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NEEA Natural Gas Portfolio Mid-Cycle Assessment

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1. Executive Summary

In May 2017, the Northwest Energy Efficiency Alliance (NEEA)'s Natural Gas Mid-Cycle Assessment Committee (Assessment Committee) hired Opinion Dynamics to complete a Mid-Cycle Assessment of NEEA's Natural Gas Portfolio (NGP). The NGP was developed in 2014 through a collaborative process that included NEEA staff and representatives from Avista Utilities, the Energy Trust of Oregon, NW Natural Gas, and Puget Sound Energy. This process resulted in a 5-year Natural Gas Business Plan (the NGBP) for a new natural gas market transformation effort.

Report Justification

As part of the NGP development process, the collaborative selected five of the most promising natural gas technologies to support through market transformation initiatives. The technologies chosen were: gas-fired heat pump water heaters, combination space and water heating systems, hearth products, rooftop HVAC, and ENERGY STAR® gas dryers. The collaborative also included a scanning task in the NGBP to pursue emerging technologies, as well as a task to advance changes in building codes and product standards. In order to oversee the portfolio, the collaborative established a Natural Gas Advisory Committee (Advisory Committee) made up of funding organizations and other interested stakeholders, including state regulatory commissions. Finally, the NGBP included a specific directive to conduct a mid-cycle assessment.

The Mid-Cycle Assessment, which has been driven by Assessment Committee members with the support of NEEA staff, includes research in six key areas: (1) product advancements, (2) the development of a pathway to cost-effective energy savings, (3) evidence of market transformation, (4) adherence to key principles of the NGBP, (5) the value proposition stakeholders recognize in the NGP, and (6) NEEA's overall health as a dual-fuel organization. The findings from this study are based on 27 in-depth interviews with 38 key stakeholders and NEEA staff involved in the effort.

Summary of Key Findings

Below we present a summary of the key findings from our assessment. The term "committee members" refers to Advisory Committee and Assessment Committee members, while "stakeholders" refers to Advisory Committee members, Assessment Committee members, and market actors.

- **A majority of market actors believe that NEEA's natural gas activities are valuable and significant**
  - Market actors repeatedly emphasized that there are limited resources nationwide devoted to the advancement of efficient gas technologies. While other organizations are examining similar technologies in their market transformation efforts, market actors reiterated that they do not believe NEEA's efforts are duplicative.
- **Committee members and NEEA staff feel that the portfolio's core technologies have not advanced as far as hoped, but most interviewees remain positive about the portfolio's potential.**
  - Two of the five core NGP technologies (gas-fired heat pump water heaters and rooftop HVAC) have reached or surpassed the lifecycle initiative stage projected to be achieved by Year 3 of the five covered by the NGBP.
  - The majority of stakeholders still see long-term promise in all or some of the core technologies.

- **Committee members have differing expectations about how long it should take to realize savings from portfolio technologies.**
  - Some committee members expected that portfolio technologies would produce cost-effective savings in the short-term (i.e., 2 to 5 years), leading to some concern that the portfolio has not yet yielded energy savings, and two funders have questions about moving forward with the remaining two years of funding.
  - Despite this concern, most existing funders are generally willing to consider funding a future portfolio cycle.
- **There is a difference of opinion between a majority of committee members who are comfortable with progress to date, and one funder who does not believe NEEA should be involved in pre-commercialization activities.**
  - Interviewees from all groups generally recognize that the NGP has involved early-stage interventions. Many stakeholders believe that this is fully warranted given the status of gas efficiency, while one committee members is uncomfortable with NEEA pursing ongoing pre-commercial product development activities.
- **Most interviewed committee members do not believe that a full integration of the gas and electric portfolios is feasible at this time.**
  - These feelings are driven by persisting concerns that an integrated portfolio could lead to gas-only or electric-only ratepayers subsidizing the opposite fuel, and concerns that the gas portfolio has not yet proved it can stand-alone.

Key Conclusions

Overall, our assessment indicates that from a process perspective, the NGP is operating effectively, adhering to its core principles, and is based on a sound central value proposition that aligns with NEEA's mission. The majority of stakeholders and funders believe that the NGP is an effective and valuable enterprise. As such, we recommend no significant changes to the portfolio's operations or guiding principles.

However, there is a clear risk to the portfolio's current funding due to:

- Funder concerns about progress of the core technologies,
- Funder disagreements about at what stage in product lifecycles NEEA should intervene, and
- Funder disagreements about the time horizon for the realization of savings

With the time remaining in the current 5-year plan, NEEA could pursue a wide range of strategies to address this risk, including expressly revisiting the NGBP with the collaborative to allow for discussion, potential changes to approach, and to ensure funder buy-in.

Finally, as to the question of integration, most interviewees do not believe fully integrating NEEA's gas and electric portfolios is feasible at this time. While there is agreement that some degree of integration could create value for stakeholders, further buy-in is required in order to achieve NEEA's aspirational goal of fully integrating its market transformation activities. NEEA should begin collaborative discussions with stakeholders in order to address concerns about integration.

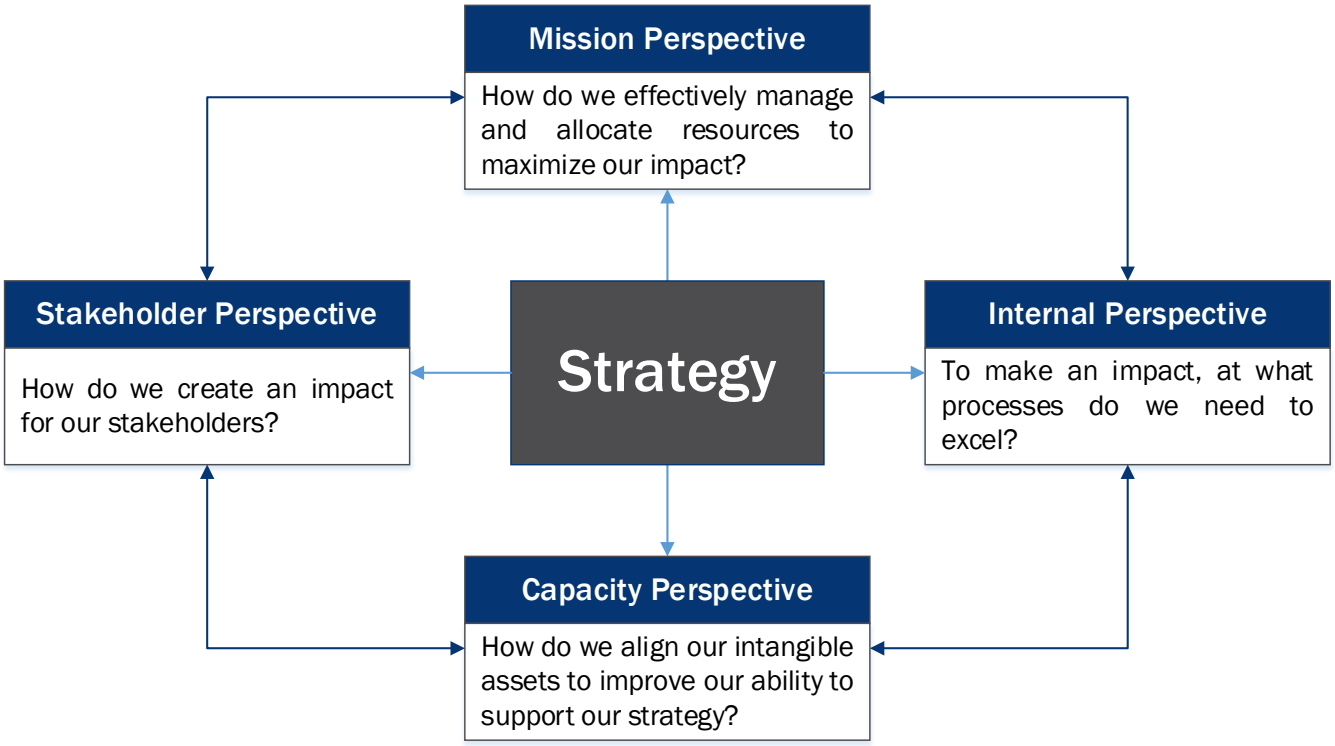
2. Background

To conduct the Mid-Cycle Assessment, Opinion Dynamics used an organizational performance framework, as well as detailed qualitative data collection activities with key stakeholders as described below.

Study Approach

This study utilizes the Balanced Scorecard, a model for evaluating organizational performance.[1] The Balanced Scorecard provides a useful framework for looking at how NEEA's vision has been translated into the current natural gas strategy, as well as a structure for the management of strategy implementation. As shown in Figure 1, based on this model, there are four perspectives from which Opinion Dynamics looked at NEEA's vision for and implementation of the NGP—mission, stakeholder, internal, and capacity—all of which are well-aligned with the perspectives captured in the NGBP and the research objectives outlined for the Mid-Cycle Assessment.

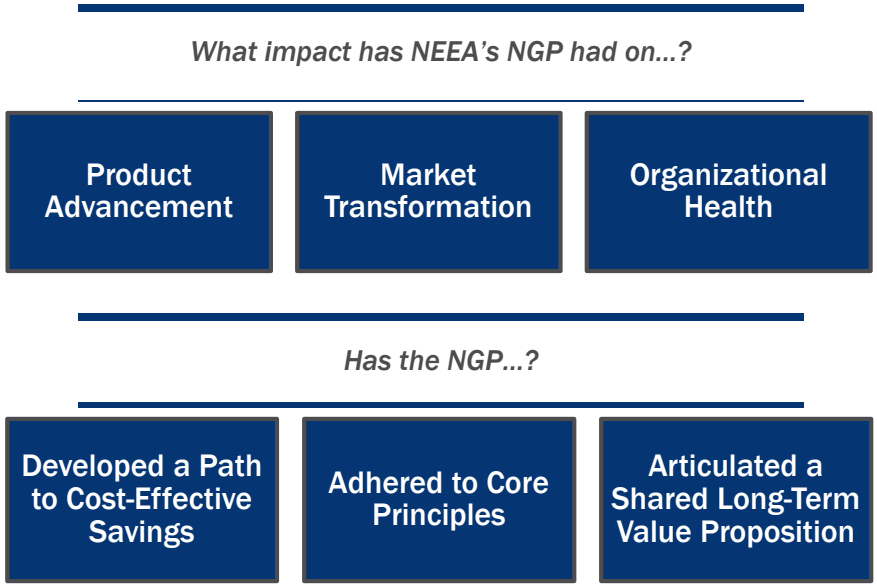
Figure 1. Research Framework



[1] Kaplan, Robert S., and David P. Norton. "Using the Balanced Scorecard as a Strategic Management System." Harvard Business Review, July-August 2007.

The study's primary objectives were developed by Assessment Committee members with support of NEEA staff, and cover the six key areas detailed in Figure 2. Opinion Dynamics also explored emergent themes and topics that surfaced in our research but were not explicitly called out as objectives.

Figure 2. Mid-Cycle Assessment Research Objectives



Research Activities

To address these objectives, we conducted in-depth interviews with members of the Assessment Committee, members of the Advisory Committee, key NEEA staff, and market actors, coupled with a detailed review of background materials relevant to the program. In addition, we conducted an in-person share-out and iteration session with the Advisory Committee. For a detailed description of each group, please see Appendix C.

Background Material Review

We conducted a detailed review of program background materials, including the NEEA Strategic and Business Plans, the NGBP, documents outlining stakeholder roles and expectations (such as the NGBP Charter), Advisory Committee meeting minutes, annual operations plans, market research results, and results from product scanning, testing, and validation.

In-Depth Interviews

As part of our in-depth interviews, we explored a wide range of topics pertaining to the NGP and allowed respondents to suggest additional topics for discussion. However, each set of interviews had key areas of focus as detailed below. Our in-depth interview guides were developed in collaboration with the Assessment Committee and key NEEA staff.

Mid-Cycle Assessment Committee Interviews

We completed interviews with all seven members of the Assessment Committee. The key objectives of the interviews were to understand the perceived value proposition for the NGP and to gather data to help assess NEEA's health as a dual fuel organization.

Natural Gas Advisory Committee Interviews

We conducted five interviews with members of the Advisory Committee.[2] We used this set of interviews to understand whether stakeholders buy-in to NEEA's NGP activities and goals.

NEEA Staff Interviews

We completed seven interviews covering 12 NEEA staff members. The key objectives of speaking with NEEA staff were to understand portfolio progress to date, understand the value proposition for the NGP, and to gather data to help assess NEEA's health as a dual fuel organization.

Market Actor Interviews

We completed interviews with eight organizations that NEEA identified as engaged in the NGP as part of this task, including research organizations (e.g., the Consortium for Energy Efficiency [CEE] and the Gas Technologies Institute [GTI]), product manufacturers, and non-funding utilities. The core objectives of our market actor interviews were to gauge (1) understanding of and opinions regarding NEEA's market transformation goals, (2) the viability of the target technologies, and (3) barriers or challenges to collaboration with NEEA.

Natural Gas Advisory Committee Interview Share-Out and Iteration

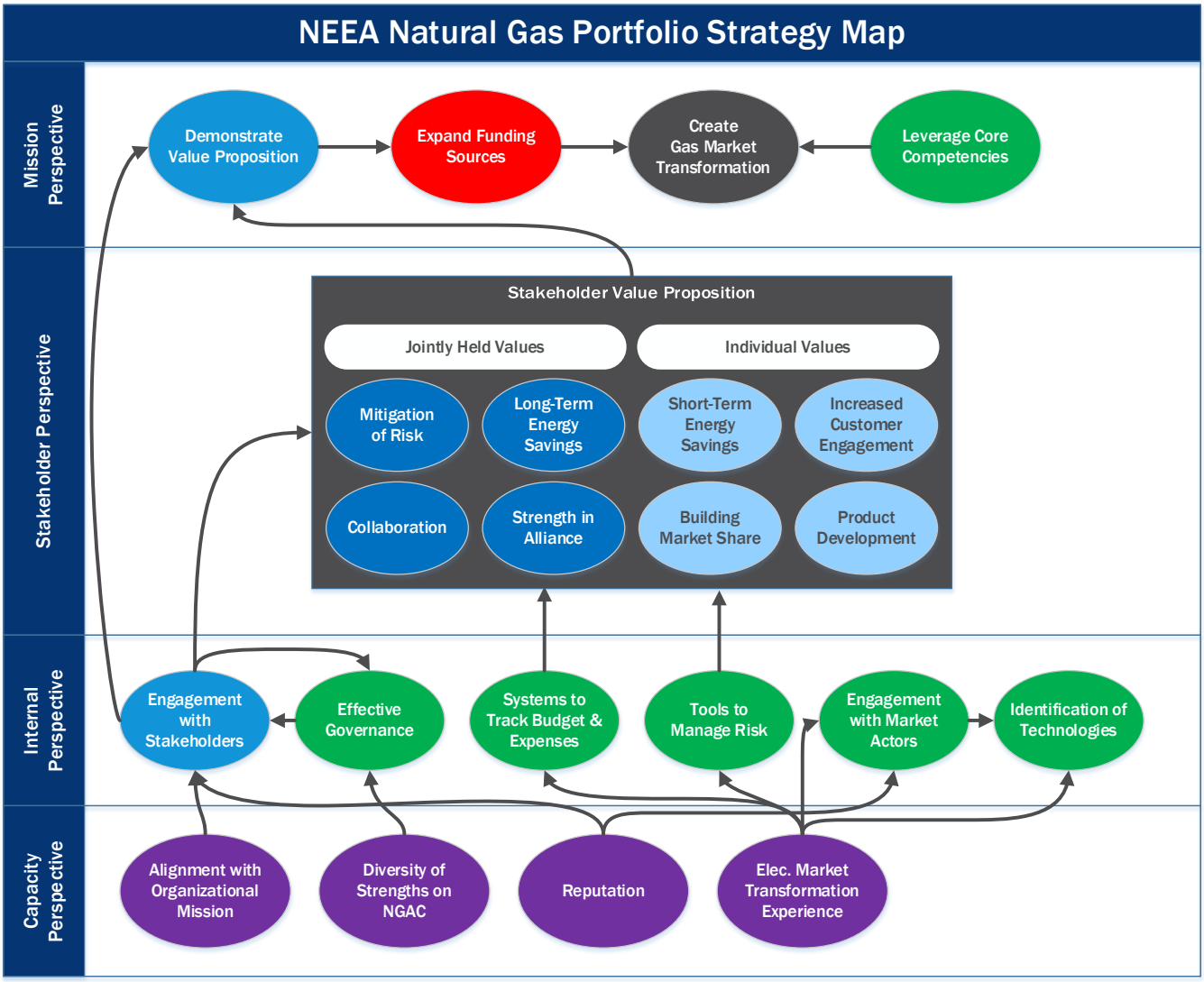
We presented emergent themes from the Advisory Committee interviews (and other data collected) to the full Advisory Committee and conducted an iteration session to discuss the feedback and perspectives from the in-depth interview process among the entire group. We used this process to help us ground our findings.

[2] As part of this task, we conducted several group interviews; in total, we spoke with nine members of the Advisory Commitee. In addition, four of the seven Assessment Committee members we spoke with also sit on the Advisory Committee.

3. Key Results

NEEA's development and deployment of the NGP has involved a wide range of stakeholders, market transformation activities, and internal processes and procedures. The ultimate goal of these efforts is to advance NEEA's organizational mission and spur natural gas market transformation. To provide context for the study findings, conclusions, and resulting actions, we present the following detailed map of NEEA's NGP strategy utilizing the Balanced Scorecard framework.

Figure 3. NGP Strategy Map



Within the following sections of the report, we outline key findings related to the NGP strategy and each of the perspectives contributing to its performance.

3.1 Key Findings

Within this section of the report, we present the most salient findings from our assessment organized by research objective. In our narrative below, the term "committee members" refers collectively to Advisory Committee and Assessment Committee members, while "stakeholders" refers to Advisory Committee members, Assessment Committee members, and market actors.

3.1.1 Portfolio Value Proposition

To assess the NGP, it is important to clearly understand the value proposition it presents to each stakeholder, as well as if there is a shared perception of the value proposition across stakeholders. Within the context of the value proposition, Opinion Dynamics also sought to understand if regional equity for the NGP is achievable.

Stakeholders continue to perceive a number of shared values in the NGP and remain closely engaged with its activities.

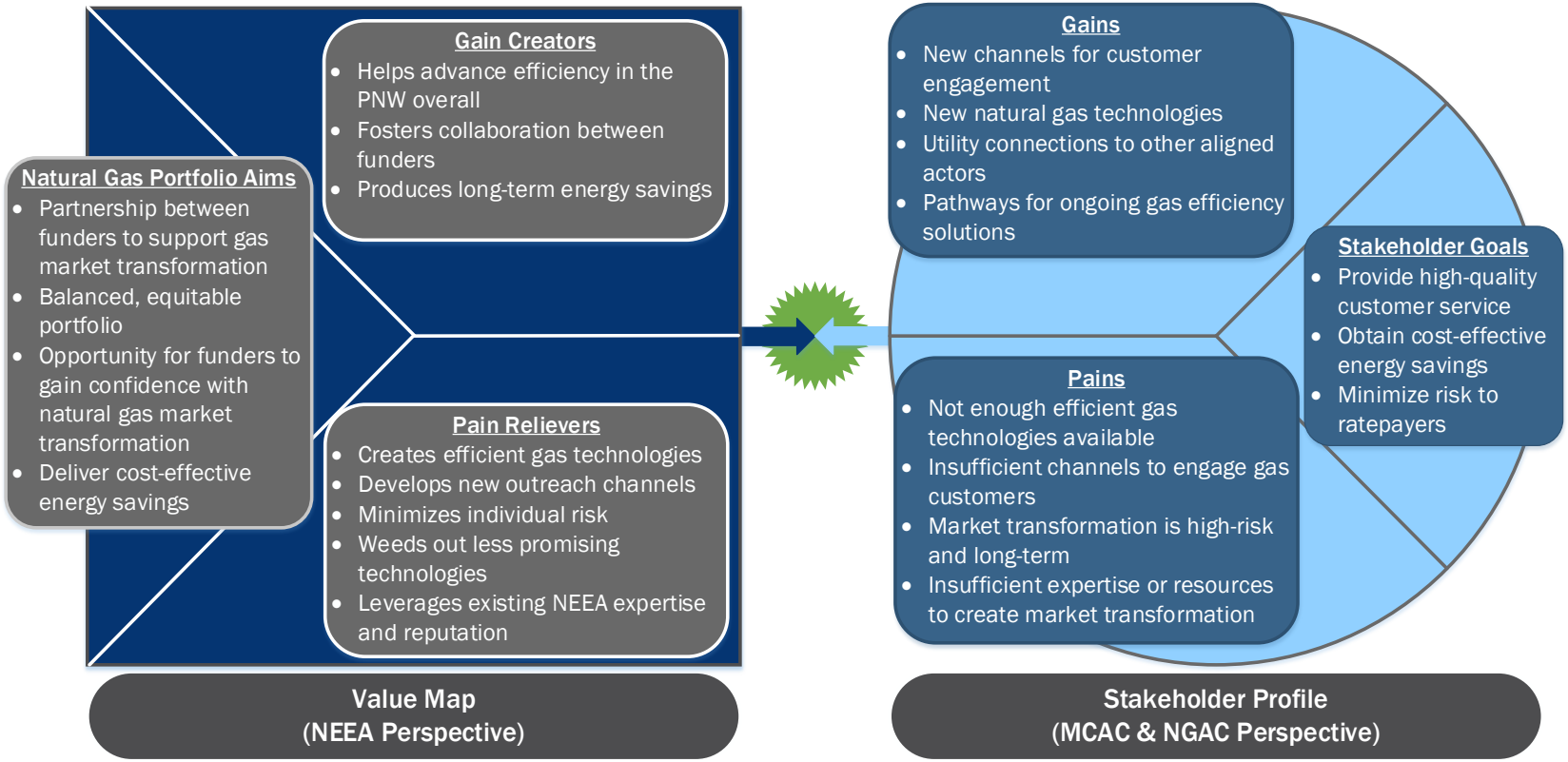
Overall, in-depth discussions indicate that stakeholders do share acceptance of a sustainable, long term value proposition for natural gas market transformation (Figure 4). This acceptance is largely rooted in a number of core values seen by many or all committee members in the portfolio:

- **Cost-Effective Energy Savings:** Stakeholders identified cost-effective energy savings as a key output of the portfolio.
- **Mitigation of Risk:** Market transformation is high-risk; funding in a group rather than funding alone distributes the potential cost of failure across funders.
- **Valuable Failure:** Identifying technologies that do not work is helpful in guiding future efforts.
- **Collaboration:** Creating collaboration between utilities that have not engaged with one another before (e.g., gas-only utilities) is valuable. Bringing them to the table is a good start.
- **Leveraging Existing Expertise and Knowledge:** Stakeholders find value in NEEA using their existing expertise to take actions that they would have difficulty pursuing individually, such as influencing codes and standards, and engaging manufacturers.

While there is broad agreement across committee members regarding the value proposition of the NGP, some portfolio funders have additional values that they would like to realize from the NGP:

- **Short-Term Energy Savings:** Some stakeholders see short-term energy savings from the portfolio (within 2-5 years) as a key component of the value proposition.
- **Customer Engagement**: Additional efficient gas technologies provide an expanded opportunity to engage customers around energy efficiency.
- **Building Market Share:** Some stakeholders see the NGP as a way to build market share for natural gas and gas technologies.

Figure 4. NGP Value Proposition Map



These differing views have existed since the portfolio planning and development process, and based on in-depth discussions, NEEA staff and committee members find this acceptable, provided that common values supply sufficient justification for the portfolio.

> *"We really tried to hone in on: 'What are the goals that we have that are consistent among us?' Let's recognize that… all of our objectives aren't going to be the same. We're going to have our own objectives as an organization, but we've got some mutually agreeable objectives. Let's stay focused on those."*

Perceived Values Among Market Actors

Manufacturers of gas equipment and organizations focused on advancing efficient gas technologies find conducting field tests on their own challenging for a variety of reasons. They see NEEA as playing a critical role in funding and field testing technologies that might not otherwise be explored due to risk.

> *"I think from my perspective… NEEA is taking some of that initial risk from manufacturers. For us it's hard to make a business case to launch an emerging product without… that cost effectiveness being there right from the start."*

Market actors also see NEEA playing a key role in attempts to identify applications for technologies that have already been developed. For example, NEEA's exploration of additional applications for existing rooftop HVAC and gas-fired heat pump technology is seen as potentially leading to the availability of an efficient technology that has significant market potential.

Finally, market actors note that NEEA's staff have a strong knowledge of the Northwest, including an understanding of how technologies fit the region, that their organizations can leverage.

Regional Equity

Equity of the NGP's activities and benefits is a guiding principle for the management of the portfolio and selection of portfolio technologies to ensure that all stakeholders realize the value the portfolio presents. While the principle of equity is incorporated in the NGBP[3] and was mentioned by many stakeholders as a topic of

[3] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 10.

interest, some interviewees believe that equity should not be a major concern for the NGP until initiatives have begun to create market transformation.

Most NEEA staff and committee members believe the portfolio is currently funded and operated in a way that the benefits are (and will be) shared equitably among ratepayers. Committee members cited specific portfolio processes to back up their views that the portfolio is proceeding in an equitable direction:

- Committee members note that all funders have had input into technology selection, providing opportunity to ensure equity
- Funders cite the fact that technologies were tested and piloted in their service territories as evidence that the portfolio is moving in an equitable direction

Despite these comments, several NEEA staff and committee members believe the portfolio's initiatives have not advanced to a stage that allows stakeholders to draw conclusions about how benefits will be shared among ratepayers.

3.1.2 Product Advancement

To date, NEEA staff and stakeholders agree that the portfolio's core initiatives have not progressed as far as hoped. NEEA uses a lifecycle model for their natural gas and electric initiatives that includes six distinct stages (as shown in Figure 5). The NGBP includes projections for where each of the NGP's five core initiatives should be during each year of the current five-year NGP cycle.

Figure 5. Natural Gas Initiative Lifecycle

At this time, two of the five portfolio initiatives (gas-fired heat pump water heaters and rooftop HVAC) have reached or are projected to pass their projected lifecycle stage for Year 3 of the portfolio (Table 1).[4] The remaining three core initiatives have progressed, but have not yet reached the stage projected in the NGBP.

[4] We note that the projections incorporated in the NGBP assumed that the portfolio would be in full operation at the beginning of 2015; delays prevented the portfolio from beginning full operations until mid-2015. This delay is one potential cause of slow initiative progress as compared to projections.

Table 1. Status for Core NGP Initiatives

Initiative	Lifecycle Stage				
	Scanning & Concept ID	Concept Opportunity Assessment	Market & Product Assessment	Strategy Testing & Finalization	Market Development
Gas-Fired Heat Pump Water Heaters			☆		
Combination Space & Water Heating Systems		☆			
Hearth Products			☆		
Rooftop HVAC		☆			
ENERGY STAR® Gas Dryers					☆

Key	
☆	Projected lifecycle stage from NGBP
	Current lifecycle stage

This is due to a number of setbacks NEEA encountered on several of the core technologies, most notably ENERGY STAR® gas dryers and hearth products.

- While it was hoped that dryers would be an "early win" based on an understanding that a market-ready product existed at the time of the portfolio's inception, laboratory testing showed that the products did not perform as expected, leading to a delay in initiative activities.
- NEEA discontinued its focus on transforming fuel efficiency for gas hearths due to cost-effectiveness concerns around this effort; the initiative refocused around (1) efforts to impact federal standards for hearths to eliminate standing pilot lights and (2) low-capacity hearth products.

> *"I'm not surprised with where we're at as far as the technology is concerned… I think we are fairly close to what I would expect from that perspective."*

Despite these setbacks, most stakeholders believe that the progress of the NGP's initiatives to date has been acceptable and that the NGP has created progress toward product advancement. While interviewees expressed the view that technological setbacks have been disappointing, they are generally unsurprised about these setbacks given the lag in natural gas technologies behind electric technologies.

Key Finding

While technologies have not advanced as far as stakeholders hoped from the outset, there is general recognition among stakeholders that this was to be expected given the early status of the core technologies and the pioneering approach of the portfolio, and most committee members believe that the progress of the NGP's initiatives to date has been acceptable.

NEEA's Role in Pre-Commercialization Activities

The NGBP clearly states that (1) the technologies chosen for focus in the NGBP are in their initial stages of development, (2) market transformation is a long-term enterprise, and (3) the savings and cost-effectiveness estimates provided in the document are based on a 20-year time frame of analysis.

NGBP

As with electric market transformation, gas market transformation is inherently a long-term investment strategy that supports energy efficiency efforts over a 20-year horizon. Most of the initiatives identified in this business plan are in the very early phases of the initiative life cycle. While NEEA does not expect them to deliver significant savings until late in this funding cycle, it projects all of these to be regionally cost-effective in the long-term.[5]

Both committee members and NEEA staff recognize that the NGP has involved early-stage interventions. However, there are differing opinions among committee members about involvement in the market at this this stage.

- Most committee members are generally supportive of the portfolio's approach, given the status of gas efficiency and the need for additional gas efficiency measures. They believe that NEEA is well suited to intervene early in the product development process.

> *"We think it's important that NEEA help develop emerging technologies. NEEA specializes in development, and they're pretty good at it."*

> *"I don't believe that we should be in the product development phase. That's not where NEEA should live."*

- However, one funder is uncomfortable with NEEA pursing ongoing pre-commercial product development activities, and sees these activities as falling outside of NEEA's scope.

Key Finding

Differing opinions exist between the majority of committee members who believe NEEA's approach to natural gas market transformation is appropriate and one funder who does not believe NEEA should intervene in pre-commercial product development.

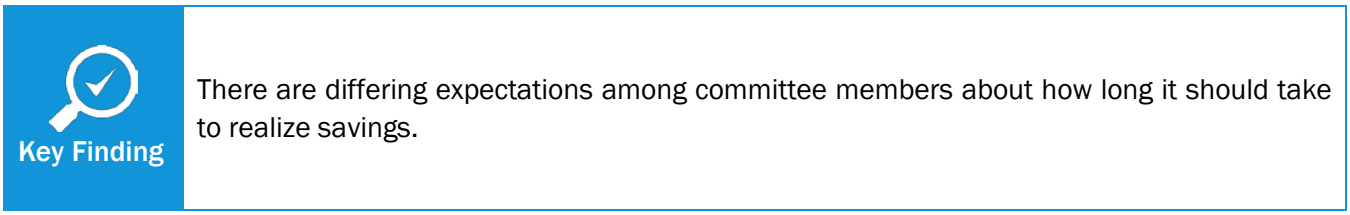
[5] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 5-6.

Potential for Commercialization of the Core Technologies

NEEA staff and interviewed market actors believe that the majority of technologies chosen for focus in the NGP continue to have potential to produce long-term savings. Interviewees are most positive about the savings potential for gas-fired heat pump water heaters and combination space and water heating systems, the initiatives for which the NGBP projected the most significant savings (Appendix A).

In contrast to NEEA staff and market actors, there are mixed perceptions among committee members as to the potential that exists for commercialization of the portfolio's core technologies. In particular, while most stakeholders still see long-term promise in all or some of the core technologies, two organizations are particularly concerned about the portfolio's potential to yield cost-effective savings.

A key driver of these mixed perceptions is the differing expectations of committee members around how long it should take to realize savings from portfolio initiatives (Section 3.1.1). Although stakeholders understand that overall market transformation is a long-term process and the NGBP does not include explicit projections for savings to be realized in the first cycle, some stakeholders expected that portfolio technologies would produce cost-effective savings in the short-term (i.e., 2 to 5 years).



3.1.3 Progress Toward Market Transformation

As part of the NGP's initiatives, NEEA is engaging with manufacturers, utilities, and other market actors in the natural gas space to advance natural gas product efficiency, including product testing and validation, scanning activities, and efforts to influence product standards. As part of this assessment, the Assessment Committee sought to understand the extent to which these groups are engaged with NEEA's NGP, as well as NEEA's presence and influence in the natural gas market.

While there is consensus among the market actors we spoke with that NEEA is not yet the "go-to authority" on natural gas market transformation, market actors know that NEEA is present in this space, are aware of NEEA's efforts, and see NEEA as a well-respected market transformation leader.

> *"I wouldn't think of them first and foremost when I think of gas efficiency. But I think NEEA is well respected among manufacturers – everybody knows the work that they do."*

> *"It helps… for me just to kind of talk about the involvement that we've had with NEEA in the past and how great they've been as a partner to us."*

Market actors specifically cited their experience working with NEEA on electric energy efficient products as being beneficial to communicating the value that NEEA can provide to their organizations in the natural gas market.

Most interviewees believe that NEEA is exploring opportunities and building partnerships where they can.

- A majority of market actors believe that NEEA's natural gas activities are valuable and significant, particularly in regards to (1) funding field testing and validation efforts, (2) building manufacturer relationships and awareness of natural gas technologies, and (3) identifying additional applications and end-uses for technologies that have already been developed.
- Market actors repeatedly emphasized that there are limited resources nationwide devoted to the advancement of efficient gas technologies. While other organizations are examining similar technologies in their market transformation efforts,[6] market actors made it clear that they do not believe NEEA's efforts are duplicative.

Key Finding

A majority of market actors we interviewed believe that NEEA's natural gas activities are valuable and significant.

3.1.4 Adherence to Core Principles

The NGBP includes specific guiding principles for the portfolio: to avoid fuel-switching, to avoid cross-subsidization of gas and electric technologies, and to implement gas efforts without diminishing NEEA's existing electric work. Committee members believe that the current portfolio initiatives, processes, and cost-accounting systems appropriately address the portfolio's guiding principles, and that NEEA staff are working diligently to ensure these risks do not occur.

Key Finding

Overall, there is agreement that NEEA is adhering to the key principles of operation in the NGBP.

[6] For example, Nicor Gas (Illinois) recently filed an energy efficiency plan that includes gas market transformation efforts and focuses on four of the five core technologies included in NEEA's NGP.

No Promotion of Fuel Switching

From the outset of the portfolio development process, stakeholders agreed that the portfolio should avoid the promotion of fuel-switching. Interviewed stakeholders agree that this key principle remains important, and they are not imminently concerned about portfolio activities resulting in fuel switching.

Despite the lack of concern about this issue, in-depth interviews with NEEA staff indicated that some stakeholders have a very low threshold for pursuing opportunities that could potentially lead to fuel switching, and there should be some codified definition of what level of risk is acceptable for decision-making.

> *"We probably need some sort of test or definition of what is acceptable, or not acceptable, because that card can be thrown for something very minor, or something really big."*

No Cross-Subsidization

To support the NGP and ensure cross-subsidization does not occur, NEEA staff developed a cost accounting system specifically for the NGP where staff members are able to track their time by funding source. Utilizing this system, program staff account for their time both by funding source and by the individual portfolio project that they work on. Administrative and overhead time is allocated between gas and electric via an internally developed NEEA formula that is periodically reviewed for suitability by NEEA staff.

The universal opinion of stakeholders is that NEEA is diligently tracking gas and electric costs separately. While some stakeholders do not feel that they have clear visibility into how NEEA is tracking spending, no stakeholders believe there has been any evidence of cross-subsidization to date. Stakeholders place a high degree of trust in NEEA to account for time appropriately and not cross-subsidize from gas to electric or vice versa.

There is also consensus among stakeholders that the technologies selected for the portfolio, and the portfolio's current management structure are set up in a way that minimizes the possibility of cross-subsidization moving forward.

> *"You know, we understand that… the gas technologies that were chosen to be in this portfolio are gas-only… And that it makes it very easy for you to fund that and be very confident that you're not cross-subsidizing."*

Cross-Portfolio Effects

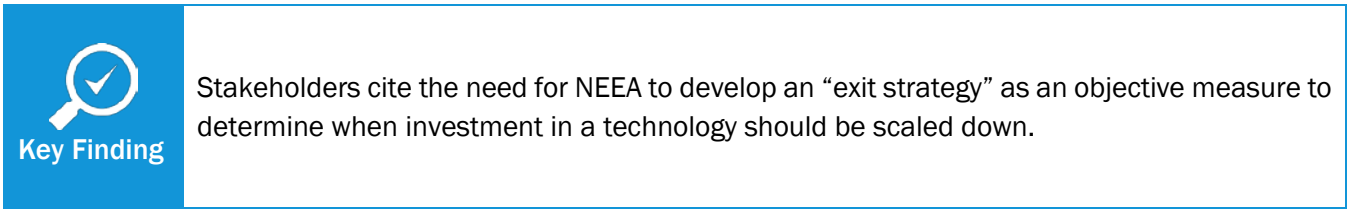
Stakeholders believe that there has been little or no direct impact on NEEA's electric efforts from the NGP to date. This is a view shared by all stakeholders, including electric-only NEEA funders. Electric-only funders also think the gas portfolio could have long-term positive effects on electric funders because there is potential for reduced overhead costs.

On the other hand, stakeholders identified a number of positive effects that NEEA's electric initiatives have had on the NGP. Both stakeholders and NEEA staff believe the NGP has heavily leveraged processes, lessons learned, and expertise from the electric portfolio. For example, several NGP staff members have relationships they built with manufacturers on the electric side that they have been able to leverage for gas initiatives.

> *"It's really clear that having an experienced technology commercialization staff and process, a lot of that competence has drifted over."*

Portfolio Risk Management

The NGBP explicitly states that the NGP should balance risks associated with the portfolio by having "a mix of projects with varying degrees of risk and with potential benefits of each commensurate with the risk."[7] Stakeholders see appropriate risk management processes in place to manage a number of key portfolio risks (see Section 4.3.1 for more detail). Stakeholders also identified several risks for which they believe there are currently no associated mitigation strategies – most notably, the risk that NEEA could pursue a technology without sufficient potential too far due to a lack of a codified "exit strategy."



3.1.5 NEEA's Health as a Dual-Fuel Organization

Understanding NEEA's organizational health related to its engagement in the natural gas market requires assessment of four key areas: (1) alignment of activities with NEEA's overall mission and vision, (2) funding sources and levels, (3) governance structure, and (4) the potential for integration of gas activities with the electric portfolio.

NGP Alignment with NEEA Mission and Vision

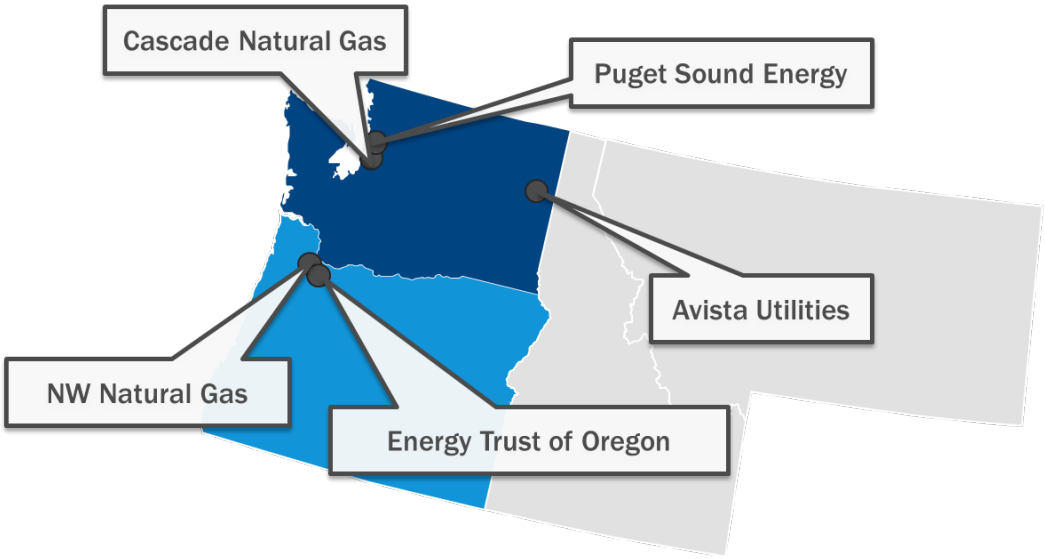
A critical question outlined by the Assessment Committee and NEEA staff for this study is whether the organization's entry into the natural gas market aligns with NEEA's mission and vision. Interviews with NEEA staff and stakeholders indicate broad consensus in this area, with both groups sharing the view that NEEA's natural gas activities are well aligned with the mission and regional vision of the alliance.

[7] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 10.

Funding Status

The NGP is currently funded by five organizations (Figure 6),[8] and there has been little progress since the portfolio was established in recruiting major Idaho and Montana gas utilities in the region to contribute.

Figure 6. NGP Funding Organizations



All funders expressed at least minor concern that no savings have been achieved by the NGP to date and that savings do not appear to be imminent. Given this concern, there is a range of views among funders as to exactly what it would take for them to continue to support the portfolio.

- The majority of funders (three) **do not see** progress to date as a major concern impacting their willingness to continue funding the portfolio for the remainder of this cycle.

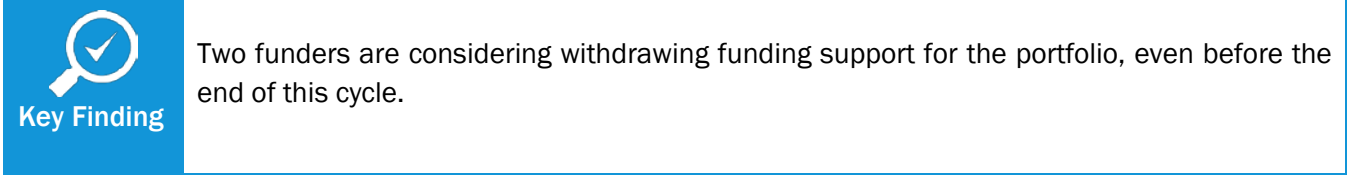
> *"We've been taking a 20-year perspective. I mean the business plan is a 20-year perspective… So by the fifth year or sixth year, I don't think anybody's losing any sleep over it."*

- However, all funders commented that to continue funding, they would need to see either:
  - Realized energy savings during the remainder of this cycle (two funders), or
  - A clear and near-term path to realized energy savings early in a future cycle (three funders).

[8] NW Natural indirectly funds the portfolio; Energy Trust of Oregon directly funds the portfolio on behalf of NW Natural and Cascade Natural's Oregon territory.

- Two funders are more concerned about the portfolio's progress toward cost-effective savings to date and expressly indicated that they are considering withdrawing support for the portfolio in its current form even before the close of the current cycle.
  - One funder is skeptical that the portfolio will produce cost-effective savings, and specifically mentioned that they would like to wait until they see results from the Mid-Cycle Assessment to make a conclusion about whether or not to keep funding the portfolio for the remainder of this cycle.

> *"From what I see right now, it looks pretty skinny to me. I don't know if there's going to be enough there. Doesn't appear like there's going to be enough there."*



One funder believes that NEEA should, at a minimum, pull back from developing technologies before the five-year timeline for the portfolio is up, citing a lack of potential of the target technologies as the rationale. This funder does not necessarily believe that funding for all technologies should be discontinued, but at minimum suggests a re-evaluation of portfolio priorities and a return to the NGBP to assess if its approach is still optimal. This stakeholder suggested NEEA can still focus natural gas efforts on other activities such as codes and standards, outreach to manufacturers, and market research, but should restructure priorities to stop focusing on early-stage technologies.

Portfolio Governance

Advisory Committee members universally believe that the committee is functioning effectively as a governing body. Interviewees praised the consensus decision-making process instituted as part of the Advisory Committee.

While most committee members believe that NEEA staff are operating with the appropriate level of autonomy and decision-making authority, a minority of committee members are concerned that NEEA staff have too much purview to make operational decisions (e.g., reallocating funds within portfolio) and suggest instituting some additional controls (e.g., a limit of how much budget can be shifted unilaterally). Conversely, some committee members believe that because NEEA staff are the subject matter experts, they should have broad latitude to make decisions about discretionary funds.

Several committee members and NEEA staff members had suggestions for changes they would like to see in the NGP governance structure moving forward. Some committee members voiced the opinion that gas-only utilities should have some representation on the overall NEEA Board, especially if the electric and gas portfolios become more integrated. One committee member supported this opinion by stating the belief that gas governance structure has been forced to fit into a structure that was designed for electric. This committee

member also suggested that the NEEA Board is far removed from NGP activities, yet can be ultimately responsible for making decisions that govern the overall direction of NEEA (and therefore, the NGP).

Integration of Natural Gas and Electric Portfolios

While NEEA laid out an aspirational goal of integrating electric and gas market transformation activities within five years at the time of development of the NGBP,[9,10] most interviewed committee members do not believe that a full integration of the gas and electric portfolios is feasible at this time. Viewpoints on integration are summarized as follows:

- **Not Feasible**: These feelings are driven by persisting concerns that an integrated portfolio could lead to gas-only or electric-only ratepayers subsidizing the opposite fuel, and concerns that the gas portfolio has not yet proven it can produce savings. Committee members also expressed some concern that gas-only funders might have their voices drowned out by electric funders in a fully integrated portfolio, and believe that gas-only funders should have representation on the NEEA Board if the portfolio moves in this direction.
- **Worthwhile**: A minority of committee members, NEEA staff, and market actors disagree with this conclusion, and believe that the benefits of full integration outweigh the challenges mentioned above. NEEA staff mention that they would like to be able to address both fuels simultaneously in some of their initiatives and that taking a siloed approach is significantly less impactful.

> *"With some commercial HVAC initiatives… I'm in a role that bridges the fence between both sides of the house. There is a huge gas component that is basically being ignored. To align… with what makes sense for just our set of funders, or for our accounting purposes, internally, that's not going to drive us towards success in trying to transform these markets."*

Despite some disagreement over this issue, most NEEA staff members and some committee members believe that portfolio integration would improve operational efficiencies, and that a **partial** portfolio integration for activities such as codes and standards, marketing, and market actor outreach could be beneficial. Most stakeholders are open to *some* level of integration in this regard. Another key consideration is the length of time it will take to determine how any form of integration would happen. As such, at least one stakeholder feels strongly that discussions on the topic should start now.

[9] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 2.
[10] Ibid., 16.

Key Finding

Most interviewed committee members do not believe a full integration of NEEA's gas and electric portfolios is feasible at this time. However, most NEEA staff members and some committee members believe that partial portfolio integration could be beneficial.

3.2 Key Conclusions and Implications for the Future of the Portfolio

Overall, our assessment indicates that from a process perspective, the NGP is operating effectively, adhering to its core principles, and is based on a sound central value proposition that aligns with NEEA's mission. The majority of stakeholders and funders believe that the NGP is an effective and valuable enterprise. As such, we recommend no significant changes to the portfolio's operations or guiding principles.

However, there is a clear risk to the portfolio's current funding due to:

- Funder concerns about progress of the core technologies,
- Funder disagreements about where NEEA should intervene in product lifecycles, and
- Funder disagreements about the time horizon for the realization of savings

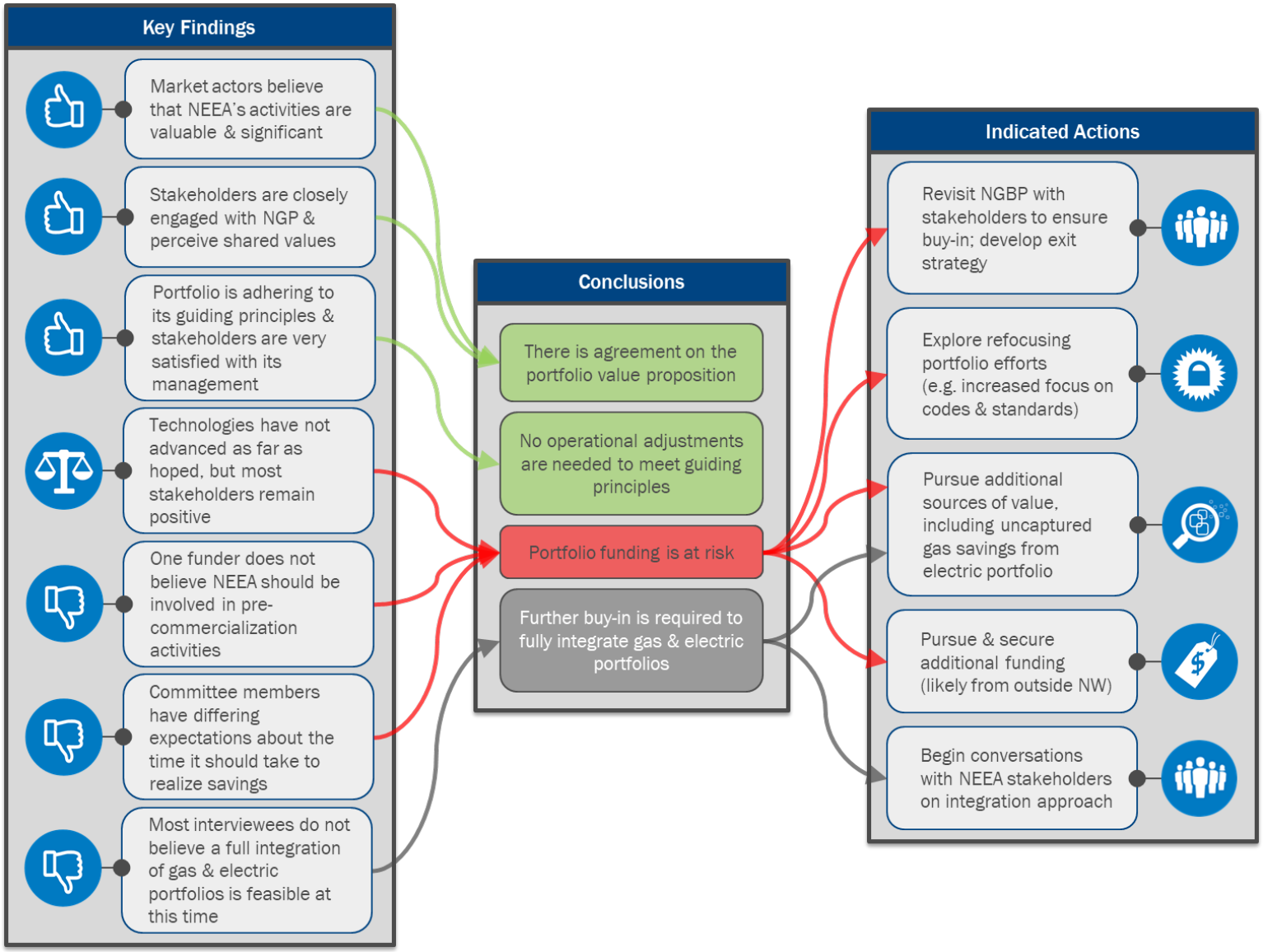
NEEA could pursue a wide range of strategies to address this risk. One funder suggests that the collaborative explicitly revisit the NGBP; we believe that, with no preconditions attached, this would be a useful exercise and could allow the portfolio to adjust and refocus its efforts to ensure funder buy-in.

As to the question of integration, most interviewees do not believe that fully integrating NEEA's gas and electric portfolios is feasible at this time. While there is agreement that some degree of integration could create value for stakeholders, further buy-in is required in order to achieve NEEA's aspirational goal of fully integrating its market transformation activities. NEEA should begin collaborative discussions with stakeholders in order to address concerns about integration.

Finally, we would be remiss not to mention that the portfolio was motivated, in part, by a desire for NEEA to realize gas savings currently being created as a byproduct of its electric initiatives and spur the development of new dual-fuel initiatives that might not be cost-effective in a siloed gas or electric portfolio (Appendix A). While this motivating desire was one key factor that led to the NGP's development, NEEA still is not capturing these savings. Although development of dual-fuel initiatives must wait until NEEA can secure stakeholder buy-in on integration, we strongly suggest that NEEA continue to explore avenues to quantify and claim gas savings realized as part of current electric initiatives.

We present key findings, conclusions, and recommended actions in Figure 7 below.

Figure 7. Conclusions & Indicated Actions



4. Additional Findings

The following sections provide additional insights we gathered as part of our study that do not directly support the key conclusions and indicated actions presented in Section 3.2.

4.1 Mission Perspective

4.1.1 Progress Toward Measuring Cost-Effective Savings

Concerns Around Portfolio Costs

Future cost-effectiveness of portfolio initiatives is a concern for funders. All funders indicated some reticence about including a large line-item cost (funding the portfolio) without immediate returns in terms of savings. While regulators mention that they allow some leeway for market transformation initiatives in assessing overall conservation portfolio cost-effectiveness, funder representatives nevertheless told us that they can find this large cost difficult to justify (for example, when conducting internal reporting).

Challenges in Developing a Cost-Effectiveness Approach

Developing an approach to assess cost-effectiveness for the NGP has been a challenge. Utilities worked together to try and create a single measure for cost effectiveness of new natural gas technologies in the region, but ran into challenges.

- **Different Avoided Costs.** While NEEA staff believe that NEEA should develop one unified cost effectiveness test for the portfolio, each funder supporting the NGP has different avoided cost assumptions, which makes it difficult to come to agreement about one avoided cost model.
  - Interviewees express some confusion in terms of the current status of selecting a cost-effectiveness measure. Utilities have generally told us that they have created their own models and are satisfied with the work that they have done, while NEEA still wants a regional cost-effectiveness model to be developed. There is not a clear recognition among those we interviewed as to who is currently leading this effort.
- **Prioritization of Cost-Effectiveness as an Issue.** Several NEEA staff members and funders believe that individual portfolio initiatives are not yet at a level where NEEA should be focusing on cost-effectiveness.

NEEA staff feel that there are two potential solutions to the challenge of developing a cost-effectiveness approach:

- Engage the Northwest Power and Conservation Council or some other regional entity to act as an arbiter.[11]

[11] The Regional Technical Forum fills this role for electric market transformation, but no similar niche is currently filled for the NGP.

- Have regulators rule on the final method to be used for determining cost effectiveness, or establish a regional measure for cost effectiveness.

4.1.2 Pursuit of Additional Funding Sources

NEEA staff and committee members have an ongoing interest in leveraging sources of additional funding for the NGP, and cite several reasons why this should be a high priority moving forward:

- **The inability to find other funders within the Northwest**. NEEA staff have actively sought out additional support, but have been unable to garner additional funding for the portfolio. NEEA staff and committee members feel that other gas utilities in the Northwest are hesitant to fund the NGP because they view electric utilities as competition and are not interested in collaboration. Furthermore, utilities with natural gas customers in Montana and Idaho have procurement portfolios and regulatory structures that do not incentivize their participation in the NGP in the same way that utilities in Oregon and Washington do.
- **Concerns about free-ridership.** Some funders are concerned with the idea that other natural gas utilities will ultimately benefit from the outcomes of the NGP, but are not currently contributing to it. A few stakeholders think that other possible funders may be holding back and watching what NEEA is doing and then may come in and fund once they see the technology is viable or creating savings.
- **NEEA alone does not have enough weight to move national markets.** All interviewees generally believe that NEEA may be able to influence some market transformation within the Northwest with the current funding structure. However, stakeholders believe that transforming the market to the level that stakeholders would like to see is going to require collaboration from organizations outside of the Northwest (especially for specific technologies with small markets in the Northwest, e.g., gas dryers). At the same time, other stakeholders feel that it is too soon to tell if the geographic coverage and funding structure is adequate to achieve portfolio goals.

4.1.3 Peripheral Wins & Scanning Outcomes

Committee members and NEEA staff identified an early, peripheral win from the NGP: a 0.67 gas water heater opportunity that spun out of engagement with potential gas-fired heat pump water heater manufacturers. While NEEA is still assessing the potential to claim savings from this measure, interviewees pointed to it as an example of the unexplored potential that exists in the natural gas efficiency market.

NEEA staff also mentioned a new modulating gas furnace that arose from the portfolio's scanning effort with significant energy saving potential. Staff also believe that they can accelerate the market for this technology relatively quickly as they have already built relationships with furnace distributors through electric market transformation programs.

4.2 Stakeholder Perspective

4.2.1 Defining Portfolio Success

Stakeholders discussed various definitions of success for the NGP (Table 2) in our interviews. These definitions generally align with stakeholders' perceptions of portfolio value.

Table 2. Stakeholder Definitions of Success

Commonly Held Definitions of Success
■ Achieving metrics laid out in the NGBP after five years ■ Building a collaborative effort toward advancing natural gas efficiency in the Northwest ■ Availability of one or more commercialized products that utilities can use to claim savings ■ Identifying and weeding out technologies that are unlikely to be successful in the long-run ■ NEEA becomes the "go-to" resource for natural gas efficiency
Rarer Definitions of Success
■ Hitting the initiative lifecycle stages laid out in the business plan ■ Ratepayers become more educated about natural gas efficiency (generating awareness) ■ NEEA integration as a dual-fuel organization ■ Having a technology materialize into an "early win" ■ Generating interest among manufacturers in developing energy efficient gas technologies

4.3 Internal and Capacity Perspectives

4.3.1 Portfolio Operations

Internal Support for the NGP within NEEA

In addition to stakeholder satisfaction with portfolio management and operations, NEEA staff also told us that they are satisfied with portfolio operations. Staff generally believe that the NGP receives an appropriate amount of internal support within NEEA.

Adherence to Key Principles in the Business Plan

No Promotion of Fuel Switching

While interviewees do not believe the NGP has created any movement toward fuel switching to date, there remains some long-run concern that transforming the market for gas technologies will inadvertently cause fuel switching. One interviewee believes that if this initiative is to become cost effective, it seems impossible to avoid impinging upon electric market share.

> *"I think we're taking electric funded intellectual property and handing it over to gas utilities to convert electric sales to gas sales and that was not the intent, so, that's a risk."*

Cross-Portfolio Effects

Several NGP staff members have previous experience on the electric side that directly aligns with their areas of focus in the NGP. For example, team members focusing on ENERGY STAR® dryers and gas-fired heat pump water heaters have related experience working with electric dryers and electric heat pump water heaters. These staff members have been able to leverage the relationships and reputation they built with manufacturers on the electric side.

Both NEEA staff and funders pointed out that NEEA will likely have more leverage in the future if they are able to bring electric and gas versions of the same product to manufacturers. This finding was corroborated by some manufacturers who said their success working with NEEA on the electric side motivated their decision to work with NEEA on the gas side.

> *"When we worked with NEEA on electric, we quickly saw a collaborator, or a partner, in NEEA that was very cutting edge in terms of technology advancement but in also in terms of aligning the utilities together to consensus."*

NEEA staff reported they are currently leveraging a small number of portfolio efforts (e.g., meetings with manufacturers) for both gas and electric which saves cost for both portfolios. At the same time, some NEEA staff reported that they see more opportunities to leverage electric efforts to advance gas efforts, but are hampered by the current cost accounting structure.

While overall, interviewees viewed cross-portfolio effects to date as primarily positive, some minor concerns were expressed about staff resource allocations between portfolios. Some committee members feel that there is a sense that "top talent" within NEEA will be drawn to the gas portfolio. On the other hand, there is also minor concern reported by NEEA staff that those who split time between gas and electric may be prioritizing electric work.

Portfolio Risk Management

As part of our interviews, we asked NEEA staff and committee members to identify the risk that they see present in the NGP, as well as the associated processes or systems they believe have been put in place for managing these risks. These are presented in Table 3 below.

Table 3. Perceived Risks and Mitigation Strategies

Perceived Risks	Identified Mitigation Strategies
■ Technological and equipment failure	■ The selection of five different technologies at a range of maturity/risk levels for inclusion in the portfolio
■ NEEA is new to market transformation efforts for natural gas technologies ■ NEEA intervening with these technologies earlier than is typical	■ Conducting a "pilot effort" ■ Built in mid-cycle review
■ Investing too much funding into one manufacturer	■ Diversification of products for gas-fired heat pump water heaters
■ Misalignment of stakeholders' objectives, which poses risks for long term governance and support of the portfolio	■ Ongoing communication with funders to ensure continued alignment of values

Stakeholders also identified several risks for which they believe there are currently no associated mitigation strategies.

- **Exit strategy:** Most committee members cited the lack of a codified "exit strategy" or definitive protocol for when NEEA should stop funding a technology due to lack of technical potential as an area where technological risk is not being properly addressed.
- **Decreased support for future natural gas market transformation efforts:** Some stakeholders mentioned that it may be difficult to garner support for future natural market transformation efforts if this initiative fails.
- **Participation due to outside pressure:** NEEA staff recognize that regulatory pressure was a motivating factor for encouraging some stakeholders to join the portfolio and that the extent to which regulators continue to encourage funders to be involved in the portfolio has potential risk implications for the future of the portfolio.
- **Decarbonization and low natural gas prices:** Interviewees from all groups recognize low natural gas prices and/or changes in the natural gas market as a risk for the portfolio that cannot be easily mitigated. Regional movement toward decarbonization was also identified as a potential risk that could not be easily mitigated, though one stakeholder suggested that if decarbonization led to increased value being placed on therm savings, this could be a long-term benefit for the portfolio.

Portfolio Management and Meetings

Advisory Committee members believe that advisory committee meetings are well-run and that their voices are being heard; there is also a shared view that stakeholders are staying engaged in the process. Meeting attendance is high, and stakeholders feel that committee members are putting significant time and energy

into this effort. NEEA staff also feel that Advisory Committee members are very engaged in the portfolio processes.

Advisory Committee members note that while meetings are very long, they are well-run and provide value to stakeholders. Committee members believe that their voice is heard in meetings, that the group is the right size for all voices to be heard, and that NEEA staff are attentive to their needs and viewpoints.

Portfolio Communications

Most stakeholders express satisfaction with communications and believe that the Advisory Committee is provided with enough information to do their jobs. Four stakeholders pointed out that meetings and communications have evolved over time to better meet the needs of stakeholders.

We did hear comments from a handful of stakeholders that maintaining momentum for the portfolio within their organization can be challenging. To address this, one stakeholder suggested NEEA staff provide committee members with "talking points" or a progress summary that could be used to easily communicate portfolio progress to others within Advisory Committee members' organizations not involved in Advisory Committee and less familiar with its focus.

Consideration	NEEA staff could provide committee members with a progress summary that could be used by Advisory Committee members to easily communicate portfolio progress upward within their own organizations.

Alignment of Expenses and Budget Projections

The portfolio expected to have filled all staff positions and be up and running at the beginning of the first year (2015). Due to delays in getting funder commitments and agreements completed, this did not occur, leading

to underspending as compared to budget projections. Since 2015, incurred portfolio expenses have roughly lined up with budget projections in the NGBP (Table 4).

Table 4. 2015-2017 NGP Budgets and Expenditures

Year	Budget	Actual	Share
Staff and General Costs			
2015	$806,017	$463,004	57%
2016	$1,409,369	$1,175,500	83%
2017 (Forecast)	$1,429,964	$1,664,395	116%
2015-2017 Total	*$3,645,350*	*$3,302,899*	*91%*
Project Initiative Costs			
2015	$762,500	$217,244	28%
2016	$1,225,000	$1,718,372	140%
2017 (Forecast)	$1,937,500	$1,978,155	102%
2015-2017 Total	*$3,925,000*	*$3,913,772*	*100%*
Total Costs			
2015	$1,568,517	$680,248	43%
2016	$2,634,369	$2,893,872	110%
2017 (Forecast)	$3,367,464	$3,642,550	108%
2015-2017 Total	**$7,570,350**	**$7,216,671**	**95%**

Appendix A. Portfolio Background & History

History & Key Drivers of Gas Market Transformation at NEEA

NEEA has operated electric market transformation efforts since 1996, but until the NGP began in the 2015-2019 funding cycle, NEEA had not previously implemented a gas market transformation initiative. In 2009, the NEEA Board changed NEEA's mission statement to be explicitly fuel-neutral, which opened up the opportunity for pursing gas technology development.

In our interviews with stakeholders and NEEA staff, we learned that a desire for a gas market transformation initiative existed, at least among some parties, well in advance of the NGP's inception. The most commonly recognized drivers behind development of a natural gas market transformation initiative mentioned by stakeholders are as follows:

- **Missed opportunities for dual-fuel savings.** Some of NEEA's initiatives (for example, New Homes) are intrinsically dual-fuel; they produce both gas and electric savings. NEEA funders, staff, and regulators recognize that this type of effort produces gas savings as an outcome of their activity; however, these savings are not captured by NEEA due to a lack of a gas funding agreement. Furthermore, some technologies or initiatives of interest are not cost-effective when examining from the perspective of a single-fuel, but could become cost-effective if both streams of savings are captured.
- **Limited availability of energy efficient natural gas technologies in the market and a recognition that gas technologies are less advanced than electric.** Due to a number of factors, including a limited number of gas end-uses to spur investment, gas technologies lag behind electric technologies in terms of available efficient options and momentum toward market transformation.
- **Regional and regulatory drivers.** Individual utilities in NEEA's footprint have specific motivations for pursuing gas market transformation, including (1) lack of available technologies to include in gas conservation portfolios, (2) desire to build customer base or increase customer engagement, and (3) regulatory pressure to pursue additional cost-effective or least-cost savings.

As a result of these drivers, NEEA initiated an effort to launch a natural gas market transformation effort in 2010. While a portfolio planning process was undertaken, the initiative did not receive backing from a critical mass of funders and was unable to move forward.

From an external perspective, significant changes in the natural gas industry occurred during the formation of this portfolio, including a fluctuation in natural gas prices and a drop in the avoided cost of natural gas, which were contributing factors to this failure to launch.[12] Interviewees also mentioned that the technology selection process for the 2010 attempt was driven solely by technical and economic criteria; NEEA staff believe it was difficult to garner support because funders believed the technologies selected were not appealing for their customers.

[12] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 4.

Portfolio Design

Based on lessons learned from the 2010 effort, NEEA organized a collaborative of stakeholders, including representatives from Avista Utilities, Energy Trust of Oregon, NW Natural Gas, Puget Sound Energy, and the Northwest Gas Association, to develop a business plan (the NGBP) for a new natural gas initiative.

This initiative was intended to be a gas-only "pilot," and included specific objectives to (1) not promote fuel-switching, (2) not cross-subsidize between gas and electric, and (3) implement gas efforts without diminishing existing electric market transformation work. The purpose of initiating the gas portfolio as a stand-alone initiative was to allow funders to gain knowledge about natural gas market transformation while avoiding the challenge of organizational restructuring. The NGBP lays out NEEA's aspirational goal of integrating electric and gas activities within five years at the time of development of the NGBP, and to include the NGP's activities into NEEA's overall strategic and business planning as an integrated part of NEEA's approach to market transformation once NEEA staff and funders became comfortable with the state of the NGP.[13,14]

Portfolio Technologies

As part of the NGP development process, the collaborative selected technologies to support through market transformation initiatives. The criteria for the selection of these technologies included[15]:

- **Cost-effectiveness:** *"Long-run market transformation based on Total Resource Cost Test (TRC)"*
- **Market transformation potential:** *"Identified market transformation barriers or opportunities; strong business case for market actors and strong customer appeal"*
- **Energy savings potential:** *"Long-term market transformation potential"*
- **Early wins**: *"Provide early demonstration of natural gas market transformation"*
- **Alignment/synergies**: *"Support NEEA's other market transformation efforts"*

Additionally, the collaborative also took the following attributes into account when selecting technologies:

- **Equity:** *"The gas market transformation portfolio should ultimately provide benefits equitably across the funder region."*
- **Risk balance/minimization**: *"The gas market transformation portfolio should have a mix of projects with varying degrees of risk and with potential benefits of each commensurate with the risk. The portfolio should be managed to an appropriate level for the size and scope of the collaborative effort."*

The collaborative selected five core technologies, described below, to be included in the portfolio.

[13] Ibid., 2.
[14] Ibid., 16.
[15] Ibid., 10.

Gas-Fired Heat Pump Water Heaters

The NGP set a goal to transform the residential gas water heating market to make gas-fired heat pump water heaters the standard in gas water heating appliances. NEEA planned to achieve this goal through working with manufacturers to commercialize the technology, developing a market for the product, and finally influencing federal manufacturing standards for gas water heaters.

At the time of the development of the NGP, NEEA recognized that there was a significant market for this product in the Northwest (1.7 million customers) and a high long-run savings potential (over 104 million therms in the Northwest during a 20-year period).

Combination Space and Water Heating Systems (Combination Systems)

Gas-fired heat pump technologies can also be applied in a combination approach, providing both space and water heating at greater efficiency than standalone high-efficiency gas furnaces and water heaters. The NGP initiative focusing on combination systems planned to work with manufacturers to develop a combination space and heat pump water heating system for use in both new construction and retrofit applications. Eventually, NEEA planned to develop this approach into new energy code proposals as an allowable compliance approach for new construction.

Combination space and water heating systems had the highest estimated potential savings out of the technologies selected for inclusion in the portfolio (over 163 million therms in the Northwest during a 20-year period).

Hearth Products

The hearth products initiative included in the NGP intended to increase market adoption of high-efficiency gas hearth products. NEEA planned to work with market actors to increase the number of efficient burner and fireplace technologies available to customers in the Northwest, as well as build awareness around these new technologies.

The total estimated potential savings in the Northwest for hearth products during a 20-year period was over 10 million therms.

Rooftop HVAC

NEEA planned to initiate efforts for two different types of rooftop HVAC technologies: (1) condensing, gas-fired rooftop units with energy factors greater than 0.90, and (2) equipment that reduces outdoor air use and that can modulate heating in response to advanced air flow controllers. NEEA's end goal was to work with market actors to speed up the market adoption of at least one of these technologies. In addition, NEEA planned to address codes and standards for these technologies and work with utilities to develop programs for these technologies.

At the time of the NGBP's development, savings estimates for rooftop HVAC technologies were not available.

ENERGY STAR® Gas Dryers

ENERGY STAR® gas dryers were identified in the NGP as a technology that had the potential to be an "early win" for the portfolio, producing savings in a short time period. NEEA specifically planned to push for incorporating ENERGY STAR® dryer guidelines into federal manufacturing specifications. As part of this initiative, NEEA planned to leverage its existing work with major appliance manufacturers developing ENERGY STAR® electric dryers.

ENERGY STAR® gas dryers had the lowest estimated long-run potential savings out of the technologies selected (3.6 million therms over a 20-year period); however, the overall amount of incremental effort required for the initiative was believed to be minimal, and the technology's potential to be an "early win" was viewed as a selling point.

Other Portfolio Activities

NEEA also recognized the necessity of other activities to advance the portfolio, such as scanning for new technologies and codes and standards work, and included these activities as tasks in the NGBP.

Savings and Budget Projections

The NGBP clearly states that market transformation is a long-term enterprise, and savings and cost-effectiveness estimates are provided in the document in a 20-year time frame of analysis.

NGBP

As with electric market transformation, gas market transformation is inherently a long-term investment strategy that supports energy efficiency efforts over a 20-year horizon. Most of the initiatives identified in this business plan are in the very early phases of the initiative life cycle. While NEEA does not expect them to deliver significant savings until late in this funding cycle, it projects all of these to be regionally cost-effective in the long-term. The three largest initiatives in the portfolio will represent a long-term, energy savings resource capable of producing over 280 million therms per year at a weighted average 20-year TRC levelized cost of $0.28/therm.[16]

NEEA anticipates the largest portion of the savings will come from the three main initiatives: gas-fired HPWHs, combination heating and water heating systems using gas-fired heat pump technology, and efficient hearth products.[17]

[16] Ibid., 5-6.
[17] Ibid., 11-12.

The table below shows the 20-year savings estimates provided in the NGBP. At the time the NGBP was developed, savings estimates were not available for rooftop HVAC.

Table 5. 20-Year Savings Estimates[18]

Initiative	20-Year Savings Potential (Therms)	%
Gas-Fired Heat Pump Water Heaters	104,564,346	37%
Combination Space and Water Heating Systems	163,643,995	58%
Hearth Products	10,535,660	4%
Dryers	3,600,000	1%
Rooftop HVAC	TBD	TBD
Total	**282,344,002**	

Funding

The four utilities participating in the collaborative (Avista, Cascade Natural, NW Natural, and PSE) agreed to be initial funders of the portfolio. At the time the NGBP was developed, these utilities represented approximately 64% of the gas market in NEEA's footprint.[19] Two gas utilities in NEEA's footprint representing a significant portion of the market, Intermountain Gas and Northwestern Energy, chose not to fund the portfolio.[20] The share of the portfolio the four funders are responsible for funding and their total contribution are outlined below (Table 6).

Table 6. Portfolio Funding Allocation[21]

Funder	Funding Share	Total (5-Year) Contribution
Avista	15.63%	$2,866,334
Cascade Natural (Washington)	9.30%	$1,704,849
ETO[a]	33.82%	$6,200,354
PSE	41.25%	$7,563,198
Total	**100%**	**$18,334,735**

[a] Energy Trust of Oregon funds the portfolio on behalf of Cascade Natural (Oregon), NW Natural (Washington), and NW Natural (Oregon).

[18] Ibid., 11.
[19] Based on NEEA's existing funding formula, which takes into account both the number of customers and the retail sales associated with each utility in NEEA's footprint.
[20] These utilities have procurement portfolios and regulatory structures that do not incentivize their participation in the same way utilities in Oregon and Washington are incentivized to participate.
[21] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 13.

Governance

The collaborative utilities also established the Advisory Committee, composed of representatives from funding utilities, non-funding stakeholders, and regulators to direct the portfolio. The Advisory Committee reports to NEEA's executive director.

The Advisory Committee was designed to be an advisory resource for NEEA by providing NEEA with "broad based advice, experience and guidance."[22] The Advisory Committee's responsibility as outlined in the charter is to ensure that NEEA's natural gas market transformation efforts align with NEEA's broader organizational strategic goals and objectives. The Advisory Committee has authority over technology development initiatives; all voting members present must reach a consensus before a technology initiative can begin or scale-up.[23]

If the Advisory Committee cannot reach consensus on a decision, the NEEA program team attempts to address the committee's concerns and brings a modified program proposal back to the Advisory Committee for a vote. If this process is still unable to reach consensus, the NEEA Executive Director, with input from the NEEA Board, has final say on the advancement of an initiative.

The NEEA Board is responsible for strategic and operations planning on behalf of NEEA, and as a result has the final say on the portfolio as it pertains to NEEA's overall mission.

Metrics for Portfolio Success

The NGBP lays out three primary criteria for measuring portfolio success in the initial five-year cycle:[24]

- Energy savings
- Acceleration of market adoption metrics
- Cost-effectiveness

Additionally, NEEA developed projections for how each portfolio technology would advance through the lifecycle initiative stages for each year of the five-year portfolio funding cycle.

[22] Northwest Energy Efficiency Alliance. Draft Natural Gas Advisory Committee Charter. January 27, 2015.
[23] A simple majority of eligible participants must be present for a vote to be held.
[24] Northwest Energy Efficiency Alliance. Natural Gas Market Transformation Business Plan 2015-2019. February 23, 2015, 6.

Appendix B. Initiative Progress Summaries

In the Appendix embedded below, we provide high-level initiative progress summaries for the NGP's five core initiatives:

- Gas-Fired Heat Pump Water Heaters
- Combination Systems
- Hearth Products
- Rooftop HVAC
- ENERGY STAR® Gas Dryers

Appendix B - Initiative Progress Summaries 2

Appendix C. Detailed Research Methods

Research Objectives

The key research objectives we sought to answer as part of this study are as follows:

- Gauge the impact NEEA has had on product advancements within the Natural Gas Portfolio
  - Identification of technical advancements in products
  - Influence on the advancements of energy efficiency product components
  - Is there potential to commercialize the advancements that are coming out of the NGP?
  - Is the balance between product development and commercialization activities appropriate?
- Assess progress made on the development of a pathway to cost-effective energy savings
  - Identification of barriers, markets, and intervention strategies
  - Progress towards development of product logic models
  - Progress towards measurement of cost-effectiveness for regional gas market transformation programs
- Determine if there is evidence of market transformation – we are looking to understand if and how:
  - Manufacturers are engaged with NEEA's efforts
  - Market actors participate in testing and validation of products
  - Partnerships emerge within the energy efficiency community
  - Market actors are aware of NEEA's efforts (product, people, process)
  - NEEA's efforts are incorporated into industry events
  - Identify and leverage learnings from successful market transformation models in the natural gas space
- Track NEEA's adherence to the key principles of operation in the Natural Gas Business Plan – how well is NEEA adhering to the principles of:
  - No evidence of promoting fuel switching
  - No cross-subsidies between gas and electric
  - Implementation of gas efforts are not diminishing existing electric market transformation work
  - Appropriate tools are in place/in development to manage and balance portfolio risk
  - Budget: Incurred expenses are in alignment with budget projections and both expenses and staff time are accurately tracked and segregated from electric work
- Identify the value proposition that stakeholders find in the Natural Gas Business Plan to understand if:
  - Stakeholders have sustained involvement in the Natural Gas Business Plan activities
  - Funders share acceptance of a sustainable (long term) value proposition for natural gas market transformation

- Sufficient market research data supports opportunity for growth
- Regional equity for natural gas market transformation work is achievable
- If the mix of funders enables NEEA to achieve savings goals

- Assess overall health of NEEA as a dual-fuel organization - critical questions for consideration include the following:
  - NEEA's entry into the natural gas market aligns with the organizational mission and the regional vision for the long term success of the alliance
  - Recommended changes for the scope, duration, and approach to the Natural Gas Business Plan
  - Level of support from other NEEA departments is adequate for advancement and success of the natural gas market transformation work
  - Projected energy savings opportunities compared to Natural Gas Business Plan estimates (savings and costs)
  - Funding sources and methods – progress and lessons regarding addition of more funders and comfort with current funding formula
  - Evidence of leverage across Natural Gas and Electric Portfolios within NEEA
  - Considerations and recommendations regarding integrated vs segregated gas and electric programs

Opinion Dynamics also explored additional themes and topics that emerged from our research, but were not explicitly called out as objectives.

Research Activities

To address the research objectives outlined above, Opinion Dynamics conducted targeted qualitative data collection activities with key stakeholders to understand the organizational structure and processes developed to support the NGP, the value proposition for this effort from both the NEEA and stakeholder perspective, the activities conducted to date and the impact of those activities, and how the organization is performing in execution of the NGBP. Our data collection was comprised of in-depth interviews with members of the Assessment Committee, members of the Advisory Committee, key NEEA staff, and market actors. In addition, we conducted a detailed review of program background materials and an in-person share-out and iteration of preliminary findings with the Advisory Committee.

Understanding Background Context

Following our project kick-off meeting, we requested and reviewed available materials to augment our understanding of the NGP. The purpose of these activities was to (1) expand our understanding of the NGP and how it was developed and (2) understand progress and data collected to date.

The materials we reviewed include the NEEA Strategic and Business Plans, the NGBP, documents outlining stakeholder roles and expectations (such as the NGBP Charter), Advisory Committee Meeting minutes, annual operations plans, market research results, and results from product scanning, testing, and validation.

In-Depth Interviews

Our primary data collection was comprised of in-depth interview activities with members of the Assessment Committee and Advisory Committee, key NEEA staff, and market actors. Table 7 presents an overview of the populations, planned interviews, and completed interviews for our in-depth interviews.

Table 7. In-Depth Interviews - Sample Design & Details

Group	Population[a]		Target Interviews	Completed Interviews	Interviewees
	Organizations	Contacts			
Assessment Committee	6	7	7	7	7
NEEA Staff	1	14	7	7	12
Advisory Committee	11	19	6	5	9
Market Actors	39	66	8	8	11
Total[b]	**53**	**102**	**28**	**27**	**38**

[a] The population for each respondent group was determined based on data provided by NEEA.

[b] Unique organizations and contacts. Four funding members sit on both the Assessment Committee and Advisory Committee.

As part of all of our in-depth interviews, we explored a wide range of topics pertaining to the NGP and allowed respondents to suggest additional topics for discussion. However, each set of interviews had key areas of focus, detailed below. Our in-depth interview guides were developed in collaboration with the Assessment Committee and key NEEA staff, and are included in Appendix D.

Mid-Cycle Assessment Committee Interviews

The Assessment Committee is made up of seven stakeholders, representing six organizations (one organization has two members who split time on the committee), as well as three NEEA staff members (addressed in the "NEEA Staff Interviews" section below). We interviewed each stakeholder member of the Assessment Committee individually.

The key objective of speaking with members of the Assessment Committee was to understand the perceived value proposition for the NGP and to gather data to help assess NEEA's health as a dual fuel organization. In terms of understanding the value proposition, we asked respondents to provide detail on the theory of change behind the NGBP and the rationale for the selecting particular target technologies. We also explored (1) the alignment of Natural Gas activities with NEEA's mission, (2) adherence to key principles of operation, (3) the adequacy of resources and appropriate tools to meet NGBP goals, and (4) any leveraging of resources and expertise from NEEA's electric activities.

Table 8 summarizes the population and interviews completed as part of this task.

Table 8. Assessment Committee Interviews - Sample Design & Details

Population		Target Interviews	Completed Interviews	Interviewees
Organizations	Contacts			
6	7	7	7	7

Natural Gas Advisory Committee Interviews

The Advisory Committee is made up of representatives from funding organizations, regulatory bodies, and non-funding organizations.

We used this set of interviews to understand whether stakeholders buy-in to NGP activities and goals. In these interviews, we collected stakeholder feedback from two angles. First, from a short-term perspective, we discussed the NGP's progress-to-date, key successes, and key challenges encountered or foreseen. We also gathered stakeholder feedback on whether the current activities, resources, and funding model for the portfolio meet their needs and are sufficient to achieve NEEA's goals. Finally, we sought stakeholder feedback on the long-term direction and prospects of NEEA's efforts.

This task included interviews with each Advisory Committee representative from the five funding organizations.[25] We also conducted two interviews with Oregon and Washington commission staff who participate in the Advisory Committee. We conducted group interviews in cases where organizations had more than one sitting member on the Advisory Committee. Table 9 provides detail on our sample design and completed interviews.

Table 9. Advisory Committee Interviews - Sample Design & Details

Respondent Group	Population		Target Interviews	Completed Interviews	Interviewees
	Organizations	Contacts			
Utility Funders[a]	3	5	3	3	5
Other Committee Members	6	10	3	2	4
Total	**11**	**19**	**11**	**5**	**9**

[a] Excluding Advisory Committee members covered as part of their participation in the Assessment Committee.

NEEA Staff Interviews

The key objectives of speaking with NEEA staff were to understand portfolio progress to date, understand the value proposition for the NGP, and to gather data to help assess NEEA's health as a dual fuel organization. We also explored (1) the alignment of Natural Gas activities with NEEA's mission, (2) adherence to key principles of operation, (3) the adequacy of resources and appropriate tools to meet NGBP goals, and (4) any leveraging of resources and expertise from NEEA's electric activities.

In consultation with the NEEA MRE Project Manager, we identified 13 NEEA staff members and a NEEA-affiliated consultant relevant to this assessment. We conducted seven interviews with this group covering 12

[25] Four funding members of the Advisory Committee sit on the Assessment Committee. We interviewed these members as part of our Assessment Committee interviews, but where possible, we also gathered information relevant to their participation on the Advisory Committee. We interviewed the additional five funding members of the Advisory Committee individually as part of this task.

individuals; where appropriate, we scheduled small group interviews (i.e, diads and triads) to expand the reach of our interviews. Table 10 presents details on our completed NEEA staff interviews.

Table 10. NEEA Staff Interviews - Sample Design & Details

Contacts	Target Interviews	Completed Interviews	Interviewees
14	7	7	12

Market Actor Interviews

Achieving the NGP's goals will ultimately require the involvement of and engagement with multiple stakeholders, including manufacturers, industry organizations, and utilities with relevant experience. NEEA's efforts to date have focused largely on manufacturer engagement with key technologies such as water heaters and rooftop HVAC, as well as on developing relationships with market actor stakeholders such as GTI and CEE. As such, we focused the market actor interviews on manufacturers, industry organizations (i.e., GTI and CEE), and other utilities with relevant experience in this space as identified by NEEA.

Securing the participation and buy-in of these market actors is critical to the achievement of NEEA's goals. As such, the core objectives of our market actor interviews were to gauge (1) understanding of and opinions regarding NEEA's market transformation goals, (2) the viability of the target technologies, and (3) barriers or challenges to collaboration with NEEA.

We spoke with eight market actors that NEEA identified as engaged in the initiative. Table 11 provides details on sample design and completed interviews.

Table 11. Market Actor Interviews - Sample Design & Details

Respondent Group	Population		Target Interviews	Completed Interviews	Interviewees
	Organizations	Contacts			
Manufacturers	22	38	5	5	7
Research Partners	10	16	2	2	3
Non-Funding Utilities	7	12	1	1	1
Total	**39**	**66**	**8**	**8**	**11**

Natural Gas Advisory Committee Interview Share-Out and Iteration

We conducted an in-person presentation and discussion of emergent themes from the Advisory Committee interviews (and other data collected) to the Advisory Committee. This process was a tool to help us ground our findings and ensure that we fully understood and accurately represented the perspective of Advisory Committee members.

Various parts of the NGP could impact different stakeholders in different ways; presenting emergent themes and refining them with participation of the full committee allowed us to test emergent themes with all stakeholders, and allowed us to determine the following:

- Did we prioritize/represent the emergent themes from our interviews properly?

- Did we understand the nuances of the themes that emerged?
- Were our findings representative of the viewpoints of the entire committee?

Appendix D. Interview Guides

The interview guides used for this study are embedded below.


MCAC Interview Guide


NGAC Interview Guide


NEEA Staff Interview Guide


Market Actor Interview Guide

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