Exh. GDF-1T

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-22______

DOCKET NO. UG-22______

DIRECT TESTIMONY OF

GRANT D. FORSYTH

REPRESENTING AVISTA CORPORATION

I. INTRODUCTION

Q. Please state your name, present position with Avista Corporation, and business address.

A. My name is Dr. Grant D. Forsyth. I am employed by Avista Corporation as its Chief Economist. My business address is 1411 E. Mission Avenue, Spokane, Washington.

Q. Dr. Forsyth, please provide information pertaining to your educational background and professional experience.

A. I am a graduate of Central Washington University with a Bachelor of Arts Degree in Economics, the University of Oregon with an MBA in Finance, and Washington State University with a Ph.D. in Economics. Before joining Avista in April 2012, I was a tenured faculty member in the Department of Economics at Eastern Washington University. In my 13-year career at EWU, beginning in 1999, I specialized in money and banking, macroeconomics, international finance, and regional economic analysis. The majority of my academic research used applied econometrics. Prior to EWU, I worked in the Czech Republic as an academic economist (1996-1997) and private sector economist (1997-1999) in the Czech financial industry. My financial industry position was the Director of Research for a diversified Czech financial holding company. In this position I oversaw a staff doing both equity and macroeconomic research.

Q. What are your current job duties at Avista?

A. My primary job duties at Avista include generating the customer and load forecasts for electric and natural gas operations,[1] and generating the peak load forecast for

[1] My forecasts are used by the Company's Financial Planning and Analysis department in the development of the financial forecast. It is also frequently used as modeling inputs by the Company's Power Supply and Gas Supply departments (recently combined into one department, Energy Supply, led by Company witness Mr. Kinney).

electric operations. I also participate in various external policy groups, such as the Washington Governor's Council of Economic Advisors and Washington's Citizen Commission for Performance Measurement of Tax Preferences.

Q. What is the purpose of your testimony in this proceeding?

A. My testimony describes the methodology used to generate growth rates for certain regulatory balances. In future Washington cases, the Company expects to use this growth rate methodology for the purpose of escalating certain regulatory balances in the determination of future revenue requirements, during multi-year rate cases, beyond first year pro forma study levels. As discussed by Company witness Ms. Andrews, however, my current calculated growth rates will be used to produce the electric and natural gas revenue requirement for Rate Year 2 of the Company's Two-Year Rate Plan, as a cross-check or statistical analysis for comparison to the Company's Rate Year 2 pro forma analysis. As discussed by Ms. Andrews, the Company is not relying on my testimony and analysis for its proposed Rate Year 2 revenue requirement. Rather, it is simply meant to demonstrate that using my statistical analysis, Avista could actually support an even higher revenue requirement.

Q. Would you please summarize the main points of your testimony?

A. Yes. My testimony will provide a computational direct and transparent method for calculating growth rates for escalating certain regulatory accounts between rate cases for multi-year rate proceedings.

Q. Are you sponsoring any exhibits to be introduced in this proceeding?

A. Yes. I am sponsoring Exh. GDF-2 which provides the data and calculations associated with my testimony.

II. GROWTH RATE METHODOLOGY FOR MULTI-YEAR RATE PROCEEDINGS

Q. Please provide a concise summary of the Company's proposed calculation methodology for growth rates to be used in future multi-year rate proceedings.

A. The Company's proposed methodology to be used for future multi-year rate proceedings, begins with a time-series of relevant account categories, in this instance for the 2014-2020 period. For example, one account category we can analyze is Amortization and Depreciation. Using this example, we will label the actual Amortization and Depreciation account balance for a given year as "V_t". The "t" is a symbol for a specific year—for example, t = 2014—and V is the dollar amount in that year. The next step is to use the data in the 2014-2020 period to calculate the annual change in V_t as follows:

$$\Delta \boldsymbol{V_t} = \boldsymbol{V_t} - \boldsymbol{V_{t-1}}$$

More precisely, ΔV_t is the change in an account category from one year to the next, starting with 2015 (as 2014 would be considered the base year):

$$\Delta \boldsymbol{V_{2015}} = \boldsymbol{V_{2015}} - \boldsymbol{V_{2014}}$$

$$\Delta \boldsymbol{V_{2016}} = \boldsymbol{V_{2016}} - \boldsymbol{V_{2015}}$$

$$\Delta \boldsymbol{V_{2017}} = \boldsymbol{V_{2017}} - \boldsymbol{V_{2016}}$$

$$\Delta \boldsymbol{V_{2018}} = \boldsymbol{V_{2018}} - \boldsymbol{V_{2017}}$$

$$\Delta \boldsymbol{V_{2019}} = \boldsymbol{V_{2019}} - \boldsymbol{V_{2018}}$$

$$\Delta \boldsymbol{V_{2020}} = \boldsymbol{V_{2020}} - \boldsymbol{V_{2019}}$$

Following the calculation of the individual year-to-year changes, the average of all six ΔV_t values is calculated as follows:

$$\overline{\Delta \boldsymbol{V}} = \frac{\Delta \boldsymbol{V_{2015}} + \Delta \boldsymbol{V_{2016}} + \Delta \boldsymbol{V_{2017}} + \Delta \boldsymbol{V_{2018}} + \Delta \boldsymbol{V_{2019}} + \Delta \boldsymbol{V_{2020}}}{\boldsymbol{6}}$$

From here, $\overline{\Delta V}$ would be used to calculate **g**, the Escalator Growth Rate, as follows:

$$g_{2020} = \frac{\overline{\Delta V}}{V_{2020}}$$

where V_{2020} is the last actual account value in a relevant series. The Escalator Growth Rate would then be used as follows to escalate the 2020 account value to a projected value (V*) for 2021:

$$V^*_{2021} = V_{2020} \cdot (1 + g_{2020})$$

If needed, the Escalator Growth Rate can be used for multiple years to generate successive values of V*—for example, over two-year period:

$$V^*_{2021} = V_{2020} \cdot (1 + g_{2020})$$

$$V^*_{2022} = V^*_{2021} \cdot (1 + g_{2021}) \; where \; g_{2021} = \frac{\overline{\Delta V}}{V^*_{2021}}$$

Q. Would the Company provide a step-by-step numerical example using actual company data relevant to the current rate case?

A. Yes. What follows is a numerical example using actual data for the Company's electric operations' Amortization and Depreciation for the 2014-2015 period. Table No. 1 below presents the base data and calculations used to arrive at ΔV_t:

Table No. 1: Example using Avista's Actual Amortization and Depreciation Data

(1) Year	(2) Value, V ($, 000s)	(3) ΔV
2014	64,456	
2015	71,829	7,373
2016	78,372	6,543
2017	82,874	4,502
2018	88,789	5,915
2019	94,723	5,934
2020	99,614	4,891

The average change, $\overline{\Delta V}$, is calculated as follows using the six ΔV_t observations shown in column (3) of the Table 1:

$$\overline{\Delta V} = \frac{\mathbf{7,373 + 6,543 + 4,502 + 5,915 + \ 5,934 + \ 4,891}}{\mathbf{6}}$$

$$\overline{\Delta V} = \frac{\mathbf{35,158}}{\mathbf{6}} = \mathbf{5,859.7}$$

Given $\overline{\Delta V}$, the next step is to calculate g, the Escalator Growth Rate, using V_{2020} = 99,614 as the starting base:

$$\boldsymbol{g_{2020}} = \frac{\overline{\Delta V}}{\boldsymbol{V_{2020}}} = \frac{\mathbf{5,859.7}}{\mathbf{99,614}} = \mathbf{0.058824}\ \boldsymbol{or}\ \mathbf{5.8824}\%$$

With the Escalator Growth Rate calculated, the escalation to V^*_{2021} would be:

$$\boldsymbol{V^*_{2021}} = \boldsymbol{V_{2020}} \cdot (\mathbf{1} + \boldsymbol{g_{2020}}) = \mathbf{99,614} \cdot (\mathbf{1} + \mathbf{0.058824}) = \mathbf{105,473.70}\ \mathbf{.}$$

Q. Why did the Company choose the 2014-2020 period for calculating the Escalation Growth Rates?

A. The Company believes this period is the most representative of the current linear trend in the relevant regulatory accounts. Using a longer-times series requires potentially more complicated calculations to adjust for changes in trends, including periods where the trend may exhibit non-linear behavior. Some of these issues have been raised in the Company's past rate filings when attrition adjusted results were utilized in those cases.

Q. Did the Company consider other methods to calculate the growth rates?

A. Yes. The method described above was compared to Escalator Growth Rates calculated using linear regression. The growth rates were found to be comparable in size using the same 2014-2020 period. Certain complex issues around regression analysis have been discussed in some of the Company's past rate filings around attrition adjustments. However, the method proposed here has advantages over regression analysis because it does not require knowledge of more advanced statistics, or software packages, to generate an Escalator Growth

Rate for any account category. In this sense it is computationally direct and transparent.

Q. Would you please explain why the proposed method produces results similar to linear regression?

A. Yes. Avista's proposed method reflects the statistical behavior of the historical data. In particular, the historical change in an account value in one year is not a good predictor of the change that occurs in the next year. In other words, there is a low correlation between $\Delta \boldsymbol{V_t}$ and $\Delta \boldsymbol{V_{t-1}}$. This can occur even if the relevant account value is consistently growing over time. Returning to Table No. 1, even though Amortization and Depreciation is growing over time, the change over one year has a low correlation with the change in the next year. In other words, $\Delta \boldsymbol{V_{2019}}$ is going to be a poor predictor $\Delta \boldsymbol{V_{2020}}$, even though both are positive. Likewise, $\Delta \boldsymbol{V_{2018}}$ is going to be a poor predictor $\Delta \boldsymbol{V_{2019}}$, and so on. This means, from a statistical point of view, a reasonable forecast for a future $\Delta \boldsymbol{V}$ is simply the average change measured over a relevant historical period. From Table 1, this was calculated as:

$$\overline{\Delta \boldsymbol{V}} = \mathbf{5,859.7}$$

Given the low correlation between historical values of ΔV, $\overline{\Delta V}$ will be near the estimated slope, α_1,of the following regression trend-line:

$$\boldsymbol{V_{2020} = \alpha_0 + \alpha_1 t + \epsilon_1}$$

In this equation, t is a time index (t = 1,…,7) for years 2014 through 2020. Given this statistical background, the advantage of the Company's approach is that no knowledge of more advanced statistics, or software packages, are required to calculate the Escalator Growth Rate for any account category.

Q. Has the Company applied the growth rates to the relevant accounts?

A. Yes. The application of the Escalator Growth Rates is part of Ms. Andrews' testimony. Ms. Andrews discusses the cross-check comparison of determining electric and natural gas Rate Year 2 revenue requirements using my growth rates, versus the results per the Rate Year 2 Pro Forma Studies produced by Ms. Andrews and used to support the Company’s Two-Year Rate Plan.

The one-year Escalator Growth Rates for all accounts are included in Table No. 2 for electric operations and Table No. 3 for natural gas operations. These rates were calculated using the methodology discussed in my testimony.

Table No. 2: Electric Operations One-year Escalator Growth Rates

Category	$\overline{\Delta V}$, 2015-2020 ($,000)	2020 Value, V ($, 000)	Escalator Growth Rate
Adjusted Operating Expenses	5,945.0	167,561	3.55%
Total Depreciation/Amortization	5,859.7	99,614	5.88%
Adjusted Taxes Other Than Income Tax	1,186.0	45,765	2.59%
Net Plant After Deferred Income Tax	75,813.2	1,669,383	4.54%
Plant in Service: Intangible	18,959.7	216,378	8.76%
Plant in Service: Production	31,881.0	937,387	3.40%
Plant in Service: Transmission	28,130.5	540,754	5.20%
Plant in Service: Distribution	56,429.3	1,181,371	4.78%
Plant in Service: General	15,144.3	287,733	5.26%
Accumulated Deprecation: Intangible	8,728.2	72,611	12.02%
Accumulated Depreciation: Production	12,872.0	402,763	3.20%
Accumulated Depreciation: Transmission	5,011.5	153,938	3.26%
Accumulated Depreciation: Distribution	16,697.2	352,905	4.73%
Accumulated Depreciation: General	4,971.7	95,550	5.20%
Deferred Taxes	(26,451.2)	(416,473)	6.35%

Table 3: Natural Gas Operations One-year Escalator Growth Rates

Category	$\overline{\Delta V}$, 2015-2020 ($,000)	2020 Value, V ($, 000)	Escalator Growth Rate
Adjusted Operating Expenses	1,868.5	42,735	4.37%
Total Depreciation/Amortization	1,628.5	23,075	7.06%
Adjusted Taxes Other Than Income Tax	316.8	7,424	4.27%
Net Plant After Deferred Income Tax	28,229.5	395,278	7.14%
Plant in Service: Storage	978.0	31,103	3.14%
Plant in Service: Distribution	28,694.2	510,059	5.63%
Plant in Service: General	15,933.0	154,767	10.29%
Accumulated Depreciation: Storage	417.2	12,024	3.47%
Accumulated Depreciation: Distribution	5,688.2	148,924	3.82%
Accumulated Depreciation: General	5,002.7	47,445	10.54%
Deferred Taxes	(6,267.7)	(92,258)	6.79%

III. INFLATIONARY IMPACTS ON GROWTH RATES

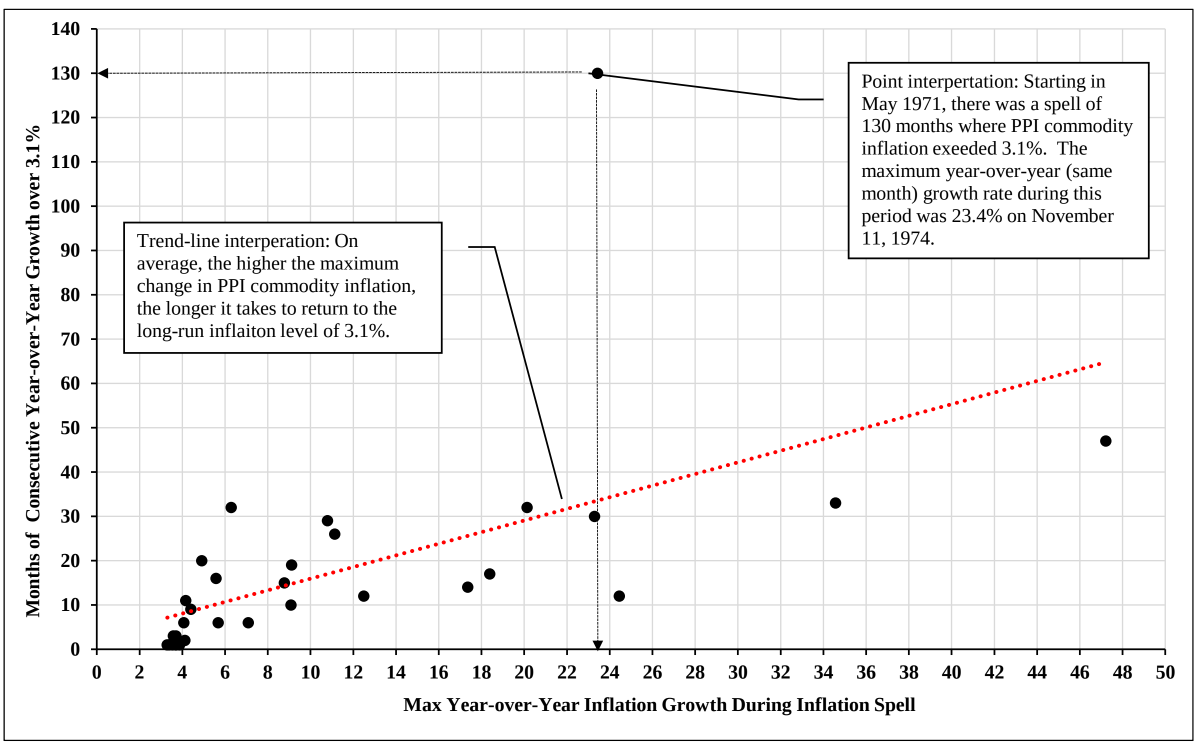
Q. Are there any other issues that may impact the current or future Escalator Growth Rates?

A. Yes. Because of the supply chain disruptions caused by the COVID pandemic, markets are experiencing escalating inflation rates at both the consumer and producer (business-to-business) level. Escalating inflation will impact the cost of the goods and services purchased by the Company. Historically, the length of time (often called a "spell") that inflation remains above the long-run average is strongly correlated with the size of the inflation spike. Figure No. 1 below demonstrates this point by looking at spells of producer price inflation that have exceeded the long-run average. The underlying producer price inflation data for Figure No. 1 is the All Commodity Producer Price Index (PPIACO) calculated by the Bureau of Labor Statistics.[2] The monthly PPIACO data extends back to

[2] U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: All Commodities [PPIACO], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PPIACO, December 16, 2021. The calculation "year-over-year, same month" means calculating monthly inflation rates relative to the same month in the previous year. Performing this calculation since 1913 and taking the average produces a long-run growth rate of 3.1%. A similar value is

1913. Since 1913, average annual PPICO inflation has been about 3.1%. Using this average, it is possible to examine spells of inflation consistently above 3.1% and those spells' correlation to the maximum year-over-year, same month inflation that occurred during that spell. Between 1913 and 2020, the U.S. experienced 32 spells of above average (over 3.1%) inflation ranging in duration from one month to 130 months. Figure No. 1 plots the duration (in months) of each spell against the maximum year-over-year, same month inflation rate that occurred during that spell. The red-dotted line in Figure No. 1 shows the regression relationship between the spell duration and the maximum inflation rate (year-over-year, same month basis) during that spell. The regression line clearly shows that on average, the higher the inflation spike, the longer the duration of the inflation spell.

<u>Figure No. 1: Relationship Between Duration of Inflation Spell and Inflation Severity</u>

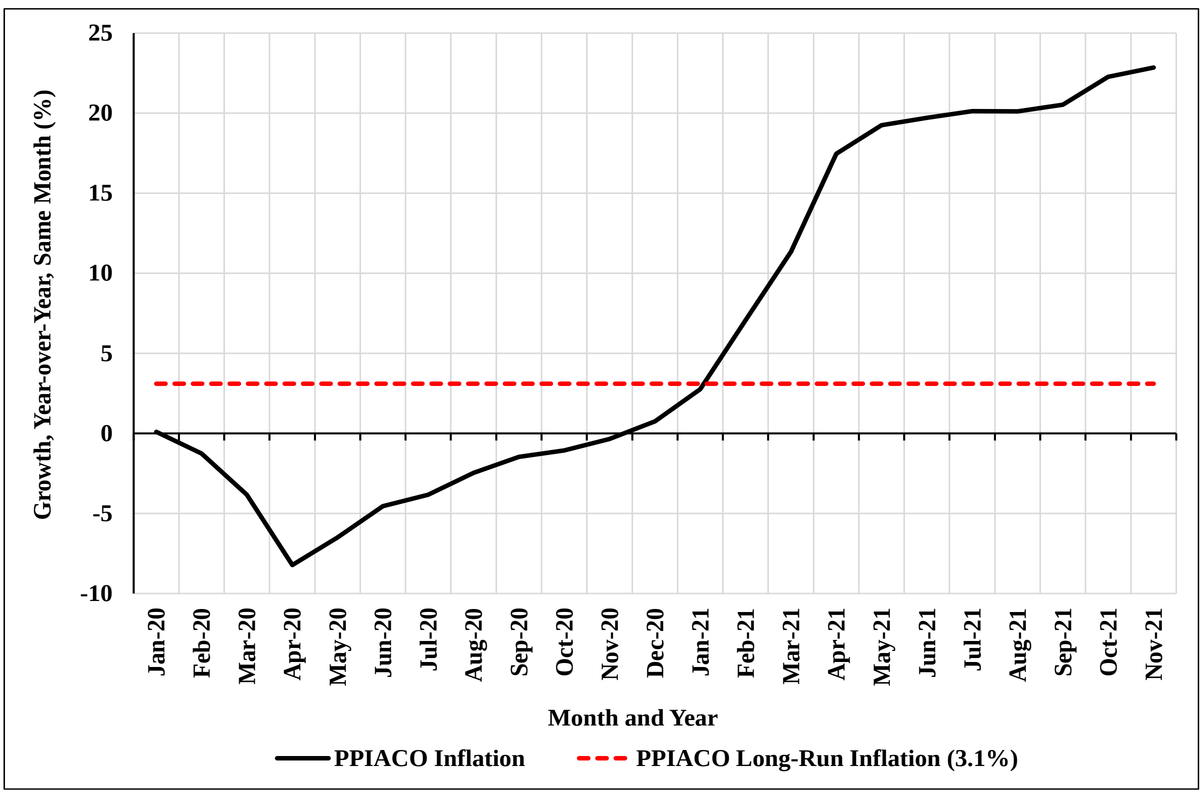


produced if one just uses the annual PPICO index to calculate inflation rates since 1913. The PPIACO covers a broad range of products, which can be found at https://www.bls.gov/web/ppi/ppitable09.pdf. Starting in July 2009, services were added to the PPPIACO. A description of the different Producer Price Indexes can be found at https://www.bls.gov/news.release/ppi.tn.htm.

Q. Can you comment on the most recent behavior of producer prices?

A. Yes. Figure No. 2 below shows year-over-year, same month growth for the All Commodity Producer Price Index (PPIACO) calculated by the Bureau of Labor Statistics for the period 2020 and 2021. Figure No. 2 shows that a new above average inflation spell started in February 2021. By November 2021, the last month in the current series, the year-over-year, same month growth rate reached nearly 23%--the highest in the current spell. <u>The size of the current spike through November 2021 suggests that the current inflation spell could be prolonged</u>. In turn, this could have a prolonged impact on future expenditure growth as the prices of the goods and services purchased by the Company increase at a faster than average rate.

<u>Figure No. 2: Recent Producer Inflation Behavior</u>



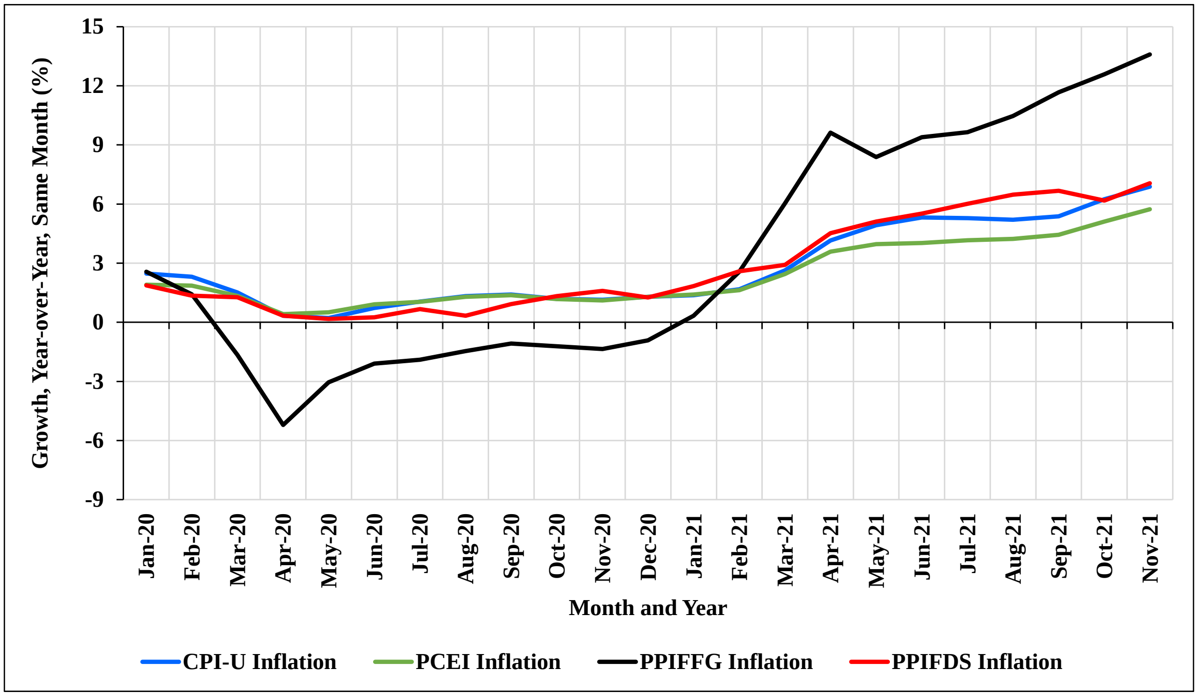
Q. Are there other measures of inflation that show current inflation

pressures?

A. Yes. Figure No. 3 shows year-over-year, same month growth for the Consumer Price Index for urban consumers (CPI-U); the Personal Consumption Expenditures Index (PCEI), the Federal Reserve's preferred measure of consumer inflation; and the Producer Price Index for Final Demand Finished Goods (PPIFFG) and Final Demand Services (PPIFDS)[3]. The consumer price indices are measuring prices paid by households and the producer price indexes are measuring prices received by producers, which are frequently not direct sales to household consumers. All four index examples show inflation pressures building simultaneous going through November 2021, with PPIFFG inflation rate at approximately twice the rate of consumer (CPI-U and PCEI) and PPIFDS inflation.

[3] U.S. Bureau of Economic Analysis, Personal Consumption Expenditures: Chain-type Price Index [PCEPI], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PCEPI, December 27, 2021. U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIAUCSL, December 28, 2021. U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Final Demand: Finished Goods [WPSFD49207], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPSFD49207, December 28, 2021. U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Final Demand: Final Demand Services [PPIFDS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PPIFDS, December 28, 2021.

Figure No. 3: Recent Inflation Behavior from other Index Measures



Q. Does this conclude your pre-filed direct testimony?

A. Yes.