ORIGINAL

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

PETITION BY TAMPA ELECTRIC FOR APPROVAL OF ITS PLAN TO BRING ITS GENERATING UNITS INTO COMPLIANCE WITH CLEAN AIR ACT	DOCKET NO. 992014-EI FILED: JANUARY 27, 2000

TESTIMONY

OF

STEPHEN L. THUMB

ON BEHALF OF

TAMPA ELECTRIC COMPANY

I. QUALIFICATIONS

Q. Please state your name and address.

A. My name is Stephen L. Thumb. My business address is 1901 North Moore Street, Suite 1200, Arlington, Virginia 22209.

Q. Please state the name of your employer and in what capacity you are employed.

A. My employer is Energy Ventures Analysis, Inc. ("EVA"). I am a principal with EVA.

Q. What type of firm is EVA?

A. EVA is a consulting firm, which engages in a variety of energy and environmental projects for private and public sector clients. In the energy area, much of our work is related to analysis of fuel markets, particularly oil, natural gas, coal and emission allowances. Our clients in these areas include coal, oil, and natural gas producers, electric utilities, industrial energy consumers, and gas pipelines and railroads. EVA has also worked for a number of public agencies, such as state regulatory commissions, the United States Environmental Protection Agency, and the United States Department of Energy, as well as intervenors in utility rate proceedings, such as consumer counsels and municipalities. Another group of clients include trade and

industry associations, such as the Electric Power Research Institute, the Gas Research Institute and the Center for Energy and Economic Development. The firm has provided testimony to nine state public utility commissions, including Florida. Furthermore, the firm has filed testimony in a number of cases in both state and Federal courts, as well as before the Federal Energy Regulatory Commission.

Q. Please describe your educational and business background.

A. I received a Bachelor of Science degree in chemical engineering from Northwestern University and a Masters Degree in Business Administration (concentration in Finance). In addition, I was qualified as a Certified Public Accountant in the state of West Virginia. Prior to joining EVA, I spent 15 years in the oil and gas industry working for Ashland Oil, Burlington Northern and Meridian Oil. I am currently a principal at EVA responsible for the firm's oil and gas practice. This work includes a wide range of assignments for a variety of clients, including electric utilities. I have either authored or co-authored 15 reports for the Electric Power Research Institute and/or the Gas Research Institute on a variety of topics concerning fossil fuels.

Q. Have you previously testified before this commission?

A. Yes. I have filed testimony in support of Tampa Electric 's Polk Prudency Review (Docket No. 960409-EI).

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. EVA was hired by Tampa Electric to assess the reasonableness of their fuel price and emission allowance forecasts used in comparing various options for Clean Air Act ("CAA") compliance, which includes the Gannon Repowering Project.

Q. Have you prepared an exhibit in support of your testimony?

A. Yes. I have prepared an exhibit titled Direct Testimony Exhibit of Stephen L. Thumb (SLT-1) which consists of 4 documents prepared under my direction and supervision. Please see Document 1 of my Exhibit (SLT-1).

III. EVA FUEL PRICE FORECASTS

Q. Does EVA provide fuel price forecasts?

A. Yes, EVA provides a variety of fuel price forecasts for its clients. EVA provides on a multi client basis its FUELCAST report series, which is prepared twice per year, which provides price projections for natural gas, coal, crude oil and petroleum products, and emission allowances. Tampa Electric is one of the subscribers to EVA's FUELCAST report series. In addition, EVA provides for some clients tailored fuel price forecasts, which among other

things include price forecasts for other fuels.

Q. Are EVA's fuel price forecasts followed by industry participants?

A. Yes. For example, industry trade press has noted the following:

> *"The authoritative Energy Ventures Analysis Inc. (EVA) has just released its latest long-term outlook that shows. . ." (Natural Gas Week, July 31, 1995, page 2); and*
>
> *"Through the years, EVA's Fuelcast, authored by principal gas analyst Stephen L. Thumb and team, has been one of the leading barometers of fossil fuel supply, demand and prices." (Natural Gas Week, February 16, 1998, page 2); and*
>
> *". . . Energy Ventures Analysis Inc. (EVA) said in its much-watched annual 'Fuel Cast'" (Natural Gas Week, August 18, 1997, page 1).*

Q. How does EVA prepare its fuel price forecasts?

A. EVA's fuel price forecasts consist of both short-term forecasts (e.g., every 45 days) and long-term forecasts (e.g., 20 years). The short-term forecasts focus largely on weather events and current market volatility. The long-term forecasts are structured to supply a detailed assessment of the supply and demand fundamentals for each fuel. In addition, EVA uses several proprietary

models to develop its forecasts. In this assessment of supply and demand fundamentals a major emphasis is placed upon identifying the primary drivers behind EVA's fuel price forecast. The identification of these primary drivers is an important part of the fuel price forecast, as one of EVA's forecast objectives is to provide the reader with enough insight that if a change in one of the primary drivers occurs it is appreciated that the associated price forecast would change.

Q. Does EVA compare its price projections to those provided by other price forecasters?

A. Yes.

Q. Are there differences with these other price forecasts?

A. Yes.

Q. What are the reasons for some of these differences?

A. Despite their best efforts to research the various primary drivers in a fuel price projection, forecasters can have different views on one or more of these primary drivers and thus differ in their price projections. In many cases the specific information is not knowable at the present time. One simple example is what will OPEC do at its next meeting with respect to its current production accord, which withholds supplies from the market. With the oil supply and

demand balance currently being very tight OPEC's actions at its next meeting will make a huge difference in the outlook for oil prices. However, what OPEC will do is not knowable at this time and there are differences in views among industry observers.

Q. In light of these differences is it reasonable to use several price forecasts and take an average of them?

A. Yes. Furthermore, an average of several price forecasts does not have to use equal weighting for each forecast.

Q. Are there any other benefits to using several price forecasts?

A. Yes. By using several price forecasts, one can ascertain the range of price projections and whether a selected price forecast is within this range provided by industry experts or an outlier, and thus potentially suspect.

IV. TAMPA ELECTRIC FUEL PRICE FORECASTS

Q. Have you reviewed the Tampa Electric gas supply price forecast and is it reasonable?

A. Yes, I have reviewed the gas supply forecast of Tampa Electric, which is presented in Mark Hornick's testimony. The Tampa Electric gas supply price forecast was within the range of other gas supply price forecasts obtained by

Tampa Electric, one of which was provided by EVA. In addition, in Documents 2 and 3 of my Exhibit (SLT-1), I have compared the Tampa Electric gas supply price forecast to industry recognized gas supply price forecasts that EVA routinely monitors and found that Tampa Electric gas supply forecast was within the range of these forecasts. In order to place the projections of these various forecasts on a comparable basis I have converted the latest available projections to common units ($/MCF), the same year constant dollars ($1997) and an average wellhead cost of gas. The Tampa Electric gas supply price projections are within zero (0) to seven (7) percent of the mean of the forecasts presented in Documents 2 and 3 of my Exhibit (SLT-1). I consider the Tampa Electric gas supply price forecast to be reasonable.

Q. Did you review any other aspects of the Tampa Electric gas price forecast?

A. Yes. I reviewed Tampa Electric's assumptions concerning gas transportation from the Henry Hub, Louisiana to the Gannon plant in Florida.

Q. What were the results of your review?

A. There are several unique aspects about gas transportation within Florida. Unlike most other regions, Florida is currently almost entirely dependent on a single pipeline, namely Florida Gas Transmission (FGT), for gas transportation to facilities within the state of Florida. Absent the existence of other transportation alternatives or negotiations to the contrary, the appropriate gas transportation cost would be FGT's current tariff. However, future facilities

within Florida will likely be able to obtain gas transportation services from one or more of three proposed pipelines. At present the tariffs for these new pipeline projects are not known and likely will be subject to negotiations. As noted in Mark Hornick's testimony, Tampa Electric examined the potential range of gas transportation costs (i.e., $0.55 to $0.80 per MMBTU) to the Gannon facility. The upper end of the range represents FGT's existing tariff and the lower end of the range represents what Tampa Electric might be able to negotiate with one of the proposed gas pipeline projects or an expansion of the FGT system, which has also been proposed. This is a reasonable approach for analyzing the gas transportation costs for the Gannon project.

Q. What is the likelihood of additional gas transportation capacity becoming available within Florida?

A. The likelihood of the gas transportation capacity within Florida being increased is very high. In Document 4 of my Exhibit (SLT-1) I have prepared a summary of the gas pipeline projects proposed for the state of Florida. While I don't expect all of these proposed projects to be completed, I do expect some combination of them to be completed. The primary reason for this assertion is that the proposed gas pipeline projects for Florida are demand driven. In other regions of the country there have been delays and/or cancellations of pipeline projects. However, for the most part, these delayed or cancelled projects were supply driven.

Q. What is the difference between supply driven and demand driven gas pipeline

projects?

A. Supply driven projects are projects, which are attempting to bring additional supplies, usually from a different producing region, to a specific market or demand center. Unless these supply driven projects are either less expensive or paid for by producers, these projects are generally not supported by the marketplace. As a result, they are often delayed until demand in the area increases or they are cancelled. Demand driven gas pipeline projects are projects that are constructed to meet growth in demand within a region. In these instances, new customers will pay for service on the new pipeline projects because transportation service on existing pipelines is not available.

Q. Why is gas demand increasing in Florida?

A. The primary reason for gas demand increasing in Florida is the construction of new gas-fired power generation projects in the state. As a part of its normal practice, EVA tracks planned power generation capacity additions throughout the nation. As a result of this effort, EVA is aware of at least 8,998 MW gas-fired power generation capacity planned for Florida. This figure is for only gas-fired combined cycle capacity and excludes proposed gas-fired peaking facilities. This 8,998 MW equates to approximately an additional 1.5 BCFD of gas demand for Florida under peak demand conditions.

Q. Have you reviewed Tampa Electric 's coal supply price forecast and is it reasonable?

A. Yes, in conjunction with other individuals at EVA, I have reviewed Tampa Electric 's coal supply forecast, which was presented in Mark Hornick's testimony. Coal, unlike natural gas, is not a homogenous fuel. There are a variety of coals—each with different characteristics, such as BTU content, ash, moisture, ash fusion temperature and sulfur content. Furthermore, only certain types of coal can be burned in a given boiler. These differences in coal characteristics affect the price of individual coal types. As a result, it is important when comparing coal price forecasts to ensure that the forecast is for the specific type(s) of coal of interest. Some coal price forecasts do not provide specific prices for the various types of coals. For example, the Energy Information Administration's forecasts provide only a single average minemouth price for all U.S. coals. In Mark Hornick's testimony, Tampa Electric has provided a comparison of its coal price projections to other coal price forecasts for the specific types of coal used by Tampa Electric. This comparison includes EVA's coal price forecast. EVA considers Tampa Electric's coal supply price forecast to be reasonable.

Q. Have you reviewed Tampa Electric 's price forecast for petroleum products and was it reasonable?

A. Yes, I have reviewed Tampa Electric 's forecast for No. 2 distillate fuel oil. While oil markets are extremely volatile and there is considerable uncertainty for what action OPEC will take concerning withholding supplies from the marketplace, Tampa Electric 's distillate price forecast appears reasonable in light of information and comparable forecasts that were available at that time.

Q. Have you reviewed Tampa Electric 's price forecast for emission allowances and is it reasonable?

A. Yes, in conjunction with other individuals at EVA, I have reviewed Tampa Electric 's price forecast for sulfur dioxide (SO_2) allowance which is presented in Mark Hornick's testimony. Tampa Electric 's SO_2 allowance price forecast is reasonable and is within the range of other available forecasts.

Q. Please summarize your testimony?

A. In conjunction with other individuals at EVA, I have reviewed Tampa Electric 's fuel and emission allowance price forecasts and have determined that they are reasonable. In addition, I have testified that it is very likely that gas transportation capacity within Florida will be expanded.

Q. Does this conclude your testimony?

A. Yes, it does.

EXHIBIT NO. 1

Exhibit (SLT-1) Document 1

RESUME OF

STEPHEN L. THUMB

EDUCATION

C.P.A.	West Virginia, 1977
M.B.A.	Finance, American University, 1972 (cum laude)
B.S.	*Chemical Engineering*, Northwestern University, 1967

EXPERIENCE

Current Position

Stephen Thumb joined Energy Ventures Analysis in 1988 and became a partner in 1990. Mr. Thumb directs EVA's natural gas and oil practice. Mr. Thumb is also EVA's senior financial analyst. Mr. Thumb is responsible for the FUELCAST Service, which is a multi-client service providing semi-annual forecasts of demand, supply and price for natural gas, coal, oil, and emission allowances. The types of projects in which Mr. Thumb is involved are described below:

Natural Gas Procurement

Evaluates natural gas procurement strategies for consumers taking into account the changing regulatory environment. For example, the procurement must address the mix of long- and short-term supply contracts, the mix of firm and interruptible transportation, and the mix of services.

Natural Gas/Oil Industry Analyses

Evaluates the natural gas and oil industries for clients concerned about supply options and availability. Studies have focused on structural issues such as pipeline capacity.

Forecasting

Provides clients with general or customized forecasts of natural gas and oil prices. Natural gas price forecasts are developed on both a wellhead or burner tip basis. Oil prices are developed for crude and refined oil products.

Financial Analysis

Serves as EVA's senior financial analyst and performs financial analyses as required. Directs the annual COALCAST report entitled Financial Performance of the Publicly-Held Coal Companies. The report analyzes the profitability and cash flow of these firms.

Acquisition and Divestiture Analysis

Performs analyses for companies considering acquisitions or divestitures. One project involved an acquisition analysis of an independent exploration and production firm with substantial natural gas reserves in the northeastern geological provinces. Another involved the acquisition of an affiliate coal mining operation.

Prior Experience

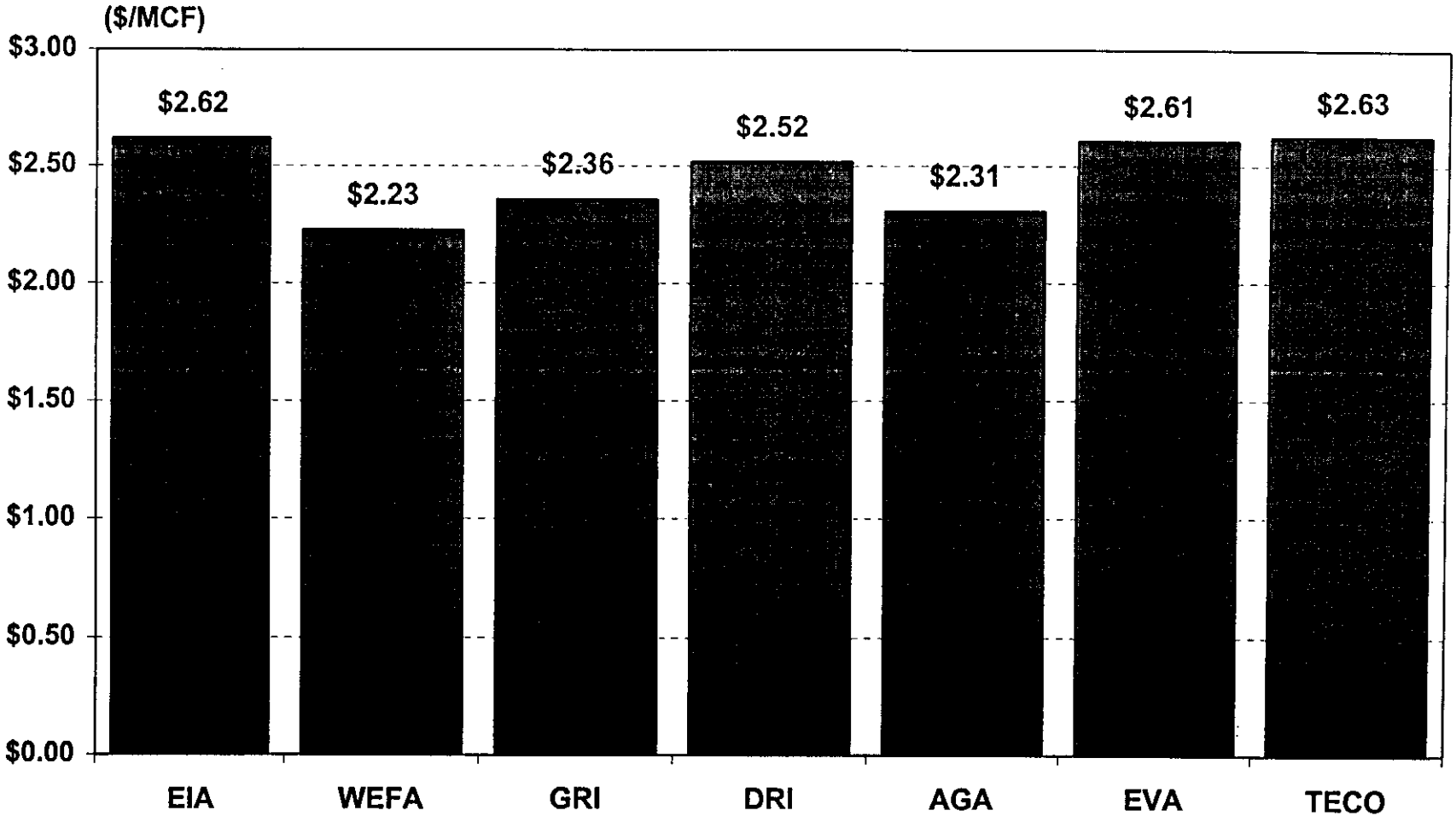
Before joining Energy Ventures Analysis, Mr. Thumb had 15 years of diversified industry experience having worked for three Fortune 100 companies. From 1982 to 1988, Mr. Thumb worked for Burlington Northern, Inc., most recently as Vice President of Planning for Meridian Oil, a wholly-owned subsidiary. Mr. Thumb's responsibilities included acquisitions, economic analysis, strategic plans, annual budgeting. Mr. Thumb's most significant accomplishment was the identification, analysis, and implementation of two major energy-related acquisitions (the El Paso Co. and Southland Royalty).

From 1974 to 1982, Mr. Thumb worked for Ashland Oil, Inc., most recently as Executive Assistant to the Chief Executive Officer. Mr. Thumb managed a number of special projects in the areas of operations and finance such as the development and marketing of a $200 million institutional drilling fund and an analysis of the firm's largest international oil production contract. Mr. Thumb also established a special employee incentive program for an oil and gas subsidiary in consultation with human resources and coordinated the redesign of an exploration and production accounting function.

From 1972 to 1974, Mr. Thumb worked for Nuclear Fuel Services, a wholly-owned subsidiary of Getty Oil. Mr. Thumb, as Manager for Financial Planning, was responsible for the preparation of economic analyses and long- and short-term plans. He also assisted the controller in numerous accounting functions.

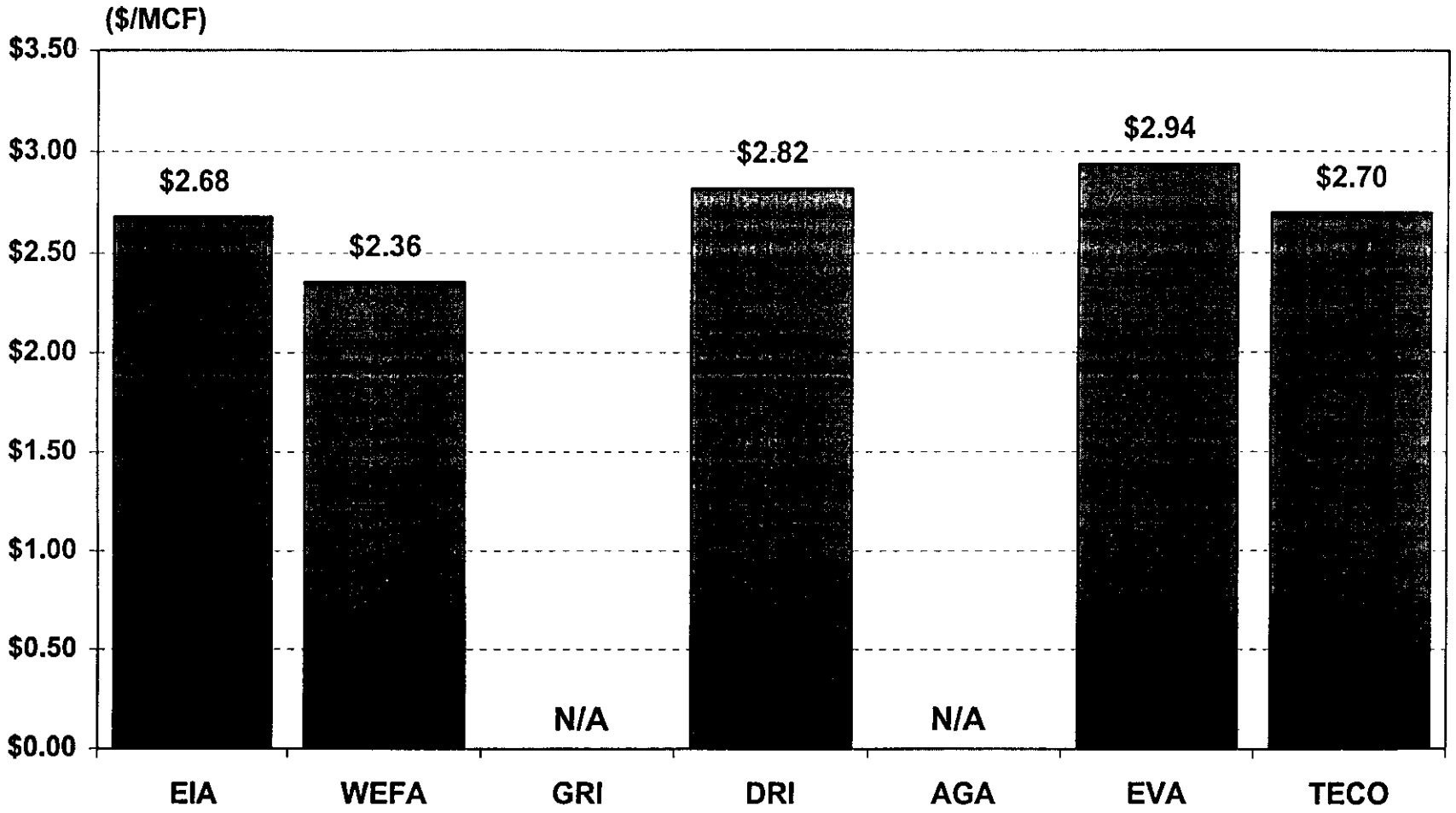
From 1967 to 1972, Mr. Thumb worked for the Division of Naval Reactors, a joint operation of the Atomic Energy Commission and the U.S. Navy, as an engineer in the fluid design section for surface ships and the radiological and chemical sections. From 1965 to 1967, Mr. Thumb worked at the Naval Ordinance Plant as a chemical and metallurgical technician.

Direct Testimony Exhibit of Stephen L. Thumb (SLT-1) Document 2
Projections of Average Wellhead Prices for Natural Gas
2015



Note: Constant 1997$
Source: EIA, Annual Energy Outlook 1999 and EVA

Direct Testimony Exhibit of Stephen L. Thumb (SLT-1) Document 3
Projections of Average Wellhead Prices for Natural Gas
2020



Note: Constant 1997$
Source: EIA, Annual Energy Outlook 1999 and EVA

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PROPOSED GAS PIPELINE PROJECTS FOR FLORIDA

Project Name	Primary Project Sponsor	Type of Project	Capacity (BCFD)	In Service Date	Starting Point	Termination	Project Cost ($ Billion)
Gulfstream	Coastal	New	1.1	6/2002	Mobile, AL	W. FL	1.6
Sawgrass	Duke	New	1.0	2003	Mobile, AL	W. FL	1.3
Bucaneer	Williams	New	0.9	4/2002	Mobile, AL	W. FL	1.5
FGT Phase IV	FGT	Expan.	0.272	5/2001	N/A	W. FL	N/A
FGT Phase V	FGT	Expan.	0.375-0.425	4/2002	N/A	W. FL	0.4

Source: Trade press and company announcements. Expan. = Expansion