

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

The Electronic Application of Duke)
Energy Kentucky, Inc., for: 1) An)
Adjustment of the Electric Rates; 2)) Case No. 2019-00271
Approval of New Tariffs; 3) Approval of)
Accounting Practices to Establish)
Regulatory Assets and Liabilities; and 4))
All Other Required Approvals and Relief.)

DIRECT TESTIMONY OF

LANG W. REYNOLDS

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

September 3, 2019

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I. INTRODUCTION AND PURPOSE

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

2 A. My name is Lang W. Reynolds and my business address is 550 South Tryon,
3 Charlotte, North Carolina 28202.

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

5 A. I am employed by Duke Energy Carolinas, LLC (DEC) as Director Electrification
6 Strategy. DEC is a subsidiary of Duke Energy Corporation (Duke Energy) which
7 provides various services to Duke Energy Kentucky, Inc. (Duke Energy Kentucky
8 or Company) and other affiliated companies of Duke Energy.

9 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND**
10 **PROFESSIONAL EXPERIENCE.**

11 A. I hold a Bachelor of Arts from Swarthmore College and Masters of Business
12 Administration from the University of Colorado. I have been employed by Duke
13 Energy since July of 2015 and worked previously for Morgan Stanley. During my
14 time at Duke Energy I have worked within the Distributed Energy Technology
15 organization and also Duke Energy Renewables before assuming the role of
16 Electric Transportation Manager in January of 2017, Manager of Electric
17 Transportation in December of 2017, and Director of Electric Transportation in
18 March of 2019.

19 **Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES AS DIRECTOR**
20 **ELECTRIFICATION STRATEGY.**

21 A. My responsibility as Director of Electric Transportation has been to establish a
22 team at Duke Energy tasked with developing and implementing projects and

1 programs to facilitate broader adoption of electric transportation in a manner that
2 drives economic and utility customer benefits across all of our utility service
3 territories. Specifically, I oversee the design and implementation of Pilot Electric
4 Vehicle (EV) Programs for the various Duke Energy jurisdictions, including
5 Kentucky. Members of my team are located throughout Duke Energy's various
6 service territories.

7 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
8 **PUBLIC SERVICE COMMISSION?**

9 A. No.

10 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
11 **PROCEEDING?**

12 A. The purpose of my testimony is to describe the components of Duke Energy
13 Kentucky's proposal to implement Electric Vehicle/Transportation Pilot Programs
14 (EV Pilot or EV Pilot Programs) to facilitate early utility system planning and to
15 assist Duke Energy's customers and the broader public in the transition to an electric
16 transportation infrastructure. Specifically, I will provide details of each program,
17 including a program description, what the Company hopes to learn from the Pilot,
18 the benefits to customers, and the estimated cost for each program.

II. DISCUSSION

A. OVERVIEW OF EV PILOT

19 **Q. WHY IS DUKE ENERGY KENTUCKY PROPOSING AN EV PILOT**
20 **PROGRAM IN THIS CASE?**

21 A. Duke Energy Kentucky believes that the increasing adoption of electric

1 transportation will provide strong economic and utility customer benefits over the
2 long term. At the same time, new EVs are entering the market and strong year-over-
3 year sales growth continues nationwide, including in Kentucky. However, in order
4 for these benefits to be achieved, the utility must have the experience and
5 infrastructure in place to support such development and even encourage its use.
6 Duke Energy Kentucky's proposed EV Pilot Program will further the development
7 of EV infrastructure in Kentucky to join other states in meeting growing market
8 needs. This belief in fostering the development of EV for the benefit of customers is
9 supported by independent research as evidenced by MJ Bradley for the state of
10 Kentucky, included as Attachment LWR-1.

11 **Q. WILL ALL KENTUCKY CUSTOMERS BENEFIT FROM THE**
12 **ADVANCEMENT OF EV INFRASTRUCTURE AND EV ADOPTION?**

13 A. Yes.

14 **Q. PLEASE EXPLAIN.**

15 A. Significant state-wide financial benefits are possible from increased EV adoption
16 as shown in Attachment LWR-1. As incremental load is created through the
17 implementation of broader public and private EV charging facilities, a broader
18 base is created through which to spread utility costs. Thus, savings to all
19 customers are anticipated to result from increasing EV adoption due to
20 incremental net revenue received by selling electricity to charge EVs in excess of
21 any increases in costs of service related to the additional load. For example, as
22 demonstrated in Attachment LWR-1, growth to five percent light duty electric
23 vehicle fleet share provides cumulative net benefits of more than \$2.8 billion

1 state-wide by 2050 (\$100 million in the form of reduced electric bills and \$2.7
2 billion in the form of reduced annual vehicle operating costs for drivers). High
3 growth (95 percent fleet share) would provide more than \$23.2 billion in
4 cumulative net benefits state-wide by 2050 (\$1.6 billion to electric utility
5 customers and \$21.6 billion to Kentucky drivers).

6 Increasing the rate of EV adoption in Kentucky therefore is the pathway to
7 realize these significant potential benefits.

8 **Q. HOW WILL DUKE ENERGY KENTUCKY'S PROPOSED PILOT**
9 **ADVANCE THE PATHWAY TO THESE BENEFITS?**

10 A. Duke Energy Kentucky believes it has an opportunity and obligation to help
11 customers achieve these potential benefits associated with higher EV adoption by
12 investing in programs that deploy electric vehicle infrastructure and EV load
13 management methods in the near term. Additionally, the Pilot will provide the
14 Company with valuable EV charging information that will be utilized to help
15 Duke Energy Kentucky develop the appropriate infrastructure, programs and
16 other offerings to ensure future electric transportation development benefits all
17 customers. Duke Energy Kentucky has developed this Pilot Program to work in
18 conjunction with other incentives available through Kentucky's access to the
19 Kentucky Volkswagen Environmental Mitigation Trust Program, which I explain
20 later in my testimony.

1 **Q. PLEASE DESCRIBE THE CURRENT EV MARKET IN KENTUCKY**
2 **AND WHAT IS CHANGING IN THE MARKETPLACE.**

3 A. As of November 2018, there were 2,200 Plug-In Electric Vehicles registered in
4 Kentucky. Over 320 (15 percent) of those vehicles are registered in the Duke
5 Energy Kentucky service territory, with 120 purchased in 2018. Currently, the
6 market for public Direct Current Fast Charging (DCFC) in northern Kentucky is
7 limited, with only one public operator with one location. As the EV market
8 evolves, the Company anticipates accelerated deployment of EV technology and
9 the potential customer benefits of increased EV adoption in the Commonwealth of
10 Kentucky. A Duke Energy study shown in Attachment LWR-2 suggests that by
11 2030, nearly 35,000 EV's could be registered in the Duke Energy Kentucky
12 service territory. At this modest growth rate, Duke Energy Kentucky's northern
13 Kentucky service territory would need approximately 125 DCFC and 1500 Level
14 II (L2) workplace and public charging plugs to provide adequate EV
15 infrastructure support, according to the U.S. Department of Energy's EVI-Pro
16 Lite calculator. A high growth rate, 25 percent market share, would bring 175,000
17 EVs to the Duke Energy Kentucky service territory and require approximately
18 230 DCFC and over 5,000 L2 charging plugs to provide adequate support.

19 **Q. WHAT IS HAPPENING WITH RESPECT TO EV CHARGING IN THE**
20 **UNITED STATES THAT HAS RELEVANCE FOR KENTUCKY?**

21 A. In the United States, utilities are investing in EV charging infrastructure as new
22 vehicles enter the market and strong sales growth continues nationwide.
23 According to the Edison Electric Institute (EEI), as of October 2018, there were 1

1 million EV's in the United States. EEI estimates the next 1 million EV's will be
2 on the road by early 2021. The availability of charging infrastructure is
3 fundamental to that growth. EEI also notes that, as of September 2018, electric
4 utilities have received state regulatory approval for nearly \$1.1 billion for electric
5 transportation investments. These investments are primarily in EV charging
6 infrastructure deployment, but could also include charging infrastructure for other
7 applications such as medium to heavy duty trucks and buses.¹

8 With the anticipated growth in the EV market, the time is now to ensure the
9 infrastructure needed to support this growth is in place. To support these goals, Duke
10 Energy Kentucky needs to better understand the grid impacts of serving EV
11 charging equipment, customer charging behaviors, the viability of utility-managed
12 charging methods, and the various costs and benefits associated with different types
13 of electric vehicle charging.

14 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S ELECTRIC**
15 **TRANSPORTATION PILOT PROGRAM PROPOSAL IN THIS CASE.**

16 A. Duke Energy Kentucky is proposing a 36-month Electric Transportation Pilot
17 Program that consists of five distinct programs. The proposed programs are designed
18 to: 1) deploy a foundational level of fast charging infrastructure; 2) research the
19 effects of increasing adoption of different types of electric vehicles on the electric
20 system; 3) research customer EV charging behavior and; 4) ascertain the potential
21 benefits to the Commonwealth of Kentucky. The five programs are as follows:

¹ Edison Electric Institute, "*Electric Vehicles Sales Forecast and the Charging Infrastructure Required through 2030*," November 2018. Accessible through https://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20EV%20Forecast%20Report_No v2018.pdf

- 1 • EV Fast Charge Program;
- 2 • Electric Transit Bus Charging Program;
- 3 • Non-Road Electrification Incentive Program;
- 4 • Residential EV Charging Incentive Program; and
- 5 • Commercial EV Charging Incentive Program.

6 The EV Pilot is intended to provide both infrastructure for EV charging in
7 the Company's northern Kentucky service territory and modest incentives to assist
8 customers in investing in EV technologies. Duke Energy Kentucky's northern
9 Kentucky service territory is uniquely situated as both I-71 and I-75 converge in this
10 region, and it is adjacent to Cincinnati, Ohio, and southeastern Indiana. This
11 proximity to major interstates and multi-state transportation makes it an ideal
12 location to deploy an EV pilot and deliver the anticipated benefits to customers.

13 **Q. HOW DOES DUKE ENERGY KENTUCKY PROPOSE TO SHARE DATA**
14 **OBTAINED THROUGH THE PILOT WITH THE COMMISSION AND**
15 **OTHER STAKEHOLDERS?**

16 A. Aggregated data will be made available to the public (while protecting
17 confidential and private customer information) through annual reports submitted
18 to the Commission for the three-year Pilot period, following the start of the Pilot
19 Program. A final report will be filed with the Commission within 180 days after
20 conclusion of the Pilot.

1 Q. PLEASE GENERALLY DESCRIBE HOW DUKE ENERGY
2 KENTUCKY'S ELECTRIC TRANSPORTATION PILOT PROGRAM
3 PROPOSAL IS DIFFERENT FROM OTHER KENTUCKY UTILITY-
4 INITIATED EV PROGRAMS.

5 A. Duke Energy Kentucky is aware of the current programs offered by Louisville
6 Gas & Electric (LG&E) and the Kentucky Utilities (KU). LG&E and KU's
7 Electric Vehicle Program currently offers two non-residential options for Level 2
8 EV charging.² Option EVSE (Electric Vehicle Supply Equipment) enables the
9 utility to install, own, and maintain a level 2 charging station for a monthly
10 service fee that the customer pays over a 5-year agreement. Option EVC (Electric
11 Vehicle Charging) enables the utility to install, own, and maintain up to 20 level 2
12 charging stations where EV drivers pay to charge their vehicles.

13 Duke Energy Kentucky's EV Pilot will study additional segments of the EV
14 market by offering incentives for single family residential level 2 charging, transit
15 bus charging, various commercial level 2 installations, non-road electrification, and
16 DC fast charging. The Duke Energy Kentucky Pilot Program is comprised of both
17 incentives for private ownership and a limited opportunity for utility-ownership of
18 fast charging assets. These differences in pilot programs will provide new and
19 additional data to the Commission and utilities that can be used to further expedite
20 EV adoption in the Commonwealth of Kentucky.

²LG&E and KU electric vehicle charging. Accessible by <https://lge-ku.com/environmental/environment/alternate-fuels-road/ev/charging> and Kentucky Public Service Commission in Case Nos. 2018-00295 dated April 30, 2019, and 2015-00355, dated April 11, 2016.

1 Q. WHAT IS THE TOTAL COST OF THE EV PILOT?

2 A. The total cost of this EV Pilot is approximately \$2.834 million. Table 1 below
3 includes a breakdown of costs per program and a total EV Pilot cost. Duke
4 Energy Kentucky witness Sarah E. Lawler, discusses the recovery of these costs
5 as part of this case in her direct testimony.

Table 1. Duke Energy Kentucky Electric Transportation Pilot Summary			
Program	Incentive Style	Units and Cost	Total Budget
EV Fast Charging	Company-Owned	5 locations \$200,000 per location	\$1,000,000 Capital \$17,500 O&M
Electric Transit Bus Charging	Company-Owned	5 charging stations \$75,000 per unit	\$375,000 Capital \$17,500 O&M
Non-Road Electrification	Incentive	200 units \$1,550 Avg per unit	\$310,000 O&M
Residential EV Charging	Incentive	300 units \$1,063 per unit	\$318,900 O&M
Commercial EV Charging	Incentive	160 units \$2,500 per unit	\$400,000 O&M
Education, Outreach, Marketing, and Project Management	-		\$394,750 O&M
		CAPITAL	\$1,375,000
		O&M	\$1,458,650
		TOTAL	\$2,833,650

B. EV FAST CHARGING (DC FAST CHARGE) PROGRAM

1 **Q. PLEASE DESCRIBE THE PROPOSED EV FAST CHARGING**
2 **PROGRAM.**

3 A. Duke Energy Kentucky plans to install, own, and operate a network of up to 5 EV
4 Fast Charging locations, totaling 10 charging stations. The EV Fast Charging
5 locations include charging equipment with electrical demand requirements of 100
6 kW or greater. Each location will include a minimum of two Fast Charging
7 Electric Vehicle Supply Equipment (EVSE) capable of charging all mass-market
8 plug-in electric vehicles intended for use on public streets and highways.

9 In order to facilitate development of a competitive market, charging
10 services at company-operated stations will be available for public charging for a
11 “Fast Charge Fee” developed to be competitive with the statewide average price
12 for fast charging services at all publicly-available, open standard DC Fast
13 Charging locations. As further explained by Duke Energy Kentucky witness Jeff
14 L. Kern, the proposed Fast Charge Fee is composed of the Commission approved
15 tariff Rate DS 3-Phase secondary non-church cap energy charge per kWh plus all
16 applicable riders and adjustments for a proposed charge of \$0.333596 per kWh.
17 The Company will review and update as needed on a quarterly basis as this
18 amount may vary as Duke Energy Kentucky rider values and EV Fast Charge
19 utilization rates change. Updates will be made no more than one time per quarter.
20 Payment may be made by Smart Phone App, radio-frequency identification
21 (RFID) card, or by credit/debit card swipe at the site. The Fast Charge Fee is

1 intended to recover, at a minimum, the cost of electric service, transaction and
2 network service costs, and operational maintenance costs.

3 **Q. HOW WILL DUKE ENERGY KENTUCKY HANDLE ANY ADDITIONAL**
4 **NET REVENUE RECEIVED FROM THE FAST CHARGE FEES?**

5 A. Any additional net revenue received by the Company through the Fast Charge Fee
6 from the EV Fast Charging Program will be credited to customers through the
7 Company's Rider PSM as explained by Company witness Lawler. The net
8 revenues will be calculated by taking the Fast Charge Fee revenues paid by EV
9 drivers less station operational costs.

10 **Q. WHAT IS THE LENGTH OF THE TERM OF DUKE ENERGY**
11 **KENTUCKY'S PROPOSED EV FAST CHARGING PROGRAM?**

12 A. Duke Energy Kentucky is proposing ownership of all EV Fast Charging assets for
13 the life of the Fast Charging Hardware, following Commission approval. The
14 Company will ensure the network remains operational for the full useful life of
15 the Fast Charging hardware.

16 **Q. WHAT IS THE USEFUL LIFE OF THE FAST CHARGING**
17 **INFRASTRUCTURE?**

18 A. Based on independent third-party analysis³ and Duke Energy's experience, Duke
19 Energy Kentucky is currently projecting a ten (10) year useful life for the EV Fast
20 Charging infrastructure. The Company proposes to continue operating the DC
21 Fast Charging units for the life of each unit. This is to protect the units from being
22 a stranded asset if the site host is unable to maintain a Fast Charging unit.

³ <https://luskin.ucla.edu/sites/default/files/Non-Residential%20Charging%20Stations.pdf>

1 **Q. HOW WILL DUKE ENERGY KENTUCKY DETERMINE THE**
2 **PLACEMENT OF THE FAST CHARGING STATIONS?**

3 A. Duke Energy Kentucky will work with regional planning agencies, customers,
4 and other valuable stakeholders to determine the best location for fast charging
5 stations at key interstate and highway corridor locations throughout Duke Energy
6 Kentucky's service territory. The Company has initially collaborated with OKI
7 (Ohio, Kentucky, and Indiana Regional Council of Governments) to prioritize the
8 placement of DC Fast Charge stations by identifying locations that require
9 minimal electric facility expansion, are within one mile of a major highway or
10 interstate, have 24/7 public access with restrooms, appropriate site lighting, and
11 nearby retail and restaurant options. Attachment LWR-3 depicts a map of
12 potential EV Fast Charge locations that follow industry best practices. This will
13 enable intra- and inter-state electric vehicle travel and build driver confidence in
14 EV range. Charging services will be available to all electric vehicle owners that
15 travel through Duke Energy Kentucky's service territory. Please note that these
16 are not final locations. Final locations will be determined during the Site Host
17 Acquisition process.

18 **Q. PLEASE DESCRIBE WHAT DUKE ENERGY KENTUCKY EXPECTS TO**
19 **LEARN FROM THE EV FAST CHARGING PROGRAM?**

20 A. Duke Energy Kentucky expects to learn the following from the DC Fast Charging
21 Program:

- 1 • Amount, timing, and overall utilization patterns of EV charging from
- 2 DC Fast Charge stations on the Company’s distribution system
- 3 network;
- 4 • Geographic and seasonal patterns of utilization;
- 5 • The proportion of patrons using stations who live within Duke Energy
- 6 Kentucky’s service territory, the Commonwealth of Kentucky, and/or
- 7 out of state;
- 8 • Charging station reliability data;
- 9 • System impacts related to Fast Charging;
- 10 • Kentucky Light Duty EV sales percentage change during the Pilot
- 11 period; and
- 12 • Customer experience information obtained by periodic surveys
- 13 conducted by Duke Energy Kentucky.

C. ELECTRIC TRANSIT BUS CHARGING PROGRAM

14 **Q. PLEASE EXPLAIN THE ELECTRIC TRANSIT BUS PROGRAM.**

15 A. The purpose of this Pilot Program is to deploy EVSE, including charging stations,
16 for EV Transit Buses (EV Transit Bus) to support EV Transit Bus adoption while
17 collecting utilization data and other load characteristics to understand potential
18 grid and utility impacts. As part of this limited pilot, Duke Energy Kentucky is
19 proposing five (5) EV Transit bus charging infrastructure installations necessary
20 to power EV Transit Buses. Duke Energy Kentucky will retain ownership and
21 perform maintenance of EVSE for the duration of the Pilot, while EV Transit bus
22 operators shall be responsible for proper operation of the EVSE according to

1 manufacturer's guidelines. A participating customer will request a new service
2 with a dedicated meter for the EVSE. Upon request, Duke Energy Kentucky will
3 install EVSE on the customer's side of the Company's meter. Any usage will be
4 billed under the customer's existing commercial rate Rates DS, DP, DT, or TT as
5 discussed by Duke Energy Kentucky witness Kern, and other riders, if applicable,
6 for the billing demand and kilowatt-hours registered or computed by or from the
7 Company's metering facilities during the current month.

8 **Q. WHO WILL BE ELIGIBLE FOR THE ELECTRIC TRANSIT BUS**
9 **CHARGING PROGRAM?**

10 A. Participation will be available on a first-come-first-served basis to non-residential
11 customers receiving electric service from Duke Energy Kentucky. Participants
12 must operate a commercial transit bus system utilizing one or more EV Transit
13 Buses, including but not limited to transit agencies, universities, airports, and non-
14 profit/municipal entities. Company-sponsored infrastructure support is available
15 for no more than 5 total charging stations. There is a two (2) charging station limit
16 per customer to support a single or multiple transit systems.

17 **Q. WILL PARTICIPANTS BE SUBJECT TO ADDITIONAL TERMS AND**
18 **CONDITIONS?**

19 A. Yes. Participants must allow Duke Energy Kentucky to install, own, and operate
20 EV Supply Equipment at the customer site and measure customer's electrical
21 charging characteristic on an individual or collective basis and to obtain any other
22 data necessary to determine the operating characteristics of the customer's use of
23 electricity. Duke Energy Kentucky is currently projecting a ten (10) year useful

1 life for the Transit Bus Charging hardware. The Company proposes to continue
2 operating the Transit Bus Charging units for the life of each unit. Prior to
3 participation, the customer and Duke Energy Kentucky will execute an Electric
4 Vehicle Transit Bus Supply Equipment Site Agreement to establish the terms and
5 conditions of the installation.

6 **Q. PLEASE DESCRIBE WHAT DUKE ENERGY KENTUCKY EXPECTS TO**
7 **LEARN FROM THE ELECTRIC TRANSIT BUS CHARGING**
8 **PROGRAM?**

9 A. Duke Energy Kentucky expects to learn the following from the Electric Transit
10 Bus Program:

- 11 • Electricity consumption and customer charging behavior for EV
12 Transit Buses;
- 13 • System impacts of EV Transit Bus charging;
- 14 • Customer operational savings associated EV Transit Bus deployment;
- 15 • Customer (participant) costs of EV Transit Bus deployment;
- 16 • Customer (participant) benefits of EV Transit Bus deployment;
- 17 • Utility system costs and benefits of EV Transit Bus deployment;
- 18 • EV Transit Bus reliability statistics; and
- 19 • Customer and passenger experience information.

D. NON-ROAD ELECTRIFICATION INCENTIVE PROGRAM

1 **Q. PLEASE EXPLAIN THE NON-ROAD ELECTRIFICATION INCENTIVE**
2 **PROGRAM.**

3 A. The purpose of this Pilot Program is to deploy non-road electrified forklifts,
4 electric truck refrigeration standby units, airport ground service equipment, and
5 airport ground power unit equipment to collect utilization data and other load
6 characteristics to understand potential grid and utility impacts. Duke Energy
7 Kentucky is proposing to create a mechanism to provide funding for incentives
8 for up to (45) electric fork trucks at \$1,500 each; (45) electric standby truck
9 refrigeration (eTRU) units at \$1,500 each; (100) airport ground service equipment
10 (GSE) at \$1,000 each; and (5) airport ground power units (GPU) at \$15,000 each.

11 **Q. WILL PARTICIPANTS BE SUBJECT TO ADDITIONAL TERMS AND**
12 **CONDITIONS?**

13 A. Yes. The Customer must either install a new meter or a data collection device for
14 the charging infrastructure for the electric vehicle charging station that will serve
15 the incentivized equipment. If a new meter is installed, the Customer must select
16 one of the following commercial rate Rates DS, DP, DT, or TT and any usage will
17 be billed thereunder with other applicable riders, for the Billing Demand and
18 kilowatt-hours registered or computed by or from the Company's metering
19 facilities during the current month. If the Customer chooses to install a data
20 collection device, such as the eGauge⁴, the device must be connected to the

⁴ <https://www.egauge.net/>

1 circuit(s) associated with the charging infrastructure EVSE that will serve the
2 incentivized equipment. The Customer must also allow Duke Energy Kentucky
3 access to the data collection device's web portal to collect utilization data. Duke
4 Energy Kentucky will use either data collection method to analyze load
5 characteristics and customer behavior in connection with the Non-Road Incentive
6 program. Upon acceptance of the customer's application and verification of
7 proper installation of all Non-Road incentivized equipment behind a separate
8 meter or monitored with a data collection device, the customer will receive a one-
9 time incentive per selected Non-Road equipment. This program shall end on and
10 after thirty-six (36) months following the initial effective date of the program,
11 unless renewed or extended by the Company.

12 **Q. WHO WILL BE ELIGIBLE FOR THE NON-ROAD ELECTRIFICATION**
13 **INCENTIVE PROGRAM?**

14 A. Applications will be considered on a first-come-first-served basis from the date
15 and time of submittal after Commission approval, up to 200 total customer
16 incentives. Customers will be limited to (5) fork truck, (5) eTRU, (15) GSE, and
17 (2) GPU incentives. Customers must prove purchase of or an official purchase
18 order of eligible non-road electrified equipment.

19 **Q. PLEASE DESCRIBE WHAT DUKE ENERGY KENTUCKY EXPECTS TO**
20 **LEARN FROM THE NON-ROAD ELECTRIFICATION INCENTIVE**
21 **PROGRAM?**

22 A. Duke Energy Kentucky expects to learn the following from the Residential EV
23 Charging Incentive Program:

- 1 • Number of incentives issued;
- 2 • Cost of non-road electrified equipment hardware and installation;
- 3 • Patterns of electricity consumption associated with different models
- 4 and types of non-road electrification equipment;
- 5 • Customer operational savings; and
- 6 • Emissions reduced.

E. RESIDENTIAL EV CHARGING INCENTIVE PROGRAM

7 **Q. PLEASE EXPLAIN THE RESIDENTIAL EV CHARGING INCENTIVE**
8 **PROGRAM.**

9 A. Duke Energy Kentucky proposes a budget of \$318,900 to identify and manage
10 residential EV charging behaviors for up to 300 eligible residential customers.
11 Customers will receive a \$500 incentive, upon verification of installation, for
12 purchasing and installing a Level II EVSE of their choice. A Level II EVSE is a
13 208/240V home charging station that can fully charge most EVs in half the time
14 of a standard Level I 120V EVSE. Customers will also be eligible to receive up to
15 an additional \$500 utility EV load-managed incentive, in the form of quarterly
16 payments of \$41.66 over the course of the 3 years, in exchange for participating in
17 load management events. Usage will be billed under the customer’s residential
18 rate. The Company will contract with a 3rd party vendor to collect usage
19 characteristics of EV charging behavior, better understand potential grid and
20 utility impacts from EV charging, and implement utility-managed charging.

21 The first year will gather “unmanaged charging” data to achieve a baseline
22 for comparison with “managed charging” events in years two and three. To

1 implement managed charging, each month the Company will set and
2 communicate defined time frames to avoid residential EV charging within 9AM
3 and 9PM. Defined time frames will be no longer than 3 hours. The customer is
4 then responsible to avoid charging their EV within the set time frames to be
5 eligible for the incentive. Participants can opt out of two (2) peak charging
6 sessions per month and still be eligible for the incentive.

7 **Q. WHO WILL BE ELIGIBLE FOR THE RESIDENTIAL EV CHARGING**
8 **INCENTIVE PROGRAM?**

9 A. Eligible customers must own, lease, or otherwise operate on a regular basis, one
10 or more plug-in EVs per installation. A plug-in vehicle includes plug-in hybrids
11 (PHEV) and battery electric vehicles (BEV). Customers must also prove purchase
12 and installation of eligible Level II EVSE at their residence. Applications will be
13 considered on a first-come-first-served basis from the date and time of submittal,
14 up to 200 total customers. Customers will be eligible for only one incentive per
15 residence. On-board vehicle charging communication is not eligible.

16 **Q. WILL PARTICIPANTS BE SUBJECT TO ADDITIONAL TERMS AND**
17 **CONDITIONS?**

18 A. Yes. Customers will register their EV and home charging schedule with the
19 Vendor. The \$41.67 quarterly payment is made up of three (3) \$13.89 monthly
20 incentives. Customers will not earn the monthly incentive if they opt out of 3 or
21 more events that given month. The opt out count will reset at the beginning of
22 each month.

1 **Q. PLEASE DESCRIBE WHAT DUKE ENERGY KENTUCKY EXPECTS TO**
2 **LEARN FROM THE RESIDENTIAL EV CHARGING INCENTIVE**
3 **PROGRAM?**

4 A. Duke Energy Kentucky expects to learn the following from the Residential EV
5 Charging Incentive Program:

- 6 • Number of load management incentives issued;
- 7 • Annual change in percentage of EV sales in Duke Energy Kentucky
8 service territory and Kentucky;
- 9 • Cost of residential EV Supply Equipment hardware and installation;
- 10 • Proportion of PHEV vs. BEV operated by Duke Energy Kentucky
11 customers;
- 12 • Amount and timing of electricity consumption for residential EV
13 charging (managed and non-managed);
- 14 • Patterns of electricity consumption associated with different models
15 and types of EVs;
- 16 • System impacts of residential EV charging, such as residential
17 transformers with more than one EV charging, number of distribution
18 upgrades that were needed and the power quality of EV-impacted
19 circuits and localized service feeds off a single transformer;
- 20 • Managed charging data; and
- 21 • Customer EV charging behaviors.

F. COMMERCIAL EV CHARGING INCENTIVE PROGRAM

1 **Q. PLEASE EXPLAIN THE COMMERCIAL EV CHARGING INCENTIVE**
2 **PROGRAM.**

3 A. Duke Energy Kentucky proposes a budget of \$400,000 to identify commercial EV
4 charging behaviors for up to 160 eligible commercial customers. Customers will
5 receive a \$2,500 incentive, upon verification of installation, for purchasing and
6 installing a Level II electric vehicle charging station of their choice. Incentive
7 allocations will be targeted at (50) for 24/7 publicly accessible units, (50) fleet
8 units, (30) private workplace units, and (30) multi-unit dwelling units.

9 **Q. WILL PARTICIPANTS BE SUBJECT TO ADDITIONAL TERMS AND**
10 **CONDITIONS?**

11 A. Yes. The Customer's charging station(s) shall be installed on Customer's side of a
12 new Company meter that will separately measure connected EVSE usage.
13 Customer must select one of the following rates listed above and any usage will
14 be billed thereunder with other applicable riders, for the Billing Demand and
15 kilowatt-hours registered or computed by or from Company's metering facilities
16 during the current month. Duke Energy Kentucky will analyze load
17 characteristics and customer behavior in connection with the EV charging
18 program. Upon acceptance of customer's application and verification of proper
19 installation of all EVSE behind a separate meter, the customer will receive a one-
20 time incentive for \$2,500 per EVSE. This program shall end on and after thirty-

1 six (36) months following the initial effective date of the program, unless renewed
2 or extended by the Company.

3 **Q. WHO WILL BE ELIGIBLE FOR THE COMMERCIAL EV CHARGING**
4 **INCENTIVE PROGRAM?**

5 A. Applications will be considered on a first-come-first-served basis from the date
6 and time of submittal with a maximum two (2) EVSE incentives per any one
7 customer location and ten (10) EVSE incentives per any one customer, for
8 customers receiving electric service from the Company. Eligible public locations
9 can be, but are not limited to city or government locations, street or curbside
10 parking, parking garages, retail, restaurant, and other locations accessible 24/7 to
11 the general public. Fleet customers, which includes public ride share companies,
12 applying for the incentive must show proof of ownership or lease of an electric
13 vehicle (PHEV or BEV) for each incentive given. All customers must prove
14 purchase and installation of eligible Level II EVSE. There will be a 10 percent
15 target for low-income commercial customers. There will be a 10 percent target
16 (16 units) for low-income commercial customers. Low-income areas will be
17 defined as neighborhoods where 50 percent of the neighborhood is at the 200
18 percent poverty level as defined by Federal Poverty Guidelines.⁵

⁵ United States Health and Human Services Poverty Guidelines for 2019. Accessed via
<https://aspe.hhs.gov/poverty-guidelines>

1 Q. PLEASE DESCRIBE WHAT DUKE ENERGY KENTUCKY HOPES TO
2 LEARN FROM THE COMMERCIAL EV CHARGING INCENTIVE
3 PROGRAM?

4 A. Duke Energy Kentucky expects to learn the following from the Commercial EV
5 Charging Incentive Program:

- 6 • Number of incentives issued;
- 7 • Change in percentage of state EV sales and percentage of EV
8 registrations in Duke Energy Kentucky's service territory;
- 9 • Selected rate summary and charging behaviors;
- 10 • Data regarding the geographic diversity of charging locations;
- 11 • Amount and timing of electricity consumption for commercial EV
12 charging;
- 13 • Comparison of commercial charging segments with residential and fast
14 charging; and
- 15 • System impacts of commercial EV charging

16 G. **MARKETING, EDUCATION, OUTREACH AND PROJECT**
17 **MANAGEMENT**

16 Q. ARE THERE ANY OTHER COSTS BEING PROPOSED IN THE PILOT?

17 A. Yes. Duke Energy Kentucky proposes to invest approximately \$85,970 towards
18 Marketing, Education & Outreach and \$308,780 in Project Management for a
19 total of \$394,750. Attachment LWR-4 illustrates the various marketing, education
20 & outreach components and costs associated with this investment.

H. RATES AND CUSTOMER PROTECTIONS

1 **Q. IS DUKE ENERGY KENTUCKY PROPOSING ANY NEW RATE**
2 **STRUCTURES TO ACCOMPANY ITS EV PILOT PROPOSAL?**

3 A. Not at this time. However, the Company is seeking Commission approval to
4 include the DCFC Fast Charging Fee under Rate DS 3-phase service. This rate is
5 what the Company will charge EV drivers who charge at the Fast Charging
6 stations.

7 **Q. WHAT TYPES OF CONSUMER PROTECTIONS DOES DUKE ENERGY**
8 **KENTUCKY PROPOSE TO BUILD INTO ITS PROGRAMS?**

9 A. The Company has multiple consumer protections in place. First, the proposal is
10 limited in time. The Pilot will cease after thirty-six (36) months, unless at that
11 time Duke Energy Kentucky proposes, subject to Commission authorization, to
12 continue, end, extend, or modify certain program elements based on data gathered
13 during the Pilot and the state of the marketplace at that time. Second, the Pilot is
14 limited in scope. The Company proposes to continue operating the Fast Charging
15 and Transit Bus Charging units for the life of each unit. This is to protect the units
16 from being a stranded asset if the site host is unable to maintain each Fast
17 Charging unit. Each program is limited to a number of participants necessary to
18 generate the data necessary to inform Duke Energy Kentucky on customer EV
19 behaviors. Finally, the Pilot is limited in costs. Total costs of the proposed pilot
20 are \$2.834 million (\$1.375 million in capital costs and \$1.459 million in O&M).

1 The Company is seeking recovery of a portion of the capital costs and a deferral
2 of certain O&M costs as discussed more fully in Ms. Lawler's testimony.

3 One hundred and eighty days after the conclusion of the Pilot, Duke
4 Energy Kentucky will file a report with the information discussed above. Before
5 or after the Pilot concludes, the Company may seek approval of newly developed
6 EV customer offerings or continuation of EV pilot programs. Furthermore, all
7 capital installations associated with the Pilot will be coordinated with other
8 Company planned work to improve efficiencies.

9 **Q. DOES DUKE ENERGY KENTUCKY BELIEVE A CERTIFICATE OF**
10 **PUBLIC CONVENIENCE AND NECESSITY (CPCN) IS REQUIRED FOR**
11 **THIS PROGRAM?**

12 A. Given the scope, cost, and nature of this Pilot, the Company does not think a
13 CPCN is required and that this Pilot meets the requirements to be considered an
14 ordinary extension of the existing system in the ordinary course of business.

15 **Q. PLEASE EXPLAIN.**

16 A. It is my understanding that Kentucky's regulations define what is considered an
17 ordinary extension through which a CPCN is not required. This includes
18 extensions that: 1) do not create wasteful duplication of plant, equipment,
19 property, or facilities; *or* 2) or conflict with the existing certificates or service of
20 other utilities operating in the same area and under the jurisdiction of the
21 commission that are in the general or contiguous area in which the utility renders
22 service; *and* 3) that do not involve sufficient capital outlay to materially affect the

1 existing financial condition of the utility involved; *or* 4) will not result in
2 increased charges to its customers.

3 Under the proposed Pilot, the Company is proposing to extend its existing
4 distribution facilities to support EV charging infrastructure that the Company does
5 not currently operate or maintain. This infrastructure will be located within the
6 Company's electric service territory, and thus will not conflict with any other
7 certificates of other utilities operating in the same area. Finally, the total estimated
8 capital costs for this Pilot are less than \$1.4 million. This is not a material outlay
9 that will affect the financial condition of the utility and given the actual revenue
10 requirement included in this case as part of the Pilot, will not materially impact
11 customer rates. Finally, even though this Pilot includes additional funding through
12 O&M that is necessary to operate and maintain the EVSE contemplated and
13 potential incentives, these costs will not be incurred until after the infrastructure is
14 constructed and any eligible incentives are paid. The Company is only seeking
15 deferral of these actual costs now, up to the proposed \$1.46 million budget, and
16 any actual expenses will be amortized in base rates in a future rate case. Thus,
17 there will be no impact to customers rates now, and any impact will be minimal in
18 the future as the Company will amortize those case over a reasonable period of
19 years.

20 **Q. WHAT IS THE KENTUCKY VOLKSWAGEN ENVIRONMENTAL**
21 **MITIGATION TRUST PROGRAM?**

22 A. The Kentucky Volkswagen Environmental Mitigation Trust Program is a
23 statewide program aimed to support the deployment of newer, cleaner alternatives

1 of vehicle transportation. The program is supported by Kentucky's \$20.3 million
2 portion of the Volkswagen Mitigation Trust Fund.⁶ Duke Energy Kentucky is
3 most interested in helping our customers pursue electric transit buses and any
4 other mode of electric transportation. In addition, Duke Energy Kentucky has
5 communicated with the Kentucky Energy and Environmental Cabinet, our
6 interested customers, and other state electric utilities to refine the development of
7 the Kentucky Beneficiary Mitigation Fund.

8 **Q. DOES DUKE ENERGY KENTUCKY PLAN ON APPLYING FOR FUNDS**
9 **FROM THE VW TRUST TO FUND THE PILOT, PLEASE EXPLAIN?**

10 A. Duke Energy Kentucky is able to support customer-submitted applications for the
11 purchase of electric transportation vehicles through the Kentucky Volkswagen
12 Mitigation Trust Fund (VW Trust). Furthermore, Duke Energy is watching the
13 Light Duty EVSE Infrastructure funding segment of the Beneficiary Mitigation
14 Fund as it develops and is considering a submission to recover any eligible Fast
15 Charging infrastructure costs. Any award received from the VW Trust will be
16 used to offset the amount of the deferral requested in this pilot within the Fast
17 Charging program. Budgeted amounts requested in this pilot do not include any
18 relief from the VW Trust.

⁶ Kentucky Volkswagen Mitigation Trust Program. Accessed by <https://eec.ky.gov/Pages/Volkswagen-Settlement.aspx>

I. OTHER DUKE ENERGY EV PROJECTS

1 **Q. HAS DUKE ENERGY PROPOSED EV PROGRAMS IN OTHER**
2 **JURISDICTIONS?**

3 A. Yes. Duke Energy Florida has an approved EV pilot in Florida⁷ and proposed EV
4 pilots in Duke Energy Carolinas in North Carolina⁸ and South Carolina.⁹
5 Similarly, Duke Energy Indiana has recently proposed an EV pilot program that is
6 very similar to what is being proposed in this case.¹⁰ Additionally, Duke Energy
7 subsidiaries have implemented smaller electric vehicle pilot programs in North
8 Carolina and Indiana service territories between 2012-2014.

9 **Q. HAVE STATE COMMISSIONS IN OTHER JURISDICTIONS**
10 **APPROVED DUKE ENERGY'S PROPOSALS?**

11 A. Yes. The Florida Utility Commission approved Duke Energy Florida's proposal
12 in Docket No. 20170783-EI. Duke Energy Carolinas has a proposal pending
13 before the North Carolina Utilities Commission in Docket Nos. E-2, Sub 1197
14 and E-7, Sub 1195, and before the South Carolina Public Service Commission in
15 Docket Nos. 2018-321-E and 2018-322-E.

16 **Q. ARE YOU AWARE OF OTHER UTILITY- SPONSORED EV**
17 **PROPOSALS IN OTHER JURISDICTIONS?**

18 A. Yes. Over \$1 billion of utility EV programs has been approved in the United
19 States since 2010. For example, in Washington, Puget Sound Energy has received
20 approval for a five-year plan to increase EV charging accessibility by owning and

⁷ Florida Public Service Commission Docket No. 20170783-EI

⁸ North Carolina Utilities Commission Docket Nos. E-2, Sub 1197 and E-7, Sub 1195

⁹ South Carolina Public Service Commission Docket Nos. 2018-321-E and 2018-322-E

¹⁰ Indiana Utility Regulatory Commission Cause No. 45253

1 operating eight (8) DC Fast Charging stations that include 32 charging units.
2 Puget Sound Energy is also helping customers install Level 2 charging stations for
3 commercial fleet and residential charging programs.¹¹ In Michigan, Consumers
4 Energy has received approval for PowerMiDrive, a three-year pilot program that
5 will provide incentives of up to \$5,000 to install up to 200 Level 2 public
6 chargers, as well as incentives of up to \$70,000 for up to 24 DC Fast-Charging
7 stations.¹² And, in Maryland, four electric utilities received approval for a
8 statewide electric vehicle portfolio consisting of residential, non-residential, and
9 public charging solutions. Many of these solutions included utility ownership of
10 EV Supply Equipment.¹³

11 Most recently, on May 14, 2019, Indiana Michigan Power Company
12 (I&M), an affiliate of the Kentucky Power Company, submitted a proposal for a
13 three-year, \$2.1 million pilot plan in Indiana to provide incentives for residential,
14 commercial, and industrial customers who own and install level 2 EV charging
15 stations. I&M also proposed a customer education and awareness program to
16 help make customers aware of their pilot program.¹⁴

¹¹ <https://www.utc.wa.gov/docs/Pages/DocketLookup.aspx?FilingID=180877>

¹² *In the Matter of the Application of Consumers Energy Company for Authority to Increase Its Rates for the Generation and Distribution of Electricity and for Other Relief*, Order, Case No. U-20134, Mich. Pub. Serv. Comm'n., issued Jan. 9, 2019, available at https://www.michigan.gov/mpsc/0,4639,7-159-16400_17280-487034--,00.html.

¹³ *In the Matter of the Petition of the Electric Vehicle Work Group for Implementation of a Statewide Electric Vehicle Portfolio*, Order No. 88997, Pub. Serv. Comm'n. of Md., issued Jan. 14, 2019, available at <https://www.psc.state.md.us/wp-content/uploads/Order-No.-88997-Case-No.-9478-EV-Portfolio-Order.pdf>.

¹⁴ Indiana Michigan Power Company. Pre-filed Verified Direct Testimony of Jeffrey W. Lehman. Cause No. 45235. Found at: <https://www.in.gov/oucc/2926.htm>

III. CONCLUSION

1 **Q. WERE ATTACHMENTS LWR-1 THROUGH 4 PREPARED OR**
2 **ASSEMBLED BY YOU OR UNDER YOUR SUPERVISION?**

3 **A. Yes, they were.**

4 **Q. DOES THIS CONCLUDE YOUR PREFILED DIRECT TESTIMONY?**

5 **A. Yes, it does.**

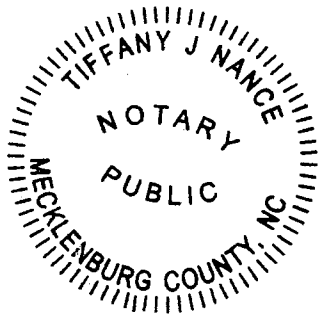
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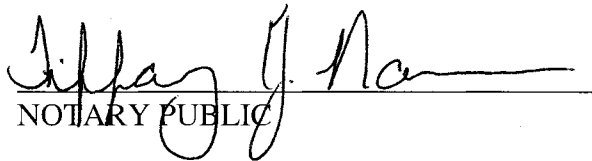
STATE OF NORTH CAROLINA)
) SS:
COUNTY OF MECKLENBURG)

The undersigned, Lang W. Reynolds, Director Electric Transportation, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.


Lang W. Reynolds Affiant

Subscribed and sworn to before me by Lang W. Reynolds on this 8 day of August, 2019.




NOTARY PUBLIC

My Commission Expires: February 1, 2023

Electric Vehicle Cost-Benefit Analysis

Plug-in Electric Vehicle Cost-Benefit Analysis: Kentucky



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About M.J. Bradley & Associates

M.J. Bradley & Associates, LLC (MJB&A), founded in 1994, is a strategic consulting firm focused on energy and environmental issues. The firm includes a multi-disciplinary team of experts with backgrounds in economics, law, engineering, and policy. The company works with private companies, public agencies, and non-profit organizations to understand and evaluate environmental regulations and policy, facilitate multi-stakeholder initiatives, shape business strategies, and deploy clean energy technologies.

Our multi-national client base includes electric and natural gas utilities, major transportation fleet operators, clean technology firms, environmental groups and government agencies.

We bring insights to executives, operating managers, and advocates. We help you find opportunity in environmental markets, anticipate and respond smartly to changes in administrative law and policy at federal and state levels. We emphasize both vision and implementation, and offer timely access to information along with ideas for using it to the best advantage.

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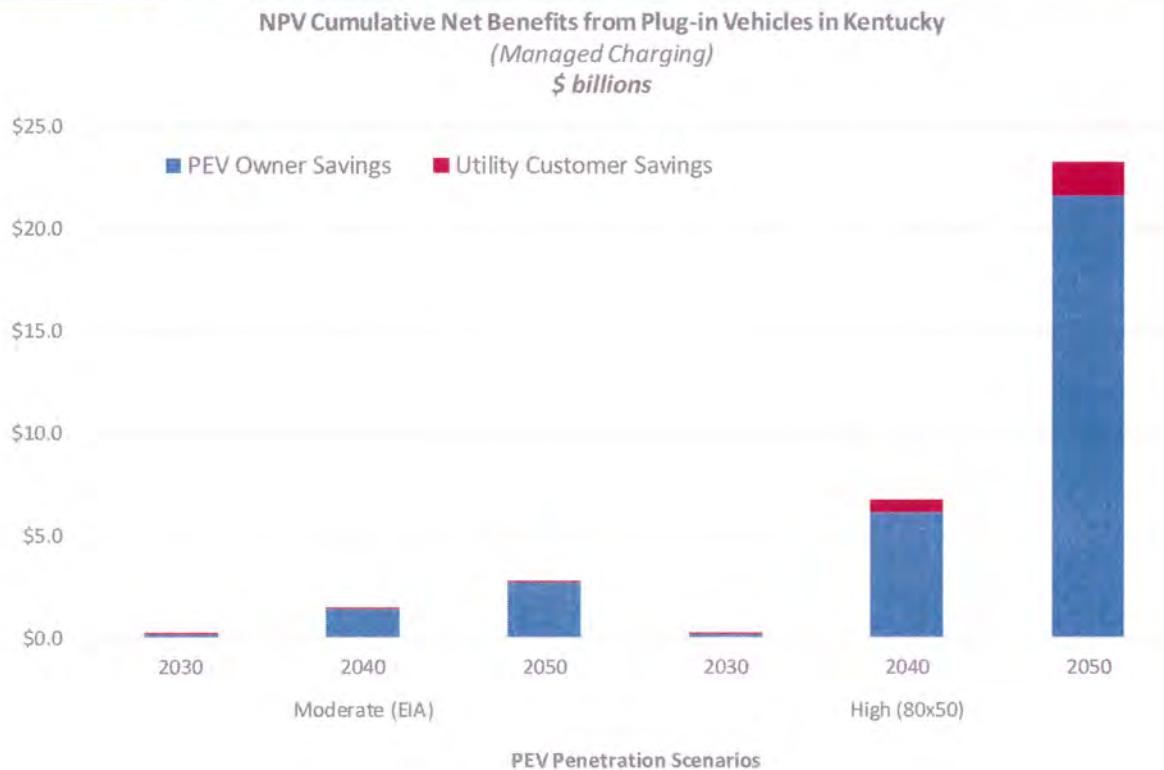
For questions or comments, please contact:

Dana Lowell
Senior Vice President
M.J. Bradley & Associates, LLC
+1 978 369 5533
dlowell@mjbradley.com

Executive Summary

This study estimated the costs and benefits of increased adoption of plug-in electric vehicles (PEVs) in the state of Kentucky. The study estimated the financial benefits that would accrue to all electric utility customers in Kentucky due to greater utilization of the electric grid during low load hours and resulting increased utility revenues from PEV charging. In addition, the study estimated the annual financial benefits to Kentucky drivers from owning PEVs—from fuel and maintenance cost savings compared to owning gasoline vehicles. The study also estimated reductions in gasoline consumption, and associated greenhouse gas (GHG) and nitrogen oxide (NOx) emission reductions from greater use of PEVs instead of gasoline vehicles.

Figure 1 NPV Cumulative Societal Net Benefits from KY PEVs



This study evaluated PEV costs and benefits for two distinct levels of PEV adoption – essentially a “business as usual” scenario of modest PEV penetration (EIA), and a much more aggressive scenario based on the PEV penetration that would be required to get the state onto a trajectory to reduce light-duty GHG emissions by 70 – 80 percent from current levels by 2050 (80x50). The levels of PEV penetration in the high 80x50 scenario are unlikely to be achieved without aggressive policy action at the state and local level, to incentivize individuals to purchase PEVs, and to support the necessary roll-out of PEV charging infrastructure.

As shown in Figure 1, if Kentucky PEV adoption follows the moderate trajectory currently assumed by the Energy Information Administration (EIA), the net present value of **cumulative net benefits from greater PEV use in the state will exceed \$2.8 billion state-wide by 2050.**¹ Of these total net benefits:

¹ Using a 3% discount rate

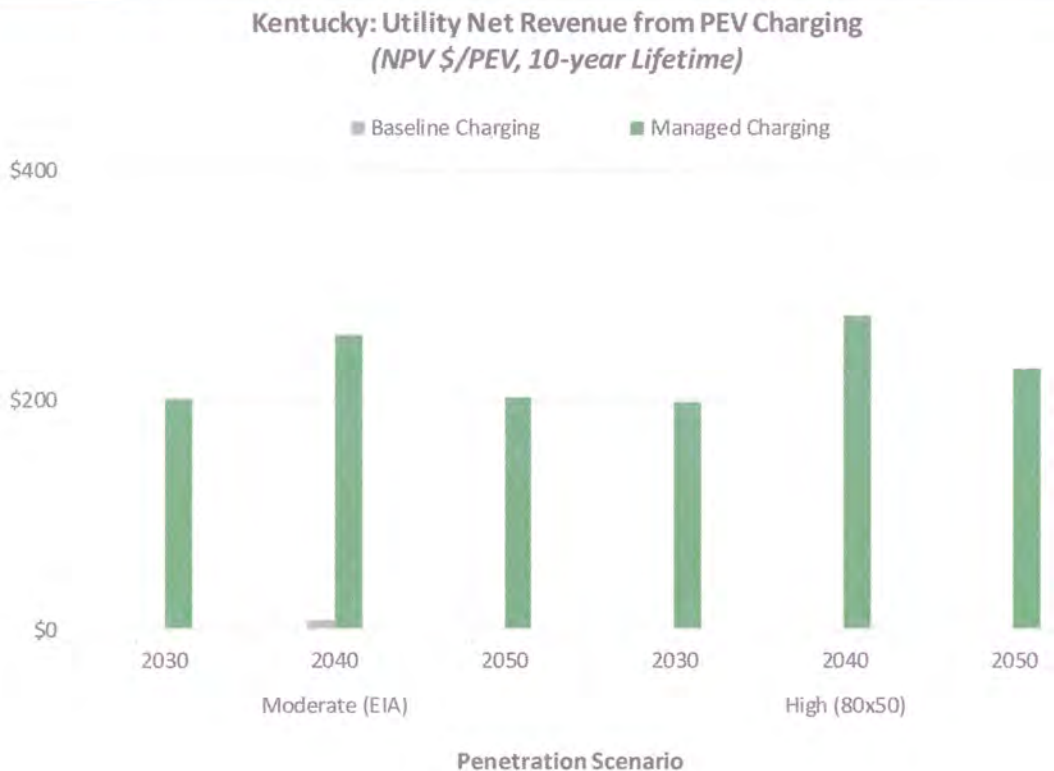
- \$0.1 billion will accrue to electric utility customers in the form of reduced electric bills, and
- \$2.7 billion will accrue directly to Kentucky drivers in the form of reduced annual vehicle operating costs.

Also shown in Figure 1, if PEV sales in Kentucky were high enough to get the state onto a trajectory to reduce light-duty GHG emissions by 70 – 80 percent from current levels by 2050 (80x50), the net present value of **cumulative net benefits from greater PEV use in Kentucky could exceed \$23.2 billion state-wide by 2050**. Of these total net benefits:

- \$1.6 billion would accrue to electric utility customers in the form of reduced electric bills, and
- \$21.6 billion would accrue directly to Kentucky drivers in the form of reduced annual vehicle operating costs.

Utility customer savings result from net revenue received by the state’s utilities, from selling electricity to charge PEVs. This net revenue is net of additional costs that would be incurred by utilities to secure additional generating capacity, and to upgrade distribution systems, to handle the incremental load from PEV charging. The NPV of projected life-time utility net revenue per PEV is shown in Figure 2. Assuming a ten-year life, the average PEV in Kentucky in 2030 is projected to increase utility net revenue by about \$199 over its life-time, if charging is managed. PEVs in service in 2050 are projected to increase utility net revenue on average by about \$214 over their life time (NPV) if charging is managed.

Figure 2 NPV of Projected Life-time Utility Net Revenue per PEV



In addition, by 2050 PEV owners are projected to save more than \$1,050 per vehicle (nominal \$) in annual operating costs, compared to owning gasoline vehicles. A large portion of this direct financial benefit to Kentucky drivers derives from reduced gasoline use—from purchase of lower cost, regionally produced electricity instead of gasoline imported to the state. Under the Moderate PEV (EIA) scenario,

PEVs will reduce cumulative gasoline use in the state by more than 0.8 billion gallons through 2050 – this cumulative gasoline savings grows to 9.9 billion gallons through 2050 under the high PEV (80x50) scenario. In 2050, annual average gasoline savings will be approximately 126 gallons per PEV under the Moderate PEV (EIA) scenario, while projected savings under the High PEV (80x50) scenario are nearly 165 gallons per PEV.

This projected gasoline savings will help to promote energy security and independence, and will keep more of vehicle owners' money in the local economy, thus generating even greater economic impact. Studies in other states have shown that the switch to PEVs can generate up to \$570,000 in additional economic impact for every million dollars of direct savings, resulting in up to 25 additional jobs in the local economy for every 1,000 PEVs in the fleet [1].

In addition, this reduction in gasoline use will reduce cumulative net GHG emissions by over 8.5 million metric tons² through 2050 under the moderate PEV scenario, and over 103 million metric tons under the high PEV scenario. The switch from gasoline vehicles to PEVs is also projected to reduce annual NOx emissions in the state by over 240 tons in 2050 under the moderate PEV (EIA) scenario, and by over 3,740 tons under the high PEV (80x50) scenario.

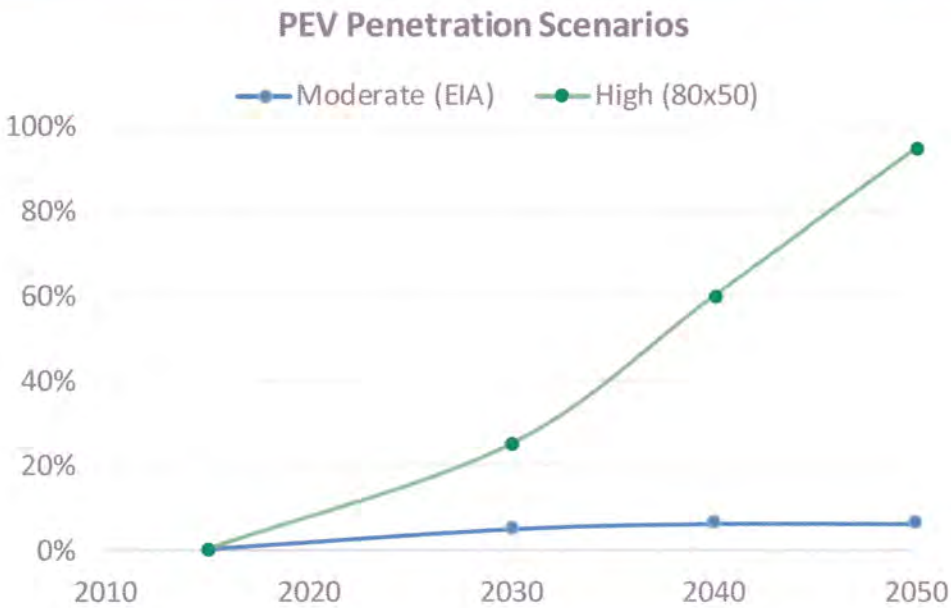
² Net of emissions from electricity generation

Study Results

This section summarizes the results of this study, including: the projected number of PEVs; electricity use and load from PEV charging; projected gasoline savings and GHG reductions compared to continued use of gasoline vehicles; financial benefits to utility customers from increased electricity sales; and projected financial benefits to Kentucky drivers compared to owning gasoline vehicles. All costs and financial benefits are presented as net present value (NPV), using a 3 percent discount rate.

Two different PEV penetration levels between 2030 and 2050 are utilized to estimate costs and benefits.³ The “Moderate PEV” scenario is based on current projections of annual PEV sales from the Energy Information Administration (EIA). The “High PEV” scenario is based on the level of PEV penetration that would be required to get onto a trajectory to reduce light-duty GHG emissions in the state by 70 - 80 percent from current levels by 2050. The moderate PEV (EIA) scenario is essentially a “business as usual” scenario that continues current trends. However, the significantly higher levels of PEV penetration in the high 80x50 scenario are unlikely to be achieved without additional aggressive policy action at the state and local level, to incentivize individuals to purchase PEVs, and to support the necessary roll-out of PEV charging infrastructure. See Figure 3 for a comparison of the two scenarios through 2050.

Figure 3 Comparison of PEV Penetration Scenarios



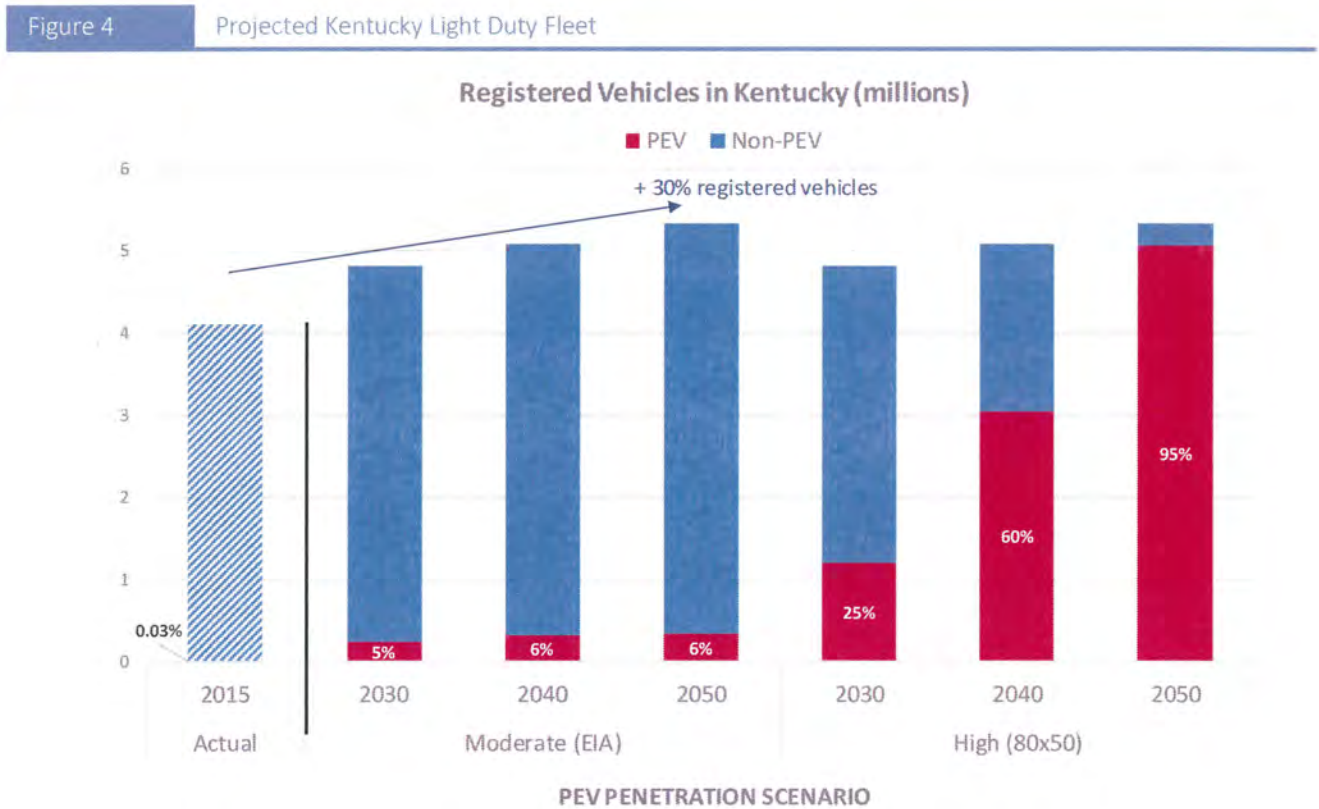
³ PEVs include battery-electric vehicles (BEV) and plug-in hybrid vehicles (PHEV). This study focused on passenger vehicles and trucks; there are opportunities for electrification of non-road equipment and heavy-duty trucks and buses, but evaluation of these applications was beyond the scope of this study.

Plug-in Electric Vehicles, Electricity Use, and Charging Load

Vehicles and Miles Traveled

The projected number of PEVs and conventional gasoline vehicles in the Kentucky light duty fleet⁴ under each PEV penetration scenario is shown in Figure 4, and the projected annual miles driven by these vehicles is shown in Figure 5. Under the Moderate PEV (EIA) scenario, the number of PEVs registered in Kentucky would increase from approximately 1,400 today to 236,000 in 2030, 314,500 in 2040, and 330,700 in 2050. Under the High PEV (80x50) scenario there would be 1.2 million PEVs in Kentucky by 2030, rising to 3.0 million in 2040, and 5.0 million in 2050. This equates to 25 percent of in-use light duty vehicles in Kentucky in 2030, rising to 60 percent in 2040 and 95 percent in 2050.⁵

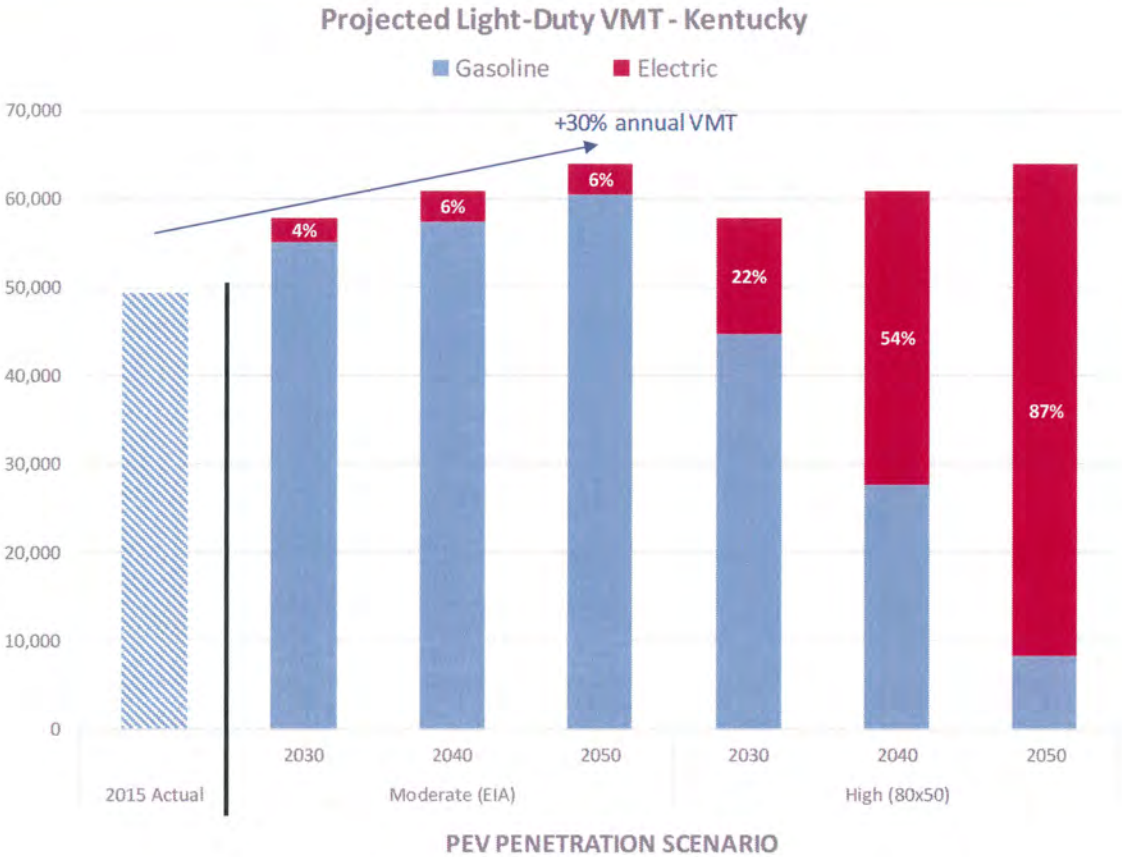
This analysis estimates that under the High PEV (80x50) scenario Kentucky will reduce light-duty fleet gasoline consumption in 2050 by 52 percent compared to a baseline with no PEVs, due to 87 percent of fleet miles being driven by PEVs on electricity (Figure 5). However, to achieve this level of electric miles, 95 percent of light-duty vehicles will be PEVs, including PHEVs (Figure 4).



⁴ This analysis only includes cars and light trucks. It does not include medium- or heavy-duty trucks and buses.

⁵ Note that under both PEV penetration scenarios the percentage of total VMT driven by PEVs on electricity each year is lower than the percentage of PEVs in the fleet. This is because PHEVs are assumed to have a “utility factor” less than one – i.e., due to range restrictions a PHEV cannot convert 100 percent of the miles driven annually by a baseline gasoline vehicle into miles powered by grid electricity. In this analysis PHEVs are assumed to have an average utility factor of 85 percent.

Figure 5 Projected Kentucky Light Duty Fleet Vehicle Miles Traveled (million miles)

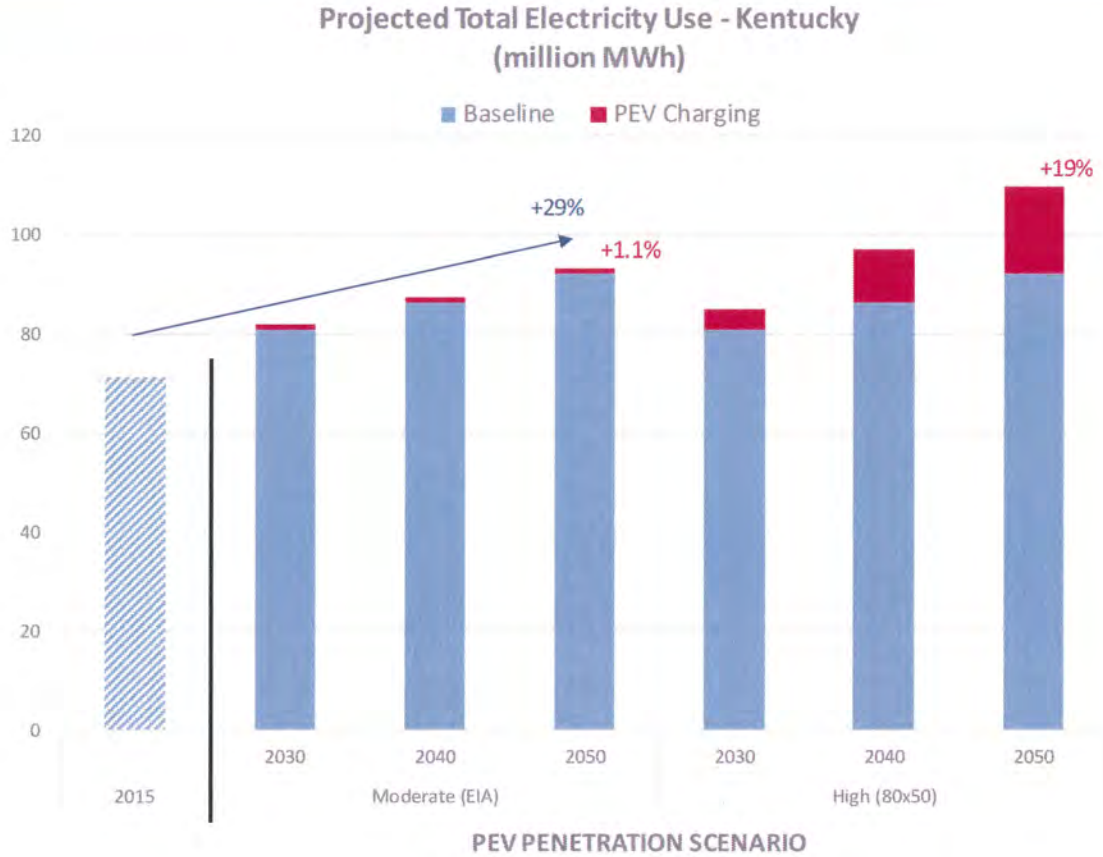


PEV Charging Electricity Use

The estimated total PEV charging electricity used in Kentucky each year under the PEV penetration scenarios is shown in Figure 6.

In Figure 6, projected baseline electricity use without PEVs is shown in blue and the estimated incremental electricity use for PEV charging is shown in red. State-wide electricity use in Kentucky is currently 71 million MWh per year. Annual electricity use is projected to increase to 81 million MWh in 2030 and continue to grow after that, reaching 92 million MWh in 2050 (29 percent greater than 2015 levels).

Figure 6 Estimated Total Electricity Use in Kentucky



Under the Moderate PEV penetration scenario, electricity used for PEV charging is projected to be 0.8 million MWh in 2030 – an increase of about 1.0 percent over baseline electricity use. By 2050, electricity for PEV charging is projected to grow to 1.0 million MWh – an increase of 1.1 percent over baseline electricity use. Under the High PEV (80x50) scenario electricity used for PEV charging is projected to be 4.1 million MWh in 2030, growing to 17.5 million MWh and adding 19 percent to baseline electricity use in 2050.

PEV Charging Load

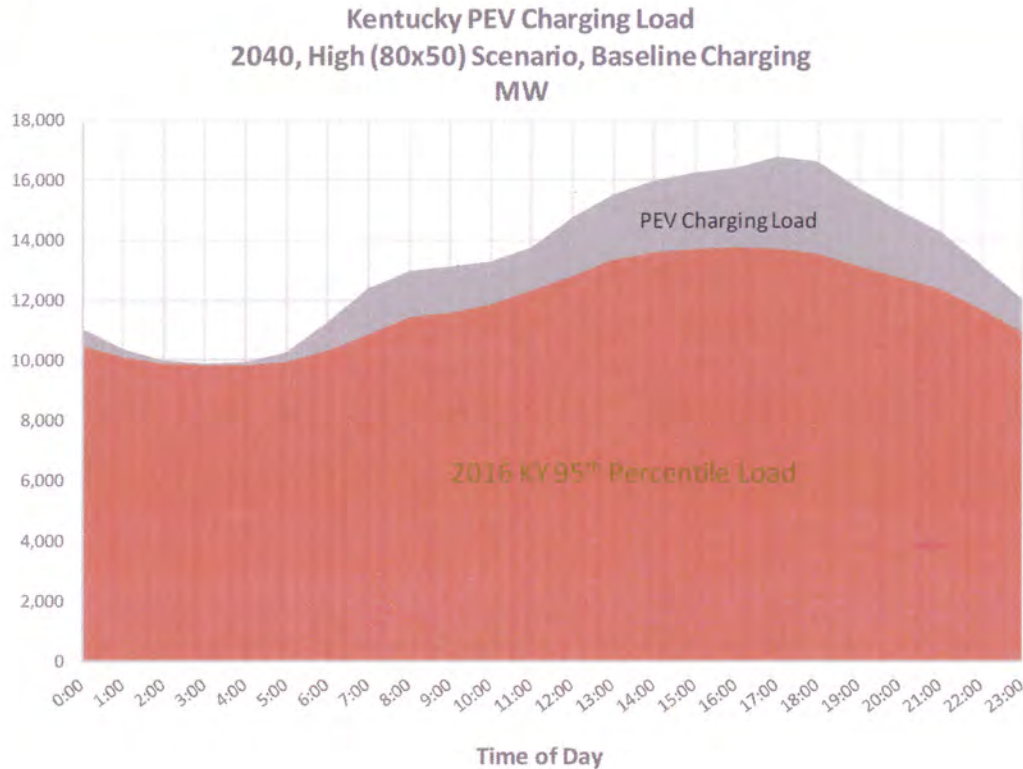
This analysis evaluated the effect of PEV charging on the Kentucky electric grid under two different charging scenarios. Under both scenarios 77 percent of all PEVs are assumed to charge exclusively at home and 23 percent are assumed to charge at locations other than at home (i.e. at work or at other “public” chargers). Under the baseline charging scenario all Kentucky drivers who charge at home are assumed to plug-in their vehicles and start charging as soon as they arrive at home each day, while under the managed charging scenario a significant portion of PEV owners are assumed to participate in a utility managed charging program to minimize PEV charging load in the late afternoon and early evening when other electricity demand is high.⁶

⁶ Utilities have many policy options to incentivize managed PEV charging. This analysis does not compare the efficacy of different options. For this analysis, managed charging is modeled as 85% of PEV owners that arrive home between noon and 11 pm delaying the start of charging until between Midnight and 2 am. This is only one of many managed charging program options that are available to utilities.

See Figure 7 (baseline) and Figure 8 (managed) for a comparison of PEV charging load under the baseline and managed charging scenarios, using the 2040 High (80x50) PEV penetration scenario as an example. In each of these figures the 2016 Kentucky 95th percentile load (MW)⁷ by time of day is plotted in orange, and the projected incremental load due to PEV charging is plotted in grey.

In 2016, daily electric load in Kentucky was generally less than 10,000 MW from midnight to 5 AM, ramping up to about 11,500 MW at 8 or 9 AM, and continuing to climb up to peak at approximately 13,700 MW between 3 PM and 5 PM, and then falling off through the evening hours.⁸

Figure 7 2040 Projected Kentucky PEV Charging Load, Baseline Charging (High PEV [80x50] scenario)

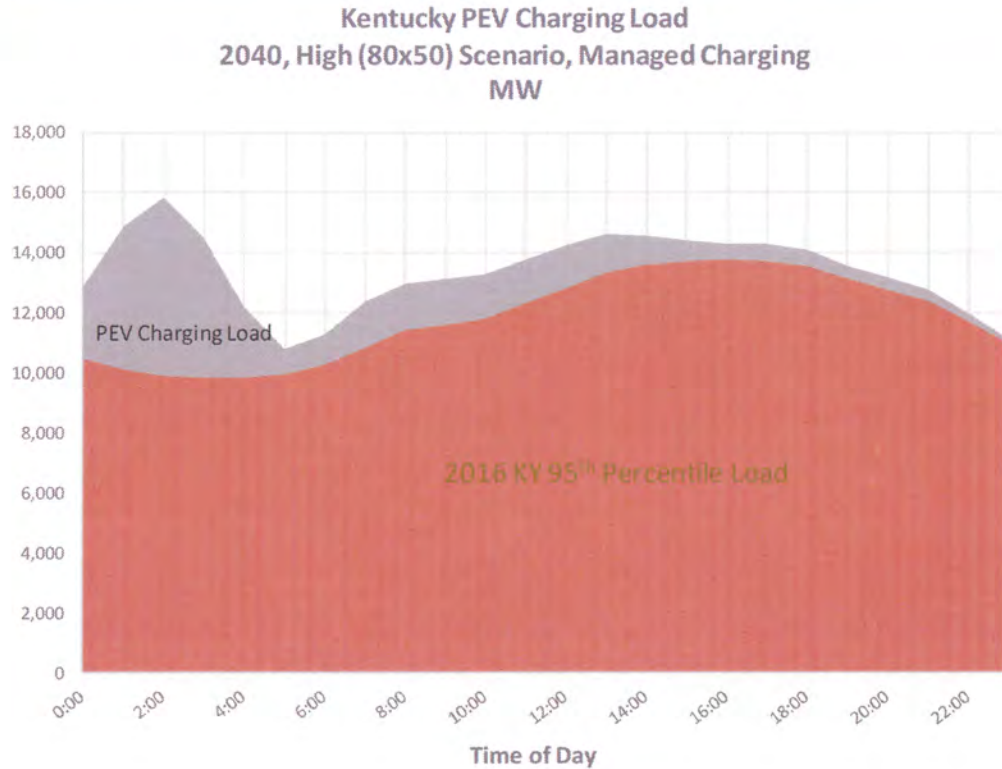


As shown in Figure 7, baseline PEV charging is projected to add load primarily between 8 AM and 8 PM, as some people charge at work early in the day, but most charge at home in the late afternoon and early evening. Under the baseline charging scenario, the PEV charging peak coincides with the existing summer afternoon peak load period between 3 PM and 5 PM.

⁷ For each hour of the day actual load in 2016 was higher than the value shown on only 5 percent of days (18 days).

⁸ In Figures 7 and 8, 95th Percentile Load is shown for the entire state of Kentucky across the entire year.

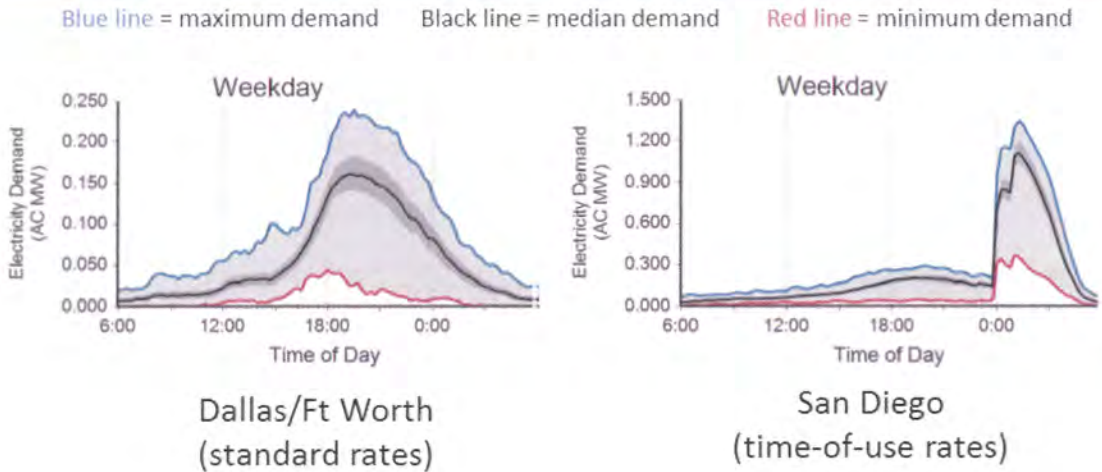
Figure 8 2040 Projected Kentucky PEV Charging Load, Managed Charging (High PEV [80x50] scenario)



As shown in Figure 8, managed charging significantly reduces the incremental PEV charging load during the summer afternoon peak load period, but creates a secondary peak in the early morning hours, between midnight and 4 AM. The shape of this early morning peak can potentially be controlled based on the design of managed charging incentives.

These baseline and managed load shapes are consistent with real world PEV charging data collected by the EV Project, as shown in Figure 9. In Figure 9 the graph on the left shows PEV charging load in the Dallas/Ft Worth area where no managed charging incentive was offered to drivers. The graph on the right shows PEV charging load in the San Diego region, where the local utility offered drivers a time-of-use rate with significantly lower costs (\$/kWh) for charging during the “super off-peak” period between midnight and 5 a.m. [2]

Figure 9 PEV Charging Load in Dallas/Ft Worth and San Diego areas, EV Project



See Table 1 for a summary of the projected incremental afternoon peak hour load (MW) in Kentucky, from PEV charging under each penetration and charging scenario. This table also includes a calculation of how much this incremental PEV charging load would add to the 2016 95th percentile peak hour load. Under the Moderate PEV (EIA) penetration scenario, PEV charging would add 241 MW of load during the afternoon peak load period on a typical weekday in 2030, which would increase the 2016 baseline peak load by about 1.8 percent. By 2050, the afternoon incremental PEV charging load would increase to 303 MW, adding 2.2 percent to the 2016 baseline afternoon peak. By comparison the afternoon peak hour PEV charging load in 2030 would be only 46 MW for the managed charging scenario, increasing to 60 MW in 2050.

Under the High PEV (80x50) penetration scenario, baseline PEV charging would increase the total 2016 afternoon peak electric load by about 38 percent in 2050, while managed charging would only increase it by about 7 percent.⁹

Table 1 Projected Incremental Afternoon Peak Hour PEV Charging Load (MW)

		Moderate PEV (EIA)			High PEV (80x50)		
		2030	2040	2050	2030	2040	2050
Baseline Charging	PEV Charging (MW)	241	288	303	1,102	3,108	5,172
	<i>Increase relative to 2016 Peak</i>	1.8%	2.1%	2.2%	8.0%	22.6%	37.6%
Managed Charging	PEV Charging (MW)	46	57	60	217	592	986
	<i>Increase relative to 2016 Peak</i>	0.3%	0.4%	0.4%	1.6%	4.3%	7.2%

⁹ Given projected significant increases in total state-wide electricity use through 2050, baseline peak load (without PEVs) is also likely to be higher in 2050 than 2016 peak load; as such the percentage increase in baseline peak load due to high levels of PEV penetration is likely to be lower than that shown in Table 1. The incremental costs of adding this peak capacity are accounted for in the analysis. As discussed below, even when accounting for these costs there are still net rate-payer benefits from high levels of PEV penetration. As the analysis shows, the net rate-payer benefits are higher with managed charging, because the cost of serving the incremental peak load is lower.

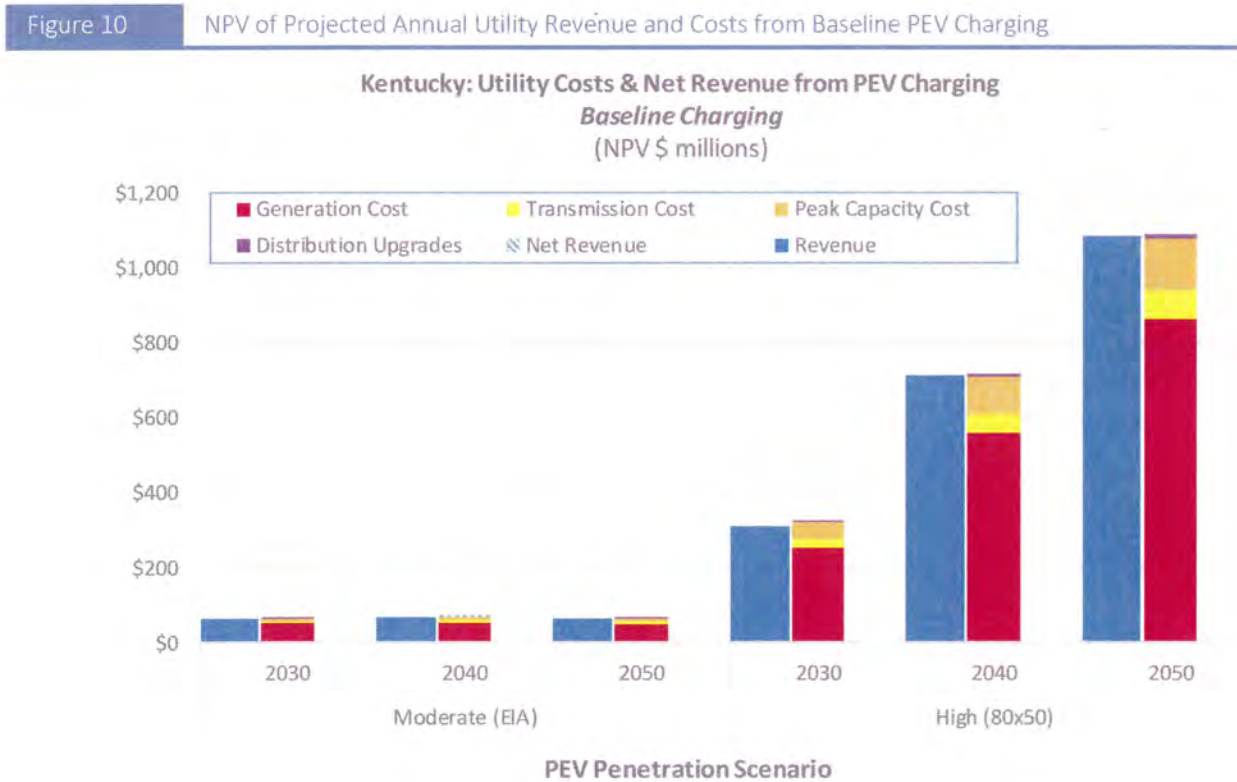
As discussed below, increased peak hour load increases a utility’s cost of providing electricity, and may result in the need to upgrade distribution infrastructure. As such, managed PEV charging can provide additional net benefits to all utility customers, by reducing the cost of providing electricity used to charge PEVs.

Utility Customer Benefits

The estimated NPV of annual revenues and costs in 2030, 2040, and 2050, for Kentucky’s electric utilities to supply electricity to charge PEVs under each penetration scenario are shown in Figure 10, assuming the baseline PEV charging scenario.

Under the Moderate PEV penetration scenario, the NPV of annual revenue from electricity sold for PEV charging in Kentucky is projected to total \$63 million in 2030 and in 2050. Under the High PEV (80x50) scenario, the NPV of annual utility revenue from PEV charging is projected to total \$309 million in 2030, rising to \$1.0 billion in 2050.

In Figure 10, projected annual utility revenue is shown in dark blue. The different elements of incremental annual cost that utilities would incur to purchase and deliver additional electricity to support PEV charging are shown in red (generation), yellow (transmission), orange (peak capacity), and purple (infrastructure upgrade cost). Generation and transmission costs are proportional to the total power (MWh) used for PEV charging, while peak capacity costs are proportional to the incremental peak load (MW) imposed by PEV charging. Infrastructure upgrade costs are costs incurred by the utility to upgrade their distribution infrastructure to handle the increased peak load imposed by PEV charging.



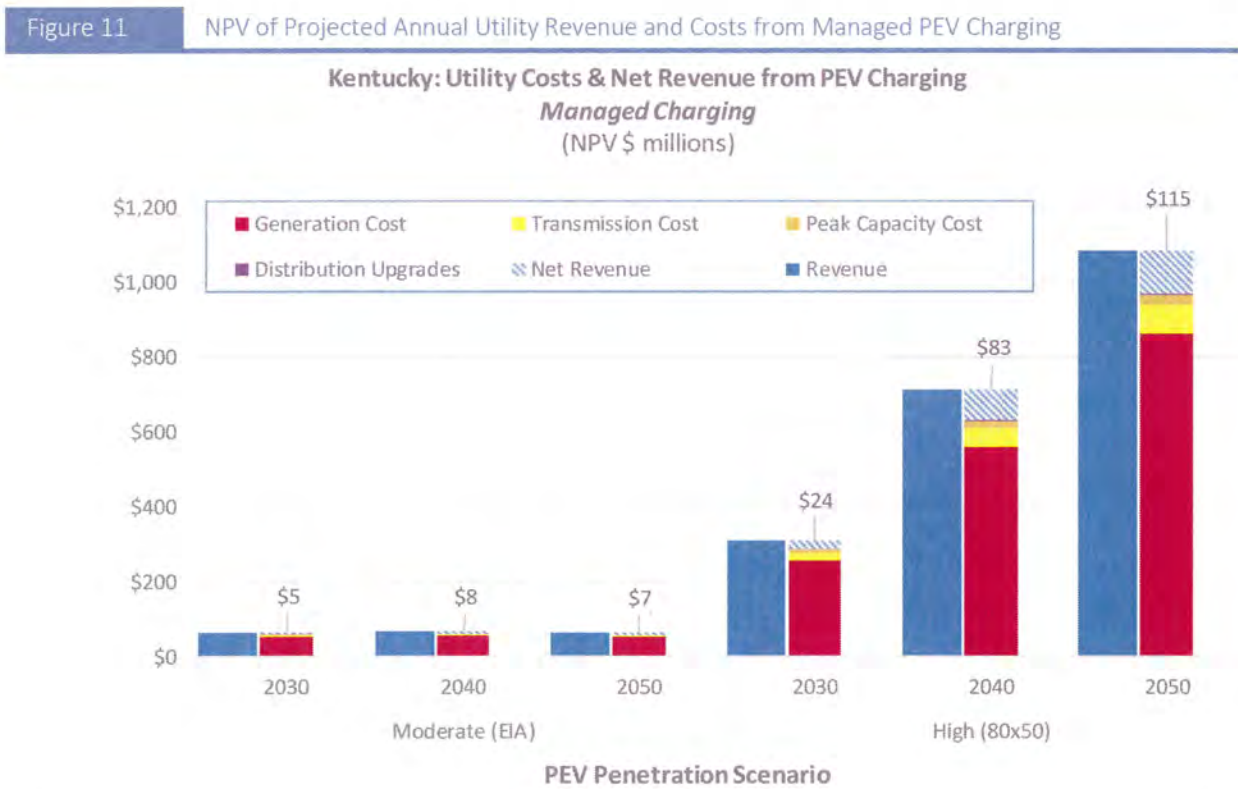
As shown in Figure 10, for both the Moderate PEV and High PEV (80x50) penetration scenarios, under the baseline charging scenario annual utility revenue from PEV charging is marginally lower than the annual incremental costs of serving the PEV charging load, resulting in zero or just slightly negative “net revenue”

(revenue minus costs) to the utility. This is due to the annual incremental cost of serving PEV charging peak load (cost of new capacity and distribution upgrades), which is slightly higher than the net revenue that utilities will receive under current rate structures (net of generation and transmission costs). Net revenue is normally shown as striped light blue bars and represents what utilities would realize from selling additional electricity for PEV charging. Under the Moderate PEV penetration scenario, the NPV of net annual revenue in Kentucky is projected to be -\$4 million in 2030, falling to -\$0.4 million in 2050. Under the High PEV (80x50) scenario, the NPV of utility net annual revenue from PEV charging is projected to total -\$14 million in 2030, falling to -\$6 million in 2050.

In Kentucky, utilities will need to rely on some form of managed PEV charging to limit incremental peak capacity costs, which are a major contributor to the negative net revenue shown above.

Figure 11 summarizes the NPV of projected annual utility revenue, costs, and net revenue for managed charging under each PEV penetration scenario. Compared to baseline charging (Figure 10) projected annual revenue, and projected annual generation and transmission costs are the same, but projected annual peak capacity and infrastructure costs are lower due to a smaller incremental peak load (see Table 1).

Compared to baseline charging, managed charging provides positive annual utility net revenue (NPV) for both penetration scenarios for all years. Managed charging increases utility net revenue to \$5 million in 2030 and \$7 million in 2050 under the Moderate PEV penetration scenario, due to lower costs. Under the High PEV (80x50) scenario, managed charging will increase the NPV of annual utility net revenue to \$24 million in 2030 and \$115 million in 2050. The NPV of projected annual utility net revenue averages \$21 per PEV in 2030, and \$21 - \$24 per PEV in 2050 if charging is managed.



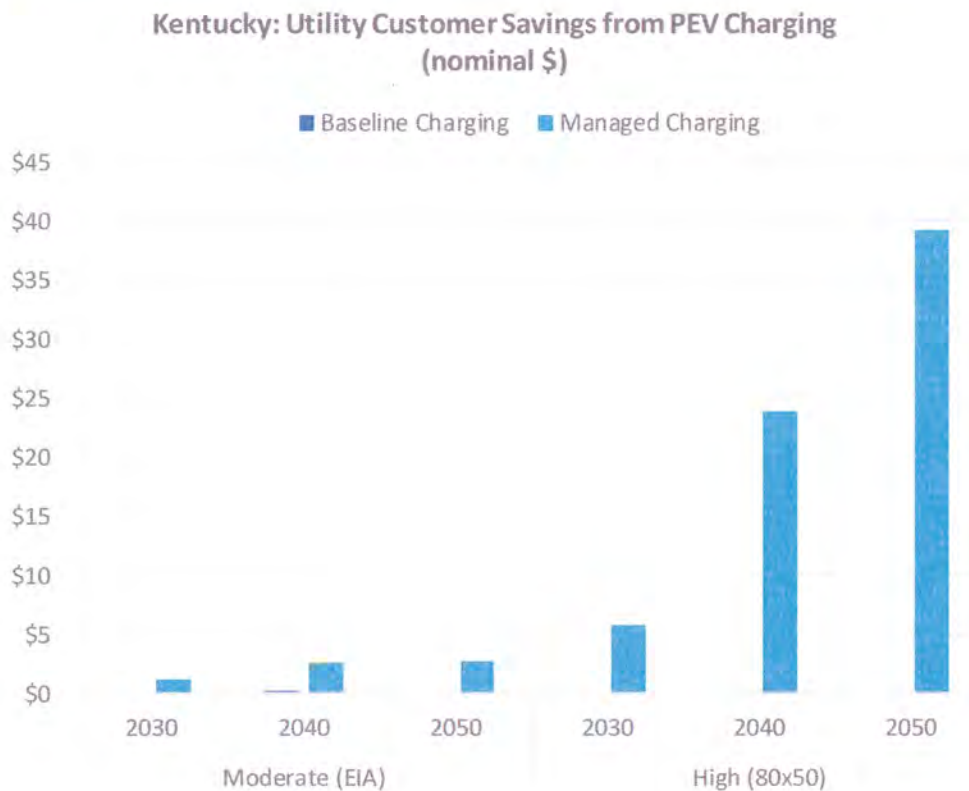
In general, a utility’s costs to maintain their distribution infrastructure increase each year with inflation, and these costs are passed on to utility customers in accordance with rules established by the Kentucky Public Service Commission (PSC), via periodic increases in residential and commercial electric rates. However, under the PSC

rules net revenue from additional electricity sales generally offset the allowable costs that can be passed on via higher rates. As such, the majority of projected utility net revenue from increased electricity sales for PEV charging (with managed charging) would in fact be passed on to utility customers in Kentucky, not retained by the utility companies.

Under current rate structures this net revenue would in effect put downward pressure on future rates, delaying or reducing future rate increases, thereby reducing electric bills for all customers. See Figure 12 for a summary of how the projected utility net revenue from PEV charging could affect average annual residential electricity bills for all Kentucky electric utility customers.¹⁰ As shown in the figure, under the High PEV (80x50) scenario projected average electric rates in Kentucky could be reduced up to 1.7 percent in 2050 due to net revenue from PEV charging, resulting in an annual savings of approximately \$39 (nominal dollars) per household in Kentucky. As discussed previously, baseline charging behavior results in negative net revenue under both penetration scenarios, which is why there are no utility customer savings in the figure.

It must be noted that how utility net revenue from PEV charging gets distributed is dependent on rate structure. Potential changes to current rates - to specifically incentivize off-peak PEV charging - could shift some or all of this benefit to PEV owners, thus reducing their electricity costs for vehicle charging without reducing costs for non-PEV owners. In either case, with even modest efforts to manage PEV charging rate payers who do not own a PEV will not be harmed by transportation electrification, and may benefit indirectly even if they continue to own gasoline vehicles.

Figure 12 Potential Effect of PEV Charging Net Revenue on Utility Customer Bills (nominal \$)



¹⁰ Based on 2016 average electricity use of 13,305 kWh per housing unit in Kentucky

Kentucky Driver Benefits

Current PEVs are more expensive to purchase than similar sized gasoline vehicles, but they are eligible for various government purchase incentives, including up to a \$7,500 federal tax credit. These incentives are important to spur an early market, but as described below PEVs are projected to provide a lower total cost of ownership than conventional vehicles in Kentucky by about 2035, even without government purchase subsidies.

The largest contributor to incremental purchase costs for PEVs compared to gasoline vehicles is the cost of batteries. Battery costs for light-duty plug-in vehicles have fallen from over \$1,000/kWh to less than \$300/kWh in the last six years; many analysts and auto companies project that battery prices will continue to fall – to below \$110/kWh by 2025, and below \$75/kWh by 2030. [3]

Based on these battery cost projections, this analysis projects that the average annual cost of owning a PEV in Kentucky will fall below the average cost of owning a gasoline vehicle by 2035, even without government purchase subsidies.¹¹ See Table 2 which summarizes the average projected annual cost of Kentucky PEVs and gasoline vehicles under each penetration scenario.

All costs in Table 2 are in nominal dollars, which is the primary reason why costs for both gasoline vehicles and PEVs are higher in 2040 and 2050 than in 2030 (due to inflation). In addition, the penetration scenarios assume that the relative number of PEV cars and higher cost PEV light trucks will change over time; in particular the High PEV (80x50) scenario assumes that there will be a significantly higher percentage of PEV light trucks in the fleet in 2050 than in 2030, which further increases the average PEV purchase cost in 2050 compared to 2030.

Table 2 Projected Fleet Average Vehicle Costs to Vehicle Owners (nominal \$)

GASOLINE VEHICLE		Moderate (EIA)			High (80x50)		
		2030	2040	2050	2030	2040	2050
Vehicle Purchase	\$/yr	\$5,257	\$5,855	\$7,167	\$4,454	\$6,125	\$8,376
Gasoline	\$/yr	\$1,228	\$1,396	\$1,673	\$1,198	\$1,499	\$1,972
Maintenance	\$/yr	\$274	\$332	\$410	\$272	\$340	\$432
TOTAL ANNUAL COST	\$/yr	\$6,759	\$7,583	\$9,251	\$5,925	\$7,964	\$10,780

PEV -KY		Moderate (EIA)			High (80x50)		
		2030	2040	2050	2030	2040	2050
Baseline Charging/Standard Rate							
Vehicle Purchase	\$/yr	\$5,257	\$5,855	\$7,167	\$5,044	\$6,436	\$8,577
Electricity	\$/yr	\$412	\$460	\$538	\$400	\$490	\$602
Gasoline	\$/yr	\$82	\$98	\$115	\$80	\$104	\$133
Personal Charger	\$/yr	\$81	\$99	\$122	\$81	\$99	\$122
Maintenance	\$/yr	\$168	\$204	\$251	\$167	\$207	\$259
TOTAL ANNUAL COST	\$/yr	\$6,000	\$6,714	\$8,194	\$5,772	\$7,335	\$9,693

Savings per PEV	\$/yr	\$759	\$869	\$1,057	\$153	\$629	\$1,087
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As shown in Table 2, under the High PEV Scenario (80x50) even in 2050 average PEV purchase costs are projected to be higher than average purchase costs for gasoline vehicles (with no government subsidies), but the annualized effect of this incremental purchase cost is outweighed by significant fuel cost savings, as well as

¹¹ The analysis assumes that all battery electric vehicles in-use after 2030 will have 200-mile range per charge and that all plug-in hybrid vehicles will have 50-mile all-electric range.

savings in scheduled maintenance costs. For the Moderate PEV Scenario in 2030, the average Kentucky PEV owner is projected to have annual operating savings of \$759 due to reduced maintenance as well as electricity costs being lower than gasoline¹². For both scenarios, this annual savings is projected to increase to \$1,050 - \$1,090 per PEV per year by 2050, as projected gasoline prices continue to increase faster than projected electricity prices.

The NPV of total annual cost savings to Kentucky drivers from greater PEV ownership are projected to be \$115 million in 2030 rising to \$124 million in 2050 under the moderate PEV penetration scenario. Under the High PEV (80x50) scenario, the NPV of total annual cost savings to Kentucky drivers from greater PEV ownership are projected to be \$118 million in 2030, rising to \$2.0 billion in 2050.

Other Benefits

Energy Security and Emissions Reductions

Along with the financial benefits to electric utility customers and PEV owners described above, light-duty vehicle electrification can provide additional benefits, including significant reductions in gasoline fuel use and transportation sector emissions.

The estimated cumulative fuel savings (barrels of gasoline¹³) from PEV use in Kentucky under each penetration scenario are shown in Figure 13. Annual fuel savings under the Moderate PEV penetration scenario are projected to total 0.9 million barrels in 2030, with cumulative savings of more than 20 million barrels by 2050. For the High PEV (80x50) scenario, annual fuel savings in 2030 are projected to be 4.2 million barrels, and by 2050 cumulative savings will exceed 236 million barrels.

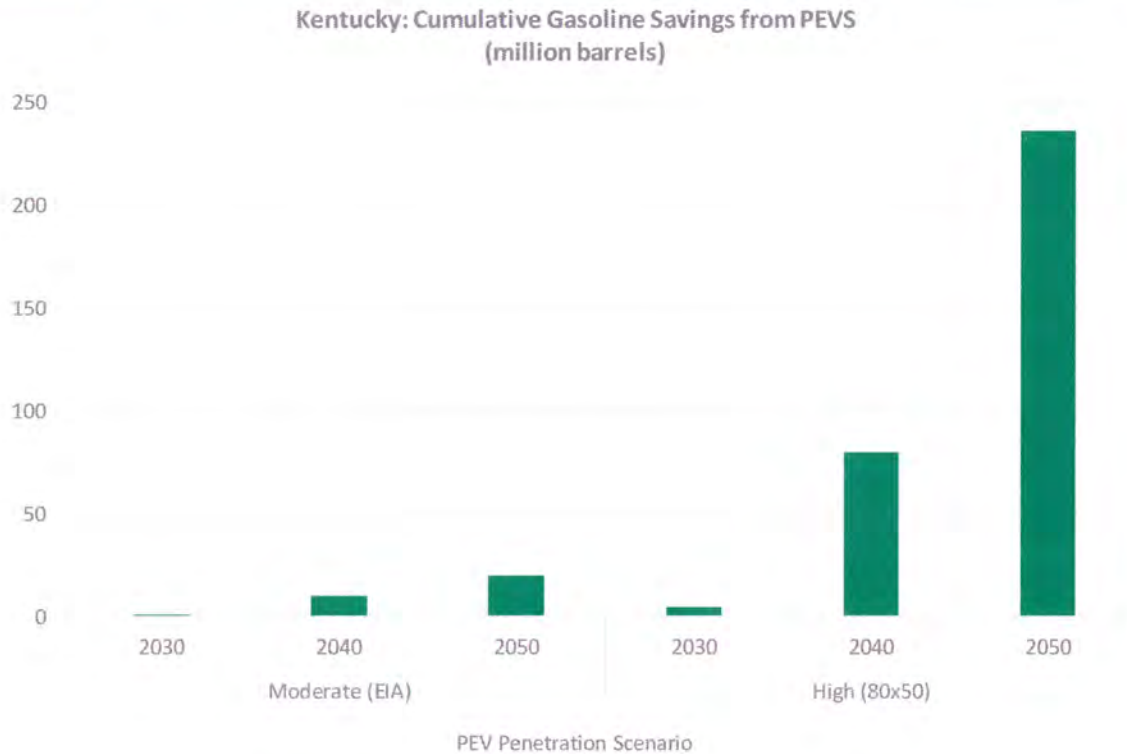
These fuel savings can help put the U.S. on a path toward energy independence, by reducing the need for imported petroleum. In addition, a number of studies have demonstrated that EVs can generate significantly greater local economic impact than gasoline vehicles - including generating additional local jobs - by keeping more of vehicle owners' money in the local economy rather than sending it out of state by purchasing gasoline.

¹² Under the moderate PEV (EIA) scenario, this analysis assumes that PEV owners will pay the same net purchase price for gasoline vehicles and PEVs, despite the higher projected purchase price of comparable PEVs. There is evidence that current PEV purchasers are foregoing the purchase of more expensive vehicles to purchase higher-priced PEVs within their target budget. With only modest future PEV penetration this analysis assumes that this behavior will continue. However, for the High PEV scenario net PEV owner benefits reflect the fact that PEV purchasers will pay a higher price for their PEVs than they would have paid for a similar gasoline vehicle.

¹³ One barrel of gasoline equals 42 US gallons

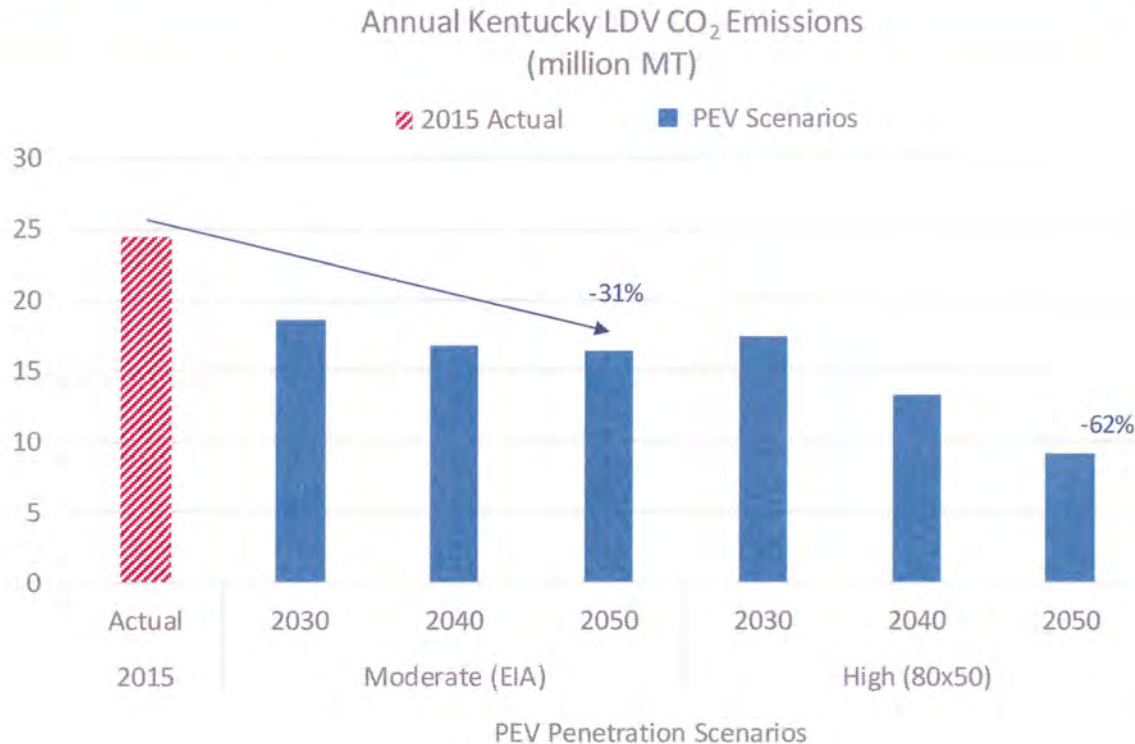
Economic impact analyses for the states of California, Florida, Ohio and Oregon have estimated that for every million dollars in direct PEV owner savings, an additional \$0.29 - \$0.57 million in secondary economic benefits will be generated within the local economy, depending on PEV adoption scenario. These studies also estimated that between 13 and 25 additional in-state jobs will be generated for every 1,000 PEVs in the fleet. [1]

Figure 13 Cumulative Gasoline Savings from PEVs in Kentucky



The projected annual greenhouse gas (GHG) emissions (million metric tons carbon-dioxide equivalent, CO₂-e million tons) from the Kentucky light duty fleet under each PEV penetration scenario are shown in Figure 14. In this figure, projected emissions under the PEV scenarios are shown in blue. The values shown represent “wells-to-wheels” emissions, including direct tailpipe emissions and “upstream” emissions from production and transport of gasoline. Estimated emission for the PEV scenarios includes GHG emissions from generating electricity to charge PEVs, as well as GHG emissions from gasoline vehicles in the fleet. Estimated emissions from PEV charging are based on EIA projections of average carbon intensity for the Reliability First Corporation / West electricity market module region, which includes Kentucky.

Figure 14 Projected GHG Emissions from the Light Duty Fleet in Kentucky



As shown in Figure 14, GHG emissions from the light duty fleet in Kentucky were approximately 24 million metric tons in 2015.

Compared to 2015 baseline emissions, in 2050 GHG emissions are projected to be reduced by up to 8 million tons under the Moderate PEV penetration scenario and as much as 15 million tons under the High PEV (80x50) scenario. Through 2050, cumulative net GHG emissions are projected to be reduced by nearly 152 million tons under the Moderate PEV penetration scenario and 234 million metric tons under the High PEV (80x50) scenario.

NOx Emissions

In 2015 the Electric Power Research Institute (EPRI), in conjunction with the Natural Resources Defense Council (NRDC), conducted national-level modeling to estimate GHG and air quality benefits from high levels of transportation electrification [4]. Under their electrification scenario EPRI estimated that NOx would be reduced by 11.4 tons and VOCs would be reduced by 5.5 tons, for every billion vehicle miles traveled¹⁴.

Extrapolating from this data, under the Moderate PEV Scenario (EIA), by 2050 light-duty vehicle electrification in Kentucky could reduce annual NOx emissions by 240 tons and reduce annual VOC emissions by 116 tons.

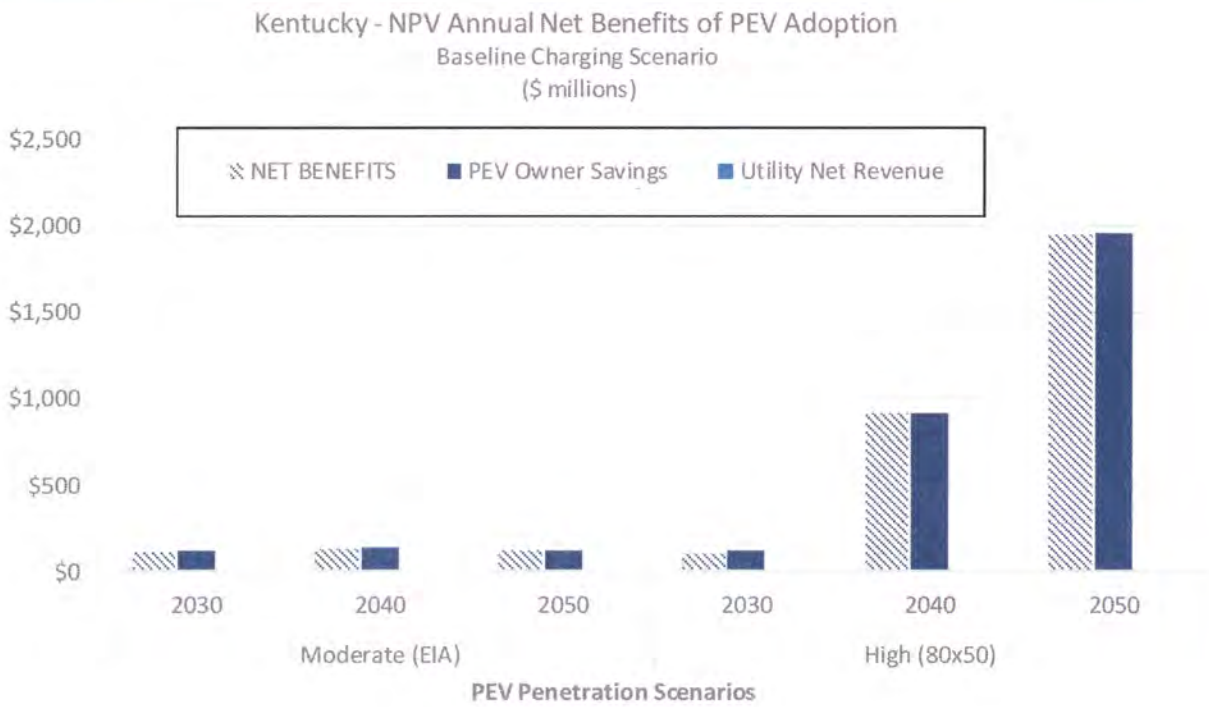
¹⁴ For light-duty vehicles the analysis assumed that by 2030 approximately 17 percent of annual vehicle miles would be powered by grid electricity, using PEVs. Based on current and projected electric sector trends the analysis also assumed that approximately 49 percent of the incremental power required for transportation electrification in 2030 would be produced using solar and wind, with the remainder produced by combined cycle natural gas plants.

Under the High PEV Scenario (80x50), total NOx reductions in 2050 could reach more than 3,740 tons per year, and total VOC reductions could reach 1,800 tons per year.¹⁵

Total Societal Benefits

The NPV of total annual estimated benefits from increased PEV use in Kentucky under each PEV penetration scenario are summarized in Figures 15 and 16. These benefits include cost savings to Kentucky drivers and utility customer savings from reduced electric bills. Figure 15 shows the NPV of annual projected societal benefits if Kentucky drivers charge in accordance with the baseline charging scenario. Figure 16 shows the NPV of projected annual benefits with managed charging.

Figure 15 Projected NPV of Total Societal Benefits from Greater PEV use in KY – Baseline Charging

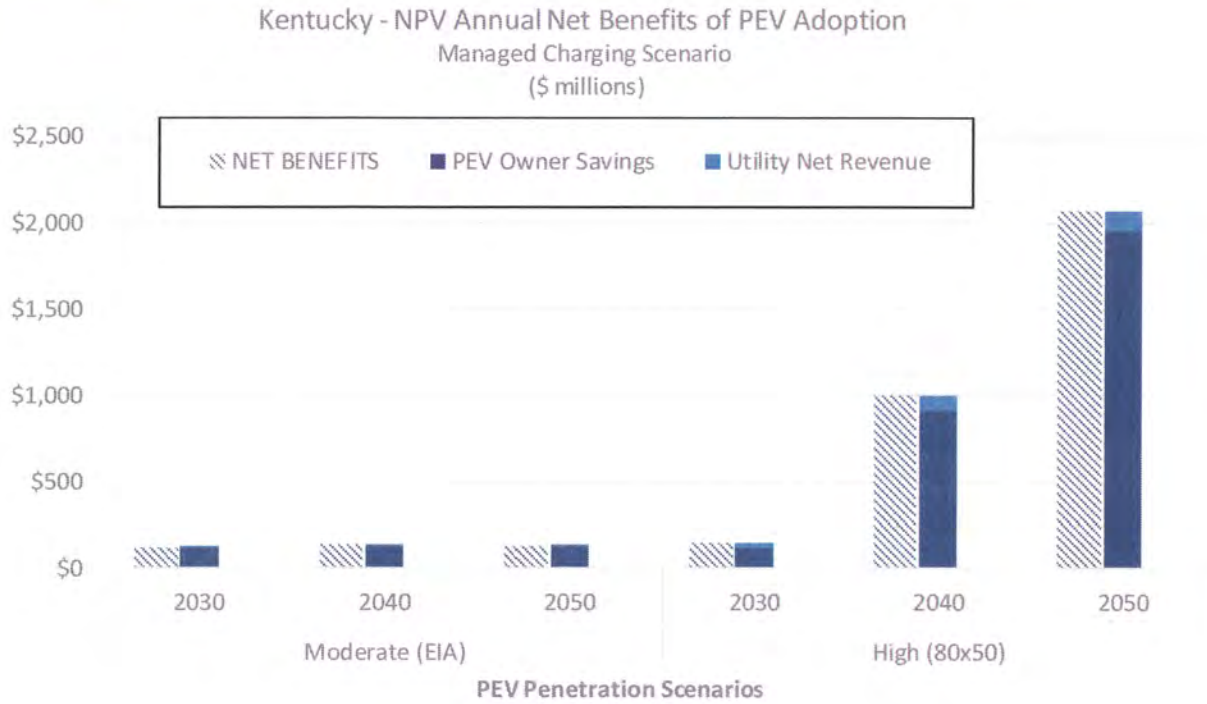


As shown in Figure 15, the NPV of annual benefits is projected to be a minimum of \$124 million per year in 2050 under the Moderate PEV penetration scenario and \$2.0 billion per year in 2050 under the High PEV (80x50) scenario. All of these annual benefits will accrue to Kentucky drivers as a cash savings in vehicle operating costs since utility net revenue is break-even to slightly negative under the baseline charging scenario, as discussed above.

¹⁵ Across the entire state, estimated annual light-duty vehicle miles traveled (VMT) totals 0.64 trillion miles in 2050. Of these miles approximately, 6 percent are powered by grid electricity under the EIA penetration scenario, and 87 percent are powered by grid electricity under the 80x50 penetration scenario

As shown in Figure 16, the NPV of annual benefits in 2050 will increase by \$7 million under the Moderate PEV (EIA) penetration scenario, and \$121 million under the High PEV (80x50) scenario with managed charging. Of these increased benefits, all will accrue to electric utility customers as a reduction in their electricity bills.

Figure 16 Projected NPV of Total Societal Benefits from Greater PEV use in KY – Managed Charging



Study Methodology

This section briefly describes the methodology used for this study. For more information on how this study was conducted, including a complete discussion of the assumptions used and their sources, see the report: *Mid-Atlantic and Northeast Plug-in Electric Vehicle Cost-Benefit Analysis, Methodology & Assumptions* (October 2016).¹⁶ This report can be found at:

http://mjbradley.com/sites/default/files/NE_PEV_CB_Analysis_Methodology.pdf

This study evaluated the costs and benefits of two distinct levels of PEV penetration in Kentucky between 2030 and 2050, based on the range of publicly available PEV adoption estimates from various analysts.

Moderate PEV Scenario –EIA: Based on EIA’s current projections for new PEV sales between 2015 and 2050, as contained in the 2017 Annual Energy Outlook (AEO). Under this scenario approximately 4.9 percent of in-use light duty vehicles in Kentucky will be PEV in 2030, rising to 6.2 percent in 2040 and remaining steady through 2050.

High PEV Scenario – 80x50: PEV penetration levels each year that would put the state on a trajectory to reduce total annual light-duty fleet GHG emissions by 70 – 80 percent from current levels in 2050. Under this scenario 25 percent of in-use vehicles will be PEV in 2030, rising to 60 percent in 2040 and 95 percent in 2050.

Both of these scenarios are compared to a baseline scenario with very little PEV penetration, and continued use of gasoline vehicles. The baseline scenario is based on future annual vehicle miles traveled (VMT) and fleet characteristics (e.g., cars versus light trucks) as projected by the Energy Information Administration in their most recent Annual Energy Outlook (AEO 2017).

Based on assumed future PEV characteristics and usage, the analysis projects annual electricity use for PEV charging at each level of penetration, as well as the average load from PEV charging by time of day. The analysis then projects the total revenue that Kentucky’s electric distribution utilities would realize from sale of this electricity, their costs of providing the electricity to their customers, and the potential net revenue (revenue in excess of costs) that could be used to support maintenance of the distribution system.

The costs of serving PEV load include the cost of electricity generation, the cost of transmission, incremental peak generation capacity costs for the additional peak load resulting from PEV charging, and annual infrastructure upgrade costs for increasing the capacity of the secondary distribution system to handle the additional load.

For each PEV penetration scenario this analysis calculates utility revenue, costs, and net revenue for two different PEV charging scenarios: 1) a baseline scenario in which all PEVs are plugged in and start to charge as soon as they arrive at home each day, and 2) a managed charging scenario in which a significant portion of PEVs that arrive home between noon and 11 PM each day delay the start of charging until after midnight.

Real world experience from the EV Project demonstrates that, without a “nudge”, drivers will generally plug in and start charging immediately upon arriving home after work (scenario 1), exacerbating system-wide evening peak demand.¹⁷ However, if given a “nudge” - in the form of a properly designed and marketed financial

¹⁶ This analysis used the same methodology as described in the referenced report, but used different PEV penetration scenarios, as described here. In addition, for this analysis fuel costs and other assumptions taken from the Energy Information Administration (EIA) were updated from EIA’s Annual Energy Outlook 2016 to those in the Annual Energy Outlook 2017. Finally, for projections of future PEV costs this analysis used updated July 2017 battery cost projections from Bloomberg New Energy Finance.

¹⁷ The EV Project is a public/private partnership partially funded by the Department of Energy which has collected and analyzed operating and charging data from more than 8,300 enrolled plug-in electric vehicles and approximately 12,000 public and residential charging stations over a two-year period.

incentive - many Kentucky drivers will choose to delay the start of charging until later times, thus reducing the effect of PEV charging on evening peak electricity demand (scenario 2). [5]

For each PEV penetration scenario, this analysis also calculates the total incremental annual cost of purchase and operation for all PEVs in the state, compared to “baseline” purchase and operation of gasoline cars and light trucks. For both PEVs and baseline vehicles annual costs include the amortized cost of purchasing the vehicle, annual costs for gasoline and electricity, and annual maintenance costs. For the Moderate PEV Scenario, it was assumed that PEV vehicle costs are the same as baseline gasoline vehicles, with the reasoning that consumers have a set budget and will purchase what they can afford, regardless of technology type. For the High PEV Scenario, the same logic could not be applied, as it is assumed that nearly all vehicle purchases will be PEV. For PEVs it also includes the amortized annual cost of the necessary home charger. This analysis is used to estimate average annual financial benefits to Kentucky drivers.

Finally, for each PEV penetration scenario this analysis calculates annual greenhouse gas (GHG) emissions from electricity generation for PEV charging, and compares that to baseline emissions from operation of gasoline vehicles. For the baseline and PEV penetration scenarios GHG emissions are expressed as carbon dioxide equivalent emissions (CO₂-e) in metric tons (MT). GHG emissions from gasoline vehicles include direct tailpipe emissions as well as “upstream” emissions from production and transport of gasoline.

For each PEV penetration scenario GHG emissions from PEV charging are calculated based on an electricity scenario that is consistent with the latest Energy Information Administration (EIA) projections for future SERC Reliability Corporation / Virginia -Carolina.

Net annual GHG reductions from the use of PEVs are calculated as baseline GHG emissions (emitted by gasoline vehicles) minus GHG emissions from each PEV penetration scenario.

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- [5] Idaho National Laboratory, *2013 EV Project Electric Vehicle Charging Infrastructure Summary Report*, January 2013 through December 2013

Acknowledgements

Lead Authors: Dana Lowell, Brian Jones, and David Seamonds

This study was conducted by M.J. Bradley & Associates for Duke Energy. It is one of six state-level analyses that will be conducted of plug-in electric vehicle costs and benefits in the different U.S. states in which Duke operates. These studies are intended to provide input to state policy discussions about actions required to promote further adoption of electric vehicles, as well as to inform internal Duke planning efforts.

Duke Energy Kentucky EV Forecast and Station Quantity Calculations

PEV Forecasts	Current number of PEV's in Kentucky - end of 2018	2,207	EPRI/Duke report using BMV data
	Current number of PEV's in Duke Energy Kentucky - end of 2018	323	EPRI/Duke report using BMV data
	Percentage of PEV's in Duke Energy Kentucky	15%	
	MJB - 2030 KY PEV Forecast - 5% market share	236,000	MJB KY Report
	MJB - 2030 Duke Energy KY PEV Forecast - 5% market share	34,539	15% of state forecast
	MJB - 2030 KY PEV Forecast - 25% market share	1,200,000	MJB KY Report
	MJB - 2030 Duke Energy KY PEV Forecast - 25% market share	175,623	15% of state forecast
	EEI - 2030 US PEV Forecast (7% of all Light Duty Vehicles will be PEV)	18,700,000	EEI EV Forecast November 2018
EEI - Ratio of total Light Duty Vehicles (KY to US)	1.54%	US Total 260M, KY has 4M	
EEI - 2030 KY PEV Forecast	287,692	4% of 18.7M	
EEI - 2030 Duke Energy KY PEV Forecast	42,104	15% of state forecast	

Current Charging Stations	# DCFC ports in Northern Kentucky	3	US DOE AFDC
	# public L2 ports in Northern Kentucky	20	US DOE AFDC

Charging Stations Needed	DCFC Qty needed to support 35,000 by 2030	125	EVI Pro Lite
	Public L2 Qty needed to support 35,000 by 2030	1533	See image below

Duke Energy Ohio Pilot Plan	Company's role in achieving 2030 goal	25%	Strategic company decision
	DCFC responsibility - Pilot proposal	31	Proposing 5 DCFC locations (10 units)
	Public L2 responsibility - Pilot proposal	378	Proposing 160 L2 stations

Your Results

In Kentucky, to support 35,000 plug-in electric vehicles you would need:

861 Workplace Level 2 Charging Plugs

672 Public Level 2 Charging Plugs

There are currently 188 plugs with an average of 1.8 plugs per charging station per the Department of Energy's [Alternative Fuels Data Center Station Locator](#).

125 Public DC Fast Charging Plugs

There are currently 58 plugs with an average of 4.8 plugs per charging station per the Department of Energy's [Alternative Fuels Data Center Station Locator](#).

Change Assumptions

Plug-in Electric Vehicles (as of 2016): 1,300

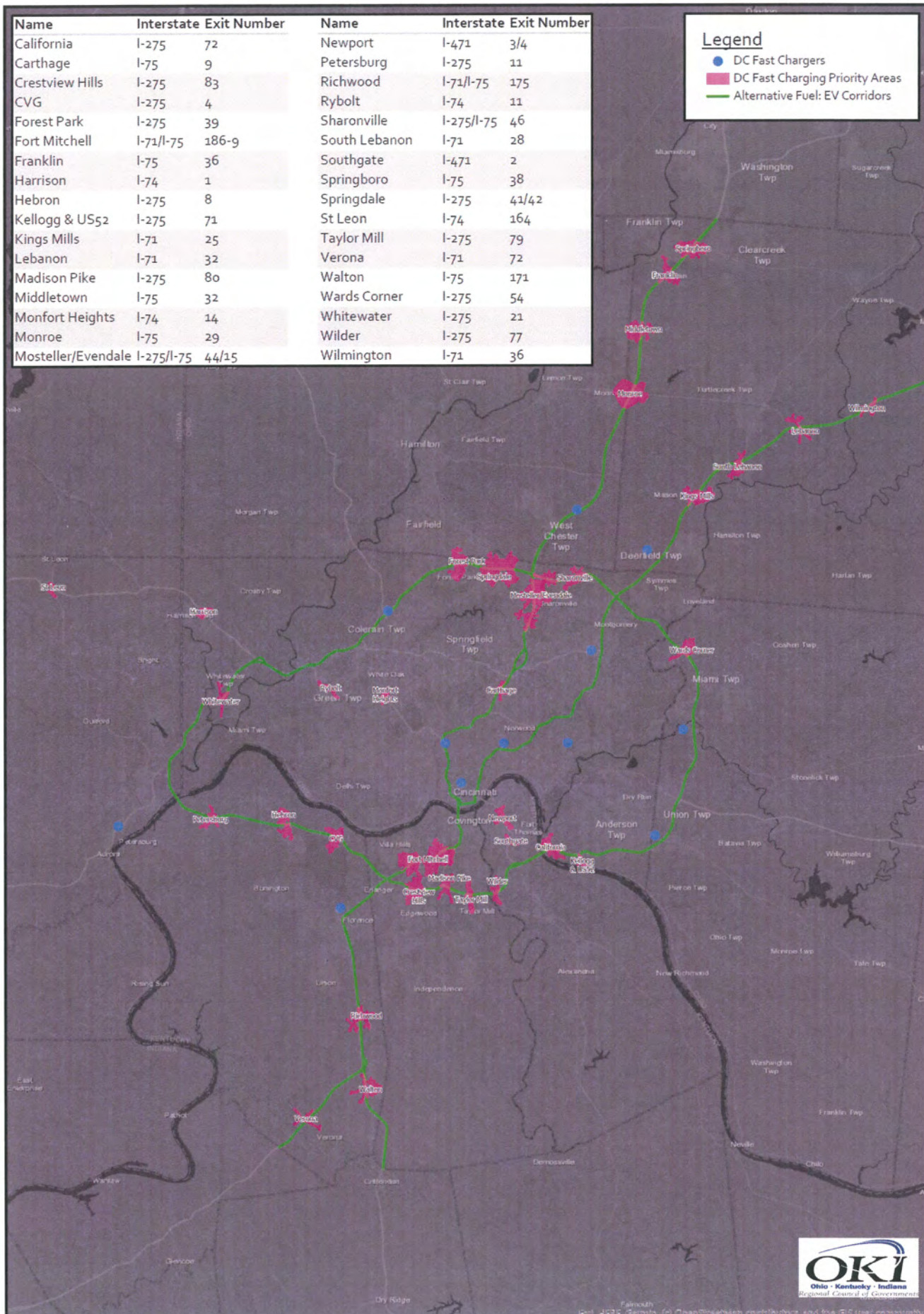
Light Duty Vehicles (as of 2016): 3,903,100

Number of vehicles to support

Vehicle Mix	Plug-in Hybrids 20-mile electric range	<input type="text" value="15"/> %
	Plug-in Hybrids 50-mile electric range	<input type="text" value="35"/> %
	All-Electric Vehicles 100-mile electric range	<input type="text" value="15"/> %
	All-Electric Vehicles 250-mile electric range	<input type="text" value="35"/> %
Total		100%

DC Fast Charging Priority Areas

OKI Region



Name	Interstate	Exit Number	Name	Interstate	Exit Number
California	I-275	72	Newport	I-471	3/4
Carthage	I-75	9	Petersburg	I-275	11
Crestview Hills	I-275	83	Richwood	I-71/I-75	175
CVG	I-275	4	Rybolt	I-74	11
Forest Park	I-275	39	Sharonville	I-275/I-75	46
Fort Mitchell	I-71/I-75	186-9	South Lebanon	I-71	28
Franklin	I-75	36	Southgate	I-471	2
Harrison	I-74	1	Springboro	I-75	38
Hebron	I-275	8	Springdale	I-275	41/42
Kellogg & US52	I-275	71	St Leon	I-74	164
Kings Mills	I-71	25	Taylor Mill	I-275	79
Lebanon	I-71	32	Verona	I-71	72
Madison Pike	I-275	80	Walton	I-75	171
Middletown	I-75	32	Wards Corner	I-275	54
Monfort Heights	I-74	14	Whitewater	I-275	21
Monroe	I-75	29	Wilder	I-275	77
Mosteller/Evendale	I-275/I-75	44/15	Wilmington	I-71	36



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Media	Description	2020 Budget	2021 Budget	2022 Budget	2023 Budget	
Collateral & Promotional Items	Print literature, promos for events	\$2,225	\$1,120	\$1,200	\$125	
Events & Outreach	Community outreach to Schools, Dealerships, etc	\$2,200	\$1,250	\$600	\$100	
Web Development	includes video(s) specific to P&P DEO development email	\$5,500	\$4,125	\$2,250	\$1,225	
Email Marketing	campaigns to reach individual segments	\$1,750	\$1,020	\$600	\$300	
Social media marketing (Paid)	Facebook, twitter, SEM, streaming radio	\$3,250	\$2,500	\$2,150	\$1,250	
General Awareness	promotion of EVs to customers not currently aware of advantages	\$2,800	\$1,800	\$1,350	\$1,000	
Paid Search (YouTube)	Drive site visits and engagement by intercepting relevant search queries	\$2,825	\$2,250	\$2,050	\$1,425	
Paid Search (Bing and Google)	Drive site visits and engagement by intercepting relevant search queries	\$2,750	\$2,650	\$1,920	\$1,300	
Out of home	Billboards, gas station TV, etc	\$5,215	\$3,250	\$2,300	\$1,000	
Photography (location)	Two 8-hour day shoots. Photos specific to DEO	\$4,200	\$2,800	\$1,520	\$100	
Photography (assets)	Two 8-hour day shoots. Chargers, infrastructure, etc.	\$2,925	\$2,600	\$1,200	\$0	
		\$35,640	\$25,365	\$17,140	\$7,825	\$85,970

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

The Electronic Application of Duke)
Energy Kentucky, Inc., for: 1) An)
Adjustment of the Electric Rates; 2)) Case No. 2019-00271
Approval of New Tariffs; 3) Approval of)
Accounting Practices to Establish)
Regulatory Assets and Liabilities; and 4))
All Other Required Approvals and Relief.)

DIRECT TESTIMONY OF
ANDREW S. RITCH
ON BEHALF OF
DUKE ENERGY KENTUCKY, INC.

September 3, 2019

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I. INTRODUCTION AND PURPOSE

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

2 A. My name is Andrew S. Ritch. My business address is 139 East Fourth Street,
3 Cincinnati, Ohio 45202.

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

5 A. I am employed by Duke Energy Business Services LLC (DEBS) as a Wholesale
6 Renewable Manager. DEBS provides various administrative and other services to
7 Duke Energy Kentucky, Inc. (Duke Energy Kentucky or Company) and other
8 affiliated companies of Duke Energy Corporation (Duke Energy).

9 **Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL**
10 **BACKGROUND AND PROFESSIONAL EXPERIENCE.**

11 A. I have a Bachelor's degree from Colby College in Waterville, Maine, and an
12 MBA from the F.W. Olin Graduate School of Business at Babson College in
13 Wellesley, Massachusetts. I have worked for Duke Energy and its predecessor
14 companies since 2002. My career began in a management training program,
15 leading efforts in Strategic Sourcing and Corporate Budgeting and Financial
16 Forecasting. In 2006, I moved to a Senior Analyst role in Investor Relations.
17 Prior to my current role, I was the Director of Corporate Strategy and Business
18 Planning for the U.S. Franchised Electric and Gas Businesses.

1 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND**
2 **RESPONSIBILITIES AS WHOLESALE RENEWABLE MANAGER.**

3 A. I am responsible for providing overall strategy, policy and direction for renewable
4 energy assets within Duke Energy's Midwest regulated businesses, including
5 Duke Energy Kentucky.

6 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
7 **PUBLIC SERVICE COMMISSION?**

8 A. No.

9 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
10 **PROCEEDING?**

11 A. The purpose of my testimony is to support the Company's voluntary Green
12 Source Advantage Program (GSA Program) and proposal to implement a new
13 Green Source Advantage Tariff (Rate GSA) for interested, qualifying, non-
14 residential customers.

II. GREEN SOURCE ADVANTAGE PROGRAM

15 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S GREEN SOURCE**
16 **ADVANTAGE PROGRAM PROPOSAL.**

17 A. The GSA Program is a voluntary opportunity for qualifying customers that wish
18 to partner with Duke Energy Kentucky to meet their specific, internal corporate
19 sustainability goals in a convenient and cost-effective way. Through this program,
20 customers may request that the Company procure renewable energy resources on
21 behalf of the customer, with the cost and any net revenues of these commitments
22 captured and billed to the customer through this new tariff.

1 **Q. WHY IS DUKE ENERGY KENTUCKY MAKING THIS PROPOSAL?**

2 A. Duke Energy Kentucky is proposing this program in response to customer
3 demand, and to support economic development opportunities within Duke Energy
4 Kentucky's service territory. Several of Duke Energy Kentucky's larger
5 commercial and industrial customers have expressed interest in procuring
6 renewable energy resources and partnering with Duke Energy Kentucky to meet
7 their individual corporate sustainability goals or aspirations. While Duke Energy
8 Kentucky has its own renewable energy investment strategy for the benefit of all
9 customers (and as detailed within our recently filed Integrated Resource Plan),
10 this voluntary, unsubsidized program provides an opportunity for something that
11 is more customizable for the individual, sophisticated customer that wishes to
12 invest in a specific, identifiable resource that may not have been developed
13 without their interest (additionality).

14 **Q. HOW IS THE GSA PROGRAM DIFFERENT THAN THE COMPANY'S**
15 **EXISTING GREEN POWER TARIFF, GOGREEN KENTUCKY?**

16 A. Under the current GoGreen Kentucky program, Duke Energy Kentucky will
17 procure renewable energy credits (RECs) from the market for interested
18 customers. These RECs are typically generated by existing renewable energy
19 assets and can be located anywhere. Moreover, the program does not allow for the
20 contribution to the development of additional renewable generation. The proposed
21 GSA Program, however, is intended for customers wishing to contribute to the
22 development of specific renewable resources. As proposed, these customers will
23 enter into a binding obligation through Duke Energy Kentucky to enable the

1 monetization of an entitlement to costs and revenues associated with a specific
2 amount of energy, capacity (to the extent possible) and RECs generated from a
3 specific project in the wholesale electric markets, most likely through a regional
4 transmission organization, such as PJM Interconnection, L.L.C. (PJM). Any net
5 costs or net revenues are then flowed back to the participating customer on their
6 Duke Energy Kentucky utility bill. The participating customers may retain the
7 RECs for their own use or monetize them in the market.

8 **Q. PLEASE EXPLAIN HOW THE GSA PROGRAM WILL WORK.**

9 A. Duke Energy Kentucky will solicit third party developers through requests for
10 proposals based upon the identified level of participation, in megawatts (MW),
11 from qualifying customers, and will then enter into purchase agreements with
12 renewable energy project developers. Duke Energy Kentucky will enter into a
13 purchased power agreement (PPA) with the developer to construct a defined
14 number of MW of renewable capacity through one or more facilities located in
15 the footprint of PJM's market. Participating customers will then enter into a
16 service contract with Duke Energy Kentucky for the same term of years (up to 20)
17 and terms/conditions as the PPA. The participating customer will then receive the
18 net benefits created under their program contract, including the value of any
19 RECs.

20 **Q. PLEASE EXPLAIN THE GSA PROGRAM LIMITATIONS AND HOW**
21 **CUSTOMERS QUALIFY UNDER RATE GSA.**

22 A. Eligibility for the Program is limited to nonresidential customers with a minimum
23 Maximum Annual Demand of 1,000 kilowatts (kW) or a minimum aggregated

1 Maximum Annual Demand at multiple service locations in Duke Energy
2 Kentucky's service territory of 5,000 kW. The third-party renewable energy
3 project owner must meter 100 percent of generation output consistent with Duke
4 Energy Kentucky's requirements and PJM capacity and energy market
5 requirements. All environmental attributes affiliated with their purchased amount,
6 including but not limited to RECs, "renewable energy credits" or "green tags,"
7 associated with the renewable generation system will be conveyed to the
8 participating customer for the life of the GSA service agreement. To mitigate the
9 potential for an administrative burden in running the program and to minimize the
10 costs of the program, the Company reserves the right to limit the number of
11 customers and/or generation capacity served under this program on the same retail
12 distribution circuit.

13 **Q. WILL THE RENEWABLE RESOURCES BE USED TO DIRECTLY**
14 **SERVE THE PARTICIPATING CUSTOMER'S LOAD?**

15 A. No. The load/energy needs of the participating customer will continue to be
16 satisfied by Duke Energy Kentucky's own generation assets and participating
17 customers will continue to pay all applicable rates and charges. The purpose of
18 the program is to: 1) provide an easy, seamless way for interested, eligible
19 customers to satisfy individual sustainability goals; and 2) to create a hedge
20 against the regulated costs of electricity by using the wholesale energy markets.
21 The output of these GSA Program contracted resources (energy) will be
22 dispatched and sold and any revenues received from such sales will be netted
23 against the costs of the resource. The net cost of these two transactions is the

1 amount that will be billed to the participating customer. To the extent the
2 revenues for energy from these resources exceed the costs on any given month,
3 the participating customer(s) will see a credit. However, in months where the
4 costs exceed the revenues, customers will see an incremental charge. Because this
5 resource is “outside” the Company’s generation, and paid for solely by the
6 contracting customer(s) there will be no impact to the Company’s fuel adjustment
7 clause or profit sharing mechanism.

8 **Q. CAN THE RESOURCE BE LOCATED ANYWHERE IN PJM?**

9 A. Yes. As stated previously, the assets will be located within PJM. The resource can
10 be located anywhere in PJM to provide the most opportunistic pricing without
11 limitation to a particular delivery area. Because the resource is not going to be
12 used to meet the customers actual load or demand, but rather functions as more of
13 a market hedge, there is no need for the resource to be restricted to deliverability
14 to the Duke Energy Kentucky local delivery area zone (LDA) in PJM. That is not
15 to say the resource cannot be located in the Duke Energy Kentucky LDA, just that
16 such a geographic restriction does not exist.

17 **Q. CAN THE NEW RENEWABLE ENERGY RESOURCE BE CONNECTED**
18 **USING EITHER A DISTRIBUTION OR TRANSMISSION**
19 **INTERCONNECTION?**

20 A. Yes, but there are different steps that must be taken depending on the
21 interconnection point. If the resource is connected using a transmission
22 connection, the resource will automatically participate in the PJM wholesale
23 markets as a discrete generator, receiving charges or credits resulting from its

1 operation. If the resource is connected using a distribution connection, the
2 resource would need a Wholesale Market Participation Agreement (WMPA) with
3 PJM, allowing the resource to participate in the wholesale markets. In addition, if
4 connected using a distribution connection, Duke Energy Kentucky, when
5 calculating its customer demand, would then modify its load calculation to
6 include the effect of the renewable energy resource. Thus, said in another way, the
7 existing customer demand would not be affected by the additional renewable
8 energy resource generation, even if the asset is connected at the distribution level.
9 This is why the third-party renewable energy project owner must meter 100
10 percent of generation output consistent with Duke Energy Kentucky and PJM
11 capacity and energy market requirements.

12 **Q. IF THE RESOURCE IS LOCATED WITHIN DUKE ENERGY**
13 **KENTUCKY'S LOCAL DELIVERY AREA, HOW WILL THE COMPANY**
14 **ENSURE THAT THE REVENUES AND COSTS RESULTING FROM**
15 **OPERATION OF THE RENEWABLE ENERGY RESOURCE AREN'T**
16 **COMINGLED WITH OTHER COMPANY GENERATING RESOURCES**
17 **AND LOAD?**

18 A. Duke Energy Kentucky will create a separate sub-account for the new resource
19 with PJM, ensuring that all settlement accounting from PJM is maintained on an
20 individual settlement statement dedicated to only that resource(s).

1 **Q. WHY ARE ALL THESE STEPS TAKEN?**

2 A. These steps ensure that there is no cross-subsidization between the renewable
3 energy resource dedicated to this customer and the other Duke Energy Kentucky
4 generation assets or native load.

5 **Q. WHAT HAPPENS WHEN A NEW RENEWABLE ENERGY RESOURCE**
6 **IS CONSTRUCTED IN AN AREA OUTSIDE OF DUKE ENERGY**
7 **KENTUCKY'S LDA BUT WITHIN PJM, AND THAT AREA'S**
8 **TRANSMISSION PROVIDER DECIDES TO LEAVE PJM?**

9 A. The Company would work to monetize the asset using different means, either
10 inside another RTO or as an asset outside of an RTO, and then transfer this
11 revenue to the customer.

12 **Q. WILL THESE GSA PROGRAM RESOURCES PROVIDE ANY**
13 **CAPACITY VALUE?**

14 A. Whether there is capacity value will depend upon a number of factors, including
15 whether or not the resource complies with PJM's capacity performance criteria.
16 Duke Energy Kentucky does not anticipate purchasing any capacity from the
17 customer under the GSA due to the PJM capacity performance risks, so any
18 capacity value, like energy, will be solely determined within the market.
19 However, Duke Energy Kentucky will work with the customer to determine the
20 level of risk the customer is willing to take with regard to such assets in the
21 capacity performance market. All risk of compliance will rest with the GSA
22 customer if they want to maximize the capacity value of the asset. These terms
23 would be included in the GSA service agreement entered into with the customer.

1 **Q. ARE THERE ANY INCREMENTAL COSTS OF PARTICIPATION**
2 **OTHER THAN THE PPA FOR CUSTOMERS?**

3 A. Yes. The customer will have to pay a non-refundable \$2,000 application fee to
4 cover the Company's costs to solicit the underlying resources. Duke Energy
5 Kentucky will refund the fee only in the unlikely event the customer's application
6 is rejected due to insufficiently-available renewable capacity. Duke Energy
7 Kentucky will also charge a nominal monthly administration fee of \$375 to cover
8 the costs of managing the contract, processing PJM data, and calculating any net
9 revenues/costs on the customer's bill.

10 **Q. WHY WOULD A CUSTOMER DESIRE THIS KIND OF STRUCTURE?**

11 A. The goal of the program is to make it as easy as possible for customers to
12 purchase renewable energy to satisfy their sustainability goals. By transacting on
13 their behalf (buying the energy from the renewable energy project owner, selling
14 it into the wholesale market, and billing or crediting the customer just for the net
15 difference between the two), it is the hope of the Company that customers view
16 this structure as a value-added convenience.

17 **Q. PLEASE EXPLAIN RATE GSA.**

18 A. Rate GSA is the proposed tariff that outlines the terms and conditions of this
19 proposed program. Duke Energy Kentucky witness Jeff Kern further discusses the
20 tariff in his Direct Testimony.

1 **Q. WHAT WILL HAPPEN IN THE UNLIKELY EVENT A PARTICIPATING**
2 **CUSTOMER LEAVES DUKE ENERGY KENTUCKY'S SERVICE**
3 **TERRITORY OR DEFAULTS DURING THE TERM OF THE GSA**
4 **SERVICE AGREEMENT?**

5 A. Generally, the GSA service agreement will define the scope of the project and the
6 customer's participation. There will be terms and conditions regarding collateral
7 needed, and conditions for acceleration of payments under the contract if the
8 customer were to discontinue service, go out of business, *etc.* These terms would
9 be necessary to protect Duke Energy Kentucky and its other customers so that
10 they are not harmed in the event of a premature termination of the agreement by
11 the GSA customer.

12 **Q. WILL DUKE ENERGY KENTUCKY FILE ANY GSA AGREEMENTS**
13 **WITH THE COMMISSION?**

14 A. Yes. The Company will follow the normal procedures for service agreements like
15 this and will file any final contracts, subject to appropriate confidentiality
16 protections for the customer.

III. CONCLUSION

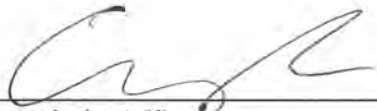
17 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

18 A. Yes.

VERIFICATION


STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, Andrew Ritch, Wholesale Renewable Manager, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.



Andrew Ritch, Affiant

Subscribed and sworn to before me by Andrew Ritch, on this 8th day of August, 2019.



NOTARY PUBLIC

My Commission Expires: 1/5/2024



ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2024

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

The Electronic Application of Duke)
Energy Kentucky, Inc., for: 1) An)
Adjustment of the Electric Rates; 2)) Case No. 2019-00271
Approval of New Tariffs; 3) Approval of)
Accounting Practices to Establish)
Regulatory Assets and Liabilities; and 4))
All Other Required Approvals and Relief.)

DIRECT TESTIMONY OF

JEFFREY R. SETSER

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

September 3, 2019

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ATTACHMENTS:

- Attachment JRS-1 Service Company Utility Service Agreement

- Attachment JRS-2 Operating Companies Service Agreement

- Attachment JRS-3 Second Amended Restated Operating Company/Non-Utility Company Service Agreement

- Attachment JRS-4 Asymmetrically Priced Operating Company/Non-Utility Companies Service Agreements

- Attachment JRS-5 Affiliate Asset Transfer Agreement

I. INTRODUCTION AND PURPOSE

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

2 A. My name is Jeffrey R. Setser, and my business address is 550 South Tyron Street,
3 Charlotte, North Carolina 28202.

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

5 A. I am employed by Duke Energy Business Services LLC (DEBS), as Director of
6 Allocations and Reporting. DEBS provides various administrative and other services
7 to Duke Energy Kentucky, Inc., (Duke Energy Kentucky or Company) and other
8 affiliated companies of Duke Energy Corporation (Duke Energy).

9 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND**
10 **PROFESSIONAL EXPERIENCE.**

11 A. I graduated with a Bachelor of Science Degree in Industrial Engineering from
12 North Carolina State University and a Master's Degree in Business
13 Administration from Queens University in Charlotte. I am a Certified Public
14 Accountant in North Carolina.

15 I joined the company in 1984 in the Nuclear Production Department's
16 corporate office as an Assistant Engineer, primarily focusing on nuclear process
17 improvement activities. In 1986, I moved to Catawba Nuclear Station where I was
18 promoted to Associate Engineer and responsible for nuclear outage scheduling
19 and training. In 1989, I was promoted to Nuclear Production Engineer responsible
20 for the supervision and scheduling of all online plant activities, and the planning
21 for Nuclear Station Modifications. In 1992, I joined the Catawba Nuclear Station
22 Business group as a Strategic Business Consultant responsible for site financial

1 reporting, budgeting, performance measures, accounting support, economic
2 analysis and business case justifications. In 1996, I assumed the role of Catawba
3 Nuclear Station Manager of Financial Analysis supervising the development of
4 business plans, budgets and measures and the reporting on site financial results. In
5 2000, I moved back to the corporate offices as an Accounting Manager
6 overseeing the utilities Accounting Controls and Application Support Department,
7 which included the management of department level allocation processes. In
8 2002, I joined the Corporate Controllers department as an Accounting Manager
9 where I held numerous roles, including overseeing the accounting and reporting
10 for stock based compensation, employee and executive benefits, managing the
11 intercompany billing process and service level agreements for joint venture and
12 foreign entities, accounting for Canadian entities related to corporate and captive
13 insurance, reporting and analysis on the Duke Energy Other business segment,
14 and supervising the allocation of benefits and corporate costs. In 2006, I assumed
15 my current role as Director of Allocations and Reporting in the Corporate
16 Controller's department.

17 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS DIRECTOR OF**
18 **ALLOCATIONS AND REPORTING.**

19 A. I am responsible for various accounting activities, including the cost allocation
20 processes for service company costs utilized for Duke Energy and its affiliates,
21 including allocations to Duke Energy Kentucky.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
2 **PUBLIC SERVICE COMMISSION?**

3 A. Yes.

4 **Q WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
5 **PROCEEDING?**

6 A. My testimony in this proceeding addresses the various cost assignment processes
7 utilized by Duke Energy Kentucky and its affiliates, including its service
8 company, DEBS, which as an ordinary course of business provide services among
9 each other.

10 I discuss the primary service agreements used by Duke Energy Kentucky
11 to enable the sharing of expertise and personnel between and among the Duke
12 Energy family of companies and to assign costs for such services. These service
13 agreements include the following: (1) the Service Company Utility Service
14 Agreement (DEBS Service Agreement); (2) the Operating Companies Service
15 Agreement (Operating Company Service Agreement); (3) the Operating
16 Company/Non-Utility Companies Service Agreements (Cost-Based Non-Utility
17 Service Agreement); (4) the Asymmetrically-Priced Duke Energy Kentucky, Inc.,
18 Non-Utility Companies Service Agreement (Asymmetric Non-Utility
19 Agreement); and (5) the Intercompany Asset Transfer Agreement (Asset Transfer
20 Agreement). In my testimony, I briefly describe the history of these agreements as
21 well as the Commission's approval thereof. I also describe the processes to be
22 used to assign costs to the various parties under those agreements as well as the
23 nature and types of cost assignment that Duke Energy Kentucky experiences as a

1 combination gas and electric utility and wholly owned subsidiary of Duke Energy
2 Ohio, Inc., (Duke Energy Ohio). I sponsor certain information that I supplied to
3 Duke Energy Kentucky witness, Christopher Jacobi for his use in developing the
4 forecasted financial data. Finally, I also sponsor the information contained in
5 Filing Requirement (FR) 16(7)(u).

II. THE SERVICE AGREEMENTS

A. OVERVIEW OF THE MAJOR SERVICE AGREEMENTS

6 **Q. DO ALL CHARGES FOR DUKE ENERGY KENTUCKY ORIGINATE ON**
7 **DUKE ENERGY KENTUCKY'S BOOKS?**

8 A. No. Charges can originate either on Duke Energy Kentucky's books for its own
9 operations or can originate from its parent company, Duke Energy Ohio, and/or
10 other affiliated companies pursuant to several Commission-approved affiliate
11 service agreements. These services enable Duke Energy Kentucky to provide safe
12 and reliable utility service to its Kentucky customers at a reasonable price.

13 **Q. PLEASE BRIEFLY DESCRIBE THE VARIOUS SERVICE**
14 **AGREEMENTS THAT ENABLE DUKE ENERGY KENTUCKY TO**
15 **PROVIDE SAFE, RELIABLE, AND REASONABLE SERVICE TO ITS**
16 **KENTUCKY CUSTOMERS.**

17 A. Duke Energy Kentucky has several service agreements in place that allow the
18 Company to provide services to, or receive services from the Duke Energy family
19 of companies that are incidental or necessary to the provision of utility service.
20 These agreements provide for the standard procedures and defined accounting

1 processes for cost assignment that allow these services to occur on an equitably-
2 priced basis among all parties.

3 I have attached the five major service agreements to my testimony, all of
4 which were effective when the Company commenced these proceedings and
5 submitted its pre-filing notice. Attachment JRS-1 is the DEBS Service Agreement
6 that governs the provision of various services and the associated cost allocations
7 to Duke Energy Kentucky for the services DEBS provides. DEBS is a Federal
8 Energy Regulatory Commission (FERC) authorized service company that
9 provides various administrative and other services to Duke Energy Kentucky and
10 other affiliated companies of Duke Energy.

11 Attachment JRS-2 is the Operating Company Service Agreement that
12 governs services performed between or among Duke Energy's regulated utility
13 operating companies and the cost allocations or assignments for providing and
14 receiving those services.

15 Attachment JRS-3 and JRS-4 are the two Utility/Non-Utility Companies
16 Service Agreements, which govern the services performed and cost allocations
17 between Duke Energy Kentucky and its non-utility affiliates.

18 Finally, Attachment JRS-5 is the Asset Transfer Agreement that allows for
19 the "at cost" transfer of assets by and between Duke Energy Kentucky and its
20 regulated utility affiliates.

1 **Q. HAS DUKE ENERGY KENTUCKY HISTORICALLY RELIED UPON**
2 **SERVICE AGREEMENTS TO SERVE ITS KENTUCKY CUSTOMERS?**

3 A. Yes. These service agreements allow Duke Energy Kentucky, and in turn, its
4 customers to have access to equipment and personnel that are common to utility
5 operations and share in those costs between multiple businesses as opposed to
6 having to maintain separate pools of personnel. The use of service agreements has
7 helped Duke Energy Kentucky, and its regulated utility affiliates, to manage
8 staffing levels and costs through the sharing of common business functions and to
9 have ready access to experienced and expertly trained personnel to manage its
10 business and various utility functions. Absent the ability to share these resources,
11 Duke Energy Kentucky would have to maintain its own independent
12 organizations and systems, as well as cost responsibility, for various operations
13 including, but not limited to engineering, construction, operations and
14 maintenance, installation services, equipment testing, generation technical
15 support, environmental health and safety and procurement services, not to
16 mention, accounting, human resources, legal, and other necessary business
17 functions.

18 **Q. WHY IS THAT?**

19 A. Duke Energy Kentucky itself is relatively small in size. It has approximately
20 142,900 electric and approximately 100,000 gas customers. Because of its size,
21 the relationship between Duke Energy Kentucky and its parent, Duke Energy
22 Ohio, as well as its affiliated regulated and service companies have been
23 instrumental in allowing Duke Energy Kentucky to provide service to its

1 Kentucky customers at a reasonable price. The Company has benefitted from the
2 economies of scale that occur with being part of a larger corporate family that are
3 not present as a stand-alone entity. By sharing resources and personnel, Duke
4 Energy Kentucky is able to function as a lean utility without having to invest in its
5 own full-time corporate personnel and resources that are otherwise able to be
6 shared among a family of companies.

7 Throughout its history, Duke Energy Kentucky has benefitted from the
8 relationships with the families of companies of which it has been a member. Since
9 1945, Duke Energy Kentucky (f/k/a The Union Light Heat & Power Company)
10 has been a wholly owned subsidiary of Duke Energy Ohio (f/k/a/ The Cincinnati
11 Gas & Electric Company [CG&E]). The respective service territories of the two
12 utilities are contiguous and interconnected. The two companies have operated in
13 symmetry in terms of personnel and facilities and have shared in costs, equipment
14 and personnel, for more than seventy years.

15 With the creation of Cinergy Corp (Cinergy) in the mid 1990's, by way of
16 the merger of the CG&E with Public Service Indiana, to the merger between
17 Cinergy and Duke Power in 2006, followed by the merger of Duke Energy and
18 Progress Energy (Progress) in 2012, to the most recent merger between Duke
19 Energy and Piedmont Natural Gas Company (Piedmont), Duke Energy Kentucky
20 has benefitted from the pool of expert personnel resources and access to
21 equipment and expertise from its sister companies. Duke Energy Kentucky has
22 been able to share in common business functions rather than maintain its own
23 dedicated and thus duplicative functions. These shared functions include but are

1 not limited to, executive and management personnel, human resources,
2 accounting, tax, legal services, and engineering. Through the Utility Service
3 Agreement, Duke Energy Kentucky has also been able to take advantage of the
4 key personnel employed by its sister utilities, allowing the Company to take
5 advantage of the economies of scale and best practices that exist with an
6 organization the size of Duke Energy through shared expertise and resources.

7 **Q. HAVE THERE BEEN ANY CHANGES TO THESE AGREEMENTS**
8 **SINCE THE TIME OF THE COMPANY'S LAST NATURAL GAS RATE**
9 **CASE IN 2018 OR ITS MOST RECENT ELECTRIC RATE CASE IN**
10 **2017?**

11 A. There are regular and normal updates that occur to these agreements to reflect
12 changes in the Duke Energy corporate structure. Companies are routinely
13 dissolved and are eliminated from some of the agreements. Duke Energy
14 Kentucky routinely files updates to these agreements when there are material
15 changes and also as part of its annual reporting. These agreements are included in
16 the Appendix to the Company's Cost Allocation Manual that is routinely
17 submitted to the Commission annually in March.

18 Since the time of the Company's last electric base rate case in 2017, there
19 have been changes to these agreements primarily to reflect the addition or
20 removal of the parties (affiliated companies) to these agreements. As a result of
21 these and other additions and deletions to the service agreement participants,
22 allocations (direct and indirect) between and among the parties have also changed

1 over the years. There have not been any substantial changes to these agreements
2 since the Company's recently concluded electric base rate case, 2017-00321.

3 **Q. PLEASE BRIEFLY DESCRIBE THE DEBS AGREEMENT.**

4 A. This agreement permits DEBS to provide services that are corporate or general
5 utility in nature and are used by various business units, including Duke Energy
6 Kentucky. In general, the services provided by the service companies include, but
7 are not limited to the following:

- Information Systems;
- Meters; Transportation;
- System Maintenance;
- Marketing and Customer Relations;
- Transmission and Distribution Engineering and Construction;
- Power and Gas Engineering and Construction;
- Human Resources;
- Supply Chain;
- Facilities;
- Accounting;
- Power and Gas Planning and Operations;
- Public Affairs;
- Legal;
- Rates;
- Finance;
- Rights of Way;
- Internal Auditing;
- Environmental, Health and Safety;
- Fuels;
- Investor Relations;
- Planning; and
- Executive.

8 By the terms of the DEBS Service Agreement, compensation for any service
9 rendered by the DEBS to its utility affiliates is the fully embedded cost thereof
10 (*i.e.*, the sum of: (i) direct costs; (ii) indirect costs; and (iii) costs of capital),
11 except to the extent otherwise required by Section 482 of the Internal Revenue
12 Code. Each client company is required to reasonably cooperate with each
13 respective service provider to record billings and payments in their common
14 accounting systems. The affiliate companies receiving services from DEBS are
15 referred to as "Client Companies".

1 **Q. PLEASE BRIEFLY DESCRIBE THE OPERATING COMPANY SERVICE**
2 **AGREEMENT AND ITS HISTORY.**

3 A. Like the DEBS Service Agreement, the Operating Company Service Agreement
4 has been in place in some form for decades. Under this agreement, Duke Energy
5 Kentucky and its utility affiliates, Duke Energy Carolinas LLC., (Duke Energy
6 Carolinas), Duke Energy Ohio, Duke Energy Indiana, LLC., (Duke Energy
7 Indiana), Duke Energy Progress, LLC., Duke Energy Florida, LLC., and
8 Piedmont, are permitted to provide and receive services to and from each other in
9 the normal course of conducting business at the providing company's fully
10 embedded cost. This agreement was most recently approved by the Commission
11 on June 1, 2017, in Case No 2016-00312 reflecting the addition of Piedmont.
12 Prior to that, the agreement was reviewed and approved by the Commission on
13 August 2, 2011, in Case No 2011-00124, as part of the merger of Duke Energy
14 Corporation and Progress. A copy of this agreement included as Attachment JRS-
15 2. The services which may be provided between affiliate operating companies
16 may include, but are not limited to the following:

- Engineering and Construction;
- Operations and Maintenance;
- Installation Services;
- Equipment Testing;
- Generation Technical Support;
- Environmental, Health and Safety;
- Customer Operations; and
- Procurement Services.

17 By the terms of the Operating Company Service Agreement,
18 compensation for any service rendered between utility affiliates is the fully
19 embedded cost thereof (*i.e.*, the sum of: (i) direct costs; (ii) indirect costs; and (iii)
20 costs of capital), except to the extent otherwise required by Section 482 of the
21 Internal Revenue Code. Each client company is required to reasonably cooperate

1 with each respective service provider to record billings and payments in their
2 common accounting systems.

3 **Q. PLEASE DESCRIBE THE TWO NON-UTILITY SERVICE**
4 **AGREEMENTS.**

5 A. Duke Energy Kentucky is a party to two service agreements that identify services
6 and cost allocations between the Company and its non-utility affiliates. The
7 distinction between these two agreements is due to timing in relation to FERC
8 Orders and the types of pricing for the provision of services allowed therein.

9 Under the Cost-Based Non-Utility Service Agreement, Duke Energy
10 Kentucky and certain of its non-utility affiliates are authorized to provide certain
11 services to one another, priced at the providing company's fully embedded cost. A
12 copy of this agreement is included in Attachment JRS-3. This agreement was last
13 approved by the Commission on November 27, 2005, in Case No 2005-00228, as
14 part of the merger of Duke Energy Corporation and Cinergy Corp. The permitted
15 services provided by Duke Energy Kentucky to certain of its non-utility affiliates
16 may include, but are not limited to the following:

- Engineering and Construction;
- Operations and Maintenance;
- Installation Services;
- Equipment testing;
- Generation Technical Support;
- Environmental, Health and Safety; and
- Procurement Services.

1 The types of services that may be provided by certain non-utility affiliates to
2 Duke Energy Kentucky, include, but are not limited to, the following:

- Information Technology Services;
- Monitoring;
- Surveying;
- Inspecting;
- Constructing;
- Locating and Marking of Overhead and Underground Utility Facilities;
- Meter Reading;
- Materials Management;
- Vegetation Management;
and
- Marketing and Customer Relations.

3 By the terms of the Cost-Based Non-Utility Agreement, requests for services will
4 be made in writing, in substantially the same form as set forth in “Exhibit A” of
5 the Agreement. Compensation for any service rendered between Duke Energy
6 Kentucky and its non-utility affiliates are the fully embedded cost thereof (*i.e.*, the
7 sum of: (i) direct costs; (ii) indirect costs; and (iii) costs of capital), except to the
8 extent otherwise required by Section 482 of the Internal Revenue Code. The non-
9 utility affiliates that are parties to this agreement are limited to those that existed
10 prior to FERC’s February 2008 Order 707 (Order 707) that expanded FERC’s
11 asymmetrical pricing rules to include transfers of non-power goods and services
12 between a franchised utility and its non-utility affiliates.

13 Non-utility companies that became affiliates of Duke Energy Kentucky
14 after Order 707 are subject to a different service agreement, the Asymmetric Non-
15 Utility Service Agreement, included as Attachment JRS-4. The Asymmetric Non-
16 Utility Service Agreement was created in response to Order 707. The non-utility
17 affiliates who are parties to this agreement are subject to the asymmetric pricing
18 requirements of FERC, which is also consistent with Kentucky’s own default
19 affiliate pricing requirements. Duke Energy Kentucky provides (non-tariffed)

1 goods or services to a Party to this agreement at the greater of cost or market, but
2 pays the lesser of cost or market for any goods or services received under this
3 agreement.

4 **Q. CAN YOU PLEASE EXPLAIN WHAT CHANGED WITH THE FERC 707**
5 **ORDER?**

6 A. It is my understanding that prior to Order 707, FERC's asymmetrical pricing rules
7 only applied to transfers of non-power goods and services between franchised
8 utilities and nonregulated utility affiliates. However, following the Order 707
9 ruling, FERC's asymmetric pricing requirements were extended to all transactions
10 between utilities and their non-utility affiliates. This asymmetric pricing
11 requirement excluded services provided by service companies or services between
12 and among regulated utility affiliates. The Order 707 ruling also provided a
13 grandfathering exception to the asymmetric pricing for pre-existing service
14 agreements between regulated utilities and their non-regulated non-utility
15 affiliates, as well as, state affiliate pricing rules that are stricter than FERC's
16 pricing restrictions.

17 In short, the Asymmetric Non-Utility Agreement was entered into in
18 response to FERC Order 707 and includes new affiliates that were created after
19 the effective date of Order 707 and that are not grandfathered as parties under the
20 Cost-Based Non-Utility Service Agreement. The Cost-Based Non-Utility
21 Agreement remains unchanged since the issuance of Order 707, except to reflect
22 the dissolution of non-utility companies that were at one time a party. No new

1 companies have been added to that Cost-Based Non-Utility Agreement since the
2 Order 707.

3 **Q. PLEASE EXPLAIN HOW SERVICES BETWEEN DUKE ENERGY**
4 **KENTUCKY AND ITS AFFILIATES THAT ARE NOT COVERED BY**
5 **THE AFOREMENTIONED SERVICE AGREEMENTS ARE PRICED?**

6 A. Non-covered services, as well as non-utility affiliates that are not a party to the
7 Cost-based Non-Utility Service Agreement, must follow Kentucky's stricter
8 asymmetric pricing for any transaction with Duke Energy Kentucky unless
9 Commission approval and a waiver is first obtained.

10 **Q. PLEASE EXPLAIN AND DESCRIBE THE ASSET TRANSFER**
11 **AGREEMENT.**

12 A. This agreement permits the transfer of assets between and among Duke Energy
13 Kentucky and its regulated utility affiliates, excluding commodities, at the
14 transferring company's fully-allocated cost, subject to certain limitations. This
15 agreement was most recently approved by the Commission on June 1, 2017, in
16 Case No. 2016-00312, to reflect the addition of Piedmont. Prior to that, the
17 Commission approved the agreement on August 2, 2011, in Case No. 2011-
18 00124, as part of the merger of Duke Energy Progress Energy. A copy of this
19 agreement is included as Attachment JRS-5.

1 **Q. ARE THERE ANY LIMITATIONS APPLICABLE TO TRANSACTIONS**
2 **INVOLVING DUKE ENERGY KENTUCKY UNDER THE ASSET**
3 **TRANSFER AGREEMENT?**

4 A. The Commission approved this agreement under several conditions, including
5 that:

- 6 • Duke Energy Kentucky agrees that it would continue to seek
7 Commission approval under KRS 278.218 over all transactions
8 involving Duke Energy Kentucky assets that have an original book
9 value of over \$1,000,000 and that are to be transferred for reasons
10 other than obsolescence or if the parts are to be used to continue to
11 provide service to the utility customers;
- 12 • Duke Energy Kentucky agree to abide by the KRS 278.218 approval
13 threshold for transfers involving its natural gas assets; and
- 14 • Duke Energy Kentucky maintains a list of all transactions under the
15 Intercompany Asset Transfer Agreement in its Cost Allocation Manual
16 (CAM).

17 **Q. DOES DUKE ENERGY KENTUCKY MAINTAIN THE LIST OF**
18 **TRANSACTIONS IN ITS CAM?**

19 A. Yes. The Company submits those transactions to the Commission annually each
20 March as part of an annual CAM update.

III. COST ALLOCATIONS

A. OVERVIEW OF COST ALLOCATIONS

1 **Q. PLEASE DESCRIBE WHAT IS MEANT BY THE TERM “COST”.**

2 A. “Cost”, as used in the Utility Service Agreement and Non-Utility Service
3 Agreement, means fully embedded cost, which is the sum of: (1) direct costs; (2)
4 indirect costs; and (3) cost of capital. Direct costs include labor, material and
5 other expenses incurred specifically for a particular service and any associated
6 loadings. Indirect costs include labor, material and other expenses, and any
7 associated loadings that cannot be directly identified with any particular service.
8 Indirect costs include, but are not limited to, overhead costs, administrative
9 support costs, and taxes. Cost of capital represents financing costs, including, but
10 not limited to, interest on debt and a fair return on equity to shareholders.

11 **Q. PLEASE DESCRIBE THE COST ALLOCATIONS THAT AFFECT DUKE**
12 **ENERGY KENTUCKY AND ITS AFFILIATES?**

13 A. In general, there are four primary categories of cost allocations that affect Duke
14 Energy Kentucky and its affiliates: (1) cost allocations from DEBS; (2) cost
15 allocations between Duke Energy Kentucky and Duke Energy Ohio for common
16 costs shared by Duke Energy Ohio and Duke Energy Kentucky; (3) cost
17 allocations for goods and services provided between and among Duke Energy
18 Kentucky and its sister regulated utilities; and (4) administrative and general
19 (A&G) cost allocations between its gas and electric operations for both capital
20 and expense accounts.

1 Duke Energy Kentucky also provides various services and goods to and
2 receives various services and goods from its regulated and non-regulated affiliates
3 as set forth in various service agreements I previously described.

4 **Q. WHAT ARE “LOADINGS”?**

5 A. “Loadings” represent costs that are incurred and aggregated in “cost pools”,
6 which are then subsequently “loaded” out to specific entities and projects by
7 attaching an additional charge (loading rate) to the associated direct cost. Duke
8 Energy’s loadings include fringe benefits (*e.g.*, medical, dental, pension,
9 postretirement), indirect labor (*e.g.*, vacation, holiday, sick-time), stores, freight
10 and handling (*e.g.*, material management labor, freight), transportation (*e.g.*,
11 vehicle leases, fuel, oil), and payroll taxes (*e.g.*, Federal Insurance Contributions
12 Act (FICA) taxes, and state and federal unemployment taxes). Loading rates are
13 determined through annual studies of both actual and budgeted information and
14 are calculated by dividing the anticipated component costs by anticipated labor
15 cost, material issues, or vehicle utilization, as applicable.

B. COST ALLOCATIONS UNDER THE SERVICE AGREEMENTS

16 **Q. PLEASE DESCRIBE HOW COSTS INCURRED BY DEBS ARE**
17 **ACCOUNTED FOR UNDER THE SERVICE AGREEMENTS.**

18 A. DEBS maintains an accounting system in which all of its costs are accumulated.
19 These costs are charged to the appropriate Client companies monthly, using one
20 of the three approved methods of assignment.

1 **Q. WHAT ARE THE APPROVED METHODS OF ASSIGNMENT?**

2 A. The approved methods of assignment are: (1) directly assignable; (2)
3 distributable; and (3) allocable.

4 **Q. PLEASE DESCRIBE EACH METHOD OF ASSIGNMENT.**

5 A. The directly assignable basis of cost assignment is utilized to directly charge costs
6 for services specifically performed for a single Client company. The distributable
7 cost assignment method is used to assign costs for services rendered specifically
8 for two or more Client companies. The allocable method of assignment is used to
9 allocate costs for services of a general nature, which are applicable to all Client
10 companies or to a class or classes of Client companies.

11 **Q. WHAT TYPES OF EXPENDITURES ARE DIRECTLY ASSIGNED FROM**
12 **DEBS TO DUKE ENERGY KENTUCKY?**

13 A. DEBS employees who work on a project specifically for Duke Energy Kentucky
14 charge their labor and expenses directly to Duke Energy Kentucky. For example,
15 the legal services function will charge Duke Energy Kentucky directly for work
16 performed specifically for Duke Energy Kentucky. This is determined by the
17 number of hours spent on jurisdictional activities.

18 **Q. PLEASE EXPLAIN THE ALLOCABLE CHARGES FROM DEBS TO**
19 **DUKE ENERGY KENTUCKY.**

20 A. Allocable charges to Duke Energy Kentucky are for a portion of expenditures
21 originating on DEBS' books that are applicable to Duke Energy Kentucky and
22 one or more other Client Companies, but which are not directly assignable to
23 Duke Energy Kentucky. These charges are allocated to Duke Energy Kentucky

1 based on allocation ratios set forth in Appendix A of the DEBS Service
2 Agreement. For example, costs related to Investor Relations activities are
3 applicable to all Duke Energy affiliates but cannot be directly charged to any one
4 affiliate. Those costs are allocated to all affiliates using the allocation factor
5 described for the Investor Relations Function in Appendix A of the DEBS Service
6 Agreement.

7 **Q. WHAT ARE THE ALLOCATION METHODS SPECIFIED IN APPENDIX**
8 **A OF THE DEBS SERVICE AGREEMENT?**

9 A. Twenty (20) allocation ratios are specified in the Utility Service Agreement.
10 These ratios are the: (1) Sales Ratio; (2) Electric Peak Load Ratio; (3) Number of
11 Customers Ratio; (4) Number of Employees Ratio; (5) Construction-Expenditures
12 Ratio; (6) Miles of Electric Distribution Lines Ratio; (7) Circuit Miles of Electric
13 Transmission Lines Ratio; (8) Millions of Instructions Per Second Ratio; (9)
14 Revenues Ratio; (10) Inventory Ratio; (11) Procurement Spending Ratio; (12)
15 Square Footage Ratio; (13) Gross Margin Ratio; (14) Labor Dollars Ratio; (15)
16 Number of Personal Computer Work Stations Ratio; (16) Number of Information
17 Systems Servers Ratio; (17) Total Property, Plant and Equipment Ratio; (18)
18 Generating Unit MW Capability Ratio; (19) Number of Meters Ratio; and (20)
19 O&M Expenditures Ratio.

20 **Q. WHAT WAS THE RATIONALE BEHIND THE SELECTION OF THESE**
21 **RATIOS?**

22 A. Consistent with traditional cost causation principles, the ratios represent “cost
23 drivers” for a particular function (*i.e.*, those factors which are the greatest

1 contributors to costs). For example, costs related to human resources are allocated
2 based on the Number of Employees Ratio. Costs related to support of personal
3 computers are allocated based on the Number of Personal Computer Workstations
4 Ratio. Costs related to meter reading and to customer billing and payment
5 processing in the Marketing and Customer Relations Function are allocated based
6 on the Number of Customers Ratio. For some Functions, costs of a general nature
7 are allocated based on a weighted-average of more than one ratio. The DEBS
8 Service Agreement describes how the weighted-average ratios are calculated.

9 **Q. UNDER WHAT CIRCUMSTANCES ARE THE ALLOCATION RATIOS**
10 **SET FORTH IN APPENDIX A OF THE DEBS SERVICE AGREEMENT**
11 **USED TO DETERMINE CHARGES TO DUKE ENERGY KENTUCKY?**

12 A. The allocation ratios provided in Appendix A of the DEBS Service Agreement are
13 used to assign charges to Client Companies, including Duke Energy Kentucky,
14 for activities that cannot be charged directly. For example, costs associated with
15 the human resources function are allocated to the Client Companies, including
16 Duke Energy Kentucky, using the Number of Employees Ratio as provided in the
17 DEBS Service Agreement.

18 **Q. WHAT PROCESSES DO DEBS' EMPLOYEES FOLLOW IN**
19 **ALLOCATING THEIR TIME AND EXPENSES?**

20 A. All source documents (*e.g.*, time records, expense accounts, and journal entries)
21 applicable to DEBS require a special input code, "Operating Unit" (OU), to be
22 used. The initiating department determines the appropriate OU for each
23 transaction. The specific OU indicates whether the cost should be assigned

1 directly, distributed, or allocated, and it also determines the appropriate
2 percentage allocation to be used. Using the OU, the accounting system will
3 process each transaction and assign the appropriate costs to each respective Client
4 Company. For the allocable OUs, the percentage allocated to each Client
5 Company is determined periodically, at a minimum on an annual basis, by way of
6 a cost study.

7 **Q. PLEASE DESCRIBE FURTHER THE COST STUDY USED TO**
8 **DETERMINE THE OU ALLOCATION PERCENTAGES.**

9 A. On a periodic basis, but no less than annually, DEBS conducts a cost study,
10 applying the applicable data to the allocation ratios described in Appendix A to
11 the DEBS Service Agreement. From these cost studies, DEBS updates the
12 allocation percentages of each allocable OU to reflect the current underlying
13 foundation of the allocation ratios. For example, annually, the OU based on the
14 number of employees, which is primarily utilized by the human resources
15 function within DEBS, is updated to reflect the number of employees of each of
16 DEBS' affiliate companies.

17 **Q. WERE ANY AUDITS CONDUCTED OF DEBS?**

18 A. Yes. Duke Energy has conducted an internal audit of DEBS' cost allocations on a
19 regular basis. In addition, Duke Energy Kentucky agreed to a series of bi-annual
20 audits of its affiliate transactions as part of various merger commitments. The
21 final and most recently completed audit was submitted to the Commission on June
22 20, 2017. To date, these audit reports support that Duke Energy has adequate

1 processes in place for allocating costs and have not found any material or
2 significant deficiencies.

C. COST ALLOCATIONS FOR COMMON COSTS SHARED BY DUKE ENERGY KENTUCKY AND DUKE ENERGY OHIO

3 **Q. PLEASE EXPLAIN THE DIRECT CHARGES FROM DUKE ENERGY**
4 **OHIO TO DUKE ENERGY KENTUCKY?**

5 A. Direct charges from Duke Energy Ohio to Duke Energy Kentucky are for costs
6 such as employee labor, employee expenses, and inventory (material) transactions
7 which are specifically incurred for Duke Energy Kentucky's gas and/or electric
8 operations.

9 **Q. WHAT TYPES OF CHARGES ARE ALLOCATED TO DUKE ENERGY**
10 **KENTUCKY FROM DUKE ENERGY OHIO?**

11 A. Charges allocated to Duke Energy Kentucky from Duke Energy Ohio represent a
12 portion of costs originating on Duke Energy Ohio's books that apply to gas and/or
13 electric activities which cannot be charged directly and which apply to both Duke
14 Energy Kentucky and Duke Energy Ohio.

15 **Q. WHAT TYPES OF EXPENDITURES ARE CHARGED DIRECTLY**
16 **VERSUS ALLOCATED TO DUKE ENERGY KENTUCKY?**

17 A. The majority of common costs for Duke Energy Kentucky and Duke Energy Ohio
18 are direct charged to the appropriate affiliate. Expenditures incurred directly for a
19 specific project can be charged directly to Duke Energy Kentucky. A small
20 portion of common costs may be allocated to Duke Energy Kentucky from Duke
21 Energy Ohio. These costs include certain metering and customer related costs.

**D. COST ALLOCATIONS FOR COMMON COSTS
SHARED BY DUKE ENERGY KENTUCKY
AND DUKE ENERGY'S CAROLINA UTILITIES**

1 **Q. PLEASE EXPLAIN THE AFFILIATE CHARGES FROM DUKE ENERGY**
2 **CAROLINAS AND DUKE ENERGY PROGRESS TO DUKE ENERGY**
3 **KENTUCKY?**

4 A. As part of the Duke Energy Progress Energy merger certain employees who were
5 engaged in core utility functions that primarily supported the Carolina utilities
6 were transferred in 2013 from DEBS into one of the Carolina utilities. While
7 these employees primarily support the Carolinas, they also provide support to
8 other jurisdictions including Duke Energy Kentucky. As a result of the transfer of
9 employees there was an increase in charges from the Carolinas that was
10 previously incurred from DEBS.

11 **Q. WHAT TYPES OF CHARGES ARE ALLOCATED TO DUKE ENERGY**
12 **KENTUCKY FROM DUKE ENERGY'S CAROLINA UTILITIES?**

13 A. Charges allocated to Duke Energy Kentucky from Duke Energy's Carolina
14 utilities represent a portion of costs originating on the Carolina Utilities books that
15 apply to electric and/or gas activities which cannot be charged directly and apply
16 to multiple Duke Energy jurisdictions including Duke Energy Kentucky.

17 **Q. WHAT TYPES OF EXPENDITURES ARE CHARGED DIRECTLY**
18 **VERSUS ALLOCATED TO DUKE ENERGY KENTUCKY?**

19 A. The majority of common costs for Duke Energy Kentucky and Duke Energy's
20 Carolina utilities are direct charged to the appropriate affiliate. Expenditures
21 incurred directly for a specific project can be charged directly to Duke Energy

1 Kentucky. A small portion of common costs are allocated to Duke Energy's
2 utilities from the Carolina's including Duke Energy Kentucky. These costs are
3 primarily customer operations related, but also include smaller amounts for
4 engineering, construction, operation, maintenance and fuel purchasing related
5 costs.

**E. A&G COST ALLOCATIONS BETWEEN DUKE ENERGY KENTUCKY'S
GAS AND ELECTRIC OPERATIONS**

6 **Q. WHAT TYPES OF EXPENDITURES ARE CHARGED DIRECTLY**
7 **VERSUS ALLOCATED TO DUKE ENERGY KENTUCKY GAS OR**
8 **ELECTRIC OPERATIONS?**

9 A. Most expenditures incurred directly for a specific project can be charged directly
10 to a gas or an electric account. Certain administrative costs for general support
11 functions, such as Accounts Payable and Accounting, are common to both gas and
12 electric operations, and must be allocated. In addition, a portion of those costs is
13 also capitalized.

14 **Q. HOW HAVE THE ALLOCATION BASES FOR A&G EXPENDITURES**
15 **BEEN DETERMINED?**

16 A. To the extent that costs cannot be directly charged to gas and/or electric expense,
17 they are allocated using a subset of the bases specified in the Operating Company
18 Service Agreement. Annually, a cost study is conducted, applying the applicable
19 data to this subset of allocation. From these cost studies, the allocation
20 percentages of each allocable OU is updated to reflect the current underlying
21 foundation of the allocation ratios. For example, annually, the OU based on the
22 labor dollars ratio, which is primarily utilized for employee related costs, is

1 updated to reflect the labor dollars in both the gas and electric functions of Duke
2 Energy Kentucky.

3 **Q. HOW IS THIS INFORMATION USED TO DETERMINE ASSIGNMENT**
4 **OF COMMON A&G COSTS?**

5 A. The cost allocation process for common A&G expenditures allocates costs based
6 on statistical data that best relates to the specific activity to be allocated. For
7 example employee related costs to be allocated are distributed based on the labor
8 dollars ratio.

9 **Q. WERE THE CURRENT ALLOCATION PROCESSES YOU DESCRIBED**
10 **REFLECTED IN THE FORECASTED TEST PERIOD OF THIS CASE?**

11 A. Yes.

12 **Q. DO YOU ANTICIPATE THE COST ALLOCATION PROCESSES TO**
13 **HAVE A MATERIAL IMPACT TO THE AMOUNT OF EXPENDITURES**
14 **ALLOCATED TO DUKE ENERGY KENTUCKY'S ELECTRIC**
15 **OPERATIONS ON AN ONGOING BASIS?**

16 A. No. Many of the allocation factors are the same as the previous allocation factors.
17 All of the allocation factors have been developed with the intent of assigning
18 costs consistent with cost causation. Given that objective, I do not anticipate a
19 material impact to the amount of expenditures allocated to Duke Energy
20 Kentucky's electric operations.

IV. SCHEDULES AND FILING REQUIREMENTS
SPONSORED BY WITNESS

1 **Q. PLEASE DESCRIBE FR 16(7)(u).**

2 A. FR 16(7)(u) contains the affiliate allocations during the base year, forecasted test
3 year and previous three calendar years.

4 **Q. PLEASE DESCRIBE FR 16(7)(u), PAGES 1 AND 2 OF 5.**

5 A. FR 16(7)(u), pages 1 and 2 of 5, outline the service functions and methods used
6 during the test year according to the Operating Company Service and Cost-based
7 Non-Utility Service Agreements to allocate costs that could not be charged
8 directly by DEBS to the regulated and non-regulated Duke Energy affiliates,
9 including Duke Energy Kentucky. FR 16(7)(u), page 2(a) of 5, summarizes the
10 total amount of expenditures charged from DEBS to Duke Energy Kentucky for
11 the three years ended December 31, 2016, 2017, and 2018, and for the base period
12 and the forecasted test period which include the twelve-month periods ending
13 November 30, 2019, and March 31, 2021, respectively.

14 **Q. ARE THE ALLOCATION METHODS LISTED IN FR 16(7)(u), PAGE 2**
15 **OF 5 THE SAME COST ALLOCATION METHODS CONTAINED IN**
16 **THE UTILITY SERVICE AGREEMENT APPROVED FOR USE IN 2010?**

17 A. The allocation methods listed in FR 16(7)(u), page 2 of 5, are the 20 allocation
18 methods contained in the current Utility Service Agreement.

1 **Q. PLEASE BRIEFLY DESCRIBE FR 16(7)(u), PAGES 2(a) OF 5.**

2 A. FR 16(7)(u), page 2(a) of 5, provides the bases used to allocate common charges
3 between DEBS and Duke Energy Kentucky. FR 16(7)(u), page 2(a) identifies 12
4 allocation methods used during the test period to allocate to Duke Energy
5 Kentucky Electric which are either specifically identified or a combination of the
6 allocation methods identified on FR 16(7)(u) 2 of 5. FR 16(7)(u), page 2(a) of 5,
7 provides the amount of these costs allocated to Duke Energy Kentucky Electric
8 for the three years ended December 31, 2016, 2017 and 2018, for the base period,
9 and for the forecasted test period ending November 30, 2019, and March 31,
10 2021, respectively.

11 **Q. PLEASE BRIEFLY DESCRIBE FR 16(7)(u), PAGES 3 AND 3(a) OF 5.**

12 A. FR 16(7)(u), page 3 of 5, describes the process for assigning costs between Duke
13 Energy Ohio and Duke Energy Kentucky which originate on Duke Energy Ohio's
14 books and are directly assigned or allocated to Duke Energy Kentucky. FR
15 16(7)(u), page 3(a) of 5, provides the bases used to allocate charges and the
16 amount of these costs allocated to Duke Energy Kentucky for the three years
17 ended December 31, 2016, 2017 and 2018, for the base period, and for the
18 forecasted test period ending November 30, 2019, and March 31, 2021,
19 respectively.

20 **Q. PLEASE BRIEFLY DESCRIBE FR 16(7)(u), PAGES 4 AND 4(a) OF 5.**

21 A. FR 16(7)(u), page 4 of 5, describes the purpose and process for assigning costs
22 between Duke Energy Carolina, Duke Energy Progress and Duke Energy
23 Kentucky, which originate on Duke Energy's Carolina utilities books and are

1 directly assigned or allocated to Duke Energy Kentucky. FR 16(7)(u), page 4(a)
2 of 5, provides the bases used to allocate charges and the amount of these costs
3 allocated to Duke Energy Kentucky for the three years ended December 31, 2016,
4 2017 and 2018, for the base period, and for the forecasted test period ending
5 November 30, 2019, and March 31, 2021, respectively.

6 **Q. PLEASE BRIEFLY DESCRIBE FR 16(7)(u), PAGES 5 AND 5(a) OF 5.**

7 A. FR 16(7)(u), page 5 of 5, provides the bases used to allocate A&G charges
8 between gas and electric operations for those items that cannot be directly
9 charged. FR 16(7)(u), page 5(a) of 5, summarizes the total amount of A&G
10 expenditures allocated between gas and electric A&G expense accounts for the
11 three years ended December 31, 2016, 2017 and 2018, for the base period, and the
12 forecasted test period ending November 30, 2019, and March 31, 2021,
13 respectively.

14 **Q. ARE THE ALLOCATIONS INDICATED ON FR 16(7)(u), PAGE 5 OF 5**
15 **USED TO DETERMINE ALL CHARGES THAT SHOULD BE**
16 **RECORDED TO GAS AND ELECTRIC OPERATIONS FOR BOTH**
17 **CAPITAL AND EXPENSE ACCOUNTS?**

18 A. No. Expenditures applicable to gas or electric operations are charged directly
19 whenever possible. For example, employees performing work on a specific
20 project will charge directly to the appropriate gas and/or electric expense or
21 capital account.

1 **Q. IN YOUR OPINION, ARE THE ALLOCATION FACTORS AND COSTS**
2 **ASSIGNED TO DUKE ENERGY KENTUCKY REASONABLE?**

3 A. Yes. These costs are reasonable. All costs are assigned and allocated in
4 compliance with these agreements. The Duke Energy and the Company's
5 accounting processes are audited and verified to ensure that costs are properly
6 assigned and allocated. The amount of costs that are being allocated to Duke
7 Energy Kentucky are consistent with what the Company would otherwise
8 experience if it did not have the benefit of being a part of a larger family of
9 utilities. In fact, based upon the Duke Energy market research for determining
10 salaries for shared and utility employees, the costs of common business functions
11 that are allocated to Duke Energy Kentucky and shared among all affiliated
12 companies result in a lower overall cost to the individual companies than if they
13 had to maintain separate and duplicative individual functions.

14 **Q. DID YOU PROVIDE ANY INFORMATION TO OTHER WITNESSES**
15 **FOR THEIR USE IN THIS PROCEEDING?**

16 A. Yes, I supplied Mr. Jacobi with the allocation factors in effect for his use in
17 developing the forecasted financial data.

V. CONCLUSION

1 Q. WERE ATTACHMENTS JRS-1, JRS-2, JRS-3, JRS-4, JRS-5, THE
2 INFORMATION YOU PREPARED FOR MR. JACOBI AND FR 16(7)(u)
3 PREPARED BY YOU OR UNDER YOUR SUPERVISION?

4 A. Yes.

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

6 A. Yes.

**SERVICE COMPANY
UTILITY SERVICE AGREEMENT**

This Service Company Utility Service Agreement (this "Agreement") is by and among Duke Energy Carolinas, LLC ("DEC"), a North Carolina limited liability company, Duke Energy Ohio, Inc., an Ohio corporation ("DEO"), Duke Energy Indiana, LLC an Indiana limited liability company ("DEI"), Duke Energy Kentucky, Inc., a Kentucky corporation ("DEK"), Duke Energy Progress, LLC, a North Carolina limited liability company ("DEP"), Piedmont Natural Gas Company, Inc., a North Carolina corporation ("Piedmont"), Duke Energy Florida, LLC ("DEF"), a Florida limited liability company, and Duke Energy Business Services LLC ("DEBS"), a Delaware limited liability company. DEBS is sometimes hereinafter referred to as a "Service Company." DEC, DEO, DEI, DEK, DEP, DEF, and Piedmont are sometimes hereinafter referred to individually as a "Client Company" and collectively as the "Client Companies". The Effective Date as stated herein is the date on which this Agreement is executed or, as may be required, submitted to the appropriate regulatory body for approval, whichever occurs last. This Agreement supersedes and replaces in its entirety all previous Service Company Utility Service Agreements dated before the Effective Date of this Agreement.

WITNESSETH

WHEREAS, each of the Client Companies and the Service Company are direct or indirect subsidiaries of Duke Energy Corporation;

WHEREAS, the Service Company and the Client Companies have entered into this Agreement whereby the Service Company agrees to provide and the Client Companies agree to accept and pay for various services as provided herein at cost, except to the extent otherwise required by Section 482 of the Internal Revenue Code; and

WHEREAS, economies and efficiencies benefiting the Client Companies will result from the performance by the Service Company of services as herein provided;

NOW, THEREFORE, in consideration of the premises and the mutual agreements herein contained, the parties to this Agreement covenant and agree as follows:

ARTICLE I – SERVICES

Section 1.1 The Service Company shall furnish to the Client Companies, upon the terms and conditions hereinafter set forth, such of the services described in Appendix A hereto, at such times, for such periods and in such manner as the Client Companies may from time to time request and which the Service Company concludes it is equipped to perform. The Service Company shall also provide Client Companies with such special services, including without limitation cost management services, in addition to those services described in Appendix A hereto, as may be requested by a Client Company and which the Service Company concludes it is equipped to perform. In supplying such services, the Service Company may (i) arrange, where it deems appropriate, for the services of such experts, consultants, advisers and other persons with necessary qualifications as are required for or pertinent to the rendition of such services, and (ii) tender payments to third parties as agent for and on behalf of Client Companies, with such charges being passed through to the appropriate Client Companies.

Section 1.2 Each of the Client Companies shall take from the Service Company such of the services described in Section 1.1 and such additional general or special services, whether or not now contemplated, as are requested from time to time by the Client Companies and which the Service Company concludes it is equipped to perform.

Section 1.3 The services described herein shall be directly assigned, distributed or allocated by activity, process, project, responsibility center, work order or other appropriate basis. A Client Company shall have the right from time to time to amend, alter or rescind any activity, process, project, responsibility center or work order, provided that (i) any such amendment or alteration which results in a material change in the scope of the services to be performed or equipment to be provided is agreed to by the Service Company, (ii) the cost for the services covered by the activity, process, project, responsibility center or work order shall include any expense incurred by the Service Company as a direct result of such amendment, alteration or rescission of the activity, process, project, responsibility center or work order, and (iii) no amendment, alteration or rescission of an activity, process, project, responsibility center or work order shall release a Client Company from liability for all costs already incurred by or contracted for by the Service Company pursuant to the activity, process, project, responsibility center or work order, regardless of whether the services associated with such costs have been completed.

Section 1.4 The Service Company shall maintain a staff trained and experienced in the design, construction, operation, maintenance and management of public utility properties.

ARTICLE II - COMPENSATION

Section 2.1 Except to the extent otherwise required by Section 482 of the Internal Revenue Code, as compensation for the services to be rendered hereunder, each of the Client Companies shall pay to the Service Company all costs which reasonably can be identified and related to particular services performed by the Service Company for or on its behalf. Where more than one Client Company is involved in or has received benefits from a service performed, costs will be directly assigned, distributed or allocated, as set forth in Appendix A hereto, between or among such companies on a basis reasonably related to the service performed to the extent reasonably practicable.

Section 2.2 The method of assignment, distribution or allocation of costs described in Appendix A shall be subject to review annually, or more frequently if appropriate. Such method of assignment, distribution or allocation of costs may be modified or changed by the Service Company without the necessity of an amendment to this Agreement, provided that in each instance, all services rendered hereunder shall be at actual cost thereof, fairly and equitably assigned, distributed or allocated, except to the extent otherwise required by Section 482 of the Internal Revenue Code. The Service Company shall promptly advise the Client Companies of any material changes in such method of assignment, distribution or allocation. As appropriate, the Client Companies shall advise the North Carolina Utilities Commission ("NCUC"), the Public Service Commission of South Carolina, the Florida Public Service Commission; the Indiana Utility Regulatory Commission, the Public Utilities Commission of Ohio, the Kentucky Public Service Commission, and the Tennessee Regulatory Authority ("the "Affected State Commissions") of any such changes. Such notice shall be in compliance with the requirements of applicable state law, regulations and regulatory conditions.

Section 2.3 The Service Company shall render a monthly statement to each Client Company which shall reflect the billing information necessary to identify the costs charged for that month. By the last day of each month, each Client Company shall remit to the Service Company all charges billed to it. For avoidance of doubt, the Service Company and each Client Company may satisfy the foregoing requirement by recording billings and payments required hereunder in their common accounting systems without rendering paper or electronic monthly statements or remitting cash payments.

Section 2.4 Subject to Section 482 of the Internal Revenue Code, it is the intent of this Agreement that the payment for services rendered by the Service Company to the Client Companies shall cover all the costs of its doing business (less the cost of services provided to affiliated companies not a party to

this Agreement and to other non-affiliated companies, and credits for any miscellaneous income items), including, but not limited to, salaries and wages, office supplies and expenses, outside services employed, property insurance, injuries and damages, employee pensions and benefits, miscellaneous general expenses, rents, maintenance of structures and equipment, depreciation and amortization and compensation for use of capital. Without limitation of the foregoing, "cost," as used in this Agreement, means fully embedded cost, namely, the sum of (1) direct costs, (2) indirect costs and (3) costs of capital.

ARTICLE III - TERM

Section 3.1 This Agreement is entered into as of the Effective Date and shall continue in force with respect to a Client Company until terminated by the Service Company and Client Company with respect to such Client Company (provided that no such termination with respect to less than all of the Client Companies shall thereby affect the term of this Agreement or any of the provisions hereof) or until terminated by unanimous agreement of all the parties then signatory to this Agreement.

ARTICLE IV – ACCOUNTS AND RECORDS

Section 4.1 The Service Company shall utilize the Uniform System of Accounts prescribed by the Federal Energy Regulatory Commission.

Section 4.2 The Service Company shall permit each Affected State Commission and applicable statutory utility consumer representative(s), together with other interested parties as required under applicable law, access to its accounts and records, including the basis and computation of allocations, necessary for each Affected State Commission to review a Client Company's operating results.

ARTICLE V – MISCELLANEOUS

Section 5.1 Counterparts. This Agreement may be executed in one or more counterparts, all of which shall be considered one and the same agreement and shall become effective when one or more counterparts have been signed by each party and delivered to the other parties.

Section 5.2 Entire Agreement; No Third Party Beneficiaries. This Agreement (including Appendix A and any other appendices or other exhibits or schedules hereto) (i) constitutes the entire agreement, and supersedes any prior agreements and understandings, both written and oral, among the parties with respect to the subject matter of this Agreement; and (ii) is not intended to confer upon any person other than the parties hereto any rights or remedies.

Section 5.3 Governing Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York, regardless of the laws that might otherwise govern under applicable principles of conflict of laws.

Section 5.4 Assignment. Neither this Agreement nor any of the rights, interests or obligations hereunder shall be assigned, in whole or in part, by operation of law or otherwise by any of the parties hereto without the prior written consent of each of the other parties. Any attempted or purported assignment in violation of the preceding sentence shall be null and void and of no effect whatsoever. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties and their respective successors and assigns.

Section 5.5 Amendments. This Agreement may not be amended except by an instrument in writing signed on behalf of each of the parties. To the extent that applicable state law or regulation or other binding obligation requires that any such amendment be filed with any Affected State Commission for its review

or otherwise, each Client Company shall comply in all respects with any such requirements.

Section 5.6 Interpretation. When a reference is made in this Agreement to an Article, Section or Appendix or other Exhibit, such reference shall be to an Article or Section of, or an Appendix or other Exhibit to, this Agreement unless otherwise indicated. The headings contained in this Agreement are for convenience of reference only and shall not affect in any way the meaning or interpretation of this Agreement. Whenever the words “include”, “includes” or “including” are used in this Agreement, they shall be deemed to be followed by the words “without limitation”. The words “hereof”, “herein” and “hereunder” and words of similar import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement. The definitions contained in this Agreement are applicable to the singular as well as the plural forms of such terms and to the masculine as well as to the feminine and neuter genders of such term. References to a person are also to its permitted successors and assigns.

Section 5.7 DEC, DEP, and Piedmont Conditions. In addition to the terms and conditions set forth herein, with respect to DEC and DEP, the provisions set out in Appendix B are hereby incorporated herein by reference. In addition, DEC’s, DEP’s, and Piedmont’s participation in this Agreement is explicitly subject to the Regulatory Conditions and Code of Conduct approved by the NCUC in its Order Approving Merger Subject to Regulatory Conditions and Code of Conduct issued, in NCUC Docket Nos. E-2, Sub 1095, E-7, Sub 1100, and G-9, Sub 682. In the event of any conflict between the provisions of this Agreement and the approved Regulatory Conditions and Code of Conduct provisions, the Regulatory Conditions and Code of Conduct shall govern.

IN WITNESS WHEREOF, the parties hereto have caused this Service Agreement to be executed as of _____, 201_.

DUKE ENERGY BUSINESS SERVICES LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY CAROLINAS, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY OHIO, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY INDIANA, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY KENTUCKY, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY PROGRESS, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY FLORIDA, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

PIEDMONT NATURAL GAS COMPANY, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Description of Services and Determination
of Charges for Services

I. The Service Company will maintain an accounting system for accumulating all costs on an activity, process, project, responsibility center, work order, or other appropriate basis. To the extent practicable, time records of hours worked by Service Company employees will be kept by activity, process, project, responsibility center or work order. Charges for salaries will be determined from such time records and will be computed on the basis of employees' labor costs, including the cost of fringe benefits, indirect labor costs and payroll taxes. Records of employee-related expenses and other indirect costs will be maintained for each functional group within the Service Company (hereinafter referred to as "Function"). Where identifiable to a particular activity, process, project, responsibility center or work order, such indirect costs will be directly assigned to such activity, process, project, responsibility center or work order. Where not identifiable to a particular activity, process, project, responsibility center or work order, such indirect costs within a Function will be distributed in relationship to the directly assigned costs of the Function. For purposes of this Appendix A, any costs not directly assigned or distributed by the Service Company will be allocated monthly.

II. Service Company costs accumulated for each activity, process, project, responsibility center or work order will be directly assigned, distributed, or allocated to the Client Companies or other Functions within the Service Company as follows:

1. Costs accumulated in an activity, process, project, responsibility center or work order for services specifically performed for a single Client Company or Function will be directly assigned and charged to such Client Company or Function.

2. Costs accumulated in an activity, process, project, responsibility center or work order for services specifically performed for two or more Client Companies or Functions will be distributed among and charged to such Client Companies or Functions. The appropriate method of distribution will be determined by the Service Company on a case-by-case basis consistent with the nature of the work performed and will be based on the application of one or more of the methods described in paragraphs IV and V of this

Appendix A. The distribution method will be provided to each such affected Client Company or Function.

3. Costs accumulated in an activity, process, project, responsibility center or work order for services of a general nature which are applicable to all Client Companies or Functions or to a class or classes of Client Companies or Functions will be allocated among and charged to such Client Companies or Functions by application of one or more of the methods described in paragraphs IV and V of this Appendix A.

III. For purposes of this Appendix A, the following definitions or methodologies shall be utilized:

1. Where applicable, the following will be utilized to convert gas sales to equivalent electric sales: 1 cubic foot of gas sales equals 0.303048 kilowatt-hour of electric sales (based on electricity at 3412 Btu/kWh and natural gas at 1034 Btu/cubic foot).

2. "Domestic utility" refers to a utility which operates in the contiguous United States of America.

3. "Gross margin" refers to revenues as defined by Generally Accepted Accounting Principles, less cost of sales, including but not limited to fuel, purchased power, emission allowances and other cost of sales.

4. "Distribution" means electric distribution and local gas distribution as applicable.

5. "Distribution Lines" mean electric power lines at distribution voltages measured in circuit miles, and gas mains and lines, as applicable.

The weights utilized in the weighted average ratios in paragraph V of this Appendix A shall represent the percentage relationship of the activities associated with the function for which costs are to be allocated. For example, if an expense item is to be allocated on the weighted average of the Gross Margin Ratio, the Labor Dollars Ratio and the Total Property, Plant and Equipment ("PP&E") Ratio, and the activity to be allocated is one-third gross margin related, one-third labor related and one-third PP&E related, 33 percent of the Gross Margin Ratio would be utilized, 33 percent of the Labor Dollars Ratio and 34

percent of the PP&E Ratio would be utilized. To illustrate this application, assuming that the Gross Margin Ratio were 53.75 percent for Company A and 46.25 percent for Company B, the Labor Dollars Ratio were 25 percent for Company A and 75 percent for Company B, and the Total PP&E Ratio were 60 percent for Company A and 40 percent for Company B, the following weighted average ratio would be computed:

Activity	Weight	Company A		Company B	
		Ratio	Weighted	Ratio	Weighted
Gross Margin Ratio	33%	53.75%	17.74%	46.25%	15.26%
Labor Dollars Ratio	33%	25.00%	8.25%	75.00%	24.75%
Total Property, Plant and Equipment Ratio	<u>34%</u>	60.00%	<u>20.40%</u>	40.00%	<u>13.60%</u>
	100%		46.39%		53.61%

IV. The following allocation methods will be applied, as specified in paragraph V of this Appendix A, to assign costs for services applicable to two or more clients and/or to allocate costs for services of a general nature.

1. Sales Ratio

A ratio, based on the applicable domestic firm kilowatt-hour electric sales (and/or the equivalent cubic feet of gas sales, where applicable), excluding intra-system sales, for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all utility Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable), This ratio will be determined annually, or at such time as may be required due to a significant change.

2. Electric Peak Load Ratio

A ratio, based on the sum of the applicable monthly domestic firm electric maximum system demands for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all utility Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where

applicable). This ratio will be determined annually, or at such time as may be required due to a significant change.

3. Number of Customers Ratio

A ratio, based on the sum of the applicable domestic firm electric customers (and/or gas customers, where applicable) at the end of a recent month in the preceding twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all domestic utility Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually, or at such time as may be required due to a significant change.

4. Number of Employees Ratio

A ratio, based on the applicable number of employees at the end of a recent month in the preceding twelve consecutive month period, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be determined annually, or at such time as may be required due to a significant change.

5. Construction-Expenditures Ratio

A ratio, based on the applicable projected construction expenditures for the following twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). Separate ratios will be computed for total construction expenditures and appropriate functional plant (i.e., production, transmission, Distribution, and general) classifications. This ratio will be

determined annually, or at such time as may be required due to a significant change.

6. Miles of Distribution Lines Ratio

In the case of electric Distribution, a ratio, based on the applicable installed circuit miles of domestic electric Distribution Lines, and in the case of gas Distribution, a ratio, based on the applicable installed miles of domestic gas Distribution Lines, in either case at the end of the preceding calendar year, the numerator of which is for a Client Company and the denominator of which is for all domestic utility Client Companies. This ratio will be determined annually, or at such time as may be required due to a significant change.

7. Circuit Miles of Electric Transmission Lines Ratio

A ratio, based on the applicable installed circuit miles of domestic electric transmission lines at the end of the preceding calendar year, the numerator of which is for a Client Company and the denominator of which is for all domestic utility Client Companies. This ratio will be determined annually, or at such time as may be required due to a significant change.

8. Millions of Instructions Per Second Ratio

A ratio, based on the sum of the applicable number of millions of instructions per second (MIPS) used to execute mainframe computer software applications for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company or Service Company Function, and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be determined annually, or at such time as may be required due to a significant change.

9. Revenues Ratio

A ratio, based on the total applicable revenues for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually or at such time as may be required due to a significant change.

10. Inventory Ratio

A ratio, based on the total applicable inventory balance for the preceding year, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). Separate ratios will be computed for total inventory and the appropriate functional plant (i.e., production, transmission, Distribution, and general) classifications. This ratio will be determined annually or at such time as may be required due to a significant change.

11. Procurement Spending Ratio

A ratio, based on the total amount of applicable procurement spending for the preceding year, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. Separate ratios will be computed for total procurement spending and appropriate functional plant (i.e., production, transmission, Distribution, and general) classifications. This ratio will be determined annually or at such time as may be required due to a significant change.

12. Square Footage Ratio

A ratio, based on the total amount of applicable square footage occupied in a recent month in the preceding twelve consecutive month period, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be determined annually or at such time as may be required due to a significant change.

13. Gross Margin Ratio

A ratio, based on the total applicable gross margin for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually or at such time as may be required due to a significant change.

14. Labor Dollars Ratio

A ratio, based on the total applicable labor dollars for a preceding twelve consecutive calendar month period, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be determined annually or at such time as may be required due to a significant change.

15. Number of Personal Computer Work Stations Ratio

A ratio, based on the total number of applicable personal computer work stations at the end of a recent month in the preceding twelve consecutive month period, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be

determined annually or at such time as may be required due to a significant change.

16. Number of Information Systems Servers Ratio

A ratio, based on the total number of applicable servers at the end of a recent month in the preceding twelve consecutive month period, the numerator of which is for a Client Company or Service Company Function and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable) and/or the Service Company. This ratio will be determined annually or at such time as may be required due to a significant change.

17. Total Property, Plant and Equipment Ratio

A ratio, based on the total applicable Property, Plant and Equipment balance (net of accumulated depreciation and amortization) for the preceding year, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually or at such time as may be required due to a significant change.

18. Generating Unit MW Capability / Maximum Dependable Capacity (MDC)

Ratio A ratio, based on the total applicable installed megawatt capability for the preceding year, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually or at such time as may be required due to a significant change.

19. Number of Meters Ratio

A ratio, based on the number of electric and/or gas meters, as applicable, the numerator of which is for a Client Company and the denominator of

which is for all domestic utility Client Companies. Separate ratios will be computed for appropriate meter classifications (e.g., type of metering technology). This ratio will be determined annually, or at such time as may be required due to a significant change.

20. O&M Expenditures Ratio

A ratio, based on the operation and maintenance (O&M) expenditures for a prior twelve month period, the numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). Separate ratios will be computed for total O&M expenditures and appropriate functional plant (i.e., production, transmission, Distribution, and general) classifications. This ratio will be determined annually.

V. A description of each Function's activities, which may be modified from time to time by the Service Company, is set forth below in paragraph "a" under each Function. As described in paragraph II, "1" and "2" of this Appendix A, where identifiable, costs will be directly assigned or distributed to Client Companies or to other Functions of the Service Company. For costs accumulated in activities, processes, projects, responsibility centers, or work orders which are for services of a general nature that cannot be directly assigned or distributed, as described in paragraph II, "3" of this Appendix A, the method or methods of allocation are set forth below in paragraph "b" under each Function. For any of the functions set forth below other than Information Systems, Transportation, Human Resources or Facilities, costs of a general nature to be allocated pursuant to this Agreement shall exclude costs of a general nature which have been allocated to affiliated companies not a party to this Agreement. Substitution or changes may be made in the methods of allocation hereinafter specified, as may be appropriate, and will be provided to state regulatory agencies and to each Client Company. Any such substitution or changes shall be in compliance with the requirements of applicable state law, regulations and regulatory conditions.

1. Information Systems

a. Description of Function

Provides communications and electronic data processing services. The activities of the Function include:

- (1) Development and support of mainframe computer software applications.
- (2) Procurement and support of personal computers and related network and software applications.
- (3) Development and support of distributed computer software applications (e.g., servers).
- (4) Installation and operation of communications systems.
- (5) Information systems management and support services.

b. Method of Allocation

- (1) Development and support of mainframe computer software applications - allocated between the Client Companies and other Functions of the Service Company based on the number of Millions of Instructions per Second Ratio (MIPS).
- (2) Procurement and support of personal computers and related network and software applications - allocated to the Client Companies and to other Functions of the Service Company based on the Number of Personal Computer Work Stations Ratio.
- (3) Development and support of distributed computer software applications - allocated to the Client Companies and to other Functions of the Service Company based on the Number of Information Systems Servers Ratio.
- (4) Installation and operation of communications systems - allocated to the Client Companies and to other Functions of the Service Company based on the Number of Employees Ratio.
- (5) Information systems management and support services – allocated to the Client Companies and to other Functions of the Service Company based on the Number of Personal Computer Work Stations Ratio.

2. Meters

a. Description of Function

Procures, tests and maintains meters.

b. Method of Allocation

Allocated to the Client Companies based on the Number of Customers Ratio.

3. Transportation

a. Description of Function

(1) Procures and maintains vehicles and equipment.

(2) Procures and maintains aircraft and equipment.

b. Method of Allocation

(1) The costs of maintaining vehicles and equipment are allocated to the Client Companies and to other Functions of the Service Company based on the Number of Employees Ratio.

(2) The costs of maintaining aircraft and equipment are allocated to the Client Companies and to other Functions of the Service Company based on a weighted average of the Gross Margin Ratio, the Labor Dollars Ratio and the PP&E Ratio.

4. System Maintenance

a. Description of Function

Coordinates maintenance and support of electric transmission systems and Distribution systems.

b. Method of Allocation

(1) Services related to electric transmission systems - allocated to the Client Companies based on the Circuit Miles of Electric Transmission Lines Ratio.

(2) Services related to electric Distribution systems - allocated to the Client Companies based on the Miles of Distribution Lines Ratio.

(3) Services related to gas Distribution systems – allocated to the Client Companies based on the Labor Dollars Ratio.

5. Marketing and Customer Relations

a. Description of Function

Advises the Client Companies in relations with domestic utility customers.

The activities of the Function include:

- (1) Design and administration of sales and demand-side management programs.
- (2) Customer meter reading, billing and payment processing.
- (3) Customer services including the operation of call center.

b. Method of Allocation

- (1) Design and administration of sales and demand-side management programs - allocated to the Client Companies based on the Number of Customers Ratio.
- (2) Customer billing and payment processing - allocated to the Client Companies based on the Number of Customers Ratio.
- (3) Customer Services - allocated to the Client Companies based on the Number of Customers Ratio.

6. Transmission and Distribution Engineering and Construction

a. Description of Function

Designs and monitors construction of electric transmission and Distribution Lines and associated facilities. Prepares cost and schedule estimates, visits construction sites to ensure that construction activities coincide with plans, and administers construction contracts.

b. Method of Allocation

- (1) Transmission engineering and construction allocated to the Client Companies based on the Electric Transmission Plant's Construction-Expenditures Ratio.
- (2) Distribution engineering and construction allocated to the Client Companies based on the Distribution plant's Construction-Expenditures Ratio.

7. Power Engineering and Construction

a. Description of Function

Designs, monitors and supports the construction and retirement of electric generation facilities. Prepares specifications and administers contracts for construction of new electric generating units, improvements to existing electric generating units, and the retirement of existing electric generating equipment, including developing associated operating processes with operations personnel. Prepares cost and schedule estimates and visits construction sites to ensure that construction and retirement activities meet schedules and plans.

b. Method of Allocation

Allocated to the Client Companies based on the Electric Production Plant's Construction-Expenditures Ratio.

8. Human Resources

a. Description of Function

Establishes and administers policies and supervises compliance with legal requirements in the areas of employment, compensation, benefits and employee health and safety. Processes payroll and employee benefit payments. Supervises contract negotiations and relations with labor unions.

b. Method of Allocation

Allocated to the Client Companies and to other Functions of the Service Company based on the Number of Employees Ratio.

9. Supply Chain

a. Description of Function

Provides services in connection with the procurement of materials and contract services, processes payments to vendors, and provides management of material and supplies inventories.

b. Method of Allocation

(1) Procurement of materials and contract services and vendor payment processing - allocated to the Client Companies and to other Functions of the Service Company based on the Procurement Spending Ratio.

- (2) Management of materials and supplies inventory – allocated to the Client Companies on the Inventory Ratio.

10. Facilities

a. Description of Function

Operates and maintains office and service buildings. Provides security and housekeeping services for such buildings and procures office furniture and equipment.

b. Method of Allocation

Allocated to the Client Companies and to other Functions of the Service Company based on the Square Footage Ratio.

11. Accounting

a. Description of Function

Maintains the books and records of Duke Energy Corporation and its affiliates, prepares financial and statistical reports, prepares tax filings and supervises compliance with the laws and regulations.

b. Method of Allocation

(1) Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.

(2) Certain merger related costs are allocated based on Generating Unit MW Capability/ MDC Ratio.

12. Power and Gas Planning and Operations

a. Description of Function

Coordinate the planning, management and operation of Duke Energy Corporation's power generation, transmission and Distribution systems. The activities of the Function include:

(1) System Planning - planning of additions and retirements to the electric generation units and transmission and Distribution systems belonging to the regulated utilities owned by Duke Energy Corporation.

- (2) System Operations - coordination of the dispatch and operation of the electric generating units and transmission and Distribution systems belonging to the regulated utilities owned by Duke Energy Corporation.
 - (3) Power Operations – provides management and support services for the electric generation units owned or operated by subsidiaries of Duke Energy Corporation.
 - (4) Wholesale Power Operations – coordination of Duke Energy Corporation’s wholesale power operations.
- b. Method of Allocation
- (1) System Planning
 - (a) Generation planning - allocated to the Client Companies based on the Electric Peak Load Ratio.
 - (b) Transmission planning – allocated to the Client Companies based on the Electric Peak Load Ratio.
 - (c) Electric Distribution planning - allocated to the Client Companies based on a weighted average of the Miles of Distribution Lines Ratio and the Electric Peak Load Ratio.
 - (d) Gas Distribution planning – allocated to the Client Companies based on the Construction-Expenditures Ratio.
 - (2) System Operations –
 - (a) Generation Dispatch - allocated to the Client Companies based on the Sales Ratio.
 - (b) Transmission Operations - allocated to the Client Companies based on a weighted average of the Circuit Miles of Electric Transmission Lines Ratio and the Electric Peak Load Ratio.
 - (c) Electric Distribution Operations - allocated to the Client Companies based on a weighted average of the Miles of Distribution Lines Ratio and the Electric Peak Load Ratio.
 - (d) Gas Distribution Operations – allocated to the Client Companies based on the Construction-Expenditures Ratio.

- (3) Power Operations – allocated to the Client Companies based on the Generating Unit MW Capability / Maximum Dependable Capacity (MDC) Ratio.
- (4) Wholesale Power Operations – allocated to the Client Companies based on the Sales Ratio.

13. Public Affairs

a. Description of Function

Prepares and disseminates information to employees, customers, government officials, communities and the media. Provides graphics, reproduction lithography, photography and video services.

b. Method of Allocation

- (1) Services related to corporate governance, public policy, management and support services - allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.
- (2) Services related to utility specific activities - allocated to the Client Companies based on a weighted average of the Number of Customers Ratio and the Number of Employees Ratio.

14. Legal

a. Description of Function

Renders services relating to labor and employment law, litigation, contracts, rates and regulatory affairs, environmental matters, financing, financial reporting, real estate and other legal matters.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.

15. Rates

a. Description of Function

Determines the Client Companies' revenue requirements and rates to electric and gas requirements customers. Administers interconnection and joint ownership agreements. Researches and forecasts customers' usage.

b. Method of Allocation

Allocated to the Client Companies based on the Sales Ratio.

16. Finance

a. Description of Function

Renders services to Client Companies with respect to investments, financing, cash management, risk management, claims and fire prevention. Prepares budgets, financial forecasts and economic analyses.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.

17. Rights of Way

a. Description of Function

Purchases, surveys, records, and sells real estate interests for Client Companies.

b. Method of Allocation

(1) Services related to Distribution system - allocated to the Client Companies based on the Miles of Distribution Lines Ratio.

(2) Services related to electric generation system- allocated to the Client Companies based on the Electric Peak Load Ratio.

(3) Services related to electric transmission system – allocated to the Client Companies based on the Circuit Miles of Electric Transmission Lines Ratio.

18. Internal Auditing

a. Description of Function

Reviews internal controls and procedures to ensure that assets are safeguarded and that transactions are properly authorized and recorded.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.

19. Environmental, Health and Safety

a. Description of Function

Establishes policies and procedures and governance framework for compliance with environmental, health and safety (“EHS”) issues, monitors compliance with EHS requirements and provides EHS compliance support to the Client Companies’ personnel.

b. Method of Allocation

(1) Services related to corporate governance, environmental policy, management and support services - allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollar Ratio and the PP&E Ratio.

(2) Services related to utility specific activities – allocated to the Client Companies based on the Sales Ratio.

20. Fuels

a. Description of Function

Procures coal, gas and oil for the Client Companies. Ensures compliance with price and quality provisions of fuel contracts and arranges for transportation of the fuel to the generating stations.

b. Method of Allocation

Allocated to the Client Companies based on the Sales Ratio.

21. Investor Relations

a. Description of Function

Provides communications to investors and the financial community, performs transfer agent and shareholder record keeping functions, administers stock plans and performs stock-related regulatory reporting.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollars Ratio and the PP&E Ratio.

22. Planning

a. Description of Function

Facilitates preparation of strategic and operating plans, monitors trends and evaluates business opportunities.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollars Ratio and the PP&E Ratio.

23. Executive

a. Description of Function

Provides general administrative and executive management services.

b. Method of Allocation

Allocated to the Client Companies based on a weighted average of the Gross Margin Ratio, the Labor Dollars Ratio and the PP&E Ratio.

24. Nuclear Development

a. Description of Function

Provides design, engineering, project management and licensing for potentially proposed new operating units.

b. Method of Allocation

Directly assigned/charged to participating jurisdictions.

Duke Energy Carolinas, LLC, Duke Energy Progress, LLC and Piedmont Natural Gas Company, Inc. Conditions

In connection with the NCUC approval of the Merger in NCUC Docket No. E-2, Sub 1095, Docket No. E-7, Sub 1100, and Docket No. G-5, Sub 682, the NCUC adopted certain Regulatory Conditions and a revised Code of Conduct governing transactions between DEC, DEP, Piedmont, and their affiliates. Pursuant to the Regulatory Conditions, the following provisions are applicable to DEC, DEP, and Piedmont:

- (a) DEC's, DEP's and Piedmont's participation in this Agreement is voluntary. DEC, DEP, or Piedmont is not obligated to take or provide services or make any purchases or sales pursuant to this Agreement, and DEC, DEP, or Piedmont may elect to discontinue its participation in this Agreement at its election after giving any required notice;
- (b) DEC, DEP or Piedmont may not make or incur a charge under this Agreement except in accordance with North Carolina law and the rules, regulations and orders of the NCUC promulgated thereunder.
- (c) DEC, DEP or Piedmont may not seek to reflect in rates any (A) costs incurred under this Agreement exceeding the amount allowed by the NCUC or (B) revenue level earned under this Agreement less than the amount imputed by the NCUC; and
- (d) DEC, DEP or Piedmont shall not assert in any forum – whether judicial, administrative, federal, state, local or otherwise – either on its own initiative or in support of other entity's assertions, that the NCUC's authority to assign, allocate, make pro-forma adjustments to or disallow revenues and costs for retail ratemaking and regulatory accounting and reporting purposes is, in whole or in part, (A) preempted by Federal Law or (B) not within the Commission's power, authority, or jurisdiction; DEC, DEP, and Piedmont will bear the full risk of any preemptive effects of Federal Law with respect to this Agreement.

OPERATING COMPANIES SERVICE AGREEMENT

This Operating Companies Service Agreement (this “Agreement”) by and among Duke Energy Carolinas, LLC (“DEC”), a North Carolina limited liability company, Duke Energy Ohio, Inc. (“DEO”), an Ohio corporation, Duke Energy Indiana, LLC (“DEI”), an Indiana limited liability company, Duke Energy Kentucky, Inc. (“DEK”), a Kentucky corporation, Duke Energy Progress, LLC (“DEP”), a North Carolina limited liability company, and Duke Energy Florida, LLC (“DEF”), a Florida limited liability company and Piedmont Natural Gas Company, Inc., a North Carolina corporation (“Piedmont”),, supersedes and replaces in its entirety all previous Operating Company Service Agreements dated before the Effective Date of this Agreement. The Effective date as stated herein is the date on which this agreement is signed or, as may be required, submitted to the appropriate regulatory body for approval, whichever occurs last. DEC, DEO, DEI, DEK, DEP DEF and Piedmont are referred to collectively as the “Operating Companies” and, individually, an “Operating Company.”

WITNESSETH:

WHEREAS, Duke Energy Corporation (“Duke Energy”) is a Delaware corporation;

WHEREAS, each Operating Company is a subsidiary of Duke Energy and a public utility company;

WHEREAS, in the ordinary course of their businesses, Operating Companies maintain organizations of employees with technical expertise in matters affecting public utility companies and related businesses and own or acquire related equipment, facilities, properties and other resources; and

WHEREAS, subject to the terms and conditions herein set forth, and taking into consideration the parties’ utility responsibilities or primary business operations, as the case may be, the parties hereto are willing, upon request from time to time, to perform such services, and in connection therewith to make available such equipment, facilities, properties and other resources, as they shall request from each other;

NOW, THEREFORE, in consideration of the premises and the mutual covenants herein contained, the parties agree as follows:

ARTICLE 1. PROVISION OF SERVICES; LOANED EMPLOYEES

Section 1.1 Provision of Services.

(a) Except as hereinafter provided with respect to DEC, DEP, and Piedmont providing services for each other, upon receipt by a party hereto (in such capacity, a “Service Provider”) of a written request in substantially the same form attached hereto as Exhibit A (a “Service Request”) from another party hereto (in such capacity, a “Client Company”) for the provision to such Client

Company of such services as are specified therein, including if applicable use of any related equipment, facilities, properties or other resources (collectively, "Services"), the Service Provider, if in its sole discretion it has available the personnel or other resources needed to perform the Service Request without impairment of its utility responsibilities or business operations, as the case may be, shall furnish such Services to the Client Company at such times, for such periods and in such manner as the Client Company shall have so requested and otherwise in accordance with the provisions hereof.

(b) For purposes of this Agreement, "Services" may include, but shall not be limited to, services in such areas as engineering and construction; operations and maintenance; installation services; equipment testing; generation technical support; environmental, health and safety; and procurement services (including, but not limited to, fuel procurement).

(c) "Services" may also include the use of assets, equipment and facilities, provided the Client Company compensates the Service Provider for such use in accordance with Article 3.

(d) For the avoidance of doubt, affiliate transactions involving sales or other transfers of assets, goods, energy commodities (including electricity, natural gas, coal and other combustible fuels) or thermal energy products are outside the scope of this Agreement.

Section 1.2 Loaned Employees.

(a) If specifically requested in connection with the provision of Services, Service Provider shall loan one or more of its employees to such Client Company, provided that such loan shall not, in the sole discretion of Service Provider, interfere with or impair Service Provider's utility responsibilities or business operations, as the case may be. After the commencement thereof, any such loaned employees may be withdrawn by Service Provider from tasks duly assigned by Client Company, prior to completion thereof as contemplated in the associated Service Request, only with the consent of Client Company (which shall not be unreasonably withheld or delayed), except in the event of a demonstrable emergency requiring the use of any such employees in another capacity for Service Provider.

(b) While performing work on behalf of Client Company, any such loaned employees shall be under its supervision and control, and Client Company shall be responsible for their actions to the same extent as though such persons were its employees (it being understood that such persons shall nevertheless remain employees of Service Provider and nothing herein shall be construed as creating an employer-employee relationship between any Client Company and any loaned employees). Accordingly, for the duration of any such loan, Service Provider shall continue to provide its loaned employees with the same payroll, pension, savings, tax withholding, unemployment, bookkeeping and other personnel support services then being provided by Service Provider to its other employees.

ARTICLE 2. SERVICE REQUESTS

Section 2.1 Procedure. All Services (including any loans of employees) (i) shall be performed in accordance with Service Requests issued by or on behalf of Client Company and

accepted by Service Provider and (ii) shall be assigned to applicable activities, processes, projects, responsibility centers or on other appropriate bases to enable specific work to be properly assigned. Service Requests shall be as specific as practicable in defining the Services requested. Client Company shall have the right from time to time to amend or rescind any Service Request, *provided* that (a) Service Provider consents to any amendment that results in a material change in the scope of Services to be provided, (b) the costs associated with an amended or rescinded Service Request shall include the costs incurred by Service Provider as a result of such amendment or rescission, and (c) no amendment or rescission of a Service Request shall release Client Company from any liability for costs already incurred or contracted for by Service Provider pursuant to the original Service Request, regardless of whether any labor or the furnishing of any property or other resources has been commenced or completed.

ARTICLE 3. COMPENSATION FOR SERVICES

Section 3.1 Cost of Services. As compensation for any Services rendered to it pursuant to this Agreement, Client Company shall pay to Service Provider the Cost thereof, except to the extent otherwise required by Section 482 of the Internal Revenue Code. "Costs" means the sum of (i) direct costs, (ii) indirect costs and (iii) costs of capital. As soon as practicable after the close of each month, Service Provider shall render to each Client Company a statement reflecting the billing information necessary to identify the costs charged for that month. By the last day of each month, Client Company shall remit to Service Provider all charges billed to it. For avoidance of doubt, the Service Provider and each Client Company may satisfy the foregoing requirement by recording billings and payments required hereunder in their common accounting systems without rendering paper or electronic monthly statements or remitting cash payments.

Section 3.2 Exception. In the event any Services to be rendered under this Agreement are to be provided to or from DEC, DEP, and Piedmont in accordance with DEC's, DEP's, and Piedmont's North Carolina Code of Conduct at anything other than fully embedded cost as described above, then prior to entering into the transaction, DEI, DEK, DEF or DEO, whichever is applicable, shall provide 30 days written notice to the respective state commission staffs and state consumer representatives explaining the proposed transaction, including the benefits of the transaction. If no objection is received within 30 days, then the transaction may proceed. If one or more third parties object to the transaction in writing within 30 days, then DEI, DEK, DEF or DEO, whichever is applicable, must seek specific state commission approval of the transaction prior to entering into the transaction.

ARTICLE 4. LIMITATION OF LIABILITY; INDEMNIFICATION

Section 4.1 Limitation of Liability/Services. In performing Services pursuant to Section 1.1 hereof, Service Provider will exercise due care to assure that the Services are performed in a workmanlike manner in accordance with the specifications set forth in the applicable Service Request and consistent with any applicable legal standards. The sole and exclusive responsibility of Service Provider for any deficiency therein shall be promptly to correct or repair such deficiency or to re-perform such Services, in either case at no additional cost to Client Company, so that the Services fully conform to the standards described in the first sentence of this Section 4.1. No Service Provider makes any other warranty with respect to the provision of Services, and each Client Company agrees to accept any Services without further warranty of any nature.

Section 4.2 Limitation of Liability/Loaned Employees. In furnishing Services under Section 1.2 hereof (*i.e.*, involving loaned employees), neither the Service Provider, nor any officer, director, employee or agent thereof, shall have any responsibility whatsoever to any Client Company receiving such Services, and Client Company specifically releases Service Provider and such persons, on account of any claims, liabilities, injuries, damages or other consequences arising in connection with the provision of such Services under any theory of liability, whether in contract, tort (including negligence or strict liability) or otherwise, it being understood and agreed that any such loaned employees are made available without warranty as to their suitability or expertise.

Section 4.3 Disclaimer. WITH RESPECT TO ANY SERVICES PROVIDED UNDER THIS AGREEMENT, THE SERVICE PROVIDER THEREOF MAKES NO WARRANTY OR REPRESENTATION OTHER THAN AS SET FORTH IN SECTION 4.1, AND THE PARTIES HERETO HEREBY AGREE THAT NO OTHER WARRANTY, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING BUT NOT LIMITED TO ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE), SHALL BE APPLICABLE TO THE PROVISION OF ANY SUCH SERVICES. THE PARTIES FURTHER AGREE THAT THE REMEDIES STATED HEREIN ARE EXCLUSIVE AND SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ANY PARTY HERETO FOR A FAILURE BY ANY OTHER PARTY HERETO TO COMPLY WITH ITS WARRANTY OBLIGATIONS.

Section 4.4 Indemnification.

(a) Subject to subparagraph (b) of this Section 4.4, Service Provider shall release, defend, indemnify and hold harmless each Client Company, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any loss, liability, claim, damage, expense (including costs of investigation and defense and reasonable attorneys' fees), whether or not involving a third-party claim, incurred or sustained by or against any such Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services.

(b) Notwithstanding any other provision hereof, Service Provider's total liability hereunder with respect to any specific Services shall be limited to the amount actually paid to Service Provider for its performance of the specific Services for which the liability arises, and under no circumstances shall Service Provider be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

Section 4.5 Procedure for Indemnification. Within 15 business days after receipt by any Client Company of notice of any claim or the commencement of any action, suit, litigation or other proceeding against it (a "Proceeding") with respect to which it is eligible for indemnification hereunder, such Client Company shall notify Service Provider thereof in writing (it being understood that failure to so notify Service Provider shall not relieve the latter of its indemnification obligation, unless Service Provider establishes that defense thereof has been prejudiced by such

failure). Thereafter, Service Provider shall be entitled to participate in such Proceeding and, at its election upon notice to such Client Company and at its expense, to assume the defense of such Proceeding. Without the prior written consent of such Client Company, Service Provider shall not enter into any settlement of any third-party claim that would lead to liability or create any financial or other obligation on the part of such Client Company for which such Client Company is not entitled to indemnification hereunder. If such Client Company has given timely notice to Service Provider of the commencement of such Proceeding, but Service Provider has not, within 15 business days after receipt of such notice, given notice to Client Company of its election to assume the defense thereof, Service Provider shall be bound by any determination made in such Proceeding or any compromise or settlement made by Client Company. A claim for indemnification for any matter not involving a third-party claim may be asserted by notice from the applicable Client Company to Service Provider.

ARTICLE 5. MISCELLANEOUS

Section 5.1 Amendments. Any amendments to this Agreement shall be in writing executed by each of the parties hereto. To the extent that applicable state law or regulation or other binding obligation requires that any such amendment be filed with any affected state public utility commission for its review or otherwise, each Operating Company shall comply in all respects with any such requirements.

Section 5.2 Effective Date; Term. This Agreement shall become effective on the Effective Date and shall continue in full force and effect as to each party until terminated by any party, as to itself only, upon not less than 30 days prior written notice to the other parties hereto. Any such termination of parties shall not be deemed an amendment hereto. This Agreement may be terminated and thereafter be of no further force and effect upon the mutual consent of all of the parties hereto.

Section 5.3 Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof and supersedes any prior or contemporaneous contracts, agreements, understandings or arrangements, whether written or oral, with respect thereto. Any oral or written statements, representations, promises, negotiations or agreements, whether prior hereto or concurrently herewith, are superseded by and merged into this Agreement.

Section 5.4 Severability. If any provision of this Agreement or any application thereof shall be determined to be invalid or unenforceable, the remainder of this Agreement and any other application thereof shall not be affected thereby.

Section 5.5 Assignment. Neither this Agreement nor any of the rights, interests or obligations hereunder shall be assigned, in whole or in part, by operation of law or otherwise by any of the parties hereto without the prior written consent of each of the other parties. Any attempted or purported assignment in violation of the preceding sentence shall be null and void and of no effect whatsoever. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties and their respective successors and assigns.

Section 5.6 Governing Law. This Agreement shall be construed and enforced under and in accordance with the laws of the State of New York, without regard to conflicts of laws principles.

Section 5.7 Captions, Headings. The captions and headings used in this Agreement are for convenience of reference only and shall not affect the construction to be accorded any of the provisions hereof. As used in this Agreement, “hereof,” “hereunder,” “herein,” “hereto,” and words of like import refer to this Agreement as a whole and not to any particular section or other paragraph or subparagraph thereof.

Section 5.8 Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed a duplicate original hereof, but all of which shall be deemed one and the same Agreement.

Section 5.9 DEC, DEP, and Piedmont Conditions. In addition to the terms and conditions set forth herein, with respect to DEC, DEP, and Piedmont, the provisions set out in Appendix B are hereby incorporated herein by reference. In addition, except with respect to the pricing of Services as set forth herein, DEC’s, DEP’s and Piedmont’s participation in this Agreement is explicitly subject to the Regulatory Conditions and Code of Conduct approved by the North Carolina Utilities Commission (“NCUC”) in its *Order Approving Merger Subject to Regulatory Conditions and Code of Conduct* issued, in Docket Nos. E-2, Sub 1095 and E-7, Sub 1100, and G-9, Sub 682, and applicable to South Carolina, as such Regulatory Conditions and Code of Conduct may be amended from time to time. In the event of any conflict between the provisions of this Agreement and the approved Regulatory Conditions and Code of Conduct provisions, the Regulatory Conditions and Code of Conduct shall govern.

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed on _____, 201_, on its behalf by an appropriate officer thereunto duly authorized.

Duke Energy Carolinas, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Ohio, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Indiana, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Kentucky, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Progress, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Florida, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Piedmont Natural Gas Company, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary



Folder Name: efr148v1-003818
Status: New

Service Request for Affiliates

* Red Asterisk indicates required fields * Functional Area (for the Service Provider):

Service Provider

* Service Provider
* Legal Approval Representative

Proposed Service

* Description of Proposed Service

Please Provide Basis for Estimated Costs, include # of employees requested and amount of time requested.

* Estimated Costs

(Numbers only, no commas or decimals)

* Scheduled Start

Date

* Scheduled Completion

Date

Client Company

* Client Company

PeopleSoft Accounting Codes for the Services Provided

*** Process OR Project & Activities OR GL Account for Client Company must be entered

* Client Company Operating Unit

* Service Provider Resp. Center

* Process

* Project

* Activity

* GL Account

Confirmation of Service Provider Utility Responsibilities by Service Provider Approver

* Check this box to confirm that this Service Request will not result in impairment of Service Provider's utility responsibilities or business operations.

Confirmation of Service Provider Utility Responsibilities by Service Provider Approver

- * Check this box to confirm that this Service Request will not result in impairment of Service Provider's utility responsibilities or business operations.

Miscellaneous Comments

Comments

Comments Log

Attachments

[Help](#)

Filename	Size

Approver Selection

The approvers should be appropriate according to the [Delegation of Authority \(DOA\) matrix](#).

Route To:	Name	Phone	Status
* Client Company	<input type="text"/> <input type="button" value="Select"/>	<input type="text"/>	<input type="text"/>
* Service Provider	<input type="text"/> <input type="button" value="Select"/>	<input type="text"/>	<input type="text"/>
* Legal	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submitter Details

Created by Created on 11/10/2015 1:19:43 PM

* Phone

Last Modified by Last Modified

Exhibit B

DUKE ENERGY CAROLINAS, LLC DUKE ENERGY PROGRESS, LLC, AND PIEDMONT NATURAL GAS COMPANY, INC. CONDITIONS

1. In connection with the NCUC approval of the Merger in NCUC Docket No. E-2, Sub 1095, Docket No. E-7, Sub 1100, and Docket No. G-5, Sub 682, the NCUC adopted certain Regulatory Conditions and a revised Code of Conduct governing transactions between DEC, DEP, Piedmont, and their affiliates. Pursuant to the Regulatory Conditions, the following provisions are applicable to DEC, DEP, and Piedmont:

(a) DEC's, DEP's and Piedmont's participation in this Agreement is voluntary. DEC, DEP, or Piedmont is not obligated to take or provide services or make any purchases or sales pursuant to this Agreement, and DEC, DEP, or Piedmont may elect to discontinue its participation in this Agreement at its election after giving any required notice;

(b) DEC, DEP or Piedmont may not make or incur a charge under this Agreement except in accordance with North Carolina law and the rules, regulations and orders of the NCUC promulgated thereunder.

(c) DEC, DEP or Piedmont may not seek to reflect in rates any (A) costs incurred under this Agreement exceeding the amount allowed by the NCUC or (B) revenue level earned under this Agreement less than the amount imputed by the NCUC; and

(d) DEC, DEP or Piedmont shall not assert in any forum – whether judicial, administrative, federal, state, local or otherwise – either on its own initiative or in support of other entity's assertions, that the NCUC's authority to assign, allocate, make pro-forma adjustments to or disallow revenues and costs for retail ratemaking and regulatory accounting and reporting purposes is, in whole or in part, (A) preempted by Federal Law or (B) not within the Commission's power, authority, or jurisdiction; DEC, DEP, and Piedmont will bear the full risk of any preemptive effects of Federal Law with respect to this Agreement.

2. Transfers by DEC, DEP, or Piedmont. With respect to the transfer by DEC, DEP, or Piedmont under this Agreement of the control of, operational responsibility for, or ownership of any DEC, DEP, or Piedmont assets used for the generation, transmission or distribution of electric power to its North Carolina retail customers with a gross book value in excess of ten million dollars, the following shall apply: (a) neither DEC, DEP nor Piedmont may commit to or carry out the transfer except in accordance with all applicable law, and the rules, regulations and orders of the NCUC promulgated thereunder; and (b) neither DEC, DEP, or Piedmont may include in its North Carolina cost of service or rates the value of the transfer, whether or not subject to federal law, except as allowed by the NCUC in accordance with North Carolina law.

3. Access to DEC, DEP or Piedmont Information. Any Operating Company providing Services to DEC or DEP pursuant to this Agreement, including any loaned employees under Section 1.2 of the Agreement, shall be permitted to have access to DEC's, DEP's or Piedmont's Customer Information and Confidential Systems Operation Information, as those terms are defined in the Code of Conduct, to the extent necessary for the performance of such Services; provided that such Operating Company shall take reasonable steps to protect the confidentiality of such Information.

Exhibit B

4. Procedures for Services Received By DEC, DEP, or Piedmont from each other or the other Operating Companies and for Services Provided by DEC, DEP or Piedmont to each other or the other Operating Companies. DEC, DEP, and Piedmont shall receive from each other and the other Operating Companies, upon the terms and conditions set forth in this agreement, such of the services listed in the Operating Companies Service Agreement List on file with the NCUC, at such times, for such periods and in such manner as DEC, DEP, or Piedmont may from time to time request of each other or another Operating Company. DEC, DEP, or Piedmont may provide to each other and the other Operating Companies, upon the terms and conditions set forth in this Agreement, at such times for such periods, and in such a manner as DEC, DEP or Piedmont concludes it is equipped to perform for each other or another Operating Company. DEC, DEP, or Piedmont may perform these services for each other as described in this paragraph without the requirement of a written request in substantially the form attached to this Agreement as Exhibit A.

**AMENDED AND RESTATED OPERATING COMPANY/NONUTILITY COMPANIES
SERVICE AGREEMENT**

This Amended and Restated Operating Company/Nonutility Companies Service Agreement (this "Agreement") dated September 1, 2008 (the "Effective Date") by and among Duke Energy Kentucky, Inc., a Kentucky corporation ("Operating Company"), and the respective associate nonutility companies listed on the signature pages hereto (each, a "Nonutility Company") supersedes and restates in its entirety the Operating Company/Nonutility Service Agreement entered into between the Operating Company and each Nonutility Company dated January 2, 2007.

WITNESSETH:

WHEREAS, Duke Energy Corporation ("Duke Energy") is a Delaware corporation;

WHEREAS, Operating Company is a subsidiary of Duke Energy and a public utility company;

WHEREAS, each Nonutility Company is a subsidiary of Duke Energy that is or was formed to engage in any one or more non-regulated businesses;

WHEREAS, certain non-regulated public utilities were added in error to the Operating Company/Nonutility Companies Service Agreement dated January 2, 2007 and are being removed in this Agreement;

WHEREAS, in the ordinary course of their businesses, Operating Company and each Nonutility Company maintain organizations of employees with technical expertise in matters affecting public utility companies and related businesses and own or acquire related equipment, facilities, properties and other resources; and

WHEREAS, subject to the terms and conditions herein set forth, and taking into consideration the parties' utility responsibilities or primary business operations, as the case may be, the parties hereto are willing, upon request from time to time, to perform such services, and in connection therewith to make available such equipment, facilities, properties and other resources, as they shall request from each other;

NOW, THEREFORE, in consideration of the premises and the mutual covenants herein contained, the parties agree as follows:

ARTICLE 1. PROVISION OF SERVICES; LOANED EMPLOYEES

Section 1.1 Provision of Services.

(a) Upon receipt by a party hereto (in such capacity, a "Service Provider") of a written request in substantially the form attached hereto as Exhibit A (a "Service Request") from another party hereto (in such capacity, a "Client Company") for the provision to such Client Company of such services as are specified therein, including if applicable use of any related equipment, facilities,

properties or other resources (collectively, "Services"), the Service Provider, if in its sole discretion it has available the personnel or other resources needed to perform the Service Request without impairment of its utility responsibilities or business operations, as the case may be, shall furnish such Services to the Client Company at such times, for such periods and in such manner as the Client Company shall have so requested and otherwise in accordance with the provisions hereof.

(b) For purposes of this Agreement, "Services" may include, but shall not be limited to: (i) in the case of Services that may be provided by Operating Company hereunder, services in such areas as engineering and construction; operations and maintenance; installation services; equipment testing; generation technical support; environmental, health and safety; and procurement services;¹ and (ii) in the case of Services that may be provided by Nonutility Companies hereunder, services in such areas as information technology services; monitoring, surveying, inspecting, constructing, locating and marking of overhead and underground utility facilities; meter reading; materials management; vegetation management; and marketing and customer relations.

(c) For the avoidance of doubt, affiliate transactions involving sales or other transfers of assets, goods, energy commodities (including electricity, natural gas, coal and other combustible fuels) or thermal energy products are outside the scope of this Agreement.

Section 1.2 Loaned Employees.

(a) If specifically requested in connection with the provision of Services, Service Provider shall loan one or more of its employees to such Client Company, provided that such loan shall not, in the sole discretion of Service Provider, interfere with or impair Service Provider's utility responsibilities or business operations, as the case may be. After the commencement thereof, any such loaned employees may be withdrawn by Service Provider from tasks duly assigned by Client Company, prior to completion thereof as contemplated in the associated Service Request, only with the consent of Client Company (which shall not be unreasonably withheld or delayed), except in the event of a demonstrable emergency requiring the use of any such employees in another capacity for Service Provider.

(b) While performing work on behalf of Client Company, any such loaned employees shall be under its supervision and control, and Client Company shall be responsible for their actions to the same extent as though such persons were its employees (it being understood that such persons shall nevertheless remain employees of Service Provider and nothing herein shall be construed as creating an employer-employee relationship between any Client Company and any loaned employees). Accordingly, for the duration of any such loan, Service Provider shall continue to provide its loaned employees with the same payroll, pension, savings, tax withholding, unemployment, bookkeeping and other personnel support services then being provided by Service Provider to its other employees.

ARTICLE 2. SERVICE REQUESTS

Section 2.1 Procedure. All Services (including any loans of employees) (i) shall be performed in accordance with Service Requests issued by or on behalf of Client Company and accepted by Service Provider and (ii) shall be assigned to applicable activities, processes, projects, responsibility centers or on other appropriate bases to enable specific work to be properly assigned. Service Requests shall be as specific as practicable in defining the Services requested. Client Company shall have the right from time to time to amend or rescind any Service Request, *provided* that (a) Service Provider consents to any amendment that results in a material change in the scope of Services to be provided, (b) the costs associated with an amended or rescinded Service Request shall include the costs incurred by Service Provider as a result of such amendment or rescission, and (c) no amendment or rescission of a Service Request shall release Client Company from any liability for costs already incurred or contracted for by Service Provider pursuant to the original Service Request, regardless of whether any labor or the furnishing of any property or other resources has been commenced or completed.

ARTICLE 3. COMPENSATION FOR SERVICES

Section 3.1 Cost of Services. As compensation for any Services rendered to it pursuant to this Agreement, Client Company shall pay to Service Provider the fully embedded cost thereof (i.e., the sum of (i) direct costs, (ii) indirect costs and (iii) costs of capital), except to the extent otherwise required by Section 482 of the Internal Revenue Code. As soon as practicable after the close of each month, Service Provider shall render to each Client Company a statement reflecting the billing information necessary to identify the costs charged for that month. By the last day of each month, Client Company shall remit to Service Provider all charged billed to it.

ARTICLE 4. LIMITATION OF LIABILITY; INDEMNIFICATION

Section 4.1 Limitation of Liability/Services. In performing Services pursuant to Section 1.1 hereof, Service Provider will exercise due care to assure that the Services are performed in a workmanlike manner in accordance with the specifications set forth in the applicable Service Request and consistent with any applicable legal standards. The sole and exclusive responsibility of Service Provider for any deficiency therein shall be promptly to correct or repair such deficiency or to re-perform such Services, in either case at no additional cost to Client Company, so that the Services fully conform to the standards described in the first sentence of this Section 4.1. No Service Provider makes any other warranty with respect to the provision of Services, and each Client Company agrees to accept any Services without further warranty of any nature.

Section 4.2 Limitation of Liability/Loaned Employees. In furnishing Services under Section 1.2 hereof (i.e., involving loaned employees), neither the Service Provider, nor any officer, director, employee or agent thereof, shall have any responsibility whatever to any Client Company receiving such Services, and Client Company specifically releases Service Provider and such persons, on account of any claims, liabilities, injuries, damages or other consequences arising in connection with the provision of such Services under any theory of liability, whether in contract, tort (including negligence or strict liability) or otherwise, it being understood and agreed that any such loaned employees are made available without warranty as to their suitability or expertise.

Section 4.3 Disclaimer. WITH RESPECT TO ANY SERVICES PROVIDED UNDER THIS AGREEMENT, THE SERVICE PROVIDER THEREOF MAKES NO WARRANTY OR REPRESENTATION OTHER THAN AS SET FORTH IN SECTION 4.1, AND THE PARTIES HERETO HEREBY AGREE THAT NO OTHER WARRANTY, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING BUT NOT LIMITED TO ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE), SHALL BE APPLICABLE TO THE PROVISION OF ANY SUCH SERVICES. THE PARTIES FURTHER AGREE THAT THE REMEDIES STATED HEREIN ARE EXCLUSIVE AND SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ANY PARTY HERETO FOR A FAILURE BY ANY OTHER PARTY HERETO TO COMPLY WITH ITS WARRANTY OBLIGATIONS.

Section 4.4 Indemnification.

(a) Indemnification In Respect of Services Provided by Operating Company.

(i) In circumstances where Operating Company is a Service Provider: (x) subject to subparagraph (ii) of this Section 4.4(a), Service Provider shall release, defend, indemnify and hold harmless each Client Company, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any loss, liability, claim, damage, expense (including costs of investigation and defense and reasonable attorneys' fees), whether or not involving a third-party claim (collectively, "Damages"), incurred or sustained by or against Service Provider or any such Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services, and (y) each Nonutility Company that is a Client Company with respect to such Services shall release, defend, indemnify and hold harmless Service Provider, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any Damages incurred or sustained by or against Service Provider or any such Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services, to the extent such Damages are not covered by Service Provider's indemnification obligation as provided in the preceding clause (x) or exceed the liability limits provided in subparagraph (ii) of this Section 4.4(a).

(ii) Notwithstanding any other provision hereof, in circumstances where Operating Company is a Service Provider: (x) Service Provider's total liability hereunder with respect to any specific Services shall be limited to the amount actually paid to Service Provider for its performance of the specific Services for which the liability arises, and (y) under no circumstances shall Service Provider be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

(b) Indemnification In Respect of Services Provided by Any Nonutility Company.

(i) In circumstances where a Nonutility Company is a Service Provider (*i.e.*, where Operating Company is the Client Company): (x) subject to subparagraph (ii) of this Section 4.4(b),

Service Provider shall release, defend, indemnify and hold harmless the Client Company, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any Damages incurred or sustained by or against Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services.

(ii) Notwithstanding any other provision hereof, in circumstances where a Nonutility Company is a Service Provider (*i.e.*, where Operating Company is the Client Company), under no circumstances shall Service Provider be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

Section 4.5 Procedure for Indemnification. Within 15 business days after receipt by any Client Company of notice of any claim or the commencement of any action, suit, litigation or other proceeding against it (a "Proceeding") with respect to which it is eligible for indemnification hereunder, such Client Company shall notify Service Provider thereof in writing (it being understood that failure so to notify Service Provider shall not relieve the latter of its indemnification obligation, unless Service Provider establishes that defense thereof has been prejudiced by such failure). Thereafter, Service Provider shall be entitled to participate in such Proceeding and, at its election upon notice to such Client Company and at its expense, to assume the defense of such Proceeding. Without the prior written consent of such Client Company, Service Provider shall not enter into any settlement of any third-party claim that would lead to liability or create any financial or other obligation on the part of such Client Company for which it such Client Company is not entitled to indemnification hereunder. If such Client Company has given timely notice to Service Provider of the commencement of such Proceeding, but Service Provider has not, within 15 business days after receipt of such notice, given notice to Client Company of its election to assume the defense thereof, Service Provider shall be bound by any determination made in such Proceeding or any compromise or settlement made by Client Company. A claim for indemnification for any matter not involving a third-party claim may be asserted by notice from the applicable Client Company to Service Provider.

ARTICLE 5. MISCELLANEOUS

Section 5.1 Amendments. Any amendments to this Agreement shall be in writing executed by each of the parties hereto. To the extent that applicable state law or regulation or other binding obligation requires that any such amendment be filed with the Kentucky Public Service Commission for its review or otherwise, Operating Company shall comply in all respects with any such requirements.

Section 5.2 Effective Date; Term. This Agreement shall become effective on the Effective Date and shall continue in full force and effect as to each party until terminated by any party, as to itself only, upon not less than 30 days prior written notice to the other parties hereto. Any such

Any such termination of parties shall not be deemed an amendment hereto. This Agreement may be terminated and thereafter be of no further force and effect upon the mutual consent of all of the parties hereto.

Section 5.3 Additional Parties. After the effective date of this Agreement, additional Nonutility Companies may become parties to this Agreement by executing appropriate signature pages, whereupon any such additional signatory shall be deemed a "party" hereto all purposes hereof and shall thereupon become bound by the terms and conditions of this Agreement as if an original party hereto. The addition of any such further signatories, in the absence of any changes to the terms of this Agreement, shall not be deemed an amendment hereto.

Section 5.4 Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof and supersedes any prior or contemporaneous contracts, agreements, understandings or arrangements, whether written or oral, with respect thereto (including that certain Services Agreement between Operating Company and certain nonutility subsidiaries of Duke Energy dated April 3, 2006). Any oral or written statements, representations, promises, negotiations or agreements, whether prior hereto or concurrently herewith, are superseded by and merged into this Agreement.

Section 5.5 Severability. If any provision of this Agreement or any application thereof shall be determined to be invalid or unenforceable, the remainder of this Agreement and any other application thereof shall not be affected thereby.

Section 5.6 Assignment. Neither this Agreement nor any of the rights, interests or obligations hereunder shall be assigned, in whole or in part, by operation of law or otherwise by any of the parties hereto without the prior written consent of each of the other parties. Any attempted or purported assignment in violation of the preceding sentence shall be null and void and of no effect whatsoever. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties and their respective successors and assigns.

Section 5.7 Governing Law. This Agreement shall be construed and enforced under and in accordance with the laws of the State of Kentucky, without regard to conflicts of laws principles.

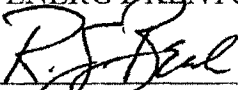
Section 5.8 Captions, etc. The captions and headings used in this Agreement are for convenience of reference only and shall not affect the construction to be accorded any of the provisions hereof. As used in this Agreement, "hereof," "hereunder," "herein," "hereto," and words of like import refer to this Agreement as a whole and not to any particular section or other paragraph or subparagraph thereof.

Section 5.9 Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed a duplicate original hereof, but all of which shall be deemed one and the same Agreement.


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IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed on its behalf by an appropriate officer thereunto duly authorized.

DUKE ENERGY KENTUCKY, INC.

By: 
Richard G. Beach
Assistant Secretary

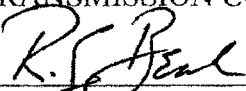
CINERGY CORP.

By: 
Richard G. Beach
Assistant Secretary

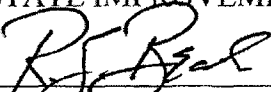
CINERGY INVESTMENTS, INC.

By: _____
George Dwight, II
Assistant Secretary

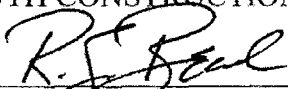
KO TRANSMISSION COMPANY

By: 
Richard G. Beach
Assistant Secretary

TRI-STATE IMPROVEMENT COMPANY

By: 
Richard G. Beach
Assistant Secretary

SOUTH CONSTRUCTION COMPANY, INC.

By: 
Richard G. Beach
Assistant Secretary

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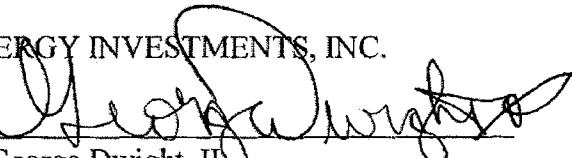
DUKE ENERGY KENTUCKY, INC.

By: _____
Richard G. Beach
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CINERGY CORP.

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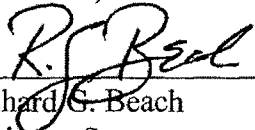
TRI-STATE IMPROVEMENT COMPANY

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CINPOWER I, LLC

By: 
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DUKE ENERGY ENGINEERING, INC.

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George Dwight, II
Assistant Secretary

DUKE ENERGY GENERATION SERVICES
HOLDING COMPANY, INC.

By: _____
George Dwight, II
Assistant Secretary

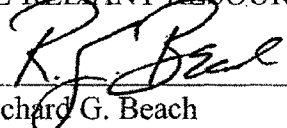
SUEZ-DEGS, LLC

By: _____
David A. Ledonne
Vice President

SUEZ-DEGS OF ORLANDO, LLC

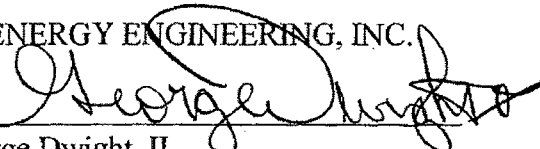
By: _____
George Dwight, II
Assistant Secretary


DUKE-RELIANT RESOURCES, INC.

By: 
Richard G. Beach
Assistant Secretary

CINPOWER I, LLC


By: _____
Richard G. Beach
Assistant Secretary

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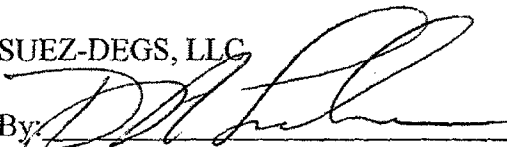
DUKE ENERGY ENGINEERING, INC.

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George Dwight, II
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DUKE ENERGY GENERATION SERVICES
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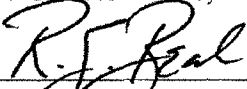
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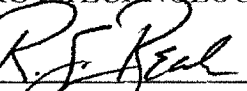
DUKE-RELIANT RESOURCES, INC.

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Richard G. Beach
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RELIANT SERVICES, LLC

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Assistant Secretary

CINERGY TECHNOLOGY, INC.

By: 
Richard G. Beach
Assistant Secretary

DEGS OF TUSCOLA, INC.

By: _____
George Dwight, II
Assistant Secretary

ENERGY EQUIPMENT LEASING LLC

By: _____
George Dwight, II
Assistant Secretary

DEGS OF BOCA RATON, LLC

By: _____
George Dwight, II
Assistant Secretary

DEGS OF CINCINNATI, LLC

By: _____
George Dwight, II
Assistant Secretary

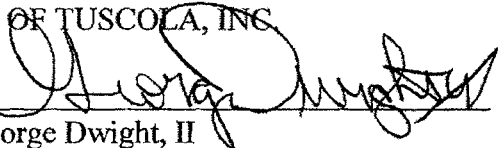
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Richard G. Beach
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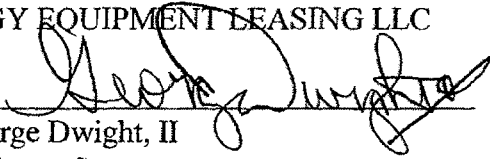
CINERGY TECHNOLOGY, INC.

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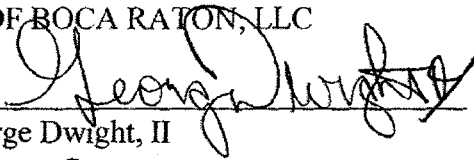
DEGS OF TUSCOLA, INC

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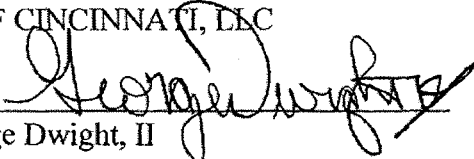
ENERGY EQUIPMENT LEASING LLC

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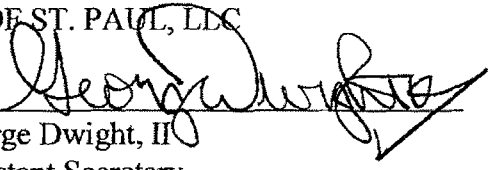
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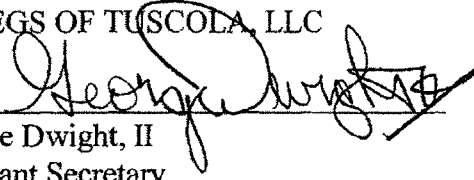
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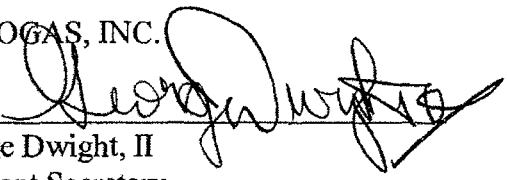
DEGS OF ST. PAUL, LLC

By: 
George Dwight, II
Assistant Secretary

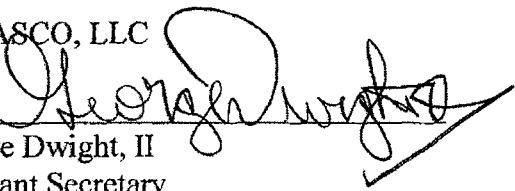
SUEZ-DEGS OF TUSCOLA, LLC

By: 
George Dwight, II
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DEGS BIOGAS, INC.

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DEGS GASCO, LLC

By: 
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DUKE ENERGY ONE, INC.

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CINERGY POWER GENERATION SERVICES, LLC

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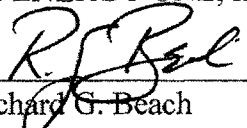
DEGS BIOGAS, INC.

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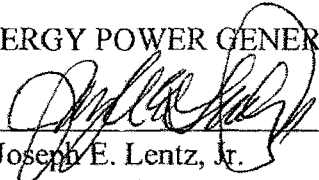
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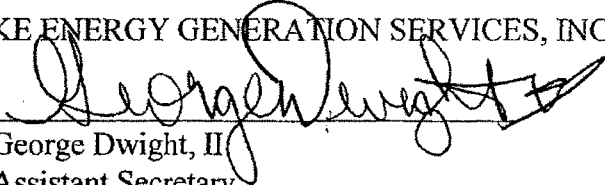
DUKE ENERGY ONE, INC.

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DUKE ENERGY GENERATION SERVICES, INC.

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DUKE TECHNOLOGIES, INC.

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DUKE VENTURES II, LLC

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CINERGY WHOLESALE ENERGY, INC.

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DUKETEC, LLC

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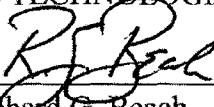
DUKETEC I, LLC

By: _____
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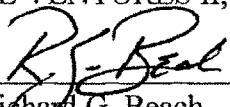
DUKE ENERGY GENERATION SERVICES, INC.

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George Dwight, II
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DUKE TECHNOLOGIES, INC.

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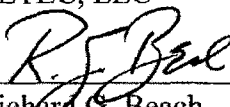
DUKE VENTURES II, LLC

By:  _____
Richard G. Beach
Assistant Secretary

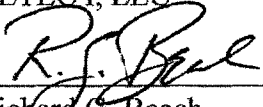
CINERGY WHOLESALE ENERGY, INC.

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Joseph E. Lentz, Jr.
Vice President

DUKETEC, LLC

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Richard G. Beach
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DUKETEC I, LLC

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DUKE ENERGY GENERATION SERVICES, INC.

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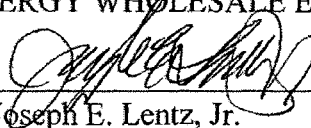
DUKE TECHNOLOGIES, INC.

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DUKETEC, LLC

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DUKETEC I, LLC

By: _____
Richard G. Beach
Assistant Secretary

EVENT RESOURCES I LLC

By: 
Richard G. Beach
Assistant Secretary

LANSING GRAND RIVER UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

OKLAHOMA ARCADIAN UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

SHREVEPORT RED RIVER UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

SYNCAP II, LLC

By: _____
George Dwight, II
Assistant Secretary

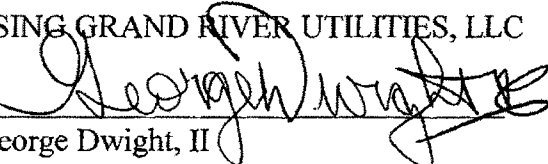
SUEZ/VWNA/DEGS OF LANSING, LLC

By: _____
George Dwight, II
Assistant Secretary

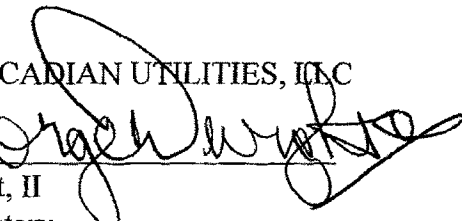
EVENT RESOURCES I LLC

By: _____
Richard G. Beach
Assistant Secretary

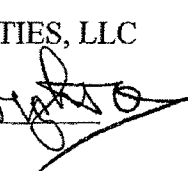
LANSING GRAND RIVER UTILITIES, LLC

By: 
George Dwight, II
Assistant Secretary

OKLAHOMA ARCADIAN UTILITIES, LLC

By: 
George Dwight, II
Assistant Secretary

SHREVEPORT RED RIVER UTILITIES, LLC

By: 
George Dwight, II
Assistant Secretary


SYNCAP II, LLC

By:
George Dwight, II
Assistant Secretary

SUEZ/VWNA/DEGS OF LANSING, LLC

By:
George Dwight, II
Assistant Secretary

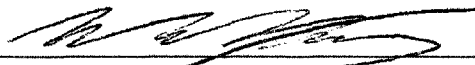
BSPE, L.P.

By: 
Wouter T. van Kempen
Authorized Representative


BSPE GENERAL, LLC

By: 
Wouter T. van Kempen
Authorized Representative

BSPE HOLDINGS, LLC

By: 
Wouter T. van Kempen
Authorized Representative

BSPE LIMITED, LLC

By: 
Wouter T. van Kempen
Authorized Representative

CSGP OF SOUTHEAST TEXAS, LLC

By: _____
George Dwight, II
Assistant Secretary

OWINGS MILLS ENERGY EQUIPMENT LEASING LLC

By: _____
George Dwight, II
Assistant Secretary

BSPE, L.P.

By: _____
Wouter T. van Kempen
Authorized Representative

BSPE GENERAL, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

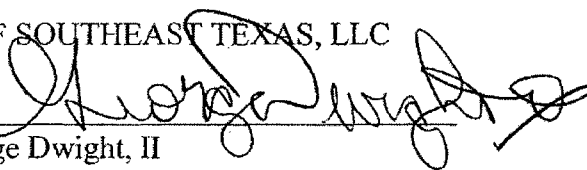
BSPE HOLDINGS, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

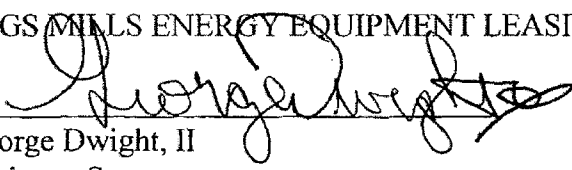
BSPE LIMITED, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

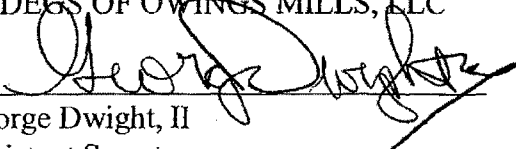
CSGP OF SOUTHEAST TEXAS, LLC

By: _____

George Dwight, II
Assistant Secretary

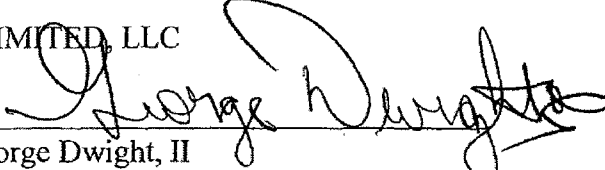
OWINGS MILLS ENERGY EQUIPMENT LEASING LLC

By: _____

George Dwight, II
Assistant Secretary

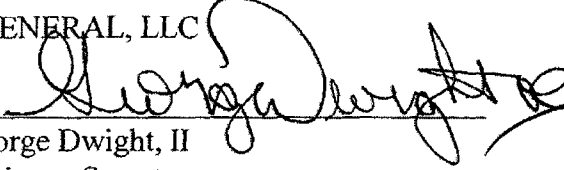
SUEZ-DEGS OF OWINGS MILLS, LLC

By: 
George Dwight, II
Assistant Secretary

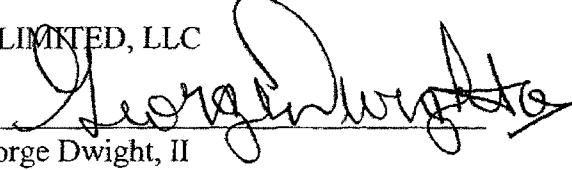
CST LIMITED, LLC

By: 
George Dwight, II
Assistant Secretary

CST GENERAL, LLC

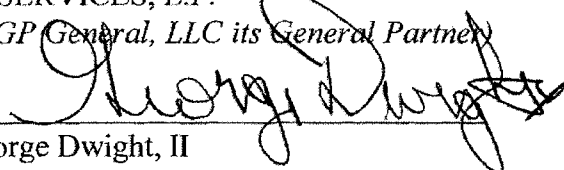
By: 
George Dwight, II
Assistant Secretary

CSGP LIMITED, LLC

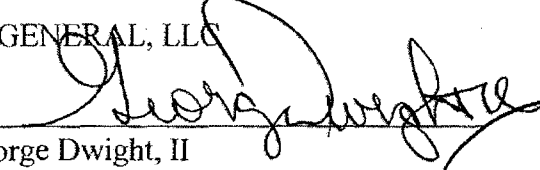
By: 
George Dwight, II
Assistant Secretary

CSGP SERVICES, L.P.

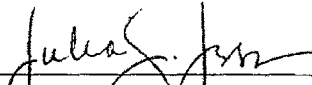
(by CSGP General, LLC its General Partner)

By: 
George Dwight, II
Assistant Secretary

CSGP GENERAL, LLC

By: 
George Dwight, II
Assistant Secretary

CINERGY GLOBAL TRADING LIMITED

By: 

Julia S. Janson
Secretary

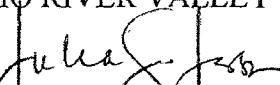
CINERGY ORIGINATION & TRADE, LLC

By: _____
Richard G. Beach
Assistant Secretary

DEGS OF PHILADELPHIA, LLC

By: _____
George Dwight, II
Assistant Secretary

OHIO RIVER VALLEY PROPANE, LLC

By: 

Julia S. Janson
Secretary

CINERGY RETAIL POWER LIMITED, INC.

By: _____
Richard G. Beach
Assistant Secretary


CINERGY RETAIL POWER GENERAL, INC.

By: _____
Joseph E. Lentz, Jr.
Vice President

CINERGY GLOBAL TRADING LIMITED

By: _____
Julia S. Janson
Secretary

CINERGY ORIGINATION & TRADE, LLC

By:  _____
Richard G. Beach
Assistant Secretary

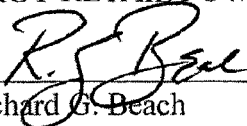
DEGS OF PHILADELPHIA, LLC

By: _____
George Dwight, II
Assistant Secretary

OHIO RIVER VALLEY PROPANE, LLC

By: _____
Julia S. Janson
Secretary

CINERGY RETAIL POWER LIMITED, INC.

By:  _____
Richard G. Beach
Assistant Secretary

CINERGY RETAIL POWER GENERAL, INC.

By: _____
Joseph E. Lentz, Jr.
Vice President

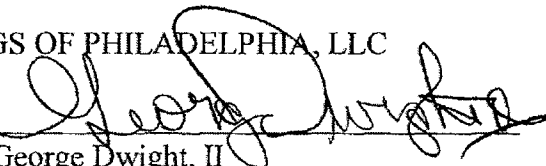
CINERGY GLOBAL TRADING LIMITED

By: _____
Julia S. Janson
Secretary

CINERGY ORIGINATION & TRADE, LLC

By: _____
Richard G. Beach
Assistant Secretary

DEGS OF PHILADELPHIA, LLC

By:  _____
George Dwight, II
Assistant Secretary

OHIO RIVER VALLEY PROPANE, LLC

By: _____
Julia S. Janson
Secretary

CINERGY RETAIL POWER LIMITED, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY RETAIL POWER GENERAL, INC.

By: _____
Joseph E. Lentz, Jr.
Vice President

CINERGY GLOBAL TRADING LIMITED

By: _____
Julia S. Janson
Secretary

CINERGY ORIGINATION & TRADE, LLC

By: _____
Richard G. Beach
Assistant Secretary

DEGS OF PHILADELPHIA, LLC

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George Dwight, II
Assistant Secretary


OHIO RIVER VALLEY PROPANE, LLC

By: _____
Julia S. Janson
Secretary

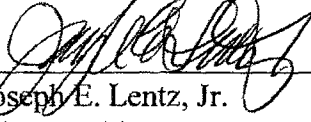
CINERGY RETAIL POWER LIMITED, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY RETAIL POWER GENERAL, INC.

By:  _____
Joseph E. Lentz, Jr.
Vice President

CINERGY RETAIL POWER, L.P.
(by Cinergy Retail Power General, Inc. its General Partner)

By: 

Joseph E. Lentz, Jr.
Vice President

DELTA TOWNSHIP UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

CINERGY LIMITED HOLDINGS, LLC

By: _____
Greer E. Mendelow
Assistant Secretary

CINERGY GENERAL HOLDINGS, LLC

By: _____
Julia S. Janson
Secretary

CINERGY RECEIVABLES COMPANY LLC

By: _____
Richard G. Beach
Secretary

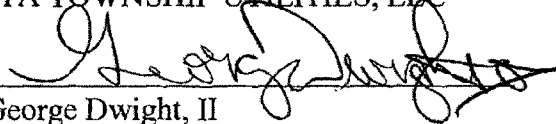
CINFUEL RESOURCES, INC.

By: _____
George Dwight, II
Assistant Secretary

CINERGY RETAIL POWER, L.P.
(by Cinergy Retail Power General, Inc. its General Partner)

By: _____
Joseph E. Lentz, Jr.
Vice President

DELTA TOWNSHIP UTILITIES, LLC

By: 
George Dwight, II
Assistant Secretary

CINERGY LIMITED HOLDINGS, LLC

By: _____
Greer E. Mendelow
Assistant Secretary

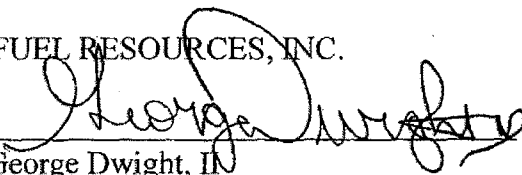
CINERGY GENERAL HOLDINGS, LLC

By: _____
Julia S. Janson
Secretary

CINERGY RECEIVABLES COMPANY LLC

By: _____
Richard G. Beach
Secretary

CINFUEL RESOURCES, INC.

By: 
George Dwight, II
Assistant Secretary

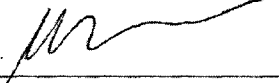
CINERGY RETAIL POWER, L.P.
(by Cinergy Retail Power General, Inc. its General Partner)

By: _____
Joseph E. Lentz, Jr.
Vice President

DELTA TOWNSHIP UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

CINERGY LIMITED HOLDINGS, LLC

By:  _____
Greer E. Mendelow
Assistant Secretary

CINERGY GENERAL HOLDINGS, LLC

By: _____
Julia S. Janson
Secretary

CINERGY RECEIVABLES COMPANY LLC

By: _____
Richard G. Beach
Secretary

CINFUEL RESOURCES, INC.

By: _____
George Dwight, II
Assistant Secretary

CINERGY RETAIL POWER, L.P.
(by Cinergy Retail Power General, Inc. its General Partner)

By: _____
Joseph E. Lentz, Jr.
Vice President

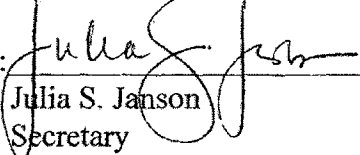
DELTA TOWNSHIP UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

CINERGY LIMITED HOLDINGS, LLC

By: _____
Greer E. Mendelow
Assistant Secretary

CINERGY GENERAL HOLDINGS, LLC

By:  _____
Julia S. Janson
Secretary

CINERGY RECEIVABLES COMPANY LLC

By: _____
Richard G. Beach
Secretary

CINFUEL RESOURCES, INC.

By: _____
George Dwight, II
Assistant Secretary

CINERGY RETAIL POWER, L.P.
(by Cinergy Retail Power General, Inc. its General Partner)

By: _____
Joseph E. Lentz, Jr.
Vice President

DELTA TOWNSHIP UTILITIES, LLC

By: _____
George Dwight, II
Assistant Secretary

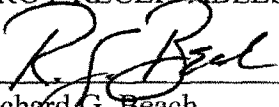
CINERGY LIMITED HOLDINGS, LLC

By: _____
Greer E. Mendelow
Assistant Secretary

CINERGY GENERAL HOLDINGS, LLC

By: _____
Julia S. Janson
Secretary

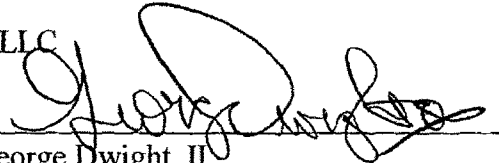
CINERGY RECEIVABLES COMPANY LLC

By:  _____
Richard G. Beach
Secretary

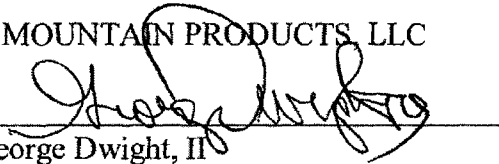
CINFUEL RESOURCES, INC.

By: _____
George Dwight, II
Assistant Secretary

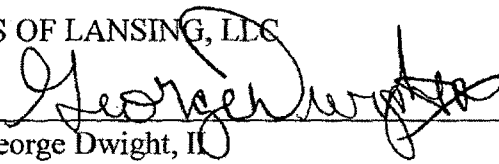
LH1, LLC

By: 
George Dwight, II
Assistant Secretary

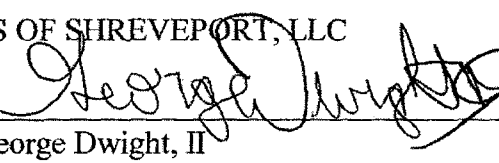
OAK MOUNTAIN PRODUCTS, LLC

By: 
George Dwight, II
Assistant Secretary

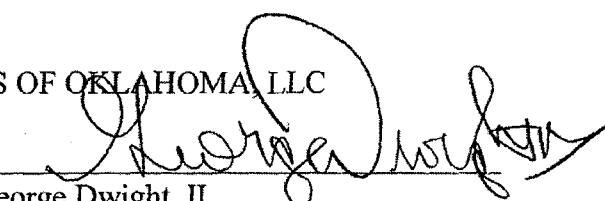
DEGS OF LANSING, LLC

By: 
George Dwight, II
Assistant Secretary

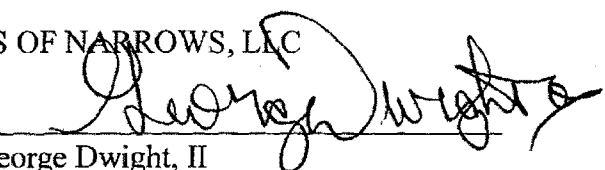
DEGS OF SHREVEPORT, LLC

By: 
George Dwight, II
Assistant Secretary

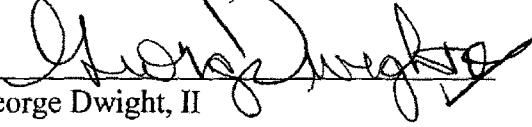
DEGS OF OKLAHOMA, LLC

By: 
George Dwight, II
Assistant Secretary

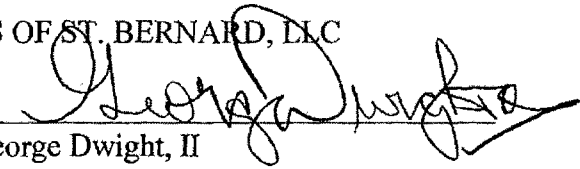
DEGS OF NARROWS, LLC

By: 
George Dwight, II
Assistant Secretary

DEGS OF ROCK HILL, LLC

By: 
George Dwight, II
Assistant Secretary

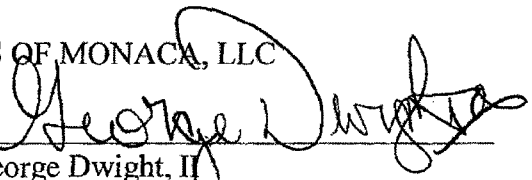
DEGS OF ST. BERNARD, LLC

By: 
George Dwight, II
Assistant Secretary

CINERGY CLIMATE CHANGE INVESTMENTS, LLC

By: _____
Richard G. Beach
Assistant Secretary

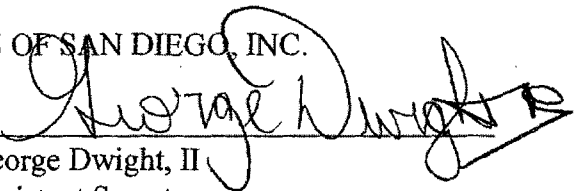
DEGS OF MONACA, LLC

By: 
George Dwight, II
Assistant Secretary

DUKETEC II, LLC

By: _____
Richard G. Beach
Assistant Secretary

DEGS OF SAN DIEGO, INC.

By: 
George Dwight, II
Assistant Secretary

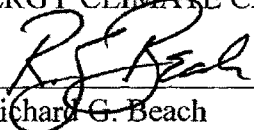
DEGS OF ROCK HILL, LLC

By: _____
George Dwight, II
Assistant Secretary

DEGS OF ST. BERNARD, LLC

By: _____
George Dwight, II
Assistant Secretary

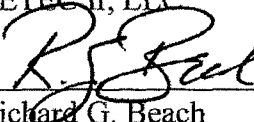
CINERGY CLIMATE CHANGE INVESTMENTS, LLC

By:  _____
Richard G. Beach
Assistant Secretary

DEGS OF MONACA, LLC

By: _____
George Dwight, II
Assistant Secretary

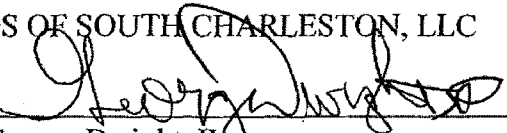
DUKETEC II, LLC

By:  _____
Richard G. Beach
Assistant Secretary

DEGS OF SAN DIEGO, INC.

By: _____
George Dwight, II
Assistant Secretary

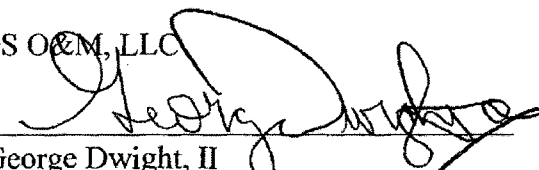
DEGS OF SOUTH CHARLESTON, LLC

By: 
George Dwight, II
Assistant Secretary

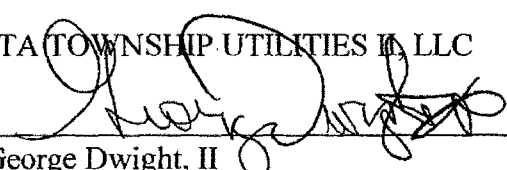
CINERGY SOLUTIONS – UTILITY, INC.

By: _____
Richard G. Beach
Assistant Secretary

DEGS O&M, LLC

By: 
George Dwight, II
Assistant Secretary

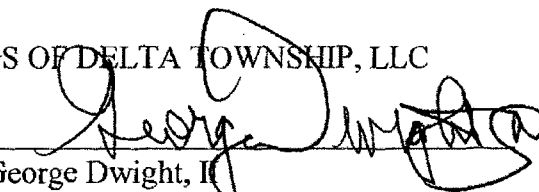
DELTA TOWNSHIP UTILITIES II, LLC

By: 
George Dwight, II
Assistant Secretary

ENVIRONMENTAL WOOD SUPPLY, LLC

By: _____
David A. Ledonne
Vice President

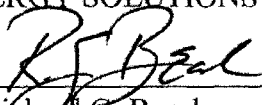
DEGS OF DELTA TOWNSHIP, LLC

By: 
George Dwight, II
Assistant Secretary

DEGS OF SOUTH CHARLESTON, LLC

By: _____
George Dwight, II
Assistant Secretary

CINERGY SOLUTIONS - UTILITY, INC.

By:  _____
Richard G. Beach
Assistant Secretary

DEGS O&M, LLC

By: _____
George Dwight, II
Assistant Secretary

DELTA TOWNSHIP UTILITIES II, LLC

By: _____
George Dwight, II
Assistant Secretary

ENVIRONMENTAL WOOD SUPPLY, LLC

By: _____
David A. Ledonne
Vice President

DEGS OF DELTA TOWNSHIP, LLC

By: _____
George Dwight, II
Assistant Secretary

DEGS OF SOUTH CHARLESTON, LLC

By: _____
George Dwight, II
Assistant Secretary

CINERGY SOLUTIONS -- UTILITY, INC.

By: _____
Richard G. Beach
Assistant Secretary

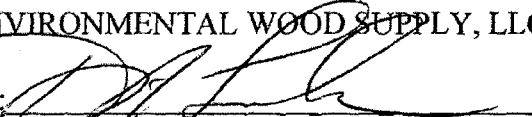
DEGS O&M, LLC

By: _____
George Dwight, II
Assistant Secretary

DELTA TOWNSHIP UTILITIES II, LLC

By: _____
George Dwight, II
Assistant Secretary

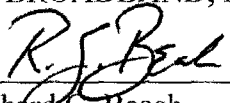
ENVIRONMENTAL WOOD SUPPLY, LLC

By: 
David A. Ledonne
Vice President


DEGS OF DELTA TOWNSHIP, LLC

By: _____
George Dwight, II
Assistant Secretary

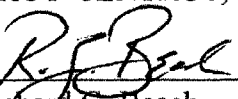
DUKE BROADBAND, LLC

By: 
Richard G. Beach
Assistant Secretary

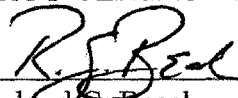
DUKE-CADENCE, INC.

By: 
Richard G. Beach
Assistant Secretary

CINERGY-CENTRUS, INC.

By: 
Richard G. Beach
Assistant Secretary


CINERGY-CENTRUS COMMUNICATIONS, INC.

By: 
Richard G. Beach
Assistant Secretary

DEGS EPCOM COLLEGE PARK, LLC

By: _____
George Dwight, II
Assistant Secretary

DUKE SUPPLY NETWORK, LLC

By: 
Richard G. Beach
Assistant Secretary

DUKE BROADBAND, LLC

By: _____
Richard G. Beach
Assistant Secretary

DUKE-CADENCE, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY-CENTRUS, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY-CENTRUS COMMUNICATIONS, INC.

By: _____
Richard G. Beach
Assistant Secretary

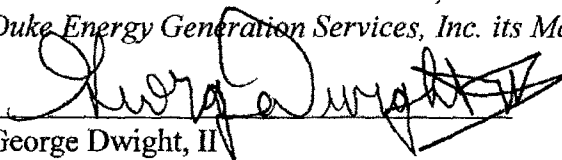
DEGS EPCOM COLLEGE PARK, LLC

By: _____
George Dwight,
Assistant Secretary

DUKE SUPPLY NETWORK, LLC

By: _____
Richard G. Beach
Assistant Secretary

CINERGY SOLUTIONS PARTNERS, LLC
(by Duke Energy Generation Services, Inc. its Managing Member)

By: 
George Dwight, II
Assistant Secretary

DUKE COMMUNICATIONS HOLDINGS, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY TWO, INC.

By: _____
Richard G. Beach
Assistant Secretary

GREEN POWER G.P., LLC

By: _____
Wouter T. van Kempen
Authorized Representative

GREEN POWER HOLDINGS, LLC

By: _____
Wouter T. van Kempen
Authorized Representative


GREEN POWER LIMITED, LLC

By: _____
Wouter T. van Kempen
Authorized Representative


CINERGY SOLUTIONS PARTNERS, LLC
(by Duke Energy Generation Services, Inc. its Managing Member)

By: _____
George Dwight, II
Assistant Secretary

DUKE COMMUNICATIONS HOLDINGS, INC.

By:  _____
Richard G. Beach
Assistant Secretary

CINERGY TWO, INC.

By:  _____
Richard G. Beach
Assistant Secretary

GREEN POWER G.P., LLC

By: _____
Wouter T. van Kempen
Authorized Representative

GREEN POWER HOLDINGS, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

GREEN POWER LIMITED, LLC

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Wouter T. van Kempen
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George Dwight, II
Assistant Secretary

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By: _____
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Assistant Secretary

CINERGY TWO, INC.

By: _____
Richard G. Beach
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Wouter T. van Kempen
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GREEN POWER HOLDINGS, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

GREEN POWER LIMITED, LLC

By: _____
Wouter T. van Kempen
Authorized Representative

SUEZ-DEGS OF ASHTABULA, LLC

By: _____
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF LANSING, LLC

By: _____
George Dwight, II
Assistant Secretary

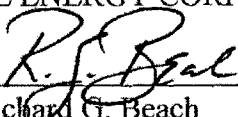
SUEZ-DEGS OF ROCHESTER, LLC

By: _____
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF SILVER GROVE, LLC

By: _____
George Dwight, II
Assistant Secretary

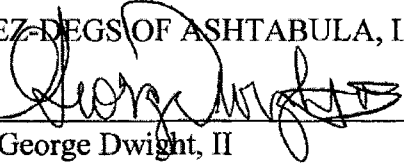
DUKE ENERGY CORPORATION

By: 
Richard G. Beach
Assistant Corporate Secretary

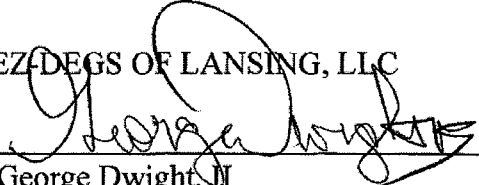
BISON INSURANCE COMPANY LIMITED

By: _____
Edwin Keith Bone
Senior Vice President

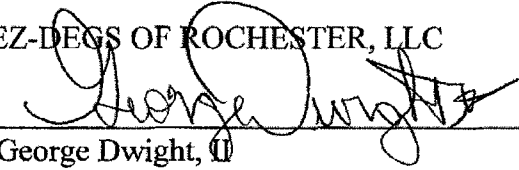
SUEZ-DEGS OF ASHTABULA, LLC

By: 
George Dwight, II
Assistant Secretary

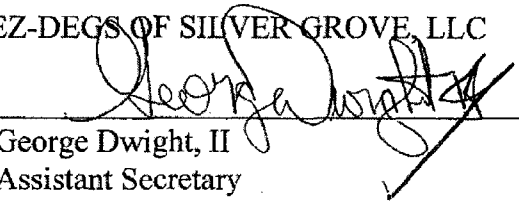
SUEZ-DEGS OF LANSING, LLC

By: 
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF ROCHESTER, LLC

By: 
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF SILVER GROVE, LLC

By: 
George Dwight, II
Assistant Secretary

DUKE ENERGY CORPORATION

By: _____
Richard G. Beach
Assistant Corporate Secretary

BISON INSURANCE COMPANY LIMITED

By: _____
George V. Brown
President and Chief Executive Officer

SUEZ-DEGS OF ASHTABULA, LLC

By: _____
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF LANSING, LLC

By: _____
George Dwight, II
Assistant Secretary

SUEZ-DEGS OF ROCHESTER, LLC

By: _____
George Dwight, II
Assistant Secretary

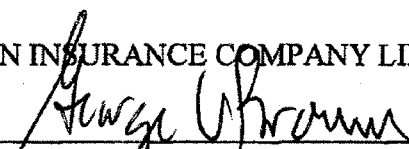
SUEZ-DEGS OF SILVER GROVE, LLC

By: _____
George Dwight, II
Assistant Secretary

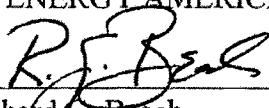
DUKE ENERGY CORPORATION

By: _____
Richard G. Beach
Assistant Corporate Secretary

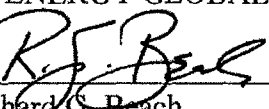
BISON INSURANCE COMPANY LIMITED

By:  _____
George V. Brown
President and Chief Executive Officer

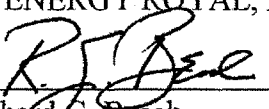
DUKE ENERGY AMERICAS, LLC

By: 
Richard G. Beach
Assistant Secretary

DUKE ENERGY GLOBAL MARKETS, INC.

By: 
Richard G. Beach
Assistant Secretary

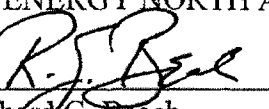
DUKE ENERGY ROYAL, LLC

By: 
Richard G. Beach
Assistant Secretary

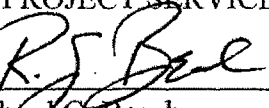
DUKE ENERGY INTERNATIONAL, LLC

By: _____
Javier Gonzalez
Assistant Secretary

DUKE ENERGY NORTH AMERICA, LLC

By: 
Richard G. Beach
Assistant Secretary

DUKE PROJECT SERVICES, INC.

By: 
Richard G. Beach
Assistant Secretary

DUKE ENERGY AMERICAS, LLC

By: _____
Richard G. Beach
Assistant Secretary

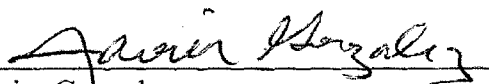
DUKE ENERGY GLOBAL MARKETS, INC.

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY ROYAL, LLC

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY INTERNATIONAL, LLC

By: 
Javier Gonzalez
Assistant Secretary

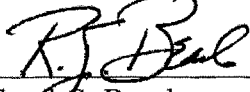
DUKE ENERGY NORTH AMERICA, LLC

By: _____
Richard G. Beach
Assistant Secretary

DUKE PROJECT SERVICES, INC.

By: _____
Richard G. Beach
Assistant Secretary


DUKE VENTURES, LLC

By: 
Richard G. Beach
Assistant Secretary

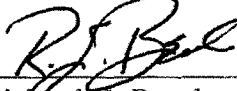
CRESCENT RESOURCES, LLC

By: _____
Kay H. Arnette
Assistant Secretary


DUKENET COMMUNICATIONS, LLC

By: 
Richard G. Beach
Assistant Secretary


PANENERGY CORP

By: 
Richard G. Beach
Assistant Secretary

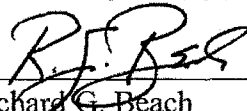
DUKE ENERGY SERVICES, INC.

By: 
Richard G. Beach
Assistant Secretary

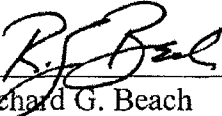
DETFI MANAGEMENT, INC.

By: 
Richard G. Beach
Assistant Secretary

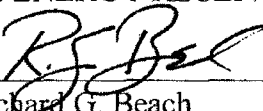
DUKE ENERGY BUSINESS SERVICES LLC

By: 
Richard G. Beach
Assistant Secretary


DUKE ENERGY MERCHANTS, LLC

By: 
Richard G. Beach
Assistant Secretary

DUKE ENERGY RECEIVABLES FINANCE COMPANY, LLC

By: 
Richard G. Beach
Assistant Secretary

DUKENET COMMUNICATION SERVICES, LLC

By: 
Richard G. Beach
Assistant Secretary

Service Request Form

Please use this form for all service requests. All data fields are required.

Facilitator/Contact Information:

First Name: []
Last Name: []
Phone: []
Email: []

Service Provider:

- Pull Down List to Select -

Or Other:

- Pull Down List to Select -

Service Provider Contact Information:

First Name: []
Last Name: []
Phone: []

email Address of Service Provider Approver:

The approver should be appropriate according to the Expenditures, Divestitures & Terminations Category of the Delegation of Authority (DOA) matrix.

Description of Proposed Service and Please Provide Basis for Estimated Costs:

[]

Client Company:

- Pull Down List to Select -

Or Other:

- Pull Down List to Select -

Client Company Contact Information:

First Name: []
Last Name: []
Phone: []

(this e-mail address must be filled in properly for form to send automatically to the Client Approver)

email Address of Client Company

The approver should be appropriate

Approver: according to the Expenditures,
Divestitures & Terminations Category of
the Delegation of Authority (DOA) matrix.

Estimated Costs: \$
Format Numbers Only - do not include commas or periods

Scheduled Start Date:
MM/DD/YYYY

Scheduled
Completion Date:
MM/DD/YYYY

Legal Approval
Representative:

**Accounting codes (FMIS / BDMS) of Duke Energy
Company receiving the services:**

Process / Work Code(s):

n/a / Corp. Number:

RCTo / Line of Business:

RCFrom / Center:

Project:

Activity:

**ASSYMMETRICALLY-PROCEED DUKE ENERGY KENTUCKY, INC. /NONUTILITY
COMPANIES
SERVICE AGREEMENT**

This Operating Company/Nonutility Companies Service Agreement (this "Agreement") is made and entered into as of October 1, 2009 (the "Effective Date") by and among Duke Energy Kentucky, Inc., a Kentucky corporation ("Operating Company"), and the respective associate nonutility companies listed on the signature pages hereto (each, a "Nonutility Company").

WITNESSETH:

WHEREAS, Duke Energy Corporation ("Duke Energy") is a Delaware corporation;

WHEREAS, Operating Company is a subsidiary of Duke Energy and a public utility company;

WHEREAS, each Nonutility Company is a subsidiary of Duke Energy that is or was formed to engage in any one or more non-regulated businesses;

WHEREAS, in the ordinary course of their businesses, Operating Company and each Nonutility Company maintain organizations of employees with technical expertise in matters affecting public utility companies and related businesses and own or acquire related equipment, facilities, properties and other resources; and

WHEREAS, subject to the terms and conditions herein set forth, and taking into consideration the parties' utility responsibilities or primary business operations, as the case may be, the parties hereto are willing, upon request from time to time, to perform such services, and in connection therewith to make available such equipment, facilities, properties and other resources, as they shall request from each other;

NOW, THEREFORE, in consideration of the premises and the mutual covenants herein contained, the parties agree as follows:

ARTICLE 1. PROVISION OF SERVICES; LOANED EMPLOYEES

Section 1.1 Provision of Services.

(a) Upon receipt by a party hereto (in such capacity, a "Service Provider") of a written request in substantially the form attached hereto as Exhibit A (a "Service Request") from another party hereto (in such capacity, a "Client Company") for the provision to such Client Company of such services as are specified therein, including if applicable use of any related equipment, facilities, properties or other resources (collectively, "Services"), the Service Provider, if in its sole discretion it has available the personnel or other resources needed to perform the Service Request without impairment of its utility responsibilities or business operations, as the case may be, shall furnish such Services to the Client Company at such times, for such periods and in such manner as the Client Company shall have so requested and otherwise in accordance with the provisions hereof.

(b) For purposes of this Agreement, "Services" may include, but shall not be limited to: (i) in the case of Services that may be provided by Operating Company hereunder, services in such areas as engineering and construction; operations and maintenance; installation services; equipment testing; generation technical support; environmental, health and safety; and procurement services; and (ii) in the case of Services that may be provided by Nonutility Companies hereunder, services in such areas as information technology services; monitoring, surveying, inspecting, constructing, locating and marking of overhead and underground utility facilities; meter reading; materials management; vegetation management; and marketing and customer relations.

(c) For the avoidance of doubt, affiliate transactions involving sales or other transfers of assets, goods, energy commodities (including electricity, natural gas, coal and other combustible fuels) or thermal energy products are outside the scope of this Agreement.

Section 1.2 Loaned Employees.

(a) If specifically requested in connection with the provision of Services, Service Provider shall loan one or more of its employees to such Client Company, provided that such loan shall not, in the sole discretion of Service Provider, interfere with or impair Service Provider's utility responsibilities or business operations, as the case may be. After the commencement thereof, any such loaned employees may be withdrawn by Service Provider from tasks duly assigned by Client Company, prior to completion thereof as contemplated in the associated Service Request, only with the consent of Client Company (which shall not be unreasonably withheld or delayed), except in the event of a demonstrable emergency requiring the use of any such employees in another capacity for Service Provider.

(b) While performing work on behalf of Client Company, any such loaned employees shall be under its supervision and control, and Client Company shall be responsible for their actions to the same extent as though such persons were its employees (it being understood that such persons shall nevertheless remain employees of Service Provider and nothing herein shall be construed as creating an employer-employee relationship between any Client Company and any loaned employees). Accordingly, for the duration of any such loan, Service Provider shall continue to provide its loaned employees with the same payroll, pension, savings, tax withholding, unemployment, bookkeeping and other personnel support services then being provided by Service Provider to its other employees.

ARTICLE 2. SERVICE REQUESTS

Section 2.1 Procedure. All Services (including any loans of employees) (i) shall be performed in accordance with Service Requests issued by or on behalf of Client Company and accepted by Service Provider and (ii) shall be assigned to applicable activities, processes, projects, responsibility centers or on other appropriate bases to enable specific work to be properly assigned. Service Requests shall be as specific as practicable in defining the Services requested. Client Company shall have the right from time to time to amend or rescind any Service Request, *provided* that (a) Service Provider consents to any amendment that results in a material change in the scope of Services to be provided, (b) the costs associated with an amended or rescinded Service Request shall include the costs incurred by Service Provider as a result of such amendment or rescission, and (c) no

amendment or rescission of a Service Request shall release Client Company from any liability for costs already incurred or contracted for by Service Provider pursuant to the original Service Request, regardless of whether any labor or the furnishing of any property or other resources has been commenced or completed.

ARTICLE 3. COMPENSATION FOR SERVICES

Section 3.1 Cost of Services. Except to the extent otherwise required by Section 482 of the Internal Revenue Code or analogous state tax law, as compensation for any Services rendered to it pursuant to this Agreement, Client Company shall pay to Service Provider an amount consistent with the Commonwealth of Kentucky's affiliate transaction pricing requirements, KRS 278.2207. Accordingly (i) Services provided by the Operating Company to a Nonutility Company shall be priced at the greater of Cost or market, and (ii) Services provided by a Nonutility Company to the Operating Company shall be priced at the lesser of Cost or market. "Cost" means the sum of (i) direct costs, (ii) indirect costs and (iii) costs of capital. As soon as practicable after the close of each month, Service Provider shall render to each Client Company a statement reflecting the billing information necessary to identify the costs charged for that month. By the last day of each month, Client Company shall remit to Service Provider all charges billed to it. For avoidance of doubt, the Service Provider and each Client Company may satisfy the foregoing requirement by recording billings and payments required hereunder in their common accounting systems without rendering paper or electronic monthly statements or remitting cash payments.

ARTICLE 4. LIMITATION OF LIABILITY; INDEMNIFICATION

Section 4.1 Limitation of Liability/Services. In performing Services pursuant to Section 1.1 hereof, Service Provider will exercise due care to assure that the Services are performed in a workmanlike manner in accordance with the specifications set forth in the applicable Service Request and consistent with any applicable legal standards. The sole and exclusive responsibility of Service Provider for any deficiency therein shall be promptly to correct or repair such deficiency or to re-perform such Services, in either case at no additional cost to Client Company, so that the Services fully conform to the standards described in the first sentence of this Section 4.1. No Service Provider makes any other warranty with respect to the provision of Services, and each Client Company agrees to accept any Services without further warranty of any nature.

Section 4.2 Limitation of Liability/Loaned Employees. In furnishing Services under Section 1.2 hereof (i.e., involving loaned employees), neither the Service Provider, nor any officer, director, employee or agent thereof, shall have any responsibility whatever to any Client Company receiving such Services, and Client Company specifically releases Service Provider and such persons, on account of any claims, liabilities, injuries, damages or other consequences arising in connection with the provision of such Services under any theory of liability, whether in contract, tort (including negligence or strict liability) or otherwise, it being understood and agreed that any such loaned employees are made available without warranty as to their suitability or expertise.

Section 4.3 Disclaimer. WITH RESPECT TO ANY SERVICES PROVIDED UNDER THIS AGREEMENT, THE SERVICE PROVIDER THEREOF MAKES NO WARRANTY OR REPRESENTATION OTHER THAN AS SET FORTH IN SECTION 4.1, AND THE PARTIES

HERETO HEREBY AGREE THAT NO OTHER WARRANTY, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING BUT NOT LIMITED TO ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE), SHALL BE APPLICABLE TO THE PROVISION OF ANY SUCH SERVICES. THE PARTIES FURTHER AGREE THAT THE REMEDIES STATED HEREIN ARE EXCLUSIVE AND SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ANY PARTY HERETO FOR A FAILURE BY ANY OTHER PARTY HERETO TO COMPLY WITH ITS WARRANTY OBLIGATIONS.

Section 4.4 Indemnification.

(a) Indemnification In Respect of Services Provided by Operating Company.

(i) In circumstances where Operating Company is a Service Provider: (x) subject to subparagraph (ii) of this Section 4.4(a), Service Provider shall release, defend, indemnify and hold harmless each Client Company, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any loss, liability, claim, damage, expense (including costs of investigation and defense and reasonable attorneys' fees), whether or not involving a third-party claim (collectively, "Damages"), incurred or sustained by or against Service Provider or any such Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services, and (y) each Nonutility Company that is a Client Company with respect to such Services shall release, defend, indemnify and hold harmless Service Provider, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any Damages incurred or sustained by or against Service Provider or any such Client Company arising, directly or indirectly, from or in connection with Service Provider's negligence or willful misconduct in the performance of the Services, to the extent such Damages are not covered by Service Provider's indemnification obligation as provided in the preceding clause (x) or exceed the liability limits provided in subparagraph (ii) of this Section 4.4(a).

(ii) Notwithstanding any other provision hereof, in circumstances where Operating Company is a Service Provider: (x) Service Provider's total liability hereunder with respect to any specific Services shall be limited to the amount actually paid to Service Provider for its performance of the specific Services for which the liability arises, and (y) under no circumstances shall Service Provider be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

(b) Indemnification In Respect of Services Provided by Any Nonutility Company.

(i) In circumstances where a Nonutility Company is a Service Provider (i.e., where Operating Company is the Client Company): (x) subject to subparagraph (ii) of this Section 4.4(b), Service Provider shall release, defend, indemnify and hold harmless the Client Company, including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any Damages incurred or sustained by or against Client Company arising, directly or indirectly, from

or in connection with Service Provider's negligence or willful misconduct in the performance of the Services.

(ii) Notwithstanding any other provision hereof, in circumstances where a Nonutility Company is a Service Provider (i.e., where Operating Company is the Client Company), under no circumstances shall Service Provider be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

Section 4.5 Procedure for Indemnification. Within 15 business days after receipt by any Client Company of notice of any claim or the commencement of any action, suit, litigation or other proceeding against it (a "Proceeding") with respect to which it is eligible for indemnification hereunder, such Client Company shall notify Service Provider thereof in writing (it being understood that failure so to notify Service Provider shall not relieve the latter of its indemnification obligation, unless Service Provider establishes that defense thereof has been prejudiced by such failure). Thereafter, Service Provider shall be entitled to participate in such Proceeding and, at its election upon notice to such Client Company and at its expense, to assume the defense of such Proceeding. Without the prior written consent of such Client Company, Service Provider shall not enter into any settlement of any third-party claim that would lead to liability or create any financial or other obligation on the part of such Client Company for which it such Client Company is not entitled to indemnification hereunder. If such Client Company has given timely notice to Service Provider of the commencement of such Proceeding, but Service Provider has not, within 15 business days after receipt of such notice, given notice to Client Company of its election to assume the defense thereof, Service Provider shall be bound by any determination made in such Proceeding or any compromise or settlement made by Client Company. A claim for indemnification for any matter not involving a third-party claim may be asserted by notice from the applicable Client Company to Service Provider.

ARTICLE 5. MISCELLANEOUS

Section 5.1 Amendments. Any amendments to this Agreement shall be in writing executed by each of the parties hereto. To the extent that applicable state law or regulation or other binding obligation requires that any such amendment be filed with the Kentucky Public Service Commission for its review or otherwise, Operating Company shall comply in all respects with any such requirements.

Section 5.2 Effective Date; Term. This Agreement shall become effective on the Effective Date and shall continue in full force and effect as to each party until terminated by any party, as to itself only, upon not less than 30 days prior written notice to the other parties hereto. Any such termination of parties shall not be deemed an amendment hereto. This Agreement may be terminated and thereafter be of no further force and effect upon the mutual consent of all of the parties hereto.

Section 5.3 Additional Parties. After the Effective Date of this Agreement, additional Nonutility Companies may become parties to this Agreement by executing appropriate signature pages, whereupon any such additional signatory shall be deemed a "party" hereto all purposes hereof and shall thereupon become bound by the terms and conditions of this Agreement as if an original party hereto. The addition of any such further signatories, in the absence of any changes to the terms of this Agreement, shall not be deemed an amendment hereto.

Section 5.4 Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof and supersedes any prior or contemporaneous contracts, agreements, understandings or arrangements, whether written or oral, with respect thereto. Any oral or written statements, representations, promises, negotiations or agreements, whether prior hereto or concurrently herewith, are superseded by and merged into this Agreement.

Section 5.5 Severability. If any provision of this Agreement or any application thereof shall be determined to be invalid or unenforceable, the remainder of this Agreement and any other application thereof shall not be affected thereby.

Section 5.6 Assignment. Neither this Agreement nor any of the rights, interests or obligations hereunder shall be assigned, in whole or in part, by operation of law or otherwise by any of the parties hereto without the prior written consent of each of the other parties. Any attempted or purported assignment in violation of the preceding sentence shall be null and void and of no effect whatsoever. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties and their respective successors and assigns.

Section 5.7 Governing Law. This Agreement shall be construed and enforced under and in accordance with the laws of the State of Kentucky, without regard to conflicts of laws principles.

Section 5.8 Captions, etc. The captions and headings used in this Agreement are for convenience of reference only and shall not affect the construction to be accorded any of the provisions hereof. As used in this Agreement, "hereof," "hereunder," "herein," "hereto," and words of like import refer to this Agreement as a whole and not to any particular section or other paragraph or subparagraph thereof.

Section 5.9 Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed a duplicate original hereof, but all of which shall be deemed one and the same Agreement.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed on its behalf by an appropriate officer thereunto duly authorized.

DUKE ENERGY KENTUCKY, INC.

By: Nancy M. Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE-AMERICAN TRANSMISSION COMPANY, LLC

(by Duke Energy Transmission Holding Company, LLC, its Parent)

By: Nancy M. Wright
Nancy M. Wright
Assistant Corporate Secretary

CINCAP V, LLC

(by Duke Energy Commercial Enterprises, Inc., its Managing Member)

By: Nancy M. Wright
Nancy M. Wright
Assistant Corporate Secretary

DEG BIOMASS, LLC

By: Nancy M. Wright
Nancy M. Wright
Assistant Secretary

DEGS WIND SUPPLY, LLC

By: Nancy M. Wright
Nancy M. Wright
Assistant Secretary

DEGS WIND SUPPLY II, LLC

By: Nancy M. Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY COMMERCIAL ENTERPRISES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY INDUSTRIAL SALES, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY MARKETING AMERICA, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE VENTURES REAL ESTATE, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

HAPPY JACK WINDPOWER, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

KIT CARSON WINDPOWER, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

NORTH ALLEGHENY WIND, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

NOTRESS WINDPOWER, LLC
(by TE Notrees, LLC its General Partner)

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

OCOTILLO WINDPOWER, LLC
(by TE Ocotillo, LLC its General Partner)

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

SILVER SAGE WINDPOWER, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

THREE BUTTES WINDPOWER, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

TOP OF THE WORLD WIND ENERGY, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

LAUREL HILL WIND ENERGY, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

INTERCOMPANY ASSET TRANSFER AGREEMENT

This **Intercompany Asset Transfer Agreement** (this “Agreement”) is made and entered into by and among Duke Energy Carolinas, LLC (“DEC”), a North Carolina limited liability company, Duke Energy Ohio, Inc. (“DEO”), an Ohio corporation, Duke Energy Indiana, LLC (“DEI”), an Indiana limited liability company, Duke Energy Progress, LLC (“DEP”), a North Carolina limited liability company, Duke Energy Florida, LLC (“DEF”), a Florida limited liability company, Duke Energy Kentucky, Inc. (“DEK”), a Kentucky corporation, and Piedmont Natural Gas Company, Inc., a North Carolina corporation (collectively the “Operating Companies” and, individually, an “Operating Company”). The Effective Date as stated herein is the date on which this Agreement is executed or, as may be required, submitted to the appropriate regulatory body for approval, whichever occurs last. This Agreement supersedes and replaces in its entirety all previous Intercompany Asset Transfer Agreements dated before the Effective Date of this Agreement.

WITNESSETH:

WHEREAS, Duke Energy Corporation (“Duke Energy”) is a Delaware corporation;

WHEREAS, each Operating Company is a subsidiary of Duke Energy and a public utility company;

WHEREAS, in the ordinary course of their businesses, the Operating Companies maintain inventory and other assets for the operation and maintenance of their respective electric utility, and with respect to DEO DEK, and Piedmont, gas utility, businesses; and

WHEREAS, subject to the terms and conditions herein set forth, and taking into consideration the Operating Companies’ utility responsibilities, each Operating Company is willing, upon request from time to time, to transfer Assets, as defined herein, to each other Operating Company, as each shall request from each other.

NOW, THEREFORE, in consideration of the premises and the mutual covenants herein contained, the parties agree as follows:

ARTICLE 1. TRANSFER OF ASSETS

Section 1.1 Transfer. Upon request from one party (“Recipient”), the other party (“Transferor”) shall transfer to the Recipient those Assets requested by Recipient, provided that (i) Transferor believes, in its reasonable judgment, that such transfer will not jeopardize Transferor’s ability to render electric utility service or natural gas utility service to its customers consistent with Good Utility Practice; (ii) the Cost of any shipment of transmission- or generation-related item(s) does not exceed \$10,000,000; (iii) DEC and DEP shall not transfer any Asset hereunder in contravention of S.C. Code Ann. § 58-27-1300; (iii) DEK shall not transfer any Asset hereunder in contravention of KRS 278.218. and (iv) DEC and DEP may transfer or take receipt of any transmission transformers or other transmission-related equipment under this

Agreement to or from DEC, DEP or DEF. DEC and DEP shall not, however, transfer or take receipt of any transmission transformers or transmission-related equipment to or from DEO, DEI, and DEK, other than transmission-related equipment that may be used on/with transformers within a range of voltages or regardless of voltage. "Assets" means parts inventory, capital spares, equipment and other goods except for the following: coal; natural gas; fuel oil used for electric power generation; emission allowances; electric power; and environmental control reagents. "Good Utility Practice" means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry in the United States during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather includes all acceptable practices, methods, or acts generally accepted in the region.

Section 1.2 Compensation. Except to the extent otherwise required by Section 482 of the Internal Revenue Code or analogous state tax law, Recipient shall compensate Transferor for any Assets transferred hereunder at Cost. "Cost" means (i) for items of inventory accounted for in the FERC Uniform System of Accounts account 154 ("Inventory Items"), the average unit price of such Inventory Items as recorded on the books of the Transferor, plus stores, freight, handling, and other applicable costs, and (ii) for assets other than Inventory Items, net book value.

Alternatively, to the extent that an Asset may be transferred under this Agreement, the Transferor and Recipient may agree that the Asset transferred to the Recipient be replaced in kind. In this event, Transferor and Recipient shall agree to the timing of such replacement, and other necessary terms and conditions, and such in-kind replacement shall be deemed a transferred Asset for all purposes hereunder.

Section 1.3 Payment. Each Operating Company shall reasonably cooperate with each other Operating Company to record billings and payments required hereunder in their common accounting systems.

Section 1.4 Delivery; Title and Risk of Loss. The parties shall cooperate in providing transportation equipment necessary to deliver the Assets to the Recipient. Assets will be delivered FOB transportation equipment at the Transferor's location where such Assets reside ("Shipping Point"). All costs of transportation, including the cost of transporting in-kind replacement Assets to Transferor, shall be borne by the Recipient. Title to and risk of loss of the transferred Assets shall pass from the Transferor to the Recipient at the Shipping Point.

ARTICLE 2. WARRANTIES

Section 2.1 Warranties. Each Operating Company, as Transferor, warrants that it will have good and marketable title to the Assets transferred hereunder. Further, each Operating Company, as Transferor, warrants that it shall obtain release of any liens or other encumbrances on the transferred Assets within a reasonable time. ALL ASSETS TRANSFERRED

HEREUNDER ARE BEING SOLD “AS IS, WHERE IS” AND WITHOUT ANY WARRANTY AS TO ITS CONDITION, INCLUDING WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Section 2.2 Disclaimer. WITH RESPECT TO ANY ASSETS TRANSFERRED HEREUNDER, EACH OPERATING COMPANY AS TRANSFEROR MAKES NO WARRANTY OR REPRESENTATION OTHER THAN AS SET FORTH IN SECTION 2.1, AND THE PARTIES HERETO HEREBY AGREE THAT NO OTHER WARRANTY, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING BUT NOT LIMITED TO ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE), SHALL BE APPLICABLE TO SUCH ASSETS. THE PARTIES FURTHER AGREE THAT THE REMEDIES STATED HEREIN ARE EXCLUSIVE AND SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ANY PARTY HERETO FOR A FAILURE BY ANY OTHER PARTY HERETO TO COMPLY WITH ITS WARRANTY OBLIGATIONS.

ARTICLE 3. INDEMNIFICATION

Section 3.1 Indemnification; Limitation of Liability

(a) Subject to subparagraph (b) of this Section 3.1, each party (the “Indemnifying Party”) shall release, defend, indemnify and hold harmless the other party (the “Indemnified Party”), including any officer, director, employee or agent thereof, from and against, and shall pay the full amount of, any loss, liability, claim, damage, expense (including costs of investigation and defense and reasonable attorneys’ fees), whether or not involving a third-party claim, incurred or sustained by or against any such Indemnified Party arising, directly or indirectly, from or in connection with Indemnifying Party’s negligence or willful misconduct in the performance of its obligations hereunder.

(b) Notwithstanding any other provision hereof, each party’s total liability hereunder with respect to any Assets shall be limited to the amount actually paid to Transferor for such Assets for which the liability arises, and under no circumstances shall Transferor be liable for consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise (it being the intent of the parties that the indemnification obligations in this Agreement shall cover only actual damages and accordingly, without limitation of the foregoing, shall be net of any insurance proceeds actually received in respect of any such damages).

Section 3.2 Procedure for Indemnification. Within 15 business days after receipt by an Indemnified Party of notice of any claim or the commencement of any action, suit, litigation or other proceeding against it (a “Proceeding”) with respect to which it is eligible for indemnification hereunder, the Indemnified Party shall notify the Indemnifying Party thereof in writing (it being understood that failure so to notify the Indemnifying Party shall not relieve the latter of its indemnification obligation, unless the Indemnifying Party establishes that defense thereof has been prejudiced by such failure). Thereafter, the Indemnifying Party shall be entitled

to participate in such Proceeding and, at its election upon notice to such Indemnified Party and at its expense, to assume the defense of such Proceeding. Without the prior written consent of such Indemnified Party, Indemnifying Party shall not enter into any settlement of any third-party claim that would lead to liability or create any financial or other obligation on the part of such Indemnified Party for which such Indemnified Party is not entitled to indemnification hereunder. If such Indemnified Party has given timely notice to Indemnifying Party of the commencement of such Proceeding, but Indemnifying Party has not, within 15 business days after receipt of such notice, given notice to Indemnified Party of its election to assume the defense thereof, Indemnifying Party shall be bound by any determination made in such Proceeding or any compromise or settlement made by Indemnified Party. A claim for indemnification for any matter not involving a third-party claim may be asserted by notice from the applicable Indemnified Party to Indemnifying Party.

ARTICLE 4. MISCELLANEOUS

Section 4.1 Amendments. Any amendments to this Agreement shall be in writing executed by each of the parties hereto. To the extent that applicable state law or regulation or other binding obligation requires that any such amendment be filed with any affected state public utility commission for its review or otherwise, each Operating Company shall comply in all respects with any such requirements.

Section 4.2 Effective Date; Term. This Agreement shall become effective on the Effective Date and shall continue in full force and effect until terminated by either party upon not less than 30 days prior written notice to the other party. This Agreement may be terminated and thereafter be of no further force and effect upon the mutual consent of the parties hereto.

Section 4.3 Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the subject matter hereof and supersedes any prior or contemporaneous contracts, agreements, understandings or arrangements, whether written or oral, with respect thereto. Any oral or written statements, representations, promises, negotiations or agreements, whether prior hereto or concurrently herewith, are superseded by and merged into this Agreement.

Section 4.4 Severability. If any provision of this Agreement or any application thereof shall be determined to be invalid or unenforceable, the remainder of this Agreement and any other application thereof shall not be affected thereby.

Section 4.5 Assignment. Neither this Agreement nor any of the rights, interests or obligations hereunder shall be assigned, in whole or in part, by operation of law or otherwise by any party hereto without the prior written consent of the other party. Any attempted or purported assignment in violation of the preceding sentence shall be null and void and of no effect whatsoever. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties and their respective successors and assigns.

Section 4.6 Governing Law. This Agreement shall be construed and enforced under and in accordance with the laws of the State of New York, without regard to conflicts of laws principles.

Section 4.7 Captions, etc. The captions and headings used in this Agreement are for convenience of reference only and shall not affect the construction to be accorded any of the provisions hereof. As used in this Agreement, “hereof,” “hereunder,” “herein,” “hereto,” and words of like import refer to this Agreement as a whole and not to any particular section or other paragraph or subparagraph thereof.

Section 4.8 Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed a duplicate original hereof, but all of which shall be deemed one and the same Agreement.

Section 4.9 DEC, DEP, and Piedmont Conditions. In addition to the terms and conditions set forth herein, with respect to DEC, DEP, and Piedmont, the provisions set out in Exhibit A are hereby incorporated herein by reference. In addition, except with respect to the pricing of Asset transfers as set forth herein, DEC’s, DEP’s and Piedmont’s participation in this Agreement is explicitly subject to the Regulatory Conditions and Code of Conduct approved by the NCUC in its Order Approving Merger Subject to Regulatory Conditions and Code of Conduct issued in Docket No. E-2, Sub 1095, Docket No. E-7, Sub 1100, and Docket No. G-9, Sub 682 (“Merger Order”), as such Regulatory Conditions and Code of Conduct may be amended from time to time. In accordance with Regulatory Condition 3.9 as approved in the Merger Order, nothing in this Agreement shall be construed or interpreted so as to commit DEC or DEP, or to involve DEC or DEP in, joint planning, coordination, or operation of generation, transmission, or distribution facilities with one or more affiliates nor shall it be interpreted as otherwise altering DEC’s or DEP’s obligations with respect to the Regulatory Conditions approved in the Merger Order. In the event of a conflict between the provisions of this Agreement and the Regulatory Conditions and Code, the Regulatory Conditions and Code shall govern, except as altered by the Commission by Order for this Agreement.

Section 4.10 DEI Conditions. DEI agrees and acknowledges that in accordance with its Affiliate Standards, Section II O (i) it will make Assets available to non-affiliated wholesale power marketers under the same terms, conditions and prices, and at the same time, as it makes Assets available to a DEO’s wholesale power marketing function, and (ii) it will process all requests for Assets from DEO’s wholesale power marketing function and non-affiliated wholesale power marketers on a non-discriminatory basis.

Section 4.11 Regulatory Approvals. This Agreement is expressly contingent on the receipt of all regulatory approvals or waivers deemed necessary by the parties.

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed on _____, 201__, on its behalf by an appropriate officer thereunto duly authorized.

Duke Energy Carolinas, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Indiana, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Ohio, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Kentucky, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Progress, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Florida, LLC

By: _____
Nancy M. Wright
Assistant Corporate Secretary

Piedmont Natural Gas Company, Inc.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

EXHIBIT A

Duke Energy Carolinas, LLC, Duke Energy Progress, LLC and Piedmont Natural Gas Company, Inc. Conditions

In connection with the NCUC approval of the Merger in NCUC Docket No. E-2, Sub 1095, Docket No. E-7, Sub 1100, and Docket No. G-5, Sub 682, the NCUC adopted certain Regulatory Conditions and a revised Code of Conduct governing transactions between DEC, DEP, Piedmont, and their affiliates. Pursuant to the Regulatory Conditions, the following provisions are applicable to DEC, DEP, and Piedmont:

- (a) DEC's, DEP's and Piedmont's participation in this Agreement is voluntary. DEC, DEP, or Piedmont is not obligated to take or provide services or make any purchases or sales pursuant to this Agreement, and DEC, DEP, or Piedmont may elect to discontinue its participation in this Agreement at its election after giving any required notice;
- (b) DEC, DEP or Piedmont may not make or incur a charge under this Agreement except in accordance with North Carolina law and the rules, regulations and orders of the NCUC promulgated thereunder.
- (c) DEC, DEP or Piedmont may not seek to reflect in rates any (A) costs incurred under this Agreement exceeding the amount allowed by the NCUC or (B) revenue level earned under this Agreement less than the amount imputed by the NCUC; and
- (d) DEC, DEP or Piedmont shall not assert in any forum – whether judicial, administrative, federal, state, local or otherwise – either on its own initiative or in support of other entity's assertions, that the NCUC's authority to assign, allocate, make pro-forma adjustments to or disallow revenues and costs for retail ratemaking and regulatory accounting and reporting purposes is, in whole or in part, (A) preempted by Federal Law or (B) not within the Commission's power, authority, or jurisdiction; DEC, DEP, and Piedmont will bear the full risk of any preemptive effects of Federal Law with respect to this Agreement.