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*Also Licensed in Indiana

March 20, 2013

Mr. Jeff Derouen
Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
Frankfort, KY 40601

RE: In the Matter of: Consideration of the Implementation of Smart Grid and Smart Meter Technologies, Case No. 2012-00428

Dear Mr. Derouen:

Enclosed find an original and fourteen (14) copies of the responses of Big River Electric Corporation ("Big Rivers"), Jackson Purchase Energy Corporation, Kenergy Corp., and Meade County Rural Electric Cooperative Corporation to the Commission Staff's and the Office of the Attorney General's Requests for Information, dated February 27, 2013, in the abovementioned matter. A copy of these responses is being sent by first class, U.S. Mail to the parties listed on the attached service list.

Please confirm the Commission's receipt of these responses by placing the Commission's date stamp on the additional, enclosed copy and returning it to Big Rivers in the postage paid, self-addressed envelope provided. Should you have any questions about this filing you may contact either me or Roger Hickman at roger.hickman@bigrivers.com.

Sincerely yours,

Tyson Kamuf

cc: Billie J. Richert
Service List

Telephone (270) 926-4000
Telecopier (270) 683-6694

.. Ann Building
PO Box 727
Owensboro, Kentucky
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www.westkylaw.com

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Clayton O. Oswald
Taylor Keller & Oswald, PLLC
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1306 W. 5th St., Suite 100
London, KY 40743-3440

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, Michael L. French, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Michael L. French

COMMONWEALTH OF KENTUCKY)
COUNTY OF MEADE)

SUBSCRIBED AND SWORN TO before me by Michael L. French on this the 18 day of March, 2013.

Notary Public, Ky. State at Large
My Commission Expires 12-21-2016
480341

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, Roger D. Hickman, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Roger D. Hickman

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Roger D. Hickman on this the 15th day of March, 2013.

April R. Johns
Notary Public, Ky. State at Large
My Commission Expires 8-9-2014

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, Gregory A. Hight, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Gregory A. Hight

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Gregory A. Hight on this the 15th day of March, 2013.

Notary Public, Ky. State at Large
My Commission Expires 8-9-2014

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, John E. Newland, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

John E. Newland

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by John E. Newland on this the 19 day of March, 2013.

Notary Public, Ky. State at Large
My Commission Expires 11/13/2016
Notary ID # 478427

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, Russell L. Pogue, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Russell L. Pogue

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Russell L. Pogue on this the 15th day of March, 2013.

Notary Public, Ky. State at Large
My Commission Expires 8-9-2014

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

VERIFICATION

I, Scott W. Ribble, verify, state, and affirm that I prepared or supervised the preparation of my responses to data requests filed with this Verification, and that those responses are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Scott W. Ribble

COMMONWEALTH OF KENTUCKY)
COUNTY OF McCRACKEN)

SUBSCRIBED AND SWORN TO before me by Scott W. Ribble on this the 12th day of March, 2013.

Notary Public, Ky. State at Large 457050
My Commission Expires 12-22-15

ORIGINAL

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES	)))	**Case No. 2012-00428**

Responses to Commission Staff's Request for Information dated February 27, 2013

FILED: March 20, 2013

ORIGINAL

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information dated February 27, 2013

March 20, 2013

Item 12) ***Refer to page 6 of the Direct Testimony of Roger D. Hickman ("Hickman Testimony"), lines 19-20. Provide a description of the Cooperative Research Network ("CRN"), including the types of research it performs, its membership, and its funding sources.***

Response) As noted on the National Rural Electric Cooperative Association website, (http://www.nreca.coop/programs/CRN/Pages/default.aspx), "[t]he Cooperative Research Network™ (CRN), the technology research arm of the National Rural Electric Cooperative Association (NRECA), conducts collaborative research to accelerate technological innovation that can be applied by electric cooperatives worldwide."

"The more than 900 co-ops nationwide comprise a real-world test bed for demonstrating the viability of emerging technologies. Partnering with co-ops, national labs, academic institutions and industry, CRN research is driven by the needs cooperatives and their consumer members. CRN's guides, publications and online tools help cooperatives meet their members' expectations for affordable, reliable electric power using the most advanced technologies available."

A group of CRN's member advisors set the CRN's research priorities. These research priorities are in the areas of distribution operations; energy innovations; generation, fuels and environmental control technology; renewable and distributed energy; smarter grid; and transmission and substation assets. In these research efforts, CRN is currently partnering with the U.S. Department of Energy. CRN may also partner with the Electric Power Research Institute

("EPRI"), national research labs, and universities and research centers, to name a few.

Funding from both the NRECA and CRN comes from its member cooperatives.

Witness) Roger D. Hickman (*Big Rivers*[1])

[1] Big Rivers = Big Rivers electric Corporation.

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION
OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information
dated February 27, 2013

March 20, 2013

Item 13) ***Refer to the Hickman Testimony regarding the experience of Jackson Purchase and Meade County with Smart Grid investments, pages 8-11.***

a. State the capabilities of Jackson Purchase's and Meade County's AMI meters.

b. State which AMI capabilities Jackson Purchase and Meade County utilize and whether each cooperative plans to utilize more of the capabilities in the future.

c. State whether Jackson Purchase's self-healing network is limited to the three substations surrounding the Kentucky Oaks Mall.

i. If the response is no, provide a further description of Jackson Purchase's self-healing network.

ii. If yes, provide any plan Jackson Purchase has for expansion of the self-healing network.

Response)

a.

JPEC –

These meters allow for "on-demand" readings, kWh meter reads, last interval kW demand, load profile (5,15,30 or 60 min intervals), Time-Of-Use ("TOU") (four rates and four

schedules), last interval average voltage, voltage profile (5, 15, 30 or 60 min intervals), outage count and duration log, tamper detection, addressing, net metering, and freeze register (storage of current demand and usage reading for later retrieval). Specifications for these meters are attached hereto.

MCRECC –

Attached is a list of the Landis + Gyr meter capabilities. MCRECC uses the default set up of these meters as described in this list.

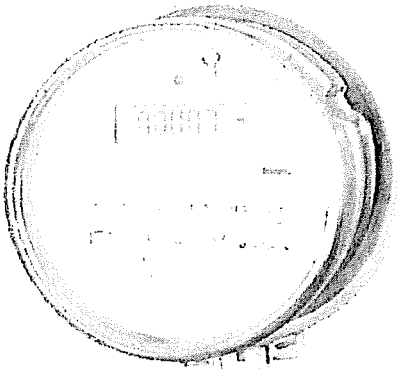
b. JPEC presently is not using the tamper detection or TOU functions of the meters. MCRECC has no plans to change the information received from the meters due to the limits of information that the system can bring back per day.

c. At this time JPEC's self-healing network is only limited to the three current substations. JPEC has no current plans for expansion.

Witnesses) Scott W. Ribble (*JPEC*[2]) and Michael L. French (*MCRECC*[3])

[2] JPEC = Jackson Purchase Energy Corporation.
[3] MCRECC = Meade County Rural Electric Cooperative Corporation

MCT-410iL
Metering and Control Transponder



MCT-410 series Metering and Control Transponders use two-way Cannon Power Line Communications (PLC) to provide low cost remote meter reading and advanced data collection.

Overview

Based upon the Sensus iCon™ meter, the MCT-410iL is designed to replace a residential meter, and plugs into a standard four-jaw meter socket. The MCT-410iL includes a solid state single-phase meter with power line communications.

The MCT provides high speed, cost-effective remote meter reading from customer or line locations using two-way Cannon PLC. The Cannon PLC system uses utility power lines to provide reliable communications from the distribution substation through the distribution transformer to the end metering or control points.

Functionality

The standard functions of the MCT-410iL include remote kWh meter reading, outage recording, freeze register capability, Load Profile, Voltage Profile, and Time-Of-Use (TOU).

System control is via a Cannon Technologies Yukon® Master Station, which supports the Cannon PLC system. The Master Station can be tied to a utility billing or customer information system for automatic download of billing information. Cannon Technologies guarantees compatibility with your billing system.

CANNON TECHNOLOGIES
Powered by Yukon®

Benefits

Each meter stores vast amounts of data in non-volatile memory, which allows interval and peak usage data to be obtained without having to download and manage the data in a database.

There is no longer a need to install special meters at problem accounts. Each meter comes with full Load Profile, Voltage Profile, Outage Profile, and Disconnect capability.

Cannon PLC provides *on-demand* reads from the meter within 3 to 6 seconds round trip. This allows customer issues to be resolved during a customer service call. Reads can be repeated immediately if needed.

Features

- Calculates kW demand, records peak kW, and stores in the meter.
- Remotely settable 5, 15, 30, or 60 minute Load Profile intervals.
- Four programmable TOU rates including critical peak.
- Calculates voltages to an accuracy of ± 1% and records min/max voltages.
- Remotely settable 5, 15, 30, or 60 minute Voltage Profile intervals.
- Logs date, time, and duration of power outages.
- Tamper detection.
- Uses utility-owned power line communications.
- Group addressing.
- Simple plug-in installation requiring no field test equipment or programming.
- Electronic LCD register.
- Polycarbonate or glass meter covers.
- Real-time clock without the need for a battery.

CANNON TECHNOLOGIES
Powered by Yukon®

Minneapolis, Minnesota
800.827.7966
info@cannontech.com
www.cannontech.com

MCT-410iL Model Features

Communication

Cannon PLC allows *on-demand* reads within 3-6 seconds (round trip). Cannon PLC also supports one-way and two-way load management and distribution automation, simultaneous with metering activity.

kWh Meter Reading

kWh data is read directly from the electronic meter.

Last Interval kW Demand

kW demand is calculated over a configurable interval of 1 minute to 60 minutes.

Peak kW is recorded with the date and time it occurred.

Load Profile

Load Profile data is recorded at 5, 15, 30, or 60 minute intervals.

Default configuration stores up to 150 days of Load Profile data for a 15 minute interval on a single channel.

Time-of-Use

Up to four TOU rates and four TOU schedules can be remotely configured. One of the TOU rates can be configured for Critical Peak mode.

Time zone with daylight savings time and holiday dates are user configurable.

Last Interval Average Voltage

Average voltage is calculated over a configurable interval of 30 seconds to 15 minutes. The default interval is 1 minute.

The minimum and maximum voltages are recorded with the date and time they occurred.

Voltage Profile

Voltage Profile data is recorded at 5, 15, 30, or 60 minute intervals.

Default configuration stores up to 18 days of Voltage Profile data for a 15 minute interval on a single channel.

Outage Count and Duration Log

Time/date and duration of the six most recent power interruptions are logged.

Outage duration is calculated in cycles or seconds. Number of missing cycles required to record an outage is configurable.

Tamper Detection

Tamper flag is set on the detection of reverse power or zero usage in a single day.

Addressing

Unique Addressing – All meters are shipped with a factory-installed unique address, eliminating the need for on-site programming.

Group Addressing – Supports over 8000 group addresses for use with the following commands: Freeze Register, Critical Peak, voltage min/max reset, and power outage counter.

Freeze Register

The *Freeze Register* command stores the current demand and usage readings for later retrieval. This command can be used with unique meter addressing or can be broadcast using group addressing. The *Freeze Register* command allows utilities to fine tune the billing period for improved accuracy.

For example, a utility can broadcast a freeze command at midnight on a reading day and then collect the data at a later time.

SPECIFICATIONS

Communication

Type: Two-way Cannon Power Line Communications (PLC)

Carrier Frequency: 9.6 or 12.5 kHz

Modulation: CPSK Coherent Phase Shift Keying

Data Rate: 72 to 76 bps

Error Detection: Six bit BCH Code on all carrier messages

Operating Requirements

Voltage: 240 VAC, 60 Hz

Temperature:
-40°F to 185° F (-40° C to 85°C)

Humidity: 0 to 95% non-condensing

Accuracy

Exceeds ANSI C12.20,
Class 0.2 Accuracy

Surge Withstand Capability

Oscillatory:
6kV @ 100kHz waveform per ANSI C12.1 (IEEE C62.41)

Fast Transient:
6kV @ 1.2x50µs - 8x20µs waveform per ANSI C12.1 (IEEE C62.41)

Electrostatic Discharge

15kV through Air per
ANSI C12.1 (IEC61004-2)

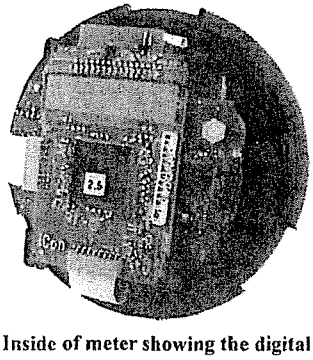
Declarations of Conformity

Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE

Complies with IC: ICES – 006;
En conformité avec IC: NMB -006

Dimensions

6.95" H x 6.95" W x 5.00" D
(17.65 x 17.65 x 12.7 cm)



Inside of meter showing the digital meter chassis with the Cannon Technologies MCT-410iL board.

COOPER Power Systems
Energy Automation Solutions

MCT-410cL
Metering and Control Transponder

MCT-410 series Metering and Control Transponders use two-way Cannon Power Line Communications (PLC) to provide low cost remote meter reading and advanced data collection.

Overview

Based upon the Itron CENTRON™ meter, the MCT-410cL is designed to replace a residential meter and plugs into a standard meter socket. The MCT-410cL is available as a retrofit kit and in the following forms:

- Form 1S
- Form 2S (Class 200 or Class 320)
- Form 3S
- Form 4S
- Form 12S

The MCT provides high speed, cost-effective remote meter reading from customer or line locations using two-way Cannon PLC. The Cannon PLC system uses utility power lines to provide reliable communications from the distribution substation through the distribution transformer to the end metering or control points.

Functionality

Every MCT-410cL includes the standard functions of remote kWh meter reading, outage recording, freeze register capability, Load Profile, Voltage Profile, Time-Of-Use (TOU), and Net Metering.

System control is via a Cannon Technologies Yukon® Master Station, which supports the Cannon PLC system. The Master Station can be tied to a utility billing or customer information system for automatic download of billing information. Cannon Technologies guarantees 100% compatibility with your billing system.

CANNON TECHNOLOGIES
Powered by Yukon®

Benefits

Each meter stores vast amounts of data in non-volatile memory, which allows interval and peak usage data to be obtained without having to download and manage the data in a database.

There is no longer a need to install special meters at problem accounts. Each meter comes with full Load Profile, Voltage Profile, Outage Profile, and Disconnect capability.

Cannon PLC provides *on-demand* reads from the meter within 3 to 6 seconds round trip. This allows customer issues to be resolved during a customer service call. Reads can be repeated immediately if needed.

Features

- Calculates kW demand, records peak kW, and stores in the meter.
- Remotely settable 5, 15, 30, or 60 minute Load Profile intervals.
- Four programmable TOU rates including critical peak.
- Calculates voltages to an accuracy of ± 1% and records min/max voltages.
- Remotely settable 5, 15, 30, or 60 minute Voltage Profile intervals.
- Net metering of energy usage.
- Logs date, time, and duration of power outages.
- Tamper detection.
- Uses utility-owned power line communications.
- Group addressing.
- Simple plug-in installation requiring no field test equipment or programming.
- Electronic LCD register.
- Polycarbonate or glass meter covers.
- Real-time clock without the need for a battery.

CANNON TECHNOLOGIES
Powered by Yukon™

Minneapolis, Minnesota
800.827.7966
info@cannontech.com
www.cannontech.com

MCT-410cL Model Features

Communication

Cannon PLC allows *on-demand* reads within 3 to 6 seconds (round trip). Cannon PLC also supports one-way and two-way load management and distribution automation, simultaneous with metering activity.

kWh Meter Reading

Watt-hour pulses are received directly from the electronic meter sensor and are stored in non-volatile memory.

Last Interval kW Demand

kW demand is calculated over a configurable interval of 1 minute to 60 minutes Peak kW is recorded with the date and time it occurred.

Load Profile

Load Profile data is recorded at 5, 15, 30, or 60 minute intervals. Default configuration stores up to 150 days of Load Profile data for a 15 minute interval on a single channel.

Time-of-Use

Up to four TOU rates and four TOU schedules can be remotely configured. One of the TOU rates can be configured for Critical Peak mode.

Time zone with daylight savings time and holiday dates are user configurable.

Last Interval Average Voltage

Average voltage is calculated over a configurable interval of 15 seconds to 60 minutes.

The minimum and maximum voltages are recorded with the date and time they occurred.

Voltage Profile

Voltage Profile data is recorded at 5, 15, 30, or 60 minute intervals. Default configuration stores up to 18 days of Voltage Profile data for a 15 minute interval on a single channel.

Net Metering

The MCT-410cL can record and store the energy consumption and direction. This enables the user to monitor the net energy usage in each meter.

Outage Count and Duration Log

Time/date and duration of the six most recent power interruptions are logged.

Outage duration is calculated in cycles or seconds. Number of missing cycles required to record an outage is configurable.

Tamper Detection

A tamper flag can be set on the detection of reverse power or zero usage in a single day.

Addressing

Unique Addressing – All meters are shipped with a factory-installed unique address, eliminating the need for on-site programming.

Group Addressing – Supports over 8000 group addresses for use with the following commands: Freeze Register, Critical Peak, voltage min/max reset, and power outage counter.

Freeze Register

The *Freeze Register* command stores the current demand and usage readings for later retrieval. This command can be used with unique meter addressing or can be broadcast using group addressing. The *Freeze Register* command allows utilities to fine tune the billing period for improved accuracy.

For example, a utility can broadcast a freeze command at midnight on a reading day and then collect the data at a later time.

3S and 4S Versions

The 3S and 4S versions of the MCT-410cL have the ability to store a multiplier in the meter so the display reflects either metered usage or billed usage.

SPECIFICATIONS

Communication

Type: Two-way Cannon Power Line Communications (PLC)

Carrier Frequency: 9.6 or 12.5 kHz

Modulation: CPSK Coherent Phase Shift Keying

Data Rate: 72 to 76 bps

Error Detection: Six bit BCH Code on all carrier messages

Operating Requirements

Voltage: 120/240 VAC, 60 Hz

Temperature:
-40° F to 185° F (-40° C to 85° C)

Humidity: 0 to 95% non-condensing

Accuracy

Meets ANSI C12.20, Class 0.5 Accuracy

Surge Withstand Capability

Oscillatory:
6kV @ 100kHz waveform per ANSI C12.1 (IEEE C62.41)

Fast Transient:
6kV @ 1.2x50µs - 8x20µs waveform per ANSI C12.1 (IEEE C62.41)

Electrostatic Discharge

15kV through Air per ANSI C12.1 (IEC61004-2)

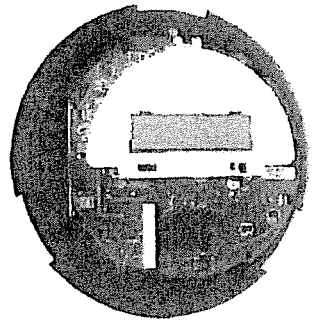
Declarations of Conformity

Tested To Comply With FCC Standards FOR HOME OR OFFICE USE

Complies with IC: ICES – 006;
En conformité avec IC: NMB -006

Dimensions

6.95" H x 6.95" W x 4.00" D
(17.65 x 17.65 x 12.7 cm)



Inside of meter showing the digital meter chassis with the Cannon Technologies MCT-410cL board.

COOPER Power Systems
Energy Automation Solutions

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The data transmitted by the TS2 endpoint can be customized by the user. TS2 endpoints can be custom programmed with combinations of any of the packet components in or the pre-programmed packet definition in Command Center.

1. CENTRON and electromechanical endpoints deliver energy, demand, TOU, and momentary and sustained interruptions.
2. The FOCUS AL delivers the above but also voltage. PUBS-0624-0001

The TS2 FOCUS AX/AX-SD endpoint ships with a default setting as follows:
- Present kWh Delivered Only Total 99999
- Present Demand Max Delivered Only 99.999
- Present Demand Max Delivered Only Time
- Demand Reset Pending Bit
- Meter Outage Count

Packet Definition Components
The AX/AS-SD endpoint supports the following packet definition options:
□ NOTE: Landis+Gyr's FOCUS AX/AX-SD endpoints are capable of providing hourly energy and demand values. Prior to remotely activating streaming data in any endpoint, the TS2 System, including the PLC 3000 Collector and Command Center must be capable of supporting streaming data endpoints. To learn the details of using this very powerful feature, check the Landis+Gyr website for training opportunities offered on a regular basis. After completion of training, Landis+Gyr will provide you with the ability to upgrade your TS2 system.

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Table 3-1. Packet Definition Components
Landis+Gyr Chapter 3 - Data Collection
User Guide 98-1573 Rev AD 33

Data Options Register Name Description
Instantaneous: Current
Phase A Instantaneous Current Phase A
Phase B Instantaneous Current Phase B
Phase C Instantaneous Current Phase C

Instantaneous: Voltage
The TS2 FOCUS AX/AX-SD endpoint samples the meter once per minute to deliver these voltage values.
Voltage 1 Voltage1 read from meter in 1/8 volts
Voltage 1 Mean Voltage 1 Mean
Voltage 1 Max
Maximum Voltage 1 value seen since last demand reset in 1/8 volts
Voltage 1 Max Time
Time in 15 minute increments for maximum voltage 1
Voltage 1 Max Date Day of Year for maximum voltage 1
Voltage 1 Min
Minimum Voltage 1 value seen since last demand reset in 1/8 volts
Voltage 1 Min Time
Time in 15 minute increments for minimum voltage 1
Voltage 1 Min Date Day of Year for minimum voltage 1
Voltage 1 Std. Dev. Voltage 1 Standard Deviation
Instantaneous: Voltage
Voltage 2 is only used in a Form 12S application and refers to the voltage measured on phase C of the meter
Voltage 2 Voltage1 read from meter in 1/8 volts
Voltage 2 Mean Voltage 1 Mean
Voltage 2 Max
Maximum Voltage 1 value seen since last demand reset in 1/8 volts
Voltage 2 Max Time
Time in 15 minute increments for maximum voltage 1
Voltage 2 Max Date Day of Year for maximum voltage 1
Voltage 2 Min
Minimum Voltage 1 value seen since last demand reset in 1/8 volts
Voltage 2 Min Time
Time in 15 minute increments for minimum voltage 1
Voltage 2 Min Date Day of Year for minimum voltage 1
Voltage 2 Std. Dev. Voltage 1 Standard Deviation
Present: KW Max (Del Only)

Fund + Harmonics
Present Demand Max Del Only Fund + Harmonics
Fund + Harmonics Time
Present Demand Max Del Only Fund + Harmonics Time
Fund + Harmonics Date
Present Demand Max Del Only Fund + Harmonics Date
Fund + Harmonics Rate A
Present Demand Max Del Only Fund + Harmonics Rate A
Fund + Harmonics Time Rate A
Present Demand Max Del Only Fund + Harmonics Time Rate A
Fund + Harmonics Date Rate A
Present Demand Max Del Only Fund + Harmonics Date Rate A
Fund + Harmonics Rate B
Present Demand Max Del Only Fund + Harmonics Rate B
Fund + Harmonics Time Rate B
Present Demand Max Del Only Fund + Harmonics Time Rate B
Fund + Harmonics Date Rate B
Present Demand Max Del Only Fund + Harmonics Date Rate B
Fund + Harmonics Rate C
Present Demand Max Del Only Fund + Harmonics Rate C
Fund + Harmonics Time Rate C
Present Demand Max Del Only Fund + Harmonics Time Rate C
Fund + Harmonics Date Rate C

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Present Demand Max Del Only Fund +
Harmonics Date Rate C
Fund + Harmonics
Rate D
Present Demand Max Del Only Fund +
Harmonics Rate D
Fund + Harmonics
Time Rate D
Present Demand Max Del Only Fund +
Harmonics Rate D
Fund + Harmonics
Date Rate D
Present Demand Max Del Only Fund +
Harmonics Date Rate D
Present: kWh Total: Del + Rcvd
Fund + Harmonics
Fund + Harmonics
Rate A
Present kWh Total Del + Rcvd Fund +
Harmonics Rate A
Fund + Harmonics
Rate B
Present kWh Total Del + Rcvd Fund +
Harmonics Rate B
Fund + Harmonics
Rate C
Present kWh Total Del + Rcvd Fund +
Harmonics Rate C
Fund + Harmonics
Rate D
Present kWh Total Del + Rcvd Fund +
Harmonics Rate D
Present: kWh
Total: Del Only
Total
KWh accumulates the power used by the customer with a resolution of 1 kWh. KWh accumulation is based on the amount of dials the meter has and ranges from 4 digits (9999 kWh) to 7 digits (9999999 kWh). This option is user-defined and is set to match the meter dial kWh.
Rate A Present kWh Del Only Rate A
Rate B Present kWh Del Only Rate B
Rate C Present kWh Del Only Rate C
Rate D Present kWh Del Only Rate d
Present: kWh Total: Rcvd Only
Total
32 bit received-kilowatt-hour register. The kWh register has a resolution of 1kWh.

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Rate A Present kWh Rcvd Only Rate A
Rate B Present kWh Rcvd Only Rate B
Rate C Present kWh Rcvd Only Rate C
Rate D Present kWh Rcvd Only Rate D
Present: kWh Total: Del - Rcvd
Total
Present kWh Total Del - Rcvd Fund +
Harmonics
Rate A Present kWh Del - Rcvd Rate A
Rate B Present kWh Del - Rcvd Rate B
Rate C Present kWh Del - Rcvd Rate C
Rate D Present kWh Del - Rcvd Rate D
Present: Meter
Diagnostics
Meter Diagnostics
Meter time in minutes (0-1439), (0 = midnight)
Diagnostics 1 Counter
Diagnostics 2 Counter
Diagnostics 3 Counter
Diagnostics 4 Counter
Diagnostics 5 Counter
Diagnostics 6 Counter
Diagnostics 7 Counter
Time previous data was written (last demand reset time)
Day previous data was written (last demand reset day of year)
Internal BIT
Interface BIT
Meter outage count register
Days since demand reset
TOU flags
Current DR8 error
Present: Meter
Diagnostics
Focus AX
Diagnostics
Service Disconnect
BITS
From MT33 offset 0 (8 bits)
Trigger Limit Window From MT33 offset 1 (8 bits)
Max Triggers in
Window
From MT33 offset 2 (8 bits)
SL Cum. Demand
Interval
From MT33 offset 3 (8 bits)

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SL Demand
Threshold
From MT33 offset 4 (24 bits)
SL Hold Time From MT33 offset 7 (8 bits)
SF Demand
Threshold
From MT33 offset 8 (32 bits)
Meter Method
Status Bits
From MT12 offset 0 (8 bits)
Switch Status Bits From MT12 offset 1 (8 bits)
Relay Status Bits From MT12 offset 2 (8 bits)
SD Switch Status From MT12 offset 5 (8 bits)
SD Operations
Counter
From MT12 offset 10 (16 bits)
Switch Status
Present: Meter
Diagnostics
Continued
Focus AX
Diagnostics
Continued
Load-Side Voltage
Phase A
From MT13 offset 49 (16 bits)
Load-Side Voltage
Phase C
From MT13 offset 51 (16 bits)
Number of Times
Programmed
From MT13 offset 51 (16 bits)
Invalid Login
Attempts
From ST14 offset 14 (16 bits)
Meter Temperature
Meter temperature from MT13 Offset 44 in degrees C +128 to -128 (8 bits)
Displayed Dials
Number of displayed dials (digits) left of decimal
Contact Trigger Threshold
Contact Trigger Duration
Contact Open Options
SD LS Voltage Close Threshold
SD Retry Count
Alert A

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Alert B (Use at least 2 bits for status of switch)
Alert C (Combines Errors 1 and 2)
Days Since Last Reset
Power Failure Count
Watchdog Timeout Count
LCO Close Time
LCO Open Time
DR Tampering
Queue Packet Type
Queue Packet Number of BITs
SD Switch State
Present TVR Diagnostics
Endpoint Serial
Number
Present Tcvr Diagnostics Mfg Serial Number
HHP Scratch
Memory
Present Tcvr Diagnostics HHP Scratch Pad
Memory
Endpoint Time in
Minutes (0-1439,
0=Midnight)
Present Tcvr Diagnostics Endpoint Time in
Minutes (0-1439, 0=Midnight)
Automatic Gain
Control Setting
Present Tcvr Diagnostics Automatic Gain
Control Setting
Demand Reset
Pending Bit
Present Tcvr Diagnostics Demand Reset
Pending Bit
Percentage SubID
Received
Present Tcvr Diagnostics Percentage SubID
Received
TOU Mode Flags TOU Mode Flags
Number of Demand
Resets
Number of Demand Resets
Previous kW-Max
Previous kW Max Previous Demand Max
Prev. kW Time Previous Demand Max Time
Prev. kW Date Previous Demand Max Date
Previous kW-Max (Del only)

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Prev kW Del Rate A
Previous Demand Max Del Only Fund +
Harmonics Rate A
Prev kW Del Time
Rate A
Previous Demand Max Del Only Fund +
Harmonics Time Rate A
Prev kW Del Date
Rate B
Previous Demand Max Del Only Fund +
Harmonics Date Rate A
Prev kW Del Rate B
Previous Demand Max Del Only Fund +
Harmonics Rate B
Prev kW Del Time
Rate B
Previous Demand Max Del Only Fund +
Harmonics Time Rate B
Prev kW Del Date
Rate B
Previous Demand Max Del Only Fund +
Harmonics Date Rate B
Prev kW Del Rate C
Previous Demand Max Del Only Fund +
Harmonics Rate C
Prev kW Del Time
Rate C
Previous Demand Max Del Only Fund +
Harmonics Time Rate C
Prev kW Del Date
Rate C
Previous Demand Max Del Only Fund +
Harmonics Date Rate C
Prev kW Del Rate D
Previous Demand Max Del Only Fund +
Harmonics Rate D
Prev kW Del Time
Rate D
Previous Demand Max Del Only Fund +
Harmonics Time Rate D
Prev kW Del Date
Rate D
Previous Demand Max Del Only Fund +
Harmonics Date Rate D
Previous kWh-Total (Del only)

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Total
Previous kWh Total Del Only Fund +
Harmonics (M)
Rate A
Previous kWh Total Del Only Fund +
Harmonics Rate A
Rate B
Previous kWh Total Del Only Fund +
Harmonics Rate B
Rate C
Previous kWh Total Del Only Fund +
Harmonics Rate C
Rate D
Previous kWh Total Del Only Fund +
Harmonics Rate D
Prevous
kWh-Total (Rcvd
Only)
Total
Previous kWh Total Rcvd Only Fund +
Harmonics
Rate A Previous kWh Rcvd Only Rate A
Rate B Previous kWh Rcvd Only Rate B
Rate C Previous kWh Rcvd Only Rate C
Rate D Previous kWh Rcvd Only Rate D
□ NOTE: The TS2 AX module does not support the momentary and sustained outages found in other TS2 modules. Only the meter outage count is available and is not included in the MAIFI/SAIFI reports in Command Center.

Previous kWh-Total (Del +
Rcvd)
Total
Previous kWh Total Del + Rcvd Fund +
Harmonics
Rate A
Previous kWh Total Del + Rcvd Fund +
Harmonics Rate A
Rate B
Previous kWh Total Del + Rcvd Fund +
Harmonics Rate B
Rate C
Previous kWh Total Del + Rcvd Fund +
Harmonics Rate C
Rate D
Previous kWh Total Del + Rcvd Fund +

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Harmonics Rate D
Previous kWh-Total (Del -
Rcvd)
Total
Previous kWh Total Del - Rcvd Fund +
Harmonics
Rate A Previous kWh Del - Rcvd Only Rate A
Rate B Previous kWh Del - Rcvd Only Rate B
Rate C Previous kWh Del - Rcvd Only Rate C
Rate D Previous kWh Del - Rcvd Only Rate D

kV2c packets can be custom programmed with combinations of any of the packet components in Table 1 or one of the pre-programmed packet definitions in Command Center can be used. The pre-programmed packet definitions are designed to cover the most common situations while maintaining ease of programming.

Default Packet

The default packet is as follows:

Contents: kWh, Max kW - Packet intended for kWh billing only, demand data for operations/customer service (No Soft Switches; assumes monthly demand resets)

- KWH2 (10) - 20 bits (20 bits to the left of the decimal, 0 - 1,048,575 kWh)
- KW3 (3) - 20 bits (10 bits to left of decimal, 10 to right. 0.000 - 1023.999 kW)
- KV2DiagBits (96) - 8 bits
- TcvrDemandResetPending (211) - 1 bit

Packet Name: kWh, Max kW

Packet Description: No soft switches; intended for kWh billing only, daily demand data for operations/customer service (assumes monthly demand resets with subsequent collection of demand billing data via scheduled read).

Frequency: This packet is sent each day of the week.

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Item 14) *Refer to page 9 of the Hickman Testimony, at lines 11-16, concerning technical issues related to Jackson Purchase's AMI system.*

a. *Provide an explanation as to why Jackson Purchase's AMI system is unable to remotely read 500-1,000 meters on a monthly basis.*
   i. *Is the problem isolated to the same 500-1,000 meters each month?*
   ii. *Other than installing repeaters, what steps has Jackson Purchase taken to address and resolve this issue?*
b. *Regarding the band-rate issues, what steps has Jackson Purchase taken to address and resolve this issue?*
c. *State whether it is likely that the band-rate issues identified by Jackson Purchase are correctable, and if so, provide the potential cost of correcting the issues. If such issues are not correctable, explain why Jackson Purchase chose to implement a full-scale AMI system rather than an Automated Meter Reading ("AMR") system, given that future AMI options are limited.*

Response)

a. No vendor will provide a 100% meter-read guarantee with his product. At the least, one expects some small percentage of meters, *e.g.*, 0.5%, to be unreadable.

i. No. It varies from month to month, and meter to meter.

ii. JPEC looked at its system performance and addressed

1. system noise that might interfere with signal integrity,
2. inspection of meters and services, and
3. replacing suspect connectors and other hardware that could be contributing to any interference.

The installation of repeaters has been the only proven solution to enable more meter reads.

b. Band rate is a vendor limitation. Please see the response to Item 14a above.

c. The band-rate issue is a vendor limitation; currently JPEC does not know if the vendor has any plans on increasing the band rate. JPEC elected to use Cannon Technologies because they were the most technologically advanced AMI system at the time.

Witness) Scott W. Ribble (*JPEC*)

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Item 15) *Refer to the Hickman Testimony, page 10, regarding the experience of Kenergy with Smart Grid investments.*

a. *Provide a more detailed explanation of Kenergy's pilot programs.*
b. *Provide with more specificity the reasons why Kenergy suspended its two AMI pilot programs.*
c. *What is the current timeline for the full system deployment feasibility study? Provide a copy of the study when completed.*

Response)

a. Kenergy's pilots were four years (ACLARA) and three years (CANNON) in duration. The ACLARA pilot was with 1000 meters and the CANNON pilot included 100 meters. Only single phase customers were included in the pilots. A pilot team made up of employees from every department reviewed progress and issues on a regular basis.
b. Interval data from the ACLARA modules could only be evaluated in sixty minute segments. The CANNON system required additional amplification in order to receive meter data on demand. Both were more costly than had been projected. The user

interface for the ACLARA was found to be difficult to navigate. For these reasons Kenergy decided to postpone AMI investigation.

c. The present plans are to begin an initial evaluation of the AMI technology in Q4 of 2013 with a decision targeted for a year later, which will result in a 2015 deployment if the evaluation is positive.

Witness) John E. Newland (*Kenergy*[4])

[4] Kenergy = Kenergy Corp.

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Item 16) *Refer to the Hickman Testimony, page I1 regarding the experience of Meade County with Smart Grid investments. Describe any self-healing network that Meade County operates.*

Response) Meade County Rural Electric Cooperative Corporation has no self-healing network.

Witness) Michael L. French (*MCRECC*)

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Item 17) ***Refer to page 12 of the Hickman Testimony. Fully explain the rationale why Big Rivers believes that not all Smart Grid investments necessarily would be subject to approval by the Commission, pursuant to KRS 278.020.***

Response) Under current law, Big Rivers does not believe that every investment in Smart Grid technology would require a Certificate of Public Convenience and Necessity. A minor upgrade to communications infrastructure, *e.g.*, upgrading from one version to a more current version, that would otherwise qualify as an ordinary extension in the usual course of business would not, and should not, require a Certificate of Public Convenience and Necessity simply because it could be considered a Smart Grid investment.

Witness) Roger D. Hickman (*Big Rivers*)

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Item 18) ***Refer to the Hickman Testimony, page 13 beginning at line 18, which states that Big Rivers and its member cooperatives believe any Smart Grid investment standard adopted by the Commission should also clearly define the Commission's position regarding cost recovery. State whether Big Rivers and its member cooperatives have a position concerning the cost-recovery mechanism that should be used if a Smart Grid investment standard is adopted.***

Response) Big Rivers and its Members ("the Big Rivers Parties") currently do not have a specific cost recovery mechanism in mind for recovering any Smart Grid investments. The Big Rivers Parties believe the Commission should evaluate rate recovery for all Smart Grid investments based upon the long held principles of prudently incurred costs which are recovered through fair, just, and reasonable rates.

Possible features, or guiding principles, of a Smart Grid Cost Recovery Mechanism may include, but not be limited to, the list below.

1. The Commission would review any Smart Grid project for which recovery is sought through the mechanism prior to the project's implementation. Depending on the dollar-value of the project, that review may, or may not, be through the Commission's CPCN authority.

2. A utility would be allowed to recover all capital costs and O&M costs related to the Smart Grid project.
3. Recovery of capital costs may differ between investor-owned utilities and cooperatives. For example, the former might include a rate of return on capital invested, while the latter might include a return based upon a Times Interest Earned Ratio (TIER).
4. The Commission may elect to conduct periodic reviews of such a cost recovery mechanism similar to the six-month reviews of Fuel Adjustment Clauses. Perhaps these Commission reviews would be less frequently, e.g., annually.
5. These reviews may include a determination of whether the previously recovered costs should be adjusted.

Given the technologically driven nature of Smart Grid investments, and the potentially high level of technological obsolescence of these investments, *i.e.*, the "technology tiger" mentioned in the Hickman Testimony, Big Rivers and its Members strongly believe the Commission must move expeditiously to review all Smart Grid investments which may come before the Commission.

Witness) Roger D. Hickman (*Big Rivers*)

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Item 19) ***Refer to the Hickman Testimony beginning on page 16 regarding dynamic pricing.***

a. Describe the type of cost-benefit analysis that should support dynamic pricing.

b. Identify which forms of dynamic pricing (TOU pricing, critical peak pricing, real-time pricing, etc.) that each Big Rivers member cooperative can implement. Explain your response.

Response)

a. As noted in the Hickman Testimony at page 16 of 26, lines 6 through 11; at page 17 of 26, line 18 through page 18 of 26, line 4; and at page 22 of 26, lines 10 through 13, any cost-benefit analysis should reflect good utility practice.

b. Implementation of dynamic pricing by Big Rivers and/or its Members will be driven by their respective rate designs, and the ability to program any meters to match those rate designs. Also, the form of the dynamic pricing will be driven somewhat by the companies' individual customer bases and the interrelationship between rate design and the effort to increase customer participation. Stated another way, one rate design may lead to

higher levels of customer participation versus another rate design. That level of customer participation will also be impacted by each individual customer's preferences and drivers.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 20) ***Refer to the Hickman Testimony, page 20, lines 7-16, regarding the data network architecture for Smart Grid technology.***

a. Identify the areas of Big Rivers and each member cooperative that are not Internet Protocol ("IP") ready.

b. Identify the network architecture that Big Rivers and each member cooperative support. Explain

Response)

a. Big Rivers and its Members are unaware of the specific areas within their respective service areas that are not IP ready. Big Rivers' and its Members' concerns regarding this recommendation from the Kentucky Smart Grid Roadmap are based upon anecdotal experiences. Throughout our service areas, individuals experience dropped cell phone calls and loss of WiFi access, or very weak signals for each such service. The same has been true for travels in other parts of Kentucky, e.g., the mountainous areas of Eastern Kentucky or I-71 between Louisville and Lexington.

b.

Big Rivers –

Big Rivers' network architecture is based on a privately-owned microwave radio infrastructure that provides secure

communication to each corporate facility, including each substation. For those areas that are not part of the radio infrastructure, such as a meter in the field, a combination of leased DSL and cellular service is used for communications.

JPEC –

JPEC uses Ethernet (IP addressing) for communications with devices located in the substations. However, the substation meters use a proprietary communications address unique to the manufacturer.

Kenergy –

Much of Kenergy's telecommunication architecture is IP addressable. The major part not yet IP ready is the SCADA telecommunications to a majority subset of the company's substations which will be migrated to IP over the next few years. Kenergy's network consists of multiple inter-connected sites over a 14 county area. It has multiple connections to the Internet, a redundant fiber optic network between its major sites, and fiber and microwave connections to its substations and outlying offices. Its server systems are primarily Windows and Linux based virtualized when possible.

MCRECC -

MCRECC has a mixture of Digital Subscriber Line ("DSL") and microwave to its substations which connects back to its corporate LAN. All DSL accounts use a Virtual Private Network ("VPN") tunnel for cyber security.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 21) ***Refer to the Hickman Testimony, page 21, lines 12-21 and page 22, lines 1-2. Explain procedurally how any university research can be performed in conjunction with EPRI, IEEE, EEI, and NRECA/CRN.***

Response) As noted in Big Rivers' response to Item 12 above, the Cooperative Research Network ("CRN") has experience in conducting research with universities and with the EPRI. Any interested university should contact the CRN, the EPRI, and the EEI directly to ascertain the degree to which there are university research projects which may interest these parties in conducting joint research. Oversight of these projects would most likely be done in a manner agreed upon by the parties to the research.

Witness) Roger D. Hickman (*Big Rivers*)

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Item 22) ***Refer to the Hickman Testimony, page 25 which discusses the belief of Big Rivers and its member cooperatives that energy-efficiency upgrades to housing and small-commercial structures is a better, more cost-effective option to increase energy conservation and efficiency than Smart Grid and/or smart meter implementation. Provide the current efforts of Big Rivers and its member cooperatives to encourage and promote energy-efficiency upgrades to housing and small-commercial property.***

Response) Please see Big Rivers' Demand-Side Management Report dated January 31, 2013, which is attached hereto.

Witness) Russell L. Pogue (*Big Rivers*)

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Big Rivers Electric Corporation

Demand Side Management (DSM) Report January 31, 2013

Provided to the Kentucky Public Service Commission
Pursuant to Ordering Paragraph No. 9
of
The Commission's Order dated November 17, 2011
in
Case No. 2011-00036

Big Rivers Electric Corporation
Demand Side Management ("DSM") Report
January 31, 2013

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Program Summary

Big Rivers Electric Corporation has taken a proactive approach to advance the goal of Strategy 1 of the 2008 Governor's Intelligent Energy Choices plan "to improve the efficiency of Kentucky's homes, buildings, industries and transportation fleet by establishing a goal of offsetting at least 18 percent of Kentucky's projected 2025 energy demand."

The purpose of this DSM report is to provide descriptions and data about DSM programs currently being offered.

DSM/Energy Efficiency Programs

1. Residential Lighting Replacement Program (CFL distribution)
2. Residential ENERGY STAR® Clothes Washer Replacement
3. Residential ENERGY STAR® Refrigerator Replacement
4. Residential ENERGY STAR® Heating, Ventilation and Air Conditioning (HVAC) Program
5. Residential Weatherization Program - Primary Heating Electric
6. Residential Weatherization Program - Primary Heating Gas
7. Residential Touchstone Energy® New Home Construction Program
8. Residential and Commercial HVAC & Refrigeration Tune-Up Program
9. Commercial/Industrial High Efficiency Lighting Replacement Program
10. Commercial/Industrial General Energy Efficiency Program

2012 DSM/Energy Efficiency Results

The 2012 Year-End DSM Program Results are shown in the table at the top of the following page.

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Big Rivers Electric Corporation
2012 Demand Side Management/Energy Efficiency Program Results

DSM Program	Units	Total Meas.	Total Spend
Residential Lighting Program	Lamps	51,792	$101,914.00
Residential Energy Star (ES) Appliances	-	-	-
Energy Star Clothes Washer	Washers	563	56,300
Energy Star Refrigerator	Refrigerators	383	38,300
ES Heating, Ventilation and Air Conditioning (HVAC) Program	HVAC Units	100	41,450
Residential Weatherization Program - Electric Heat	Homes	9	48,221
Residential Weatherization Program - Gas Heat	Homes	1	3,690
Residential Touchstone Energy New Construction Program	New Homes	71	56,250
HVAC Tune-Up Program	HVAC Units	332	10,350
Commercial/Industrial Efficient Lighting Program	KW	420	147,113
Commercial/Industrial Efficient Equipment Program	KW	27	9,495
Promotional Expense	-	-	75,013
Total			$588,096

The Energy Efficiency programs are being offered at all three of Big Rivers' Member Cooperatives. Meade County Rural Electric Cooperative Corporation ("MCRECC") has been offering the programs since January 2012. Kenergy Corp. ("Kenergy") began program offerings in May 2012. Jackson Purchase Energy Corporation ("Jackson Purchase") began offering programs to retail members in July 2012. Many of the programs have significant lead times, such as commercial programs, new home construction and residential weatherization and the delayed start reduced the spend in 2012 in many of the programs.

The actual spend for 2012 was $588,096 or slightly less that 59% of projected. Promotional expenses were $75,013 or 37% of projected.

The programs are currently under review and will be evaluated for potential improvements. The DSM/EE working group will examine the recommended changes, which may result in modifications to the current programs and potential new programs in 2013.

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2012 Budget

The table on the following page shows the 2012 energy efficiency program targets and spending levels for each program. This table also quantifies the deemed impact of each target on energy consumption and peak kW. Appendix A of this report shows the year-end results of 2012 and descriptions of each program.

The 2012 budget of $1,000,000 was split into two segments. The first segment addresses incentives or direct payments to Members when a measure is implemented. The total incentive budget was $800,000. The second segment involves the additional $200,000 set aside for promotional and regulatory administrative costs associated with the program.

Specific program budgets are flexible and are tailored to retail member response to each program. Member Cooperatives are able to adjust or shift budgets to address successful programs. Program requirements for each individual program plans are minimum standards; Member Cooperatives may establish more stringent requirements at their discretion.

Member Cooperatives collect required documentation and submit an invoice, with a summary spreadsheet for each program to Big Rivers for reimbursement monthly. The invoice contains the following information for each incentive paid:

1. Date
2. Account Number
3. Name
4. Service Address
5. City
6. Zip Code
7. Incentive Description Details
8. Incentive Amount

Each program has a separate summary spreadsheet. Multiple program summary spreadsheets may be combined on the same invoice. Promotional reimbursement requires a copy of the advertisement used in printed media. Radio advertising is submitted with a script.

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Big Rivers 2012 DSM/Energy Efficiency Program Targets

Residential Programs	Annual kWh Savings Per Unit	Winter kW Savings Per Unit	Summer kW Savings Per Unit	Unit Quantity	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Target Spend 2012
Residential Lighting Program								
CFL bulbs	31	0.007	0.003	57,143	1,752,004	408.0	179.2	$100,000
Residential Efficient Appliances								
Clothes Washer Rebate	224	0.007	0.026	400	89,600	2.8	10.4	$40,000
Energy Star Refrigerator + Recycling	1,084	0.076	0.089	400	433,600	30.4	35.6	$40,000
HVAC Program								
Dual Fuel	3,448	7.066	0.146	50	172,400	353.3	7.3	$25,000
Air Source Heat Pump	692	0.000	0.146	35	24,220	0.0	5.1	$7,000
Goethermal	3,658	4.453	0.365	24	87,792	106.9	8.8	$18,000
Weatherization Program								
Stick-Built Home	6,980	4.950	0.890	75	523,500	371.3	66.8	$150,000
Manufactured Home	4,680	2.200	0.300	25	117,000	55.0	7.5	$50,000
New Construction								
Gas Heat	2,435	0.260	0.580	48	116,880	12.5	27.8	$36,000
Air Source Heat Pump	4,922	2.700	0.580	20	98,430	54.0	11.6	$20,000
Dual Fuel Heat Pump (w/ Gas)	8,370	9.766	0.580	20	167,390	195.3	11.6	$24,000
Geothermal Heat Pump	8,580	7.150	0.799	10	85,795	71.5	8.0	$20,000
Tune-Up								
HVAC Tune-Up	636	0.000	0.304	1,320	839,520	0.0	400.9	$33,000

Commercial/Industrial (C/I) Programs	Annual kWh Savings Per $	Winter kW Savings Per $	Summer kW Savings Per $	Total kW Reduced	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Target Spend 2012
C&I Lighting								
Lighting Projects	12	0.0029	0.0027	543	2,219,784	543.0	507.3	$190,000
C&I Products								
Misc. Efficient Projects	7	0.0005	0.0029	86	213,452	16.1	86.0	$30,000
	Annual kWh Savings Per Unit	Winter kW Savings Per Unit	Summer kW Savings Per Unit	Unit Quantity	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Target Spend 2012
Tune-Up								
HVAC Tune-Up*	5,268	0.000	1.200	340	1,791,120	0.0	408.0	$17,000.00
* Assumed 6 tons/unit								
				Total DSM Program Savings:	8,732,487	2,722.1	1,736.8	$886,000

Appendix A:
DSM Program Plans

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Big Rivers 2012 DSM/Energy Efficiency Program Actual

Residential Programs	Annual kWh Savings Per Unit	Winter kW Savings Per Unit	Summer kW Savings Per Unit	Unit Quantity	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Spend 2012
Residential Lighting Program								
CFL bulbs	31	0.007	0.003	51,792	1,587,943	369.8	162.4	$101,914
Residential Efficient Appliances								
Clothes Washer Rebate	224	0.007	0.026	563	126,112	3.9	14.6	$56,300
Energy Star Refrigerator + Recycling	1,084	0.076	0.089	383	415,172	29.1	34.1	$38,300
HVAC Program								
Dual Fuel	3,448	7.066	0.146	33	113,784	233.2	4.8	$16,500
Air Source Heat Pump	692	0.000	0.146	46	31,832	0.0	6.7	$9,200
Goethermal	3,658	4.453	0.365	21	76,818	93.5	7.7	$15,750
Weatherization Program								
Stick-Built Home	6,980	4.950	0.890	9	62,820	44.6	8.0	$46,720
Manufactured Home	4,680	2.200	0.300	1	4,680	2.2	0.3	$5,190
New Construction								
Gas Heat	2,435	0.260	0.580	67	163,145	17.4	38.9	$50,250
Air Source Heat Pump	4,922	2.700	0.580	2	9,843	5.4	1.2	$2,000
Dual Fuel Heat Pump (w/ Gas)	8,370	9.766	0.580	0	0	0.0	0.0	$0
Geothermal Heat Pump	8,580	7.150	0.799	2	17,159	14.3	1.6	$4,000
Tune-Up								
HVAC Tune-Up	636	0.000	0.304	260	165,360	0.0	79.0	$6,500

Commercial/Industrial (C/I) Programs	Annual kWh Savings Per $	Winter kW Savings Per $	Summer kW Savings Per $	Total kW Reduced	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Spend 2012
C&I Lighting								
Lighting Projects	12	0.0028	0.0027	418	1,710,419	418.4	390.9	$147,113
C&I Products								
Misc. Efficient Projects	8	0.0006	0.0032	31	76,446	5.8	30.8	$9,495
	Annual kWh Savings Per Unit	Winter kW Savings Per Unit	Summer kW Savings Per Unit	Unit Quantity	Total Annual kWh Savings	Total Winter kW Savings	Total Summer kW Savings	Spend 2012
Tune-Up								
HVAC Tune-Up*	5,268	0.000	1.200	77	405,636	0.0	92.4	$3,850.00
* Assumed 6 tons/unit								
				Total DSM Program Savings	4,967,189	1,237.6	876.3	$613,052

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Program: Residential Lighting Replacement Program (CFL Distribution)

Overview
This program promotes increased use of ENERGY STAR® rated Compact Fluorescent Light ("CFL") lamps among the retail members of Big Rivers' Member Cooperatives by providing reimbursement to Member Cooperatives for CFL lamps distributed to their retail members.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
Big Rivers will reimburse the Member Cooperatives for the purchase of CFL lamps that the Member Cooperative buys and distributes to its retail members for use in the Member Cooperative's service area. Member Cooperatives must submit invoices to Big Rivers and must include proper documentation of the purchase from the CFL supplier and of the distribution to retail members. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $100,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential ENERGY STAR® Clothes Washer Replacement Program

Overview
This program promotes increased use of ENERGY STAR® rated clothes washing machines.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
Big Rivers will provide an incentive payment of $100 for each ENERGY STAR® rated clothes washer that is purchased and installed in the Member Cooperative's system. Member Cooperatives must submit invoices to Big Rivers and must include proper documentation of the purchase and installation from a legitimate retail appliance supplier. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $40,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential ENERGY STAR® Refrigerator Replacement Program

Overview
This program promotes increased use of ENERGY STAR® rated refrigerators and the removal from operation of existing older, low-efficiency refrigerators.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
Big Rivers will provide an incentive payment of $100 for each ENERGY STAR® rated refrigerator that is purchased and installed in the Member Cooperative's system. Member Cooperatives must submit invoices to Big Rivers and must include proper documentation of the purchase and installation of the new appliance, and the removal of the old appliance from legitimate retail appliance suppliers. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $40,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential ENERGY STAR® Heating, Ventilation and Air Conditioning ("HVAC") Program

Overview
This program promotes increased use of high efficiency HVAC systems among the retail members of the member cooperatives by providing reimbursement to member cooperative members for upgrading their HVAC systems beyond contractor grade minimums to one of three ENERGY STAR®-rated HVAC systems.

Target Participants
Target participants of this program for Big Rivers include its three member cooperatives. The target end users are the retail members of the member cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
Big Rivers will reimburse the member cooperatives for the HVAC efficiency upgrades by a retail member on the member cooperative's system. Member cooperatives must submit invoices to Big Rivers and must include proper documentation. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

The following is the program administrative process:

1. The retail consumer will provide a receipt of installation and purchase of equipment from a licensed contractor dated within the eligibility timeframe of the program selected by the member cooperative.
2. The member cooperative will be responsible for verification of installation.
3. The initial incentives shall be the following per replacement unit installed:

    - Geothermal $750
    - Dual Fuel $500
    - Air Source $200

Annual Budget
The 2012 budget for this program is $50,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Program: Residential ENERGY STAR® Heating, Ventilation and Air Conditioning ("HVAC") Program (*continued*)

Evaluation, Measurement and Verification ("EM&V")

Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential Weatherization Programs – Primary Heating Electric and Primary Heating Gas

Overview
This program promotes the implementation of weatherization measures among the retail members of the member cooperatives by providing reimbursement to member cooperatives for undertaking weatherization improvements at their homes.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the retail members of the Member Cooperatives. This program is available to any retail residential member of the Member Cooperative taking service under the Big Rivers Rural Delivery Service ("RDS") tariff, with an all-electric home to maximize the benefit of the program.

Member Incentives
Sherlock Homes is a weatherization contractor headquartered in Bloomington Indiana, which has been performing weatherization projects for Hoosier Energy for the last two years with tremendous success. To-date Sherlock Homes has weatherized nearly 2,000 site-built and manufactured homes in Indiana.

Big Rivers will provide 50% of the cost of the weatherization for residential members with an electric primary heating system (Primary Heating Electric), or 25% of the cost for members with a non-electric primary heating system (Primary Heating Gas). Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $200,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential Touchstone Energy® New Home Construction Program

Overview
This program provides incentives to home owners and builders to use energy efficient building standards as outlined in the Touchstone Energy® certification program, which requires a Home Energy Rating System ("HERS") rating of 85 or lower.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
The incentive is based on the HVAC system installed in the retail member's Touchstone Energy® Certified Home. The following incentives apply:

Geothermal Heat Pump (ground coupled heat pump)	$2,000
Air Source Heat Pump	$1,000
Dual Fuel Heat Pump (ASHP w/ Gas back-up)	$1,200
Gas Heat	$ 750

The Member Cooperative will provide a copy of the original certification document and the analysis form used to determine the HERS score and a copy of the receipt from a licensed HVAC contractor specifying the HVAC system installed in the home of the retail member. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $100,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Residential and Commercial HVAC & Refrigeration Tune-Up Program

Overview
This program promotes the initiation of annual maintenance on heating and air conditioning equipment among the retail members of the Member Cooperatives by providing reimbursement to Member Cooperative retail members that have their heating and cooling systems professionally cleaned and serviced.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the residential and commercial retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives

Big Rivers will offer incentives to Member Cooperatives for retail member homeowners and commercial businesses that have their heating and cooling systems professionally cleaned and serviced.

Member Cooperatives will receive a $25 incentive for each residential unit and $50 for each commercial unit that is cleaned and serviced.

For retail members with multiple units, each incentive paid will require an individual receipt from a licensed HVAC contractor.

Member Cooperatives must submit invoices to Big Rivers and must include proper documentation. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $50,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Commercial / Industrial High Efficiency Lighting Replacement Program

Overview
This program provides an incentive to commercial and industrial retail member consumers for whom service is taken under Big Rivers' RDS tariff to upgrade poorly designed and low efficiency lighting systems.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the commercial and industrial retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
The following are the project steps:

1. The lighting contractor, supplier, electrical contractor or electrician will provide to the retail member the documented changes made to the facility lighting system. The retail member will also be required to provide an invoice for materials and installation services associated with the project.
2. The Member Cooperative will verify the installation of the new lighting system and collect a copy of the specification of the lighting system conversion impact, signed by the retail member, with the following information:

    - Lamp and ballast (or fixture) specifications prior to conversion including total wattage
    - New fixture specifications including total wattage
    - Estimated hours of operation
    - Estimated kWh saved per year
    - Total kW demand reduction

3. The Member Cooperative shall submit an invoice to Big Rivers with copies of individual lighting project specification documents with the following information:

    - Member Name
    - Account Number
    - Service Address
    - kW Reduction Total
    - Annual Hours of Operation
    - Incentive Amount

Program: Commercial / Industrial High Efficiency Lighting Replacement Program (*continued*)

4. The initial incentive shall be set at $350 per kW reduction. This amount will be evaluated continuously and adjusted depending on reaction by retail members qualifying.

Each of the incentive payments will require the fixture/lamp change be verified by the Member Cooperative personnel or third party. A worksheet is provided to determine the change in demand of the lighting system The retail member will also be required to provide the project costs for planning purposes. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $190,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

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Program: Commercial / Industrial General Energy Efficiency Program

Overview
This program provides an incentive to retail commercial and industrial retail member-consumers served under the Big Rivers RDS tariff to upgrade all aspects of cost-effective energy efficiency achievable in individual facilities.

Target Participants
Target participants of this program for Big Rivers include its three Member Cooperatives. The target end users are the commercial and industrial retail members of the Member Cooperatives taking service under the Big Rivers Rural Delivery Service ("RDS") tariff.

Member Incentives
The requirements of the program are:

1. The retail member, contractor, supplier, electrical contractor or electrician will provide to the retail member the documented changes made to the facility equipment resulting in the demand reduction. The retail member will also be required to provide an invoice for materials and installation services associated with the project.
2. The Member Cooperative will verify the installation of the new equipment and collect a copy of the specification of the equipment conversion impact, signed by the retail member, with the following information:
    - Equipment specifications of existing equipment, including total wattage
    - Replacement equipment specifications, including total wattage
    - Estimated hours of operation
    - Estimated kWh saved per year
    - Total kW demand reduction
3. The Member Cooperative shall submit an invoice to Big Rivers with copies of individual project specification documents and a printed summary excel spreadsheet with the following information:

    - Member Name
    - Account Number
    - Service Address
    - kW Reduction Total
    - Annual Hours of Operation
    - Incentive Amount

Program: Commercial / Industrial General Energy Efficiency Program (*continued*)

4. The initial incentive shall be set at $350 per kW reduction with a maximum incentive of $10,000 per project unless approved by Big Rivers on an individual basis. This amount will be assessed continuously and adjusted depending on reaction by retail commercial members qualifying under this program.

Each of the incentive payments will require that equipment changes be verified by a Member Cooperative's personnel or third party. A worksheet is provided to determine the change in demand resulting in equipment upgrades. The retail member will also be required to provide the project costs for planning purposes. Big Rivers will also reimburse a Member's reasonable costs of promoting this program, if the promotional program and its costs are pre-approved by Big Rivers.

Annual Budget
The 2012 budget for this program is $30,000. Budget levels for future years may vary based upon the experience gained after program implementation.

Evaluation, Measurement and Verification ("EM&V")
Big Rivers will initiate a process of Evaluation, Measurement and Verification for the program. The EM&V process will ensure the quality and effectiveness of the program and optimal use of resources.

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION
OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information dated February 27, 2013

March 20, 2013

Item 23) ***Refer to the Hickman Testimony, page 25, lines 18-21. Provide the specific features Big Rivers and its member cooperatives believe should be included in the opt-out provisions of any programs involving smart meters.***

Response) Big Rivers' Members believe that features of any opt-out provision may include, but not be limited to, the list below.

1. Customers who opt-out will still be responsible for their portion of Smart Meter program costs, whether that cost is passed along through base rates or through some special cost recovery mechanism (see Big Rivers' and its Members' response to Item 18 above).
2. Customers who opt-out must reimburse the utility for all incremental costs which may arise from their decision, *e.g.*, reimbursements for visits for meter reads, meter inspections, *etc.*
3. As part of a Smart Meter program roll-out, customers may be advised of their 'opt-out rights' and the additional charges they would incur should they elect to opt-out.

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION
OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information
dated February 27, 2013

March 20, 2013

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION
OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information
dated February 27, 2013

March 20, 2013

Item 98) ***With regard to calendar years 2007 through 2012, identify and discuss what Smart Grid and/or Smart Meter initiatives the utility implemented. The discussion should include but not be limited to the reasons why each initiative qualifies as a Smart Grid and/or Smart Metering initiative; the date of installation; the total cost of installation; and any benefits resulting from the initiatives, quantifiable or otherwise: received by both the utility and the customers.***

Response)

JPEC –

Please refer to the Hickman Testimony from page 8 of 26, line 3 through page 10 of 26, line 2.

Kenergy –

Please see the response to Item 15 above, and the Hickman Testimony from page 10 of 26, lines 3 through 19. Additionally, Kenergy incurred $193,000 of costs in connection with the pilot projects that has been expensed. There were no quantifiable benefits to the pilots.

MCRECC –

MCRECC started the installation of a Survalent SCADA system in 2009. With this SCADA installation, MCRECC has been changing out old recloser controls

with no communication ability to new SCADA ready controls. This project is ongoing with the addition of SCADA-ready regulator controls over the next three years as stated in MCRECC's 2013–2015 Commission-approved Construction Work Plan ("CWP").

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

BIG RIVERS ELECTRIC CORPORATION
JACKSON PURCHASE ENERGY CORPORATION
KENERGY CORP.
MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
CASE NO. 2012-00428

Response to Commission Staff's Request for Information dated February 27, 2013

March 20, 2013

Item 99) ***With regard to calendar years 2013 through 2018, identify and discuss what additional Smart Grid and/or Smart Meter initiatives the utility has forecasted to be implemented. The discussion should include but not be limited to why each forecasted initiative qualifies as a Smart Grid and/or Smart Metering initiative; the forecasted date of installation; the forecasted total cost of installation; and any forecasted benefits to result from the initiatives, quantifiable or otherwise, received by both the utility and the customers.***

Response)

JPEC –

JPEC is working on a CVR (conservation voltage reduction) project which should be operational in the fall of 2013. This project will be to use the customer voltage data at the end meter to reduce the system voltage. Reduction in system voltage also means a reduction in the peak demand for the system. This program requires the upgrading of JPEC's SCADA system, interfaces with the AMI, replacement of controls to JPEC's feeder regulators, and improvements to the communications infrastructure. This project has been budgeted at $500,000, and approved by the Commission in JPEC's 2012–2015 CWP.

Kenergy –

Please see response to Item 15 above. Additionally, an AMI system deployment is by nature a Smart Metering initiative. At this time, Kenergy has not forecasted an installation date nor estimated the installation cost. Kenergy anticipates the realized benefits will be identified as an initial step of any future pilot program.

MCRECC –

As noted in its response to Item 98 above, the Survalent SCADA system installation is ongoing and in MCRECC's Commission-approved 2013–2015 CWP. This project is on-going and, therefore, any benefits are unknown at this time.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and
Michael L. French (*MCRECC*)

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Item 100) ***With regard to DA Smart Grid Initiatives provide the following:***

a. the number of DA systems installed as of December 31, 2012, along with the associated benefits realized.
b. the number of DA systems to be installed in the next five years.
c. the total number of DA systems to be installed when the DA system is completely deployed.

Response)

JPEC –

JPEC had one DA system installed as of December 31, 2012. During times of system abnormalities, the DA system has worked as expected to move load from one substation to another. JPEC has no plans to install any DA systems in the next five years. JPEC will have one DA system installed when the system is completely deployed.

Kenergy –

Kenergy has no DA systems. Kenergy has no current plans for any installation of DA systems within the next five years.

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MCRECC –

MCRECC County has no DA systems other than SCADA.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and
Michael L. French (*MCRECC*)

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Item 101) *With regard to VoltVAR Optimization, provide the following:*

a. *the number of VoltVAR Optimization systems installed as of December 31, 2012, along with the associated benefits realized.*
b. *the number of VoltVAR Optimization systems to be installed in the next five years, along with the forecasted in-service date.*
c. *the total number of VoltVAR Optimization systems to be installed when the VoltVAR Optimization system is completely deployed.*

Response)

JPEC –

JPEC had no VoltVAR Optimization system installed as of December 31, 2012. During the next five years, JPEC plans to install one VoltVAR Optimization system; therefore, one VoltVAR Optimization system will be installed with complete deployment.

Kenergy –

Kenergy has no VoltVAR Optimization systems. Kenergy has no current plans for any installation of VoltVAR Optimization systems within the next five years.

MCRECC –

Meade County has no Volt/VAR Optimization.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 102) ***With regard to Supervisory Control and Data Acquisition ("SCADA") Smart Grid Initiatives, provide the following:***

a. the number of SCADA systems installed as of December 31, 2012, along with the associated benefits realized.

b. the number of SCADA systems to be installed in the next five years, along with the forecasted in service date.

c. the total number of SCADA systems to be installed when the SCADA system is completely deployed.

Response)

JPEC –

a. JPEC has a single SCADA system by OSI (Open Systems International) to all feeders in all substations. Status point data for substation equipment is brought back to Dispatch.

b. JPEC is currently switching SCADA vendors to Survalent Technology as the Volt/Var system is implemented.

c. JPEC does not foresee the addition of other SCADA systems in the future. JPEC may consider collecting data from down line devices from the Substation.

Kenergy –

a. Kenergy has a single SCADA system by ACS (Advanced Control Systems) deployed to every feeder of every rural substation site. The status of equipment and value of selected data points are reported to the control center. At present this is limited to devices inside a substation. No down line devices are included.
b. New substations, if constructed, will be equipped in the same way.
c. Future expansion will be to a single SCADA system. Additional deployment of devices beyond the substation will be incorporated into the system. The type and timing of the down line devices has not been determined.

MCRECC –

Please see MCRECC's response to Item 98 above.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 103) *As it relates to Dynamic Pricing (where rates are established hourly throughout the day) Tariffs or TOU Tariffs, provide the following:*

a. the number of customers the utility has or had on these types of tariffs, identified separately by specific tariff.
b. whether these customers shifted load from high-price times periods to lower-priced time periods.
c. whether these customers consumed more, less or the same number of kWh.
d. whether the utility reached any findings or conclusions based on its experience with customers on Dynamic Pricing and/or TOU Tariffs.

Response)

Big Rivers –

Big Rivers' Standard Rate Schedule LICX makes tariff real-time pricing available to applicable retail customers. No retail customers have taken advantage of that provision.

JPEC –

JPEC has no customers on any dynamic pricing tariff.

Kenergy –

Kenergy has no customers on any dynamic pricing tariff.

MCRECC –

MCRECC has two commercial members on a TOU rate. One consumer has not seen a difference in his cost as most of his operation is on peak; the other customer only operates off peak. In MCRECC's tariff (Schedule 3A and Schedule 4), the kWh charge stays the same on-peak or off-peak. The demand cost is only present on-peak. Schedule 3A and Schedule 4 define the on-peak and off-peak periods.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*),
John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 104) ***Describe precautions taken and/or standards developed by the utility to address concerns regarding cybersecurity and privacy issues.***

Response) For equipment deemed as 'critical infrastructure', Big Rivers is mandated to follow the North American Electric Reliability Corporation's ("NERC") Critical Infrastructure Protection ("CIP") NERC CIP Reliability standards ("the NERC CIP Standards"). Please see the following link for the current standards - http://www.nerc.com/page.php?cid=2|20

For hardware and data deemed non-critical, Big Rivers and/or its Members follow the major elements outlined in the NRECA/CRN *Guide to Developing a Cyber Security and Risk Management Plan.* This NRECA/CRN Guide is available on-line at: http://www.smartgrid.gov/sites/default/files/doc/files/CyberSecurityGuideforanElectricCooperativeV11-2%5B1%5D.pdf. The National Institute of Standards and Technology also provides similar guidance in a number of documents under the *Guidelines for Smart Grid Cybersecurity.* These are –

1. Introduction to NISTIR 7628 – http://csrc.nist.gov/publications/nistir/ir7628/introduction-to-nistir-7628.pdf.
2. Volume 1 – Smart Grid Cyber Security Strategy, Architecture, and High-Level Requirements http://csrc.nist.gov/publications/nistir/ir7628/nistir-7628_vol1.pdf.

3. Volume 2 – Privacy and the Smart Grid
http://csrc.nist.gov/publications/nistir/ir7628/nistir-7628_vol2.pdf.
4. Volume 3 – Supportive Analysis and References
http://csrc.nist.gov/publications/nistir/ir7628/nistir-7628_vol3.pdf.

A few examples of the recommendations that Big Rivers has implemented are as follows:

1. Use authenticated, two-factor encrypted VPN's for remote access;
2. Use minimum security standard for all remotely connected hardware and use equipment to verify every connection meets this standard;
3. Use 'on-the-wire' Intrusion & Malware detection and prevention equipment making both the downloading as well as the 'phone-home' type data leakage associated with hacking and malware difficult.
4. Use of physical access security hardware to prevent unauthorized physical access to important cyber-secure areas.
5. An annual vulnerability assessment done by a third party auditor. Big Rivers last such assessment was in January 2013.
6. Use encrypted data streams for all remote connection that may contain private data.

Finally, Big Rivers and JPEC receive a daily report through Infragard®, a partnership between the private sector and the Federal Bureau of Investigation, regarding security breaches and other cyber-security issues. As noted on its website, Infragard® "includes individuals, academic institutions, state and local law enforcement agencies, and other participants dedicated to sharing information and intelligence to prevent hostile acts against the United States."

Witnesses) Gregory A. Hight (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 105) ***Provide a discussion and details of progress made regarding the concern raised by the utilities as it relates to the interoperability standards for Smart Grid equipment and software.***

Response) Big Rivers and its Members are unaware of any such progress.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 106) ***Provide a discussion concerning how the costs (investment and operating and maintenance costs) associated with the installation of Smart Grid facilities should be recovered from the ratepayers.***

Response) Please see the response to Item 18 above.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 107) ***State whether the utility would favor a requirement that it report to the Commission so that the Commission is aware of the jurisdictional Smart Grid and/or Smart Meter activities within the Commonwealth. As a specific example, the requirement could order that a report be provided each September regarding the Smart Grid and/or Smart Meter activities the utility is planning to perform during the upcoming calendar year, followed by an April report of the Smart Grid and/or Smart Meter activities the utility completed the preceding calendar year.***

Response) Any Smart Grid and/or Smart Meter investments and projects of Big Rivers' Members are presented in their respective Construction Work Plans which are reviewed by the Commission. Consequently, Big Rivers' Members see no need for this additional reporting.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 108) ***State whether the utility believes KRS 278.285 is an appropriate approach to recovering the costs (investment and operation and maintenance) associated with Smart Grid investments.***

Response) An approach similar to KRS 278.285 would be one appropriate mechanism for enabling a utility to recover the costs of smart grid investments, especially to the extent it allows rate recovery to be known prior to the time the investment is made. Please see Big Rivers and its Members response to Item 18.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*),
John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 109) ***State whether the utility believes a tracking mechanism as described beginning on page 3 of the Wathen Testimony on behalf of Duke Kentucky is an appropriate approach to recovering the costs associated with Smart Grid investments.***

Response) The Big Rivers Parties believe a tracking mechanism similar to that described by Mr. Wathen might be an appropriate approach for recovery of Smart Grid investments costs. Please see Big Rivers' and its Members' response to Item 18 above.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 110) ***State whether the utility has commissioned a thorough DSM and Energy Efficiency ("DSM-EE") potential study for its service territory. If the response is yes, provide the results of the study. If no, explain why not.***

Response) Big Rivers filed a DSM Potential Study as Appendix B of its 2010 Integrated Resource Plan ("IRP"). Big Rivers' 2010 IRP is filed on the Commission's docket web system under Case No. 2010-00443. Specifically, the DSM Potential Study can be found on pages 191–343 of Big Rivers' 2010 IRP accessible at the following link:
http://www.psc.ky.gov/PSCSCF/2010%20cases/2010-00443/20101115_Big%20Rivers_IRP.pdf

Witness) Russell L. Pogue (*Big Rivers*)

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Item 111) ***Refer to the Munsey Testimony on behalf of Kentucky Power, page 10, lines 11-19 regarding the Green Button initiative. Describe the extent of your utility's participation in this industry-led effort.***

Response) Big Rivers and its Members are not participants in the Green Button initiative.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 112) ***Refer to the Roush Testimony on behalf of Kentucky Power, DMR Exhibit 1. Provide a similar exhibit containing a list of time-differentiated rates available to your customers.***

Response)

Tariff	Description	Currently In Effect	PSC Case	Order Date
Big Rivers Electric Corporation				
LICX[5]	Large Industrial Customer Expansion Tariff	Yes	2007-00164	02-01-2008
QFS[6]	Cogeneration/Small Power Production Sales Tariff – > 100 kW	Yes	2007-00455	(?)
Jackson Purchase Energy Corporation				
None. Not Applicable				
Kenergy Corp.				
None. Not Applicable				
Meade County Rural Electric Corporative Corporation				
Schedule 3A	Three Phase Power Service, 0 KVA – 999 KVA, Optional Time–Of–Day (TOD) Rate	Yes	2004-01047	09-01-2004
Schedule 4	Large Power Service, 1000 KVA and Larger (TOD)	Yes	2005-00905	09-01-2005

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

[5] Called Schedule 10 in the tariff approved by the Commission in Case No. 2007-00164.
[6] Called Schedule 9 in the tariff approved by the Commission in Case No. 2007-00455.

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Item 113) *Provide a description of the type of meters (mechanical, electromechanical, AMR [one-way communication], AMI [two-way communication]) currently used by the utility. Include in the description the reasons the current meters were chosen and any plans to move to a different type of metering configuration.*

Response)

JPEC –

JPEC uses CENTRON® Itron and Sensus iCon™ meters for residential applications with Landis and Gyr for poly-phase metering. JPEC originally purchased the Icon meters due to price, but later added the Itron meters to the system after a dispute between Sensus and Cooper Power Systems lead to the manufacture and service of iCcon™ meters being discontinued. JPEC currently does not foresee any need to change metering manufacturers in the future.

Kenergy –

The vast majority of Kenergy meters are electromechanical. All purchases for the last four years have been electronic meters. The electronic meter was chosen because of accuracy, competitive pricing, and the ease of retrofitting if AMI were to be deployed.

MCRECC –

MCRECC uses a mixture of digital and retrofitted electro-mechanical meters. These meters have the Landis+Gyr PLC AMI module installed. Around 2006, digital meters were purchased due to the fact that electro-mechanical meters are not manufactured with the AMI module installed.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 114) *If either AMR or AMI metering is in use, state whether the utility has received any customer complaints concerning those meters. If the response is yes, provide the following:*

a. *the number of complaints, separated by gas and electric if a combination utility, along with the total number of customers served.*
b. *how the complaints were addressed by the utility.*
c. *a detailed explanation as to whether customers should have the ability to opt out of using either AMR or AMI metering.*
d. *If customers were to be given the opportunity to opt out of using either AMR or AMI metering, provide:*
   i. *an explanation as to whether the utility should establish a monthly manual metering reading tariff or charge applied to the opt-out customers to recover the costs associated with manually reading the non-AMR or -AMI accounts.*
   ii. *an explanation as to whether these opt-out customers could still receive benefit from the utility using either AMR or AMI metering.*
   iii. *an explanation addressing the point at which opt-out customers, either in terms of number of customers or a*

percent of customers, affect the benefits of the utility using either the AMR or AMI metering.

Response)

a.

JPEC –

JPEC has received two customer complaints with the last one being received over one year ago.

Kenergy –

Not applicable.

MCRECC –

MCRECC has received no complaints due to AMI meters.

b.

JPEC –

JPEC addressed the complaints with telephone conversations with each retail member to assure them that JPEC is not controlling its retail members' loads.

Kenergy –

Not applicable.

MCRECC –

Not Applicable.

c. and d.

Please see Big Rivers' Members' response to Item 23 above.

Witnesses) Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 115) ***In testimony, each utility cited cybersecurity as an area of concern related to the implementation of Smart Grid technologies. Provide and describe your company's policy regarding cybersecurity or the standard your company has adopted governing cybersecurity. If your company has not adopted any policy or standard, identify and describe any industry or nationally recognized standards or guidelines that you may be aware of that the Commission should consider relating to cybersecurity issues and concerns.***

Response) Please see the response to Item 104 above.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)

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Item 116) ***If not previously addressed, provide a detailed discussion of whether deployment of smart meters should allow for an opt-out provision.***

Response) Please see the response to Item 23 above.

Witnesses) Roger D. Hickman (*Big Rivers*), Scott W. Ribble (*JPEC*), John E. Newland (*Kenergy*), and Michael L. French (*MCRECC*)