Company Exhibit _____

BEFORE THE
PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Review of the Alternative Energy Rider Contained in the Tariffs of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company	))))))	Case No.11-5201-EL-RDR

DIRECT TESTIMONY OF

ROBERT EARLE

ON BEHALF OF

OHIO EDISON COMPANY
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
THE TOLEDO EDISON COMPANY

JANUARY 23, 2013

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Robert Earle. I am employed by Analysis Group, Inc. (Analysis Group), a consulting firm that provides microeconomic, strategy, and financial analyses. My business address is 650 California St., Floor 23, San Francisco, California 94108. Analysis Group has approximately 500 employees and offices in Boston, Chicago, Dallas, Denver, Los Angeles, Menlo Park, Montreal, New York City, San Francisco, Washington, D.C., and Beijing.

Q. Will you briefly describe your educational and business background?

A. I received an undergraduate degree in mathematics from the College of William and Mary in Virginia, and an M.S. and Ph.D. in operations research from Stanford University in California. I have been employed by Analysis Group as a Vice President since January 2009. Prior to my affiliation with Analysis Group, I was a Principal at the Brattle Group Inc. and Charles River Associates, Inc., and was the manager of economic analysis at the California Power Exchange. My professional experience and qualifications are summarized in my résumé, which is included as Attachment RE-1 to this testimony. Much of my work in the last several years has involved consulting with electric power industry clients on a variety of matters including renewables issues, wholesale bulk power markets and competition, transmission access and pricing, and contractual terms for wholesale service.

Q. Have you previously provided testimony before regulatory commissions and courts?

A. Yes. I have previously provided testimony, expert reports, or expert affidavits before the Federal Energy Regulatory Commission, the Public Utilities Commission of Texas, the New Brunswick Public Utilities Board, the Oklahoma Corporation Commission, the Superior Court of California in Los Angeles County, and the Texas District Court in Dallas, Texas. My résumé, Attachment RE-1, includes a list of such occasions.

II. PURPOSE AND SUMMARY OF CONCLUSIONS

Q. What is the purpose of your testimony?

A. In order to meet the Ohio AEPS requirements for 2009, 2010 and 2011, the FirstEnergy Ohio utilities conducted a series of six Requests for Proposals ("RFPs") to secure four categories of Renewable Energy Credits ("RECs"): In-State Solar RECs, All-States Solar RECs, In-State All Renewables RECs, and All-States All Renewables RECs.[1] The RFPs were issued on the following dates: July 15, 2009 ("RFP1"), September 23, 2009 ("RFP2"), July 1, 2010 ("RFP3"), March 8, 2011 ("RFP4"), August 1, 2011("RFP5"), and September 13, 2011 ("RFP6").

Exeter Associates, Inc. ("Exeter") reviewed the results of the FirstEnergy Ohio utilities' procurement of RECs by analyzing the quantities of RECs bid, the prices associated with those bids and the decisions of the FirstEnergy Ohio utilities regarding the bids received.[2] In the Exeter Report, Exeter found that the RFP process allowed the FirstEnergy Ohio

[1] Not all four categories of RECs were included in every RFP.
[2] "Confidential Final Report: Management/Performance Audit of the Alternative Energy Resource Rider (Rider AER) of the FirstEnergy Ohio Utility Companies for October 2009 through December 2011", (henceforth, "Exeter Report").

utilities to procure RECs at regionally-consistent and reasonable prices for three out of the four REC categories: All-States All Renewables, All-States Solar RECs and In-State Solar RECs. Specifically, the Exeter Report states that prices paid for All-States All Renewables RECs were reasonably consistent with other regional REC prices; the prices paid by the FirstEnergy Ohio utilities for All-States Solar RECs were consistent with solar REC prices regionally; and the prices paid for In-State Solar RECs were consistent with prices for solar RECs elsewhere.[3]

Exeter, however, claims that the FirstEnergy Ohio utilities paid unreasonably high prices for In-State All Renewables RECs in RFP1, RFP2, and RFP3. Exeter states that the prices paid for these RECs were "well above the prices customarily seen in any of the other RECs markets throughout the country contemporaneous with… the purchasing decisions made by the FirstEnergy Ohio utilities."[4]

I have examined the assertions in the Exeter Report about the prices paid for In-State All Renewables RECs for compliance years 2009 through 2011 in RFPs 1-3. In this testimony, I comment on (a) whether costs of developing renewable energy are the sole determinant of the market price of RECs, (b) whether the market price of RECs should approximate the additional revenue required by project owners to facilitate the development of eligible renewable projects, and (c) whether it is appropriate to use REC prices in other jurisdictions to determine whether the prices paid for Ohio In-State All Renewables RECs were reasonable.

[3] Exeter Report, p. iii-iv.
[4] Exeter Report, p. 28.

Q. Please summarize your conclusions.

A. REC market prices have many determinants other than the cost of development of renewable energy projects. For example, it is fundamental that market prices are determined by the supply-demand balance in a market. Therefore, the market price of RECs will not necessarily approximate the additional revenue required by project owners to develop new projects. These factors along with (a) the restriction of supply to Ohio of In-State All Renewables RECs, (b) financing challenges for renewable energy in Ohio and the REC supply shortage at the time of the RFPs in question, (c) the relative size and lack of maturity of the markets in question, (d) the lack of an Alternative Compliance Payment in Ohio, and (e) the difference in the product definitions in other jurisdictions, make Ohio In-State All Renewables REC prices not comparable to prices elsewhere. Accordingly, out-of-state market prices should not be a benchmark for the reasonableness of Ohio In-State All Renewables REC prices. For these reasons, the Exeter Report does not support its conclusion that prices paid by the FirstEnergy Ohio utilities for In-State All Renewables RECs in RFP1, RFP2, and RFP3 were unreasonable.

III. DETERMINANTS OF THE PRICE OF RECS

Q. Are costs of development of renewable generation the only determinant of the price of RECs?

A. No. A basic principle in economics is that prices are determined by both demand and supply. Under the idealized conditions of perfect competition, price is given by the intersection of the supply curve and the demand curve as illustrated in Attachment RE-2. If there is increased demand, then the market clearing price will change as illustrated in

Attachment RE-3. With increased demand, the demand curve shifts to the right with a resulting *increase* in price and quantity sold in the market ("market clearing quantity"). In a similar manner, if there is increased supply, then the market clearing price will change as illustrated in Attachment RE-4. With increased supply, the supply curve pivots to the right with a resulting *decrease* in price and *increase* in quantity sold in the market ("market clearing quantity"). In addition, the costs of development are not the only consideration for determining the supply curve for RECs.

Q. Please discuss important determinants of the supply curve for RECs.

A. As a general matter, the factors determining the supply curve for RECs include generator costs, energy market revenues, sourcing requirements or quotas, financing costs, regulatory and political risks, and the nascence of the market. I discuss each of these in turn. For generators using non-renewable resources to break even, the energy market revenues must be at least the cost of generation.[5] RECs, however, give renewable generation another revenue stream. Therefore, for a renewable generator to be able to break even, the price for RECs must be at least the cost of generation from that renewable facility minus energy market revenues.

The minimum price for RECs that a renewable facility will need to receive in order to offer RECs will depend on (a) whether it is an existing facility and (b) the time frame of the REC sales. Consider, for example, an existing renewables facility, such as a biomass facility, with a marginal operating cost (fuel and variable operations and maintenance costs) of $44.30/MWh that is trying to decide whether to sell power into the spot market.

[5] Energy market revenues could include sales of electric power as well as payments for capacity and ancillary services.

If the spot market price for electricity is $41.00/MWh, the REC price that the biomass plant would need to break even would need to be at least $3.30/MWh.[6] On the other hand, the calculation for a developer considering whether to build a biomass plant is different. The developer would want to be able to recover its capital costs (including a return on equity) along with fixed and marginal operating costs in the prices from the energy markets and for RECs in order for the plant to be built. For example, if the all-in costs including capital costs for a biomass facility were $115.40/MWh, and the average revenues from the energy market were expected to be $101.00/MWh, the expected price of RECs would need to be at least $14.40/MWh for the developer to be willing to build the biomass facility.[7]

The Exeter Report mentions some of the specific factors that affect the supply curve that go beyond the costs of development.[8] First, the geographical area from which eligible RECs can be drawn will affect the price. As discussed in the Exeter Report, if the geographical area is restricted, prices will be higher than they would be otherwise. This is because, as discussed below, the geographic restriction acts as an import quota restricting supply. Second, the level of energy prices will affect RECs prices. Higher energy prices will tend to result in lower RECs prices and vice versa.

Financing costs are also important for the development of new generation, and were particularly so at the time of the RFPs in 2009 and 2010. The global financial crisis disrupted investment in renewable power in the U.S. This is because tax credit incentives had been a main driver of renewable energy investment. In order for tax credit incentives

[6] $44.30-$41.00=$3.30. The numbers presented are for illustrative purposes only.
[7] $115.40-101.00=$14.40. The numbers presented are for illustrative purposes only.
[8] Exeter Report, p. 30.

to be effective, investors must have tax liabilities (*i.e.*, owe taxes) against which the tax credits can be applied. Investors who invest in order to reduce their tax liabilities are called "tax equity" investors. The recession, however, resulted in diminished corporate profits and therefore lower tax liabilities. As a consequence, the number of large tax equity investors in renewables shrunk from twenty to around five during 2008-2009. Debt financing also dried up as a result of credit tightening globally. In order to address these problems, the American Recovery and Reinvestment Act of 2009 ("ARRA") provided for temporary grants of up to thirty percent of a project's capital cost in lieu of tax credits. However, by the end of July 2010, the time of the last of the RFPs at issue (RFP 3), renewables projects in Ohio had garnered only $7.1 million in grants or less than two-tenths of a percent of the total $4.3 billion in grants nationwide. Thus, increased financing costs constrained entry into the market and therefore Ohio supply, placing upward pressure on REC prices.

Another important determinant of the supply curve for RECs is sourcing requirements or quotas. In establishing the requirement that half of renewables be from inside the state, the Ohio legislature created a separate product market through effectively creating an import quota. In general, import quotas are often imposed, among other reasons, to protect local industries and encourage local economic development and job creation. Import quotas typically result in higher prices for restricted goods in the importing jurisdiction. For example, the U.S. has had an import quota on raw cane sugar equal to about forty-three percent of U.S. production over the last five years resulting in a price in

the U.S. for sugar approximately fifty-four percent higher than the world price for raw cane sugar.[9]

In addition, regulatory and political risk is an important determinant of supply. Government support for renewable generation waxes and wanes. Because investments in renewable generation are long-lived investments that last for twenty or more years, developers pay close attention to potential changes in government policy. For instance, many renewable developers have depended on government support through production tax credits (PTC) and investment tax credits (ITC) as discussed above. The PTC program has expired a number of times with resulting drops in investment in wind generation. Its extension beyond 2012 was opposed by forty-seven members of Congress in September 2012, [10] though the recent "fiscal cliff" deal extended the credits for another year. Increased political or regulatory risk will result in developers requiring higher RECs prices in order to compensate for the potential losses because of discontinued political support. As political or regulatory risk increases, developers will require higher energy market revenues and REC prices to cover their costs.

Beyond the political and regulatory risks that a supplier must consider in whether to enter a market are the risks that a supplier faces when entering a nascent commodity market as opposed to a more established commodity market. Nascent markets are typically

[9] United States Department of Agriculture (USDA) Economic Research Service, Topic: Sugar and Sweeteners (http://www.ers.usda.gov/topics/crops/sugar-and-sweeteners-yearbook-tables.aspx). USDA FSA News Releases about historical sugar tariff rate quotas. (http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=ner&newstype=newsrel). The sugar import quota is technically a "tariff rate quota." That is, amounts under the quota limit pay a lower tariff rate, while those over the quota pay a higher tariff rate. Years referenced are USDA fiscal years.

[10] Joint letter from Rep. Mike Pompeo (R-Kansas) and House Republicans to the Honorable John Boehner, Speaker, U.S. House of Representatives, September 21, 2012.

characterized by lack of transparent and stable pricing. The mechanisms for determining the market price in nascent markets are typically through private discovery processes such as RFPs or bilateral negotiations. In contrast, more established markets will tend to have clearer price discovery processes, such as through published indices that make it easier for a supplier to determine the prices it might receive if it enters a market. In consequence, suppliers will demand a premium from new markets which lack the open information about prices available in more mature markets, resulting in higher prices.

Thus, depending on its situation, a supplier of RECs may have considerations other than its development cost including whether the facility is existing or still to be developed, financing costs, imposition of sourcing requirements or quotas, and premiums from regulatory risk and the newness of a market.

Q. What are the main determinants of the demand curve for RECs?

A. The demand curve for RECs is generally driven by state requirements that a fixed percentage of electric power sales consist of renewable energy or be covered by RECs. Absent other factors, discussed below, this tends to imply a fixed demand or vertical demand curve as illustrated in Attachment RE-5 for RECs produced in a given year.

Three considerations could change this picture. First, purchasers may spread their purchases of a given vintage of RECs over several years. For example, a utility that needs RECs for the year 2015 might purchase some of those RECs ahead of time in the years 2013 and 2014. In the absence of a supply shortage this tends to make the demand curve at any given moment less vertical as illustrated in Attachment RE-2. When there is

a supply shortage, however, REC purchasers may buy RECs prior to their vintage year in order to avoid higher prices or lack of ability to purchase those RECs later.

Second, banking of RECs allows RECs created in one year to be used in later years. The number of years RECs can be banked varies from state to state; ranges of three to five years are common. In Ohio, RECs can be banked for five years. There is some theoretical evidence that banking reduces price levels and volatility. For a market for a new product, however, banking may tend to increase prices in early years if purchasers buy and bank RECs in the first years because of concerns about shortages in later years.

A third factor that influences the demand curve is the existence of a price cap or an alternative compliance payment ("ACP") that acts as a "safety valve" or price cap on REC prices by allowing a utility to pay the ACP in lieu of purchasing RECs.[11] Suppliers with costs greater than the ACP will stay out of the market because buyers will pay the ACP rather than purchasing RECs from those suppliers. Attachment RE-6 shows that if the ACP is below the market clearing price, then the quantity supplied by the market is lower than it would be without an ACP. In contrast, without an ACP, the price rises to the point where supply and demand intersect, resulting in a higher price (corresponding to the situation in Ohio). Absent unusual circumstances, market prices will not go above the ACP.

[11] The assumption is that the utility would be able to recover the ACP from ratepayers. See Exeter Report, p. 30.

Q. Are there other factors that are important to the determination of the price of RECs in a competitive market?

A. Yes. In situations when there is scarcity of supply, prices can greatly exceed the cost of production. As Attachment RE-7 illustrates, when there is scarcity, the supply curve becomes vertical and intersects the demand curve at a price higher than the supply cost. Scarcity of supply can often happen in nascent markets when there is a sudden increase in demand without matching supply available as happened in the Ohio In-State All Renewables RECs market in 2009 and 2010.

Q. Do you agree with the Exeter Report that based on costs of renewable energy development in Ohio, the prices for In-State All Renewables RECs could not reasonably be very different from REC prices elsewhere in the country?

A. No. As discussed above, REC prices depend on the supply and demand balance. A report done for NARUC by Exeter and other consultants in September 2011 seems to show a negative supply balance for Ohio In-State All Renewables Requirements for 2009 and a slightly positive supply balance for 2010.[12] Moreover, Navigant Consulting confirmed that the In-State All Renewables market was tight in 2009 and 2010.[13] As a result, the pricing dynamic illustrated in Attachment RE-7 would come into play. Because of the shortage at quantity Q*, the supply curve becomes vertical. If the market clears where the (now vertical) supply curve hits the demand curve, there is a scarcity

[12] "Alternative Energy Resource Market Assessment", NARUC, September 2011.
[13] "Navigant Consulting's Report on Request for Proposals Conducted for Ohio Edison Company, The Cleveland Electric Illuminating Company, and Toledo Edison Company ("FirstEnergy") To Supply Renewable Energy Credits in Compliance with Applicable Ohio Rules and Regulations for Renewable Energy Benchmark Requirements", August 21, 2009, p. 12, EA Set 3-INT-3 Attachment 1-Confidential.

rent, as shown in the figure. As a result, the market price is above the cost of supply. Furthermore, as discussed above, the on-going financial crisis in 2009 greatly affected development costs. The inability to receive financing at all, or only at a very high or prohibitive cost, drove up supplier development costs and limited entry. Because there was less supply from existing facilities in Ohio relative to most other states, the effect of the increase in development costs disproportionately affected Ohio more adversely than other states.[14] With such an uncertainty of development, as the percentage requirements for the RPS went up in future years, the prices for RECs could have very well continued to go up if the market did not expand. Indeed, the relative lack of federal grants to develop renewable energy in Ohio by July 2010 (as noted, only two-tenths of a percent) illustrates the difference between the supply situation in Ohio compared with elsewhere in the U.S.

IV. MARKET PRICE OF RECS AND DEVELOPER COSTS

Q. Does the market price of RECs approximate the additional revenue required by project owners for the development of eligible renewable projects?

A. Not necessarily. In theory, this could be true under certain conditions including equilibrium, *i.e.*, the exact matching of long-run supply and demand. Markets, however, are thrown out of equilibrium due to shocks (or large changes) to demand or supply. In particular, new markets, such as the In-State All Renewables RECs market in Ohio in 2009 and 2010, are almost by definition in a state of disequilibrium. For new markets,

[14] Of the jurisdictions that currently have renewable portfolio standards, Ohio produced less renewable power as a percentage of total power production in 2010 than all jurisdictions except for the District of Columbia. Ohio produced less renewable power in 2010 than all jurisdictions except for Delaware, the District of Columbia, New Jersey, Rhode Island, and Hawaii. Moreover, Ohio had less renewable capacity in 2010 than all jurisdictions but Delaware, the District of Columbia, New Jersey, and Rhode Island.

suppliers are in the process of attempting to meet new demand and understand the dynamics of the new market. In Ohio in 2009 and 2010, demand was new and supply was struggling to catch up with the new demand. The expectation that such a new market would immediately reflect long-run market equilibrium conditions is mistaken.

Indeed, as discussed above, under conditions of shortage such as appear to have occurred in Ohio in 2009 and 2010, prices would be expected to rise well above the additional revenue required by project owners for the development of eligible renewable projects.

On the other hand, prices can fall well below the additional revenue required by project owners for the development of eligible renewable projects. When existing supply is greater than demand, existing suppliers take into account their short-run marginal costs such as fuel and operating expenses, rather than long-run costs such as already incurred capital costs in determining what they might charge for RECs. As discussed above, a hypothetical biomass facility that was already built with a marginal operating cost of $44.30/MWh would only need a REC price of $3.30 if the electric power price was $41.00. Or, an existing wind facility with short-run marginal costs close to zero would be willing to sell RECs for any price above zero as long as the price for power it received was above zero.[15]

As a result, prices in REC markets, just as in other capital intensive markets, can fluctuate widely. Depending on the conditions, REC prices could potentially vary from well above development costs to prices well below development costs resulting in volatile REC

[15] Over the very short run, owners of renewable generation might ignore debt-service costs in considering the price at which they are willing to sell RECs. This situation is not sustainable over a longer period because, as a general matter, debt must be serviced in order for an entity to continue to be viable.

prices. For example, prices for Texas RECs fell by fifty to sixty-six percent from January 2005 to July 2006. Prices in the New Jersey SREC markets have shown great volatility as well with the vintage 2012 SREC having fallen by almost ninety percent from January 2011 to November 2012 as illustrated in Attachment RE-8.[16] Similarly, prices in Ohio for All-State All Renewables RECs have shown great variation since their inception. The idea that at any given time the price of RECs should equal the additional revenue required by project owners for the development of eligible renewable projects is demonstrably incorrect.

Q. Do you agree with the Exeter Report that the decline in the market price for In-State All Renewables RECs was knowable (albeit without certainty) and therefore the FirstEnergy Ohio utilities should have necessarily delayed some of its purchases of In-State All Renewables RECs?

A. No. The Exeter Report appears to base its claim on the knowability of the decline in REC prices based on the experience in other states.[17] However, as discussed below, the situation in Ohio In-State All Renewables RECs was different from the situation for RECs in other states. Moreover, what the Exeter Report seems to suggest is that the FirstEnergy Ohio utilities could have "timed the market" and out-guessed suppliers as to their intentions and ability to enter the market. As a general matter, efforts to time markets are speculative, and hence suggesting that the FirstEnergy Ohio utilities take a position as to when the price in the In-State All Renewables REC markets might decrease

[16] The prices in Attachment RE-8 and other Attachments to this testimony are the SNL RECs Index prices published by SNL Energy. SNL gathers information from a variety of sources and the data do not necessarily represent completed trades.
[17] Exeter Report, p. 32, 33.

is equivalent to proposing that the FirstEnergy Ohio utilities should have, based on what is known after the fact, engaged in speculation in its efforts to comply with a statutory mandate. But at the time of the RFPs in question, the exact amount and timing of future investment in renewables in Ohio was unknowable. It is not reasonable to suggest that the FirstEnergy Ohio utilities could have known that prices in In-State All Renewables RECs would have declined in time to meet their requirements at a lower cost and therefore the FirstEnergy Ohio utilities should have necessarily delayed some of its purchases of In-State All Renewables RECs.

V. COMPARISON OF OHIO REC PRICES TO PRICES ELSEWHERE

Q. Under what conditions can one compare market prices in one area with market prices in another?

A. For the same product, one would expect that, under the same supply and demand conditions, prices in one market would be expected to be close to those in another. In particular, when it is possible to trade a good between markets, then one would expect the "law of one price" to hold, *i.e.*, the price paid for the same good should be the same everywhere.

Q. Were there significant differences in the supply-demand dynamic in Ohio for In-State All Renewables RECs than for the supply of RECs elsewhere that would make comparisons in prices problematic?

A. Yes. There were several differences including some relating to the important determinants of REC prices. First, as noted, the in-state requirement for RECs is equivalent to the imposition of a quota. Few states had such requirements and those that

did had other significant differences from Ohio. Second, as a newer market, Ohio REC prices would have been more likely subject to a higher premium than other REC markets. Third, financing in Ohio for renewables in 2009 and 2010 was problematic. This constricted new supply that was necessary to meet RPS requirements. As a newer market, these difficulties weighed more heavily on Ohio. Fourth, compared to a number of other markets, Ohio did not have an ACP mechanism that would act as a limit on REC prices.

Q. Please describe the significance of the in-state requirement or quota.

A. A basic application of the economics of import quotas suggests that Ohio's In-State All Renewables requirement means the average price paid for In-State All Renewables RECs will be higher than what it would be otherwise. Even in the example of the U.S. sugar market, a relatively mature and transparent market, the U.S. sugar quota resulted in higher prices than there would be otherwise. The U.S. price for sugar was about fifty-four percent higher than the world price.

Even under better market conditions in Ohio, In-State renewables cost much more than All-State renewables. Attachment RE-9 shows that from January to June 2012, the price for 2011 vintage In-State All Renewables RECs was 118 to 900 percent more than the price of 2011 vintage All-State All Renewables RECs. Similarly, the price premium for 2012 vintage All-State All Renewables RECs continued to be substantial varying from thirty-one to eighty-nine percent. Attachment RE-10 shows similar high market premiums from January 2012 to November 2012 for Ohio In-State SRECs over All-State SRECs, with the 2012 vintage In-State SRECs costing 2.8 to 5.9 times the cost of the All-

State SRECs. Indeed, except for the In-State SRECs for the District of Columbia during the first half of 2011, the price for 2010-2013 vintage In-State SRECs exceeded that of every regional SREC for which data was available for the period of January 2011 through November 2012. Attachment RE-11 shows the prices for In-State SRECs (except for the District of Columbia vintage 2011) in red, the prices for regional SRECs in blue, and the price for the DC vintage 2011 SRECs (which are "In-State") in black. The blue, regional SREC prices are always below the red, In-State SREC prices. The DC vintage 2011 SREC prices during the first half of 2011 are an exception to regional SREC prices being lower than In-State SRECs. This picture changes dramatically, however, as the solar requirement in DC ramped up with the vintage 2011 SREC prices reaching over $300/MWh well above the prices for regional SRECs as well as most In-State SREC prices.

The Exeter Report compares "tier one" REC prices in twelve other jurisdictions to Ohio In-State All Renewables prices.[18] RPS programs often consist of various tiers in which renewables technologies considered to have similar effects are combined into one tier or class. Tier one RPS schedules are sometimes considered to be the most environmentally friendly or preferred category of renewables. Attachment RE-12 shows that except for one of the compared prices – those from Texas – none of those jurisdictions have in-state requirements for all renewables RECs.[19] Indeed, nationwide, only six states arguably have in-state requirements; the rest either require delivery to the state or to the Regional Transmission Organization ("RTO") in which the state is located. RECs for

[18] Exeter Report, p. 26. The jurisdictions used as comparisons are Connecticut, Delaware, the District of Columbia, Illinois, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Texas.
[19] The jurisdictions used as comparisons in the Exeter Report are in bold on Attachment RE-12.

Pennsylvania, for instance, can come from anywhere in the PJM footprint. As a result, unlike Ohio, more expensive local resources in Pennsylvania would not set the price for that state's RECs. Therefore, the REC prices in the jurisdictions in Exeter's comparator group other than Texas are not comparable to those for Ohio In-State All Renewables RECs in 2009 and 2010.

In the case of Texas, there is not an explicit quota, but there are interconnection requirements. As an electrically isolated region this requirement effectively limits where Texas RECs can originate. The situation with Texas, however, is very different from that in Ohio. In 2010, Texas had 358 million MWh in retail electricity sales compared with 154 million in Ohio, over 2.3 times as much.[20] In that same year, Texas' renewable generation was 8.1 percent of the state's retail sales, while Ohio's renewable generation was 0.7 percent of its retail sales.[21] Moreover, Texas' technical potential for renewable generation is over ten times that in Ohio.[22] As a result, both the market for renewable energy and potential supply of renewable power in Texas were very different from those in Ohio, and REC prices in Texas are not comparable to Ohio In-State All Renewables REC prices in 2009 and 2010.

Q. Please describe how the RECs market in Ohio was nascent relative to other markets during 2009 and 2010 and how that would have affected the price for Ohio In-State All Renewables RECs.

[20] EIA, *State Electricity Profiles 2010*, January 2012, p. 216, 259.
[21] EIA, *State Renewable Electricity Profiles 2010*, March 2012, p. 105, 129.
[22] Lopez, Anthony, Billy Roberts, Donna Heimiller, Nate Blair, and Gian Porro, *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*, NREL/TP-6A2051946, July 2012.

A. As the Exeter Report notes, the RECs markets in Ohio in 2009 and 2010 were nascent.[23] Nascent commodity markets are typically characterized by lack of transparent and stable pricing. As discussed above, the mechanisms for determining the market price in nascent markets are typically through private discovery processes such as RFPs or bilateral negotiations. In contrast, more established commodity markets will tend to have clearer price discovery processes such as through published indices which make it easier for a supplier to determine the prices it might receive if it enters a market. As a result, suppliers will demand a premium from new markets which lack the open information about prices available in more mature markets.

Attachment RE-13 shows a summary of state RPS programs, including the year of authorizing legislation or regulation and the first compliance year for those states with mandatory RPS. The first compliance year or the year of initial legislation shows that compared with most other jurisdictions, the Ohio REC markets were less mature than others in 2009 and 2010. Of the twelve jurisdictions that the Exeter Report uses as comparators to Ohio, five jurisdictions had their first compliance year for tier one programs at least three years before 2009, the first compliance year in Ohio.[24] This means all of these jurisdictions had substantial live market experience with their RPS compared to the nascent Ohio markets in 2009 and 2010.[25] Of the remaining comparator states, five had their initial RPS legislation or regulation enacted at least three years before Ohio enacted its legislation in 2008, meaning that developers in these states had

[23] Exeter Report, p. 8.
[24] The jurisdictions used as comparisons in the Exeter Report are in bold on Attachment RE-13.
[25] Those states are Connecticut, Maryland, Massachusetts, New Jersey, and Texas.

substantial lead time to consider entering these markets.[26] The remaining two jurisdictions in Exeter's comparator group, Illinois and New Hampshire, had their initial legislation enacted in 2007 with first compliance years in 2008 and 2009, respectively. So even these two remaining states had more time for RECs market to develop by 2009 or 2010 than did Ohio, where the initial legislation was enacted less than one year before the first year compliance was first required. Beyond the extra time the comparator states had to develop markets in comparison to Ohio, as discussed above, developers in the comparator states, having started earlier than Ohio, faced a more favorable financing environment for renewables than those in Ohio did. Therefore, the Ohio In-State All Renewables REC prices in 2009 and 2010 are not comparable to the tier one prices in Exeter's selected jurisdictions.

The enacting legislation went into effect at the end of July 2008 and first compliance year in Ohio occurred in the 2009. It is therefore not surprising that there would likely be confusion during the 2009-2010 period among potential suppliers about the new rules for the new market and how they should be interpreted. Such confusion would have further contributed to reluctance to participate in the REC markets or to invest in its early stages.[27]

Moreover, the coverage given to the Ohio market in 2009 and 2010 by various reporting services is further indication of its lack of maturity compared to other markets. Mature, developed markets tend to be covered by reporting services and through the coverage, price transparency is developed. The Ohio RECs markets (including the In-state All

[26] These jurisdictions are Delaware, the District of Columbia, Maine, Pennsylvania, and Rhode Island.
[27] "Market Research Report Regarding Supplier Views on REC RFPs", Navigant Consulting, June 3, 2010, p. 6, EA Set 1-INT-3 Attachment 1-Confidential.

Renewables market) were not covered by Spectron in its "Spectrometer" broker sheets until the third quarter of 2010. In contrast, Spectron broker sheets did cover RECs for various PJM states such as New Jersey, the District of Columbia, Pennsylvania, Illinois, Maryland, and Delaware showing the bids and offers for RECs from those states. The Chicago Climate Futures Exchange ("CCFE"), established in 2004 and acquired by IntercontinentalExchange ("ICE") in 2010, listed RECs for Connecticut, Massachusetts, and New Jersey, as well as voluntary RECs. The CCFE did not list RECs for Ohio during its existence. ICE has continued to list the products listed by CCFE, but to date does not appear to have listed products for any Ohio RECs.

Therefore, the newness of the Ohio RECs markets in 2009 and 2010, compared to other markets, along with the lack of coverage of the Ohio markets, shows that the Ohio RECs markets were still in the early stages of development in 2009 and 2010. As a result, potential renewables developers would have looked on the Ohio market with caution and required a premium for entering the market. This resulted in In-State All Renewables REC prices in Ohio being higher than they would have been in other, more mature jurisdictions, making Ohio In-State All Renewables REC prices not comparable to those elsewhere.

Q. Please describe how financing for renewables generation in Ohio was restricted in 2009 and 2010 and constricted new supply.

A. As discussed earlier, financing was particularly difficult for new renewables projects in 2009 and 2010 at the time of the RFPs in question and because the Ohio market was relatively new, financing challenges would have been greater in Ohio than in most other

states. The global economic crisis starting in late 2007 made the financing of new projects more difficult. Even though the U.S. government instituted a grant program to address these difficulties, Ohio's share of that program by the end of July 2010 was very small, garnering only two-tenths of a percent of the available funding. Moreover, the newness of the RECs market in Ohio made the financing of Ohio-based renewables projects unattractive compared to renewables projects in other states having more mature RECs markets. Thus, the financing challenges and nascent nature of the Ohio market exacerbated the shortage in RECs that Ohio started with in 2009 and kept Ohio behind other jurisdictions.

Q. Please describe the significance of the lack of an ACP in Ohio.

A. As noted, an ACP can act as a safety valve or price cap on REC prices as illustrated in Attachment RE-6. The compliance payment in Ohio, however, was not recoverable by utilities. Therefore, the compliance payment in Ohio would not have acted as a price cap as noted in the Exeter Report because the burden of the compliance payment would fall upon utility shareholders.[28] Moreover, as I understand from counsel, payment of the compliance payment in Ohio would not have relieved the FirstEnergy Ohio utilities of the obligation to procure RECs. As a result, there was not an ACP that would have acted like a price cap in Ohio compared with other jurisdictions such as Delaware, Maine, Maryland, Massachusetts, New Jersey, and Rhode Island. In such jurisdictions, REC prices have been constrained by the ACP. In Ohio, however, the supply picture for Ohio In-State All Renewables was that of a shortage as discussed above. As a result, in the

[28] Exeter Report, p. iv.

absence of an ACP, it is natural that prices could reach very high levels well above supplier costs, as illustrated in Attachment RE-7. Therefore, for the foregoing reasons, comparing Ohio In-State All Renewables REC prices to REC prices in jurisdictions with an ACP is problematic.

Q. Are there any additional factors that suggest that it is problematic to compare Ohio In-State All Renewables REC prices with REC prices outside Ohio?

A. Yes. There are differences in product definitions across markets that make comparison across markets difficult as discussed in the Exeter Report.[29] For instance, coal mine methane is a qualifying Tier 1 source in Pennsylvania, but it is not in New Jersey, Connecticut, or Maryland. Moreover, transferability of the product from one jurisdiction to another is not always automatic or reciprocal. For instance, there are RECs from Illinois that are eligible for Pennsylvania, but not Ohio, while there are RECs from Pennsylvania that are eligible for Ohio, but not for Illinois. As a result, comparing prices across these jurisdictions without taking into account the lack of transferability is inappropriate.

Q. What do you conclude about the comparability in 2009 and 2010 of the prices of Ohio In-State All Renewables RECs to the prices for RECs elsewhere?

A. Ohio In-State All Renewables REC prices were not comparable to REC prices elsewhere during 2009 and 2010. As discussed above, the imposition of an import quota, the nascent nature of the market, the financing difficulties and constrained supply, the lack of an ACP, as well as the difference in the product definitions in other jurisdictions, result in

[29] Exeter Report, p.8.

incomparability. Therefore, the Exeter Report does not support its conclusion that prices paid by the FirstEnergy Ohio utilities for In-State All Renewables RECs in RFP1, RFP2, and RFP3 were unreasonable.

Q. Does this conclude your testimony?

A. Yes. I reserve the right to supplement, if necessary.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was delivered to the following persons by e-mail this 23d day of January, 2013:

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Summary: Testimony of Robert Earle electronically filed by MR. DAVID A KUTIK on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company