

FINANCIAL EXHIBIT

(1) **Section 12(2)(a) Amount and kinds of stock authorized.**

1,000,000 shares of Capital Stock \$15 par value amounting to \$15,000,000 par value.

(2) **Section 12(2)(b) Amount and kinds of stock issued and outstanding.**

585,333 shares of Capital Stock \$15 par value amounting to \$8,779,995 total par value. Total Capital Stock and Additional Paid-in Capital as of March 31, 2016:

Capital Stock and Additional Paid-in Capital
As of March 31, 2016
(\$ per 1,000)

Capital Stock	\$8,780
Premiums thereon	18,839
Total Capital Contributions from Parent (since 2006)	8,594
Contribution from Parent Company for Purchase of Generation Assets	<u>140,061</u>
Total Capital Stock and Additional Paid-in-Capital	<u>\$176,274</u>

(3) **Section 12(2)(c) Terms of preference or preferred stock, cumulative or participating, or on dividends or assets or otherwise.**

There is no preferred stock authorized, issued or outstanding.

(4) **Section 12(2)(d) Brief description of each mortgage on property of applicant, giving date of execution, name of mortgagor, name or mortgagee, or trustee, amount of indebtedness authorized to be secured, and the amount of indebtedness actually secured, together with any sinking fund provision.**

Duke Energy Kentucky does not have any liabilities secured by a mortgage.

(5) **Section 12(2)(e) Amount of bonds authorized, and amount issued, giving the name of the public utility which issued the same, describing each class separately, and giving the date of issue, face value, rate of interest, date of maturity and how secured, together with the amount of interest paid thereon during the last fiscal year.**

The Company has four outstanding issues of unsecured senior debentures issued under an Indenture dated December 1, 2004, between itself and Deutsche Bank Trust Company Americas, as Trustee, as supplemented by three Supplemental Indentures. The Indenture allows the Company to issue debt securities in an unlimited amount from time to time. The Debentures issued and outstanding under the Indenture are the following:

Supplemental Indenture	Date of Issue	Principal Amount Authorized and Issued	Principal Amount Outstanding	Rate of Interest	Date of Maturity	Interest Paid Year 2015
1 st Supplemental	3/7/2006	50,000,000	0	5.750%	3/10/2016	2,875,000
1 st Supplemental	3/7/2006	65,000,000	65,000,000	6.200%	3/10/2036	4,030,000
2 nd Supplemental	9/22/2009	100,000,000	100,000,000	4.650%	10/1/2019	4,650,000
3 rd Supplemental	1/5/2016	45,000,000	45,000,000	3.420%	1/15/2026	0
3 rd Supplemental	1/5/2016	50,000,000	50,000,000	4.450%	1/15/2046	0
			260,000,000			11,555,000

(6) **Section 12(2)(f) Each note outstanding, giving date of issue, amount, date of maturity, rate of interest, in whose favor, together with amount of interest paid thereon during the last fiscal year.**

Not applicable.

(7) **Section 12(2)(g) Other indebtedness, giving same by classes and describing security, if any, with a brief statement of the devolution or assumption of any portion of such indebtedness upon or by person or corporation if the original liability has been transferred, together with amount of interest paid thereon during the last fiscal year.**

The Company has two series of Pollution Control Revenue Refunding Bonds issued under a Trust Indenture dated as of August 1, 2006 and a Trust Indenture dated as of December 1, 2008, between the County of Boone, Kentucky and Deutsche Bank National Trust Company as Trustee. The Company's obligation to make payments equal to debt service on the Bonds is evidenced by a Loan Agreement dated as of August 1, 2006 and December 1, 2008 between the County of Boone, Kentucky and Duke Energy Kentucky. The Bonds issued under the Indentures are as follows:

Indenture	Date of Issue	Principal Amount Authorized and Issued	Principal Amount Outstanding	Rate of Interest	Date of Maturity	Interest Paid Year 2015
Series 2010	11/24/2010	26,720,000	26,720,000	0.04% ⁽¹⁾	8/1/2027	9,531
Series 2008A	12/01/2011	50,000,000	<u>50,000,000</u>	1.07% ⁽²⁾	8/1/2027	<u>536,552</u>
			<u>76,720,000</u>			<u>546,083</u>

(1) The interest rate represents the average floating-rate of interest on the bonds for 2015. The interest rate on the bonds resets every 7 days through an auction process. The variable-rate debt was swapped to a fixed rate of 3.86% for the life of the debt.

(2) The interest rate represents the average floating-rate of interest on the bonds for 2015. The interest rate on the bonds resets on the first day of every month based on 75% of the sum of one month and spread of 1.25%.

The Company has issued and has outstanding as of March 31, 2016 the following capital leases:

Series	Date of Issue	Principal Amount Authorized and Issued	Principal Amount Outstanding	Rate of Interest	Date of Maturity
Erlanger	12/30/2006	2,100,000	945,305	8.634	09/30/2020
2007	12/31/2007	3,066,955	786,911	5.115	12/31/2016
2009	04/21/2009	3,429,432	1,248,752	4.821	04/21/2018
2010	06/18/2010	<u>955,061</u>	<u>447,761</u>	3.330	06/18/2019
		<u>9,551,448</u>	<u>3,428,729</u>		

The Company also has \$25,000,000 of money pool borrowings outstanding as of March 31, 2016, which is classified as Long-Term Debt payable to affiliated companies. This obligation, which is short-term by nature, is classified as long-term due to Duke Energy Kentucky's intent and ability to utilize such borrowings as long-term financing.

(8) **Section 12(2)(h) Rate and amount of dividends paid during the last five (5) previous fiscal years, and the amount of capital stock on which dividends were paid each year.**

DIVIDENDS PER SHARE

<u>Year Ending</u>	<u>Per Share</u>	<u>Total</u>	<u>No. of Shares</u>	<u>Par Value of Stock</u>
December 31, 2011	230.64	135,000,000	585,333	8,779,995
December 31, 2012	17.08	10,000,000	585,333	8,779,995
December 31, 2013	68.34	40,001,000	585,333	8,779,995
December 31, 2014	0.00	0	585,333	8,779,995
December 31, 2015	93.96	55,000,000	585,333	8,779,995

(9) Section 12(2)(i) Detailed Income Statement and Balance Sheet

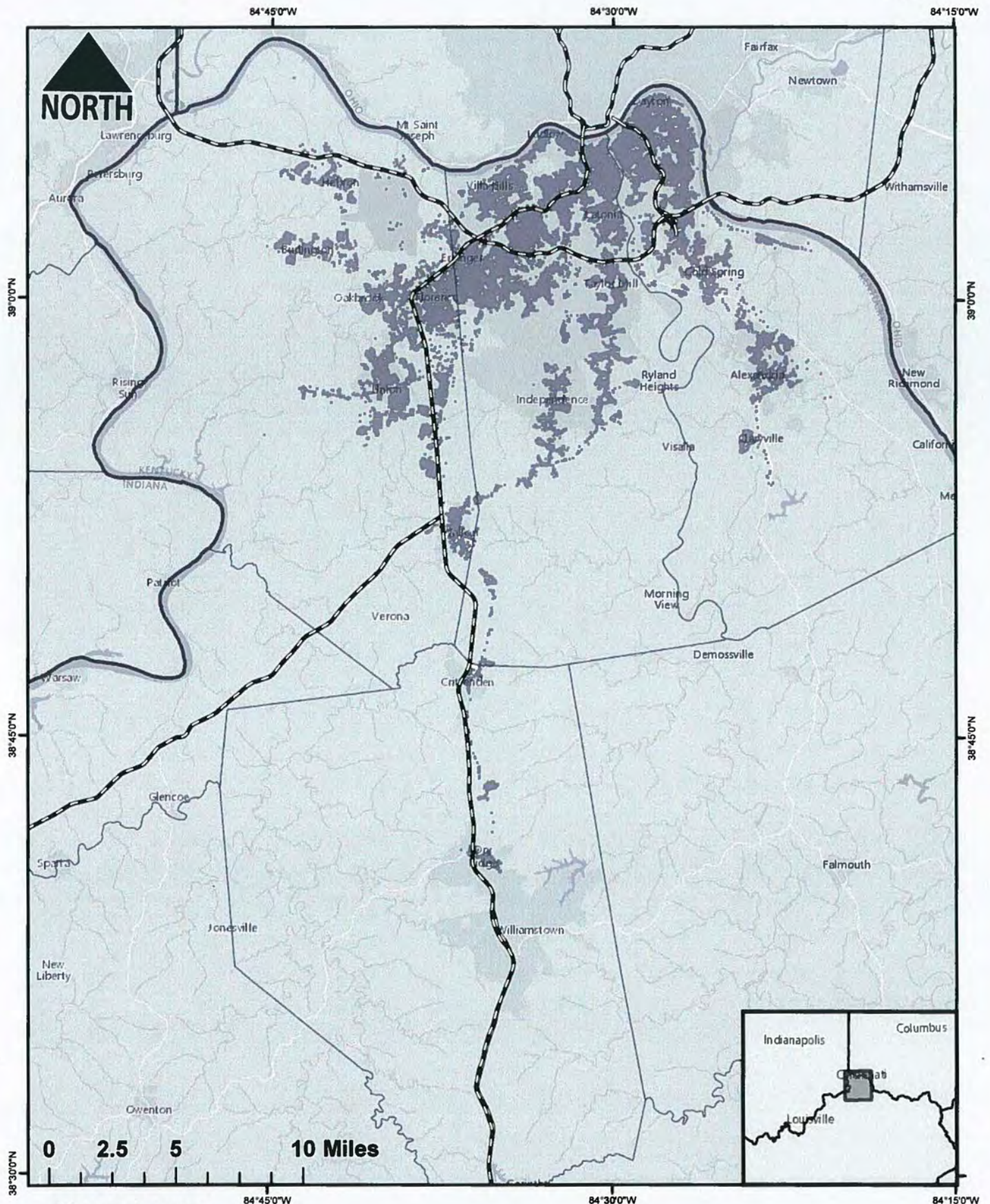
See the attached pages for the detailed Income Statement for the twelve months ended March 31, 2016 and the detailed Balance Sheet as of March 31, 2016.

DUKE ENERGY KENTUCKY, INC.
CONDENSED STATEMENTS OF OPERATIONS
(Unaudited)
(In thousands)

	Twelve Months Ended March 31 2016
Operating Revenues	
	349,645
	-
Electric	349,645
	84,525
	-
Gas	84,525
Total operating revenues	434,170
Operating Expenses	
Fuel used in electric generation and purchased power	133,841
Natural gas purchased	29,143
Operation, maintenance and other	131,502
Depreciation and amortization	42,396
Property and other taxes	13,148
Goodwill and other impairment charges	-
Total operating expenses	350,030
Gains on Sales of Other Assets and Other, net	11
Operating Income	84,151
Other Income and Expenses, net	1,272
Interest Expense	14,794
Income Before Income Taxes	70,629
Income Tax Expense	23,614
Income From Continuing Operations	47,015
Income From Discontinued Operations, net of tax	-
Net Income	47,015

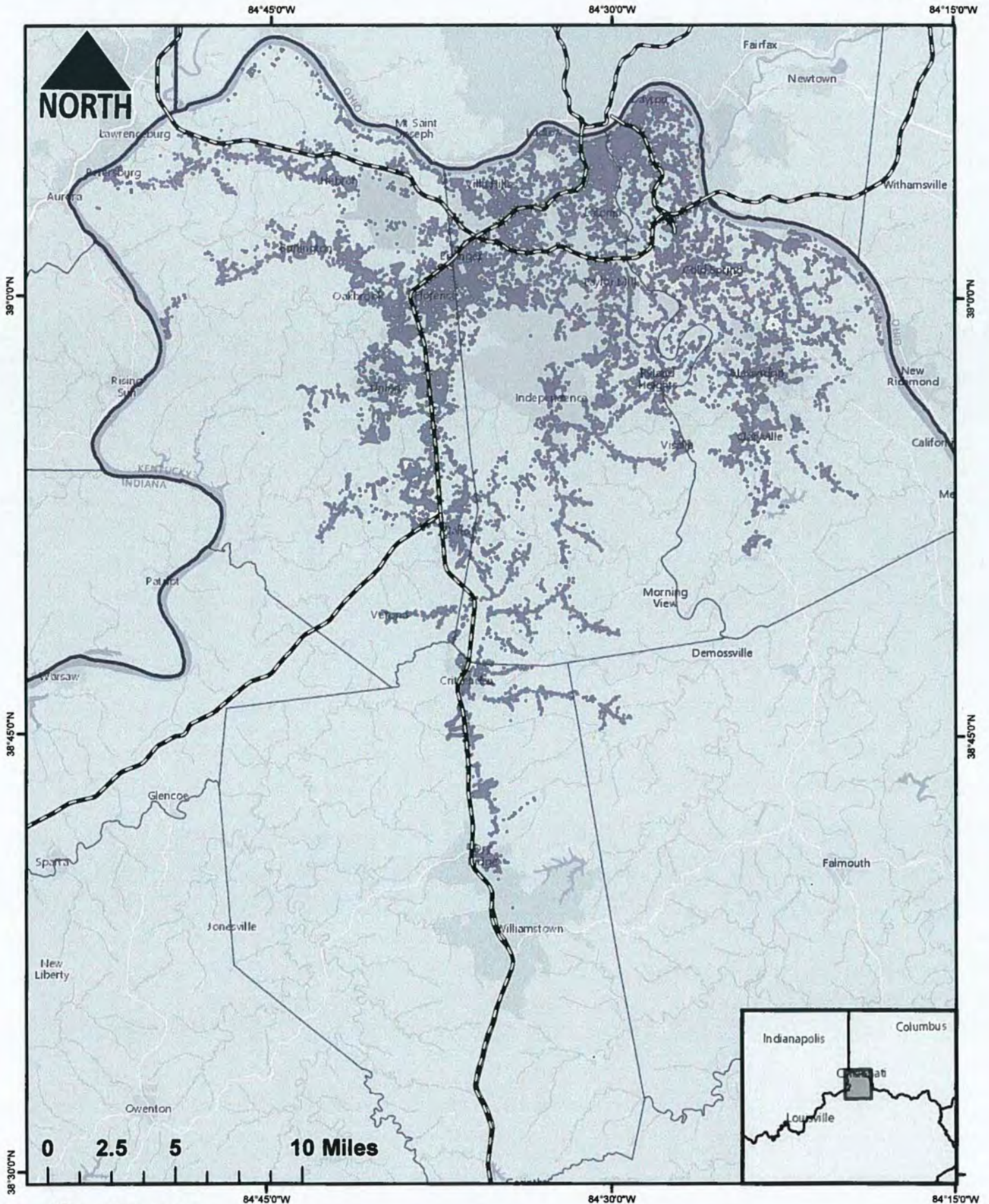
DUKE ENERGY KENTUCKY, INC.
Condensed Balance Sheets
(Unaudited)

(In thousands, except share amounts)	March 31, 2016	December 31, 2015
ASSETS		
Current Assets		
Cash and Cash Equivalents	10,728	9,141
Receivables (net of allowance for doubtful accounts of \$165 at March 31, 2016 and \$195 at December 31, 2015)	1,706	5,488
Receivables from affiliated companies	8,721	11,499
Notes receivable from affiliated companies	18,843	-
Inventory	41,143	44,141
Regulatory Assets	6,730	8,879
Other	17,746	36,956
Total Current Assets	105,617	116,104
Investments and Other Assets		
Intangibles, net	127	89
Other	5,609	6,359
Total Investments and Other Assets	5,736	6,448
Property, Plant and Equipment		
Cost	2,093,052	2,079,761
Less Accumulated Depreciation and Amortization	(930,078)	(923,578)
Net Property Plant and Equipment	1,162,974	1,156,183
Regulatory Assets and Deferred Debits		
Regulatory Assets	71,440	61,411
Other	310	332
Total Regulatory Assets and Deferred Debits	71,750	61,743
Total Assets	1,346,077	1,340,478
LIABILITIES AND COMMON STOCKHOLDERS' EQUITY		
Current Liabilities		
Accounts Payable	17,428	25,654
Accounts payable to affiliated companies	14,195	14,426
Notes payable to affiliated companies	-	55,743
Taxes Accrued	10,831	10,550
Interest Accrued	3,527	3,343
Current Maturities of Long-Term Debt	51,446	101,519
Regulatory Liabilities	2,527	2,668
Other	17,509	19,260
Total Current Liabilities	117,463	233,163
Long-Term Debt	287,006	192,508
Notes payable to affiliated companies	25,000	25,000
Deferred Credits and Other Liabilities		
Deferred Income Taxes	297,675	289,642
Investment Tax Credit	836	887
Accrued Pension and Other Post-Retirement Benefit Costs	11,668	11,649
Asset Retirement Obligations	103,345	103,500
Regulatory Liabilities	52,867	52,986
Other	27,048	26,711
Total Deferred Credits and Other Liabilities	493,439	485,375
Commitments and Contingencies		
Equity		
Common Stock, \$15.00 par value, 1,000,000 shares authorized and 585,333 shares outstanding at March, 31, 2016 and December 31, 2015	8,780	8,780
Additional Paid in Capital	167,494	167,494
Retained Earnings	246,895	228,158
Total Equity	423,169	404,432
Total Liabilities and Equity	1,346,077	1,340,478



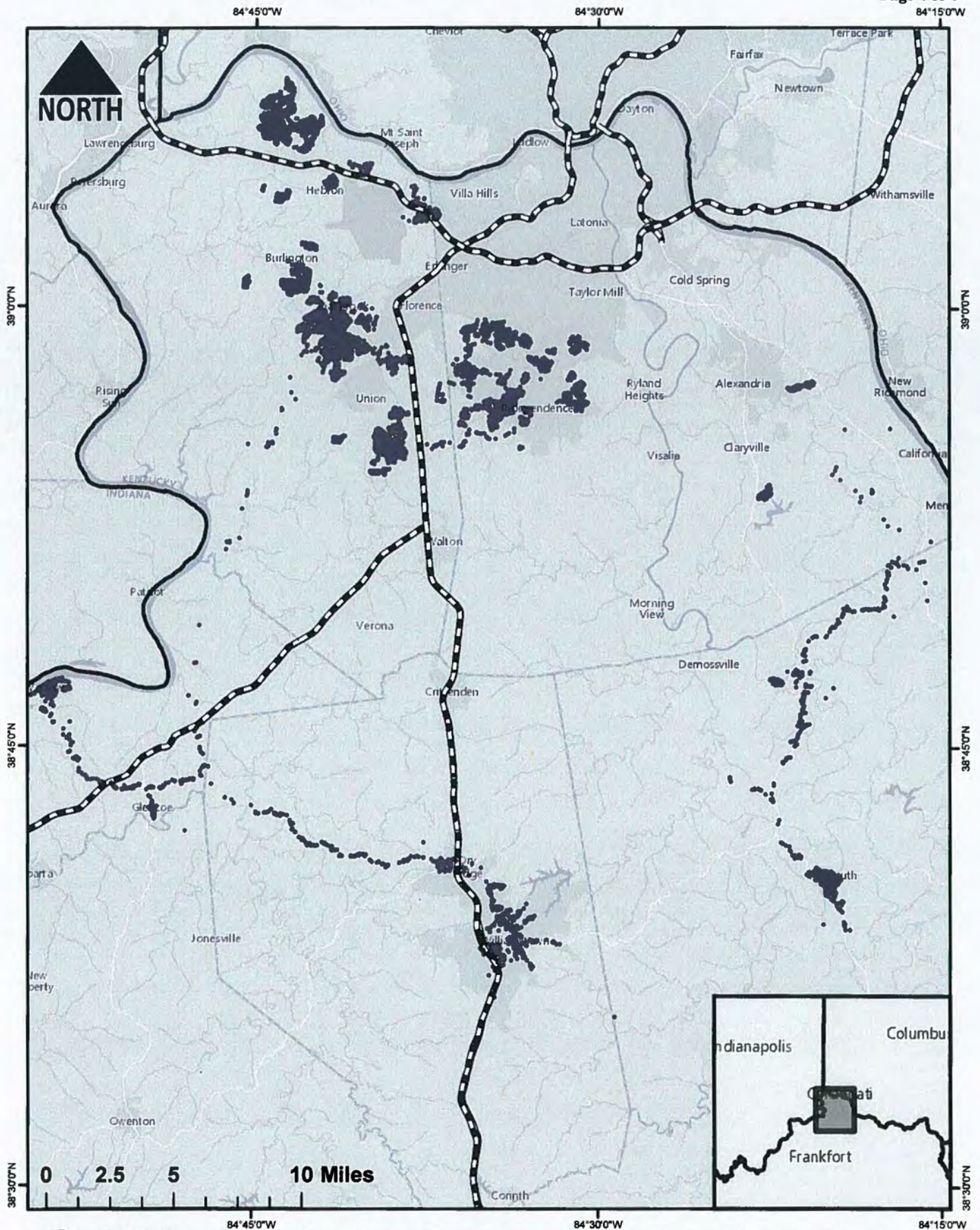
Kentucky Premises
with Electric & Gas

Coordinate System: State Plane Kentucky North
Source(s): US Census. ESRI. Smallworld.



Kentucky Premises
with only Electric

Coordinate System: State Plane Kentucky North
Source(s): US Census, ESRI, Smallworld.



Kentucky Gas Only
Service Areas

Coordinate System: State Plane Kentucky North
Source(s): US Census. ESRI. Smallworld.



OpenWay[®]

CENTRON[®] Meter

The OpenWay system delivers a truly smart meter for the residential mass market. Itron engineers have built upon our proven CENTRON solid-state platform to deliver an advanced meter that provides a cornerstone technology for the smart grid.

Featuring open-standards architecture, modular design for flexibility in communications, and extensive features and functionality, the OpenWay CENTRON supports the most demanding smart grid business requirements today and well into the future.

A key component of any advanced metering or smart grid initiative, the OpenWay CENTRON meter is a truly smart device used to collect, process and transmit vital energy information to utility systems. Rather than simply inserting a network communication card into a standard meter, Itron developed an advanced meter where calculations and usage data are calculated within the meter itself, allowing utilities to leverage time-based rates, demand response, home networking and many other smart grid applications.

The OpenWay CENTRON system provides enhanced security and a reliable approach to data collection and communications between the meter and the network. Storage and transport of register data are provided through ANSI C12.19 and C12.22

open standards technology. In addition, each OpenWay CENTRON meter comes factory-equipped with a ZigBee[®] radio to provide a built-in communications pathway into the home for data presentation, load control and demand response. ZigBee also provides a communication channel with 2.4GZ OpenWay Gas Modules.

The OpenWay CENTRON also provides robust data storage capability to support time-of-use pricing, load profile data and other data-intensive applications, as well as the most advanced feature set available to support smart grid requirements. These features include full two-way communication, a load-limiting remote disconnect and reconnect switch, positive outage detection and restoration notification, voltage monitoring, automatic tamper and theft detection, as well as the ability to reprogram the meter remotely and upload new firmware via the network.

The OpenWay CENTRON meter is the smart meter for the smart grid.

FEATURES

Time-of-Use and Critical Peak Pricing

- » The OpenWay CENTRON supports four TOU rates as well as CPP
- » TOU registers may be displayed on the meter's display

Load Profile

- » Four channels of configurable load profile data are available in the following default parameters: (1) single channel 30-minute data 753 days; (2) two channels 30-minute data 501 days
- » Modified parameters are available via configuration download
- » The OpenWay CENTRON module provides over one year of 15-minute load profile data storage

OpenWay RFLAN Module

- » Two-way, unlicensed RF module
- » Adaptive-tree RFLAN architecture provides easy installation and self-healing capabilities

Home Area Network (HAN)

- » Every OpenWay CENTRON meter includes a ZigBee radio for interfacing with the HAN, in-home displays and load control devices
- » The OpenWay CENTRON can store consumption from 2.4GZ OpenWay gas modules utilizing the ZigBee radio

Bi-Directional Metering

- » The OpenWay CENTRON measures and displays active energy (kWh) delivered, received, uni-directional and/or net or apparent energy (kVAh) delivered and/or received

Disconnect/Reconnect with Load Limiting

- » The OpenWay CENTRON forms 1S, 2S, 12S network, and 25S is available with a 200 amp remote disconnect/reconnect switch as an optional feature. The switch can be operated on demand, or automatically as part of a service-limiting configuration

Tamper Detection

- » Tamper indications can be communicated regularly through the OpenWay system
- » Tamperers include: inversion, removal and reverse power flow
- » SiteScan Diagnostics (advanced polyphase register only)

Non-Volatile Memory

- » All programming, register, TOU and load profile data are stored in the EEPROM during a power outage. A battery maintains just the clock circuitry during a power outage

Voltage Monitoring

- » Instantaneous voltage
- » Voltage monitoring system

Standard Features

- » Electronic LCD display
- » Polycarbonate cover
- » Optical tower
- » Test LED

Register Capabilities

- » 4 energies, 1 demand:
 - Wh (delivered, received, net, uni-directional)
 - VAh (delivered arithmetic, received arithmetic, Lag)
 - W (max delivered, max received, max net, max uni-directional)
- » Configurable event log
- » All programming, register, TOU and load profile data are stored in the EEPROM during a power outage. Battery maintains the clock circuitry during a power outage

Option Availability

- » Identification/accounting aids
- » Remote disconnect/reconnect
- » Multiple WAN options including GPRS and CDMA
- » Option slot for additional communications options

Technical Data

Meets applicable standards:

- » ANSI C12.1 - 2008 (American National Standard for Electric Meters - Code for Electricity Metering)
- » ANSI C12.18 - 1996 (American National Standard - Protocol Specification for ANSI Type 2 Optical Port)
- » ANSI C12.19 - 2008 (American National Standard - Utility Industry End Device Data Tables)
- » ANSI C12.20 - 2002 for Hardware 2.0 and 3.0 (American National Standard for Electricity Meters - 0.2 and 0.5 Accuracy Classes)
- » ANSI C12.20 - 2010 for Hardware 3.1 (American National Standard for Electricity Meters - 0.2 and 0.5 Accuracy Classes)
- » ANSI C12.22 - 2008 (consult Section 9 of the standard)
- » ANSI/IEEE C62.41.1-2002 (Characterization of surges on Low-Voltage AC Power Circuits)
- » ANSI/IEEE C62.41.2-2002 (Characterization of surges on Low-Voltage AC Power Circuits)
- » IEC 61000-4-2
- » IEC 61000-4-4
- » UL2735 for Hardware 3.1

Reference Information

- » OpenWay CENTRON Technical Reference Guide
- » Hardware Specification Form

SPECIFICATIONS**Specifications**

Power Requirements	Voltage Rating: 120 V, 240 V Operating Voltage: $\pm 20\%$ (60Hz) Battery Voltage: 3.6 V nominal	Frequency: 60Hz Operating Range: ± 3 Hz Battery Operating Range: 3.6 V nominal; 3.4 V - 3.8 V		
Operating Environment	Temperature: -40° to +85°C	Humidity: 0% to 95% non-condensing		
Transient / Surge Suppression	IEC 61000-4-4-2004-0ANSI C62.45-2002			
Accuracy	ANSI C12.20 0.5 accuracy class			
General	Demand interval lengths: Demand calculation: Peak	Programmable: 5, 6, 10, 12, 15, 20, 30 and 60 min. Energy calculation: Basic: Wh and VAh		
Time	Line sync: Power line frequency Battery: +0.005% $\text{@}25^{\circ}\text{C}$; +0.005% to -0.02% over full temperature range	Crystal sync: +0.01% $\text{@} 25^{\circ}\text{C}$; +0.025% over full temperature range		
Display	Nine-digit liquid crystal display Six-digit data height: 0.4" Annunciator height: 0.088"	Display duration: 1-15 seconds Three-digit code number height: 0.24" 3-segment electronic load indicator		
Characteristic Data	Starting Current: 20 mA (Class 200), 5 mA (Class 20)			
Register Burden	0.66W			
Burden Data (C2S0D) (United States)	Form	Watt Loss	VA Loss	Test Voltage
	1S	2.796	6.759	120
	2S	3.773	12.357	240
	3S	2.123	7.068	120
	3S	2.350	14.255	240
	4S	2.535	14.619	240
Burden Data (C2S0D) (Canada)	Form	Watt Loss	VA Loss	Test Voltage
	1S	2.686	6.999	120
	2S	3.203	11.89	240
	3S	2.123	7.068	120
	3S	2.350	14.255	240
	4S	2.535	14.619	240
12S	2.831	7.393	120	
Service Switch (Optional)	200A; can be programmed as service (load) limiting Service Switch is available in Forms 1S, 2S, and 12S/25S			
Modules	Standard OpenWay Register			
Additional Base Functionality	Cell Relay (available in Form 2S only)			

Product Availability

Volts / Service	Meter Class	Test Amps	Kh (Pulse/Wh)	Meter Form	Register Descriptions
120 V	200	30	1.0	1S	OpenWay RF with or without Disconnect
240 V	200	30	1.0	2S	OpenWay RF with or without Disconnect
240 V	320	50	1.0	2S	OpenWay RF
120 V	20	2.5	1.0	3S	OpenWay RF
240 V	20	2.5	1.0	3S	OpenWay RF
240 V	20	2.5	1.0	4S	OpenWay RF
120 V	200	30	1.0	12S/25S	OpenWay RF with or without Disconnect

SPECIFICATIONS

Dimensions

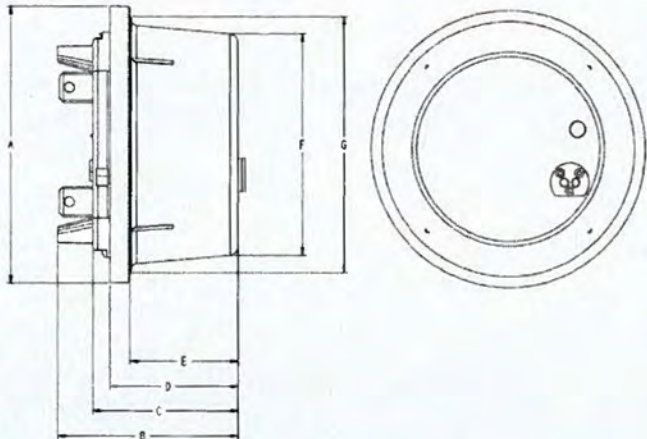
C2S0/C2S0D - Forms 1S, 2S and 12S						
A	B	C	D	E	F	G
6.95"	5.27"	4.37"	3.97"	3.47"	5.68"	6.30"
17.66 cm	13.39 cm	11.10 cm	10.08 cm	8.82 cm	14.43 cm	16 cm

C2S0/C2S0D - Forms 3S and 4S						
A	B	C	D	E	F	G
6.95"	4.56"	3.66"	3.23"	2.73"	5.56"	6.42"
17.66 cm	11.59 cm	9.30 cm	8.21 cm	6.94 cm	14.13 cm	16.31 cm

Shipping Weights

Polycarbonate C2S0/C2S0D	Pounds	Kilograms
	4 Meter Cartons	11 lbs
96 Meter Pallets	280 lbs	127 kg

C2S0/C2S0D Dimensions



Join us in creating a more resourceful world.
 To learn more visit itron.com

While Itron strives to make the content of its marketing materials as timely and accurate as possible, Itron makes no claims, promises, or guarantees about the accuracy, completeness, or adequacy of, and expressly disclaims liability for errors and omissions in, such materials. No warranty of any kind, implied, expressed, or statutory, including but not limited to the warranties of non-infringement of third party rights, title, merchantability, and fitness for a particular purpose, is given with respect to the content of these marketing materials. ITRON is a registered trademark of Itron, Inc. © Copyright 2016 Itron. All rights reserved. 100808SP-10 2/16

CORPORATE HQ

2111 North Molter Road
 Liberty Lake, WA 99019 USA
Phone: 1.800.635.5461
Fax: 1.509.891.3355



OpenWay® CENTRON®

Cellular LTE

The smart meter for the smart grid, the OpenWay CENTRON, is now available with an LTE Itron Cellular Module (ICM). This integrated OpenWay Cellular solution provides a complementary communication pathway by incorporating WAN functionality—under the OpenWay CENTRON meter cover—to connect the meter directly to the OpenWay Collection Engine via a public wireless network.

The OpenWay CENTRON Cellular LTE takes advantage of new advanced 4G LTE networks. This results in more efficient coverage, higher bandwidth and longer network longevity. The OpenWay CENTRON Cellular LTE includes both a ZigBee® wireless component and an LTE ICM that can be tailored to fit your unique needs. The module comes factory installed within the OpenWay CENTRON meter—the solution ships as one complete unit, ready for field deployment.

FEATURES AND BENEFITS

Flexible Two-Way Communications

- » Execute all supported reading, configuration and firmware download functionality through user-configurable schedules controlled by head-end meter data management software
- » Acquire readings on an on-demand basis when necessary

Automated Interval Data/Energy Usage Retrieval

- » Receive and transmit meter interval data for up to four unique energy values in intervals as small as five minutes. Recorded events and exceptions with each interval are also transmitted to the head-end software, which interprets them and logs appropriate messages (such as time adjustments)

Pushing Intelligence to the Edge

- » Enable future applications in edge intelligence by utilizing on the newest Itron Riva technology platform. By pushing computing power to the edge devices, closer to where problems and opportunities occur, we enable faster, better decision making.

Automated Register, Self-Read and TOU Retrieval

- » Configure the module to read and transmit totals, self-reads, maximum demand, time-of-use (TOU) and critical peak pricing (CPP) values

Demand Reset Capability

- » Perform demand resets, over the network or locally via tools or the demand reset switch

Power Outage and Restoration Alarms

- » Transmit a real-time "last gasp" notification when detecting an AC power outage with built-in ultracapacitor energy storage. The meter then notifies the head-end when the AC power is restored

Service Diagnostic and Tamper Detection Alerts

- » The OpenWay CENTRON Cellular LTE can detect and report exceptions for meter inversion, meter removal, reverse

energy flow and power outages. The OpenWay CENTRON Cellular LTE architecture provides the power outage notification (PON) and tamper associated with a meter removal immediately upon power down. This results in two exception messages upon power down, PON and Removal tamper.

Secure Boot

- » The OpenWay CENTRON Cellular LTE has the capability to validate digital signature prior to uploading and applying any new ICM firmware.

Bi-Directional Metering

- » Support bi-directional net metering with the OpenWay CENTRON. Both received and delivered data metrics are stored in the meter and can be sent to the utility as needed to support green-credit electricity programs for consumers who own renewable energy facilities or participate in vehicle-to-grid systems

Automated ID Tracking

- » Attach barcode labels and important identifiers (such as the ICC-ID / MS-ISDN) to the integrated module for tracking and troubleshooting purposes

On-Demand Reads for Move In/Outs and Remote Disconnect

- » Remote disconnect available on all singlephase Class 200 devices

- » Perform remote disconnects through the Collection Engine by retrieving a final read for a customer and then an initial read for a subsequent customer
- » Allow service to be disconnected or reconnected remotely as well via a load-limiting service switch in the meter, eliminating the need to roll a truck to turn service on or off

900 MHz ERT Reader

- » Collect Encoder Receiver Transmitter (ERT) from 100G DLS Gas Modules. The ICM can collect consumption data and tamper counts from nearby 100G ERT modules and report this back to the Collection Engine and other upstream systems.

Clock Synchronization

- » Synchronize the meter clock automatically when time deviation falls within a user-defined boundary

Integration & Installation

- » Ensure simplified installation in the field. The ICM is a fully integrated, under-the-cover option installed within the OpenWay CENTRON. The solution is shipped from the factory as one complete unit with the module installed, ready for field deployment.

HARDWARE

CPU board (CPU)	32-bit ARM processor, 128MB RAM, 256MB flash
Capacitor Storage Bank (CSB)	Supplies power for data transmissions and all functions for outage notification
ICM Modem	Modem communicates with head-end using LTE and SMS Services
ZigBee Transceiver	Enables communication with Home Area Network (HAN) devices
Internal/External Antennas	Singlephase: Flexible dual frequency on board internal antenna for the modem and ERT available on all forms. Polyphase: Multi-band internal antenna with diversity. External Omni Directional antenna for modem available on all polyphase forms.
Tilt Detector	Detects unauthorized movement or removal of the device

INPUT/OUTPUT SIGNAL

ICM Power Input Voltage	Singlephase: 120-240 VAC Polyphase: 120-480 VAC
Capacitor Storage Bank (CSB)	3.3V / TTL compatible asynchronous
ERT Reader	900 MHz radio supports 100G Gas and 100W+ Water endpoints

VERSION AND COMPATIBILITY

Meter Hardware Version	3.1
Meter Firmware Version	Singlephase: SR 6.1 or higher Polyphase: SR 6.6 or higher
OpenWay Tools Compatibility	Singlephase: 4.00.91 or higher Polyphase: 4.20.00 or higher
OpenWay Collection Engine Compatibility	Singlephase: SR 6.1 or higher Polyphase: SR 6.6 or higher

SPECIFICATIONS

Regulatory and Industry Specifications

- » FCC Part 15 Class B
- » ANSI C37.90.1 – 1989: (SWC)
- » ANSI C12.20 (Class 0.5) – 1998
- » PTCRB Certified
- » Network Carrier Certified
- » Measurement Canada Certified
- » Industry Canada Certified

Temperature Range:

- » Operating: [-40°C, +85°C]
- » Transmission (wireless): [-30°C, +70°C]

Humidity Range

- » 0% to 95% non-condensing

Accuracy

- » Meets ANSI 12.20 for accuracy class 0.5% (Singlephase) and 0.2% (Polyphase)
- » Optional Singlephase Adder: 0.2% Accuracy Class

Supported Meter Forms

- Singlephase without Disconnect
 - » CL 200: 1S, 2S, 12S, 25S
 - » CL 320: 2S
- Singlephase with Disconnect
 - » CL 200: 1S, 2S, 12S, 25S
- Polyphase
 - » CL 20: 3S, 4S, 9S, 9S/36S, 45S
 - » CL 100: 1S
 - » CL 200: 2S, 12S, 16S
 - » CL 320: 2S, 12S, 16S

Carriers Supported

- » Verizon Wireless
- » Rogers Wireless



Join us in creating a more **resourceful world.**
To learn more, visit **Itron.com**

CORPORATE HEADQUARTERS

2111 N Molter Road
Liberty Lake, WA 99019
USA

Phone: 1.800.635.5461

Fax: 1.509.891.3355

While Itron strives to make the content of its marketing materials as timely and accurate as possible, Itron makes no claims, promises, or guarantees about the accuracy, completeness, or adequacy of, and expressly disclaims liability for errors and omissions in, such materials. No warranty of any kind, implied, expressed, or statutory, including but not limited to the warranties of non-infringement of third party rights, title, merchantability, and fitness for a particular purpose, is given with respect to the content of these marketing materials.
© Copyright 2015, Itron. All rights reserved. 101407SP-04 10/15



Knowledge to Shape Your Future

2.4GZ OpenWay®

Gas Module

Introduction

The 2.4GZ OpenWay Gas module is Itron's radio-frequency (RF) gas meter module for use with Itron's industry-leading OpenWay smart grid advanced metering Infrastructure (AMI) system. The 2.4GZ is built upon the legacy foundation of the field-proven Itron 40-series gas ERT® module and maintains the fundamental magnet and reed switch design which boasts an accuracy of 99.999 percent between the index read and module read—an unprecedented benchmark in accuracy. The 2.4GZ uses open-architecture ZigBee® wireless networking for the ultimate interoperable solution for combination gas and electric utilities.

Features

As a key component of an AMI or smart grid deployment, the 2.4GZ OpenWay Gas module:

- > Can be read by OpenWay CENTRON® meters without need for additional infrastructure
- > Enables two-way communications with the OpenWay CENTRON meter, allowing remote reprogramming of non-measurement parameters and firmware download
- > Continually stores and updates the last 40 days of hourly interval data
- > Offers programmable Daily Freeze Time read for any hour
- > Operates in bubble-up mode and does not require an FCC license
- > Provides a 20-year battery life to ensure low operating and maintenance costs, while providing battery replacement in the field as an option
- > Features an updated housing to optimize antenna performance and maximize the RF signal
- > Introduces an improved wriggler design for residential gas meters making installation faster and easier than ever before, especially when gas is flowing through the meter
- > Made in the USA at Itron's state-of-the-art facilities in Waseca, Minnesota



The 2.4GZ OpenWay Gas module—the most advanced radio-based meter module for all your AMI and smart grid needs.

Residential Meters

> Itron METRIS 250



> Sensus/
Rockwell R275



> Elster American
AC250



> National 250



Commercial Meters

> Itron 1000A



> Sensus/
Rockwell 750



> Elster American
AL800



Rotary Meters

> Dresser B3 with
Direct mount



> Dresser LMMA
with Remote ERT



Electronic Correctors

> Mercury Mini-AT



Residential diaphragm meters

Itron provides an extensive line of direct-mount 2.4GZ OpenWay Gas modules for use with residential diaphragm gas meters. Capacities range from 75 to 630 CFH for popular models from Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, Itron/Actaris/Schlumberger/Sprague and National/Lancaster. Direct-mount modules are also available for older Sprague 1A meters. The compact design and direct engagement to the meter drive assure the unparalleled accuracy that makes Itron gas modules the industry standard. For easier installation, 2.4GZ wrigglers have been modified from traditional ERT modules on American, Sensus/Rockwell and Itron/Sprague meters.

A remote-mount module is available for some less common meter types where a direct-mount solution is not available.

Commercial diaphragm meters

Itron also provides direct-mount 2.4GZ OpenWay Gas modules for use with the following commercial diaphragm meters: Elster American Meter, Itron/Actaris/Schlumberger and Sensus/Invensys/Equimeter/Rockwell. The unobtrusive profile is easy to install and the direct meter drive engagement assures the highest level of accuracy.

Elster American Meter, and Itron/Actaris/Schlumberger commercial diaphragm meters with top-mount instrument drives utilize the same version commercial direct-mount module. For American commercial diaphragm meters, the module mounts directly to the meter. For Itron/Actaris/Schlumberger meters, an adapter kit must be purchased.

A remote-mount module is available for some less common meter types where a direct-mount solution is not available.

Rotary meters

Itron has several solutions for interfacing with rotary gas meters. For Dresser LMMA and B3 rotary meters with Dresser-supplied AMR adapter, Itron offers the American residential 2.4GZ OpenWay Gas module. For Dresser rotary meters with Instrument Drive (ID), Itron offers the direct-mount module designed for American commercial diaphragm meters. For Dresser, Romet and American Meter rotary meters with pulse output (version 17 or higher required for Dresser) and a military connector pin, Itron offers the remote-mount 2.4GZ module.

Electronic Correctors

Itron offers a remote-mount 2.4GZ OpenWay Gas module for Mercury Instruments for EC-AT, Mini-P, Mini-AT and Mini-Max electronic correctors. The module can be connected to these gas electronic correctors for temperature- and pressure-corrected consumption (Form A board required). The module attaches easily to the Mercury corrector circuit board through the Phoenix connector already installed on Mercury units. One 2.4GZ module can be used for uncorrected consumption and a second module can be used for corrected consumption.

Functional Specifications

- > Power source: Two "A" cell lithium batteries
- > Radio programming parameters: Index reading, count rate, index rollover, pressure compensation, Daily Freeze Time, Transmit Time and message type (see Transmit Options)
- > Output power: +15dBm (32 milliwatts)
- > Tamper detection for direct-mount modules: Mercury-free tilt tamper and magnetic tamper
- > Operating temperature: -40°F to +158°F (-40°C to +70°C)
- > Operating humidity: 5 to 95 percent non-condensing relative humidity
 - 2.4GZ OpenWay Gas modules can be installed indoors or outdoors above grade
- > Product Identification: Numeric and bar-coded serial number
- > Low battery status indicator

Communications Protocol

- > ZigBee Smart Energy 1.0

Transmit Options

- > **Standard Mode**
The 2.4GZ transmits the current index read and Daily Freeze Time read which is programmable for any hour
- > **Daily Mode**
In addition to transmitting the standard mode information, the 2.4GZ also transmits 40 days of daily interval data, based on Daily Freeze Time interval reads
- > **Hourly Mode**
In addition to transmitting the standard mode information, the 2.4GZ will also transmit the last 24 hourly intervals

Programming Device

- > 2.4GZ OpenWay Gas modules can be programmed using Bluetooth™-enabled FC200 or FC300 handheld computers and ZigBee Belt Clip Radio with Endpoint-Link or Endpoint-Link Pro software version 5.5 or higher.

2.4GZ OpenWay Gas modules can also be programmed using Itron's ZigBee Belt Clip Radio and a customer supplied laptop with Endpoint-Link version 5.5 or higher. The Belt Clip Radio can be connected to a laptop via USB cable or Bluetooth

Approved Reading Device

- > 2.4GZ OpenWay Gas modules with Smart Energy 1.0 require:
 - Collection Engine SR2.0 SP5.1 or higher
 - OpenWay CENTRON meter HW1.5, HW2.0 or higher running on SR2.0 SP5.1 or higher

Battery Life and Design Life

- > All 2.4GZ OpenWay Gas modules contain two field-replaceable "A" cell lithium batteries
- > 2.4GZ can be programmed to transmit every 12 or 24 hours; battery life is the same regardless of information being transmitted
 - 1 scheduled transmission per day results in 18 to 20 year battery life
 - 2 scheduled transmissions per day results in 15 to 17 year battery life
- > All 2.4GZ OpenWay Gas modules are designed for a 20-year total life

Regulatory & Standards

- > FCC compliance: Part 15.247 and Part 15.249 (programming) certified
- > Industry Canada 864D-24GZ: Measurement Canada (pending)
- > Safety approvals: Intrinsically safe per UL Class I, Division 1, Groups C & D

Operational

- > All 2.4GZ OpenWay Gas modules operate in bubble-up mode without the need for an FCC license
- > Frequency band: 2.4 to 2.4835 GHz ISM band
- > Data integrity: Verified in every message

Physical Information

- > All 2.4GZ OpenWay Gas modules have encapsulated electronics for protection against environmental hazards and tampering. Material of construction on all module housings is gray polycarbonate. For direct-mount residential modules, gasket material is molded Santoprene® and index cover material is clear polycarbonate

Physical

	Elster American	Sensus/Rockwell	Itron/Sprague	National	All
Residential	5.54" x 3.57" x 3.1"	4.3" x 3.8" x 2.9"	6" x 4.1" x 3.9"	6" x 3.3" x 3.9"	
Commercial	5.16" x 2.42" x 5.16"	5.38" x 4" x 2.5"	5.16" x 2.42" x 5.16"		
Remote					4.9" x 3.6" x 2.5"

Shipping Information

	Modules Per Box	Box Dimensions	Box Weight	Modules Per Pallet*	Pallet Dimensions	Pallet Weight
Residential Direct-Mount						
Elster American	20	20" x 11.9" x 8.6"	16.7 lbs / 7.6 kg	800	40" x 48" x 48" H	668 lbs / 303 kg
Sensus/Rockwell	20	20" x 11.9" x 8.6"	14.7 lbs / 6.7 kg	800	40" x 48" x 48" H	588 lbs / 267 kg
Itron/Sprague	20	21.5" x 13" x 9"	20.4 lbs / 9.4 kg	600	40" x 48" x 50" H	648 lbs / 294 kg
National	20	21.5" x 13" x 9"	20.4 lbs / 9.4 kg	600	40" x 48" x 50" H	648 lbs / 294 kg
Commercial Direct-Mount						
Elster American & Itron	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 54" H	530 lbs / 240 kg
Sensus/Rockwell	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 54" H	530 lbs / 240 kg
Remotes	20	23.5" x 19.5" x 4.25"	22 lbs / 10.1 kg	880	40" x 48" x 48" H	968 lbs / 438 kg

* Modules are not stacked when shipped but can be stored two pallets high. Modules are to be stored indoors. If outdoor storage is necessary, modules must be sheltered from weather and damage.

Meter Compatibility

- > Refer to Gas Meter Compatibility List (PUB-0117-002) for detailed information on gas meter compatibility

Additional Information

- > 2.4GZ OpenWay Gas Module Installation Guide – Direct Mount (TDC-0816)
- > 2.4GZ OpenWay Gas Module Installation Guide – Remote Mount (TDC-0838)
- > Gas Endpoint Ordering Guide (PUB-0117-001)
- > Endpoint-Link Endpoint Programming Guide (TDC-0744)
- > Endpoint-Link Checklist (TDC-0671)

About Itron Inc.

Itron Inc. is a leading technology provider to the global energy and water industries. Our company is the world's leading provider of intelligent metering, data collection and utility software solutions, with nearly 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water. Our products include electricity, gas, water and heat meters; data collection and communication systems, including automated meter reading (AMR) and advanced metering infrastructure (AMI); meter data management and related software applications; as well as project management, installation, and consulting services. To know more, start here: www.itron.com



Corporate Headquarters
2111 North Molter Road
Liberty Lake, WA 99019
USA
Phone: 1.800.635.5461
Fax: 1.509.891.3355
www.itron.com



100G DLS Datalogging

ERT® Module

The 100G DLS Datalogging ERT® module is the fourth evolution in Itron's line of 100 series radio frequency (RF) gas meter modules and is part of our industry-leading portfolio of RF-based meter data collection solutions. The 100G DLS Datalogging ERT, or 100G DLS, offers all the benefits of its 100G predecessors while delivering a new message called SCM+, which is different from the legacy SCM message. The new SCM+ message has the capacity to use serial numbers up to 10 digits long and includes other valuable data. The 100G DLS also offers optional enhanced security with the addition of authentication and encryption.

The 100G DLS boasts an accuracy of 99.999 percent between the index read and ERT read—an unprecedented benchmark in Advanced Metering Infrastructure (AMI) and Automated Meter Reading (AMR). The module also achieves the industry's highest UL rating for intrinsic safety. The two-way 100G DLS surpasses its predecessor, the 100G DLN, by offering optional authentication of command and encryption of communications data when Itron Security Manager is added to your Itron system. Additionally, the 100G DLS offers extended data—low battery indicator, metrology and non-metrology programming counters—which can be read not only by fixed network, but for the first time by mobile and handheld readers. The 100G DLS also offers improved tilt tamper detection.

The 100G DLS automatically stores 40 days of hourly data, providing a "black box" of hourly usage which has proven valuable in case of a catastrophic event. This functionality benefits mobile customers by providing valuable information for: move in/move out reads to minimize off-cycle reading; daily data for customer service and billing disputes; monthly gas balancing reads; hourly data to facilitate load studies and data to support mid-cycle rate changes. With its programmable output power and two-way functionality, the 100G DLS easily enables migration from mobile to fixed network reading and supports time-synchronized interval data and Gas Day Take reads.

FEATURES

- » Offers optional enhanced security with authentication of command and encryption of communications data
- » New SCM+ message allows unique ERT ID numbers up to 10 digits and includes extended data
- » Can be read alongside legacy gas ERT modules with Itron's 900 MHz ChoiceConnect® handheld, mobile and fixed network data collection solutions
- » Continually stores and updates the last 40 days of hourly interval data which can be read via handheld, mobile and fixed network
- » Operates in bubble-up mode and does not require a license from the Federal Communications Commission (FCC) or Industry Canada (IC)

- » Designed for a 20-year battery life regardless of data collection solution to ensure low operating and maintenance costs
- » Module design makes installation fast and easy, especially when gas is flowing through the meter
- » Made in the USA at Itron's facility in Waseca, Minnesota

Residential Meters

Itron provides the most extensive line of direct mount 100G DLS ERT modules for use with residential diaphragm gas meters. Capacities range from 75 to 630 CFH for popular models from Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, Itron/Actaris/Schlumberger/Sprague and National/Lancaster. Direct mount modules are also available for older Sprague 1A and Sprague 175RM meters. The compact design and direct engagement with the meter drive assure the unparalleled accuracy that makes Itron gas ERT modules the industry standard. A remote mount module is available for some less common meter types where a direct mount solution is not available.



Itron I-250



Sensus/ Rockwell R275



Elster American AC250



National 250

Commercial Meters

Itron also provides direct mount 100G DLS ERT modules for use with the following commercial diaphragm meters: Elster American Meter, Itron/Actaris/Schlumberger and Sensus/Invensys/Equimeter/Rockwell. The unobtrusive profile is easy-to-install and the direct meter drive engagement assures the highest level of accuracy. Built-in passive radiators are standard on all commercial, direct mount 100G DLS ERT modules.

Elster American Meter, and Itron/Actaris/Schlumberger commercial diaphragm

meters with top-mount instrument drives utilize the same version commercial direct mount module. For Elster American Meter commercial diaphragm meters, the ERT mounts directly to the meter. For Itron/Actaris/Schlumberger meters, an adapter kit must be purchased. A remote mount module is available for some less common meter types where a direct mount solution is not available.



Itron 1000A



Sensus/ Rockwell 750



Elster American AL 800

Rotary Meters

Itron has several solutions for interfacing with rotary gas meters. For Dresser LMMA and B3 rotary meters with Dresser-supplied AMI/AMR adapter, Itron offers the American residential 100G DLS. For Dresser rotary meters with Instrument Drive (ID), Itron offers the direct mount ERT designed for American commercial diaphragm meters. For Dresser, Romet and American Meter rotary meters with pulse output (version 17 or higher required for Dresser) and a military connector pin, Itron offers the remote mount 100G DLS.



Dresser B3 with Direct mount



Dresser LMMA with Remote ERT

Electronic Meters and Correctors

Itron offers a remote mount 100G DLS for Itron's DATTUS meter. One 100G DLS can be used for uncorrected consumption and a second module can be used for corrected consumption.

Itron offers a remote mount 100G DLS for Honeywell/Mercury Instruments EC-AT, Mini-P, Mini-AT, Mini-Max and TCI electronic correctors. The ERT

can be connected to these devices for temperature- and/or pressure-corrected consumption (Form A board required). The ERT attaches easily to the Mercury corrector circuit board through the terminal strip connector already installed on Mercury units (module to TCI is wired). Itron offers a remote mount 100G DLS for Dresser Micro Correctors (IMC/W, MC2 and Eagle MPplus. For Mercury, Dresser, and Eagle, one 100G DLS module can be used for uncorrected consumption and a second module can be used for corrected consumption.



DATTUS III



Mercury Mini-AT



Eagle MPplus



Dresser IMC

Functional Specifications

- » Power source:
 - Direct mount module: "A" cell lithium battery
 - Remote-mount module: Two "A" cell lithium batteries
- » Radio programming parameters: Utility ID, index reading, count rate, index rollover, pressure compensation, security level, output power and bubble-up rate
- » Tamper detection:
 - Direct mount module: mercury-free tilt tamper and magnetic tamper
 - Remote mount module: mercury-free tilt tamper and cut cable (for Mercury TCI, optionally can get any TCI alarm in place of cut cable)
- » Battery Counter Indicator
- » Operating temperature: -40°F to +158°F (-40°C to +70°C)
- » Operating humidity:
 - 5 to 95% non-condensing relative humidity
 - 100G DLS ERT modules can be installed indoors or outdoors above grade
- » Product identification: Numeric and bar-coded ERT module type and up to 10 digit serial number

Programming Mode Options

- » Mobile/Handheld Mode* with +10 dBm output power (10 milliwatts) and a 15-second bubble-up rate with a 20-year battery life. This mode is recommended when using traditional walk-by or drive-by meter reading methods
- » Mobile HP Mode* with +24dBm output power (250 milliwatts) and a 60-second bubble-up rate with a 20-year battery life. This mode allows readings to be collected from further away, bypassing many streets and reducing total miles driven
- » Hard-to-Read Mobile/Handheld Mode* with +24 dBm output power (250 milliwatts) and a 30-second bubble-up rate. This mode reduces battery life to 18 years with basic security and 13 years with enhanced security. Assuming that utilities would prefer a 20-year battery life, this mode should only be used for exceptionally hard-to-read applications such as meters on a roof or in a sub-basement
- » Fixed Network Mode** with +27 dBm output power (500 milliwatts), and a 5-minute bubble-up rate of the Network Interval Message (NIM). The NIM includes the current index read and the last 8 hourly intervals (7 full hours and one partial hour) with a 20-year battery life
- » Itron Cellular Solutions (ICS) Mode** The 100G DLS module is compatible with the OpenWay CENTRON with 3G Itron Cellular Module (ICM) and is programmed with FDM Endpoint Tools Enhanced or FDM. In ICS mode, the 100G DLS transmits a high-powered network interval message (NIM) RF message every five minutes across 50 channels for optimum operation. Output power in this mode is 500 milliwatts or +27 dBm with a 20-year battery life

NOTE: The 100G DLS must be in full security mode to work with ICS
**NOTE: Interspersed in the high power NIM, the 100G transmits a medium power RF message at 10 milliwatts or +10 dBm every 60 seconds

Approved Reading Devices for Collecting Reads with Basic Security

Handheld and Mobile Application Software
SCM+ Only:

- » MV-RS v8.5.5 or higher
- » Field Collection System (FCS) v2.3 or higher
 - Including FCS DC v2.3.10.1 and FCS DC v2.4.8.2
- » Mobile Collection Software v3.4 or higher

- » Field Deployment Manager (FDM) v3.3 or higher

Handheld and Mobile Application Software
Datalogging:

- » MV-RS v8.5.5 or higher
- » Field Collection System (FCS) v2.3 or higher
 - Including FCS DC v2.3.10.1 and FCS DC v2.4.8.2 and the database update script from FCS Server 2.3.2.4 HF5 and FCS Server 2.4.1.20 HF8
- » Mobile Collection Software v3.4 or higher
- » Field Deployment Manager (FDM) v3.3 or higher

Handhelds and Radios:

- » FC300SR: All models along with application software listed above
- » 900MHz Belt Clip Radio: All models require firmware v1.6.12 or higher along with FDM software listed above
- » FC200SR: Application software listed above along with models listed here:
 - SCM+ Only: FC2-0005-002, FC2-0006-002, FC2-0005-003, FC2-0006-003, FC2-0006-004
 - Datalogging: FC2-0005-004, FC2-0006-004, FC2-0005-104, FC2-0006-104

Mobile Collectors:

- » MC3 when used with Mobile Collection Software v3.4 and application software listed above.
 - SCM+ Only: DCU-5300-001 *, DCU-5300-011U *, DCU-5300-101U, DCU-5300-111U
 - Datalogging: DCU-5300-001DL, DCU-5300-001DLU, DCU-5300-011DLU, DCU-5310-001, DCU-5310-011, DCU-5310-011U
- » MCLite when used with application software listed above.
 - SCM+ Only: DCU-5000-001 *, DCU-5000-002 *, DCU-5000-002U *, DCU-5000-102U
 - Datalogging: DCU-5000-002DL, DCU-5310-201

Network Products:

- » ChoiceConnect Network Software v4.1.6.68
- » CCU100: All models when used with Network Software v4.1.6.68 or higher
- » Repeater 100: All models when used with Network Software v4.1.6.68 or higher
- » CCU 4.2: All models when used with

updated Network Software and the included firmware update

Approved Reading Devices for Collecting Reads with Enhanced Security

Note: Requires purchase of security keys (SEC-0000-001), Itron Security Manager and FDM or FDM Endpoint Tools Enhanced

Handheld and Mobile Application Software:

- » Field Collection System (FCS) v2.5 or higher
 - » Mobile Collection Software v3.5.1 or higher
 - » Field Deployment Manager (FDM)
 - FDM work orders v3.3 or higher
 - or FDM Endpoint Tools Enhanced v3.3 or higher
- Note: ICS mode requires v3.4 or higher

- » FC300SR: All models along with application software listed above
- » 900MHz Belt Clip Radio - All models require firmware v1.6.12 or higher along with FDM software listed above
- » FC200SR: Application software listed above along with models listed here:
 - SCM+ Only: FC2-0005-002, FC2-0006-002, FC2-0005-003, FC2-0006-003, FC2-0006-004
 - Datalogging: FC2-0005-004, FC2-0006-004, FC2-0005-104, FC2-0006-104

Mobile Collectors:

- » MC3 when used with Mobile Collection Software v3.4 and application software listed above.
 - SCM+ Only: DCU-5300-001 *, DCU-5300-011U *, DCU-5300-101U, DCU-5300-111U
 - Datalogging: DCU-5300-001DL, DCU-5300-001DLU, DCU-5300-011DLU, DCU-5310-001, DCU-5310-011, DCU-5310-011U
- » MCLite when used with application software listed above.
 - SCM+ Only: DCU-5000-001 *, DCU-5000-002 *, DCU-5000-002U *, DCU-5000-102U
 - Datalogging: DCU-5000-002DL, DCU-5310-201

Network Products:

- » ChoiceConnect Network Software v5.0
- » CCU 100: All models support enhanced security when used with Network Software v5.0
- » Repeater 100: All models support enhanced security when used with Network Software v5.0 and the included firmware update

*Firmware must be updated at service center

Battery Life and Design Life

- » 100G DLS allows for a field-replaceable "A" cell lithium battery
- » All programming modes and security levels support a 20-year battery life (20+ years for remotes) except Hard-to-Read Mobile/Handheld mode, which reduces battery life to 18 years with basic security and 13 years with enhanced security
- » All 100G DLS modules are designed for a 20-year total life

Regulatory & Standards

- » FCC compliance: Part 15.247 and Part 15.249 (programming) certified
- » FCC ID EWQ100GDLAS, Industry Canada 864D-100GDLAS; Measurement Canada (AG-0546)
- » Safety approvals: Intrinsically safe per UL Class I, Division 1, Groups C & D

Operational

- » All 100G DLS ERT modules operate without the need for an FCC or IC license
- » Frequency Range: Frequency-Hopping Spread Spectrum 903 to 926.85 MHz in the ISM band
- » Program frequency: 908 MHz
- » NIM: FM modulation; all other messages are AM modulated
- » Data integrity: Verified in every message

Physical

All 100G DLS ERT modules have encapsulated electronics for protection against environmental hazards and tampering. All 100G DLS module housings are made of gray polycarbonate. For direct mount residential ERT modules, the gasket material is molded Sevrene™ and the index cover material is clear polycarbonate.

Meter Compatibility

Refer to Gas & Telemetry Module Compatibility List (PUB-0117-002) for detailed information on gas meter compatibility.

Additional Information

- » 100G DLS Datalogging ERT Module Installation Guide: Direct Mount (TDC-0823)
- » 100G DLS Datalogging ERT Module Installation Guide: Remote Mount (TDC-0824)
- » Gas & Telemetry Module Ordering Guide (PUB-0117-001)
- » 100 Series Technology Guide (TDC-0825)
- » Field Deployment Manager Endpoint Tools Mobile Application Guide (TDC-0934)
- » Field Deployment Manager Endpoint Tools Configuration Guide (TDC-0935)
- » Field Deployment Manager Endpoint Checklist (TDC-0942)

Physical (width x height x depth)

	Elster American	Sensus/Rockwell	Itron/Sprague	National	All
Residential	5.54" x 3.57" x 3.1"	4.3" x 3.8" x 2.9"	6" x 4.1" x 3.9"	6" x 3.3" x 3.9"	
Commercial	5.16" x 2.42" x 5.16"	5.38" x 4" x 2.5"	5.16" x 2.42" x 5.16"		
Remote					4.9" x 3.6" x 2.5"

Shipping Information

	Modules Per Box	Box Dimensions	Box Weight	Modules Per Pallet*	Pallet Dimensions	Pallet Weight
Residential Direct-Mount						
Elster American	20	20" x 11.9" x 8.6"	16.7 lbs / 7.6 kg	800	40" x 48" x 48" H	668 lbs / 303 kg
Sensus/Rockwell	20	20" x 11.9" x 8.6"	14.7 lbs / 6.7 kg	800	40" x 48" x 48" H	588 lbs / 267 kg
Itron/Sprague	20	21.5" x 13" x 9"	20.4 lbs / 9.4 kg	600	40" x 48" x 50" H	612 lbs / 278 kg
National	20	21.5" x 13" x 9"	20.4 lbs / 9.4 kg	600	40" x 48" x 50" H	612 lbs / 278 kg
Commercial Direct-Mount						
Elster American & Itron	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 52.5" H	480 lbs / 218 kg
Sensus/Rockwell	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 52.5" H	480 lbs / 218 kg
Remotes	20	23" x 15.8" x 6.5"	22 lbs / 10.1 kg	500	40" x 48" x 37.5" H	550 lbs / 253 kg

* Modules are not stacked when shipped but can be stored two pallets high. Modules are to be stored indoors. If outdoor storage is necessary, modules must be sheltered from weather and damage.



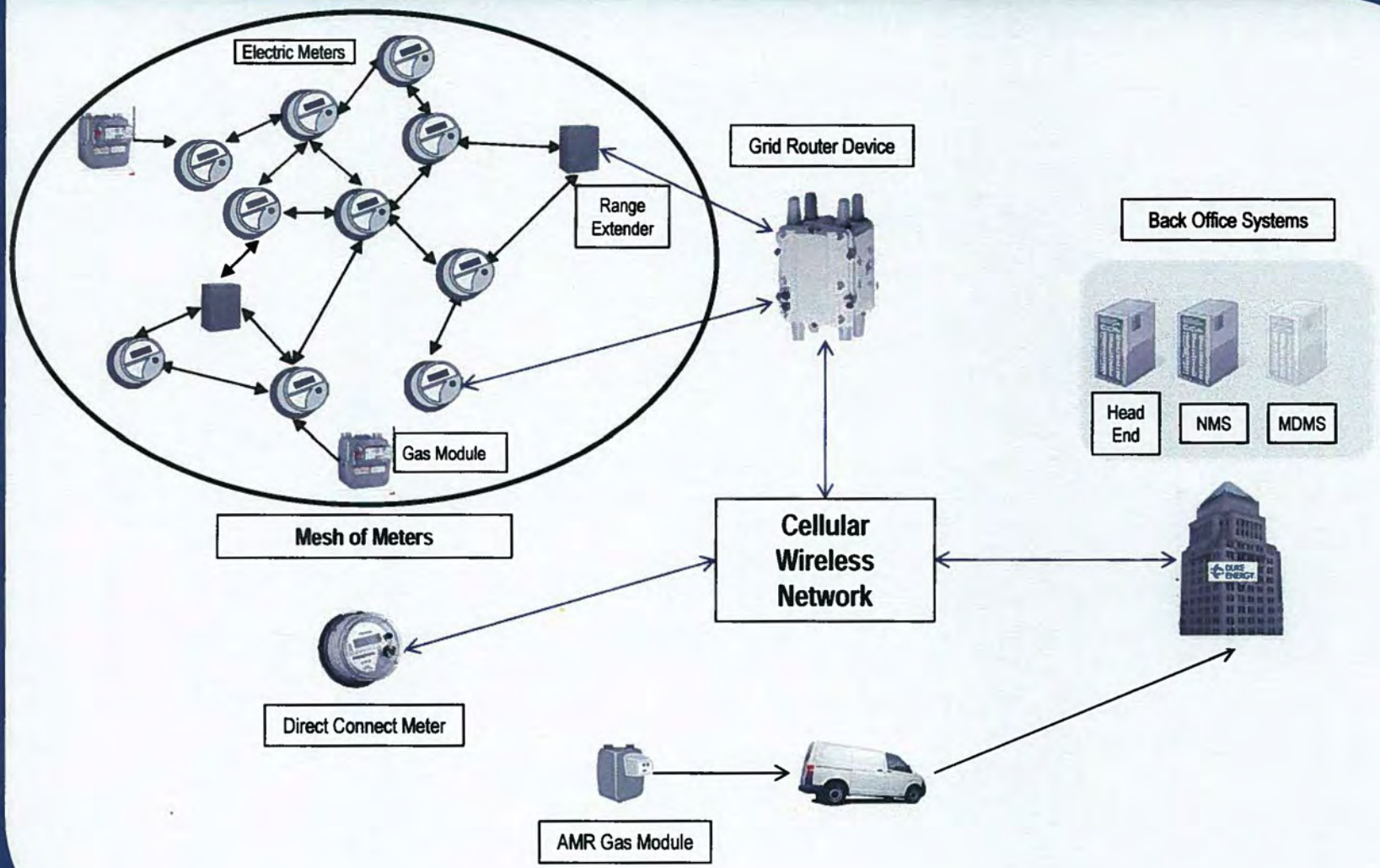
Join us in creating a more resourceful world.
To learn more visit itron.com

CORPORATE HQ

2111 North Molter Road
Liberty Lake, WA 99019 USA
Phone: 1.800.635.5461
Fax: 1.509.891.3355

While Itron strives to make the content of its marketing materials as timely and accurate as possible, Itron makes no claims, promises, or guarantees about the accuracy, completeness, or adequacy of, and expressly disclaims liability for errors and omissions in, such materials. No warranty of any kind, implied, expressed, or statutory, including but not limited to the warranties of non-infringement of third party rights, title, merchantability, and fitness for a particular purpose, is given with respect to the content of these marketing materials. © Copyright 2015 Itron. All rights reserved. 101274SP-06 4/15

Advanced Metering Infrastructure (AMI)



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

In the Matter of:

The Application of Duke Energy Kentucky,)
Inc., for (1) a Certificate of Public)
Convenience and Necessity Authorizing)
the Construction of an Advanced Metering) Case No. 2016-00152
Infrastructure; (2) Request for Accounting)
Treatment; and (3) All Other Necessary)
Waivers, Approvals, and Relief.)

DIRECT TESTIMONY OF

JAMES P. HENNING

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

April 25, 2016

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION AND PURPOSE	1
II. OVERVIEW OF DUKE ENERGY KENTUCKY, INC.	4
III. STRATEGIC VISION.....	8
IV. CUSTOMER PROGRAMS AND SERVICES	13
V. CPCN REQUIREMENTS.....	15
VI. CONCLUSION	18

I. INTRODUCTION AND PURPOSE

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

2 A. My name is James P. Henning, and my business address is 139 East Fourth Street,
3 Cincinnati, Ohio 45202.

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

5 A. I am employed by Duke Energy Business Services LLC (DEBS) as State
6 President of Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the
7 Company) and Duke Energy Ohio, Inc. (Duke Energy Ohio). DEBS provides
8 various administrative and other services to Duke Energy Kentucky and other
9 affiliated companies of Duke Energy Corporation (Duke Energy Corp.).

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

12 A. I received a Bachelor of Science in Financial Services from Wright State
13 University in 1988, and a Master's Degree in Business Administration from the
14 University of South Florida in 1990. I have attended numerous other industry and
15 company sponsored programs and courses.

16 I have worked in the energy industry for 26 years. From 1990 through
17 1993, I was employed at The Dayton Power & Light Company (DP&L) as a Gas
18 Analyst in the Gas Supply Planning Department. My responsibilities as a Gas
19 Analyst included natural gas and interstate pipeline procurement, system load
20 forecasting, and daily load dispatching. From 1993 through 1996, I worked for
21 DP&L's non-regulated natural gas sales company (MVR) as a Manager of Natural
22 Gas Sales and Marketing. In 1996, I joined Cinergy Corp.'s non-regulated natural

1 gas sales company (Cinergy Resources, Inc.) as the Manager of Energy Sales and
2 Services and worked in this capacity until 2000. As Manager of Energy Sales and
3 Services, my responsibilities included the coordination of all retail sales,
4 marketing and customer service activities in the Kentucky, Indiana, and Ohio
5 markets. From 2000 through 2001, I worked for various departments within
6 Cinergy Corp., including Environmental Services, Labor Relations, and Gas
7 Operations. Beginning October 2001, I led the commercial activities of Duke
8 Energy's regulated natural gas business in Kentucky and Ohio as General
9 Manager, Gas Commercial Operations. My responsibilities included leading the
10 planning, procurement, and recovery of more than \$400 million of annual natural
11 gas supply. I directed the 24 hour/day physical operations and control of Duke
12 Energy's natural gas distribution system. I also led the teams responsible for
13 managing the relationships with large business natural gas customers, as well as
14 the management and administration of the company's natural gas customer choice
15 program.

16 In September 2010, I became Vice President of Government and
17 Regulatory affairs for Duke Energy Kentucky and Duke Energy Ohio. In this
18 role, I was responsible for the government and regulatory policies and strategies
19 to strengthen the Duke Energy Kentucky and Duke Energy Ohio mission of
20 providing safe, reliable, and affordable energy for customers located in both
21 states. I assumed the role of President of Duke Energy Kentucky and Duke
22 Energy Ohio in December 2012.

1 **Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AS PRESIDENT,**
2 **DUKE ENERGY KENTUCKY.**

3 A. As President of Duke Energy Kentucky, I am responsible for ensuring that our
4 customers continue to have access to safe, reliable, and reasonably priced natural
5 gas and electric service and that these services are provided in accordance with
6 applicable federal and state laws and regulations. I am also involved in external
7 efforts relating to governmental and regulatory affairs, interacting with state and
8 community leaders and regulators on matters relevant to Duke Energy Kentucky's
9 business and presence in Kentucky. I am responsible for the Company's
10 community relations and economic development efforts, as well as Duke
11 Energy's regional charitable contributions giving through the foundation.

12 As President of Duke Energy Kentucky, I am committed to finding
13 opportunities to better serve our Kentucky customers and to manage our costs of
14 providing their desired levels of safe and reliable electric and natural gas service.

15 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
16 **PUBLIC SERVICE COMMISSION?**

17 A. Yes. Most recently, I provided testimony on behalf of the Company in Case No.
18 2014-00201, regarding Duke Energy Kentucky's application to purchase the
19 remaining 31 percent of the East Bend Generating Station from DP&L.

20 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
21 **PROCEEDING?**

22 A. The purpose of my testimony is to discuss and support Duke Energy Kentucky's
23 request for approval of a Certificate of Public Convenience and Necessity

1 (CPCN) to replace and upgrade its electric and gas metering infrastructure
2 technology (Metering Upgrade) and the associated requests for accounting
3 treatment. In doing so, I provide an overview of Duke Energy Kentucky's
4 operations. I then explain Duke Energy's strategic vision that leads to the
5 metering infrastructure investments and upgrades, and how these investments
6 will, in turn, allow Duke Energy Kentucky to adapt to better serve its customers.

II. OVERVIEW OF DUKE ENERGY KENTUCKY, INC.

7 **Q. IN CARRYING OUT YOUR RESPONSIBILITIES AS PRESIDENT OF**
8 **DUKE ENERGY KENTUCKY, DO YOU REGULARLY COMMUNICATE**
9 **AND COLLABORATE WITH THE EXECUTIVE MANAGEMENT OF**
10 **DUKE ENERGY CORP.?**

11 A. Yes. As President for both Duke Energy Kentucky, and its parent, Duke Energy
12 Ohio, I work closely with Duke Energy Corp.'s executive management, as well as
13 the other state utility Presidents within the Duke Energy Corp. family of
14 businesses. As president of Duke Energy Kentucky, I have ultimate responsibility
15 for the performance of the Company, including meeting its commitment to
16 provide safe, reliable, and reasonably priced service to our customers. This
17 collaboration provides Duke Energy Kentucky with valuable resources and access
18 to personnel and expertise from the Duke Energy Corp. family of companies to
19 facilitate the Company's commitment to our customers.

20 **Q. PLEASE GENERALLY DESCRIBE DUKE ENERGY KENTUCKY'S**
21 **OPERATIONS.**

1 A. Duke Energy Kentucky is a regulated utility operating company that provides
2 retail electric services in five counties and natural gas service in seven counties in
3 northern Kentucky. Duke Energy Kentucky's local business office is in Erlanger,
4 Kentucky, with its main business office across the Ohio River in Cincinnati, Ohio.
5 Duke Energy Kentucky serves a relatively densely populated territory that, though
6 not heavily industrialized, consists of a fairly diverse mix of industrial customers.

7 Duke Energy Kentucky currently provides natural gas distribution service
8 to approximately 100,000 customers in Boone, Campbell, Gallatin, Grant,
9 Kenton, Bracken and Pendleton counties in northern Kentucky. The customer
10 base consists of approximately 92,000 residential and 8,000 general service
11 (commercial and industrial) customers. The Company also owns, operates, and
12 maintains approximately 1,490 miles of mains on its natural gas distribution
13 system.

14 Duke Energy Kentucky also provides retail electric service to just under
15 140,000 customers in Boone, Campbell, Grant, Kenton, and Pendleton counties in
16 northern Kentucky. The Company's electric customer base consists of
17 approximately 125,000 residential and approximately 15,000 non-residential
18 (including large and small commercial, street lighting, and public authority)
19 customers. The Company owns, operates, and maintains approximately 147 miles
20 of transmission lines and 2,134 miles of distribution lines.

21 Duke Energy Kentucky's gas and electric service territories encompass
22 approximately 2,148 and 700 square miles, respectively. In addition, Duke
23 Energy Kentucky has operational facilities in Covington and Erlanger Kentucky.

1 Duke Energy Kentucky currently owns and operates approximately 1,077
2 megawatts (MW) of net installed generating capacity. This generating capacity
3 includes a 100% ownership stake in East Bend, a coal-fired, base load generating
4 unit in Rabbit Hash, Boone County, Kentucky that accounts for approximately
5 600 MW of net installed capacity. Finally, the Company owns and operates the
6 Woodsdale Generating Station (Woodsdale), a six-unit natural gas or propane-
7 fired station located in Trenton, Ohio. Woodsdale accounts for approximately
8 462 MWs of net installed peaking capacity (based on summer rating). All of
9 these generation assets are dispatched into PJM Interconnection, L.L.C., which
10 maintains responsibility for reliability of supply within its footprint.

11 **Q. PLEASE BRIEFLY SUMMARIZE DUKE ENERGY KENTUCKY'S**
12 **APPLICATION AND THE RELIEF REQUESTED IN THIS**
13 **PROCEEDING.**

14 **A.** Duke Energy Kentucky is requesting that the Commission grant a CPCN to allow
15 the Company to implement a customer Metering Upgrade for both its gas and
16 electric operations. Duke Energy Kentucky's existing metering infrastructure
17 consists mostly of electro-mechanical meters that are manually read once a month
18 by Company personnel. The current metering infrastructure also includes a small
19 number of advanced electric meters and natural gas modules that were
20 implemented as part of an advanced metering pilot between 2007 and 2008. With
21 the Metering Upgrade, Duke Energy Kentucky is seeking approval to install
22 Advanced Metering Infrastructure (AMI) devices for the Company's electric and
23 combination electric and natural gas customers (Combination Customers) and

1 Automated Meter Reading (AMR) devices for its customers who only receive
2 natural gas service from the Company (gas-only customers). Duke Energy
3 Kentucky also requests specific accounting treatment related to the undepreciated
4 remaining net book value of the Company's existing metering equipment and
5 inventory, proposal for depreciation rates for the new investments, and any
6 necessary waivers to optimize the functionality of the Metering Upgrade and
7 obtain the expected operational efficiencies that it enables.

8 **Q. PLEASE FURTHER DESCRIBE THE METERING UPGRADE**
9 **TECHNOLOGIES THAT DUKE ENERGY KENTUCKY IS PROPOSING**
10 **TO DEPLOY.**

11 A. Duke Energy Kentucky will deploy an Itron OpenWay AMI solution that will
12 involve installing approximately 143,000 electric AMI meters and attaching
13 approximately 82,500 AMI gas modules on existing gas meters for Combination
14 Customers. That excludes some large commercial and industrial customers who
15 already have some form of an advanced meter. Approximately 21,000 of Duke
16 Energy Kentucky's 100,000 gas customers are gas-only accounts. Those gas-only
17 customers will receive drive-by AMR modules attached to their existing gas
18 meters. The deployment schedule for this Metering Upgrade solution across
19 Duke Energy Kentucky's gas and electric territory will take just approximately
20 two years once approved by the Commission. The Company anticipates that upon
21 approval, planning and procurement will take approximately three to six months
22 with full meter deployment being achieved approximately 18 months later. The
23 table below details the number of active customers and the number of meters and

1 modules that will be installed as part of the Metering Upgrade. There are some
2 customers with multiple meters at a single location.

	Electric	Gas Combo	Gas Only	Total Gas
Customers	139,981	78,642	21,169	99,811
Planned Meters/Modules	143,000	82,500	20,500	103,000
Meter/Module Technology	AMI Meter	AMI Module	AMR Module	AMI/AMR Module

3 **Q. IN ADDITION TO YOUR TESTIMONY, PLEASE IDENTIFY THE**
4 **WITNESSES SUPPORTING THE COMPANY'S APPLICATION.**

5 A. In addition to my testimony, Duke Energy Kentucky is submitting the pre-filed
6 testimony of the following witnesses in support of the Application:

- 7 • Peggy A. Laub discusses the Company's accounting treatment requests, and
8 estimated rate impacts of the new installation.
- 9 • Donald L. Schneider, Jr. describes the Company's history with advanced
10 metering technologies, the type and capabilities of the metering technology
11 that Duke Energy Kentucky will install, the Company's deployment plan, and
12 the cost-benefit analysis supporting the Metering Upgrade.
- 13 • Alexander J. "Sasha" Weintraub Ph.D., discusses the new programs and
14 services that are enabled through the Company's Metering Upgrade solution.

III. STRATEGIC VISION

15 **Q. PLEASE BRIEFLY EXPLAIN DUKE ENERGY'S STRATEGIC VISION**
16 **THAT LED TO THESE PROPOSED INVESTMENTS.**

17 A. Duke Energy is focused on leading the way to cleaner, smarter energy solutions
18 that customer's value. In order to achieve that vision, Duke Energy recognizes

1 that it must transform and enhance the customer experience across all our
2 jurisdictions. This means that Duke Energy Kentucky must be able to provide its
3 customers with access to a greater level of their individual energy (electric and
4 natural gas) consumption data and tools to act on that data so that each customer
5 has the ability to make intelligent and informed decisions regarding how much
6 and how efficiently they consume energy. The gateway to this transformation is
7 ensuring that a proper infrastructure is in place that can provide customers with
8 the information and ability to not only make those decisions, but to control how
9 they interact with Duke Energy Kentucky. Duke Energy Kentucky's Metering
10 Upgrade application is that first step. The Metering Upgrade will allow the
11 Company to enhance its ability to serve its customers by providing them with
12 greater access to data and control over their energy consumption, and it will also
13 allow the Company to more efficiently manage its costs.

14 **Q. HOW DOES THE METERING UPGRADE SUPPORT DUKE ENERGY**
15 **KENTUCKY'S OWN STRATEGIC VISION?**

16 **A.** The Metering Upgrade proposed in this CPCN application enables Duke Energy
17 Kentucky to fulfill its strategic vision to lead the way to cleaner, smarter energy
18 solutions that our customers value. The Metering Upgrade technologies are
19 customer-focused. With the access to interval consumption information,
20 customers are afforded greater convenience, control and transparency over their
21 energy consumption. The technology will give customers access to their interval
22 energy consumption data on a daily basis, with the exception of gas-only
23 customers, versus the current model, where the only usage or consumption

1 information a customer receives is based upon last month's usage. The Metering
2 Upgrade technologies are also sustainable; they enable more efficient operations
3 and enhanced safety. Finally, the Metering Upgrade technologies are reliable and
4 smart, in that the increased communication capability between the utility meter
5 and the utility's back-office systems will mean that Duke Energy Kentucky will
6 have greater awareness and understanding of customer outages and can respond
7 more efficiently.

8 **Q. YOU MENTIONED THAT GREATER ACCESS TO CONSUMPTION**
9 **INFORMATION WILL AFFORD CUSTOMERS GREATER**
10 **CONVENIENCE, CONTROL AND TRANSPARENCY OVER THEIR**
11 **ENERGY CONSUMPTION. WOULD YOU PLEASE EXPLAIN THIS**
12 **PREMISE FURTHER?**

13 **A.** There are several ways the Metering Upgrade enables greater customer
14 convenience. At the most basic level, it enables the Company to perform meter
15 reads and meter service orders remotely and not inconvenience the customer with
16 a personal visit. That means a meter reader will not be on a customer's property
17 every month to obtain a read. When electric customers request their service be
18 switched on or off, or when they are disconnected for non-payment and need
19 power restored, the Company can perform those services remotely and almost
20 immediately, rather than needing to schedule site visits.

21 Obtaining regular monthly access to our 64,883 interior meters (33,666
22 electric and 31,217 natural gas) can be challenging for the Company and
23 inconvenient for the customer. Of the more than 64,000 total interior meters,

1 nearly 50,000 are standard electro-mechanical meters requiring manual reading.
2 The Metering Upgrade will eliminate interior access challenges by enabling
3 remote meter reading, meaning the Company will no longer have to enter these
4 customers' homes on a monthly basis just to read a meter. Remote meter reading
5 will relieve customer inconvenience of providing keys to neighbors or to the
6 Company and eliminates the access issues currently experienced, such as reading
7 delays and struggles with setting mutually-convenient appointments. Duke
8 Energy Kentucky maintains nearly 20,000 keys on file so it can enter a customer's
9 premises simply to access interior meters. Converting all interior meters to an
10 AMI or AMR solution will reduce costs, interior access challenges, and safety
11 issues, the Company experiences on a monthly basis.

12 Finally, the AMI piece of the Metering Upgrade will be integrated into our
13 efforts to increase communications with customers about outages and restoration
14 timelines. Being able to better understand when and where outages occur will
15 help us to better respond to events, have greater transparency, and explain those
16 events to customers.

17 The AMI piece of the Metering Upgrade also makes more detailed usage
18 information conveniently available to customers, but, more importantly, it
19 provides greater transparency into when their usage occurs and allows them to
20 take control of how much and when they use natural gas or electric service. As
21 soon as a customer's AMI meter is certified for billing, they will be able to view
22 their interval usage data via the Duke Energy web portal. Electric usage is
23 presented in hourly intervals and gas usage is presented in daily intervals.

1 Customers can then choose to take action on the newly available information to
2 reduce their consumption and thereby help benefit the environment. As described
3 in Dr. Weintraub's testimony, enhanced basic services enabled by the AMI
4 technology will offer additional tools for customers to take control over their
5 energy usage.

6 **Q. HOW DOES THE METERING UPGRADE ENABLE MORE EFFICIENT**
7 **OPERATIONS AND ENHANCE SAFETY?**

8 A. The Metering Upgrade will allow the Company to reduce its operations and
9 maintenance costs and increase its revenue capture. The most obvious benefit of
10 a Metering Upgrade is that the Company will be able to perform monthly meter
11 reads remotely (and in some instances, on demand), instead of deploying meter
12 reading technicians on a monthly basis or to obtain special/off-cycle meter
13 readings. Duke Energy Kentucky will be able to reduce truck rolls for meter-
14 related service orders and for unexpected events such as outages. Duke Energy
15 Kentucky will also be able to remotely connect and disconnect its electric
16 customers who request to establish or terminate service or who become eligible
17 for disconnection due to non-payment of bills. This will allow the Company to
18 better control customer balances and arrearages, especially in instances where
19 meter access has been restricted or difficult to obtain. The Company will still
20 follow all required customer notifications prior to disconnection, but we will be
21 better able to control our costs in doing so. The Company will still continue to
22 connect and disconnect all gas customer accounts in person.

23 Additionally, performing remote meter reading and meter-related service

1 orders will also reduce the occurrence of employee-related safety incidents that
2 may occur during travel or service performance. Today, Duke Energy Kentucky
3 representatives encounter many potential safety threats, such as pets and
4 tripping/slipping hazards, when they must enter customer property or premises.
5 The Metering Upgrade will reduce such risks because the need for representatives
6 to enter a customer's property to simply read or service a meter or complete
7 connection or disconnection requirements will be reduced significantly.

8 In terms of increased revenue capture, being able to more quickly restore
9 service after outages is one way the Metering Upgrade enables that benefit. Data
10 from the advanced meters will be used to increase efficiencies with respect to
11 outage restoration. The Metering Upgrade will also improve Duke Energy
12 Kentucky's revenue capture in that with our existing electro-mechanical meters,
13 the Company does not know immediately if a meter is malfunctioning or has been
14 tampered with without a physical inspection of the meter. Not so with the
15 Metering Upgrade. More efficient operation of all customers' meters means we
16 will not have to shift the burden of less reliable revenue capture across our
17 customer base.

IV. CUSTOMER PROGRAMS AND SERVICES

18 **Q. WHAT PROGRAMS AND SERVICES WILL EVENTUALLY BE**
19 **AVAILABLE TO CUSTOMERS ONCE THE METERING UPGRADE IS**
20 **COMPLETED?**

21 **A.** In summary, the Company has been identifying and developing a suite of
22 enhanced basic customer services that we would like to provide customers once

1 the Metering Upgrade is completed. Some examples of enhanced basic customer
2 services and customer programs that the Metering Upgrade would enable and
3 Duke Energy Kentucky customers could voluntarily choose are: Pick Your Due
4 Date, Outage Notification, Pay as you Go, and Predictive Usage Estimator and
5 Alerts. Dr. Weintraub discusses and supports these programs in his direct
6 testimony.

7 **Q. WILL ALL CUSTOMERS BE ABLE TO TAKE ADVANTAGE OF THESE**
8 **PROGRAMS?**

9 A. The timing and availability of these programs will vary based upon the types of
10 customers, whether residential, non-residential, gas-only or electric/Combination
11 Customers. As Dr. Weintraub explains, Duke Energy Kentucky is committed to
12 developing and offering its customers the enhanced basic services that they desire
13 and that are enabled through this advanced metering technology.

14 **Q. ARE THESE CUSTOMER OFFERINGS MANDATORY FOR**
15 **CUSTOMERS TO USE?**

16 A. No. These programs are enabled by the Metering Upgrade, but customers will be
17 able to choose whether or not to participate or otherwise avail themselves of these
18 offerings. However, the estimated benefits through more efficient operations
19 enabled by the Metering Upgrade, as well as any potential cost savings through
20 reduction in manual meter reading expense that can be achieved once a full
21 deployment and operation is achieved, will be experienced by all customers in
22 future rate cases. Duke Energy Kentucky believes that the better the Company is
23 able to provide customers with energy flexibility, resources, and services, the

1 more satisfied its customers will become.

V. CPCN REQUIREMENTS

2 **Q. DO YOU BELIEVE THAT THE COMPANY'S PROPOSAL TO**
3 **UPGRADE ITS METERING INFRASTRUCTURE IS NECESSARY AND**
4 **BENEFICIAL TO DUKE ENERGY'S CUSTOMERS?**

5 A. Yes. As I previously discussed, this Metering Upgrade is the gateway technology
6 that allows Duke Energy Kentucky to adapt to meet our customers' expectations
7 and desires to have more awareness, transparency and control over their energy
8 consumption. The Metering Upgrade also allows Duke Energy Kentucky to
9 become even more efficient and responsive to our customer while managing our
10 costs over the long term.

11 **Q. HAS THE COMPANY PROVIDED "COPIES OF FRANCHISES OR**
12 **PERMITS, IF ANY, FROM THE PROPER PUBLIC AUTHORITY FOR**
13 **THE PROPOSED CONSTRUCTION OR EXTENSION, IF NOT**
14 **PREVIOUSLY FILED WITH THE COMMISSION"?**

15 A. All existing franchises are on file with this Commission. The Company does not
16 anticipate any additional permits are required for this construction and installation
17 of the Metering Upgrade.

18 **Q. HAS THE COMPANY PROVIDED "A FULL DESCRIPTION OF THE**
19 **PROPOSED LOCATION, ROUTE, OR ROUTES OF THE PROPOSED**
20 **CONSTRUCTION OR EXTENSION, INCLUDING A DESCRIPTION OF**
21 **THE MANNER OF THE CONSTRUCTION AND THE NAMES OF ALL**
22 **PUBLIC UTILITIES, CORPORATIONS, OR PERSONS WITH WHOM**

1 **THE PROPOSED CONSTRUCTION OR EXTENSION IS LIKELY TO**
2 **COMPETE”?**

3 A. Yes. Mr. Schneider supports the Company’s deployment plan. As he explains in
4 his testimony, the construction will occur throughout Duke Energy Kentucky’s
5 electric and natural gas service territory by providing a Metering Upgrade to
6 customers. The Metering Upgrade solution is solely for the benefit of Duke
7 Energy Kentucky and its customers, and thus will not compete with any other
8 utilities, corporations or persons.

9 **Q. HAS THE COMPANY PROVIDED “MAPS TO SUITABLE SCALE**
10 **SHOWING THE LOCATION OR ROUTE OF THE PROPOSED**
11 **CONSTRUCTION OR EXTENSION, AS WELL AS THE LOCATION TO**
12 **SCALE OF LIKE FACILITIES OWNED BY OTHERS LOCATED**
13 **ANYWHERE WITHIN THE MAP AREA WITH ADEQUATE**
14 **IDENTIFICATION AS TO THE OWNERSHIP OF THE OTHER**
15 **FACILITIES”?**

16 A. Yes. Duke Energy Kentucky has provided a detailed map of its service territory
17 showing the deployment plan for its electric and natural gas territories as part of
18 its Application, reflected in Exhibit 2 to the Company’s Application. The
19 construction consists of upgrading the metering equipment throughout the
20 Company’s service territory. The Metering Upgrade will only impact Duke
21 Energy Kentucky’s metering equipment for its customers.

1 Q. HAS THE COMPANY PROVIDED “PLANS AND SPECIFICATIONS
2 AND DRAWINGS OF THE PROPOSED PLANT, EQUIPMENT, AND
3 FACILITIES”?

4 A. Yes. Exhibits 3 and 4 to the Company’s Application contain the specifications of
5 the Metering Upgrade proposed to be constructed and installed throughout the
6 Company’s service territory. Mr. Schneider fully explains and supports this
7 information in his direct testimony.

8 Q. HAS THE COMPANY DESCRIBED “THE MANNER IN DETAIL IN
9 WHICH THE APPLICANT PROPOSES TO FINANCE THE PROPOSED
10 CONSTRUCTION OR EXTENSION”?

11 A. Yes. As explained by Ms. Laub, Duke Energy Kentucky proposes to finance the
12 Metering Upgrade through its ongoing operations. Exhibit 1 to the Company’s
13 Application includes a financial exhibit supporting the Company’s current
14 financial position.

15 Q. HAS THE COMPANY PROVIDED “AN ESTIMATED ANNUAL COST
16 OF OPERATION AFTER THE PROPOSED FACILITIES ARE PLACED
17 INTO SERVICE”?

18 A. Yes. Mr. Schneider supports a cost-benefit analysis for the Company’s Metering
19 Upgrade solution, including the estimated cost for full deployment, the annual
20 ongoing cost of operation, and the estimated benefits that can be achieved once
21 full deployment and operation is achieved.

VI. CONCLUSION

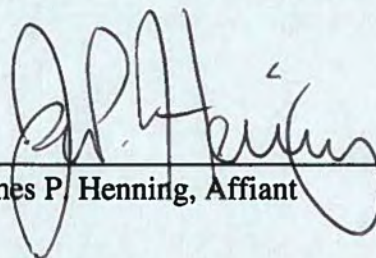
1 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

2 **A. Yes.**

VERIFICATION

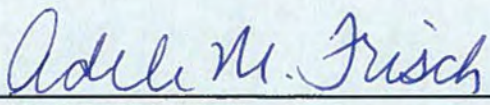
STATE OF OHIO)
) **SS:**
COUNTY OF HAMILTON)

The undersigned, James P. Henning, State President of Duke Energy Kentucky, Inc. and Duke Energy Ohio, Inc., being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony are true and correct to the best of his knowledge, information and belief.



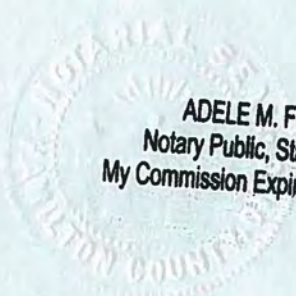
James P Henning, Affiant

Subscribed and sworn to before me by James P. Henning on this 25th day of April, 2016.



NOTARY PUBLIC

My Commission Expires: 1/5/2019



ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2019