry into Q4 and to achieve the annual target for trade ally designations. Company designations have continued to be a challenge due to the administrative burden on companies, as well as the low additional value of a company designation in areas where efficiency programs do not offer referrals or other benefits for designees. In Q4, the program will implement targeted outreach to potential company designees in an effort to reach the threshold for this goal.
		At least 25 individuals achieve NXT Level 2 designation	25 individuals designated	20 individuals designated	On target or better	28 trade allies have achieved NXT Level 2 designation, surpassing the program's 2019 target. An additional 45 trade allies were enrolled in NXT Level 2 as of the end of Q3, some still moving through the curriculum from previous NXT Level workshops, and some participating in the second NXT Level 2 webinar series of this year which took place via a two-part series on September 26 and October 3, respectively. More trade allies are expected to achieve their NXT Level 2 designation this year and early in 2020.
		NXT Level 2 offered to additional participants in areas of lower designee concentration	Training offered by Q3 2019	Training offered by Q4 2019	On target or better	The program has now successfully delivered two webinar series of the initial NXT Level 2 workshop (traditionally offered in person), one in May to over 30 participants from all 4 states, including areas of lower designee concentration, and one in September-October to 29 participants (attendance details forthcoming). The webinar offers the equivalent workshop content in two webinars, after which participants move through the NXT Level 2 curriculum as prescribed. Given the strong attendance and ability to reach trade allies across the region, the program is exploring ways to enhance this delivery method, seeking ways to make it even more robust and engaging.

Infrastructure Programs						
Program Name	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Notes
		NXT Level 2 rolled out in person in at least two locations in region	Training rolled out by Q2 2019	Training rolled out by Q4 2019	On target or better	The program reached this target goal in Q1 this year, having hosted NXT Level 2 in-person workshops in the Puget Sound area in Q4 2018 and the Portland area in Q1 2019.
Commercial and Industrial Strategic Energy Management (SEM) Infrastructure; Debbie Driscoll	Provide a holistic and integrated set of tools to support regional partners and the market in building market capability, awareness and demand for SEM	75 or more individuals participate in 2019 SEM Collaborative events	75 participants in 2019 SEM Collaborative events	50 participants in 2019 SEM Collaborative events	On target or better	The NW SEM Collaborative held its 2019 Fall Workshop on October 24 in Portland. Feedback has been very positive. The event attracted nearly 70 attendees, and when combined with Working Group participation throughout the year, the Collaborative has engaged over 80 people this year.
		NEEA supports active funder engagement in SEM standard practices by offering branded customization of EMA, LMS and SEM Hub	5+ active, customized LMS, EMA or SEM Hub implemented; 200 registered EMA users	5+ customized LMS, EMA or SEM Hub implemented either active or in development; 100 registered EMA users	Heads up; corrective action in process	There have not been any additional customizations of SEM Hub tools since Q2; there are three active, customized versions of the SEM Hub's Energy Management Assessment (EMA) tool and one active, customized version of its Learning Management System (LMS) platform with SEM online courses. There are also currently 95 registered users of the SEM Hub (non-customized) EMA (up by 18 users since Q2) and 259 users total across all EMA sites (up by 29 users since Q2). NEEA staff continue to work with funders who have expressed interest in customizing either the EMA and/or LMS, including Puget Sound Energy Industrial, Pacific Power, Energy Trust of Oregon, and Tacoma Power; however, no concrete plans are in place to create customized versions in Q4.
		Regional collaboration on approach for SEM market measurement and data management	Regional collaboration on a plan by end of Q2 2019	Regional collaboration on a plan by end of Q4 2019	On target or better	The program provided a regional SEM Data Plan for funder review in Q3, available at <a href="https://conduitsnw.org/Pages/File.aspx?rid=4931">https://conduitsnw.org/Pages/File.aspx?rid=4931</a> . Funders supported moving forward with the proposed first step, a meta-analysis of existing evaluations and reports to summarize regional key performance indicators, program achievements and data gaps. The information is expected to provide insights to programs and serve as the foundation for future Data Plan activities. Contracting is in process; NEEA staff anticipate completing the meta-analysis by January 2020.

Infrastructure Programs						
Program Name	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Notes
		Three or more NW SEM Collaborative workgroups meet actively and produce outputs that build body of knowledge and alignment, and are shared in regional or national forums	Three or more workgroups meet at least quarterly and present work outputs in regional or national forums	Two workgroups meet at least quarterly and present work outputs in regional or national forums	On target or better	All four workgroups were active in Q3: Beyond the E; Measurement and Verification (M&V); SEM Benchmarking; and Integrating SEM. The Measurement and Verification Working Group recently published a new overview of energy modeling approaches on SEMHub.com: <a href="https://semhub.com/resources/sem-energy-modeling-method-selection-guide">https://semhub.com/resources/sem-energy-modeling-method-selection-guide</a> . The volunteer-led whitepaper provides very relevant and needed information on the selection and application of a variety of SEM M&V methods.
		Achieve 8,500+ page views, 850+ resource downloads, and 300 return visits via www.semhub.com (Q4)	8,500+ page views and 850+ resource downloads	5,000+ page views and 500+ resource downloads	On target or better	In Q3 the program surpassed its annual goal thresholds for both page views and resource downloads via <a href="http://www.semhub.com">http://www.semhub.com</a> , and is still on track to hit the goal target by the end of 2019. There were 1,885 new page views in Q3, for a total of 6,832 year-to-date, and 177 resource downloads, for a total of 667 year-to-date. Overall, views, resource downloads and user traffic were slightly lower than in Q2, but still high. The site saw 540 new users in Q3. NEEA staff continued outreach to users through the new SEM Hub newsletter launched in Q2, and also heavily promoted the SEM Collaborative Fall Workshop (October 24 in Portland).
Industrial Technical Training (ITT); Warren Fish	Provide a coordinated program of technical trainings to support industrial energy efficiency programs and build market capacity for Strategic Energy Management (SEM).	180+ Individuals Participate in ITT Courses with 17+ Average Class Size	180 participants by Q4	180 participants by Q4	On target or better	Through the end of Q3, eight in-person trainings were delivered to 141 attendees, with an average class size of 18. No trainings occurred in Q3 and four remaining trainings are planned for Q4: <ul style="list-style-type: none"> <li>Pumping System Optimization: Tacoma, Washington, October 3<sup>rd</sup>; Best Lighting Retrofits Now and Future Impacts: Great Falls, Montana, October 22<sup>nd</sup> and Vancouver, Washington, October 24<sup>th</sup>; Industrial Refrigeration Systems Energy Management, Hermiston, Oregon, November 6<sup>th</sup>.</li> </ul> Since the ITT program is concluding at the end of 2019, NEEA staff are working with stakeholders on the disposition of program assets, sharing all of the tools, templates, contact information, and other resources about ITT with all interested funders.

Infrastructure Programs						
Program Name	Program Goal	2019 Operations Plan Milestones	Target	Threshold	Q3 Status	Notes
		Achieve Funder Satisfaction Rate of 95%+	95% satisfaction rate by Q4	95% satisfaction rate by Q4	On target or better	2019 funder satisfaction level is currently at 95% and on track to meet our annual goal of 95%+.
		Achieve Trainee Satisfaction Rate of 95%+	95% satisfaction rate by Q4	95% satisfaction rate by Q4	On target or better	2019 attendee satisfaction level is currently 99% and is on track to exceed our 95%+ annual goal.
		Deliver 9 Training Courses	9 courses by Q4	9 courses by Q4	On target or better	The 2019 annual training plan, developed in concert with participating funders, includes a total of 12 scheduled trainings. Eight of the 12 trainings in 2019 were completed in Q1 and Q2. The four remaining trainings in the 2019 plan are all completed or on-track to go forward as planned.

# 2019 Q4

## Emerging Technology Quarterly Report

### WHAT'S NEW:



As we enter the final stretch of 2019, I'm reflecting on the year's innovations that should benefit our region's pipeline of efficient products. This isn't an exhaustive list, but merely items that I think are particularly interesting. What innovations from 2019 are high on your list? I'd love to hear from you.

**Variable Capacity Heat Pump Test Method:** In March 2019, the Canadian Standards Association (CSA Group) published CSA EXP-07, a load-based test method for variable capacity heat pumps. It includes procedures for testing heat pumps in all climates. Early 2019 testing shows that the test method does a great job of identifying heat pumps that work best in climates relevant to the Northwest. We expect manufacturers to use this test method to innovate and maximize the value of their heat pumps for each climate zone, delivering predictable real-world savings and helping the region reduce its residential HVAC load.

**Luminaire Level Controls for HVAC and Plug Loads:** For years, luminaire level lighting controls have promised the ability to also control HVAC and plug loads. In 2019, NEEA staff launched a field study to test this capability. Our hypothesis is that luminaire level controls (lighting, HVAC and plugs) will provide unmatched occupant comfort while saving energy without the need for special programming, leading to significant savings for lighting, HVAC and auxiliary loads.

**Primary and Secondary Windows:** In 2019, the Attachment Energy Rating Council (AERC) launched a residential window attachment certification process and label. A similar certification process is in development for commercial window attachments and is scheduled for launch in early 2020. In response to these independent certification processes, we are seeing significant innovation in both primary and secondary window products for residential and commercial buildings including suspended film window attachments, thin triple pane primary and secondary windows, and low-e films. In 2020, there will be a greater variety of window treatments than ever before enabling building owners to choose efficient options to meet their needs for comfort, security, sound attenuation, and aesthetics.

Please don't hesitate to connect with me if you have questions about our emerging technology portfolio or if you have ideas for products we should consider.

Thank you,

~ Mark Rehley, Sr. Manager ~

### TABLE OF CONTENTS

<b>At a Glance</b>	<u><a href="#">2</a></u>
<b>Emerging Technology Project List</b>	<u><a href="#">3</a></u>
<b>Residential</b>	<u><a href="#">3</a></u>
<b>Commercial</b>	<u><a href="#">6</a></u>
<b>Industrial/Agricultural</b>	<u><a href="#">8</a></u>
<b>Cross-Sector</b>	<u><a href="#">9</a></u>
<b>Definitions</b>	<u><a href="#">13</a></u>
Market/Commercial Readiness	<u><a href="#">13</a></u>
Product Performance Readiness	<u><a href="#">13</a></u>
Program Readiness	<u><a href="#">13</a></u>
<b>Contact Us</b>	<u><a href="#">14</a></u>
Ask questions	<u><a href="#">14</a></u>
Request feedback	<u><a href="#">14</a></u>
Suggest technologies	<u><a href="#">14</a></u>

# Readiness Levels

## AT A GLANCE

Ratings based on 1=low & 5=high

PRODUCT  
PERFORMANCE\*

MARKET/  
COMMERCIAL\*

PROGRAM\*



## Residential

Advanced Walls

3

2

1

Clothes Washers

4

5

5

Ductless Heat Pump Product Innovations

2

3

3

Smart Thermostats

3

5

4

Thin, Lightweight Triple Pane Window

3

1

2

Ultra-High Definition TVs

3

5

5



## Commercial

Advanced Research Projects Agency - Energy (ARPA-e)

1

1

1

Luminaire Level Lighting Controls

2

3

3

Luminaire Level Lighting Controls with HVAC Control

2

3

3

Very High Efficiency DOAS

5

4

4



## Industrial/ Agricultural

Compressed Air Saving Unit

2

3

3



## Cross-Sector

Combination Hot Water and Space Heat (Gas & Electric)

3

4

2

Extended Motor Products

3

2

3

Split-system Heat Pump Water Heater

3

3

4

Switch Reluctance Motors

4

3

3

Variable-Capacity Split System Heat Pumps

3

3

4

Window Attachments

3

3

3

\*Full Readiness Level Definitions provided on page [13](#)

\*PRODUCT PERFORMANCE READINESS: Measurement of energy savings viability, fitness for use, and the Regional Technical Forum measure status if applicable

\*MARKET/COMMERCIAL READINESS: Measurement of supply chain maturity, product availability, presence of market failures, and lack of market maturity

\*PROGRAM READINESS: Measurement of cost effectiveness, program delivery and interventions, and a risk assessment of technical, market, program and regulatory risk



# Residential

## EMERGING TECHNOLOGY PROJECTS

### Advanced Walls

**Product Description:** External wall systems with increased insulative levels.

**Project Objective:** Document three “Net Zero Class” wall systems, assess performance, and identify market barriers.

**Project Update:**

Phase 1 report is complete. Contact Christopher Dymond for a copy.

Phase 2 work is in progress and expected to be complete by the end of 2019.

Phase 3 activities may be integrated into NEEA's Next Step Homes (NSH) program activities during 2020-21.

**Product Manager:** Christopher Dymond  
cdymond@neea.org  
503.688.5454

Product	3	Comm/Market	2	Program	1
---------	---	-------------	---	---------	---

### Clothes Washers

**Product Description:** Residential appliance for washing clothes.

**Project Objective:**

Project 1 - Compare the water and energy use differences between a GE agitator top load washer that is ENERGY STAR certified versus a GE agitator washer that is not ENERGY STAR certified; including a tear down analysis.

Project 2 – Develop and validate a lab test protocol that reflects real-world fabric types, load sizes, and/or washer settings while ensuring it is repeatable and reproducible for the industry to implement.

**Project Update:** A contract has been awarded to complete projects 1 and 2. The work will be completed in 2020.

**Product Manager:** Nick Leritz  
nleritz@neea.org  
503.688.5455

Product	4	Comm/Market	5	Program	5
---------	---	-------------	---	---------	---





# Residential

## EMERGING TECHNOLOGY PROJECTS

### *Ductless Heat Pump (DHP) Product Innovations*

**Product Description:** HVAC split systems, including ductless split systems, utilize variable speed (inverter-driven) compressors and fans.

**Project Objective:** NEEA staff, Pacific Northwest National Lab (PNNL), Bonneville Power Administration (BPA) and Silicon Valley Power (SVP) are working on a project to identify 2-4 low cost standards of practice and/or technology solutions to maximize the annual performance of a DHP (mini-split) when installed in a home with a pre-existing heating system (electric zonal and electric forced air furnaces).

**Project Update:** Phase 1 is complete (identifying all use cases and currently available products). Phase 2 is complete. Phase 3 is complete (testing PNNL lab homes). Winter and cooling season data collection complete. Phase 4 (analysis and report writing) is underway and due to be complete by the end of 2019.

**Product Manager:** Christopher Dymond  
cdymond@neea.org  
503.688.5454

Product	2	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---

### *Smart Thermostats*

**Product Description:** Residential thermostats that control various heating and cooling equipment, utilize weather and occupancy data to better manage the systems, and engage homeowner to more closely manage energy use and comfort.

**Project Objectives:** To develop a method to estimate energy savings for Smart Thermostats based on performance metrics. This will enable Northwest utilities to quickly screen new products for inclusion in Qualified Products Lists (QPLs) and estimate energy savings.

**Project Status:** Vendor has been chosen. Project will kick off as soon as funding contracts and vendor contract is signed.

**Product Manager:** Dave Kresta  
dkresta@neea.org  
503.688.5459

Product	3	Comm/Market	5	Program	4
---------	---	-------------	---	---------	---



# Residential

## EMERGING TECHNOLOGY PROJECTS

### *Thin, Lightweight Triple Pane Window*

**Product Description:** Primary window using three panes of glass: two standard thickness and one center thin pane of glass. The thickness and weight are similar to standard, double pane windows.

**Project Objective:** Document product costs by component to demonstrate potential cost effectiveness, and document manufacturer engagement and interest.

**Project Update:** The report is completed, but not yet published, contact Christopher Dymond at [cdymond@neea.org](mailto:cdymond@neea.org) for copy of final draft.

**Product Manager:** John Jennings  
[jjennings@neea.org](mailto:jjennings@neea.org)  
 4503.688.5471

Product	3	Comm/Market	1	Program	2
---------	---	-------------	---	---------	---

### *Ultra-High Definition (UHD) TVs*

**Product Description:** 4K Ultra high definition (UHD) TVs with various forms of advanced display technologies.

**Project Objectives:** An updated Department of Energy (DOE) TV Test Procedure and IEC (International Electrotechnical Commission) test clip that adequately address existing features, such as Automatic Brightness Control (ABC) and Motion Detection Dimming (MDD), to prevent gaming of test results by manufacturers and that incorporate emerging technology such as UHD, True and Upscaled High Dynamic Range (HDR), increasing panel brightness, stand-by power, etc.

An updated ENERGY STAR specification that addresses issues with ABC/MDD, new energy consuming features such as UHD, and accounts for the DOE test procedure and IEC test clip updates.

**Project Update:** Work continues in updating the IEC test clip and informing edits to the federal test method to address new technology features such as HDR and connectivity.

A test stand is being developed to support in-retail automated testing using the draft test clips and draft test procedure. NEEA staff plan to test up to 150 TVs during October of 2019 to characterize the use and deployment of advanced TV features.

**Product Manager:** Chris Walgamott  
[cwlgamott@neea.org](mailto:cwlgamott@neea.org)  
 503.688.5484

Product	3	Comm/Market	5	Program	5
---------	---	-------------	---	---------	---



# Commercial

## EMERGING TECHNOLOGY PROJECTS

### *Advanced Research Projects Agency-Energy (ARPA-e)*

**Project Description:** Approximately every three years, ARPA-e issues OPEN Funding Opportunity Announcements (FOAs) as a means to address the full range of energy-related technologies and fund those potentially disruptive technology concepts not currently supported through an ARPA-e focused FOA. ARPA-e selects individuals and organizations with experience in the energy sector to review and rate applications for funding. NEEA staff were invited by ARPA-e to review over 20 initial OPEN funding proposals including LED lighting, window attachments, and HVAC. The proposals gave NEEA staff visibility of a range of pre-commercialized technologies that might impact future energy efficient products for our region.

**Project Update:** Funding has been awarded to over 40 projects. Follow this link for more information about these projects that received funding from the OPEN FOAs [https://arpa.e.energy.gov/sites/default/files/documents/files/OPEN\\_2018\\_Project\\_Descriptions\\_FINAL%20VERSION.pdf](https://arpa.e.energy.gov/sites/default/files/documents/files/OPEN_2018_Project_Descriptions_FINAL%20VERSION.pdf)

**Product Manager:** Chris Wolgamott  
cwolgamott@neea.org  
503.688.5484

Product	1	Comm/Market	1	Program	1
---------	---	-------------	---	---------	---

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

**Product Description:** Advanced lighting control systems, either with wireless sensors or with luminaire integrated lighting controls, providing occupancy-sensor and light-level control plus energy metering.

**Project Description:** The Next Generation Lighting Systems (NGLS) competition in 2017 and 2018 selected connected lighting for testing its installation, commissioning and energy performance in a real-world test location. Installations for retrofit kits (Competition Two) is now closed for entries; installations took place in January 2018, and the installed systems will join the Competition One systems in the Living Lab at Parson's School of Design in New York City. NEEA staff have participated as observers in the process.

**Project Update:** Phase 3 of the Interior installs was completed in Q3. Results were promising from the Bluetooth Mesh system that was installed. Good results were seen from the upgrade of past Phases to most current systems. PNNL is currently writing a report due in Q1 2020. Two to three new systems are waiting to be installed before the end of Q4 2019.

**Product Manager:** Chris Wolgamott  
cwolgamott@neea.org  
503.688.5484

Product	2	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---



# Commercial

## EMERGING TECHNOLOGY PROJECTS

### *Luminaire Level Lighting Controls (LLLC) with HVAC Control*

**Product Description:** Luminaire level lighting controls with additional sensors and supports for HVAC control.

**Project Objective:** To define if there is additional energy savings from more granulated sensors in every general lighting fixture. Looking at different control strategies for HVAC and how the HVAC controls look at the information that is being collected by the lighting sensors.

**Project Update:** Study has begun, we are in the baseline gathering status. NEEA staff are working with Integrated Design Lab (IDL) to complete the study method and guidelines. HVAC software should be installed by end of Q4 2019 along with controlled plugs.

**Product Manager:** Chris Wolgamott  
cwolgamott@neea.org  
503.688.5484

Product	2	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---

### *Very High Efficiency Dedicated Outside Air Supply (VHE DOAS)*

**Product Description:** Replacing packaged rooftop units (RTU) with a combination dedicated outdoor air system, heat recovery ventilator, and high efficiency heat pump. The key distinguishing feature is the separation of ventilation from heating and cooling via Dedicated Outside Air System (DOAS) with high efficiency heat recovery ventilation (HRV) system to minimize the ventilation conditioning load.

**Project Objectives:** Demonstrate feasibility and savings potential in different building types and climates. Improve energy modeling and modeling tools for DOAS/HRV systems.

**Project Update:** Seven projects with draft technical reports are complete. Five projects have completed case studies on BetterBricks.com. Two reports in process and one project completed the data collection with analysis underway. Two baseline heat pump projects are being monitored; modeling guidelines have been developed. Economic analysis of VHE compared to baseline and mid-level systems has been completed. Sensitivity analyses of product requirements underway. Outreach to several HRV manufacturers regarding potential qualifying equipment underway.

**Product Manager:** John Jennings  
jjennings@neea.org  
4503.688.5471

Product	5	Comm/Market	4	Program	4
---------	---	-------------	---	---------	---



# Industrial/Agricultural

## EMERGING TECHNOLOGY PROJECTS

### *Compressed Air Saving Unit*

**Product Description:** Variable control air nozzle for compressed air open blowing applications.

**Project Objectives:** Savings value for Regional Technical Forum (RTF) to review.

**Project Update:** Field data highlighted an issue with the adjustment for pulsing frequency. NEEA staff are working with manufacturers to see what options are available to make the adjustment repeatable.

**Product Manager:** Geoff Wickes  
gwickes@neea.org  
503.688.5456

Product	2	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---





# Cross-Sector

## EMERGING TECHNOLOGY PROJECTS

### Combination Hot Water and Space Heat

(Gas & Electric)

**Product Description:** An integrated appliance providing space and water heating. Production options include different refrigerants and water, air, and refrigerant working fluids.

**Electric:**

- CO2 refrigerant split system – Sanden Eco-Runo
- 410a refrigerant integrated system – Chiltrix

**Gas:**

- Condensing gas integrated system – NTI
- Vapor Compression Heat Pump – Intellichoice, m-Trigen
- Stirling cycle heat pump – boostHEAT, Thermolift
- Internal combustion engine (ICE) driven heat pump – Tecogen Illios, Blue Mountain Energy
- Absorption heat pump – Stone Mountain Technologies Inc. (SMTI), Robur

**Project Objective:** Demonstrate the performance and adaptability of these systems to provide space conditioning and domestic water heating systems in existing homes and small commercial applications.

**Project Status:** Electric

- Eco-Runo: Project scope was reduced from 11 units to 9 units due to loss of WSU staff in 2018. Nine Eco Runo heat pump systems. Data has been collected for two years on 7 systems to date. Draft report due EOY 2019. Final report due Q2 2020.

**Project Status:** Gas

- Robur - The two Robur Heat Pumps performed close to Robur's stated efficiencies thus far in the field study. In July 2019, one of the heat pumps experienced a motor failure confirmed by the unit's diagnostic system; motor was replaced and returned

to operation. The installation site experienced no impact as the second Robur unit continued to operate without issue. Project will conclude November 2019; final report due in Q1 2020.

- Blue Mountain Energy - ICE Heat Pump: Project cancelled.
- SMTI - Absorption Air Source Heat Pump: : Installation of two field test units on two homes in La Crosse, WI continue to operate well. Controls have been further optimized and monitoring of the field units continues through 2019. Final report is due Q1 2020.
- SaltX – Thermal-Mechanical Heat Pump: NEEA staff's project with SaltX has been assigned to HeatAmp (a spin-off of SaltX), effective Sept. 2019. Rheem and HeatAmp are collaborating on commercializing a natural gas combination space and water heating system and NEEA staff will be participating to accelerate this development. The product requirements document and market investigation efforts will be complete in Q4 2019. The planned project completion date is June 2020.
- boostHEAT - NEEA staff are developing a proposal for field and lab testing a boostHEAT product in the Northwest. If the field study is approved, it will start in Q1 2020 following the arrival of product from France.
- Thermolift – NEEA staff are planning to test first production systems from Thermolift. Originally, testing was going to start Q1 2020. Due to product delays, testing will begin Q2-Q3 2020.

**Product Managers:** Christopher Dymond (electric) / Eric Olson (gas)  
 cdymond@neea.org / eolson@neea.org  
 503.688.5454 / 503.688.5435

Product	3	Comm/Market	4	Program	2
---------	---	-------------	---	---------	---



# Cross-Sector

## EMERGING TECHNOLOGY PROJECTS

### *Extended Motor Products (XMP)*

**Product Description:** Integrated motor systems with optimized performance to a system curve. Includes motor, controller, and fan / pump / compressor combinations.

**Product Description:**

**Fan:** Fan, motor and integrated controls.

**Compressed Air:** Compressor, motor and integrated controls.

**Project Objectives:**

**Fan:** Develop standardized specification, testing method and label to make fan selection reflect performance and energy use.

**Compressed Air:** Leverage the XMP label concept to allow the marketplace to select the most appropriate air compressor for the customer application. Develop a functional label, performance measurement of wire to air metric, UES (Unit Energy Savings), through the RTF.

**Pump:** Validate RTF planned savings for clear water pumps and circulators.

**Project Update:**

**Fan:** A contractor was selected, and prep work and research are underway with the RTF. Technical and industry work groups have been identified. NEEA staff intend to present measures to the RTF no later than end of 2019.

**Compressed Air:** No new activity this quarter. Industry members still considering timing of launching the metric.

**Pump:** NEEA staff are in an active working group with the initiative team. Research is complete. Pacific Gas and Electric (PG&E) assisted with funding the \$600K research project. Research findings have started to be transferred to the RTF Contract Analyst Team (CAT) as they become available. Then it will go to the RTF for “proven” status later 2019. Savings look promising. Findings will be presented to the Pumps Working Group in July, with a report published Q4 2019.

**Product Manager:** Geoff Wickes  
 gwickes@neea.org  
 503.688.5456

Product	3	Comm/Market	2	Program	3
---------	---	-------------	---	---------	---





# Cross-Sector

## EMERGING TECHNOLOGY PROJECTS

### *Split-system Heat Pump Water Heater*

**Product Description:** Split-system heat pump water heaters separate the heat pump from the water tank. These products offer a heat pump alternative for locations where the integral product doesn't fit.

**Project Update:** Ecotope hosted, and NEEA staff participated in, a multifamily water heating workshop that demonstrated approaches to using heat pump water heaters in multifamily buildings. Heat pump water heaters in multifamily buildings offers significant regional technical savings potential (~150aMW), but the savings are highly dependent on equipment and design.

**Product Manager:** Geoff Wickes  
 gwickes@neea.org  
 503.688.5456

Product	3	Comm/Market	3	Program	4
---------	---	-------------	---	---------	---

### *Switch Reluctance Motors*

**Product Description:** A Switched Reluctance Motor (SRM) is a type of stepper motor, an electric motor that runs by reluctance torque. It is easier to control and has greater efficiency at part load conditions.

**Project Objective:** Document efficiency potential for the northwest including considerations for savings from applications where a gear box or belt are eliminated.

**Project Update:** Revised completion date of report set to Q4 2019.

**Product Manager:** Mark Rehley  
 mrehey@neea.org  
 503.688.5499

Product	4	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---



# Cross-Sector

## EMERGING TECHNOLOGY PROJECTS

### Variable-Capacity Split System Heat Pumps

**Product Description:** A split-system heat pump based on the successful inverter-driven technology found in ductless heat pumps.

**Project Objective:** Develop and validate a test procedure to generate an accurate seasonal Coefficient of Performance (COP) value for heat pumps. This project is a collaboration of NEEA staff, PG&E, BPA, Purdue University, seven Canadian utilities, Natural Resources Canada (NRCAN) and the Electric Power Research Institute (EPRI), with the Canadian Standards Association.

**Project Update:** NEEA staff and NRCAN have completed the testing of 15 cold climate heat pumps.

PG&E is setting up a lab to retest several so we can assess the reproducibility of the test. NEEA staff will host a preliminary findings webinar on November 26th, 2019. Contact Christopher Dymond for info. A plain language guide and preliminary findings report will be completed by EOY 2019.

**Product Manager:** Christopher Dymond  
cdymond@neea.org  
503.688.5454

Product	3	Comm/Market	3	Program	4
---------	---	-------------	---	---------	---

### Window Attachments

**Product Description:** Products that attach to existing low performance windows to increase their energy performance; includes films, blinds, storm windows, secondary glazing systems, awnings, etc.

**Project Objective:** Assess the energy savings and product performance of low-e surface applied films.

**Project Update:** PNNL is preparing to install and test in-place, on an occupied administrative building, the newest generation of hard-coat, washable Low-e Surface Applied Films (SAF). This physical testing will evaluate technical, qualitative, and product “fit for use” durational performance, including visual and thermal comfort improvements. The testing will occur from 9 to 12 months through seasonal changes and temperature extremes.

**Product Manager:** Mark Rehley  
mrehley@neea.org  
503.688.5499

Product	3	Comm/Market	3	Program	3
---------	---	-------------	---	---------	---

# Definitions

## MARKET & COMMERCIAL READINESS

	Level 1: Pre-commercial	Level 2: Limited	Level 3: Niche	Level 4: Growing	Level 5: Wide
<b>Supply Chain Maturity &amp; Market Demand</b>	Not commercially available or limited, pre-commercial availability	Commercially available outside of region  Requires special order  Limited market awareness	Commercially available in NW from 1 manufacturer through standard channels  Niche market demand	Commercially available in NW from at least two manufacturers  Growing market demand	Commercially Available from 2+ manufacturers, well developed supply chain across region  Wide market demand

## PRODUCT PERFORMANCE READINESS

	Level 1: Unvalidated	Level 2: Engineering Validation	Level 3: Lab Validation	Level 4: Limited Field Validation	Level 5: Confirmed
<b>Savings Reliability &amp; Fitness for Use</b>	Manufacturer claims energy savings but not validated by unbiased experts	Concept validated by unbiased expert via technical review and engineering calculations	Independent lab testing of product features and energy use in typical applications with clear baseline established	Lab and small scale field testing across broader range of applications and systems conditions	Reliable prediction of performance across the range of intended applications; fully evaluable savings via established protocols by regional or national bodies

## PROGRAM READINESS

	Level 1: None	Level 2: Exploratory	Level 3: Preliminary Pilots	Level 4: Full-scale Pilots	Level 5: Ready
<b>Cost Effectiveness Knowledge</b> <i>(technical and market potential, product cost at scale, non-energy benefits)</i>	None or very limited	Performance readiness at 2; initial market size calculated (units per year)	Performance readiness at 3; product cost at-scale estimated	Performance readiness at 4; product costs at or trending towards at-scale levels; preliminary estimates of non-energy benefits	Performance readiness at 5; CE calculations based on solid estimates or proven values
<b>Market &amp; Program Knowledge</b>	None or very limited	Preliminary research exposes barriers and/ or similarities to other successfully transformed markets warranting further efforts	Market research illuminates barriers and opportunities to intervene; preliminary logic model developed; small-scale pilots	Formal market characterization underway; larger-scale pilots to test program elements and barrier removal	Formal logic model developed; market characterization and large-scale pilots prove out program design and barrier removal
<b>Risk Assessment</b> <i>(Market, Program, Regulatory)</i>	No risk assessment	Limited risk assessment	Preliminary risk assessment complete - major categories of risk understood	Well-developed risk assessment - no major unresolved risks	Periodic risk assessment process in place



**Mark Rehley**

Sr. Manager, Emerging Technology  
& Product Management

mrehley@neea.org  
503.688.5499



**Christopher Dymond**

Sr. Product Manager

cdymond@neea.org  
503.688.5454



**Chris Wolgamott**

Sr. Product Manager

cwolgamott@neea.org  
503.688.5484



**Dave Kresta**

Sr. Product Manager

dkresta@neea.org  
503.688.5459



**Geoff Wickes**

Sr. Product Manager

gwickes@neea.org  
503.688.5456



**Jeff Rigotti**

Sr. Product Manager

jrigotti@neea.org  
503.688.5494



**John Jennings**

Sr. Product Manager

jjennings@neea.org  
503.688.5471

**Jennifer Tierney**

Sr. Product Manager

njtierney@neea.org  
503.688.5412



**Eric Olson**

Sr. Product Manager

eolson@neea.org  
503.688.5435

**TOGETHER** We Are Transforming the Northwest



# 2019 Q3 *Codes, Standards and New Construction Quarterly Newsletter*

## *Codes Update*

**National Model Code:** The International Code Council (ICC) opened up public comments on the 2021 International Energy Conservation Code (IECC) in July. The commercial code had a total of 161 public comments submitted on 234 proposals presented at the Committee Action Hearings in May. The residential code had 159 public comments submitted on a total of 272 proposals.

NEEA staff and the Northwest Energy Code Group (NWECEG) submitted 9 public comments on several proposals. One public comment modified NEEA's C406 Option Package proposal that more accurately accounts for the energy credit points associated with Heat Pump Water Heaters and provides more value for this option. Other public comments included comments on equipment table provisions and demand control ventilation that will provide clarity to the code requirements. The NWECEG submitted 5 public comments on the residential code proposals.

NEEA and the NWECEG will participate in the final Public Hearings in Las Vegas in October. Proposals passed at these hearings will be subject to final electronic voting by all IECC members including those not at the hearings in October. The final proposals that are approved in the electronic voting will be the basis of the 2021 IECC. The 2021 IECC edition is expected to be published in the June 2020 timeframe.

## *Washington*

**Commercial Code:** NEEA staff and contractors participated in two State Building Code Council (SBCC) public meetings and two Mechanical Ventilation and Energy (MVE) public meetings in July to provide technical testimony on the commercial provisions and assist in modifying the proposed 2018 Washington State Energy Code. NEEA staff provided a lighting requirement based on newly developed ASHRAE Standard 90.1-2019 values, which the MVE committee had recommended to the SBCC council. The lighting values will reduce overall lighting energy consumption by 8%, which is a significant amount of savings from a single proposal.

NEEA staff and contractors also contributed toward addressing issues that were identified in the legislative draft of the new code requirements. Two of the most important issues included: 1) the coverage of building types that require the HVAC Total System Performance Ratio (TSPR) and 2) how additional efficiency package requirements would be applied to core and shell building



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

[BLiu@neea.org](mailto:BLiu@neea.org)



permits. Correcting code language in the legislative draft prevents confusion, misapplication of code, unintended consequences, and will increase code compliance.

The 2018 Washington State Energy Code commercial portion was approved by the SBCC on July 26, 2019 and has an anticipated effective date of July 1, 2020. The final draft 2018 WSEC commercial portion can be found at this [website](#).

**Residential Code:** In Q1 2019, Washington State initiated the process of integrating the 2015 Washington State Energy Code (WSEC) residential portion and the 2018 IECC residential provision. In addition, a total of 34 proposed state amendments were submitted to the State Building Code Council (SBCC) in April 2019. NEEA staff and contractors submitted several code change proposals with energy efficiency improvements and participated in several public meetings including the Technical Advisory Group and Mechanical Ventilation and Energy (MVE) committee meetings held in Q2. SBCC held two public hearings in September to review proposals and hear public testimony. NEEA staff and contractors provided technical testimony to support proposals that advance energy efficiency. SBCC plans to vote on the new residential energy code in Q4 2019. The anticipated effective date of the 2018 WSEC residential provision is July 1, 2020.

**Education and Training:** NEEA continued to provide technical assistance and trainings on the current WA commercial and residential energy codes (2015 WSEC). The training attendees include design and construction professionals, building officials, plan examiners, home builders, contractors, field inspectors and fire marshals.

For the commercial code, a training series has been scheduled for this fall to provide an overview-level summary of the most substantive changes in the upcoming 2018 WSEC. Trainings will be hosted by regional ICC chapters and will be open to jurisdictions plus design and construction professionals. Presentations will include a discussion forum to collect feedback about technical resources and trainings needed, and demonstrations of the new WSEC commercial technical support and compliance documentation webtool. Upcoming trainings include:

- October 2nd – ASHRAE Puget Sound Chapter, Seattle – 2018 WSEC outlook presentation.
- October 10th – ICC-SW Chapter, Vancouver – 2018 WSEC outlook, building science and building enclosure testing.

For the residential code, stakeholder meetings were conducted in support of a collaborative effort to create 2018 WSEC training modules and technical assistance. The residential energy code trainings delivered in Q3 are listed in the table below.



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

[BLiu@neea.org](mailto:BLiu@neea.org)

Course	Length of Course	Attendees	Location	Date
Duct Testing Training	3 hours	9	Olympia	7/22/19
Duct Testing Training	3 hours	25	Spokane	8/21/19
WSEC*	3 hours	20	Tumwater	8/23/19
Duct Testing Training	3 hours	1	Olympia	8/27/19
WSEC*	3 hours	29	Coupeville	9/20/19

\*WSEC: 2015 Washington State Energy Code (residential code)

**Code Compliance Tool:** NEEA continued development work for the web-based WA commercial code [compliance documentation portal](#). The technical support features of this website were publicly launched in February. At the end of Q3, there were over 1,500 registered users for this new tool. The lighting and envelope online compliance documentation tools were publicly launched this quarter, including SMART checklist features. Alpha testing of the mechanical compliance documentation features was initiated in September and limited public beta testing will occur in October. Public launch of the mechanical compliance console is scheduled for late October-early November.

**Commercial Code Evaluation:** The Washington Commercial Code field Evaluation study is in the field. The contractor will visit approximately 100 new commercial building sites throughout the state. This field study is focused on understanding how commercial new construction is being affected by current commercial code across the state. It will provide NEEA and its stakeholders information that will assist with code development and implementation efforts (education and training) by looking at which building systems are present, which compliance paths are being selected, and which code requirements are or are not being met. In Q3 2019, the contractor visited approximately 15 jurisdiction offices throughout the state to collect data regarding code compliance options that were selected for use. The data collection will be completed in Q1 of 2020 and the evaluation will be completed in Q4 of 2020.

**Residential Code Evaluation:** The Washington Residential Code Evaluation study is in progress and will provide NEEA and its stakeholders information to better understand how the 2015 Residential Washington State Energy Code has affected new home construction. The information will be used to support NEEA's on-going code development and training efforts and assist NEEA's efforts to update savings model assumptions and estimations. Phase 1 (review of permit and other documentation) is complete. The working group will review the findings by mid-October to feed into the final work plan for site visits.

## Oregon

**Code Update:** The Oregon Building Code Division has adopted the 2019 Oregon Structural Specialty Code (OSSC), 2019 Oregon Zero Energy Ready Commercial Code (Commercial Code), and 2019 Oregon Mechanical Specialty Code (OMSC). The 2019 OSSC and 2019 OMSC are available on the [ICC website](#) and the energy provisions are available on the Division's [website](#).



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

BLiu@neea.org



These codes are available for use as of October 1, 2019 and will become mandatory on January 1, 2020. The prior versions of the codes will remain available for use during the three-month transition period. The 2019 Oregon Commercial Code adopts ASHRAE Standard 90.1–2016 for commercial buildings and 2018 IECC commercial provisions for multifamily buildings.

**Education and Training:** NEEA continued to provide technical assistance and trainings on the current Oregon commercial and residential energy codes. This quarter NEEA coordinated with Energy Trust of Oregon and Oregon Department of Energy to finalize the training plan in preparation for the newly adopted Oregon commercial code (ASHRAE Standard 90.1-2016). Energy Trust and NEEA will host two rounds of trainings in Q4:

- November 7th – 4 hour in-person training in Portland.
- The week of November 11th - A series of webinars.

The residential energy code trainings delivered in Q3 are listed in the table below.

Course	Length of Course	Attendees
Designing for the Future	1 hour	14
Building Science Fundamentals	1 hour	17
Durability and Water Management	1 hour	11
Thermodynamics	1 hour	10
Moisture Management	1 hour	19
Building Exterior Shell Training	1 hour	2
Solving Energy Code Problems	1 hour	14
HVAC and the Energy Code	1 hour	26
Energy Code Compliance	1 hour	4
Home Energy Performance Scores	1 hour	6
2017 Oregon Energy Code	1 hour	107
Making Sense of the Energy Code	2 hours	19
Energy Code Option 6	1 hour	12
Total		261

**Commercial Code Evaluation:** The Oregon Commercial Code Evaluation Study final report is complete. Due to additional analysis requests, the posting deadline was pushed out from what was reported in the last newsletter. The report review and posting on the NEEA website is anticipated to be completed by the end of October 2019.

## Idaho

**Code Update:** The Idaho Building Code Board (BCB) voted to approve the 2018 IECC with Idaho amendments on August 13, 2019. The approved Idaho residential energy code contains



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

BLiu@neea.org

statewide amendments to decrease the efficiency requirements compared to the 2018 IECC<sup>1</sup>. The approved commercial code contains a minor amendment to 2018 IECC (i.e. commissioning) without significant energy impact. The next step will be Legislator approval in Q1 2020 with an anticipated effective date of January 1, 2021. Idaho Division of Building Safety (DBS) and Idaho Association of Building Officials (IDABO) will conduct legislative luncheons in Q4 2019 to provide updates regarding the 2018 IECC codes and answer any questions.

**Education and Training:** The Idaho Energy Code Collaborative has offered 11 code related trainings to over 93 participants in Q3. The code trainings delivered in Q3 are listed in the table below.

Course	Length of Course	Attendees	Location	Date
Duct and Envelope Tightness	8 hours	19	Meridian	7/9/2019
Duct and Envelope Tightness	8 hours	19	Meridian	7/10/2019
Air Balance	8 hours	19	Meridian	7/11/2019
Air Balance	4 hours	3	Meridian	7/11/2019
Duct and Envelope Tightness	12 hours	3	Meridian	7/11/19 - 7/12/19
Effective Air Sealing	2 hours	2	Meridian	7/12/2019
2018 IECC Updates	2 hours	4	Meridian	7/17/2019
Residential Code	1 hours	2	Kuna	7/18/2019
Effective Air Sealing	1 hour	2	Kuna	7/18/2019
Air Balance	4 hours	8	Coeur d'Alene	8/5/2019
2018 IECC	8 hours	12	Nampa	9/11/2019

## Montana

**Code Update:** The Energy Code development process began during Q3 2019. The Montana Department of Labor and Industry held three listening sessions in Helena, Billings and Missoula in August. The total code adoption process could take 6-8 months. In response to the listening sessions, the State Building Codes Bureau will make recommendations to the Building Codes Council. The Council accepts public comment and makes recommendations to the Bureau. The

<sup>1</sup> The amendment includes requiring blower door testing for only 20% of single family homes, changing the U-factor from 0.30 to 0.31 for the fenestration in climate zone 5, changing the ceiling insulation requirements from R49 to R38, changing the above grade wall insulation by allowing R-22 instead of R-20 plus R-5 continued insulation, and changing the ERI index from 61 to 68.



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

BLiu@neea.org

Bureau then revises its adoption language and presents it to the Energy and Telecommunications Interim Committee. The final language is then published by the Secretary of State for public comment. The Building Codes Bureau will begin enforcing the code as soon as it is adopted with local jurisdictions having up to 90 days to adopt and begin enforcing the code.

The Bureau will likely form a working group of industry stakeholders to discuss the energy code. Persons interested in participating in the working group should email Eric Copeland ([ecopeland@mt.gov](mailto:ecopeland@mt.gov)).

**Education and Training:** No trainings were offered in Q3 2019 in Montana.

## ***New Construction Program Update***

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

**Total System Performance Ratio:** NEEA staff added savings to Total System Performance Ratio (TSPR) output reports based on utility feedback regarding what additional data points are needed for a TSPR-based utility program. NEEA will continue to work with Puget Sound utilities and the University of Washington Integrated Design Lab to pilot TSPR on real world projects in Q4 2019. User feedback on TSPR will help refine the user interface of the tool and inform 2020 TSPR training content.

**Washington CCE:** NEEA staff and the proposal review group reviewed proposals and selected a contractor in response to a Washington State Commercial New Construction Technical Roadmap Request for Proposal (RFP) in September 2019. Scope of work is being finalized with the contractor and work will kick off in early October. An update on the Roadmap will be provided at an upcoming Washington CCE meeting in Q4.

**Idaho CCE:** NEEA staff, in conjunction with the Idaho Code Collaborative, developed a draft five-year strategic plan that will establish goals, target audience, and key focus areas and will help direct the Collaborative's activities over the next five years. The Collaborative will look to finalize the plan in Q4 2019.

### **Next Step Homes Program**

On September 12, 2019 NEEA staff presented at the Built Green Annual Conference in Lynnwood, WA. The conference brings together sustainable, green builders and programs from across the Northwest to discuss cutting-edge information on the built environment. Topics included: building science, policy, post-occupancy research, and discussions on equity, affordability, and community issues. NEEA staff presented on the topic of using data to transform the market for high-performance homes in the Pacific Northwest.

NEEA staff had one home site visit and high-performance home training planned for Q3 in Roseburg, OR. Q3 is historically a busy time for builders and initial response to participation was



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

[BLiu@neea.org](mailto:BLiu@neea.org)

not large enough to meet training attendee goals. Consequently, the training was postponed. NEEA staff are currently working with the Energy Trust of Oregon to change the training to a “Top 10 Best Practices for Today’s Homebuilder” in-person training and reschedule it mid-November for in Grants Pass, OR.

During Q3, NEEA started collaborating with National Renewable Energy Labs (NREL) and Pivotal Energy Solutions to develop a residential building energy software product that uses EnergyPlus to calculate energy consumption and the Energy Rating Index (ERI), which will be used to credit and/or incentivize building energy efficiency technologies. The long-term goal of this project is to make EnergyPlus a viable product available to energy modelers, raters, verifiers, utilities, program administrators and program evaluators in residential new construction and, ultimately, drive consistency in the calculation of energy consumption and key performance metrics.

The Performance Path Integrated Savings and Incentive Calculator was finalized and released for use in the AXIS database in August 2019. The Calculator allows for easier, more efficient processing of homes in utility incentive programs.

Two new utility programs were successfully launched on October 1, 2019: The City of Richland (WA) and Inland Power & Light (WA).

In September, the BetterBuiltNW team (NEEA’s Residential New Construction market-facing brand) completed and presented the Utility Performance Path Program Launch Guide. The Guide is a hands-on resource intended to lead interested utilities through the process of successfully implementing a Performance Path program.

## Manufactured Homes Program

As a tactic to increase retailer awareness of NEEM+, NEEA staff launched a retailer sales challenge that will offer incentives to sales staff for NEEM+ homes. The challenge will run through Q1 2020 and retailers around the region are eligible to participate.

Thirteen NEEM+ homes were completed and certified in Q3 2019. Kit Homes in Idaho completed 11 and Palm Harbor Homes in Oregon completed two. These manufacturers both reported increasing demand and sales of NEEM+ homes from their key retailers.

NEEA continues to partner with Northwest Energy Works (NEW) to recruit additional manufacturers who offer the NEEM+ specification. Skyline, Valley, and Golden West retailers are all still considering including NEEM+ in their product offerings and working with their supply chain to weigh cost impacts. NEEA staff will continue recruitment into 2020.

The NEEM+ digital ad campaign, which launched earlier this year and focused on increasing consumer awareness and demand for NEEM+ homes, continues to exceed campaign goals. The campaign is scheduled to run through December 2019. Q3 performance highlight metrics include:



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

BLiu@neea.org

- Over 3.4 million impressions generated, over 1.9 million completed video views, and 23,016 clicks back to the [NEEM campaign landing page](#).
- 1,730 clicks on the “Find Retailer” link and 1,260 conversions on the “Retailer URL” links.
- The industry benchmark for conversions is 2.85%. To date, the Retailer URL Conversion Rate is 5.5% and the Find Retailer Conversion rate is 7.5% (increased from 4.4% and 6.1% in June).

## Standards Update

### Federal

**Variable Refrigerant Flow (VRF) Test Procedure and Standard:** NEEA staff participated in three sets of two-day meetings this quarter through DOE’s rulemaking process to develop the VRF test procedure. The working group reached unanimous consensus in October 2019 for a term sheet on the test procedure that will be sent to the Appliance Standard Rulemaking Advisory Committee (ASRAC) for approval. The new test procedure is expected to reveal more realistic ratings that include controls capability to adjust refrigerant temperature and require that a certain amount of latent cooling loads be accounted for at the 75% and 100% load test points in IEER rating. In Q4, we expect as many as four sets of two-day meetings to complete the negotiation of standard efficiency levels based upon the new test procedure. This is one of the few DOE rulemakings expected to provide energy savings in the current regulatory environment.

**Residential Clothes Washer Standards Request for Information:** DOE published a request for information pertaining to standards for residential clothes washers. NEEA staff and contractor are developing comments and data which we plan to submit to DOE on October 17, 2019. NEEA has been working on various research studies associated with clothes washers and has been collecting clothes washer sales data for the Northwest region since 2015.

**Residential Clothes Dryer Test Procedure Notice of Proposed Rule:** DOE published a Clothes Dryers Test Procedure Notice of Proposed Rulemaking and held a public meeting on September 17, 2019. NEEA staff and contractor attended the public meeting and presented data and findings we have developed since the last rulemaking for the residential clothes dryers test procedure. NEEA is working with extra-regional partners to combine our data sets for submission. The comment period for this product was extended based upon a request to provide further data to inform DOE test procedure, based upon extensive testing performed by NEEA and the California Investor Owned Utilities (IOUs). Comments on the test procedure and data are due in November 2019.

**General Service Lamps (GSL) Final Rule:** DOE issued a final rule that eliminates efficiency standards for many of the lamps sold in the Northwest. The rule rolls back a 2017 light bulb definition that would expand the standards to cover the full range of bulb shapes and sizes used in the region, including candle- and globe-shaped bulbs, candelabra-based bulbs, and reflector bulbs used in ceiling fixtures or track lighting. Several states, including Washington, have



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

[BLiu@neea.org](mailto:BLiu@neea.org)

adopted state appliance standards that have DOE's original 2017 final rule as a backstop. It is not clear whether the state standards will be able to pre-empt DOE's federal standards. As a result, regional energy savings projected from these lamps that were accounted for in the Northwest Power and Conservation Council's (NWPPCC) Seventh Power Plan may need to be reviewed.

**Proposed Determination to Eliminate 2020 standards for "A-Lamps":** DOE also issued a proposed determination designed to eliminate the 2020 standards for "A-lamps," or general service bulbs. DOE indicates in the notice that this would prevent automatic standards enacted by Congress in 2007 from taking effect. This proposed determination would affect projected savings estimated in the region's Seventh Power Plan. It is expected that there may be litigation concerning both the GSL Lamp Rule and proposed "A-Lamp" determination that may affect the final outcome of DOE's action.

## Washington

WA Department of Commerce kicked off the rulemaking process in Q3 2019 for the newly signed Appliance Efficiency Standards Bill ([HB 1444](#)). Commerce Department hosted the rulemaking workshop on August 5, 2019 to provide the overview of the rulemaking requirements, identify and prioritize rulemaking issues and gather public input on water heater implementation. During the public comment period, NEEA staff submitted [technical comments](#) and provided the latest technical specification regarding grid-connected electric water heater requirements.

## Canada

The CSA (Canadian Standards Association) modular commercial gas furnaces test procedure (P.8) has been under development for 18 months. NEEA staff and contractor worked with the CSA Technical Committee to develop a calculation-based test procedure that reflects annual heating energy use of commercial gas furnaces. The proposed P.8 test procedure standard accounts for shell losses, heat recovery, electrical consumption and dampers to represent energy use that reflects the relative efficiency of each technology to a unit's overall efficiency rating. We completed refinement in the calculation method and the new test procedure is expected to vote out by the CSA Technical Committee for public review in Q4 2019.



*Please address questions to:*

Bing Liu, P.E., FAHRAE

Sr. Manager, Codes, Standards and New Construction

[BLiu@neea.org](mailto:BLiu@neea.org)