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April 26, 2006

**Via Federal Express**

Ms. Elizabeth O'Donnell  
Executive Director  
Public Service Commission  
211 Sower Boulevard, P.O. Box 615  
Frankfort, Kentucky 40602-0615

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**APR 27 2006**

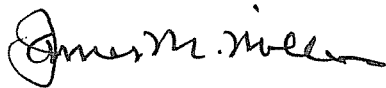
**PUBLIC SERVICE  
COMMISSION**

Re: In the Matter of: Consideration of the Requirements  
of the Federal Energy Policy Act of 2005 Regarding  
Time-Based Metering, Demand Response, and  
Interconnection Service, Administrative Case No. 2006-00045

Dear Ms. O'Donnell:

Enclosed are an original and seven copies of the response of Big Rivers Electric Corporation and its three member systems, Kenergy Corp., Jackson Purchase Energy Corporation, and Meade County Rural Electric Cooperative Corporation, to the Commission Staff's Second Information Request in the above-styled matter. I certify that a copy of this filing has been served this day on the persons shown on the attached service list.

Sincerely yours,



James M. Miller

JMM/ej  
Enclosures

cc: Service List

**SERVICE LIST**  
**PSC CASE NO. 2006-00045**

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**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

**RECEIVED**

APR 27 2006

PUBLIC SERVICE  
COMMISSION

**In the Matter of:**

**CONSIDERATION OF THE REQUIREMENTS )  
OF THE FEDERAL ENERGY POLICY ACT OF )  
2005 REGARDING TIME-BASED METERING, )  
DEMAND RESPONSE, AND INTERCONNECTION )  
SERVICE )**

**CASE NO.  
2006-00045**

**RESPONSE OF BIG RIVERS ELECTRIC CORPORATION,  
KENERGY CORP., JACKSON PURCHASE ENERGY  
CORPORATION, AND MEADE COUNTY RURAL ELECTRIC  
COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST**

April 27, 2006



RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST

APRIL 27, 2006

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4 **Item 1)** Refer to page 2 of the introductory comments filed by Big Rivers and its  
5 Member Systems, specifically the discussion of Big Rivers' wholesale power costs under  
6 its contract with LG&E Energy Marketing ("LEM").

7 a. Are Big Rivers and LEM in the process of terminating that  
8 contract and, pursuant to that termination, will Big Rivers resume responsibility for the  
9 operation of its generating facilities?

10 b. If the answer to 1(a) is yes, upon resumption of responsibility for  
11 operating those generating facilities, will Big Rivers' cost of power from its own  
12 generation continue to be based on a flat energy charge like that currently in place under  
13 the LEM contract? Explain the response.

14  
15 **Response)** a. Big Rivers Electric Corporation ("Big Rivers"), E.ON US LLC,  
16 and certain subsidiaries or affiliates of E.ON US LLC are actively engaged in  
17 negotiations on an agreement to terminate the transactions among them that were entered  
18 into as of July 15, 1998. The contract between Big Rivers and LEM is one of the  
19 contracts that will be terminated if agreement is reached, and the transaction  
20 contemplated in the agreement closes. If the transaction is successfully completed, Big  
21 Rivers would resume responsibility for operations of its generating facilities.

22 b. Big Rivers has not finally determined all the accounting and  
23 rate details that will be proposed to the Public Service Commission in Big Rivers'  
24 anticipated application for approval of the unwind transaction referred to in subpart a of  
25 this response.  
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28 **Witness: Travis D. Housley, P.E.**  
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RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST  
APRIL 27, 2006

**Item 2)** Refer to Big Rivers' and the Member Systems' response to Item 1 of the  
"Smart Metering" requests in Appendix C of the Commission's February 24, 2006 Order.  
a. When did Big Rivers withdraw the Time-of-Day Rate tariff?  
b. Provide the number of customers opting for the Time-of-Day Rate  
tariff and the amount of load of such customers during the period the tariff was in effect.

**Response)** a. Big Rivers withdrew the tariff effective September 2, 1997.  
b. Big Rivers did not have any customer request service under the  
Time-of-Day tariff. The same is true for Kenergy Corp. ("Kenergy") and Jackson  
Purchase Electric Corporation ("JPEC"). Meade County Rural Electric Cooperative  
("Meade County RECC") currently has one customer on a Time-of-Day tariff. The  
average demand for the customer is approximately 9-10 kW.

**Big Rivers Witness: C. William Blackburn and Russ Pogue**

**Meade County Witness: David Poe**



RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST

APRIL 27, 2006

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4 **Item 3)** Refer to page 3 of the introductory comments filed by Big Rivers and its  
5 Member Systems, specifically the concerns about communications systems. The  
6 comments state that those “system may not be as robust as in the more urban areas of the  
7 state and not as capable of supporting these communications.” (Emphasis added). Are  
8 there specific limitations of the communications systems of which Big Rivers and its  
9 Member Systems are aware, or does the concern reflect what is unknown, i.e., a lack of  
10 information on the communications systems? Explain the response.  
11

12 **Response)** Big Rivers and its three distribution cooperative members, Kenergy,  
13 JPEC and Meade County RECC (collectively referred to herein as the “Member  
14 Systems”) are not aware of any specific limitations of the communications system. The  
15 basis of the comment is the general knowledge that cellular and wireless  
16 communications as well as broadband internet services are not as readily available in  
17 the rural sections of the state as in the more urban areas.  
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19 **Witness:** Travis D. Housley, P.E.  
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RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST  
APRIL 27, 2006

**Item 4)** Refer to the March 23, 2006 response A-2 of LG&E and KU to Item 2 of the "Smart Metering" requests, which refers to simple seasonal rates, and to the first bullet under Residential and Small Commercial of the same response. Do Big Rivers and its Member Systems share the same view regarding simple seasonal rates? Explain the response.

**Response)** Big Rivers and its Member Systems share the view that "offering different rates in winter and summer would qualify as time-based pricing without a need for smart meters or any other new technology". Big Rivers and its Member Systems also share some of the concerns raised in the LG&E/KU response. One of those concerns is the possibility that consumers may not view the seasonal pricing differentials as sufficient enough to shift demand away from the peak seasons. Another concern is that seasonal rates "do not address critical peaks during any given day".

However, before seasonal rates should be implemented there must be an economic justification for the rates. For seasonal rates to be economically justified there must be some seasonal variation in the load that can be shifted or reduced, as well as some cost differential to serve the seasonal load. For Big Rivers and its Member Systems there is little seasonal variation in load and presently there is no cost differential to serve its load in either season.

**Witness: C. William Blackburn and Russ Pogue**



RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST

APRIL 27, 2006

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**Item 5)** Provide a brief discussion relative to Big Rivers' and its Member Systems' Demand-Side Management ("DSM") programs and explain if and how potential demand response resources are considered in your integrated resource planning process.

**Response)** Most of Big Rivers' DSM programs presently in use and planned for the future depend on the Member Systems promotion of energy conservation through more efficient use of electricity. Through these programs, homes are more efficiently insulated and the saturation levels of energy efficient appliances and HVAC systems become higher. The results of these programs are captured in the average usage per customer, which is used in the analyses to arrive at a native load and demand in Big Rivers' Load Forecast. The load forecast which captures demand response for the long term is then used as the basis for native load requirements of Big Rivers' Integrated Resource Plan.

Big Rivers' DSM programs do not use smart metering for demand response. Therefore no consideration is given for smart metering in Big Rivers' integrated resource planning process.

A listing of the current energy efficiency programs offered by Big Rivers and its Members is available in the most recent Big Rivers Integrated Resource Plan. The relevant pages are attached.

**Witness: C. William Blackburn and Russ Pogue**

### **1.1.1. Existing Big Rivers Demand-Side Programs**

Big Rivers publishes a quarterly magazine on behalf of its three distribution electric cooperatives called the "Commercial and Industrial News." Since January 1999 the publication has covered energy related topics focusing on energy efficiency and management. Big Rivers is in the process of evaluating a dual fuel home incentive, but such an incentive program has not been approved. Big Rivers has developed information for its three member distribution cooperatives that compares annual operating costs for various types of heating systems (fossil fuel versus electric systems), and each cooperative chooses how and when they use that information. Big Rivers is also reviewing the provisions of the new Federal Energy legislation enacted in July 2005 to monitor new appliance energy efficiency standards that go into effect on January 1, 2006. Big Rivers is in the process of evaluating a dual fuel heating system incentive, but such an incentive program has not been approved.

Big Rivers remains a strong proponent for the efficient use of Kentucky's energy resources and is committed to helping members educate their member-consumers about the importance of efficient energy usage. Big Rivers continues to work with its members to develop energy efficiency programs designed to communicate to member-consumers the energy savings associated with energy efficient construction techniques and equipment. The programs are communicated through an assortment of collateral materials, and training is available for architects, builders and energy managers and employees of the distribution cooperative.

In addition, Big Rivers continues to provide direct support to its members and their commercial and industrial customers to promote efficient and cost effective energy use. Documents will be developed to inform members of benefits outlined in the new energy bill. Big Rivers will continue to support the incentive programs both financially and through the development of promotional material.

Additional education is provided to commercial and industrial accounts through on-site visits and the Commercial & Industrial News, a quarterly Big Rivers' publication. Big Rivers also provides the following commercial and industrial services through JPEC, Kenergy and MCRECC:

#### **1.1.1.1. Energy Efficiency Workshop.**

JPEC, MCRECC and Kenergy provide educational workshops for customers on energy saving devices and techniques. The workshops are educational seminars designed to present information on energy savings devices and techniques to the employees of the three distribution cooperatives. The employees who attend the seminar are persons who work for commercial businesses that buy power from the distribution cooperatives. Electrical safety workshops are also available.

#### **1.1.1.2. Energy-Use Assessment.**

This assessment or audit assists customers to improve energy efficiency by using the utilities expertise in energy delivery and use combined with a customer's knowledge to identify opportunities to lower energy costs and improve



efficiency. The cooperatives have been working with customers for years to improve facility and process efficiency.

#### **1.1.1.3. Operation Assessment**

This service evaluates when and how energy is used in a customer's facility. Many facilities have the ability to adjust operations and/or equipment controls to save energy and money.

#### **1.1.1.4. Customer Billing Review**

Customer service staff from Kenergy, MCRECC and JPEC visit a customer's facility to explain and answer questions about billing documents and rate structures.

#### **1.1.1.5. Commercial Lighting Evaluation**

Cooperative staff can evaluate the necessary facility and security lighting to provide productive and safe light levels. MCRECC, JPEC and Kenergy can also provide leased lighting options.

#### **1.1.1.6. Power Factor Correction Assistance**

JPEC, MCRECC and Kenergy provide technical support to commercial and industrial customers to correct low power factor, resulting in significant savings those customers each year. Low power factor results in higher electricity costs. The cooperatives provide engineering assistance and will work with a customer's electric contractor to ensure proper correction levels.

#### **1.1.1.7. Power Quality Assessment**

Customers who experience equipment damage or productivity losses as a result of power quality problems may call their distribution cooperative commercial and industrial service representative. Cooperative staff will assist any customer to identify the source of the problem whether it is inside the facility, on the power system or a result of a neighboring customer.

#### **1.1.1.8. Power Quality Correction**

Engineering and customer service staff members assist commercial and industrial customers to correctly identified the source of power quality problems and provide technical support to correct the problem.

#### **1.1.1.9. Energy Use Summary**

MCRECC, Kenergy and JPEC all provide energy use summaries on their associated web sites. Three to four years of energy use and billing data is displayed in graphical and tabular form along with weather data for the previous two years. Information from the most recent bill is necessary to access the website for security reasons.

#### **1.1.1.10. Remote Meter Data Collection**

Technology has made it possible for customers to view hourly data from the meter. The information can be securely displayed on the Internet for use by customers to manage their energy use.

**1.1.1.11. Customized Billing Services**

Recent changes in bill printing have made available to cooperative customers the ability to receive multiple bills in the same mailing.

**1.1.1.12. Residential Energy Auditing**

At the cooperatives request, Big Rivers’ staff will provide telephone and onsite residential energy audits.

**1.1.2. Existing Member Cooperative Demand-Side**

**1.1.2.1. Kenergy**

Kenergy offers educational and informative brochures, magazine articles, and television and radio commercials relating to energy efficiency topics. The ground source heat pump continues to be the central HVAC technology promoted. Energy Resource Conservation Loans at 5 percent interest are available from Kenergy to qualifying customers installing a geothermal system in their existing homes. This offer is not available for new construction. The loans may finance up to 100 percent of the installation cost and may be amortized for up to 60 months. Kenergy publishes advertisements in newspapers and magazines that describe their 5% financing for installations in existing homes for geothermal energy systems. Informative pamphlets and magazine articles are used by Kenergy to educate customers on the energy savings gained by installing a geothermal system.

Kenergy’s web site provides operating cost information such as the following annual cost estimates and efficiencies for different types of heating and cooling equipment in an average-size home (approximately 1,500 sq. ft). Resistance heat includes baseboards, ceiling cable and electric furnace. Propane based on \$1.20 per gallon + \$40 yearly tank rental. Natural gas based on \$.80 per CCF.

ANNUAL HEATING & COOLING OPERATING COSTS	
Resistance Heat	\$816.05
Propane Heat 80% Efficient	\$967.52
Natural Gas	\$605.16
10 SEER Heat Pump	\$594.58
12 SEER Heat Pump	\$506.03
14 SEER Heat Pump	\$440.62
Geothermal	\$322.56

Kenergy is not currently conducting any load management programs.

**1.1.2.2. Jackson Purchase Energy Corporation**

JPEC provides similar informational articles and brochures for their members. One publication that they distribute is USDOE’s “Energy Savers Tips on Saving Energy & Money at Home”, a 33 page booklet which is a brochure that compiles ideas and measures that will help reduce energy usage and save money for

members. Magazine articles are also posted on the cooperative's web site with ideas on how to save energy (for example, by providing shade trees around a home to reduce peak air-conditioning loads). The JPEC web site provides the following additional links:

- A link to the electronic copy of the Energy Savers pamphlet.
- The JPEC web site provides a link to the [Department of Energy's Home Energy Saver Web Site](#). A cooperative member can go to that web site and obtain detailed information on energy use for their home and how to reduce their energy usage. A cooperative member can even customize the information for their specific type of home.

JPEC provides cash incentives for high efficiency heat pumps in new and existing residential homes. JPEC is not currently conducting any load management programs. JPEC provides free caulk to its member consumers in efforts to help consumers maintain adequate insulation of their homes.

#### **1.1.2.3. Meade County Rural Electric Cooperative Corporation**

MCRECC provides energy efficiency informational brochures on geothermal heating and cooling systems, and also publishes articles relating to energy efficiency tips in Kentucky Living magazine. The articles suggest ways to save on cooling costs during the summer and save on heating costs during the winter. Radio advertisements are also used to educate their consumers about energy efficiency topics. Advertisements increase awareness of water and energy conservation issues such as leaking faucets and to increase awareness of energy efficiency measures that can be used to save money on heating and cooling bills while still making the home comfortable.

MCRECC offers the "All Seasons Comfort Home" program to a cooperative member that is building a new home. The program provides recommended, proven standards for insulation, energy-saving features, and assistance in the selection and installation of high efficiency heat pumps and geothermal heating and cooling systems. MCRECC provides information to members on the most efficient and economical heating and cooling system equipment. MCRECC is not currently conducting any load management programs.

The energy efficiency initiatives offered by Big Rivers' member system distribution cooperatives are summarized below in Table 5.8.

#### **1.1.2.4. Summary of Existing Energy Efficiency Initiatives**

The energy efficiency initiatives offered by Big Rivers' member system cooperatives are summarized below in Table 5.8.

#### **Table 5.8**

#### **Summary of Existing Energy Efficiency Initiatives Offered by Big Rivers Electric Corporation and Its Distribution Cooperative Members**

#### **Kenergy**

- Kentucky Living Magazine – Monthly magazine to all customers - focus articles on energy efficiency for the home and business and 4 page insert from local cooperative detailing programs, safety and customer service.

- DOE Pamphlet "Energy Savers - Tips on Saving Energy & Money at Home"
- Heat Pump Programs – Incentives Programs - 5% financing for Ground Source Heat Pumps for up to 5 years
- C/I News – Quarterly magazine to commercial and industrial customers – focus on energy related topics including conservation and efficiency improvements.
- Energy Efficiency Informational Brochures "Geothermal Heating and Cooling – The Answer to Comfortable and Affordable Living"
- Distribution of compact fluorescent bulbs at annual meeting
- Incentives Programs:
  - Touchstone Energy Home
  - Water Heater Replacement
  - Add-on Heat Pump
- Heat Loss / Gain analysis for HVAC contractors
- Web Site Information and Links
  - Geothermal Heat Pump Systems
  - USDOE – Energy Saving Tips for Consumers
  - USDOE – Home Energy Audit
  - Commercial Building Energy Checklist
- Energy Audits As Needed
  - Commercial / Industrial
  - Residential
- News Paper Advertising
  - Safety
  - Energy Efficiency

#### **Jackson Purchase Energy**

- DOE Pamphlet "Energy Savers - Tips on Saving Energy & Money at Home"
- Customer Newsletter – “Plugged In” Focus articles include energy efficiency, safety information and customer service
- C/I News – Quarterly magazine to commercial and industrial customers – focus on energy related topics including conservation and efficiency improvements.
- Pamphlet - "Keep An Eye On That Thermostat"
- Pamphlet - "How much will this light bulb save you?"
- Distribution of compact fluorescent bulbs at annual meeting
- Incentives Programs:
  - Touchstone Energy Home
  - Water Heater Replacement
  - Add-on Heat Pump
- Web Site Information and Links
  - USDOE – Energy Saving Tips for Consumers
  - USDOE – Home Energy Audit
- Energy Audits As Needed
  - Commercial / Industrial
  - Residential
- News Paper Advertising

- Safety
- Energy Efficiency
- Energy Efficiency Training for Employees
  - Basic – Employees with limited customer contact receive training in energy cost and efficiencies
  - Advanced – Employees with extensive customer contact receive in addition to the basic course. Training includes additional training in HVAC, water heating, lighting, building envelope and construction techniques who in turn will provide that guidance to customers.

### **Meade County RECC**

- DOE Pamphlet "Energy Savers - Tips on Saving Energy & Money at Home"
- C/I News – Quarterly magazine to commercial and industrial customers – focus on energy related topics including conservation and efficiency improvements.
- Kentucky Living Magazine – Monthly magazine to all customers - focus articles on energy efficiency for the home and business and 4 page insert from local cooperative detailing programs, safety and customer service.
- Brochure – “Planting Trees to Save Money”
- Distribution of compact fluorescent bulbs at annual meeting
- Web Site Information and Links
  - Geothermal Heat Pump Systems
  - USDOE – Energy Saving Tips for Consumers
  - USDOE – Home Energy Audit
  - Commercial Building Energy Checklist
- Energy Audits As Needed
  - Commercial / Industrial
  - Residential
- News Paper Advertising
  - Safety
  - Energy Efficiency
- Energy Efficiency Training for Employees
  - Basic – Employees with limited customer contact receive training in energy cost and efficiencies

### **1.1.3. Demand-Side Action Plan**

The results of the economic screening of the energy efficiency measures and programs indicate that several energy efficiency measures are cost effective even after the inclusion of administrative, marketing, evaluation and incentive costs. The maximum achievable cost effective potential for electric energy efficiency measures/programs by 2015 in the Big Rivers member cooperative service areas is estimated to be approximately 12% of 2015 annual kWh sales. Big Rivers has reviewed a considerable range of technical reports and market research analyses to prepare this assessment of electric energy efficiency measures, and finds that barriers to the adoption of energy efficiency measures and practices remain in the energy marketplace. Given that many energy efficiency measures can be cost effective for homes and businesses (according to the Participant Benefit/Cost Test and the Total Resource Cost Test), and given that barriers to energy efficiency remain, Big Rivers has updated its three-year energy efficiency action

plan to help its members save energy and money, and to take advantage of the environmental and other benefits of energy efficiency programs. Listed in Table 5.9 on the following page is a summary of the key actions included in the three-year plan, along with a proposed budget.

**Table 5.9  
Summary of Three-Year Energy Efficiency Action Plan**

Action	Description	Market Barrier Addressed	Proposed Annual Budget
1	Web based information improvements will be made to the Big Rivers web site. Upgrade links to the USDOE consumer information and energy efficiency web sites. Update and continue to provide on line access to account information to customers of the distribution cooperatives through their websites. This information allows customers easy access to account/billing information and links to energy efficiency information at various state and federal websites.		\$15,000
2	Continued financial support of distribution cooperative's incentive programs. The incentive programs include: "Touchstone Energy Home Program", "Add-On Heat Pump" and "Electric Water Heater Exchange". The "Dual Fuel Touchstone Energy Home Program" is currently in development.		\$59,500
3	Enerpath Energy Auditing Software. Web based auditing system for commercial and industrial to support on-site audits performed by Big Rivers and distribution cooperative staff.		\$4,500
4	Energy efficiency services including: Energy efficiency and education material to distribution cooperatives; Energy Star related material; Energy efficient workshops for cooperative employees; Pamphlet, flyer and insert publication for cooperative members; Incentive program support. Purchase of energy efficiency publications from USDOE such as "Energy Savers, Tips on Saving Energy and Money at Home".		\$32,000
5	Purchase of Compact Fluorescent		\$8,900

Action	Description	Market Barrier Addressed	Proposed Annual Budget
	lamps for distribution cooperative members. Up to 12,000 lamps will be delivered to distribution cooperatives for annual meetings and other events.		
6	Promotion and development of collateral material for the introduction of the renewable "green" power starting in 2006.		\$28,000
7	Purchase of the Questline online energy efficiency support publication. Includes online energy efficiency website with energy expert and a monthly email newsletter for Kenergy commercial and industrial members.		\$3,600
8	Public presentation of energy efficiency presentation by Doug Rye for the MCRECC service territory.		\$3,500
9	Development and publication of the Commercial and Industrial News, a quarterly publication for the commercial and industrial member of the distribution cooperative. The C/I News presents articles on energy related issues pertinent to the market sectors. Energy efficiency articles include motors, lights, HVAC, compressors, power factor and a number of other subjects.		\$36,000
	TOTAL ANNUAL BUDGET		\$191,000

#### 1.1.4. Net Metering

Effective March 1 2005, a net metering tariff is available to Big Rivers' Members retail customers who generate electricity in parallel to the cooperatives network and generate energy using solar energy (PV).





RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, MEADE COUNTY RURAL  
ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION STAFF'S  
SECOND INFORMATION REQUEST

APRIL 27, 2006

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4 **Item 6)** Refer to the response to Item 2 of the "Interconnection" requests in  
5 Appendix C of the Commission's February 24, 2006 Order.

6 a. Describe any interconnection standard currently utilized by Big  
7 Rivers and its Member Systems.

8 b. Does the current standard differentiate between small generators of  
9 10 MVA and below, and those generators above 10 MVA? Explain the response.

10  
11 **Response)** a. The IEEE 1547 standard addresses the interconnection of  
12 distributed resources with an aggregate capacity of 10 MVA or less, interconnected at  
13 primary and/or secondary distribution voltages. Since Big Rivers' electric lines are  
14 either sub-transmission (69 kV) or transmission (138 kV, 161 kV, or 345 kV), Big  
15 Rivers does not utilize the IEEE 1547 standard, but it does utilize an interconnection  
16 standard for connecting generation to its transmission system entitled "Procedures and  
17 Requirements For Adding Generation To Big Rivers' Transmission System," a copy of  
18 which is attached hereto.

19  
20 Big Rivers electric service tariff contains a section on cogeneration and small power  
21 production which pertains to billing of Supplementary Services, Unscheduled Back-up  
22 Service, Maintenance Service, Excess Demand, and Additional charges associated with  
23 the connection of a Qualifying Facility ("QF") to Big Rivers or its Member  
24 Cooperative's facilities. The tariff requires a three party interconnection agreement  
25 between the QF, Big Rivers and the Member Cooperative prior to providing service  
26 under the tariff. In accordance with 807 KAR 5:054 the QF is responsible for utility  
27 safety and system protection.

28  
29 Big Rivers' three Member Systems all utilize the same interconnection standard for  
30 interconnecting solar generation of a capacity not greater than 15 kilowatts. The solar  
31 interconnection standard describes the required notification form, inspection  
32 requirement and fee, type of metering, billing provisions, and interconnection  
33

RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, MEADE COUNTY RURAL  
ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION STAFF'S  
SECOND INFORMATION REQUEST

APRIL 27, 2006

1  
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4 guidelines. The Member Systems have no interconnection standard for generation  
5 other than solar. The interconnection standard for solar is described in the Net  
6 Metering Tariff that each of the Member Systems currently has on file at the  
7 Commission.

8                   b.       Big Rivers' standard for interconnection of generation to its  
9 transmission system makes no reference to the size of the generator. The Member  
10 Systems' solar interconnection standard is for solar generators with capacity of less  
11 than 15 kilowatts. If the cumulative generating capacity of net metering systems  
12 reaches one-tenth of one percent of Big Rivers' or one of the Member Systems' single  
13 hour peak load during the previous calendar year, the obligation of the Cooperative to  
14 offer net metering to a new customer may be limited by the Commission.  
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17 **Witness:       Travis D. Housley, P.E.**  
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## **BIG RIVERS ELECTRIC CORPORATION**

# **PROCEDURES AND REQUIREMENTS FOR ADDING GENERATION TO BIG RIVERS' TRANSMISSION SYSTEM**

*Disclaimer: These guidelines are subject to change as determined by Big Rivers. Until such time as Big Rivers files these procedures and requirements with the Kentucky Public Service Commission or another applicable regulatory agency, Big Rivers reserves all rights to change these procedures and requirements unilaterally. After filing of such procedures and requirements, future revisions and updates will be made as determined by Big Rivers and such revisions and updates will be filed with the Kentucky Public Service Commission or another applicable regulatory agency.*

### **1. Introduction**

The addition of a generator onto the Big Rivers transmission system may have a significant impact on the operation of the system. Several factors may be affected and must be analyzed prior to the addition of generation. These include system stability, fault duty of existing equipment, overloading problems, and voltage violations.

All proposals for new or materially changed generation or tie-line interconnection in the Big Rivers control area and region must follow standard procedures to initiate and complete the Big Rivers Transmission Interconnection Study process.

All requests for interconnections will be studied in the same manner. Currently, requests for interconnections are being studied in the order received based on the date of receipt of the Interconnection Study Letter Agreement. Requests for interconnections are studied independently from one another until such time that an Interconnection and Operating Agreement is executed.

The Interconnection Study uses a system model containing transmission and generation facilities which either exist or are reasonably certain to exist during the study time frame. The study is not based upon transmission or generation facilities that may be contemplated but are not reasonably certain to exist during the study time frame. Big Rivers will have sole discretion to determine what is a reasonable certainty. The results of the study are valid as of the date of the study report. While the transmission system is relatively static, Big Rivers is not responsible for changes in the generation or transmission facilities that occur subsequent to the date of the study report and which change the results contained therein.

## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

The following is a step-by-step procedure for Big Rivers and its Customers to use as a guideline before additional generation can be connected to Big Rivers' transmission system. The timeline for this procedure is shown in **Attachment 1**.

### 2. Procedures for Arranging the Study of New Interconnections

#### 2.1 Application

To request a study for generation interconnection, the applicant shall complete the "Interconnection Study Letter Agreement" (**Attachment 2**) and return it to Big Rivers along with any pertinent data available at that time. The typical Interconnection Study data requirement form is shown in **Attachment 3**. Big Rivers will review the completed application and then execute the study request by placing it in the interconnection study queue.

#### 2.2 Interconnection Study

The prospective Customer signs an Interconnection Study Letter Agreement to initiate the Interconnection Study, which has two parts: Feasibility Study and Detailed Interconnection Study. The studies will determine the impact of connecting the facility to the Big Rivers transmission system and the impact of delivering energy from the facility to the local Big Rivers transmission system. The studies will be performed to ensure the adequacy of Big Rivers' transmission system facilities, not Customer facilities. The impact of delivering energy from the facility to a remote location will not be addressed as part of the Interconnection Study. A separate analysis, known as a System Impact Study,<sup>1</sup> will be required to determine the impact of such a transaction. Note that each Interconnection Study will investigate a single interconnection arrangement. If multiple sites, configurations, or generation output levels are desired, separate Interconnection Study agreements must be signed.

The Feasibility Study and the Detailed Interconnection Study will be performed for **summer peak operating conditions** for the projected in-service date and the interconnection configuration/MW generation specified by the Customer.

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<sup>1</sup> The System Impact Study has a process and study queue separate from the Interconnection Study queue. The System Impact Study determines if available transfer capability ("ATC") exists to accommodate the transfer of power out of or into the Big Rivers transmission system. For this study, the generator must specify a specific source and sink combination and the requested time period.

## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

### **2.2.1 Feasibility Study**

The Feasibility Study determines the local area transmission constraints for various generation output levels up to the Customer specified generation output level. The generator will be modeled at the location and during the time period specified in the Interconnection Study Letter Agreement. This study uses a load flow program to identify the generator output level(s) at which system modifications are required to avoid equipment overloads.

The Feasibility Study can be completed within 45 business days. After this study is completed and upon the Customer's written request, Big Rivers will continue the process and initiate a Detailed Interconnection Study. Failure to notify Big Rivers within 20 days in writing, as specified in the Interconnection Study Letter Agreement, will result in the Customer losing its place in the Interconnection Study queue.

### **Feasibility Study Results**

The results of the Feasibility Study will be compiled into a report that identifies the transmission constraints with various generation output levels up to the Customer specified generation level. A rough cost estimate for relieving each constraint also will be provided. If the constraint has been identified previously in an existing Big Rivers transmission system planning document, it will be noted as such. Refined estimates on costs and other project details, such as schedules and Customer requirements, will be determined in the Detailed Interconnection Study and Facility Study if the Customer chooses to continue with the study process.

### **2.2.2 Detailed Interconnection Study**

The Detailed Interconnection Study is a refinement of the Feasibility Study. Unlike the Feasibility Study, this study will identify the transmission constraints for a fixed level of generation output as specified by the Customer. The Detailed Interconnection Study is estimated to take approximately eight to ten weeks to complete once initiated, but this time period may vary depending upon the number of studies in the interconnection study queue. To ensure the integrity of the interconnection study queue, Big Rivers' transmission planning personnel perform each study in the order that the Interconnection Study Letter Agreements are received. While several studies may be performed concurrently, they are performed independently of one

## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

another. Studies may be performed either by Big Rivers' personnel or by external contractors.

There are three components of the Detailed Interconnection Study: (1) Load Flow Analysis, (2) Short Circuit/Breaker Rating Analysis, and (3) Transient Stability Analysis.

### 1. Load Flow Analysis

A load flow analysis is conducted with and without the new generation so that the proposed generator's impact on the local area can be identified. The results of load flow analysis include power flow magnitudes and voltage levels under single contingency conditions. The results of the load flow study will be used to identify equipment overloads and excessive voltage deviations that may be encountered due to the addition of new generation.

### 2. Short Circuit/Breaker Rating Analysis

A short circuit (i.e., fault current ) analysis will be performed to determine the effect that the new generation will have on the system fault currents. The new fault current levels will be used to evaluate the impact of the new generation on the fault duty (i.e., fault current interrupting capability of rating) of existing equipment, such as circuit breakers and switches. The results of this analysis may identify which equipment would have to be replaced as a result of the new generation.

### 3. Transient Stability Analysis

A transient stability analysis will be performed to determine generator unit response due to a fault on the system and unit outages. The study will focus in the area of the added generation. The transient stability analysis will determine:

- 1) Unit stability during faults
- 2) Voltage levels, frequency levels, and frequency deviation at the point of interconnections
- 3) Synchronous generator rotor oscillations and real and reactive power outputs.

This information will be collected before the disturbance, at the time of the disturbance, at discrete time intervals during the disturbance, and after the removal of the disturbance from the system.

## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

### **Detailed Interconnection Study Requirements**

Big Rivers requires the following data to begin the Detailed Interconnection Study:

- 1) Synchronous machine data
- 2) Exciter data and models
- 3) Governor data and models
- 4) Step-up transformer data (positive and zero sequence)
- 5) Line impedance to interconnection point (positive and zero sequence)
- 6) System configuration (one-line diagram)
- 7) Power system stabilizer data (if installed)
- 8) Site load data
- 9) Short circuit data
- 10) Power factor rating of the units
- 11) Detailed location map
- 12) Expected in-service date

### **Detailed Interconnection Study Results**

The Detailed Interconnection Study report will compile results from the Load Flow Analysis, Short Circuit/Breaker Rating Analysis, and Transient Stability Analysis. It will also contain a description of the necessary facilities, along with planning level cost estimates, for which the Customer is responsible. Examples of such facilities are the reconductoring of a line section, replacement of an autotransformer, replacement of circuit breakers, facilities to interconnect to the transmission system, etc. A list of assumptions and preliminary, high-level schedule also will be included.

The successful study of new interconnections to the Big Rivers system in no way provides for or guarantees transmission service. Transmission service may be arranged for separately under the terms and conditions of Big Rivers' Open Access Transmission Tariff.

Customers with incomplete data will be placed on hold until the required information is provided. Accordingly, a Customer that is on hold because it has failed to provide adequate information may receive its final interconnection study report later than the next Customer in the queue. Utilizing this process allows those Customers that have provided the necessary information not to be delayed by those Customers that have not yet provided such information.

## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

### **3. Facilities Study: Scoping of Project**

Upon completion of the Interconnection Study, the Customer may desire a more definitive cost estimate and scope of work. To initiate this, the Customer signs a "Facilities Study Letter Agreement" (**Attachment 4**) for Big Rivers to initiate a Facilities Study, whereby Big Rivers personnel will scope the project. These personnel will look at the proposed facilities identified in the Interconnection Study Report and refine the cost estimates. The personnel also may propose alternative solutions that may be more cost-effective. The deliverables of this study will be a "Scope Document" that includes:

- 1) The work scope of the project
  - a) Supervisory Control and Data Acquisition (SCADA) requirements
  - b) Metering requirements
  - c) Relay modifications on Big Rivers' system
  - d) Equipment replacement
  - e) Reconductoring of transmission lines
- 2) A list of assumptions used in developing the scope
- 3) An estimated construction schedule
- 4) A definitive project cost estimate (+/- 10%)

### **4. Letter of Intent to Proceed**

If the Customer chooses to proceed with the project on the basis of the preliminary estimates provided in the Interconnection Study results, a Letter of Intent (LOI) will be prepared for the Customer to sign. The LOI authorizes Big Rivers to perform detailed engineering design, material procurement, and construction. Included in the LOI will be the high-level project scope, preliminary cost estimates, method and timing of reimbursement, and a cancellation clause. At this time, Big Rivers will also require a secured letter of credit from the Customer in order to proceed with the project.

Additionally, neighboring transmission system owners/operators and other significantly impacted parties will be notified of the generation addition (location and capacity). The confidentiality of the customer identity will be maintained. Any concerns or study results provided by these parties will be summarized and provided to the customer.

After execution of an Interconnection and Operating Agreement, Big Rivers will then include the generation addition in power flow models submitted by Big Rivers to the regional reliability council. The generation addition will also be identified in the regional transmission system assessments as appropriate.



## Procedures and Requirements for Adding Generation to Big Rivers' Transmission System

### **5. Contracts and Agreements**

The Customer should be coordinating with Big Rivers personnel in order to develop an Interconnection and Operating Agreement. The agreement allows a physical interconnection of the generator to the Big Rivers transmission grid. Other documents may also be required depending on the individual circumstances. These include, but are not limited to, a Transmission Service Agreement, which allows the seller of the power to use the Big Rivers transmission grid to transmit power under the terms and conditions of the pro forma tariffs.

The results of the short circuit and transient stability analyses are subject to change. They are based upon the current configuration of the Big Rivers transmission system at the time of the study. Should other Customers sign interconnection agreements with Big Rivers prior to the generation developer signing its interconnection agreement, this analysis would have to be repeated with the additional generation. Big Rivers will inform the developer should this situation occur.

Attachment 1

**[Attached as separate file]**

**File intentionally omitted from this response.**

**Interconnection Study Letter Agreement Between  
Big Rivers Electric Corporation  
and**

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This Letter Agreement is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2000, between \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_ ("Customer") and Big Rivers Electric Corporation, a cooperative corporation organized and existing under the laws of the Commonwealth of Kentucky ("Big Rivers").

RECITALS

WHEREAS, Customer is proposing to develop a \_\_\_ MW generating facility to be located in \_\_\_\_\_ ("Facility") with a projected in-service date of \_\_\_\_\_; and

WHEREAS, the Facility is not connected to the Big Rivers transmission system and Customer intends to connect the proposed generating facility to the Big Rivers transmission system as follows (specify interconnection voltage, substation, and configuration): \_\_\_\_\_

---

\_\_\_\_\_; and

WHEREAS, Customer is currently proposing to establish an interconnection with the Big Rivers transmission system in order to transmit power from the Facility; and

WHEREAS, Customer has requested that Big Rivers prepare a study to determine the impact of interconnection of, and the delivery of energy from, the Facility to the Big Rivers transmission system;

NOW THEREFORE, Big Rivers and Customer agree as follows:

Big Rivers will perform an Interconnection Study, as more fully described in the "Customer Guidelines and Requirements for Adding Generation to Big Rivers' Transmission System" document, to determine the impact of connecting the Facility to the Big Rivers transmission system and the impact of delivery of energy from the Facility to the Big Rivers transmission system. The Interconnection Study consists of two phases, Feasibility Study and Detailed Interconnection Study. Big Rivers will first perform the Feasibility Study and inform Customer of the results. Big Rivers will proceed to the Detailed Interconnection Study only upon Customer's written request. The Feasibility Study and, to the extent applicable, the Detailed Interconnection Study, will be performed on the basis of summer peak operating conditions for the projected in-service date and with the interconnection configuration provided by Customer. The operating conditions will include: a) the existing system prior to the addition of the Facility (to serve as a benchmark), and b) the addition of the Facility with the total output of the Facility being transmitted to the Big Rivers transmission system.

In performing these studies, Big Rivers will rely, to the extent reasonably practicable, on existing transmission planning studies and on current Big Rivers standards and good engineering practice. The studies will be performed, either by Big Rivers personnel or external contractors, to assure the adequacy of Big Rivers system facilities, not Customer facilities. Big Rivers will proceed with the Feasibility Study based on the technical information provided by the Customer. The results of the Feasibility Study, which should be available to Customer within forty-five (45) business days after receipt of necessary information from Customer, will be provided to Customer upon completion. Customer is required, within twenty (20) business days of receipt of the results of the Feasibility Study, to notify Big Rivers in writing if Customer desires to have Big Rivers proceed to conduct the

Detailed Interconnection Study. Failure by Customer to notify Big Rivers in writing within twenty (20) business days of Customer's desire to proceed with the Interconnection Study will be deemed to be an election by Customer not to proceed with the Interconnection Study, and will result in Customer losing its place in the interconnection study queue. Customer recognizes and acknowledges that changes to the Big Rivers system during the time between the completion of the feasibility study and the Detailed Interconnection Study may provide different results. In the event that changes to the Customer's basis requirements are made, the studies may also change. Customer must provide Big Rivers with specific data requirements, including system configuration, as outlined in the "Customer Guidelines and Requirements for Adding Generation to Big Rivers' Transmission System" document no later than one month prior to Big Rivers beginning the Detailed Interconnection Study. Big Rivers will notify Customer in writing of the projected start date of the Interconnection Study and the last date to provide the required data, and Big Rivers will attempt to complete the Interconnection Study within a reasonable time after having received the required Customer data in a timely manner. Failure to provide the data in a timely manner will result in the Interconnection Study being moved to the subsequent position in the queue. The data provided by Customer is subject to verification by Big Rivers after installation of the equipment. If, in Big Rivers' reasonable judgment, the study or installed data materially differs from the original Interconnection Study request data, the Interconnection Study may not be valid, and interconnection may be delayed or a new Interconnection Study may be required.

#### Deliverables

##### Feasibility Study

- Summary of study results

##### Detailed Interconnection Study

- Summary of study results and input assumptions.
- Identification of system constraints.

The total cost of both the feasibility study and the subsequent detailed interconnection study, if requested by Customer in accordance with the above stated provisions, is estimated to be \_\_\_\_\_. Big Rivers will charge, and Customer shall pay, for the actual cost of the two studies. Customer agrees that it will remit payments to Big Rivers within thirty (30) days following receipt of invoice. Notwithstanding the above, Customer acknowledges and agrees that the minimum dollar amount to be paid to Big Rivers for the Feasibility Study and/or the Detailed Interconnection Study is \_\_\_\_\_. This minimum is applicable even if Customer elects not to proceed with the Detailed Interconnection Study phase after receiving results of the Feasibility Study.

IN WITNESS WHEREOF, Big Rivers Electric Corporation and Customer have caused this Agreement to be executed by their respected authorized officials.

BIG RIVERS ELECTRIC CORPORATION

[CUSTOMER]

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Attachment 3 Interconnection Study Data Requirement

**[Attached as separate file]**

**File intentionally omitted from this response.**

**Facilities Study Letter Agreement Between  
Big Rivers Electric Corporation  
and**

---

This Letter Agreement is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2000, between \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_ ("Customer") and Big Rivers Electric Corporation, a cooperative corporation organized and existing under the laws of the Commonwealth of Kentucky ("Big Rivers").

RECITALS

WHEREAS, Customer is proposing to develop a \_\_\_ MW generating facility to be located in \_\_\_\_\_ ("Facility") with a projected in-service date of \_\_\_\_\_; and

WHEREAS, the Facility is not connected to the Big Rivers transmission facilities; and

WHEREAS, Customer is currently proposing to establish an interconnection with the Big Rivers transmission system in order to transmit power from the Facility; and

WHEREAS, Customer has requested that Big Rivers prepare a study to determine the impact of interconnection of the Facility to Big Rivers, and the impact of delivery of capacity and energy from the Facility to the Big Rivers transmission system; and

WHEREAS, Big Rivers has completed the Interconnection Study, identified system constraints, and presented a summary of the study results to the Customer;



NOW THEREFORE, Big Rivers and Customer agree as follows:

Big Rivers will perform a Facilities Study, based on the results of the Interconnection Study, to determine the required modifications to the Big Rivers transmission system, including the cost and scheduled completion dates of such modifications.

In performing this study Big Rivers will rely on current Big Rivers standards and good engineering practice. The study will be performed to assure adequacy of Big Rivers system facilities, not Customer facilities. Big Rivers proposed to proceed with the study based on the technical information provided by Customer. In the event changes to the Customer's basic requirements are made, the studies also may change.

#### Deliverables

- Identification of any required system additions/modifications.
- Estimated costs associated with any system additions/modifications.
- Estimated project schedule.

The total cost of this study is estimated to be \_\_\_\_\_, however, Big Rivers will charge for the actual cost of the study. Customer agrees that it will remit payment to Big Rivers within thirty (30) days following receipt of invoice.

IN WITNESS WHEREOF, Big Rivers Electric Corporation and Customer have caused this Agreement to be executed by their respected authorized officials.

BIG RIVERS ELECTRIC CORPORATION

[CUSTOMER]

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_



RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST  
APRIL 27, 2006

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4 **Item 7)** Refer to the response to Item 3 of the "Interconnection" requests in  
5 Appendix C of the Commission's February 24, 2006 Order. Refer also to the March 23,  
6 2006 response of LG&E and KU to the same Commission request, which refers to  
7 customers with "open transition" switched generation that operates separately from the  
8 distribution grid.

9 a. Do Big Rivers and its Member Systems require customers to  
10 obtain their authorization to have such "open transition" switched generation  
11 arrangements for operational purposes? Explain the response.

12 b. How many customers and what amount of such generation do Big  
13 Rivers and its Member Systems customers operate and to what extent have Big Rivers  
14 and its Member Systems inquired about and/or pursued the potential for having access to  
15 this generation at times of peak demand or extreme emergency on its system? Explain  
16 the response. If you do not have full knowledge in this area, provide whatever  
17 information you have.

18 c. Would Big Rivers and its Member Systems see any value in a  
19 program encouraging these customers (through the provision of bill credits, for example)  
20 to utilize this generation voluntarily to meet their needs and free up utility resources  
21 during periods of peak demand or extreme emergency? Explain the response. If yes,  
22 describe what actions would need to be taken to allow for such a program.  
23  
24

25 **Response)** a. Neither Big Rivers nor its Member Systems require customers to  
26 obtain their authorization to have "open transition" switched generation arrangements.

27 b. Big Rivers has not collected comprehensive data on existing  
28 "open transition" switched generation on the distribution systems with the exception of  
29 poultry houses. There are currently an estimated 630 poultry houses, the majority of  
30 which are independently owned and operated. Peak summer demand for each house  
31 ranges from 9 to 13 kW depending on weather and bird growth cycle. Nearly all of the  
32 house clusters have optional stand-by generation with automatic switchgear. Big  
33

RESPONSE OF BIG RIVERS ELECTRIC CORPORATION, KENERGY CORP.,  
JACKSON PURCHASE ENERGY CORPORATION, AND MEADE COUNTY  
RURAL ELECTRIC COOPERATIVE CORPORATION TO THE COMMISSION  
STAFF'S SECOND INFORMATION REQUEST  
APRIL 27, 2006

Rivers is aware additional generating capacity is in place among large commercial and industrial members, but has not compiled a list.

c. There could be value in a program of reliable centrally controlled distributed generation. It is not known at this time whether the value would be worth the cost. The vast majority of stand-by and emergency generation in the field is diesel powered and the generation cost is high compared to coal fired generation. The actions required would include:

- Identifying generator locations
- Designing, building and maintaining a reliable communication and control scheme
- Determining generator reliability
- Determining incentive structure to attract participation from members

**Witness: Travis D. Housley, P.E. and Russ Pogue**