



# Appendix

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## A. REFERENCE BUDGET: CY 2021

Program Budgets - Reflected in the 2021 CNGC Conservation Plan				
Incentive Estimates				
Program	Budget	Allocated as DBtC	Notes	
Residential	\$2,897,659	√	<a href="#">See Residential section</a>	
Commercial/Industrial	\$1,961,057	√	<a href="#">See Com/Ind section</a>	
Low Income	\$840,000	√	<a href="#">See Low Income section</a>	
<b>Total Incentives</b>	<b>\$5,698,716</b>			
Non-Incentive/CNGC Program Implementation Expenses				
Program	Budget		Notes	
Residential	\$1,066,042		Staffing, software, marketing	
Commercial/Industrial	\$1,436,858		Third party program mgmt & marketing, CNGC support & coordination	
Low Income	\$59,900		Staffing, Marketing, training, supplies	
<b>Portfolio Admin Total</b>	<b>\$2,562,800</b>		Residential, Com/Ind, & LI Weatherization	
Portfolio Admin Expenses Breakout:		Budget	Notes	
<b>Labor</b>		\$732,964	Company staff allocated 70% residential/ 30% Commercial/ Industrial, low-income hours + part time cyclical temporary assistance for processing	
<b>Third Party Commercial/ Industrial Program Mgmt.</b>		\$1,228,225	Implementation, outreach for C/I EEIP, total for contractor coordination is dependent on vendor goal achievement	
<b>Annual Software fees</b>		\$236,648	Residential & Low-Income rebate processing, data management, eM&V, TA Program, Care Package/program update support, Virtual Inspections, etc.	
<b>Outreach / Trade Ally / Quality Control</b>		\$317,300	<b>Breakdown</b>	<b>Allocated as DBtC</b>
			\$20,000	√
			\$68,800	√
			\$5,500	√
			\$3,000	√
			\$4,000	√
			\$126,200	
			\$25,000	
			\$64,800	
<b>Other</b>	\$47,664	\$4,275		
			\$23,044	
			\$11,830	
			\$8,515	
<b>Portfolio Admin Total (Included from above)</b>	<b>\$2,562,800</b>	Non-Incentive/Admin Expenses		
<b>Total Incentives</b>	<b>\$5,698,716</b>			
<b>Regional Collaboration</b>	<b>\$159,063</b>	NEEA & RTF (excluded from DBtC)		
<b>Conservation Potential Assessment</b>	<b>\$98,386</b>	AEG CPA & Low Income Market Segment Addendum (excluded from DBtC)		
<b>Total Program Expense</b>	<b>\$8,518,965</b>	Program Delivery + Incentives + NEEA + RTF		



## **B. DEFINITIONS OF POTENTIAL**

Per Applied Energy Group's 2020 Cascade Natural Gas Conservation Potential Assessment (CPA)<sup>1</sup>:

In this study, savings estimates are developed for three types of potential ('cases'): technical, achievable technical, and achievable economic. These are developed at the measure level, and results are provided as savings impacts over the forecasting horizon. The various levels are described below.

- *Technical Potential* is defined as the theoretical upper limit of energy efficiency potential. It assumes customers adopt all feasible measures regardless of their cost. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option. Technical potential also assumes the adoption of every other available measure, where technically feasible. For example, it includes the installation of high-efficiency windows in all new construction opportunities and furnace maintenance in all existing buildings with installed furnaces. These retrofit measures are phased in over a number of years to align with the stock turnover of related equipment units, rather than modeled as immediately available all at once.
- *Achievable Technical Potential* refines technical potential by applying customer participation rates that account for market barriers, customer awareness and attitudes, program maturity, and other factors that affect market penetration of conservation measures. The customer adoption rates used in this study were based on the ramp rates developed for the Council's 2021 Plan and adjusted to reflect differences between electric and natural gas energy efficiency resources and Cascade's program experience.
- *UCT Achievable Economic Potential* further refines achievable technical potential by applying an economic cost-effectiveness screen. In this analysis, primary cost-effectiveness is measured by the utility cost test (UCT), which assesses cost-effectiveness from the utility's perspective. This test compares lifetime energy benefits to the costs of delivering the measure through a utility program, excluding monetized non-energy impacts (NEIs). These costs are the assumed incentive, represented as a percent of the incremental cost of the given efficiency measure, relative to the relevant baseline course of action (e.g. federal standard for lost opportunity and no action for retrofits), plus any non-incentive costs that are incurred by the program to deliver and implement the measure. If the benefits outweigh the costs, a given measure is included in the economic

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<sup>1</sup> 2020 Cascade Natural Gas Conservation Potential Assessment Phase 2 Final Report – Applied Energy Group Volume pg. 9-10



potential. Note that we set the measure-level cost-effectiveness threshold at 0.9 for this analysis since Cascade may include non-cost-effective measures as long as the entire portfolio is cost-effective. This is important because a portfolio considers more than just energy savings. Cascade may include popular measures that are on the cusp of cost-effectiveness, accommodate variance between climate zones, maintain a robust portfolio, or include a measure that improves customer outreach and communication. It also supports the inclusion of borderline cost-effective measures, increasing overall savings through energy efficiency offerings.

- *TRC Achievable Economic Potential* is similar to UCT's achievable economic potential in that it refines achievable technical potential through cost-effectiveness analysis. However, it uses the total resource cost (TRC) test as the screening criterion. The TRC test assesses cost-effectiveness from a combined utility and customer perspective. As such, this test includes full measure costs but also includes NEIs realized by the customer if quantifiable and monetized. In addition to NEIs, non-gas impacts were assessed following Council methodology. This includes a calibration credit for space heating equipment consumption to account for secondary heating equipment present in an average home as well as other electric end-use impacts such as cooling and interior lighting as applicable on a measure-by-measure basis. As a secondary screen, we include TRC results for comparative purposes.

- *Proxy RVT Achievable Economic Potential* is similar to the UCT and TRC achievable economic potential but assesses cost-effectiveness using a proxy for a Resource Value Test (RVT). The RVT reframes the analysis around accomplishing a jurisdiction's regional policy goals and includes hard-to-quantify impacts through quantitative or qualitative approaches. This test allows jurisdictions to define policy goals that may include additional impacts beyond the traditional utility-customer TRC approach. In May of 2017, the National Efficiency Screening Project (NESP) released a National Standard Practice Manual 5 (2017 NSPM), which details an approach for conducting screening measures under the RVT. Because the Washington Utilities and Transportation Commission (WUTC) is still considering the adoption and application of an RVT, AEG used proxy adders to investigate the sensitivity of achievable economic potential to the inclusion of additional benefits.



## **C. CASCADE NEI UPDATE**

### **Societal NEIs**

- Positive Economic Impacts to the Community – This is related to quantification of NEIs of the beneficial economic effect for the community, (i.e., job creation, sales tax receipts, etc.). The Company previously quantified this effect using 50% of the retail value (at current average tariff cost/therm for each customer class) of the first year's therm savings as a conservative estimate of this benefit. This was a one-time benefit realized in the year of the installation.

*Positive Economic Impact NEI = .5 \* (therm saved) \* \$.70/therm*

- Carbon Offsets – Ascribed a value for each ton of CO<sub>2</sub> offset (based on therm savings) @\$42/metric ton. These offsets accrued each year that the energy measure was in effect. To convert to a year 1 cost offset, the calculation to the present value of this stream of carbon offset \$ over the life of the measure.

*CO NEI = PV (interest rate, measure life, (\$42/metric ton x 11.6 lb. CO<sub>2</sub>/therm saved)/(2200 lb/metric ton))*

All Societal NEIs were removed for this BCP from the measure level calculations as the Company's Avoided Costs currently include a 2.5% SCC rate which is incorporated at the program level.

### **Participant NEIs**

- Property Value Benefit – Increasing the value of the participant's property value via installation of energy saving measures has also been mentioned in much of the literature related to quantification of NEIs that have a beneficial effect. The company previously used 10% of the retail value (at current average tariff cost/therm for each customer class) of the first year's therm savings as a conservative estimate of this benefit. This was a one-time benefit realized in the year of the installation.

*Property Value Benefit NEI = .1 \* (therm saved) \* \$.70/therm*

This has also been removed from the measure level application and is accounted for at the portfolio level as the base 10% adder to the Avoided Costs which is in alignment with industry practices to capture the non-quantifiable NEIs per AEG's recommendations.

- Reduced Maintenance Cost – Due to installation of energy savings measures, there are benefits derived via reduction in maintenance cost from improved operations systems and equipment. The Company ascribes a 5% of retail savings



value (at current average tariff cost/therm for each customer class of the therm savings.) The benefits accrue each year the energy measure is in effect. To convert to a year 1 cost offset, the Company takes the present value of this stream of maintenance benefit \$ over the life of the measure.

*Reduced Maintenance Cost NEI = PV (interest rate, measure life, (.05\* (therm saved) \* \$.70/therm)*

These have remained unchanged as they align with industry best practices

- **Water/Sewer Cost Reductions** – For those measures that also save water, the Company recommended including a credit based on \$2/1000-gallon water reduction. The benefits accrue each year the energy measure is in effect. To convert to a year 1 cost offset, the Company took the present value of this stream of water reduction benefit \$ over the life of the measure.

*Water/Sewer Reduction NEI = PV (interest rate, measure life, (\$2 x 1000 gal))*

Water/Sewer savings which affects only certain standard measures (ESKs, Dishwashers and Motion Controlled Faucets) were revised to reflect an average price of roughly \$10/1000 gallons which was obtained by examining commercial water/sewer tariffs for 3 Northwest Cities (Portland, OR, Vancouver, WA and Bellingham, WA.) These ranged from a low of approximately \$7/1000 gallons to a high of \$13/1000 gallons. A similar review was performed for the Residential program resulting in minimal inclusion of water/sewer cost reductions to this program as they are directly tied to sewage reduction as many of the water use measures use the same quantity of water and do not reduce sewage.



## **D. MARKET SEGMENTATION AND END-USE**

An important first step in calculating Cascade’s energy-efficiency potential estimates is to establish baseline energy use characteristics and disaggregate the market by sector, segment, and end use.

Residential market segmentation is split by Climate Zone and into Single family and Multi Family, resulting in six market segments.

Commercial market segmentation is split into nine segments: Office, Retail, Restaurant, Grocery, Education, Healthcare, Lodging, Warehouse, and a “Miscellaneous” category.

Industrial market segmentation is also split into nine segments: Food Processing, Agriculture, Primary Metals, Stone/ Clay/ Glass, Petroleum, Paper & Printing, Instruments, Wood & Lumber Products, and an “Other” category.

Note, LoadMAP allows for more sets of Avoided Costs to run concurrently and has a proxy Resource Value Test scenario. On April 12, 2021, Cascade and AEG met with WUTC staff and interested stakeholders to review the current state of RVT development in Washington. During that meeting, WUTC staff communicated that the formal process on RVT adoption had stalled, although it was expected to be revisited. As such, the group determined that it was still appropriate for AEG to include a proxy RVT scenario in Cascade’s 2020 CPA by applying percentage adders to benefits. As an enhancement for the study, AEG varied these percentage adders by customer income to reflect additional potential benefits for low-income customers.<sup>2</sup> In the future, LoadMAP can accept more nuanced benefits to reflect regionally approved factors.

Note alternative scenarios using three sets of potential costs of carbon, discussed in the 2020 IRP within Section 5, were developed into new Avoided Costs and LoadMAP was re-run with these scenarios in mind in late 2019.

On September 12, 2019 the WUTC adopted Social Cost of Carbon estimates from Docket UG-190730. Per these guidelines the Company incorporates a SCC through its avoided costs of 2.5% into the BCP plan and has incorporated these changes to the SCC within the 2022 Conservation plan through the updated Avoided Costs developed for the 2020 IRP.

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<sup>2</sup> 2020 Cascade Natural Gas Conservation Potential Assessment Phase 2 Final Report – Applied Energy Group Volume pg. 4.



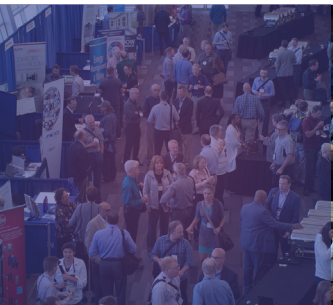
## **E. NEEA CYCLE SIX NATURAL GAS PROGRAMS**

For 2020–2024, NEEA proposed to operate a portfolio of natural gas market transformation programs that includes two gas-only programs (Condensing Rooftop Units, Efficient Gas Water Heating) and one dual-fuel program (Next Step Homes). This diverse portfolio covers residential and commercial products, retrofit and new construction applications, a range from pre-commercialized products to those currently in the market, and three product groups: HVAC, Water Heating, and New Construction.

<b>PROGRAMS</b>	<b>MARKET DESCRIPTION</b>	<b>OBJECTIVES</b>
<b>Condensing Rooftop Units (C-RTUs)</b>	Includes the supply chain that manufactures, distributes, specifies, designs and installs commercial HVAC products and the end consumer who purchases them.	<ol style="list-style-type: none"> <li>1. Transform the market so that Northwest commercial building owners and managers install C-RTUs as standard practice in applicable existing and new small to medium-sized commercial buildings.</li> <li>2. Increase Northwest specifier and installer skill in designing, sizing and configuring C-RTUs for applicable commercial buildings.</li> <li>3. Influence a federal requirement of at least 90% efficiency for commercial warm air furnaces.</li> <li>4. Influence the development of a readily-available C-RTUs with cost, weight and reliability in line with a C-RTUs.</li> </ol>
<b>Next Step Homes</b>	Includes the supply chain that designs, builds, verifies and sells residential single-family site built new homes. Leverages the work and resources of the alliance's established, electric Next Step Homes program.	<ol style="list-style-type: none"> <li>1. Maximize energy efficiency opportunities for new homes in residential new construction code requirements.</li> <li>2. Influence developers and builders to incorporate advanced energy-efficient products and practices in new homes.</li> <li>3. Inform and enable code advancement through market adoption of energy-efficient products and practices.</li> </ol>
<b>Efficient Gas Water Heating (EGWH)</b>	Includes the supply chain that manufactures, distributes (wholesale and retail), specifies, designs and installs residential gas-fired water heaters and the end consumers who purchase these products.	<ol style="list-style-type: none"> <li>1. Transform the residential gas water heating market, ultimately making gas heat pump water heaters the standard in gas water heating appliances.</li> <li>2. Influence federal manufacturing standards for residential storage gas water heaters to require a Uniform Energy Factor &gt;1 for units larger than 35 gallons by 2030.</li> </ol>







# STRATEGIC & BUSINESS PLANS 2020-2024





# NATURAL GAS PORTFOLIO

## TRANSFORMATIONAL GOAL:

Sustain a portfolio of programs and support functions that enable more cost-effective efficiency to occur sooner, in larger amounts, and/or at lower cost than otherwise expected.

### Key Transformational Strategies

1. Emerging Technology - pg 58
2. Effective Portfolio Execution - pg 61
3. Codes and Standards - pg 64
4. Convene and Collaborate - pg 66
5. Market Intelligence - pg 68

### Budgeted Special Projects

1. Strategic Energy Management - pg 63
2. Industrial Technical Training - pg 63
3. Multi-Family Dwelling Stock - pg 69 Assessment Study

# STRATEGY 1: EMERGING TECHNOLOGY

**Description:** Emerging technologies offer new and significant energy efficiency for the region. Though efficient natural gas technologies have historically lagged behind electric technologies, the Northwest's investment in natural gas efficiency in the 2015-2019 business cycle, along with investments by other utilities around the country, have accelerated market interest in commercialization efforts for new efficient products.

In the 2020-2024 funding cycle, the alliance's emerging technology efforts will continue focusing on identifying and vetting efficient natural gas products, practices and services with the potential to increase consumer choices and more efficiently use natural gas in the Northwest.

## DEFINITIONS

### Emerging Technology:

An energy-efficient product, service, or best practice that has the potential for improving performance, expanding to new markets, and/or bringing new value to the market.

**Pipeline:** Emerging technologies at various levels.

## Market Conditions and Assumptions Driving Emerging Technology Work

1. Energy efficiency emerging technology opportunities will continue to exist for the region through 2024 and beyond.
2. While emerging energy efficiency technologies are plentiful, many face cost effectiveness challenges.
3. Product cost reductions through cost engineering and potential economies of scale hold promise for meeting utility cost effectiveness targets.

## Objectives

1. Help the region achieve its long-term savings goals by scanning, tracking and assessing new gas measures.
2. Advance the alliance's portfolio of market transformation programs by introducing new emerging technologies with the strongest market potential.

## Success Metrics

1. **Portfolio Advancement:** Total energy efficiency market potential of emerging technologies advanced into the alliance's market transformation portfolio over the 5-year business cycle.
2. **Market Advancement:** Total energy efficiency market potential of emerging technologies readied for market development over the 5-year business cycle.

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## Key Activities to Provide Value to the Region

Within the alliance portfolio of programs, a portion of the work will focus on emerging technologies and product management. These activities will address products relevant to markets specific to those programs. Additional emerging technology efforts outside of programs will scan for new opportunities and will track and advance the readiness of those technologies to achieve transformation goals. By leveraging the alliance's core strengths of market influence, economies of scale and risk pooling, the region can benefit from emerging technologies at a lower risk and cost than if each organization explored these technologies on their own.

### 1. Scanning:

The alliance scans for technologies through:

- a. An open unsolicited proposal process;
- b. Annual sponsorship and technical partnership with the Gas Technology Institute;
- c. Collaboration with utilities, DOE National Labs, DOE Advanced Research Projects Agency-Energy (ARPA-E) and other organizations outside the Northwest; and,
- d. Discussions with manufacturers and other market actors.

### 2. Tracking:

In cooperation with members of the Regional Emerging Technology Advisory Committee (RETAC), NEEA staff developed a regional pipeline that includes both gas and electric emerging technologies and needed or active projects to assess these technologies. A common framework for the status (readiness) of the technologies along with a common

taxonomy for categorizing the technologies enables anyone interested in or working on emerging technologies to see opportunities and add their contributions (see Emerging Technology Appendix 7). This regional pipeline has increased the effectiveness of regional coordination and encouraged out-of-region organizations to reference and build on the region's work. The regional pipeline, combined with regional and national collaboration, will continue to be core organizing elements in advancing emerging technologies in the 2020–2024 business cycle.

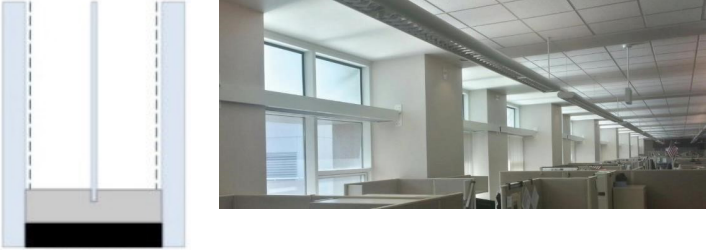


### 3. Product Management:

Once technologies are identified and prioritized, the alliance works to translate the technologies into an evaluable product or measure that is useful to meet the region's goals. Product management involves defining the product, considering the product's value based on opportunities and market barriers, developing and evaluating test methods, collaborating on performance specifications, testing commercially available products, planning for product evolution and collaborating with manufacturers to adjust products to better meet the needs of the Northwest. Product management activities vary significantly between products, but they are more aligned within product groupings.

## Examples of Natural Gas Emerging Technology Opportunities

Some examples of technologies that the alliance is tracking that could provide value to the region can be seen below.

Figure 9: Natural Gas Emerging Technology Opportunity Examples

END USE	EMERGING TECHNOLOGY	EXAMPLES
<b>Envelope</b>	<ul style="list-style-type: none"> <li>• Light-weight triple pane windows</li> <li>• Surface-applied window films with self-powered / dynamic control of solar gain and light bending for deeper day lighting and low emissivity for reduced solar gain</li> </ul>	 <p>Thin glass triple pane</p>
<b>HVAC</b>	<ul style="list-style-type: none"> <li>• Gas-driven combination systems capable of heating space and water at greater than 100% efficiency</li> <li>• Systems that are able to provide cooling capabilities and/or backup power as well as utilize internal combustion engine, adsorption/absorption or modified sterling engine technology</li> </ul>	
<b>Water Heating</b>	<ul style="list-style-type: none"> <li>• Gas-fired heat pump water heaters capable of achieving a UEF &gt;1</li> <li>• Smart circulator pumps that reduce heat loss</li> </ul>	

# STRATEGY 2: EFFECTIVE PORTFOLIO EXECUTION

**Description:** Once a new energy efficiency opportunity is identified and proven to deliver reliable energy savings, the alliance develops and implements market transformation initiatives at a scale that can accelerate adoption of these new opportunities.

In 2015–2019, the alliance began its first collaboration on natural gas market transformation. For this first five-year period, the alliance adopted a strategy that focused on implementing a small portfolio of initiatives, designed to allow the alliance to gain experience working on gas market transformation together and minimize major organizational changes. This initial foray resulted in significant progress in product development and market characterization as well as funder collaboration within the region and with extra-regional partners, such as the Gas Technology Institute. Some products from the initial portfolio met with unexpected barriers (dryers and hearths) or didn't progress as quickly as expected (combination units) and are therefore not included as full programs in the 2020–2024 business cycle.

For 2020–2024, NEEA is proposing to operate a portfolio of natural gas market transformation programs that includes two gas-only programs (Condensing Rooftop Units, Efficient Gas Water Heating) and one dual-fuel program (Next Step Homes). This diverse portfolio covers residential and commercial products, retrofit and new construction applications, a range from

pre-commercialized products to those currently in the market, and three product groups: HVAC, Water Heating, and New Construction.

The market transformation theory and key activities for each of these natural gas market transformation programs are detailed further in Appendix 2. Per the Operations Efficiency section of this plan, NEEA staff will manage the portfolio adaptively, potentially shifting resources between programs with funder guidance, as market opportunities emerge throughout the 5-year cycle.

## Market Conditions and Assumptions

NEEA's 2020–2024 Strategic Plan outlines numerous macro trends affecting the utility and energy industries. Additional market trends affecting the supply chain and their work with the alliance surfaced through interviews conducted with the supply chain. Key themes from those interviews inform the following assumptions:

1. Market consolidation, alignment with state or national regulation, global competition and pressures for greater speed to market are increasing pressure for manufacturers to seek solutions that cross regional territories. To maintain leverage with these market actors, the alliance must focus on energy efficiency solutions that can be applied across national and global markets and coordinate consistent delivery of these solutions across the nation.
2. The supply chain sees value in energy efficiency programs to reach new customer segments or increase customer loyalty.
3. Low commodity costs are making it more difficult to acquire energy efficiency cost-

effectively and requiring new and different approaches to capitalize on synergies and reduce program costs.

## Objectives

1. Implement market transformation initiatives that deliver energy savings and avoided carbon emissions.
2. Increase market channel leverage for funders and the region.

## Success Metrics

Because the programs in the natural gas portfolio are early stage (pre-Market Development), they have an estimated 20-year savings potential but no detailed models have been developed yet to forecast short-term savings. Therefore, success metrics for the 2020–2024 business cycle will be reported, but specific targets have not been defined. All metrics are currently under review and the timing and scale of savings will be further refined as alliance natural gas savings models are developed.

1. **Energy Savings:** Estimated Total Regional Savings forecasts for the alliance Portfolio. Five (2020–2024) and ten (2020–2029) year forecasts of the initiative investment portfolio will be provided.
2. **Avoided Carbon Emissions:** Annual achieved and 5-year estimated regional avoided carbon emissions as a result of the total Co-Created savings forecast.
3. **Benefit-Cost Ratio:** A Portfolio benefit-cost ratio that reflects the 20-year value of the regional investment in market transformation efforts.

## Key Activities to Provide Value to the Region

**1. Programs:** develop and implement market transformation programs by identifying and removing market barriers. See Figure 10 and Appendix 2 for more information about these programs.

**2. Alliance Marketing:** Create and execute marketing strategies that support programs in successfully achieving market transformation goals. The alliance will begin to develop marketing activities for its natural gas programs in 2020-2024, based on the approach outlined in Appendix 3.

**3. Enabling Infrastructure:** Develop and implement **Cross-Cutting Enabling Infrastructure that builds market capability, awareness and demand for energy-efficient products, services and practices or new customer engagement opportunities for funders.** See Figure 11 for examples of enabling infrastructure needed. Other activities may be identified as natural gas programs develop.

Figure 10: Natural Gas Programs

PROGRAMS	MARKET DESCRIPTION	OBJECTIVES
<b>Condensing Rooftop Units (C-RTUs)</b>	Includes the supply chain that manufactures, distributes, specifies, designs and installs commercial HVAC products and the end consumer who purchases them.	<ol style="list-style-type: none"> <li>1. Transform the market so that Northwest commercial building owners and managers install C-RTUs as standard practice in applicable existing and new small to medium-sized commercial buildings.</li> <li>2. Increase Northwest specifier and installer skill in designing, sizing and configuring C-RTUs for applicable commercial buildings.</li> <li>3. Influence a federal requirement of at least 90% efficiency for commercial warm air furnaces.</li> <li>4. Influence the development of a readily-available C-RTUs with cost, weight and reliability in line with a C-RTUs.</li> </ol>
<b>Next Step Homes</b>	Includes the supply chain that designs, builds, verifies and sells residential single-family site built new homes. Leverages the work and resources of the alliance's established, electric Next Step Homes program.	<ol style="list-style-type: none"> <li>1. Maximize energy efficiency opportunities for new homes in residential new construction code requirements.</li> <li>2. Influence developers and builders to incorporate advanced energy-efficient products and practices in new homes.</li> <li>3. Inform and enable code advancement through market adoption of energy-efficient products and practices.</li> </ol>
<b>Efficient Gas Water Heating (EGWH)</b>	Includes the supply chain that manufactures, distributes (wholesale and retail), specifies, designs and installs residential gas-fired water heaters and the end consumers who purchase these products.	<ol style="list-style-type: none"> <li>1. Transform the residential gas water heating market, ultimately making gas heat pump water heaters the standard in gas water heating appliances.</li> <li>2. Influence federal manufacturing standards for residential storage gas water heaters to require a Uniform Energy Factor &gt;1 for units larger than 35 gallons by 2030.</li> </ol>

Figure 11: Enabling Infrastructure

INFRASTRUCTURE	DESCRIPTION	OBJECTIVES
<b>MARKET RESOURCES</b>		
<b>Commercial &amp; Industrial Strategic Energy Management</b> (Special Project)	Strategic Energy Management (SEM) is recognized as a pathway to deeper energy efficiency within commercial and industrial programs, and is a foundation for deeper and more enduring customer relationships. Existing SEM infrastructure is the result of several years of regional investment and collaboration. The 2015-2019 funding cycle work established valuable SEM tools and resources on the online SEM Hub knowledge center, increased consensus on common SEM standards, and improved regional and national collaboration on SEM initiatives.	<ol style="list-style-type: none"> <li>1. Enable Commercial and industrial customers to see value in SEM as a strategy for meeting their sustainability and energy performance goals.</li> <li>2. Enable greater development and use of high-value SEM tools and resources by regional stakeholders to launch, grow, and sustain regional SEM programs.</li> <li>3. Leverage the SEM Hub Energy Management Assessment (EMA) tool to measure baseline SEM practices and identify targeted savings opportunities.</li> <li>4. Build regional and national consensus on SEM as a best practice or de facto standard.</li> </ol>
<b>TRAINING</b>		
<b>Industrial Technical Training</b> (Special Project)	Industrial Technical Training infrastructure provides coordinated technical training on key industrial energy efficiency concepts to support industrial energy efficiency programs and build market capacity to implement industrial energy efficiency projects.	<ol style="list-style-type: none"> <li>1. Build industrial energy efficiency awareness and technical capacity among the region's industrial end-users.</li> <li>2. Achieve economies of scale for providing industrial energy efficiency training in support of alliance programs.</li> </ol>



# STRATEGY 3: CODES AND STANDARDS

**Description:** Building energy codes set minimum efficiency requirements for residential and commercial buildings for the design, materials and equipment used in new construction and major renovations. Energy codes present a unique opportunity to assure savings through efficient building design, technologies, and construction practices in a cost-effective way. The alliance supports regional stakeholders in energy code development and adoption, training and implementation, as well as assessing code compliance.

Appliance and equipment standards specify the minimum energy and/or water efficiency levels of specific products including major home appliances such as clothes washers and water heaters, commercial and industrial equipment, and HVAC equipment such as gas furnaces. Equipment standards are set by U.S. DOE through a public rulemaking process. NEEA staff serve as technical experts and providers of data in U.S. DOE's rulemakings to encourage the adoption of federal appliance and equipment efficiency standards.

## Market Conditions and Assumptions Driving Codes and Standards Focus

1. The codes and standards landscape has evolved substantially over the course of the current business plan. The current federal administration has set aside U.S. DOE's federal standards and test and rating procedure rulemakings for an undetermined period. In response, the standards community has turned to state and regional forums to further this work. New partnerships will enable the development of new, more effective test and rating procedures that can be used in voluntary programs to promote the best-performing equipment and systems, while demonstrating the changes needed in federal procedures to be pursued in later rulemakings.
2. Codes and standards continue to be one of the most cost-efficient ways to ensure adoption of efficiency measures and provide significant benefits to the consumers. The alliance will continue to work with emerging technologies, utility programs and market research to develop roadmaps and long-term goals for advancing efficient codes and standards through strategic partnerships, such as with the Canadian Standards Association (CSA) and the Pacific Coast Collaborative.

## Objectives

1. Influence the development of and support for successful implementation of building energy codes in the region.
2. Continue to advance the equipment efficiency standards and improve the test rating methods and procedures.

## Success Metrics

1. Count of new code proposals reducing regional natural gas energy intensity that are adopted each year.
2. Count of new product standards which reduce regional natural gas energy intensity that are adopted each year.

## Key Activities to Provide Value to the Region

With its extensive background in product technologies of many types, and a growing catalog of field data, the alliance can be a leader in these collaborative efforts to advance progressively more efficient codes and standards. Several of the alliance programs and utility programs can leverage the new test and rating procedures to advance regional efficiency work. Later, this work can be leveraged to upgrade federal procedures.

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In the codes realm, the region has seen some notable achievements in energy code enhancement, especially in Washington State. The adoption of new codes in all four states demonstrates the regional progress in constructing better buildings and acknowledges steady improvement in building and system technologies. Post-adoption education, training and technical support to local jurisdictions support high compliance rates that, in turn, optimize building performance and realize energy savings in a cost-effective way. Specific activities the alliance implements to support these efforts include:

1. Developing and supporting energy code development in individual states. In Idaho, this requires supporting code proposals in the national model code through the International Energy Conservation Code process. In Oregon and Washington, this means supporting code proposals in their respective state-specific code processes through the Washington Department of Commerce and the Oregon Department of Energy.
2. Providing codes education, training and technical support to individual states which will support the implementation of codes and achieve energy savings in buildings.
3. Supporting the new test methods on products and systems including packaged commercial HVAC equipment.
4. Participating in the U.S. DOE equipment standards and test procedures rulemaking process by providing technical input, testing and market data and analysis.
5. Collaborating with Emerging Technology, utility programs and market research to develop roadmaps and long-term goals for advancing codes and standards through strategic partnerships, such as the Canadian Standards Association and the Pacific Code Collaborative.
6. Working with Consumer Technology Association, Institute of Electrical and Electronics Engineers, U.S. DOE and state and local agencies to standardize requirements governing open standard protocols for flexible demand functionality as an integral component of efficient products and buildings.

# STRATEGY 4: CONVENE AND COLLABORATE

**Description:** Alliance convene and collaborate activities are overseen by the Stakeholder Relations and Corporate Communications functions at NEEA. They include internal and external activities that support effective and transparent regional collaboration and market transformation programs.

NEEA staff work closely with the Natural Gas Advisory Committee (NGAC), whose purpose is to provide NEEA with broad-based advice, experience and guidance. The committee works to reach consensus on the prioritization and advancement of market transformation natural gas programs to help steer the alliance's work toward achievement of its strategic goals, priorities and objectives.

This committee is a management advisory committee, providing support to the work of NEEA managers and other staff in its program development and implementation responsibilities.

## Assumptions Driving Convene and Collaborate Activities

1. The Natural Gas Advisory Committee guides and informs program design and market strategies.
2. Board committees provide oversight and governance of the organization. There are currently five standing Board committees, including a Natural Gas Committee.
3. Funders and stakeholders require communication and coordination on the plans for and results of alliance work through formal and informal channels.
4. NEEA staff must have adequate understanding of funder and key stakeholder business needs and how they relate to alliance programs to effectively and efficiently design and execute the alliance's portfolio of work.
5. Market partners and supply chain actors must understand the alliance and the value it brings them for successful execution of market transformation programs.
6. Regional collaboration (both online and in-person) drives market transformation success and brings value to funders and stakeholders.
7. Facilitation of regional collaboration is required to achieve regional strategic goals identified by funders and stakeholders.

## Objectives

1. Ensure all alliance stakeholders are heard and their viewpoints continuously inform alliance work as it evolves by following established Rules of Engagement (see Strategy 6: Optimized Resource Allocation).
2. Convene the region to enable regional energy efficiency work that reflect the diverse needs of the region.
3. Bolster the alliance's market influence to maximize support for market transformation efforts.
4. Support organizational development and effectiveness of NEEA staff in understanding funder and regional business needs.

## Success Metric

Positive funder and stakeholder satisfaction: Measure and maintain strong funder and stakeholder satisfaction through an annual satisfaction survey and regular funder and stakeholder engagements.

## Key Activities to Provide Value to the Region

1. **Board of Directors, Board Committee, and Advisory Committee meeting facilitation to foster:**
  - a. Regional input and conversations that drive alliance work in ways that complement funders' and alliance programs.

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b. Board of Director leadership, oversight and governance of and advocacy for the organization, and contributions of insight and other support and value.

c. Collaboration between market actors, researchers, funders and industry leaders to understand technology and market trends, opportunities and pitfalls as well as advance energy efficiency opportunities.

**2. Funder Account Management** to understand and convene discussion on funder and regional perspectives on alliance initiatives, ensure funder coordination plans are implemented throughout every stage of the Initiative Lifecycle Process (see Operations Efficiency section) and that funders have the information and resources needed to collaborate effectively in alliance work.

**3. External Communications** that increase supply chain understanding of the alliance and the value it can provide market partners through NEEA's corporate website, program communications materials and other strategic communications, including those related to Strategic and Business Planning. Corporate Communications supports market

transformation programs through recognition and celebration of market partner success and participation in alliance programs.

**4. Efficiency Exchange Conference** to provide a forum for knowledge-sharing to help regional energy efficiency professionals achieve their goals as well as networking opportunities. The Efficiency Exchange Conference is an event provided for the benefit of staff from funding and stakeholder organizations.

# STRATEGY 5: MARKET INTELLIGENCE

**Description:** Market Intelligence (MI) is defined as the systematic and objective identification, collection, analysis and dissemination of data, information and insight for assisting decision making to advance and report progress of energy efficiency and market transformation. This description covers work in evaluation, research, regional studies, planning and market trend analysis.

## Assumptions Driving Market Intelligence Focus

1. Market Research and Evaluation:
  - a. The region will continue to value independent evaluations of all programs.
  - b. The number and complexity of programs will continue to increase over time.
  - c. The demand for information gathered through Market Research will continue to increase to support adaptive management and continual improvement on programs.
2. Large-scale Data Collection and Analyses Studies:
  - a. The region will continue to value the Residential Building Stock Assessment (RBSA) and Commercial Building Stock Assessment (CBSA). This will be the first cycle that gas funding supports the stock assessments.
  - b. The depth and number of codes that will be necessary to evaluate will increase.

- c. Large-scale data collection and analysis studies will require the same level of stakeholder engagement.
  - d. A lack of awareness of existing data has led to expensive duplication of research, and enabling direct access to regionally-specific energy efficiency data would help streamline and enhance regional energy efficiency efforts.
  - e. There is an emerging need for a Multi-Family Stock Assessment. Multi-family buildings make up a large and increasing share of new construction in the region, with nearly a third (31%) of commercial building floor area since 2013 happening in these building types, including an increasing portion in Idaho and Montana. (This assumption applies to a potential Special Project.)
3. Market Planning:
    - a. The region will continue to value the alliance's work to analyze, estimate, document, report and forecast the potential energy savings and other value metrics associated with the market transformation efforts of each measure and for the full portfolio, in accordance with current energy savings accounting practices.
    - b. Funders will continue to require reporting and forecast needs as is currently done.
    - c. Measure levels are increasing in complexity and volume. Alliance electric measures have grown from 80 measures in 2014 to a current volume in 2018 of 170+, and have expanded to address both electric and natural gas efficiency. The alliance expects

the size and complexity of its portfolio to remain at this current level, if not increase due to the system integration overlap complexity of future measure work.

4. Marketplace Trend Analytics:
  - a. Many of the data sets, tools and capabilities NEEA has organized for Marketplace Trend Analytics are done cost effectively, leveraging NEEA's nonprofit status.
  - b. Findings from the RBSA will continue to identify opportunities for improved performance and identify gaps in regional energy efficiency efforts.

## Objectives

1. Ensure valuable and defensible evaluation, market progress tracking and savings accounting and estimating to assess results from market transformation efforts.
2. Provide research and market intelligence that lends value to program and business planning needs for internal and external partners.
3. Maintain data collection and housing best practices.

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## Success Metrics

- 1. Actionable Information:** Evaluations that provide valuable inputs for program planning and validated assumptions for best accuracy of savings and other value reporting.
- 2. Customer Service:** Meet individual funder needs for savings forecasting, reporting and other data or market intelligence needs in a timely, accurate manner.
- 3. Actionable Data:** Increased and/or comprehensive access to data, data infrastructure, and analytics necessary to strategically influence the market toward measurable transformation.

## Key Activities

Through the MI work, NEEA enhances decision making and mitigates risk for the region for current programs, as well as for the next generation of resource planning and programs. When done on a regional scale, this work provides substantial economies of scale. Specific MI activities that support the alliance's market transformation work include:

- 1. Market Research and Evaluation** to inform market transformation efforts as well as formal evaluations of programs in market development. When possible, the alliance leverages secondary research first to inform program efforts. Primary market research in both quantitative and qualitative forms is used when secondary research is unavailable or inadequate for regional needs. Primary research provides:

- a.** Insight into potential target market sizing and segmentation;
  - b.** Market characterization efforts;
  - c.** Baseline estimates that project adoption of energy-efficient products, services and practices; and
  - d.** Independent, third-party evaluations to assess the impact or processes of alliance-funded programs.
- 2. Market Planning** to support the organization with analytical expertise responsible for forecasting and reporting cost effective, energy savings, and other value metrics. The department develops and manages cost effectiveness models, defensible methodologies to measure the effects of market interventions and other valuation tools to support alliance programs at various stages of the market transformation initiative's lifecycle. Market Planning is also responsible for the portfolio management system to ensure that the alliance is on track to meet its business plan goals.
  - 3. Marketplace Trend Analytics** delivers research findings to alliance programs and regional stakeholders to assist in their strategic decision-making. NEEA creates, purchases, and compiles gigabytes of regional data to answer business questions through the blending of data sets. These analyses may be as simple as targeting households based on structure and demographic data for a single program or as complex as identifying representative census blocks for building stock analysis research in the Northwest.

Other Market Intelligence activities that support alliance and regional energy efficiency efforts include large-scale data collection and analysis studies, including:

- 1. Regional Building Stock Assessments (Commercial & Residential)** that characterize the existing building stock to account for regional differences such as climate, building practices and fuel choices. The residential assessment will focus on single family homes. The commercial stock assessment will be scoped and started in this 2020-2024 Business Plan and will be concluded early in the next business cycle (2024-2029).
- 2. Multi-Family Dwelling Stock Assessment Study (Special Project)** To accurately characterize the Multi-Family Dwelling Unit building stock, sample design and data collection protocols need to be different from single family residential buildings and commercial buildings. By performing a Multi-Family Building Stock Assessment, the alliance will have a better understanding of the market that will support new energy efficiency opportunities.