

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for Determination) DOCKET NO. _____
of Need for Citrus County Combined)
Cycle Power Plant) Submitted for filing: May 27, 2014

DUKE ENERGY FLORIDA, INC.'S NOTICE OF FILING

Duke Energy Florida, Inc. ("DEF" or the "Company") hereby gives notice of filing the Direct Testimony of Kevin Delehanty with Exhibits KD-1 through KD-4 in support of DEF's Petition for Determination of Need for the Citrus County Combined Cycle Power Plant.

Respectfully submitted this 27th day of May, 2014.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

**In re: Petition for Determination
of Need for Citrus County Combined
Cycle Power Plant**

DOCKET NO. _____
Submitted for filing:
May 27, 2014

**DIRECT TESTIMONY
OF KEVIN DELEHANTY**

**ON BEHALF OF
DUKE ENERGY FLORIDA, INC.**

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IN RE: PETITION FOR DETERMINATION OF NEED

BY DUKE ENERGY FLORIDA

FPSC DOCKET NO. _____

DIRECT TESTIMONY OF KEVIN DELEHANTY

1 **I. INTRODUCTION AND QUALIFICATIONS.**

2 **Q. Please state your name, employer, and business address.**

3 A. My name is Kevin Delehanty and I am employed by Duke Energy Business
4 Services LLC, the service company affiliate of Duke Energy Florida, Inc. (“DEF”
5 or the “Company”). My business address is 550 South Tryon Street, Charlotte,
6 North Carolina 28202.

7
8 **Q. Please tell us your position with Duke Energy and describe your duties and
9 responsibilities in that position.**

10 A. I am the Director of Market Fundamentals. In this role, I am responsible for
11 preparation of the Fundamental Forecast, which is the Duke Energy Corporation
12 (“Duke Energy”) long-term fossil fuels commodity price forecast for all the
13 subsidiary electric utilities, including DEF. As a result, I am responsible for
14 providing the long term commodity price component of the fuels forecast to DEF
15 for its Integrated Resource Planning (“IRP”) process.

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Q. Please summarize your educational background and employment experience.

A. I received an Associate’s degree in Industrial Electronics from Spartanburg Technical College in May, 1982. In May 1990, I received a Bachelor of Science degree in Electrical Engineering from the University of South Carolina – Columbia. I have also been a licensed Professional Engineer in the State of South Carolina since 1994.

I joined Duke Power Company in June, 1982 as an Engineering Associate in the Distribution Engineering Group. From 1982 – 1987, I was a Power Quality Engineer in the Electrical System Design Group. I joined the System Planning Group in 1990 where I was responsible for production cost modeling, project evaluation, and financial analysis. Over the next ten years I served in a variety of roles leading cross functional teams in planning and asset strategy. In 2000, I joined the Bulk Power Marketing Group as a Senior Structured Planning Engineer responsible for valuation and risk analysis of large structured power deals. In 2005, I joined the Corporate Strategy Group as Manager of Commodity Price Fundamentals responsible for supervision of the commodity price forecasting process using external consultants for modeling and data. Following the merger with Cinergy in 2006, I was named Director of Market Fundamentals and Competitive Analytics responsible for the development of the long term fuel price outlooks used in all long term planning studies.

1 **II. PURPOSE AND SUMMARY OF TESTIMONY.**

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

3 A. I am testifying on behalf of DEF in support of its Petition for Determination of
4 Need for the Citrus County Combined Cycle Power Plant. I will describe the
5 process for developing the Fundamental Forecast and explain why the
6 Fundamental Forecast is a reasonable long-term fuels price forecast for the
7 Company to use in its IRP process.

8
9 **Q. Are you sponsoring any sections of Duke Energy Florida's Need Study?**

10 A. Yes. I am sponsoring the "Fuel Price Forecasts" in DEF's Need Study for the
11 Citrus County Combined Cycle Power Plant project.

12
13 **Q. Are you sponsoring any exhibits to your testimony?**

14 A. Yes. I am sponsoring the following exhibits to my testimony:

- 15 • Exhibit No. ___ (KD-1), a chart of the Company's base, high, and low
16 natural gas price forecast;
- 17 • Exhibit No. ___ (KD-2), a chart of the Company's base natural gas price
18 forecast and other industry natural gas price forecasts;
- 19 • Exhibit No. ___ (KD-3), United States Energy Information Administration
20 ("EIA") Map of major North American shale basins; and
- 21 • Exhibit No. ___ (KD-4), United States Potential Gas Committee chart of
22 Total Potential Resources.

1 The Company generated exhibits identified above were prepared under my
2 direction and control, and each is true and accurate. The other exhibits were
3 prepared by government agencies charged with collecting, collating, and
4 publishing information of the type included in the identified exhibits, they are
5 reliable industry resources for this information, and this information is typically
6 used by the Company as resource material in the preparation of the Fundamental
7 Forecast.

8
9 **Q. Please summarize your testimony.**

10 A. The Fundamental Forecast is Duke Energy's long-term fuels forecast. It is a
11 fundamentals-based forecast reflecting Duke Energy's long-term outlook for
12 resource planning purposes and other long-term investment decisions. The
13 Fundamental Forecast is based on an extensive review and a rigorous analysis of
14 available and relevant information that affects fuel commodity prices. It reflects
15 industry expertise and Duke Energy's expertise and professional judgment of
16 future fuel costs. It is further in line with other contemporary, industry fuels
17 forecasts. The Fundamental Forecast, therefore, reasonably represents future fuel
18 commodity prices.

19 Natural gas is the fuel planned for the Citrus County Combined Cycle
20 Power Plant. It is a readily available fuel source, given current and projected
21 levels of long-term supply of natural gas. The increase in the available gas supply
22 and production from conventional and, in particular, unconventional tight gas and
23 shale rock formations in the United States due to improvements in drilling and

1 well stimulation technologies is expected to continue to favorably impact fuel
2 prices. Natural gas is available in sufficiently abundant supply that natural gas is
3 a relatively economic fuel choice for power generation well into the future.
4

5 **III. DEF'S FUELS PRICE FORECAST.**

6 **Q. Does DEF have a fuels forecast?**

7 A. Yes. DEF has both a short-term fuels forecast and a long-term forecast. The
8 short-term fuels forecast is based on observed market prices and is used mainly
9 for operational purposes. The long-term forecast is a fundamentals-based forecast
10 and it reflects Duke Energy's long-term outlook for resource planning purposes
11 and other long-term investment decisions for Duke Energy and all of its electric
12 utilities, including DEF. All of the long-term fundamental commodity prices are
13 developed within the context of a comprehensive, internally consistent modeling
14 process. The short term fuel forecast is based on available futures market prices,
15 spot market prices, and short-term contract prices for the fuels used by the electric
16 utilities. The short term natural gas fuels price forecast, for example, is based on
17 the New York Mercantile Exchange ("NYMEX") futures contract prices for
18 United States natural gas. The NYMEX natural gas futures market is an electric
19 utility industry standard index of future market prices for United States natural
20 gas. The Company transitions from its reliance on the short term fuels forecast to
21 the Duke Energy Fundamental Forecast, or long term fuels forecast, for the long
22 term investment decisions, such as building and operating new power plants, in its
23 IRP process.

1 **Q. Why does Duke Energy prepare a Fundamental Forecast?**

2 A. The Fundamental Forecast is an integral part of Duke Energy's long term
3 planning processes, in particular, its resource planning. Relevant short- and long-
4 term fuel commodity prices and their differentials over time are important
5 economic factors in determining the types and timing of new generation additions
6 to DEF's system. Fuel commodity prices are also relevant to the determination of
7 the most efficient method of operating existing and proposed generation plants on
8 DEF's system in compliance with system operational and environmental
9 requirements. Duke Energy utilizes published market prices for the portion of the
10 forecast curve where the relevant fuels are actively traded, as well as other market
11 intelligence like competitive bids received in the fuel procurement process, and
12 then relies on market fundamentals to fill out the balance of the forecast. Futures
13 market prices are illiquid after the first few years and often do not reflect the
14 impacts of proposed environmental rulemaking, retirements of existing
15 generation, or changes in technology. A Fundamental Forecast is a forward-
16 looking evaluation of the marginal cost of supply at the expected level of demand.
17 Iterative modeling simulations are performed using detailed supply and demand
18 curves for each commodity until the energy markets come into balance, producing
19 an internally consistent set of future market prices. The modeling process utilizes
20 a combination of historical industry data coupled with assumptions which help
21 define the future market environment. The fundamental forecasting process
22 provides a detailed narrative of where the future energy supplies and
23 corresponding demand will come from and it will help identify the key variables.

1 Although some of these input assumptions may prove to be incorrect in the future,
2 the process itself still yields important information as to their cause and effect.

3 The real strength of the fundamental forecasting process lies in the fact that it is a
4 methodical, analytical process, repeated at regular intervals, and it is continuously
5 refined. The Fundamental Forecasting process, which allows Duke Energy to
6 evaluate the impact of the changing energy landscape on future commodity fuel
7 prices, is essential to DEF's IRP process.

8
9 **Q. How does Duke Energy prepare its Fundamental Forecast?**

10 A. Duke Energy starts its Fundamental Forecast with the assistance of an expert
11 energy consultancy in the field of fuels forecasting in the industry. Duke
12 Energy's current industry consultant is Energy Ventures Analysis, Inc. ("EVA").
13 EVA was selected from five industry energy consultant responses to a request for
14 proposal ("RFP") in July 2012. EVA was selected based on, among other factors,
15 its experience, modeling processes and tools, market and regulatory expertise.
16 EVA was selected by an internal team of experts from different Duke Energy
17 departments, including Fuel Procurement, Load & Fundamental Forecasting;
18 Strategic Engineering and Environmental Policy; and Integrated Resource
19 Planning. EVA is an industry expert in fuel price forecast modeling and analysis.

20 Duke Energy relies on EVA to employ its industry leading modeling
21 processes and databases to develop a long-term energy commodity price forecast
22 that EVA provides Duke Energy. Duke Energy subject matter experts review the
23 EVA assumptions and data inputs in the long-term energy commodity price

1 forecast for consistency with Duke Energy's own internal planning assumptions
2 and data inputs. Duke Energy works in a collaborative manner with EVA to
3 discuss the input assumptions, model results, and corresponding conclusions in
4 the EVA reference case. Following this review, Duke develops a list of input
5 assumption changes to be considered for the next iteration of the Duke reference
6 case and then works with EVA to facilitate the changes within the constraints of
7 the modeling process. This process continues until both Duke Energy and EVA
8 are satisfied that the data inputs and assumptions in the long-term commodity
9 price forecast are credible and that the results of modeling the assumptions in the
10 forecast are valid. Further, validation of the modeling assumptions and results is
11 obtained from reviews by various internal planning groups until Duke Energy is
12 comfortable with the credibility of the long-term energy commodity price
13 forecast.

14 Duke Energy has employed this process since 2005 and has worked with
15 leading energy consultants like Wood Mackenzie, CERA, ICF, Global
16 Energy/Ventyx, and EVA. The Fundamental Forecast is released each spring
17 with an updated forecast typically in the fall of the year, if required by material
18 changes in the underlying assumptions in the Fundamental Forecast. The
19 preparation of the Fundamental Forecast, however, is a continual process in the
20 sense that Duke Energy routinely monitors and updates, when necessary, the
21 assumptions underlying the Fundamental Forecast based on changes in the market
22 and evolving conditions in the national and regional economies where the electric
23 utilities are located, political and regulatory conditions, environmental conditions

1 and other factors that have or may have an impact on the Fundamental Forecast.

2
3 **Q. What types of changes are made by Duke Energy to the EVA Fundamental**
4 **Forecast assumptions?**

5 A. Duke Energy typically makes changes only to assumptions regarding data inputs
6 in technical areas where Duke Energy possesses specialized expertise or to
7 assumptions regarding future policy directives where Duke Energy believes it has
8 more complete or relevant information. For example, in the 2013 Fundamental
9 Forecast, Duke Energy adjusted state level electric sales growth rates and raised
10 the penetration level assumptions of certain renewable resources in select states
11 where Duke Energy electric utilities operate. Duke Energy also modified coal
12 plant retirement assumptions for existing coal plants, capital and operation and
13 maintenance (“O&M”) cost assumptions for new generation resources with which
14 Duke Energy has construction and operation experience, and assumed remedies
15 for future 316(b) water regulations, all based on its internal information and
16 expertise. These assumptions changes are typically few in number; the
17 overwhelming majority of the assumptions in the Fundamental Forecast were
18 developed by EVA and retained by Duke Energy.

19
20 **Q. Are there any other adjustments by Duke Energy to the EVA forecast in the**
21 **Fundamental Forecast?**

22 A. Yes. The EVA forecast did not include a national climate or carbon policy
23 assumption in the EVA Fall 2012 base forecast, which was the starting point for

1 the development of the 2013 Duke Energy outlook, i.e. the Fundamental Forecast.
2 EVA did follow up with a carbon scenario case of their own as part of their Fall
3 2013 Outlook. Duke Energy has included a price on carbon within its base
4 fundamentals outlook since 2006 as a way of capturing the potential impact of
5 uncertain future policy for regulating CO₂ emissions, and although current
6 legislative efforts to enact a policy that places a national price on carbon remain
7 highly uncertain, it is still a possibility. In the absence of legislation the United
8 State Environmental Protection Agency (“EPA”) is moving ahead with regulating
9 CO₂ emissions from existing fossil fuel-fired power plants, and we expect a
10 proposal from the EPA in June 2014. Therefore, Duke Energy believes it is
11 prudent to model a price on carbon as a way of capturing the risk of potential, but
12 uncertain future legislation and pending EPA regulation of CO₂, and the impact of
13 carbon policy at the national level within the context of its fundamental fuel price
14 outlook. The carbon price Duke Energy currently uses in its fundamentals
15 forecast is a direct input to the process and has been set at a level we believe to be
16 a reasonable trajectory to represent the risk of federal climate change legislation
17 or regulation given the current uncertainty surrounding such policy. The carbon
18 price trajectory used is also in our view reflective of the pricing that policy
19 makers might consider acceptable if or when they act.

20 Because of the high degree of uncertainty surrounding the outcome of
21 climate change policy, however, DEF, in its IRP process, runs scenarios off the
22 Duke Energy fundamental forecast carbon price trajectory that include a no
23 carbon cost forecast to produce a more robust analysis.

1 **Q. How is the Fundamental Forecast used in the IRP process?**

2 A. After the Fundamental Forecast is reviewed and validated as a credible long-term
3 commodity price forecast, it is provided to Duke Energy's fuels procurement
4 group where it is combined with other market data to develop the final fuel price
5 inputs to the resource planning models. For the natural gas commodity
6 component, the fuels procurement group utilizes futures market quotes from the
7 NYMEX to price the first three years, followed by a two year transition period of
8 blended prices to the long term fundamentals for the balance of the forecast.
9 After establishing the commodity price curve, the procurement group develops
10 plant specific fuel price inputs by factoring in existing contracts, as well as fixed
11 and variable transportation costs. Exhibit No. ___ (KD-1) to my direct testimony
12 is a chart of the fundamental natural gas forecast. Forecast scenarios based on the
13 Fundamental Forecast are also developed. These include low and high natural gas
14 forecast scenarios around the base natural gas price forecast in the Fundamental
15 Forecast. See Exhibit No. ___ (KD-1).

16
17 **Q. How were the low and high natural gas forecast scenarios developed in the**
18 **Fundamental Forecast?**

19 A. The low and high natural gas forecasts in the Fundamental Forecast are developed
20 by comparing the Duke Energy base natural gas price forecast in the Fundamental
21 Forecast to contemporary, well-recognized industry natural gas price forecasts
22 and applying statistically relevant standard deviations to the data. This
23 methodology produces the shaded areas around the Duke Energy Fundamental

1 Natural Gas Forecast shown in Exhibit No. __ (KD-1) and results in the
2 calculation of the low and high natural gas price forecasts around the
3 Fundamental Natural Gas Forecast. Based on these calculations, the low natural
4 gas forecast is 18 percent lower and the high natural gas forecast is 14 percent
5 higher than the Duke Energy Fundamental Natural Gas Forecast, as shown in
6 Exhibit No. __ (KD-1). Duke Energy's methodology reasonably anchors its low
7 and high natural gas price scenarios to contemporary industry natural gas price
8 forecasts and ensures that the range of potential natural gas prices in the Duke
9 Energy Fundamental Natural Gas Forecast is not out of line with industry
10 forecasts.

11
12 **Q. In your opinion, is the Fundamental Forecast a reasonable view of future fuel**
13 **commodity prices?**

14 A. Yes. The Fundamental Forecast is based on an extensive review and a rigorous
15 analysis of available and relevant information that affects fuel commodity prices.
16 Duke Energy relies on industry expertise and its own expertise to develop this
17 information in the Fundamental Forecast and it incorporates the best available
18 data regarding these assumptions into the Forecast. The Fundamental Forecast
19 reflects industry expertise and Duke Energy's best professional judgment of
20 future costs at the time the Fundamental Forecast is prepared.

21 Duke Energy also vets this Forecast against other forecasts available in the
22 industry, and Duke Energy-specific information regarding supply and demand,
23 marginal costs, plant operational characteristics, and observable data regarding

1 commodity prices. As shown in Exhibit No. ___ (KD-2), and as I explained
2 above with respect to the development of the low and high natural gas price
3 scenarios, the Company's natural gas forecast is in line with other contemporary
4 natural gas forecasts (both public and proprietary) prepared by leading industry
5 consultants. As a result, the Fundamental Forecast reasonably represents future
6 fuel commodity prices.

7
8 **Q. Do you have an opinion regarding the use of natural gas as a fuel source for**
9 **the Citrus County Combined Cycle Power Plant?**

10 A. Yes. Natural gas is and will be a competitively-priced fuel source for the Citrus
11 County Combined Cycle Power Plant. Natural gas is an attractive economic fuel
12 source for the generation of electricity for DEF's customers compared to the total
13 cost of generation for other types of generation technologies. Natural gas is also
14 an attractive fuel source because, compared to oil and coal, it is a cleaner burning
15 fuel and does not have the same level of environmental costs and related impacts
16 associated with generation plants using those alternative fuels. This results in a
17 favorable impact on the relative capital cost of constructing generating facilities
18 capable of complying with current and ever increasing environmental regulations.
19 As a result, natural gas is the economic fuel of choice for electric generation for
20 customers at this time.

1 **Q. Why does the Company consider natural gas to be an economic long-term**
2 **fuel source for electrical energy production?**

3 A. In the last decade advances in natural gas production technology have provided
4 natural gas producers access to unconventional gas supplies that previously were
5 not economic production resources. These unconventional gas supplies are in
6 tight gas sandstone structures and shale rock formations deep below the ground
7 where natural gas in an abundant quantity is trapped within the rock.
8 Improvements in drilling and well stimulation technologies now provide an
9 economic method to drill and hydraulically fracture the rock and capture the large
10 quantities of natural gas trapped in these impermeable rock formations. This
11 advanced drilling technology is colloquially referred to as “fracking,” because the
12 shale rock formations that trap the natural gas are fractured by high pressure water
13 injected into the rock formations during the well completion process. Vast shale
14 rock formations or “shale plays” extend across the United States and Canada.
15 Exhibit No. ___ (KD-3) to my direct testimony is a map of the North American
16 shale plays. This map from the EIA shows the current and prospective shale
17 plays in addition to the natural gas basins. As the map makes clear, there are
18 abundant shale plays in North America, providing a long-term source of supply of
19 natural gas for natural gas users in the United States.

20 The ultimate size of the United States natural gas resource base has been
21 estimated at 2,384 trillion cubic feet, as shown in Exhibit No. ___ (KD-4),
22 according to the latest report from the United States Potential Gas Committee
23 2013 Report from the United States Potential Gas Committee at the Colorado

1 School of Mines. This estimate represents a 25% increase from their previous
2 report in 2011 and at the current rate of United States consumption of
3 approximately twenty five trillion cubic feet per year, the United States has ample
4 domestic reserves.

5 As a result of the new drilling and completion technologies there has been
6 a tremendous increase in United States unconventional gas production over the
7 last five years. In the last five years the marketed production of United States
8 natural gas has increased by 21% according to the EIA. But an even more
9 impressive statistic is the percentage of natural gas production from shale
10 resources which has increased from about 11% of the national total in 2008 to
11 over 35% by the end of 2012.

12 Shale resources are increasingly displacing conventional sources of gas in
13 the Gulf of Mexico and elsewhere, and that has further implications on the
14 reliability of supply. By moving on shore, producers are reducing the time it
15 takes to bring new wells on line and those wells are less prone to disruption from
16 hurricanes. The United States gas market is still subject to market volatility, in
17 part due to the nature of the business where supply and demand must balance in
18 real time and storage is finite and limited to certain regions by geology. However,
19 short term price volatility arising from operational imbalances are not a
20 significant threat to the value proposition of a natural gas combined cycle unit, the
21 way long term fuel availability and price uncertainty is. The dramatic increase in
22 the size of the gas resource base coupled with the speed at which it can be put in
23 production has significantly improved the long term availability of natural gas and

1 immensely improved the value proposition of natural gas as a fuel source for
2 electric generation.

3 The United States power market will also benefit greatly from the
4 distributed nature of the shale reserves being located much closer to major
5 demand centers like the Northeast. The development of the Marcellus and Utica
6 shale basins has freed up pipeline capacity across the Southeastern United States,
7 which has lowered basis differentials, i.e., the variation in price based on
8 constraints at the gas hub delivery location, and will also benefit future gas
9 consumers in Florida in reduced transportation costs. This increase in the
10 available gas supply and production of natural gas is expected to continue to
11 favorably impact fuel prices with natural gas price projections being relatively
12 economic to other fuels for energy production well into the future.

13
14 **Q. If low-cost natural gas is abundant will that increase the generation of energy**
15 **from natural gas in the United States?**

16 A. Yes. Natural gas is the predominant fuel source for new electric power generation
17 in the United States, and natural gas-fired generation has displaced a significant
18 portion of the existing coal-fired generation fleet, because of the relatively low
19 cost of natural gas and the increasing cost of coal-fired generation due to the
20 compliance with increasing environmental regulations. There is also projected to
21 be a sizable increase in industrial demand for gas as well as a significant increase
22 in both pipeline and LNG exports due to the increased size of the resource base
23 and the economic cost of production. This increase in demand is factored into our

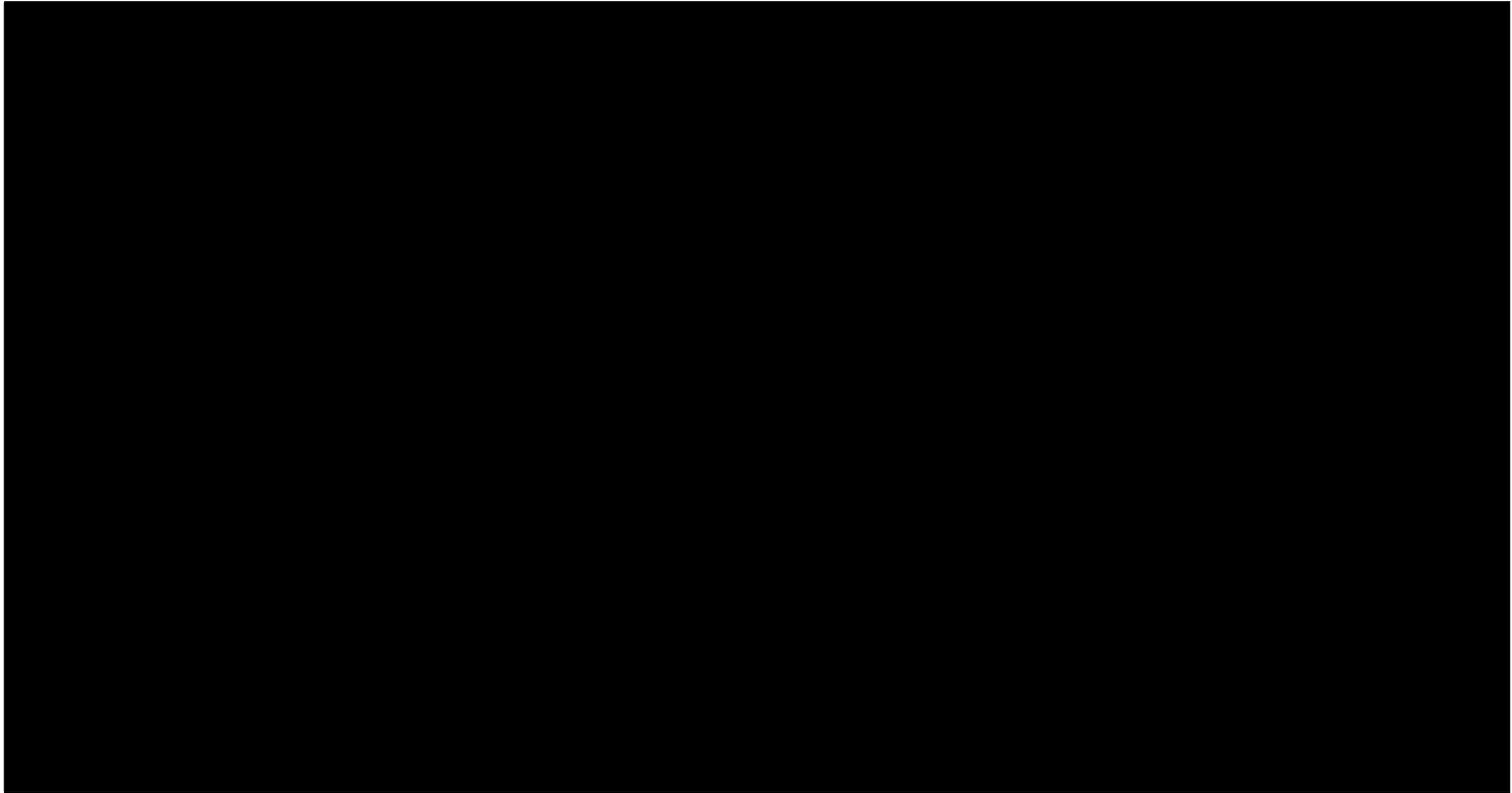
1 Fundamental Forecast and, even with the projected increase in demand for natural
2 gas, natural gas is still available in sufficiently abundant supply to render natural
3 gas a relatively economic fuel choice for power generation over the long term.
4

5 **Q. Does this conclude your testimony?**

6 A. Yes.

Docket No. _____
Duke Energy Florida
Exhibit No. _____ (KD-1)
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Docket No. _____
Duke Energy Florida
Exhibit No. _____ (KD-2)
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