



Exhibit 2, Supplement 1

Non-Energy Impact Identification and Valuation Plan

2021

Exhibit 2, Supplement 1: Non-Energy Impacts

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SUPPLEMENT 1: PSE'S COMPLIANCE WITH DOCKET 190905, ORDER 01, ATTACHMENT A: CONDITION 10A AND 10B

Docket 190905, Order 01: Attachment A, Condition 10a requires Puget Sound Energy (PSE) to “demonstrate progress toward identifying, researching and developing a plan to properly value non-energy impacts that have not previously been quantified.” Condition 10b further requires PSE to “identify the discrete non-energy impacts and the monetized value used in cost effectiveness testing for each electric conservation program.” This Supplement to Exhibit 2 for the 2021 Annual Conservation Plan (ACP) establishes PSE's actions toward achieving these requirements.

A. Condition 10a: Developing a Plan to Identify and Value NEIs

PSE has developed a plan that addresses the requirement of condition 10a. The plan outlines how PSE will go about identifying and valuing non-energy benefits, along with costs and risks of public health benefits. PSE will include these impacts and risks in its 2022-2023 Biennial Conservation Plan (BCP).

Recognizing that identifying and properly valuing non-energy impacts will require the participation of all programs within PSE's Energy Efficiency department, staff formed an NEI working group within PSE, chaired by the Energy Efficiency Manager, Development and Evaluation. The NEI Working Group (NEIWG) Charter (see Section C of this document) identifies the actions PSE will take to accomplish condition 10a's requirements.

1. Engaging a Research Partner

PSE ascertained that the effort to identify discrete non-energy impacts is not unique to PSE, and utilities across the United States have invested time and effort into identifying and quantifying these benefits and/or costs. Rather than duplicate these efforts, PSE looked for a method to use the collective knowledge and research resources of the nation's utilities to work for PSE ratepayers. PSE reached out to industry partners and identified a methodology that it believes will be the most cost-effective way to identify well-documented non-energy impacts and update them for conditions within its service territory.

PSE has contracted with DNV-GL to provide assistance with this effort, and the scope of this engagement is included in this document, Section D. DNV-GL offers a service that uses all of their known NEI research from utilities across the country, and compiled this information into a database.

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Using PSE’s individual measures, they will then “map” energy-efficiency measures to well-documented NEIs in their database. Using their methodology that accounts for the applicability of the NEI, the strength of the evidence in support of it, and economic factors, DNV-GL then adjusts the NEI values to account for unique climate and economic conditions of PSE’s customers. This initial screening through DNV-GL’s database will be a way to achieve easier-to-quantify NEIs (the “low-hanging fruit”) for the 2022-2023 biennium. PSE will then employ the NEI WG to further explore those NEIs which show promise but need additional investigation in order to properly quantify and include as a measure attribute.

2. Partnering with Washington IOUs

PSE further realized that identifying and properly valuing NEIs can be laborious and cost-prohibitive, and that other Washington State Investor Owned Utilities (IOUs) also have a requirement to identify NEIs that are appropriate for the State. To that end, PSE reached out and formed an NEI IOU working group, consisting of PSE, Avista and PacifiCorp. This working group met during the summer of 2020 and drafted a proposed charter which resembles many of the activities outlined in PSE’s NEI WG charter. PSE offered to share the effort and cost of the DNV-GL methodology outlined above, and the terms of how the utilities will combine their efforts is still under discussion. PSE expects that going forward, through cooperation and resource sharing, the IOUs’ efforts will benefit all of Washington’s utility ratepayers as conservation measures provide a more robust accounting of benefits (or costs) not formerly quantified.

B. Condition 10b: Identifying and Valuing NEIs

In the attached Exhibit 2, Supplement 2 spreadsheet, PSE provides a prescriptive measure-by-measure accounting of all NEIs currently used in the 2020-21 biennium. The spreadsheet presents an overall summary of per-unit NEI valuations attributed to each prescriptive measure. These NEIs are further included in the Exhibit 2: Cost-Effectiveness workbook, which includes measure quantities, NEI valuations both by individual measure and aggregated for the programs and portfolio, and the calculations for valuing NEIs with all formulas intact and in native format.

C. NEIWG Charter

Non-Energy Impacts Working Group Charter

May 2020

Rationale

PSE has to meet several regulatory requirements in this and the next biennium having to do with NEIs, including more thoroughly documenting NEIs, conducting research to identify and properly value NEIs that have not been previously identified, understand distributional effects of NEIs, and include this information in the 2022-23 biennial conservation plan. Program staff have expressed the concern that our limited use of non-energy benefits means we're failing to adequately value our program measures. And Energy Efficiency (EES) would benefit from closer coordination with our regional utility partners to ensure consistent reporting to regulators.

The scope of these requirements calls for a coordinated effort within EES, for which this paper proposes a Non-Energy Impacts Working Group (NEIWG).

Objective

The objective of PSE's (NEIWG) is to establish a process within EES to meet PSE's regulatory requirement to identify, research, and properly value non-energy impacts that have not previously been quantified.

Within this overarching objective, the NEIWG will also endeavor to:

1. Develop a plan, per UTC conditions, to properly value non-energy impacts which includes "the costs and risks of long-term and short-term public health benefits, environmental benefits, energy security, and other applicable non-energy impacts" in time for inclusion into the 2022-2023 Biennial Conservation Plan.
2. Develop a source file of all NEIs used by PSE programs which includes a summary page along with separate spreadsheets for each NEI which shows all supporting research, logic and calculations in native format with formulas intact, per UTC conditions.
3. Identify, per UTC conditions and forthcoming Dept. of Commerce guidance, the distribution of energy and non-energy benefits in annual plans and reports among PSE customer populations.

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4. Coordinate PSE's NEI approach with partnering regional utilities to share information, develop consistent methodologies for presenting NEI information to the UTC.
5. Utilize a database developed by EES' evaluation contractor to incorporate new NEIs not currently used by EES Programs to ensure the full value of conservation measures are being accurately accounted for.
6. Ensure EES' process of researching, quantifying, and evaluating NEIs is based on sound reasoning based on commonly accepted life-cycle cost effectiveness principles.

Membership

The NEIWG will be run out of the Strategic Planning, Evaluation and Research group, chaired by the Manager of Development and Evaluation and reporting up to the Director of EES. Membership will include but not be exclusive to representatives from:

Manager, Development & Evaluation (Chair)
Budget and Administration's Regulatory Compliance,
Business Energy Management,
Residential Energy Programs,
The "LMI" (low-medium income) Group
Programs Support

As part of the coordinating function with other regional utilities, the NEIWG will establish an informal sub-group to ensure regular communication. Representatives from partnering utilities may attend some or all of the NEIWG's meetings as deemed appropriate by the charter group.

Scope

The primary purpose of the NEIWG will be to establish a plan to meet PSE's regulatory deadlines and approve tasking to members or representatives of the NEIWG. Members of the NEIWG will:

- Review proposed NEIs for reasonableness
- Review decision agendas prior to submittal to EE management

- Provide guidance, advice, and connections to stakeholders
- Provide general oversight to the activities of the NEIWG to ensure focus on objectives

Members of the NEIWG are expected to provide support staff as needed to accomplish NEIWG objectives.

Activities

Activities will ultimately be determined and scheduled in consultation with the NEIWG itself, but here are some of the tasks that will be likely done by the working group and/or designated staff:

- Develop a database (Excel or Access) that lists all NEIs used by EES, along with supporting documentation of their rationale and all calculations provided in native format with formulas attached.
- Work with program leads to incorporate newly-identified NEIs into measure cases, or in the case of non-unit-specific NEIs, develop the methodology to incorporate them in to cost effectiveness calculations.
- Work with Program Support to ensure all automated tracking systems include NEIs where appropriate.
- Identify previously-unidentified NEIs: our evaluation contractor DNV-GL has conducted years of research on NEIs used by utilities throughout the country, and has developed a methodology to vet and adjust the NEIs based on suitability to different geographic and economic regions. Working with DNV-GL, the NEIWG will develop a database of new quantifiable NEIs for inclusion into measure cases. This effort will become part of the plan PSE is required to submit to the UTC per conditions.
- Share PSE NEIs between other regional utilities, and to the extent possible learn from other utilities' research and coordinate the accounting format to ensure consistent reporting to the UTC.
- Work with the RTF to acquire the original research and calculations on all NEIs currently provided to PSE by the RTF for inclusion into PSE's database.
- Monitor Dept. of Commerce rulemakings to ensure we receive timely guidance that specifies PSE's NEI requirements under CETA.

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- Create a research plan that utilizes EES staff, contractors, partnering utilities, and other PSE departments to better understand the distributional effects of NEIs for submission to the UTC.
- Other activities as determined by the NEIWG

D. Scope of Work - DNV-GL NEI Study

a. Background

Non-energy impacts (NEIs) include any positive (benefit) or negative (cost) impact that results from the installation of energy efficiency measures. NEIs reflect changes to economic efficiency as they capture the increased value of increased profitability of C&I customers (i.e., through lower costs or increased revenue). Because energy efficient technologies often consist of high-end alternatives to standard or baseline-efficiency equipment, they often result in changes to facilities' costs and/or production capability. Table 0 below presents a list of NEIs DNV GL identified through our review of 18 published NEI studies that are relevant to new construction and retrofit C&I energy efficiency programs.¹

Table 0. Possible NEIs

C&I Non-energy Impacts	
Administrative costs	Product Spoilage/Defects
Aesthetics	Productivity - Participant
Avoided pollution	Property Value
Ease of Selling or Leasing	Rent Revenue
Economic development	Sales Revenue
Fires/insurance damage	Supplies and materials
Indoor Air Quality	Thermal Comfort
Lighting Quality and Lifetime	Waste disposal
Noise	Water/Wastewater
O&M	Other NEI

b. Research Objectives

The overall goal of the C&I NEI research is to develop the most comprehensive set of NEI values possible to evaluate and market the PSE's C&I energy efficiency programs. The study will meet the following objectives:

1. Adapt DNV GLs database of NEIs to measures contained in the PSE Residential and C&I program tracking data. This database consists of a review of NEI studies containing 20 standardized NEIs applicable to residential program

¹ The database contains an additional 23 studies relevant to Residential programs

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measures that are taken from 23 published residential NEI studies.² The database allows DNV GL to map published NEI values to PSE's measure list and make necessary adjustments to reflect differences in economic, climatic, and programmatic conditions.

2. Provide PSE with an Excel spreadsheet identifying published NEIs that could be mapped to measures contained in 3 years of PSE's Energy efficiency program tracking data with adjustment factors used to make NEIs taken from published literature applicable to PSE programs and measures.
3. Perform gap analysis of NEIs from DNV GL's NEI database that are assigned to programs and measures in the PSE tracking data to identify areas in which follow-up research is necessary to be RTF compliant.

c. Proposed approach

This proposed scope of work describes Phase 1 of a process that will isolate NEIs from existing literature that are applicable to the 2016-2018 PSEs program tracking data and adjusts the published NEIs to be Washington specific. DNV GL will employ our internal NEI database tool (the Database) that contains 50 separate NEIs from 23 residential and 18 C&I published studies. While the database itself is not a deliverable of this project, this proposed scope of work outlines the database process and necessary assumptions and factors used to adapt published research to the PSE program tracking data.

DNV GL's will first map Measures contained in the 2016-2018 program tracking data to those contained in the NEI database. The database is designed to adjust the identified NEI values to make them Washington-specific using three factors:

- 1) Confidence (i.e. level of rigor used in the original study),
- 2) Plausibility (i.e. original study's relevance to PSE programs), and
- 3) Economics (i.e. differences in economic factors between the jurisdiction in which study originated and PSE territory).

DNV GL NEI Database approach identifies NEIs from the existing literature, assigns the those NEIs to relevant PSE programs, and adjusts estimates based on plausibility, confidence and economic adjustment factors. By considering factors both within and outside of a literature review DNV GL will minimize uncertainty in cost-effectiveness

² The DNV GL standardizes 50 standardized NEIs for C&I and residential programs that correspond to 183 distinct measure descriptions.

calculations. This activity may reduce NEI values to account for uncertainty stemming from the methods used in the original study but will improve transferability of that research to PSE territory. While the scoring and factors discussed herein can be updated dynamically in the database, DNV GL feels this methodology is the most holistic and systematic approach for this review.

The NEI database approach consists of the following 6 tasks.

1. Map PSE measures to DNV GL NEI database - NEI studies can vary considerably in how they aggregate information when reporting a quantified NEI value. Some studies may report NEI results for specific segment-program-measure level descriptions, such as “C&I-small business retrofit-4-ft linear LED lamp”. Other studies may only report NEIs for C&I lighting retrofits, while some may simply provide details that reveal the NEIs are associated with a prescriptive C&I program. DNV GL architecture combines program participant populations, programs, and measure descriptions as the “level of aggregation” (LoA).
2. Estimate confidence factors - In the event that the PSE tracking data matches more than one study in the JS for a particular NEI, the DNV GL database will apply a Confidence Factor (CF) to select a single NEI from the multiple matched studies. The CF considers six different questions that relate to best practices in NEI research. After the six questions are addressed for each study, a score is calculated from 0% to 100% to represent the level of confidence in the study results. The higher the score, the higher the level of confidence. Next, the JS studies and measures will be sorted from highest confidence to low confidence, so that the matching look-up value would select the higher confidence values first. Finally, the CF is used as de-rate for matched NEI values in the PSE tracking data to provide a conservative estimate of NEI values in our database.
3. Estimate plausibility factors - DNV GL developed a Plausibility Factor (PF) to further account for nuances in NEI research outside of the actual study methodology. The Plausibility Factor (PF) considers three variables: a) Level of matching (Level 6, Level 5, etc.) – This is based on the Standard measure descriptions defined in Task 1; b) Age of the study matched to the PSE Tracking data; and c) Changes in energy consumption within an end-use category over time. This is a metric DNV GL developed using information provided by RECS³ pertaining to the change in energy efficiency of measures in a measure group (e.g. lighting, HVAC) over time.

³ EIA. (2018, May). *Residential Energy Consumption Survey (RECS)*. Retrieved from Energy Information Agency: <https://www.eia.gov/consumption/residential/data/2015/index.php?view=microdata>

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4. Estimate economic adjustment factors - The DNV GL database uses publicly available data to develop factors that will be adjusted for NEI's based on the economic activity relative to that of Washington.
5. Calculate Washington Specific NEIs – All NEIs from the Database that match PSE measures are scored according to the combined Confidence and Plausibility scores, creating the “combined score. For each measure by NEI combination, DNV GL will keep the top 5 NEIs according to the combined score. We will then manually select the preferred NEI from the top 5 published values, adjusting to be Washington Specific by applying the plausibility, confidence, and economic adjustment factors.
6. Gap analysis – DNV GL will identify gaps in NEIs identified for the PSE program measures relative to the published literature. Gaps reflect areas in which supplemental primary research is necessary to ensure reported values reflect best practices and are RTF compliant. We will identify the following 3 sets of gaps: a) No-NEI is matched to PSE tracking data but NEIs exist in the published literature; b) NEIs are matched to the PSE tracking data, but the matched values are substantially discounted to account for uncertainty in the matching process.
7. Report results - DNV GL will provide PSE with a written report containing the results of this effort. The report will provide overall NEI results by enduse and NEI type as well as summaries of key NEIs (selling points by industry segment for up to 5 segments. DNV GL will provide PSE with a draft report for review and comment and then a final report with revisions and responses to comments incorporated.

d. Non-Energy Impact Project Schedule

This project will be billed as a fixed fee contract with milestone billing. Table 2 provides a task-level breakdown of the Phase 1 project schedule with the corresponding milestones. The Phase 1 research will require 4 months to complete.

Table 1. Schedule

	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Map PSE measures to DNV GL NEI Database		d	f													
2. Estimate confidence and plausibility factors				d	f											
3. Develop economic adjustment factor				d	f											
4. Select and calculate WA specific NEIs							d	f								
5. Gap analysis										d	f					
6. Reporting													d	f		
d = draft																
f = final																