

AEP OHIO EX. NO. _____

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application Seeking)	
Approval of Ohio Power Company's)	
Proposal to Enter into an Affiliate)	
Power Purchase Agreement)	Case No. 14-1693-EL-RDR
for Inclusion in the Power Purchase)	
Agreement Rider)	
 In the Matter of the Application of)	
Ohio Power Company for Approval of)	Case No. 14-1694-EL-AAM
Certain Accounting Authority)	

DIRECT TESTIMONY OF
TOBY L. THOMAS
IN SUPPORT OF AEP OHIO'S
APPLICATION

Filed: October 3, 2014

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TOBY L. THOMAS

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BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO
DIRECT TESTIMONY OF
TOBY L. THOMAS
ON BEHALF OF
OHIO POWER COMPANY

1 **PERSONAL DATA**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Toby L. Thomas, and my business address is 155 West Nationwide
4 Boulevard, Suite 500, Columbus, Ohio 43215.

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 A. I am employed by the AEP Generation Resources (“AEPGR”) as Vice President –
7 Competitive Generation. I am responsible for the safe, efficient, and environmentally
8 compliant operation of AEP’s competitive generating assets.

9 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**
10 **PROFESSIONAL BACKGROUND?**

11 A. I hold a Bachelor of Science Degree in Mechanical Engineering from the Rose Hulman
12 Institute of Technology. I joined AEP in 2001 as a project engineer involved in the
13 development and optimization of competitive power generation and industrial steam
14 generation projects across the United States. I have performed various roles of
15 increasing responsibility, and most recently served as the Managing Director –
16 Kentucky Power, Gas Turbine and Wind Generation prior to assuming my current role
17 in 2012. While employed at AEP, I have been involved in asset acquisitions, asset
18 management, and the operation and maintenance of a portion of AEP’s generation fleet.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED IN ANY REGULATORY**
2 **PROCEEDINGS?**

3 A. Yes. I testified before the Kentucky Public Service Commission in Case No. 2011-
4 00401.

5 **PURPOSE OF TESTIMONY**

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

7 A. The purpose of my testimony is to describe the generating units related to the
8 Company's request for a Purchase Power Agreement ("PPA") in this proceeding. I will
9 describe the characteristics of each generating unit, their economic viability in the
10 deregulated market for electricity, and the anticipated future operation of these units in
11 light of existing and anticipated environmental regulations.

12 **GENERATING UNITS**

13 **Q. WHICH GENERATING UNITS IS THE COMPANY PROPOSING TO**
14 **INCLUDE IN ITS REQUEST FOR A PPA?**

15 A. As indicated by Company witness Vegas, the generating units that AEPGR and AEP
16 Ohio included in the PPA are as follows:

- 17 • Cardinal Plant Unit 1,
18 • Conesville Plant Units 4, 5, and 6,
19 • Stuart Plant Units 1 through 4, and
20 • Zimmer Plant Unit 1.

21 **Q. IS THE COMPANY THE SOLE OWNER OF ALL THE POWER PLANTS**
22 **THAT IT PROPOSES TO INCLUDE IN THE PPA?**

1 A. No. The Company owns 100% of Cardinal Unit 1 and Conesville Units 5 and 6.
2 However, Conesville Unit 4, Stuart Units 1 through 4, and Zimmer Unit 1 are all co-
3 owned with other companies.

4 **Q. PLEASE DESCRIBE THE GENERATING UNITS THAT ARE INCLUDED IN**
5 **THE PPA.**

6 A. Each of the nine generating units included in the PPA is fired with pulverized coal,
7 where the coal is combusted in a furnace and the resulting heat is used to generate
8 steam to power a turbine. All of the units are equipped with low-nitrogen oxide
9 (“NO_x”) burners (“LNBS”) that minimize the creation of NO_x during the combustion
10 process. Conesville Units 4, 5, and 6 are also equipped with over-fire air systems that
11 further reduce NO_x via controlling the combustion process. All units are also equipped
12 with electrostatic precipitators (“ESPs”), which reduce emission of particulate matter
13 by more than 99%.

14 Located in Brilliant, Ohio (Jefferson County), Cardinal Unit 1 is a nominal 595
15 MW generating unit that was placed into service in 1967. Aside from LNBS, Unit 1 is
16 equipped with selective catalytic reduction (“SCR”) to further reduce emissions of
17 NO_x. The unit is also equipped with a flue gas desulfurization (“FGD”, or a
18 “scrubber”) system to reduce emissions of sulfur dioxide (“SO₂”). FGD systems allow
19 coal-fired generating units to consume relatively lower-cost, higher sulfur coal when
20 compared to units that are not equipped with such systems. AEPGR owns 100% of
21 Cardinal unit 1, and the unit is operated by the Cardinal Operating Company, which
22 also operates Units 2 and 3 at the plant, which are owned by Buckeye Power.

1 Conesville Units 4, 5, and 6 are located in Conesville, Ohio (Coshocton
2 County). Conesville Unit 4 has a nominal rating of 780 MW, and was placed in service
3 in 1973. The generating unit, much like Cardinal Unit 1, is equipped with SCR for NO_x
4 emissions reduction and an FGD system that allows it to consume a blend of high sulfur
5 and low sulfur coals. Conesville Units 5 and 6 are similarly-designed generating
6 units, each capable of generating 405 MW, and were placed in service in 1976 and
7 1978, respectively. These generating units are equipped with FGD systems. AEPGR
8 owns 43.5% of Conesville Unit 4, 100% of units 5 and 6, and is responsible for the
9 operation of all three of these generating units.

10 The Stuart power plant is located in Aberdeen, Ohio (Brown County). The
11 Stuart Plant is comprised of four similarly designed generating units, each rated at 585
12 MW, for a total plant capacity of 2,340 MW. Units 1 through 4 were placed in service
13 in 1971, 1970, 1972, and 1974, respectively. These units are equipped with SCR and
14 FGD for reduction of NO_x and SO₂ emissions. AEPGR owns a 26% interest in each of
15 these four generating units, and the plant is operated by Dayton Power & Light.

16 The Zimmer Plant is located in Moscow, Ohio (Clermont County). Unit 1 at the
17 Zimmer Plant, which was placed in service in 1991, is a nominal 1,300 MW generating
18 unit that is equipped with SCR for NO_x reduction as well as FGD for SO₂ reduction.
19 AEPGR owns a 25.4% interest in the Zimmer Plant, which is operated by Duke Energy.

20 **Q. PLEASE DESCRIBE YOUR ROLE WITH REGARD TO THE OPERATION**
21 **OF, AND INVESTMENT IN, THE AFOREMENTIONED GENERATING**
22 **UNITS.**

1 A. For the units above, which AEPGR operates (Cardinal Unit 1, Conesville Units 4, 5 and
2 6), I am responsible for the day-to-day operation of those generating units, as well as
3 the long-term planning for those units with regard to capital investments and long-term
4 maintenance initiatives.

5 For the Stuart and Zimmer units, the operator of each of those respective plants
6 is responsible for the day-to-day operations. As the Vice President – Competitive
7 Generation for AEPGR, I am a member of the Engineering and Operating Committee
8 for those generating units. Through my participation in this committee I am kept
9 informed of the operation of the generating units, and I participate in review and
10 approval processes for capital investment and operation and maintenance expense
11 budgets. I am involved with major decisions regarding the operation of the generating
12 units, as well as the development of future plans for expenditures. So, while AEPGR is
13 not responsible for the daily operational decisions at those generating units, AEPGR is
14 involved in the decision making process that is used to determine their long-term
15 operation. This allows AEPGR to review operational and investment decisions, and to
16 provide our input to the other co-owners as appropriate.

17 **ROLE OF THE OFFERED GENERATING UNITS IN AEPGR'S FLEET**

18 **Q. HOW DO THESE GENERATING UNITS COMPARE TO THE BROADER**
19 **GENERATION MARKET IN WHICH AEPGR PARTICIPATES?**

20 A. These generating units, Cardinal 1, Conesville 4, 5, and 6, Stuart 1, 2, 3, and 4, and
21 Zimmer 1, are all generating units that I would describe as marginal units with respect
22 to their economic viability while operating in a deregulated market. Although these
23 units are not currently planned to be retired in the next few years for economic or

1 environmental reasons, as further explained below the future market-based revenue
2 uncertainty and fixed cost structure make them vulnerable to early retirement. These
3 units are capable of safely and reliably generating electricity, and can be economically
4 viable in a deregulated market if the market price of electricity reaches sufficient levels.

5 **Q. WHAT IS AEPGR'S STRATEGY TO INVEST IN THESE GENERATING**
6 **UNITS?**

7 A. To date, these marginal units have been well-maintained and are anticipated to be
8 capable of meeting environmental regulations in the foreseeable future with reasonable
9 amounts of capital investment, but uncertainty of market-based revenue from the PJM
10 capacity and energy markets may not support sufficient economic returns due to the
11 fixed cost structure of solid fuel, baseload assets. Therefore, investments in these units
12 are generally made based on a short-term view of what the market will support over the
13 next few years.

14 Because market electricity prices are currently low, it is difficult to justify
15 significant levels of capital expenditures that could only be recouped over long periods
16 of time, which places them at greater risk of being retired due to a lack of needed
17 investment. For example, if the company anticipates that a plant will require additional
18 capital investment to meet a future environmental regulation, but current market prices
19 do not support that level of required capital, it could result in the decision to retire a
20 unit rather than invest the capital in a generating unit, if the investment is projected to
21 have a payback period of more than a few years.

22 An extended period of depressed market conditions could also lead to an earlier
23 retirement of these units for economic reasons, or at the very least could lead to a

1 prolonged low level of investment that could degrade the reliability of the units in the
2 long-term.

3 **Q. WHAT IS YOUR APPROXIMATE PLANNING HORIZON FOR CAPITAL**
4 **INVESTMENTS AS IT EXISTS TODAY?**

5 A. With the current state of the electricity market, my horizon for making investments in
6 the generating units generally goes out approximately three years. Obviously, the
7 farther into the future we look the more uncertainty is introduced, but at least for a three
8 year period we have a price signal in the capacity price that resulted from the most
9 recent PJM Interconnection Reliability Pricing Model auction, where capacity prices
10 are set in future years based on offers into that auction. Also, we have a relatively good
11 picture of what the market will look like three years out in terms of known
12 environmental regulations and likely plant retirements both internal and external to our
13 Company. There can still be a great deal of variability in these signals, particularly the
14 capacity payment amount, but it does provide something to use that far out that is
15 reliable for planning purposes.

16 Beyond a three year timeframe, the uncertainty regarding capacity and energy
17 prices that the market will bear increases significantly, making the case for any longer-
18 term investment that much more difficult.

19 **Q. ARE CURRENT MARKET CONDITIONS THREATENING THE FUTURE**
20 **VIABILITY OF OHIO GENERATION, AND IN PARTICULAR THE PPA**
21 **UNITS?**

22 A. Yes. The PPA units are on the economic “bubble”, meaning the market conditions, as
23 described by Company witness Pearce, are not providing the necessary economic

1 signals for incremental investment in these units. The plants have been saddled with
2 increased fixed costs resulting from recent environmental installations. Market
3 revenues continue to be insufficient for recovering costs. Market volatility and
4 unpredictability only serve to make the situation in which these generating units are
5 in more tenuous. Because of these factors, any major capital spending that might be
6 required in the future, whether for existing equipment repairs or for new
7 environmental requirements, could lead to premature retirements. A shutdown of
8 these plants would cause job loss and economic hardships for employees as well as
9 many Ohio citizens, and would be a significant blow to the Ohio tax base and other
10 industries that rely on the plants for business. Approval by the Commission of the
11 PPA Rider and the prudence of AEP Ohio's decision to enter into the life-of-unit
12 PPAs substantially reduces the likelihood that generating plants will face closure
13 before their useful life has ended.

14 **Q. HOW WOULD A PPA THAT INCLUDED THESE UNITS CHANGE AEPGR'S**
15 **INVESTMENT STRATEGY FOR THE GENERATING UNITS?**

16 A. The revenues that would be received through a PPA would allow the company to take a
17 longer-term view when making investments in these power plants. This, in turn, would
18 lead to a different investment strategy in these units than AEPGR would use if we were
19 to base those decisions solely on short-term market pricing signals.

20 The short-term pricing signals to which I am referring are those reflected in
21 Exhibit KDP-1 in the testimony of AEP Ohio witness Pearce in this proceeding. As
22 demonstrated in that exhibit, it is the volatility of the market that makes any type of

1 long-term and significant investment very difficult to justify based on the uncertain
2 market revenues that any one of the generating units may earn in any given year.

3 **Q. WHY DOES AEPGR SUPPORT OFFERING THESE UNITS TO BE**
4 **INCLUDED IN THE PROPOSED PPA?**

5 A. As I mentioned previously, these units are marginal with respect to market based
6 revenue. The units that AEPGR has offered for this PPA may be able to run profitably
7 in the market over the next few years, but their long-term viability is uncertain due to
8 the great number of unknowns when contemplating the future of the deregulated market
9 for electricity. This uncertainty makes it more difficult to justify significant future
10 investment in these generating units and will likely contribute to the retirement of these
11 units sooner than if the units operated in an economic environment that exhibited less
12 risk.

13 AEPGR views the PPA as a way to mitigate the risk of these units retiring
14 within the next few years. Although there is potential upside for these units when
15 compared to the currently forecasted market, AEPGR is willing to forego that potential
16 upside for the relatively stable revenues that a PPA would offer.

17 **Q. DOES AEPGR ANTICIPATE THAT THESE UNITS WILL RETIRE IN THE**
18 **NEAR FUTURE IF THE PPA IS NOT APPROVED?**

19 A. Not necessarily. AEPGR has no plans to retire these units at this time, but basing
20 future decisions regarding the operation of these units wholly on volatile market
21 conditions increases the risk of unit retirements occurring sooner than would be done
22 under a more stable construct. By contrast, the prospect of retiring these generating
23 units in the next few years is virtually nonexistent if the PPA is approved, as it will

1 allow us to take a longer-term view of the operation of, and level of investment in,
2 these generating units.

3 **Q. FOR HOW MANY MORE YEARS ARE THE PLANTS IN THE PROPOSED**
4 **PPA ANTICIPATED TO OPERATE?**

5 A. Each of the plants in question is capable of continuing to operate beyond 2030, based
6 on current knowledge of physical equipment at each unit and presuming an appropriate
7 level of future capital investment and maintenance expense can be justified
8 economically.

9 **Q. IS AEPGR COMMITTING TO RETIRE EACH GENERATING UNIT AT ITS**
10 **CURRENTLY PLANNED RETIREMENT DATE?**

11 A. No. The anticipated retirement date for each unit is based on using reasonable
12 engineering judgment to estimate end-of-life for major pieces of equipment. The
13 planned retirement dates reflect only the physical capability of the units to operate and
14 even then are only estimates that are subject to change.

15 **Q. HOW WOULD THIS PPA AFFECT THE REMAINING LIFE OF THESE**
16 **UNITS?**

17 A. The planned unit retirements dates, which are currently beyond 2030, are not
18 definitively affected by the approval or disapproval of the PPA. But as I mentioned, the
19 planned life is based solely on the physical condition of equipment, and does not take
20 into account other factors such as market power prices. Currently, there is a prospect of
21 the units retiring prior to their planned dates due to future market price volatility, but
22 approval of the PPA would make it highly likely that the units continue to operate until
23 the currently-planned retirement dates, based on what we know today.

1 **Q. IN YOUR PROFESSIONAL OPINION, HAVE THESE POWER PLANTS BEEN**
2 **MAINTAINED IN SUCH A WAY THAT THEY CAN CONTINUE TO**
3 **GENERATE POWER THROUGH 2030 AND BEYOND?**

4 A. Yes. These generating units have been properly maintained in the past, and with the
5 proper level of capital investment and O&M expense these power plants are capable of
6 operating in compliance with known and reasonably anticipated environmental
7 regulations over the life of the proposed PPA, which would support continued operation
8 until the planned retirement date for each unit.

9 **ENVIRONMENTAL REGULATIONS**

10 **Q. WHAT EXISTING AND PROPOSED ENVIRONMENTAL REGULATIONS**
11 **MAY AFFECT THESE GENERATING UNITS?**

12 A. The existing and proposed environmental regulations that are currently included in
13 compliance planning for these units consist of the existing Mercury and Air Toxics
14 Standards (“MATS Rule”), the proposed Coal Combustion Residuals Rule (“CCR
15 Rule”), the proposed Effluent Limitation Guidelines (“ELG”), and also proposed
16 rulemaking under section 316(b) of the Clean Water Act. These units could also be
17 subject to future regulations with respect to greenhouse gas (“GHG”).

18 **Q. WHAT IS THE MATS RULE, AND ARE THE COAL-FIRED UNITS YOU**
19 **DESCRIBE IN YOUR TESTIMONY EXPECTED TO MEET THE**
20 **REQUIREMENTS OF THE MATS RULE?**

1 A. The MATS Rule requires coal-fired power plants to meet stringent emission limits for
2 mercury, acid gases, and other hazardous air pollutants, and establishes a compliance
3 deadline of April 16, 2015¹ to meet those requirements.

4 The units that are equipped with SCR and FGD (Cardinal Unit 1, Conesville
5 Unit 4, Stuart Units 1-4 and Zimmer Unit 1) systems are anticipated to meet the
6 mercury requirements under the MATS Rule via the co-benefit removal of mercury,
7 whereby the SCR converts mercury to a state that is soluble in, and removed by, the
8 existing FGD equipment.

9 However, because Conesville Units 5 and 6 are not equipped with SCR systems,
10 additional capital investment is necessary to ensure compliance with the mercury
11 requirements of the MATS Rule. At this time, the Company is developing a design for
12 the future installation of an emerging technology that will allow the units to meet
13 mercury emission limits established under the MATS Rule at a lower capital cost than
14 would be incurred for the installation of an SCR system.

15 Cardinal Unit 1 and Conesville Units 4, 5, and 6, Stuart 1, 2, 3 and 4 and
16 Zimmer also plan to install mercury monitoring equipment to ensure that they are in
17 compliance with the monitoring provisions of the MATS Rule.

18 **Q. PLEASE DESCRIBE THE PROPOSED ENVIRONMENTAL REGULATIONS**
19 **THAT MAY AFFECT THESE PLANTS.**

20 A. For coal-fired power plants the proposed CCR Rule includes specific design and
21 monitoring standards for new and existing landfills and surface impoundments, as well
22 as measures to ensure and maintain the structural integrity of surface

¹ One-year administrative extensions can be sought for generating units that require additional time to construct control systems to achieve compliance with the rule.

1 impoundment/ponds. The proposed CCR rulemaking would require the conversion of
2 most “wet” ash impoundments to “dry” ash landfills, the relining or closing of any
3 remaining ash impoundment ponds, and the construction of additional wastewater
4 treatment facilities. The Companies anticipate that the CCR Rule - based on the
5 preliminary assumption that these residual materials may be categorized as “Subtitle
6 D,” or non-hazardous materials - would require plant modifications and capital
7 expenditures to address these requirements by approximately 2019. The final rule is
8 scheduled to be complete by December 19, 2014.

9 The Conesville and Zimmer units are already equipped with dry flyash handling
10 systems, while Cardinal Unit 1 and Stuart Units 1 through 4 are planned to undergo
11 conversions to dry flyash handling systems. These projects are also anticipated to
12 position these plants for future compliance with the CCR rulemaking.

13 EPA proposed an update to the ELG for the steam electric power generating
14 category in the Federal Register on June 7, 2013. The proposed ELG would require
15 more stringent controls on certain discharges from certain electric generating units, and
16 will set technology-based limits for wastewater discharges from power plants with a
17 main focus on process and wastewater from FGD, fly ash sluice water, bottom ash
18 sluice water and landfill/pond leachate. The Companies anticipate that wastewater
19 treatment projects will be necessary at Cardinal Unit 1 and Stuart Units 1 through 4,
20 and these have been considered as part of the respective long-term unit evaluations. As
21 the result of a Consent Decree with other parties to the rulemaking, EPA is anticipated
22 to issue a final rule by September 30, 2015. Similar to the future impact from the

1 anticipated CCR rule, dry fly ash conversions and/or dry ash landfill construction will
2 position the generating units for future compliance with the final ELG rulemaking.

3 A proposed rule under Section 316(b) of the Clean Water Act was issued by
4 EPA on March 28, 2011, and was subsequently filed in the Federal Register on August
5 15, 2014. The rule prescribes technology standards for cooling water intake structures
6 that would decrease interference with fish and other aquatic organisms, and requires the
7 Company to now develop a final compliance plan that will need to be approved by state
8 agencies at a later date. Given that Conesville Units 4-6, Stuart Unit 4 and Zimmer Unit
9 1 are equipped with natural or mechanical draft cooling towers, the most significant
10 potential impact of the proposed rule to these generating units would be the need to
11 install additional fish screening at the front of the water intake structure to reduce
12 impingement and entrainment potential. Cardinal Unit 1 and Stuart Units 1-3 have
13 once-through cooling system whereby water is taken from and returned to the river to
14 provide unit cooling. These systems may require additional capital investment, but at
15 this time the rulemaking is not anticipated to require the units to install cooling towers.
16 The compliance timeframe based on the final rule is not later than 2022.

17 **Q. WHAT IS THE CURRENT STATUS OF GREENHOUSE GAS REGULATION**
18 **THAT MAY AFFECT THESE GENERATING UNITS?**

19 **A.** Company witness McManus discusses the current status, and potential future
20 implications, of proposed greenhouse gas regulations.

21 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

22 **A.** Yes, it does.

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