**EXH. MNL-1T**
**DOCKETS UE-240004/UG-240005**
**2024 PSE GENERAL RATE CASE**
**WITNESS: MARK NEWTON LOWRY**

**BEFORE THE**
**WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

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| **WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,** | |
| **Complainant,** | **Docket UE-240004** |
| **v.** | **Docket UG-240005** |
| **PUGET SOUND ENERGY,** | |
| **Respondent.** | |

# PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

# MARK NEWTON LOWRY

# ON BEHALF OF PUGET SOUND ENERGY

**FEBRUARY 15, 2024**

**PUGET SOUND ENERGY**

**PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF MARK NEWTON LOWRY**

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## I. INTRODUCTION

**Q. Please state your name, business address, and occupation.**

A. My name is Mark Newton Lowry, and my business address is 44 East Mifflin Street, Suite 601, Madison, Wisconsin 53703. I am the President of Pacific Economics Group Research, LLC ("PEG").

**Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?**

A. Yes, I have. It is Exh. MNL-2.

**Q. What are your duties as President of PEG?**

A. My principal duties as President are supervision of research on utility cost and other topics, expert witness testimony, and client consultation. I also oversee PEG's business affairs.

**Q. What topics are you covering in your testimony?**

A. I supervised a team that developed the inflation factors that Puget Sound Energy ("PSE" or "the Company") used in the development of cost projections for the five-year business plan it discusses in this docket. In my testimony, I first address

the need for well-supported inflation assumptions in revenue requirement projections. There follow discussions of the rationale for using inflation indexes in ratemaking, precedents for their use, and results of our inflation research for PSE. Further details of our research are provided in the report, Inflation Research for PSE, which is included as the second exhibit to my prefiled testimony, Exh. MNL-3.

**Q. What are the key takeaways from your research and testimony?**

A. Here are some notable findings.

- Determination of revenue requirements for multiyear rate plans ("MYRPs") and forward test year rate proceedings requires assumptions about input price inflation.
- Inflation in input prices faced by U.S. energy utilities has been unexpectedly rapid in recent years.
- Forecasting inflation accurately is still difficult in 2024. Inflation in the next few years may be materially higher or lower than expected.
- Forecasts of input price inflation should therefore play a larger role in rate proceedings today than they have in many years. Regulators should welcome more substantiation for inflation assumptions in revenue requirement proposals.
- Costs can be projected in real terms and converted to the nominal costs that matter for revenue requirements using inflation factors.
- There are many precedents for escalating utility rates or revenue requirements using inflation indexes. Inflation indexing is especially common in MYRPs because multiple years of inflation are at issue.

PEG has conducted empirical research for PSE that lays the foundation for using inflation indexes to establish revenue requirements in the two rate years of its proposed MYRP (2025 and 2026). This research employed sound indexing

practices and forecasts of publicly available inflation indexes from reputable agencies. Where warranted, adjustments were made for special Seattle-area business conditions.

## II. NEED FOR INFLATION RESEARCH IN CONTEMPORARY RATEMAKING

**Q. Why is research and testimony on input price trends needed in this rate case proceeding?**

A. In Washington, gas and electric utilities are required by law to propose MYRPs with their general rate cases.[1] The permissible term of these plans is two to four years. Forward-looking cost projections are allowed in Washington MYRPs and input price inflation is a determinant of future cost.

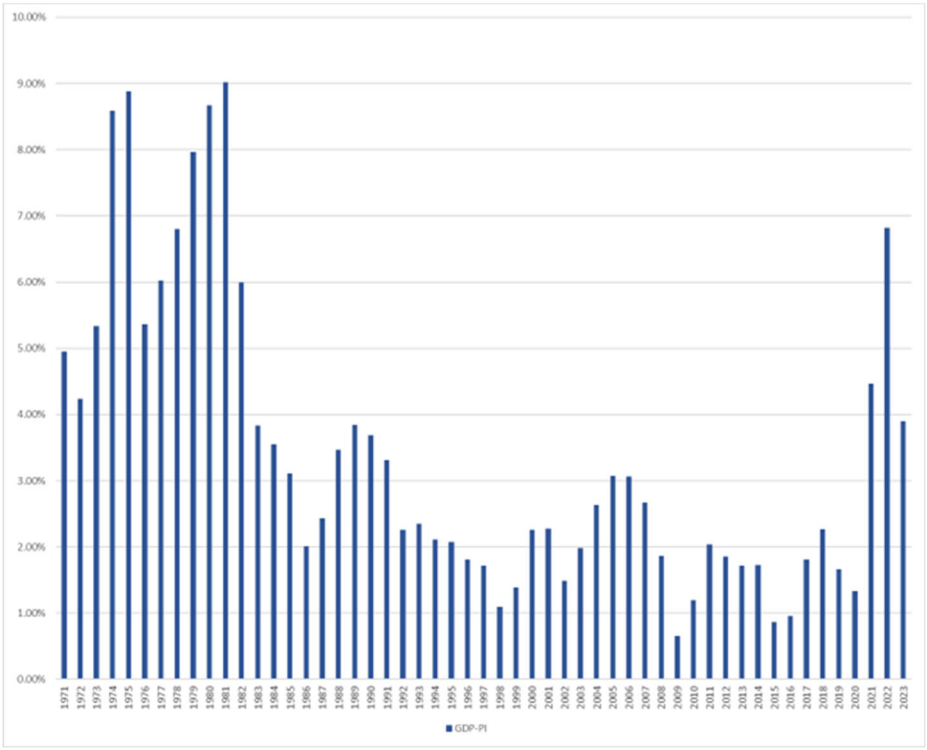
In preparing cost projections for its January 2022 general rate case and MYRP application, PSE assumed that prices of most base rate inputs it purchased would average 2.5 percent annual growth. Inflation has materially exceeded this annual rate since 2021.

Figure 1 shows the inflation in the U.S. government's gross domestic product price index ("GDP-PI") from 1971 through the third quarter of 2023. As is shown in Figure 1, GDP-PI inflation has in the last three years reached its highest rates since the oil price shock of 1979-80.

[1] RCW 80.28.425, Multiyear rate plan.

**Figure 1**

**History of GDP-PI Inflation**

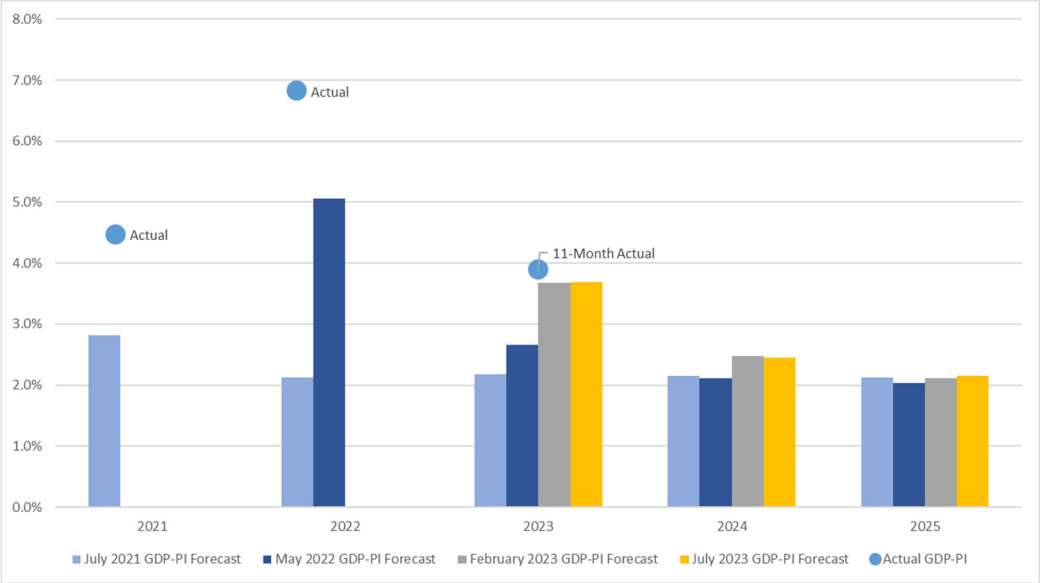



Source: U.S. Bureau of Economic Analysis Table 1.5.4. Price Indexes for Gross Domestic Product, Expanded Detail (Last Revised on: December 21, 2023)

PSE had lots of company when it underestimated future inflation. Figure 2 shows a comparison of Congressional Budget Office ("CBO") forecasts to actuals for GDP-PI inflation in recent years. It can be seen that CBO's forecasts of recent GDP-PI inflation have been well below actuals.

**Figure 2**

**Forecasted and Actual GDP-PI Inflation Using CBO Forecasts**

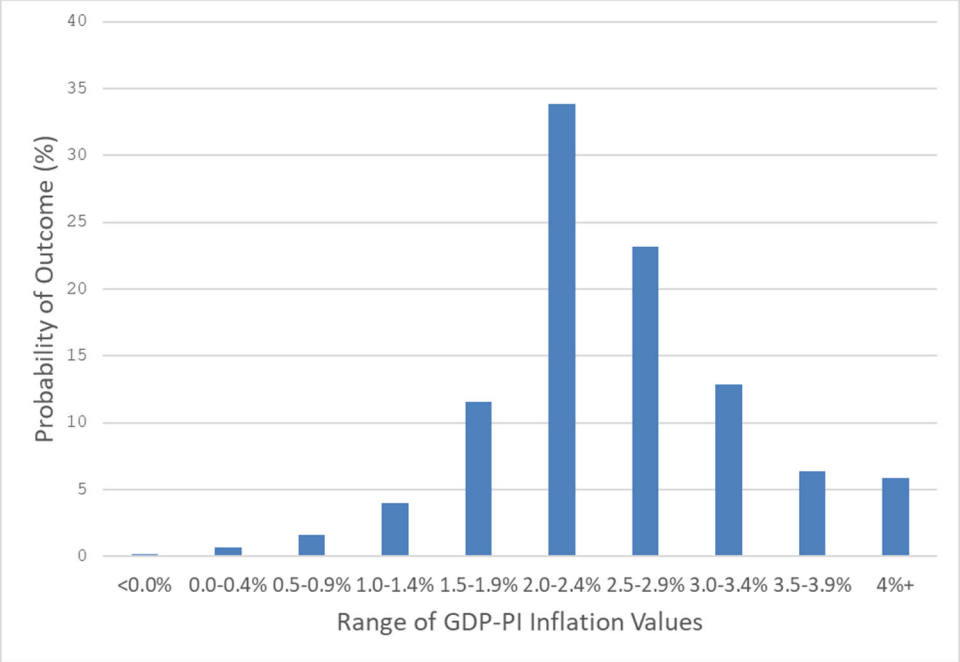



Sources: CBO 10-year Economic Projections and U.S. Bureau of Economic Analysis, Table 1.5.4

The Philadelphia Federal Reserve Bank's Survey of Professional Forecasters provides detailed quarterly predictions of macroeconomic variables. Figure 3 depicts the full range of forecasted probabilities for 2024 GDP-PI inflation according to the survey. As is shown in Figure 3, the professional forecasters believe inflation could be much higher as well as much lower than the mean forecast.

**Figure 3**

**Aggregate Forecasted Probability of Each Range of Potential GDP-PI Inflation Outcomes This Year**




In this proceeding, PSE's test year is the twelve months ending June 2023. The rate effective years of its MYRP will be 2025 and 2026, and the business plan extends to 2028. Inflation from June 2023 through the MYRP will thus be an issue in the proceeding.

Inflation has slowed in 2023 but may materially exceed pre-pandemic norms in some or all years of the 2024-2026 period.[2] There is, additionally, a real risk that inflation will be substantially higher or lower than expectations during these years. It is therefore beneficial for PSE to use explicit and well-substantiated inflation forecasts in its revenue requirement projections in this MYRP. As

[2] *See* Lowry, Exh. MNL-3 at 4-6.

described further below, price inflation research is frequently used in utility ratemaking and can be integrated into utility cost projections.

## III. THEORETICAL FOUNDATION FOR USING INFLATION INDEXES IN RATEMAKING

**Q. What is the theory behind using inflation indexes in revenue requirement forecasts?**

A. The cost of any input that a utility uses is the product of its quantity and price. The growth (rate) of such a cost is the sum of the growth of the quantity and price.[3] Since inflation can be brisk and vary widely from year to year, input price inflation can have a major impact on future utility revenue requirements.

The aggregate cost of several kinds of inputs that a utility uses is, analogously, the product of an input quantity index ("*Input Quantities*") and an index of input prices in the surrounding region ("*Input Prices*$^{Regional}$"). The growth in such an aggregated cost is the sum of the growth of these two indexes.

$$growth\ Cost = growth\ Input\ Quantities + growth\ Input\ Prices^{Regional}. \quad [1]$$

The growth of an input price index should be a cost-share weighted average of the growth in price subindexes.

Relation [1] implies that growth in input quantities equals growth in real cost.

[3] This result holds for certain kinds of growth rates.

$$growth\ Input\ Quantities = growth\ Cost - growth\ Input\ Prices^{Regional}$$

$$= growth\ Real\ Cost. \quad [2]$$

Cost growth is then the sum of growth in real cost and regional input prices.

$$growth\ Cost\ =\ growth\ Real\ Cost + growth\ Input\ Prices^{Regional} \quad [3]$$

Suppose, then, that in 2023 PSE makes a forecast of its real cost in 2025 that is stated in 2023 dollars ("$Real\ Cost^{2023}_{2025}$"). This forecast can be converted to *nominal* 2025 dollars ("$Cost^{2023}_{2025}$") by multiplying it by an inflation factor using an index that measures forecasted regional input price inflation between 2023 and 2025.

$$PSE\ Cost^{2023}_{2025} = PSE\ Real\ Cost^{2023}_{2025}\ \text{x}\ \frac{Regional\ Input\ Prices^{2023}_{2025}}{Regional\ Input\ Prices^{2023}_{2023}}. \quad [4]$$

An alternative approach to adjusting the revenue requirement for inflation is to make separate inflation adjustments to numerous cost categories. Summary input price indexes make inflation adjustments simpler, but at the cost of having to design and explain the price index formulas.

**Q. Are forecasts of inflation in the regional prices of all the base rate inputs that PSE uses readily available?**

A. No. Forecasts of inflation in regional prices are unavailable for most kinds of base rate inputs that the Company uses. However, for many of the inputs used by PSE, forecasts are available for national input price trends. We know that

$$growth\ Input\ Prices^{Regional}$$
$$= growth\ Input\ Prices^{National}$$
$$+ (growth\ Input\ Prices^{Regional} - growth\ Input\ Prices^{National}) \quad [5]$$

where the term in parentheses may be called a regional inflation differential. This result provides the basis for modelling regional price inflation as the sum of the forecasted growth in national input prices and a long-term regional inflation differential, denoted by $\left(\overline{Regional\ Input\ Prices} - \overline{National\ Input\ Prices}\right)$, which is defined as the difference between longer-term regional and national input price growth trends.

**Q. What types of input price indexes are appropriate for capital prices?**

A. The cost of owning capital has three basic components: depreciation, the opportunity cost of investment (often called the return on investment), and taxes. These costs depend in part on the price of asset acquisition and/or construction. In statistical research on utility cost, the trend in the price of assets is often measured by utility construction cost indexes. The return on asset ownership depends, additionally, on market rates of return on capital. The capital price inflation of a utility is accordingly a function of trends in market rates of return, unit construction costs, and tax rates.

The design of a capital price that is consistent with the cost-of-service capital accounting used in utility ratemaking is complex. When integrating inflation trends into utility capital cost projections, a complicated capital price index

formula can be sidestepped by forecasting the trends in asset prices or construction costs and then running these results through the Company's capital revenue requirement model.

## IV. PRECEDENTS FOR USING INFLATION INDEXES IN RATEMAKING

**Q. What are the precedents for using inflation indexes in ratemaking?**

A. Use of inflation indexes in utility ratemaking has been facilitated in North America by the ready availability of good inflation indexes and of standardized operating data for numerous utilities over many years. Much of the requisite data have been gathered by U.S. government agencies.

Some MYRPs in the gas and electric utility, railroad, telecommunication carrier, and oil pipeline industries have had rates or revenue requirements escalated by formulas that include inflation indexes.[4] Other MYRPs have featured "hybrid" approaches to revenue cap escalation that mix inflation indexing with other escalation methods (e.g., forecasting).[5] Inflation indexes are sometimes used to establish forward test year revenue requirements even in the absence of MYRPs.[6]

[4] *See* Lowry, Exh. MNL-3 at 11-12.
[5] *See id.* at 12.
[6] *See id.* at 13.

## V. DETAILS OF THE EMPIRICAL RESEARCH PERFORMED BY PEG

### A. Overview

**Q. Please provide an overview of your inflation research for PSE.**

A. The Company asked PEG to conduct inflation factor research for the following kinds of operations and maintenance ("O&M") expenses.

Electricity

- Production (excluding generation fuel and purchased power)
- Transmission (excluding transmission by others)
- Distribution
- Customer Accounts
- Customer Service and Information (excluding conservation)
- Administrative and General

Gas

- Distribution (excluding compressor station fuel)
- Customer Accounts
- Customer Service and Information (excluding conservation)
- Administrative and General

For these expenses, we were asked to itemize trends in salary and wage rates and material and service ("M&S") prices.

The Company also asked PEG to develop inflation factors for the following types of capital expenditures ("capex").

Electricity

- Production (excluding Colstrip)
- Transmission
- Distribution

Gas

General

Intangible

We considered a wide range of price indexes for use in our inflation factor calculations. PEG also examined PSE's detailed historical and forecasted cost data in developing inflation factors.

**Q. Please describe important qualities of inflation indexes that are used in ratemaking.**

A. The qualities of inflation indexes I find important for purposes of ratemaking include relevance, the availability of forecasts, and credibility.

- Indexes are relevant to the extent that they are designed to track the market price trends actually faced by subject utilities for their inputs. Indexes designed to measure same-region input price inflation are generally more relevant than indexes of national input price or macroeconomic (multi-sector) price inflation. For PSE, indexes specific to Washington state are relevant as well as indexes for the Seattle-Tacoma-Bellevue metropolitan area. The Company draws workers from the entire state and has generation operations outside the Seattle area. Indexes of price trends in the Pacific Northwest or broader West region are generally more relevant than those for the entire U.S.

- Inflation indexes are more useful to the extent that forecasts are readily available and frequently updated.

- Inflation indexes should ideally be computed and forecasted by credible public or private agencies.[7]

**Q. Please identify agencies that provide credible inflation indexes and/or forecasts.**

A. Agencies that calculate inflation indexes that are relevant for U.S. utility ratemaking include: the Bureau of Labor Statistics ("BLS") of the U.S.

[7] *See* Lowry, Exh. MNL-3 at 15.

Department of Labor; the Bureau of Economic Analysis ("BEA") of the U.S. Department of Commerce; the Power Planner Service of Standard and Poor's Global ("Power Planner"); and Whitman, Requardt and Associates.

Power Planner maintains and forecasts indexes for gas and electric utility wage rates, M&S prices, and (unit) construction costs. Credible forecasters of macroeconomic price inflation indexes include the CBO and Moody's Investors Service.[8]

## B. Labor Prices

**Q. Guided by the principles you discussed above, how did you calculate inflation factors for PSE's salaries and wages?**

A. PEG forecasted wage rate inflation using Company-specific salary and wage shares and Power Planner forecasts of several national BLS labor price indexes. Our forecasts also reflect the typical 0.35 percent differential between annual wage rate inflation in the Seattle area and the U.S.[9] As shown in Table 1 below, PEG forecasts regional wage rate inflation to average 3.88 percent growth over the three years from 2024 to 2026 and 3.64 percent growth over the five years from 2024 to 2028.[10]

[8] *See* Lowry, Exh. MNL-3 at 15.
[9] *See id.* at 16-28.
[10] *See id.* Table 5 at 28.

Table 1

## Wage Rate Inflation Forecasts

| Wage Rate Inflation Forecasts | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2024 | 2025 | 2026 | 2027 | 2028 | 2024-2026 | 2024-2028 |
| | | | | | | 3-year growth rate average | 5-year growth rate average |
| Annual Inflation Rate | 4.53% | 3.73% | 3.39% | 3.29% | 3.25% | **3.88%** | **3.64%** |
| Inflation Factor | 1.04639 | 1.08614 | 1.12356 | 1.16117 | 1.19957 | | |

### C. Material and Service Prices

**Q. How did you calculate inflation factors for material and service prices?**

A. Power Planner calculates and forecasts the inflation of national M&S price indexes for major expense categories of gas and electric utilities such as power distribution. These indexes are constructed from producer price indexes ("PPIs") that the BLS maintains.[11] Cost share weights for these summary price indexes are based on Federal Energy Regulatory Commission ("FERC") Form 1 cost data.

PEG believes that the Power Planner index for administrative and general ("A&G") material and service prices is sound. However, the inflation in the Power Planner M&S price indexes for other major expense categories such as power distribution are excessively volatile and grow too slowly over the 2024-26 period.[12]

These problems reflect an unsatisfactory treatment by Power Planner of prices that utilities pay for services. Weights on service price inflation are likely to be

[11] *See* Lowry, Exh. MNL-3 at 29.
[12] *See id.* at 33.

too low. Costs of services are generally not itemized on FERC Form 1. Over the years, PSE like many other energy utilities has increased the use of outsourced services for O&M tasks. The weight on services in an M&S price index matters because costs of many services that utilities purchase (e.g., vegetation management) have a sizable labor component and wage rate inflation should generally stabilize and accelerate service price inflation.

Based on this analysis, PEG made a correction to the inflation yielded by Power Planner's summary M&S price indexes for major expense categories other than A&G. We assume that inflation in prices of outsourced services used in non-A&G activities is a weighted average of inflation in Power Planner's M&S price indexes, a capital price index, and our wage rate index. A capital price index is needed because some providers of outsourced services use an appreciable amount of capital equipment (e.g., bucket trucks for tree trimming). We used the gross domestic product implicit price deflator ("GDP-IPD") as a proxy for capital price inflation.[13] Inflation in our corrected custom M&S price index for non-A&G cost categories is effectively an average of the inflation in Power Planner M&S price indexes, the GDP-IPD, and our wage rate index.[14]

The corrected custom indexes calculated by PEG for all M&S prices (that is, including prices of A&G inputs) are shown in Table 2 below. Inflation in the

[13] The GDP-IPD was used in lieu of the GDP-PI because a more recent forecast of the former is available. *See* Lowry, Exh. MNL-3 at 44-47 for further discussion.
[14] *See id.* at 33.

PEG-calculated electric M&S price index is forecasted to average 1.61 percent annual growth in the three years from 2024 to 2026 and 1.85 percent growth in the five years from 2024 to 2028. Inflation in the PEG-calculated gas M&S price index is forecasted to average 1.79 percent growth in the three years from 2024 to 2026 and 1.97 percent in the five years from 2024 to 2028.[15]

Table 2

**Corrected Custom M&S Price Inflation Forecasts**

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2024-2026 | 2024-2028 |
|---|---|---|---|---|---|---|---|
| | | | | | | 3-year growth rate average | 5-year growth rate average |
| Electric M&S Inflation | 1.05% | 2.17% | 1.61% | 2.19% | 2.22% | **1.61%** | **1.85%** |
| Inflation Factor | 1.0106 | 1.0328 | 1.0495 | 1.0728 | 1.0968 | | |
| Gas M&S Inflation | 1.24% | 1.37% | 2.75% | 2.24% | 2.25% | **1.79%** | **1.97%** |
| Inflation Factor | 1.0125 | 1.0264 | 1.0551 | 1.0789 | 1.1035 | | |

## D. Capital Asset Prices

**Q. How did you calculate inflation factors for capex?**

A. Whitman, Requardt and Associates has for many decades calculated regional gas and electric utility construction cost indexes ("Handy Whitman" indexes). The Handy Whitman indexes for the Pacific region are most relevant for PSE. Summary indexes are available for major electric utility asset categories such as power distribution. These summary electric indexes and many more granular gas

[15] *See* Lowry, Exh. MNL-3, Tables 7a and 7b at 35.

and electric utility construction cost indexes are forecasted by Power Planner. Power Planner does not publish a summary gas distribution construction cost index but PEG constructed one using Company capex shares. As shown in Table 3 below, PEG calculated separate inflation factors for the major electric and gas construction cost categories using Power Planner forecasts.[16]

[16] *See* Lowry, Exh. MNL-3 at 35-40.

Table 3[17]

## Capex Price Inflation Forecasts

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2024-2026 | 2024-2028 |
|---|---|---|---|---|---|---|---|
| | | | | | | 3-year growth rate average | 5-year growth rate average |
| **Gas Distribution** | | | | | | | |
| Annual Inflation Rate | 0.61% | -0.61% | -0.29% | 0.31% | 0.60% | **-0.10%** | **0.12%** |
| Inflation Factor | 1.0061 | 1.0000 | 0.9971 | 1.0002 | 1.0062 | | |
| **Hydraulic Production** | | | | | | | |
| Annual Inflation Rate | 0.46% | 0.44% | 0.79% | 0.79% | 0.94% | **0.57%** | **0.69%** |
| Inflation Factor | 1.0046 | 1.0091 | 1.0171 | 1.0252 | 1.0349 | | |
| **Other Non-Nuclear Production** | | | | | | | |
| Annual Inflation Rate | 8.59% | 9.09% | 4.66% | 1.06% | -1.04% | **7.45%** | **4.47%** |
| Inflation Factor | 1.0897 | 1.1934 | 1.2504 | 1.2637 | 1.2507 | | |
| **Power Transmission** | | | | | | | |
| Annual Inflation Rate | 3.03% | 0.12% | -0.62% | -0.88% | -0.24% | **0.85%** | **0.28%** |
| Inflation Factor | 1.0308 | 1.0320 | 1.0257 | 1.0167 | 1.0142 | | |
| **Power Distribution** | | | | | | | |
| Annual Inflation Rate | 6.33% | 3.12% | 1.15% | 0.54% | 1.07% | **3.53%** | **2.44%** |
| Inflation Factor | 1.0654 | 1.0991 | 1.1118 | 1.1178 | 1.1297 | | |
| **General Plant** | | | | | | | |
| Annual Inflation Rate | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | **1.00%** | **1.00%** |
| Inflation Factor | 1.0101 | 1.0202 | 1.0305 | 1.0408 | 1.0513 | | |
| **Intangible Plant** | | | | | | | |
| Annual Inflation Rate | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | **1.00%** | **1.00%** |
| Inflation Factor | 1.0101 | 1.0202 | 1.0305 | 1.0408 | 1.0513 | | |

**Q. How did you determine inflation factors for general plant and intangible plant?**

A. General plant and intangible plant have the similarity that they are not readily attributable to a particular area of utility operation. In response to our questions, PSE indicated that its expenditures on intangible plant during the proposed multiyear rate plan will consist chiefly of software. General plant consists of

[17] *See* Lowry, Exh. MNL-3 Tables 9a and 9b at 39-40.

other assets that are not easily classified into functional categories. PSE has indicated that computers and communications equipment are the biggest areas of expected general plant expenditures.

In our empirical research for most clients, we have used a Handy Whitman Index for office buildings as the inflation index for general plant additions. However, there are no Handy Whitman indexes for many kinds of general plant or intangible plant. Thus, we relied chiefly on price indexes from other sources such as the BLS.

Using capex shares provided by PSE that are specific to the Company, we computed weighted averages of growth rates in a selection of relevant inflation indexes for intangible plant and general plant. Most of the inflation subindexes were producer price indexes.

Another complication in developing inflation factors for general plant and intangible plant is that forecasts of inflation in the relevant PPIs are not to our knowledge available. We based our forecasts on the average annual inflation of the chosen indexes over the last 10 years (where available). As shown in Table 3 above, based on this research we recommend annual inflation assumptions of 1 percent for each of general plant and intangible plant.

## E. Macroeconomic Price Indexes

**Q. Are any macroeconomic inflation measures used in utility ratemaking?**

A. Yes. The GDP-PI has been used in U.S. rate and revenue cap index formulas and forward test year cost projections and it has often been used in utility cost research as a proxy for M&S price inflation.

The GDP-PI is computed by the BEA and is the federal government's featured index of inflation in prices of the economy's final goods and services. These products include capital goods and exports as well as consumer goods and services. There is less weight in the GDP-PI than in the consumer price index (all items) on prices of food, shelter, and energy commodities. The volatile inflation in these prices has little bearing on the cost of utility base rate inputs. The trend of the BEA's GDP-IPD is virtually identical to that of the GDP-PI.

**Q. Did PEG consider the use of a macroeconomic inflation measure in the revenue requirement projections for PSE?**

A. Yes. We examined the historical and, where available, forecasted trends of various national and Seattle-area macroeconomic inflation measures. These included the GDP-PI, consumer price indexes, and personal consumption expenditure price indexes.[18] The macroeconomic indexes for the national economy have had an historical tendency to grow more slowly than inflation in

[18] *See* Lowry, Exh. MNL-3 at 41-48.

the prices of utility M&S inputs and even more slowly than labor or utility construction price inflation. The slow growth of macroeconomic inflation measures has been recognized by several regulators in MYRP proceedings. Macroeconomic inflation is more rapid in Seattle, but this has been due in large measure to rapid growth in shelter prices that have little relevance to utility cost.

One area where GDP-PI could be considered in this proceeding is as an alternative to our corrected custom M&S price indexes.[19] Inflation in the GDP-PI and utility M&S prices is expected to be similar in the next few years. Use of the GDP-PI would sidestep the complicated calculations used in our corrected custom M&S price index. PSE has instead chosen to use our corrected custom M&S price index in its cost projections. This index is expected to grow a little more slowly than the GDP-PI in the next few years.

## VI. CONCLUSION

**Q. Does that conclude your prefiled direct testimony?**

A. Yes, it does.

[19] *See* Lowry, Exh. MNL-3 at 48.