# COMMONWEALTH OF KENTUCKY

# BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

JOINT APPLICATION OF LOUISVILLE GAS)AND ELECTRIC COMPANY AND KENTUCKY)UTILITIES COMPANY FOR REVIEW,)MODIFICATION, AND CONTINUATION OF)EXISTING, AND ADDITION OF NEW,)DEMAND-SIDE MANAGEMENT AND)ENERGY-EFFICIENCY PROGRAMS)

2014-00003

CASE NO.

### **Advanced Metering Systems Update Report**

On November 14, 2014, the Commission issued an Order in Case No. 2014-00003<sup>1</sup> approving an Advanced Metering Systems with Opt-In service offering ("AMS Opt-In") for up to 5,000 Louisville Gas and Electric Company ("LG&E") and up to 5,000 Kentucky Utilities Company ("KU") (collectively "the Companies') residential and small commercial customers. The goal is to provide customers who desire to have consumption data more frequently than once a month an opportunity to request and receive an advanced meter, which will present individual daily consumption through a website. Advanced meters will be installed for customers who elect to participate. A participating customer's consumption will be captured, communicated and stored. Customers will be able to monitor their hourly usage through the web within two business days. The program does not include in-home devices.

Additionally, the Commission ordered, "The Companies shall prepare a report for the pilot AMS program through June 30, 2015, which should be filed with the Commission by July 31, 2015. Thereafter, an annual report providing similar information should be filed beginning on December 31, 2015, and due by January 31, 2016, and again through December 31, 2018, due by January 31, 2016. The reports should provide the number of participants by company, measurable energy savings, the information learned, any problems and the resolution, and whether the information was accessible to the participants in a 24- to 48-hour period."<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> Case No. 2014-00003, Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of New Demand-Side Management and Energy Efficiency Programs (Ky. PSC, Nov. 14, 2014).

<sup>&</sup>lt;sup>2</sup> Id. at 32.

#### **History & Status**

In April 2014, the Companies issued a Request For Proposal ("RFP") to solicit proposals for 1) advanced electric meters; 2) network connectivity options for dispersed deployment of meters; and 3) a data presentment solution that allows customer's access to daily electricity consumption through a website. The Companies received four RFP responses, and they were evaluated on a number of criteria including 1) a flexible solution to meet the needs of RF mesh and cellular communications to meters, 2) integration into the Companies' existing back office systems, and 3) the physical and cyber security aspects of the proposed solution. Two vendors were selected as being able to meet the Companies' requirements for AMS Opt-In, and upon receipt of the Commission's Order in November 2014, the Companies began contract negotiations with these vendors to deliver the required systems and infrastructure. Contracts were awarded to these two vendors in April 2015: Landis+Gyr and Itron. Landis+Gyr will provide its Gridstream RF mesh network which will be deployed in areas of dense customer adoption in the LG&E and KU service territories, and in areas where cellular coverage may not be available. Itron will provide its TOTALGrid hosted advanced metering solution. The Companies will deploy Itron cellular meters in areas not covered by the Landis+Gyr Gridstream network.

An overview of the architecture design of the advanced metering infrastructure is shown below in Figure 1. This graphic illustrates the two communications infrastructure designs (RF Mesh for Landis+Gyr and Cellular for Itron), and customer access to the online web portal through their password-protected online account ("MyAccount").



# FIGURE 1- SYSTEM ARCHITECTURE DESIGN

## **Assessing Customer Interest**

In January 2015, the Companies posted new web content (see Figures 2 and 3) for the Advanced Meter Service on the Companies' corporate website. The purpose of the content was to help satisfy customers' interests and general inquiries about the AMS Opt-In service. It allowed them to provide their name, address, and contact information for periodic updates during the interim period while customer enrollment processes and technology deployment project plans were being developed.







### Saving Energy & Money

- Advanced Meter Service
  - I want more information
- Children's Energy Education
- = Commercial Demand Conservation
- Commercial Rebates
- Commercial Energy Analysis
- Demand Conservation
- = Fridge and Freezer Recycling
- = Home Energy Analysis
- Home Energy Rebates
- Tips and Resources
- WeCare Program



available to customers by fall of 2015. If you would like to receive updates and be notified when this service is available in your area, please click the "I want more information" button.

#### **Eligibility requirements**

The advanced meter service will be limited to the first combined 5,000 LG&E and 5,000 KU residential electric (RS rate) and small commercial (GS rate) customers who sign up for this service. This is a voluntary service available at no additional cost.

I want more information





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PPL Corporation
Privacy policy
Terms of use
Customer Bill of Rights
Mailing addresses
Contractor Health & Safety
MyHR
Investor Information
Regulated Fuel Blds
Employee Resources

#### IGE Residential 502-589-1444 800-331-7370 Business 502-627-3313

800-331-7370



Why do you need my

View More

service address?

Contact Us Online

800-383-5582

Residential 800-981-0600 Business 859-307-1200

FIGURE 2 – AMS OPT-IN INFORMATION ON THE LG&E-KU WEBSITE







Confirm Email \*

Zip \*

State \*

- Select - 🗸

- Home Energy Rebates
- Tips and Resources
- WeCare Program

Education

Analysis

Recycling

Are you an LG&E or KU customer?\*

#### PERMISSIONS

- Select -

I agree to the terms of use and privacy policy.\*



Email \*

Address \*

City \*



FIGURE 3 – AMS OPT-IN INFORMATION ON THE LG&E-KU WEBSITE

As of June 30, 2015 there have been 270 customer inquiries about the AMS Opt-In service (see Figure 4). The Companies use customer-provided address information to plot customer locations in Google Earth to aid in network deployment planning.



# FIGURE 4 – CUSTOMER INTEREST IN AMS OPT-IN

Interest in AMS Opt-In is roughly evenly distributed by company as seen in the graph below.



AMS Opt-In is available to customers in rate classes RS (Residential) and GS (small commercial), and the distribution by rate class is depicted in the graph below.



## Customer Enrollment

In June 2015, the Companies launched the AMS Opt-In enrollment website to formally gain customer approval to have an advanced meter installed at their premise. Customers that wish to enroll in the AMS Opt-In service offering log in to their online account and complete the enrollment process (see Figures 5, 6 and 7). All customers that indicated interest in AMS Opt-In and requested periodic updates were sent an e-mail requesting that they formally enroll in the service via MyAccount. As of June 30, 2015 there have been 53 customers enroll in AMS Opt-In. The enrollment process establishes customer access to the web portal where they may view interval data of electricity usage, and includes a customer survey that the Companies will use as a tool to assess customer behavior impacts of the AMS Opt-In service. The enrollment process also includes automatic notification of the Companies' metering and field services departments to facilitate the installation of advanced meters at customers' premises.



My Profile	Sign Out
	- 0.

Select Another Account		Advanced Meter Service
My Bill		
Account Overview		→ What is the Advanced Meter Service?
Payment Programs		The Advanced Meter Service is a voluntary service available to residential electric (RS rate) and small commercial electric (GS rate) customers at no additional cost. It gives customers the detailed information they can use to better understand electricity usage in their home or business
Energy Efficiency My EE Overview	_	With online access to usage information within two business days, customers can take a closer look to see when they are using energy.
Demand Conservation		Customers eligible for this service can now enroll in this program to request an advanced meter. Our goal is to have the Advanced Meter Service available to customers this fall. At that time, we will begin installing meters.
Commercial Rebate		Enroll Now
Green Energy Rebate Program	s	
Advanced Meter Service		

# FIGURE 5 – CUSTOMER ENROLLMENT WEBSITE FOR AMS OPT-IN





Select Another Account	Advanced Meter Service				
My Bill ~	Acct No:	e)		KY 40	
Overview	You may enroll for the Advanced Meter Service by providing some basic information below.				
Payment 🗸	Account Information Contact Information			1	
Programs			Fields marked with	an asterisk (*) are required	
Energy Efficiency 🗸	Name:	Para de la Para	*Name:	Parameter and the	
My EE Overview Demand Conservation	Phone Number:	(502)	*Phone Number:		
Commercial Rebate	Phone Extension:		Phone Extension:		
Green Energy Rebate Programs	Street:	NUMBER OF	Street:	221 002103 1002	
Advanced Meter Service	City:	LINDYLA	City:	Landred at	
Report Outages	State:	кү	State:	KY	
Service Requests 🛛 🗸	Zip Code:	400	Zin Code:	40	
Moving? ~	Email Address:	.com	Email Address:	e com	
Meter Reading 🗸 🗸			Enfan Audress.	.com	
Rate Comparison					

FIGURE 6 – CUSTOMER ENROLLMENT WEBSITE FOR AMS OPT-IN





# FIGURE 7 – CUSTOMER ENROLLMENT WEBSITE FOR AMS OPT-IN

As part of the enrollment process, customers are asked to complete an online survey. The survey solicits responses regarding the customer's property and appliances, energy usage habits or patterns, and how they may use the information provided by the advanced meter. Figures 8, 9 and 10 below are illustrative of the questions included in the survey, and they may be modified in the future as the Company learns more about customers' behaviors and to allow for refinement of research.

My Profile Sign Out

Account v Overview						
Payment ~ Programs	Please tell us more about how you plan to use your advanced meter. How often do you plan to review your meter usage data?					
Energy Efficiency 🗸	© Daily	Daily				
My EE Overview	Weekly	Weekly				
Demand Conservation	Monthly	Monthly				
Commercial Rebate	<ul> <li>Handful of times a year</li> <li>Don't know</li> </ul>	> Handful of times a year > Don't know				
Green Energy	For each of the following, please ind	licate how likely	you are to use yo	ur meter usa	ge data for this p	ourpose?
Rebate Programs	Check one per row					
Advanced Meter Service		Not at all likely	Somewhat likely	Likely	Very likely	Extremely likely
Report Outages	Review periodically for general awareness	©	O	©	©	O
iervice Requests 🗸	Identify opportunities for energy savings on my bill	0	0	$\odot$	0	$\odot$
woving? ~	Improve energy efficiency	O	O	O	O	O
Neter Reading 🗸 🗸	Change behavior related to energy use	0	0		0	O
Landlord Agreement	How many people at your property v	will likely review	the usage data?			
My Profile 🗸 🗸 🗸 🗸 🗸 🗸	◎ 2					
What's New	O 3 or more					
Sign Out						

FIGURE 8 - CUSTOMER ENROLLMENT SURVEY

Plea	ase tell us more about your property and your appliances.
Do	you own or rent your property?
(	D Rent
(	D Own
In w	vhat year was your property built? year
Wha	at is your property's exterior material? Check all that apply
[	Siding
	Brick
	Stucco
[	Other
Hov	v many floors do you have at your property (excluding basements)?
(	٥ 1
(	D 2
(	D 3 or more
Doe	s your property have a basement?
(	D Yes
(	D No
Plea last	ase indicate which of the following energy efficiency improvements you have made at your property within th 5 years. Check all that apply (indicate number if applicable)
	Added insulation
	Installed energy efficient windows
[	Installed energy efficient doors
	Updated appliances with energy efficient models
	Installed programmable thermostat
[	Installed CFL light bulbs
	Installed LED light bulbs
1	None



Do you have a p	programmable thermostat?
Yes	
© No	
Do you routinel	y adjust the temperature setting?
Yes	
© No	
Fo limit energy <i>Check one</i>	usage, how often is the thermostat set to a temperature which you consider uncomfortable?
Daily	
Weekly	
On occas	ion
Only whe	n I am not there
Never	
s completes th	e survey. Thank you for your participation.
s completes en	e sarvey. mank you for your participation.

FIGURE 10 - CUSTOMER ENROLLMENT SURVEY

# System Design & Project Planning

Following the Commission's November 14, 2014 Order, the Companies entered contract negotiations with Landis+Gyr and Itron. Concurrently with the contract negotiations, week-long project planning sessions were held with each vendor. The project planning sessions resulted in detailed project plans for material lead times, IT security assessment, and build-out of network communications infrastructure and other necessary systems for the AMS Opt-In service offering. Numerous internal resources including IT systems development, IT security, distribution operations, substation operations, corporate communications, and customer service are involved in the design and implementation of the necessary systems.

The design process for the RF Mesh network infrastructure includes site surveys and field surveys of proposed substation, communication towers and distribution infrastructure locations. When suitable locations are finalized and approved, construction begins for the installation of communications equipment. There are 31 substation and communication tower locations, and 233 distribution infrastructure locations included in the Companies' RF Mesh design.

The Companies will deploy a small number of meters as part of a pilot test of the network system, meters, and customer web portal ("Phase 0"). A preliminary deployment schedule is as follows:

Jun 2015	Customer enrollment launch
Sep 2015	Phase 0 meter deployment for systems testing
Oct/Nov 2015	Begin customer meter deployments

### Lessons Learned to Date

The nature of the AMS Opt-In service is that any residential or small commercial customer located anywhere in the LG&E and KU service territories may elect to participate. As such, the build-out of the necessary systems to provide the service requires careful, coordinated planning and collaboration with the vendors to provide the service in the most efficient manner. For example, the build out of the RF mesh communications network (see Figure 1) first requires identifying utility infrastructure (*e.g.*, substations, communication towers, utility poles, etc.) where RF mesh equipment (Collectors and Grid Routers) will be installed. Anticipating areas where there may be dense customer participation levels is a key input into the design. This requires site surveys and subsequent design discussions with the vendors to ensure adequate RF mesh network coverage. Similarly, locations outside of the RF mesh network coverage require coordination with cellular carriers to ensure adequate cellular coverage. The use of geographical tools and information is very valuable in the development of RF mesh network design. Understanding customer interest and their locations will continue to be useful as detailed network deployment plans are developed.

An additional consideration in the development of the design and development of necessary systems is lead time on equipment. Several components are required to successfully implement the AMS Opt-In service, and those components have differing lead times. This requires planning and coordination with vendors to ensure delivery, testing, and deployment occurs in the most efficient manner possible. The Companies conduct regular weekly project planning sessions with the vendors to coordinate the various activities required in making the AMS Opt-In service operational.

## Problems & Resolutions

As of the date of this report, no specific problems have occurred. In subsequent reports any problems and their resolution will be reported in this section.

## Subsequent Updates

The next report through December 31, 2015 is due to the Commission by January 31, 2016. Subsequent reports will grow in detail as customers enroll in the AMS Opt-In service, the Companies deploy the Landis+Gyr RF mesh network and implement the Itron TOTAL Grid hosted advanced metering solution, and feedback on customers' experiences with the web portal are documented.