# Memorandum

July 25, 2018

TO: NEEA Board of Directors

FROM: NEEA Staff

SUBJECT: Draft 2020-24 Natural Gas Market Transformation Budget and Portfolio

**BACKGROUND:**
Below is an outline of the key natural gas components of NEEA's 2020-24 Business Plan, along with a brief description of each section. The objective of providing this information is to inform a discussion around integrating this material into the third draft of the Business Plan.

**2020-24 DRAFT NATURAL GAS BUDGET AND ESTIMATED SAVINGS:**

The Ad Hoc Natural Gas Planning Committee provisionally accepted a natural gas budget of $18.9M for Cycle 6, which reflects a 3% increase overall from the Cycle 5 budget of $18.3M. The below table outlines the budget per primary strategy, as laid out in the Draft 2020-24 Strategic Plan, including direct and labor costs:

**Table 1: Proposed 5-Year Budget by Primary Strategy**

| **Primary Strategies and Administration** (Direct Costs and Salary & Benefits) | **Total 5-Year Budget ($ Thousands)** | **% of Budget** |
|---|---|---|
| Emerging Technology | $1,465 | 8% |
| Effective Portfolio Execution | $11,960 | 63% |
| Codes & Standards | $364 | 2% |
| Market Intelligence | $1,715 | 9% |
| Convene & Collaborate | $0 | 0% |
| Administration* | $3,400 | 18% |
| **Total** | **$18,904** | |

*Administration includes Stakeholder Relations, Corporate Communications, Business Administration, Information Technology, Facilities and Executive Office. Costs are allocated between Electric, End Use Load Research and Natural Gas funders based on applicable cost drivers.

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 initiative, Next Step Homes. These programs fall into three cross-product sectors; HVAC, Water Heating and New Construction; respectively, as established in the alliance's overall portfolio approach for 2020-24.

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**Table 2: Proposed 5-Year Budget and Savings by Program**

| Product Group | Program | 20-yr Total Regional Savings* *(annual therms**)* | Cycle 6 Total Regional Savings* *(annual therms**)* | Budget for Direct Project Costs ($ Thousands) |
|---|---|---|---|---|
| HVAC | Condensing RTUs (CRTUs) | 8M - 60M | 150,000 - 300,000 | $1,750 |
| Water Heating | Efficient Gas Water Heating (EGWH) | 13M - 100M | 500,000 – 1M | $4,000 |
| New Construction | Next Step Homes | 17M - 30M | 10M - 16.5M | $2,000 |
| **Total** | | **38M - 190M** | **11M – 18M** | **$7,750** |

*Total regional savings: All savings occurring from the pre-intervention starting point of the market. Estimates will be refined continuously as initiatives mature. Co-created savings will be determined for these programs in Cycle 6.
**Annual therms: Only first-year savings from a new efficient measure are accounted for.

**Table 3: Budget Changes from Cycle 5 and Cycle 6 – Direct Project Costs ($ Thousands)**

| Primary Strategies | Cycle 5 Budget | Cycle 5 Forecast | Cycle 6 Budget |
|---|---|---|---|
| **Emerging Technology** | **$750** | **$1,008** | **$1,350** |
| GTI Sponsorship | $0 | $310 | $350 |
| Combination Units | $0 | $0 | $500 |
| Scanning | $750 | $698 | $500 |
| **Effective Portfolio Execution** | **$9,313** | **$7,125** | **$7,750** |
| CRTUs | $1,313 | $2,100 | $1,750 |
| EGWH | $4,425 | $2,003 | $4,000 |
| Combination Units | $2,075 | $2,278 | $0 |
| Hearths | $1,163 | $385 | $0 |
| Dryers | $338 | $359 | $0 |
| Next Step Homes | N/A | N/A | $2,000 |
| **Codes and Standards** | **$500** | **$74** | **$200** |
| **Convene and Collaborate** | **$0** | **$0** | **$0** |
| **Market Intelligence** | **$350** | **$632** | **$1,518** |
| Building stock assessments | $0 | $0 | $1,200 |
| Marketplace trend analytics | $0 | $0 | $68 |
| Market Research Online Comm. | $0 | $25 | $100 |
| Market research and evaluation | $350 | $607 | $150 |
| **Total** | **$10,913** | **$8,838** | **$10,818** |

**Table 4: Budget Changes from Cycle 5 and Cycle 6 – Total Costs ($ Thousands)**

| | Budgeted Cycle 5 | Forecast Cycle 5 | Draft Cycle 6 | Net Change Budget Cycle 5 to Cycle 6 | % Net Budget Change | Reasons for Net Budget Change |
|---|---|---|---|---|---|---|
| Direct Project Costs | $10,913 | $8,838 | $10,818 | ($94) | -1% | Focusing efforts on two gas products and one dual fuel initiative, rather than five gas products, to meet budget targets. Adding funding for Residential Building Stock Assessment and Commercial Building Stock Assessment. |
| Salary and Benefits | $4,600 | $3,301 | $4,686 | $86 | 2% | Salary costs are flat while benefits increased by 8% in response to increased healthcare costs. |
| Admin Allocation and Other G&A | $2,822 | $2,804 | $3,400 | $578 | 20% | Admin allocation methodology updated in 2018 to better match admin costs to organization cost drivers. |
| **Total** | **$18,335** | **$14,943** | **$18,904** | **$570** | **3%** | |

## CYCLE 6 VALUE AND SUCCESS METRICS

The Board is still determining the appropriate metrics for Cycle 6 for both its electric and Natural Gas market transformation work. Please see the "Cycle 6 Value and Success Metrics" memo in the July 30 Board Workshop for the information to be discussed at that time.

## 2020-24 DRAFT MARKET TRANSFORMATION PROGRAMS:

The market transformation theory and key activities for each of these natural gas market transformation programs are detailed below. This mix of programs represents a balance of near-term and long-term opportunities, with an acceptable level of risk for its funders. This initial portfolio is anticipated to evolve over time. Per the Operations Efficiency section of the 2020-24 Business Plan, NEEA staff will manage the portfolio adaptively, potentially shifting resources between programs, at funder direction, as market opportunities emerge throughout the five-year cycle.

## Program: Condensing Rooftop Units

**Market definition:** Includes the supply chain that manufactures, distributes, specifies, designs and installs commercial HVAC products and the end consumer who purchases them.

### Market Conditions and Assumptions Driving the Market Transformation Opportunity

1. The HVAC market is not currently optimized around cost and resiliency.
2. Condensing RTUs have been in the market since 2014, but only small manufacturers offer products and sales are very low: estimated at less than 1% of the total RTU market.
3. Almost all current product offerings are custom-built units, making them inherently more expensive and resulting in longer lead times.
4. Lack of sales and investment are due to low natural gas prices, the absence of regulatory drivers, lack of market pressure to expand product lines and lack of awareness throughout the supply chain.
5. The HVAC supply chain lacks tools and education necessary to calculate projected paybacks for condensing RTUs and installation nuances.
6. Commercial warm air furnace (CWAF) manufacturers have begun developing and offering condensing heating modules for inclusion in small and large HVAC manufacturers packaged RTU product lines, opening up the potential for additional product market entry.
7. An apparent practice of utilizing conventional RTUs (meant for up to 35% outside air) in high-OA (up to 100%) applications may offer a market entry point for cost-effective condensing product lines in mild climates, like much of the Northwest.

### Long-Term Market Transformation Objectives

1. Transform the market so that Northwest commercial building owners and managers install condensing RTUs as standard practice in applicable existing and new small to medium-sized commercial buildings.
2. Increase Northwest specifiers' and installers' skill in designing, sizing and configuring condensing RTUs for applicable commercial buildings.
3. Influence a federal requirement of at least 90% efficiency for commercial warm air furnaces.
4. Influence the development of a readily-available condensing RTU with cost, weight and reliability in line with a conventional RTU.

### Success Metrics

1. Increased number of manufacturers offer condensing RTU products
2. Increased market share of condensing RTUs
3. Increased awareness, acceptance, adoption and technology expertise by HVAC supply chain, including contractors, design build firms, and engineering firms
4. Increased condensing RTUs installed in existing buildings and specified into new buildings
5. New efficiency program opportunities for the region

### Market Engagement and Activities

1. Engage with **manufacturers** to refine existing condensing products or develop new condensing products that will be comparable in cost, weight and reliability to conventional RTUs.
2. Partner with **HVAC supply chain** to increase training and awareness of the condensing RTU value proposition.

3. Engage with **code and standard bodies** to advance adoption of improved testing procedures, adopt increased efficiency requirements and streamline understanding of condensate management requirements.

**Why NEEA?**

1. The alliance has developed deep relationships with some of the largest HVAC manufacturers in the world, and has the opportunity to leverage these relationships to bring even greater benefit to the Northwest.
2. The alliance continues to foster innovative, new HVAC technologies in the Northwest. Ductless Heat Pumps have seen tremendous market growth over the last decade due to successful market interventions, and NEEA has been instrumental in bringing the components of Very High Efficiency Dedicated Outside Air Systems (VHE DOAS) to market and piloting the technology.
3. As condensing RTUs are adopted by the market, NEEA can provide a regional quality assurance feedback loop (trainings, specifications & best practices development, etc.) among manufacturers, installers, and utility program managers to support efficient, energy-saving results and positive customer experiences to transform the market.

**Prior Alliance HVAC Accomplishments to Build Upon**

1. The region has influenced more than 100,000 ductless heat pumps installed in the Northwest.
2. More than 1,500 DHP installers were oriented in the DHP program.
3. The alliance has worked with distributers in the Northwest to invest in opening regional, hands-on training centers to focus on the DHP installation process.
4. The first high efficiency HRV product line to North America was launched, and flagship VHE DOAS pilot projects in the Northwest were brought to market.
5. DOAS was incorporated in WA code for targeted building types which will lay the groundwork for VHE DOAS in later cycles.

## WATER HEATING

**Program: Efficient Gas Water Heaters**

**Market definition:** 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.

**Market Conditions and Assumptions Driving the Market Transformation Opportunity**

1. The 2015-19 Natural Gas Business Plan indicated a significant market for this product in the Northwest (1.7 million customers) and a high long-term savings potential (over 100 million annual therms in the Northwest during a 20-year period.
2. There has been minimal innovation around gas water heating technology, especially when viewed in comparison to electric water heating.
3. Near-term savings may be possible by increasing adoption of currently available or newly developed efficient gas water heating products.
4. Gas heat pump water heaters, with the potential to be twice as efficient as baseline products, are under development with broad product commercialization is estimated for 2020-2025.
5. Opportunities to influence federal standards are expected in 2030.

**Market Transformation Objectives**

1. Transform the residential gas water heating market; ultimately making gas heat pump water heaters the standard in gas water heating appliances.
2. Influence federal manufacturing standards for residential storage gas water heaters to require a Uniform Energy Factor >1 for units larger than 35 gallons by 2030.

**Success Metrics**

1. Launch of commercialized GHPWH
2. Multiple GHPWH products on market
3. Regional and national utility programs supporting EGWH, increasing supply chain support and reducing technology and product costs, which will help ensure greater product availability for Northwest customers and reduce costs for end-customers and Northwest utilities

**Market Engagement and Activities**

1. Collaborate with the **supply chain** to accelerate adoption of currently available EGWH.
2. Engage with **national and global manufacturers** driving development, commercialization and launch of GHPWH while also supporting Northwest needs such as performance in Northwest climate zones, informed and capable installer base and locally stocked product.
3. Advance **lab and field testing** to validate product performance, durability and customer acceptance while providing regular updates on objectives, milestone achievement and co-funding participation.
4. Partner with **market actors, DOE, CEE, utilities and other EE organizations** to support adoption of the Advanced Water Heater Specification (AWHS) and/or improved test procedures associated to GHPWH.
5. Leverage the alliance's **consumer and lab research** to increase EGWH sales nationally, increase supply chain support and reduce technology and product costs. This will ensure greater product availability and reduced costs for Northwest customers.

**Why NEEA?**

1. NEEA can leverage its existing relationships with utilities, manufacturers and the water heating supply chain developed through the electric heat pump water heating program.
2. Institutional experience related to ductless heat pumps and heat pump water heaters will ensure lessons learned on prior efforts translate to accelerated barrier removal and increased likelihood of locking in savings through local codes and federal standards.
3. Utility partners will benefit from decreased risk by pooling funding at the regional scale, leveraging NEEA's risk management assessment process, and collaborating with extra-regional utilities to ensure national uptake and thorough testing of new products prior to launch.

**Prior Alliance Accomplishments to Build Upon**

1. More than 30,000 residential electric heat pump water heaters sold in the region, driven by the alliance's efforts to remove barriers, increase adoption and bolster utility programs.
2. The adoption by national partners, such as CEE, of the alliance's Advanced Water Heater Specification (AWHS).
3. Successful lab and field testing of GHPWH technology, demonstrating performance capabilities and refining product design to address issues.
4. Collaboration with all major water heater manufacturers to boost interest in GHPWH exploration and development.

5. Characterized market to identify trends, barriers, opportunities and key market actors by completing the updated (gas and electric) water heater market characterization.

## NEW CONSTRUCTION

**Initiative:** Next Step Homes

**Market Definition:**
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.

**Market Conditions and Assumptions Driving the Market Transformation Opportunity**

1. Greater insight is needed into what measures will be incorporated into code to inform utility and regional efficiency programs.
2. The market, utility incentive programs and those developing, adopting and implementing code are not always aligned on long-term code goals.
3. Voluntary market adoption of efficient new construction practices leads code changes.

**Long-Term Market Transformation Objectives**

1. Enable advancement of residential new construction code requirements to maximize energy efficiency opportunities in new buildings.
2. Engage developers and builders to incorporate advanced energy-efficient products and practices in new residential buildings.
3. Increase market adoption of energy-efficient products and practices informs and enables code advancements.

**Success Metrics**

1. Increase in adoption of alliance-supported code proposals
2. New utility programs align with code road map
3. Increased utility/market actor participation in code collaborative meetings and activities
4. Increased market share of above code specifications and certification program participation

**Market Engagement and Activities**

1. Engage with **residential home builders, home energy raters, and code stakeholders** to refine the value proposition for energy-efficient new construction buildings.
2. Partner with **residential and commercial certification programs, Integrated Design Labs, and other industry associations** to align technical specifications and increase the adoption of technology, practices and future code measures.
3. Leverage **local policies and regional and national trends** toward net zero building practices to create greater alignment between code, utility programs and market practice.
4. Engage with **HUD and key code stakeholders** to support code increases for manufactured homes over time.

   Partner with **national code stakeholders** to influence International Energy Conservation Code (IECC) and HUD requirements and implementation.

**Why NEEA?**

1. NEEA actively supports code development and adoption in all four states and has existing relationships with utilities and key code stakeholders that can be leveraged to create alignment on long-term goals.
2. NEEA's code work with the Northwest states and IECC can inform state code road maps, long term goals, and utility program planning.

**Prior Alliance Accomplishments to Build Upon**

1. NEEA has collaborated widely with the region to develop and support energy code proposals in individual states. The adoption of new codes in the Northwest states reflects regional progress in building better buildings and acknowledges steady improvement in building and system technologies.
2. 20.12 aMW and 20.35 Therm savings from 2010-2016 *(including code savings).*
3. NEEA-developed platforms which utilize energy modeling to enable whole home utility programs and incentives.
4. An established code collaborative in each state to plan for upcoming code cycles and increased coordination with the market, utilities, and code stakeholders.
5. BetterBricks and BetterBuiltNW regional resources providing tools to support integrated design and above code building strategies.
6. Established partnerships with Integrated Design Labs.