COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF KENTUCKY UTILITIES COMPANY FOR AN ADJUSTMENT OF ITS ELECTRIC RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCREDIT	))))))))))	**CASE NO. 2020-00349**

APPLICATION

Applicant, Kentucky Utilities Company ("KU"), pursuant to KRS Chapter 278 and the applicable sections of 807 KAR Chapter 5, hereby applies to the Kentucky Public Service Commission ("Commission") for authority to adjust its electric rates and to establish an Economic Relief Surcredit, a Certificate of Public Convenience and Necessity ("CPCN") for the full deployment of Advanced Metering Infrastructure ("AMI") across its Kentucky service territory, and approval of certain regulatory and accounting treatments. KU's Notice of Intent to File a Rate Application, required by 807 KAR 5:001, Section 16(2), stated that the Application would be supported by a fully forecasted test period, was filed with the Commission on October 23, 2020, was provided to the Attorney General of Kentucky, Office of Rate Intervention, and is attached hereto at Tab 7 of the Filing Requirements.

In support of its Application, KU states as follows:

1. The full name and mailing address of KU are: Kentucky Utilities Company, One Quality Street, Lexington, Kentucky 40507. KU may be reached by electronic mail at the electronic mail addresses of its counsel set forth below.

2. KU is a utility engaged in the electric business. KU generates and purchases electricity, and distributes and sells electricity at retail in the following counties in Central, Northern, Southeastern, and Western Kentucky:

Adair	Edmonson	Jessamine	Ohio
Anderson	Estill	Knox	Oldham
Ballard	Fayette	Larue	Owen
Barren	Fleming	Laurel	Pendleton
Bath	Franklin	Lee	Pulaski
Bell	Fulton	Lincoln	Robertson
Bourbon	Gallatin	Livingston	Rockcastle
Boyle	Garrard	Lyon	Rowan
Bracken	Grant	Madison	Russell
Bullitt	Grayson	Marion	Scott
Caldwell	Green	Mason	Shelby
Campbell	Hardin	McCracken	Spencer
Carlisle	Harlan	McCreary	Taylor
Carroll	Harrison	McLean	Trimble
Casey	Hart	Mercer	Union
Christian	Henderson	Montgomery	Washington
Clark	Henry	Muhlenberg	Webster
Clay	Hickman	Nelson	Whitley
Crittenden	Hopkins	Nicholas	Woodford
Daviess			

3. KU was incorporated in Kentucky on August 17, 1912, and in Virginia on November 26, 1991 (and effective as of December 1, 1991), and is in good corporate standing in both states. Copies of KU's good standing certificates from the Kentucky Secretary of State and the Virginia State Corporation Commission are attached in Tab 1 of the Filing Requirements. KU conducts business in Virginia under the name "Old Dominion Power Company." A copy of its certificate of assumed name from the Virginia State Corporation Commission is attached at Tab 3 of the Filing Requirements.

4. This Application constitutes notice to the Commission pursuant to KRS 278.180(1) of the changes proposed to be made to KU's electric rates. KU's Statutory Notice is attached to this Application. KU is filing its Certificate of Notice to the public of the

changes in its tariffs that result in increased rates, which Certificate is attached hereto at Tab 6 of the Filing Requirements.

5. Pursuant to 807 KAR 5:001 Section 8, on October 23, 2020, KU filed with the Commission notice of its intent to use electronic filing procedures in this proceeding. Copies of all orders, pleadings, and other communications related to this proceeding should be directed to:

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Vice President – State Regulation and Rates
LG&E and KU Services Company
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Adjustment of Electric Rates

6. In accordance with the provisions of KRS 278.180 and 278.190, KU requests Commission approval of a change in existing rates, terms, conditions, and tariffs for electric

service. KU proposes to change its existing rates and tariffs to those rates and charges set forth in the proposed tariff attached hereto at Tab 4 of the Filing Requirements. A comparison of the present and proposed rates and charges is attached hereto at Tab 5 of the Filing Requirements. KU does not currently have any special contracts for retail electric service that contain rates not available under KU's tariff. KU has a special-contract customer that KU bills under Rate Retail Transmission Service except that the customer is not billed for the following components: Energy Charge or Fuel Adjustment Clause, and Demand-Side Management Cost Recovery Mechanism. KU also has a special contract customer served under Fluctuating Load Service Rate Schedule and Retail Transmission Service Rate Schedule who is billed in a different manner for monthly fuel charges under the Fuel Adjustment Clause. KU does not propose any changes to these special contracts. The proposed adjustments in electric rates will result in an increase in revenues of approximately $170.1 million or 10.4 percent per year for the forecasted test period compared to the operating revenues for the forecasted test period under existing electric rates.

7. The monthly residential electric bill increase due to the proposed electric base rates will be 10.67 percent, or approximately $12.85, for a customer using 1,120 kWh of electricity (the average monthly consumption of a KU residential customer).

Support for Change in Existing Rates and Tariffs

8. In accordance with 807 KAR 5:001 Section 16(1)(b)(1), KU states that the requested change in existing rates, terms, conditions, and tariffs is required to enable KU to continue providing safe and reliable service to its customers, and to afford KU a reasonable opportunity to earn a fair return on its investment property used to provide that service while attracting necessary capital at reasonable rates. KU's current rates and tariffs are inadequate

for those purposes. Therefore, as explained in more detail in the verified testimony and exhibits identified below, the requested change in existing rates is required.

9. KU supports its request for a change in its existing rates and tariffs for electric service with the verified testimony and exhibits of the following persons:

- Paul W. Thompson, President and Chief Executive Officer
- Kent W. Blake, Chief Financial Officer
- Lonnie E. Bellar, Chief Operating Officer
- David S. Sinclair, Vice President – Energy Supply and Analysis
- John K. Wolfe, Vice President – Electric Distribution
- Eileen L. Saunders, Vice President – Customer Services
- Gregory J. Meiman, Vice President – Human Resources
- Daniel K. Arbough, Treasurer
- Adrien M. McKenzie, President, FINCAP, Inc.
- Christopher M. Garrett, Controller
- John J. Spanos, President, Gannett Fleming, Inc.
- Robert M. Conroy, Vice President – State Regulation and Rates
- William Steven Seelye, Managing Partner, The Prime Group LLC

10. KU further supports its request for a change in its existing rates and tariffs for electric service with the following exhibits complying with the requirements of 807 KAR 5:001, Sections 14, 16, and 17:

Tab	Filing Requirement	Description
1	807 KAR 5:001 Section 14(1)	Name, Address, Facts
1	807 KAR 5:001 Section 14(2)	Corp. - Good Standing
1	807 KAR 5:001 Section 14(3)	LLC - Organized, Good Standing
1	807 KAR 5:001 Section 14(4)	LP - Agreement
2	807 KAR 5:001 Section 16(1)(b)1	Reason for Rate Adjustment
3	807 KAR 5:001 Section 16(1)(b)2	Certificate of Assumed Name

Tab	Filing Requirement	Description
4	807 KAR 5:001 Section 16(1)(b)3	Proposed Tariff
5	807 KAR 5:001 Section 16(1)(b)4	Proposed Tariff Changes
6	807 KAR 5:001 Section 16(1)(b)5	Statement about Customer Notice
7	807 KAR 5:001 Section 16(2)	Notice of Intent
8	807 KAR 5:001 Section 16(6)(a)	Financial Data
9	807 KAR 5:001 Section 16(6)(b)	Forecasted Adjustments
10	807 KAR 5:001 Section 16(6)(c)	Capital, Net Investment Rate Base
11	807 KAR 5:001 Section 16(6)(d)	No Revisions to Forecast
12	807 KAR 5:001 Section 16(6)(e)	Alternative Forecast
13	807 KAR 5:001 Section 16(6)(f)	Reconciliation of Rate Base and Capital
14	807 KAR 5:001 Section 16(7)(a)	Testimony
15	807 KAR 5:001 Section 16(7)(b)	Capital Construction Budget
16	807 KAR 5:001 Section 16(7)(c)	Factors Used in Preparing Forecast
17	807 KAR 5:001 Section 16(7)(d)	Annual and Monthly Budget
18	807 KAR 5:001 Section 16(7)(e)	Statement of Attestation
19	807 KAR 5:001 Section 16(7)(f)	Major Construction Projects
20	807 KAR 5:001 Section 16(7)(g)	Other Construction Projects
21	807 KAR 5:001 Section 16(7)(h)	Financial Forecasts
22	807 KAR 5:001 Section 16(7)(h)(1)	Operating Income Statement
23	807 KAR 5:001 Section 16(7)(h)(2)	Balance Sheet
24	807 KAR 5:001 Section 16(7)(h)(3)	Statement of Cash Flows
25	807 KAR 5:001 Section 16(7)(h)(4)	Revenue Requirement
26	807 KAR 5:001 Section 16(7)(h)(5)	Load Forecast
27	807 KAR 5:001 Section 16(7)(h)(6)	Access Line Forecast (Telephone)
28	807 KAR 5:001 Section 16(7)(h)(7)	Mix of Generation (Electric)
29	807 KAR 5:001 Section 16(7)(h)(8)	Mix of Gas Supply (Gas)
30	807 KAR 5:001 Section 16(7)(h)(9)	Employee Level
31	807 KAR 5:001 Section 16(7)(h)(10)	Labor Cost Changes
32	807 KAR 5:001 Section 16(7)(h)(11)	Capital Structure Requirements
33	807 KAR 5:001 Section 16(7)(h)(12)	Rate Base
34	807 KAR 5:001 Section 16(7)(h)(13)	Gallons of Water Projected (Water)
35	807 KAR 5:001 Section 16(7)(h)(14)	Customer Forecast (Gas, Water)
36	807 KAR 5:001 Section 16(7)(h)(15)	Sales Volume Forecasts (Gas)
37	807 KAR 5:001 Section 16(7)(h)(16)	Toll and Access Forecast (Telephone)
38	807 KAR 5:001 Section 16(7)(h)(17)	Detailed Explanation of Other Info
39	807 KAR 5:001 Section 16(7)(i)	FERC Audit Reports
40	807 KAR 5:001 Section 16(7)(j)	Stock or Bond Prospectuses
41	807 KAR 5:001 Section 16(7)(k)	FERC Form 1, 2
42	807 KAR 5:001 Section 16(7)(l)	Annual Reports to Shareholders
43	807 KAR 5:001 Section 16(7)(m)	Current Chart of Accounts
44	807 KAR 5:001 Section 16(7)(n)	Monthly Managerial Reports
45	807 KAR 5:001 Section 16(7)(o)	Monthly Budget Variance Reports
46	807 KAR 5:001 Section 16(7)(p)	SEC Reports (10-Ks, 8-Ks, 10-Qs)
47	807 KAR 5:001 Section 16(7)(q)	Independent Auditor’s Annual Opinion
48	807 KAR 5:001 Section 16(7)(r)	Quarterly Reports to Stockholders

Tab	Filing Requirement	Description
49	807 KAR 5:001 Section 16(7)(s)	Summary of Latest Depreciation Study
50	807 KAR 5:001 Section 16(7)(t)	Computer, Software, Hardware, etc.
51	807 KAR 5:001 Section 16(7)(u)	Affiliate, et. al., Allocations/Charges
52	807 KAR 5:001 Section 16(7)(v)	Cost-of-Service Study
53	807 KAR 5:001 Section 16(7)(w)	Incumbent Local Exchange Carriers
54	807 KAR 5:001 Section 16(8)(a)	Financial Summaries
55	807 KAR 5:001 Section 16(8)(b)	Rate Base Summaries
56	807 KAR 5:001 Section 16(8)(c)	Operating Income Summaries
57	807 KAR 5:001 Section 16(8)(d)	Summary of Income Adjustments
58	807 KAR 5:001 Section 16(8)(e)	Federal & Income State Tax Summaries
59	807 KAR 5:001 Section 16(8)(f)	Summary of Membership Dues, etc.
60	807 KAR 5:001 Section 16(8)(g)	Analyses of Payroll Costs
61	807 KAR 5:001 Section 16(8)(h)	Gross Revenue Conversion Factor
62	807 KAR 5:001 Section 16(8)(i)	Comparative Income Statements, etc.
63	807 KAR 5:001 Section 16(8)(j)	Cost of Capital Summary
64	807 KAR 5:001 Section 16(8)(k)	Financial Data and Earnings Measures
65	807 KAR 5:001 Section 16(8)(l)	Narrative Description of Tariff Changes
66	807 KAR 5:001 Section 16(8)(m)	Revenue Summary
67	807 KAR 5:001 Section 16(8)(n)	Typical Bill Comparison
68	807 KAR 5:001 Section 17(4)	Customer Notice Information
68	807 KAR 5:001 Section 17(1)	Sample Notices Posted
68	807 KAR 5:001 Section 17(2)	Method of Customer Notice
68	807 KAR 5:001 Section 17(3)	Proof of Customer Notice

11. As authorized by KRS 278.192(1), the Application for a general adjustment of electric rates is supported by a twelve-month fully forecasted test period in accordance with 807 KAR 5:001, Section 16(1)(a)2 with the forecasted test period ending June 30, 2022. The Application is supported by a base period consisting of the twelve (12) months ending February 28, 2021. As authorized by KRS 278.192(2), this base period begins not more than nine (9) months prior to the date of the filing of this Application, and is a period consisting of not less than six (6) months of historical data and not more than six (6) months of estimated data. Within forty-five (45) days after the last day of the base period, KU will file the actual results for the estimated months of the base period as required by KRS 278.192(2)(b).

12. In support of its Application for a general adjustment of rates supported by a fully forecasted test period, KU has presented its financial data for the forecasted period in the

form of pro forma adjustments to the base period, has limited the forecasted adjustments to the forecasted period, and has based capitalization and net investment rate base on a thirteen-month average for the forecasted period, all as shown in Tabs 8, 9, and 10.

13. The testimony and exhibits to the application demonstrate the rates, terms, conditions, and tariffs proposed for electric service are fair, just, and reasonable under KRS 278.030.

Reasons for Increase in Revenue Requirements

14. Based upon KU's current and projected operations, KU's existing rates will produce revenues in the forecasted test period that are approximately $170.5 million less than those necessary to meet KU's reasonable operating expenses and provide a reasonable rate of return. This revenue deficiency exists despite aggressive efforts to increase operational efficiencies and reduce costs. It is driven by necessary investments to provide safe and reliable service to KU customers. KU has experienced a $1.16 billion increase in Kentucky base rate adjusted capitalization in this proceeding relative to that used to set base rates in its last rate case proceeding. After removing the $0.72 billion capitalization associated with Environmental Cost Recovery projects, which are simply being moved from that mechanism to base rates with no net revenue increase, KU has experienced an approximately $0.44 billion increase in capitalization that translates into a $43.4 million increase in base revenue requirement. The larger Plant in Service balances increase annual depreciation expense, or recovery of investment by $15.5 million and property taxes by $4.2 million. Recommended changes in depreciation rates for KU's remaining coal-fired generation further increase KU's revenue requirement by $48.3 million. Operation and maintenance expenses have or are expected to increase by $38.3 million. Additionally, KU has experienced a $15.6 million

reduction in load and other net revenues, and an $11.5 million reduction in revenue as a result of the expiration of the refined coal agreements at its Ghent and Trimble County facilities.

Economic Relief Surcredit

15. KU proposes to provide customers a one-year surcredit through the Economic Relief Surcredit Adjustment Clause, which will provide a total surcredit of $11.9 million to KU customers. The surcredit will be applied to customers' bills during the first year that the base rates in this proceeding are in effect and will serve to mitigate the increase. The items to be returned through the surcredit include the remaining fees KU secured for its customers through its negotiation of refined coal facility agreements at the Ghent and Trimble County generation plants and its remaining unprotected excess accumulated deferred income taxes (ADIT) balances. The total surcredit amount will be distributed on a per-kWh basis over twelve months, with a one-month true-up charge or credit in the fifteenth month to ensure accurate distribution of the total surcredit amount. The design of this surcredit is comparable to the surcredit approved in Case No. 2018-00034 to distribute the benefits of the Tax Cuts and Jobs Act.[1] The surcredit is intended to ease the burden of the proposed increase for one year as the local economy recovers from the impact of the COVID-19 pandemic by more quickly returning certain regulatory liabilities to customers than currently required. The details of the surcredit and resulting tariff provisions are discussed in the testimonies of Mr. Blake and Mr. Conroy.

Certificate of Public Convenience and Necessity for AMI Deployment

16. Pursuant to KRS 278.020(1) and 807 KAR 5:001, Section 15(2), KU and Louisville Gas and Electric Company ("LG&E") ("the Companies") request a CPCN to deploy AMI infrastructure within their service territories. The proposed deployment is expected to

[1] *Kentucky Industrial Utility Customers, Inc., Complainant, v. Kentucky Utilities Company and Louisville Gas and Electric Company, Defendants*, Case No. 2018-00034, Order (Ky. PSC Mar. 20, 2018).

begin in late 2021 and to be completed in March 2026. The AMI deployment includes the replacement of the approximately 957,000 electric meters, of which approximately 538,000 of these replaced electric meters are in KU's Kentucky service territory.[2] The AMI electric meters that the Companies propose to deploy will have two-way communications capabilities that will communicate usage and other relevant data to the Companies at regular intervals and have the ability to receive information, such as software upgrades and requests to provide meter reads in real time. The AMI electric meters will also have remote service switching capabilities. The Companies' estimated capital expenditure for the proposed deployment is $302.5 million.

17. KU supports its request for a CPCN, including the information required by 807 KAR 5:001, Section 15(2) through the testimonies of Mr. Bellar, Mr. Wolfe, Ms. Saunders, and Mr. Conroy and the exhibits thereto, as well as Exhibits 1 through 5 to this Application for which Mr. Bellar is the sponsoring witness.

18. Statement of Public Convenience and Necessity (807 KAR 5:001, Section 15(2)(a)): The Companies have approximately 978,000 electric meters in their Kentucky service areas. Approximately 713,000 of these electric meters are electromechanical meters, are an average age of 32 years, are near obsolescence, and are no longer being manufactured. Each month the Companies must manually read most of their meters and manually provide meter-related services such as connecting and disconnecting meters for service. The proposed AMI infrastructure deployment will achieve several operational efficiencies as well as enhance the present quality of service and provide additional benefits to and options for the Companies'

[2] The proposed deployment also includes the insertion of an AMI module into approximately 337,000 LG&E gas meters located in LG&E electric service areas and the insertion of an encoder receiver transmitter into 11,500 LG&E meters in LG&E's gas-only service areas.

customers. The Companies estimate that the proposed AMI infrastructure deployment is the least cost alternative among several alternatives and will produce for customers over 30 years over $50 million in net present value revenue requirements savings versus the continued use of non-communicating metering equipment. The Companies' analysis is set forth in "Analysis of Metering Alternatives," which is attached to Mr. Bellar's testimony as Exhibit LEB-3. The proposed savings derive from reduction in meter reading and field services costs, avoided meter costs, and fuel savings resulting from the ability to leverage AMI to reduce customers' energy usage by incrementally lowering distribution voltages. Equally important, the proposed deployment will improve service quality and distribution system performance by providing real-time information that can be used to prevent and handle outages, validate restoration, manage voltage, and assess asset loading. The proposed AMI meters will capture more detailed and near real-time energy usage information that will permit customers to become better informed about their usage patterns and behaviors and will enable the Companies to develop and offer new programs and rate options that will potentially lower energy bills and produce greater customer satisfaction. The proposed deployment will also permit the Companies to be more flexible and responsive to customer needs by establishing service more quickly or settling overdue balances. By eliminating the need to manually read meters and manually provide some field services, it will eliminate employee safety concerns associated with those activities.

19. Permits or Franchises (807 KAR 5:001, Section 15(2)(b)): KU is not aware of any permits or franchises it must seek for the meter deployment.

20. Description of Proposed Location for Construction (807 KAR 5:001, Section 15(2)(c)): AMI infrastructure will be deployed throughout KU's Kentucky certified territory.

The deployment will not compete with the facilities of any other utility, but is intended to improve the quality and reliability of the service that KU provides in its service territory. Exhibit 1 to this Application shows the AMI deployment schedule. A map of the Companies' certified territories, which shows the location of the proposed metering deployment, is attached to this Application as Exhibit 2.

21. Area Maps (807 KAR 5:001, Section 15(2)(d)(1)): The meter program will be implemented throughout KU's service area. The required maps showing the service territory where KU proposes to implement the meter program are attached to this Application as Exhibit 2. KU believes the map satisfies 807 KAR 5:001, Section 15(2)(d)(1), but if the Commission finds it does not, KU requests a deviation from the same.

22. Plans and Specifications (807 KAR 5:001, Section 15(2)(d)(2)): Exhibit 3 to this Application contains a diagram of the overall metering systems depicting the interaction of the devices (meters, modules, routers, back office systems, etc.) being deployed as part of the proposed metering deployment. Exhibits 4 and 5 to this Application contain the specifications of the communications network and electric meters to be installed, respectively. KU believes this information satisfies 807 KAR 5:001, Section 15(2)(d)(2), but if the Commission finds it does not, KU requests a deviation from the same.

23. Financing Plans (807 KAR 5:001, Section 15(2)(e)): The total projected capital expenditures for the Companies' AMI infrastructure deployment is $302.5 million. These expenditures will be financed with a combination of new debt and equity. The mix of debt and equity used to finance the project will be determined so as to allow KU to maintain its strong investment-grade credit ratings. The cost details of the AMI infrastructure deployment are

discussed in "Analysis of Metering Alternatives" (Mr. Bellar's Testimony, Exhibit LEB-3) and in Mr. Blake's testimony.

24. Estimated Cost of Operations (807 KAR 5:001, Section 15(2)(f)): The estimated annual operating costs of the full AMI deployment are set forth in "Analysis of Metering Alternatives" (Mr. Bellar's Testimony, Exhibit LEB-3).

Ratemaking Treatment for AMI Deployment

25. KU proposes to defer recovery of the costs related to its AMI investment until the entire project is fully implemented and placed into service, which is projected to be March 2026, and all benefits associated with the AMI implementation are available. It would record its investment in the AMI project as construction work in progress and accrue an allowance for funds used during construction ("AFUDC") for the capital and financing costs during the projected five-year implementation period. It would record as a regulatory liability until its first base rate case following AMI implementation the amount that actual meter reading and field service expenses were less than the forecasted test period level embedded into the base rates awarded in this proceeding. KU would record as a regulatory asset during the implementation period (1) the operating expenses associated with the project implementation and (2) the difference between AFUDC accrued at the Companies' weighted average cost of capital as shown in this Application and that calculated using a strict interpretation of the methodology approved by the Federal Energy Regulatory Commission. Recovery of actual implementation costs would be addressed in KU's first base rate case following implementation. Mr. Blake discusses the proposed ratemaking treatment of AMI implementation costs in his testimony.

26. KU also proposes to establish a regulatory asset for the remaining net book value of its electric meters retired as a result of the Companies' proposed AMI meter deployment. Upon completion of the proposed deployment, the amount of this regulatory asset for the Companies is projected to be approximately $26.8 million. As the proposed retirement of the existing electric meters is an extraordinary and non-recurring expense that will produce savings that fully offset the costs associated with the meters' retirement, the establishment of a regulatory asset account is consistent with prior Commission decisions addressing the deployment of AMI meters. The amortization of this regulatory asset to recover any of the net book value of the replaced meters would not be addressed until the Companies' first base rate case proceeding following AMI implementation. Mr. Blake discusses the proposed establishment of this regulatory asset in his testimony.

27. The proposed ratemaking treatment is a reasonable and appropriate method for addressing the costs of the AMI Project. It will permit the installation of the AMI infrastructure without immediately affecting customer bills. Moreover, as discussed in Mr. Blake's testimony, the Companies expect the amortization of the proposed regulatory assets and liabilities associated with the AMI Project and the savings achieved from the AMI infrastructure will make unlikely any increase in revenue requirements associated with the installation and implementation of AMI infrastructure.

Request for Deviations from Commission Regulations Regarding Meter Inspection and Testing

28. The advanced technology contained in the AMI metering equipment that KU proposes to deploy throughout its territory achieves the safety and reliability objectives that certain Commission regulations pertaining to meter inspection and testing were intended to ensure and eliminates the need for continued compliance with those regulations. To avoid the

requirements that will no longer significantly enhance safety or service reliability and to eliminate the costs associated with these requirements, KU requests that the Commission authorize a deviation from those regulations. Mr. Conroy in his testimony discusses these requests and the cost savings that will result from granting the requested relief.

29. 807 KAR 5:006, Section 7(5). Section 7(5)(a) requires a utility to read each customer's meter at least quarterly except if prevented by reasons beyond its control and excepting customer-read meters subject to Section 7(5)(b). In turn, Section 7(5)(b) requires that a meter be read manually at least once during each calendar year. Commission Staff has previously opined that solid-state metering systems that record meter readings at least daily and transmit such meter readings directly to a utility's central office comply with this regulation without requiring a manual reading.[3] KU therefore requests an order confirming that interpretation and declaring that KU will be in compliance with 807 KAR 5:006, Section 7(5)(a) and (b) even if it does not physically read AMI meters. In the alternative, KU requests a permanent deviation from this regulation because AMI metering equipment will transmit at least daily the same information to KU, eliminating the need to manually read AMI electric meters.

30. 807 KAR 5:006, Section 14(3). This regulation requires a utility to "inspect the condition of its meter and service connections before making service connections to a new customer so that prior or fraudulent use of the facilities shall not be attributed to the new customer." The proposed AMI meters are capable of sensing meter tampering and other defects and transmitting such information to KU. This capability renders physical inspections of meter and service connections unnecessary. Accordingly, KU requests a permanent

[3] Letter from Beth O'Donnell, Executive Director, Kentucky Public Service Commission, to Ron Sheets, President, Kentucky Association of Electrical Cooperatives (Sept. 27, 2006).

deviation from 807 KAR 5:006, Section 14(3) for its AMI meters that allow for remote data communication.[4]

31. 807 KAR 5:006, Section 26(4)(e). Section 26(4)(e) requires an electric utility to inspect its meters at least every two years. An AMI meter provides information on its condition on a daily basis and has systems to promptly alert the utility of tampering or of malfunctions. Once receiving this information, the utility can conduct a physical inspection. This capability eliminates the need for biennial physical inspections. KU estimates that the elimination of this requirement will result in annual savings to the Companies of $300,000, which are in addition to the savings the Companies have projected as resulting from the full AMI deployment. Accordingly, KU requests a permanent deviation from the inspection requirements of 807 KAR 5:006, Section 26(4)(e) for AMI meters.

32. 807 KAR 5:041, Sections 15(3) and 16; 807 KAR 5:006 Section 19. 807 KAR 5:041 Sections 15(3) and 16 require that single-phase electric meters must be tested every eight years or in accordance with a Commission-approved sample-meter testing plan; the Company has such a testing plan, which the Commission approved in Case No. 2005-00276.[5] Because KU proposes to replace all of its existing non-AMI single-phase meters within a five-year period with new AMI equipment, continued testing during this period appears unnecessary. KU therefore requests a deviation from this regulation to suspend testing immediately and to resume testing in accordance with its existing Commission-approved testing plan after

[4] The Commission granted a similar waiver to Duke Energy Kentucky in its AMI proceeding. *See* Case No. 2016-00152, Order at 16-17 (Ky. PSC May 25, 2017).

[5] *The Joint Amended Application of the Utilities: Inter-County Energy Cooperative Corp., Kentucky Power Company, Kentucky Utilities Company, Louisville Gas and Electric Company, Owen Electric Cooperative, Inc., Shelby Energy Cooperative, Inc., and the Union Light, Heat and Power Company for Approval of a Pilot Meter Testing Plan pursuant to 807 KAR 5:041, Sections 13, 15, 16, 17, and 22*, Case No. 2005-00276, Order (Ky. PSC Nov. 10, 2005).

completion of AMI deployment. The Commission has permitted other electric utilities to suspend testing for similar deployments.[6]

Similarly, Section 15(3) requires electric utilities to test metering equipment when removed from service. KU intends during its AMI deployment to remove all existing non-AMI meters and immediately to dispose of the vast majority of the removed meters without testing them. Testing all of the removed meters would cost the Companies approximately $3.3 million and would likely serve little or no purpose, particularly because over the last five years more than 99% of the Companies' electric meters tested have been within +-2%, and of the less than 1% that were fast or slow, 90% were slow and 10% were fast, meaning that less than 0.06% of electric meters tested were fast. Granting this requested waiver would result in saving the $3.3 million that would be necessary to test all the removed meters. Therefore, KU requests a deviation from Section 15(3) to permit KU's proposed meter-testing approach concerning the removed non-AMI meters, with the resumption of full compliance with Section 15(3) after the proposed AMI deployment has been completed.

Finally, the Company requests a deviation from 807 KAR 5:006 Section 19 to the extent it applies to the meters the Company will remove from service as part of its full AMI deployment. The regulation states, "A utility shall make a test of a meter upon written request of a customer if the request is not made more frequently than once each twelve (12) months." On its face, this requirement would appear to apply only to meters still in service, not to meters

[6] *The Application of Big Sandy Rural Electric Cooperative Corporation for Deviation from the Provisions of 807 KAR 5:006, Section 6(5) and 807 KAR 5:041, Section 15(3)*, Case No. 2005-00048, Order (Ky. PSC Apr. 21, 2005) (approving a suspension of meter testing for four years while the AMR program was deployed); *The Application of Owen Electric Cooperative, Inc. for a Deviation from Approved Meter Testing Program*, Case No. 2006-00468, Order (Ky. PSC Dec. 13, 2006) (approving a deviation from its Sample Meter Testing Plan for a period of 3 years during the installation of solid-state meters); *Request of Shelby Energy Cooperative, Inc. for a Temporary Deviation from its Sample Meter Testing Plan*, Case No. 2010-00331, Order (Ky. PSC Aug. 3, 2011) (approving deviation from sample meter testing plan for two years during the installation of an AMI system).

already removed from service. But out of an abundance of caution, the Company asks the Commission to grant the Company a deviation from the entirety of 807 KAR 5:006 Section 19 with regard to all meters the Company removes—and only with regard to the meters it removes—as part of the full AMI deployment; the reasons for the deviation are the same as those given above for the Company's requested deviation from 807 KAR 5:041 Section 15(3) concerning testing of meters removed from service.

Deferral Accounting

33. KU requests the Commission approve its use of an eight-year average of generator outage expenses in its revenue requirement determination. Historical expenses for January 2017 through August 2020 and forecasted expenses for September 2020 through 2024 were utilized to develop the eight-year average outage expense included in the forecasted test year.

34. KU also requests the Commission approve the use of regulatory asset and liability accounting related to generator outage expenses that are greater or less than the eight-year average of KU's generator outage expenses. This regulatory accounting will ensure KU may collect, or will have to return to customers, through future base rates any amounts that are above or below the eight-year average embedded in the electric revenue requirement in this proceeding. This methodology is the same methodology set forth in the Stipulation and Recommendation in KU's 2016 rate case proceeding and approved by the Commission.[7] As of June 30, 2021, KU forecasts a $37.6 million jurisdictional regulatory asset associated with generator outage expense from the 2018 base rate case. It proposes to amortize this amount over an eight-year period consistent with the 2018 base rate case with amortization beginning

[7] *Electronic Application of Louisville Gas and Electric Company for an Adjustment of its Electric and Gas Rates and for Certificates of Public Convenience and Necessity*, Case No. 2016-00371, Order (Ky. PSC June 22, 2017).

when new base rates take effect. As of June 30, 2021, KU forecasts a $2.6 million remaining jurisdictional regulatory asset associated with generator outage expense from the 2016 base rate case. It proposes to amortize this remaining balance over a six-year period (eight-year amortization period less 2 years of amortization resulting from the 2018 rate case) when new base rates take effect. Mr. Garrett discusses this proposal in his testimony.

Removal of Projects from Environmental Cost Recovery Mechanism

35. KU proposes to eliminate KU Projects 28-31 and 34-38 (from KU's 2009, 2011, and 2016 ECR Plans) from its ECR mechanism and monthly filings on a going-forward basis. These projects are completed and in service or will be before the end of the test year and their costs are mostly already recovered in base rates through a series of "roll-ins." Their elimination will simplify the oversight and administration of the KU's ECR mechanism. KU proposes to recover the revenue requirements for the environmental compliance rate base associated with these projects through base rates and to continue to recover the revenue requirements of the remaining environmental compliance rate base through its ECR mechanism.

Depreciation Rates

36. In support of this Application, KU submits Mr. Spanos's testimony and the depreciation study he prepared at KU's request. Maintenance of sound depreciation rates requires periodic review of those rates and nearly five years have passed since a study was last performed for KU. Mr. Spanos recommends KU's continued use of the Average Service Life and remaining life basis methodology of depreciation, and KU agrees with that recommendation. His study and recommendations include revised life and salvage parameters based on updated historical information, industry benchmarks, and site visits to KU's facilities.

WHEREFORE, Kentucky Utilities Company respectfully requests the Kentucky Public Service Commission to enter an order:

1. Approving the revised tariff sheets for electric service at Tab 4 of the Filing Requirements;

2. Approving rates to reflect a revenue increase of $170.1 million for KU's operations;

3. Approving KU's proposed Economic Relief Surcredit;

4. Granting a CPCN for the full deployment and implementation of AMI infrastructure in KU's Kentucky service territory;

5. Authorizing KU to defer recovery of AMI Project investment until the entire project is fully implemented, to record investment in the AMI Project as construction work in progress, and to accrue an allowance for funds used during construction for the capital and financing costs during the projected five-year implementation period;

6. Authorizing KU to record a regulatory liability until its first base rate proceeding following implementation for the excess of forecasted test period meter reading and field service expenses embedded in base rates approved in this proceeding over actual meter reading and field expenses;

7. Authorizing KU to record a regulatory asset during the implementation period composed of operating expenses associated with the project implementation and the difference between AFUDC accrued at the Companies' weighted average cost of capital as shown in this Application and that calculated using a strict interpretation of the methodology approved by the Federal Energy Regulatory Commission;

8. Authorizing KU to establish a regulatory asset to reflect the remaining net book value of the electric meters that are retired as a result of the full AMI deployment;

9. Declaring KU's use of AMI to measure and monitor its customers' electricity use satisfies the meter reading requirements of 807 KAR 5:006, Section 7(5), or in the alternative authorizing KU to deviate from the requirement of 807 KAR 5:006, Section 7(5), when a customer's usage is measured and monitored by an AMI meter;

10. Authorizing KU to:

a. Permanently deviate from 807 KAR 5:006, Section 14(3) for its AMI meters that allow for remote data communication;

b. Permanently deviate from the inspection requirements of 807 KAR 5:006, Section 26(4)(e);

c. Suspend the testing of electric meters as required by 807 KAR 5:041, Sections 15(3) and 16 until after the proposed AMI deployment has been completed;

d. Deviate from 807 KAR 5:041, Section 15(3) as it relates to the testing of electric meters removed from service as part of the AMI deployment;

e. Deviate from 807 KAR 5:006 Section 19 in its entirety concerning meters the Company removes as part of the AMI deployment;

11. Approving KU's use of an eight-year average of generator outage expenses in its revenue requirement determination and the use of regulatory asset and liability accounting for the generator outage expenses consistent with the proposals set forth in Mr. Garrett's testimony;

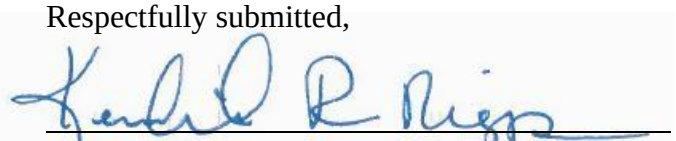
12. Approving KU's ECR Plan termination as described in the testimony of Mr. Conroy;

13. Approving KU's proposed depreciation rates; and

14. Granting all other relief to which KU may be entitled.

Dated: November 25, 2020

Respectfully submitted,



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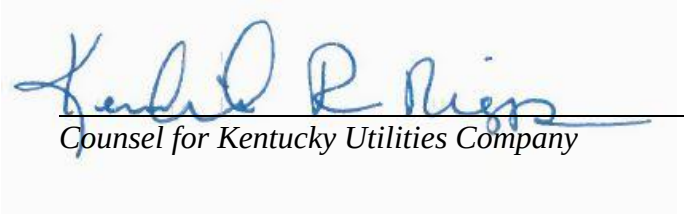
Counsel for Kentucky Utilities Company

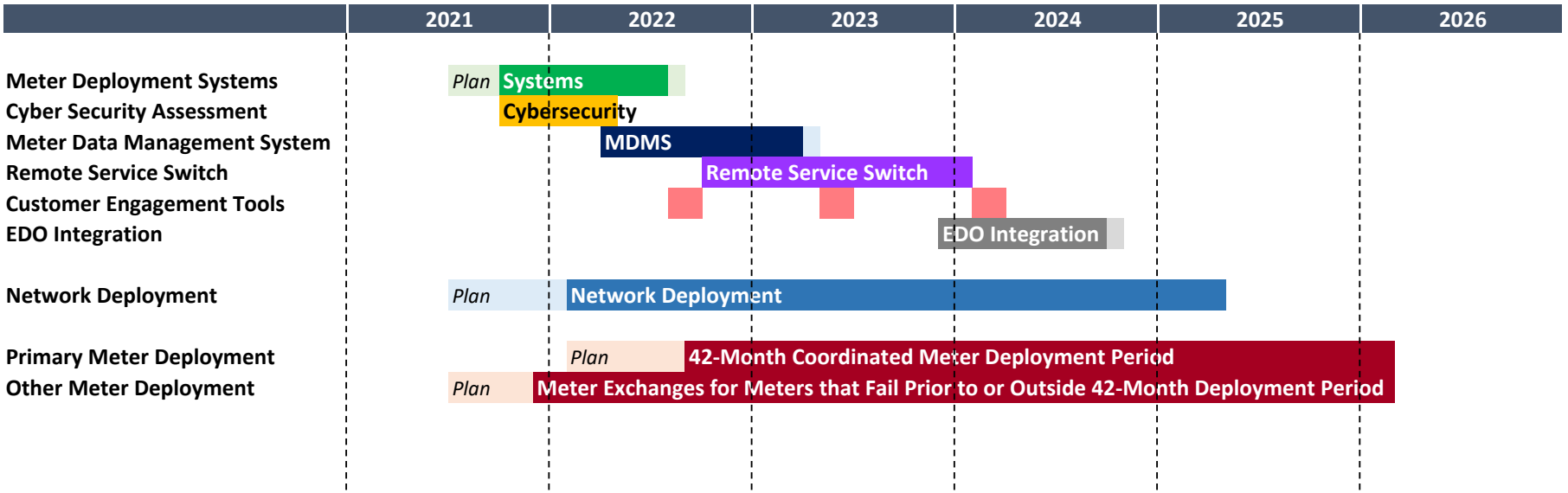
CERTIFICATE OF COMPLIANCE

In accordance with 807 KAR 5:001 Section 8(7), this is to certify that Kentucky Utilities Company's November 25, 2020 electronic filing is a true and accurate copy of the documents being filed in paper medium; that the electronic filing has been transmitted to the Commission on November 25, 2020; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; and that a true and correct copy in paper medium will be delivered to the Commission within 30 days of the lifting of the State of Emergency.

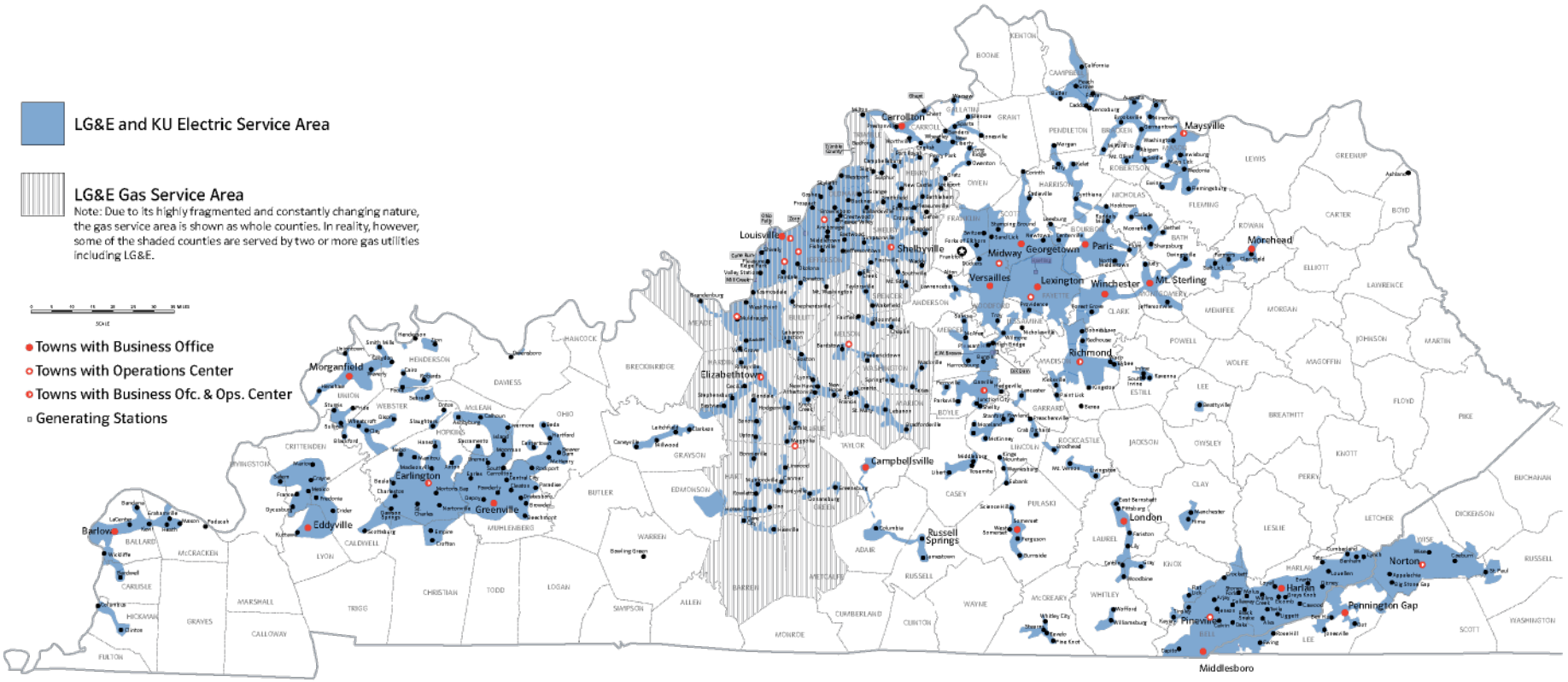


Counsel for Kentucky Utilities Company

AMI Deployment Schedule



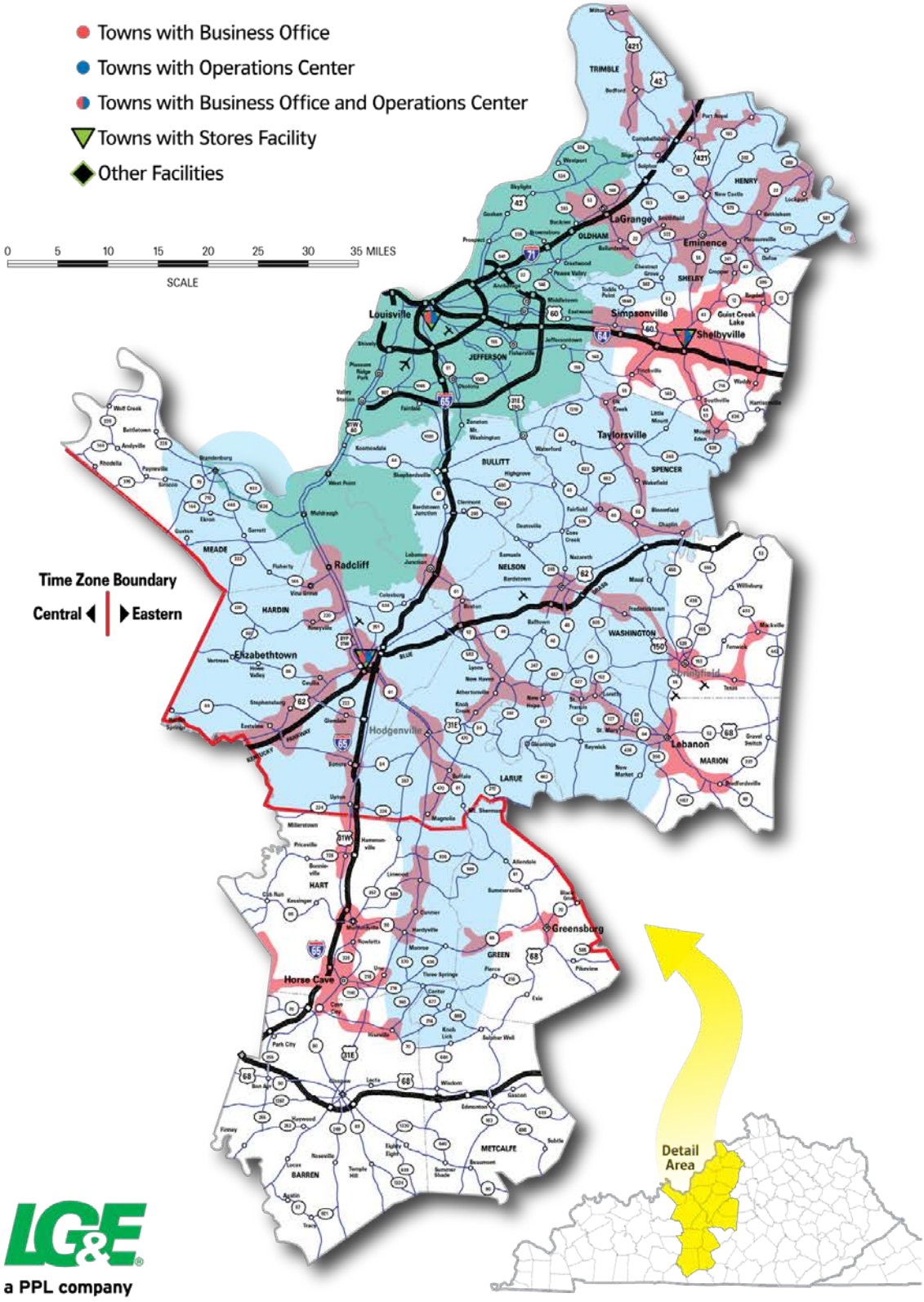
LG&E KU OVEC
PPL companies



Gas Service Area

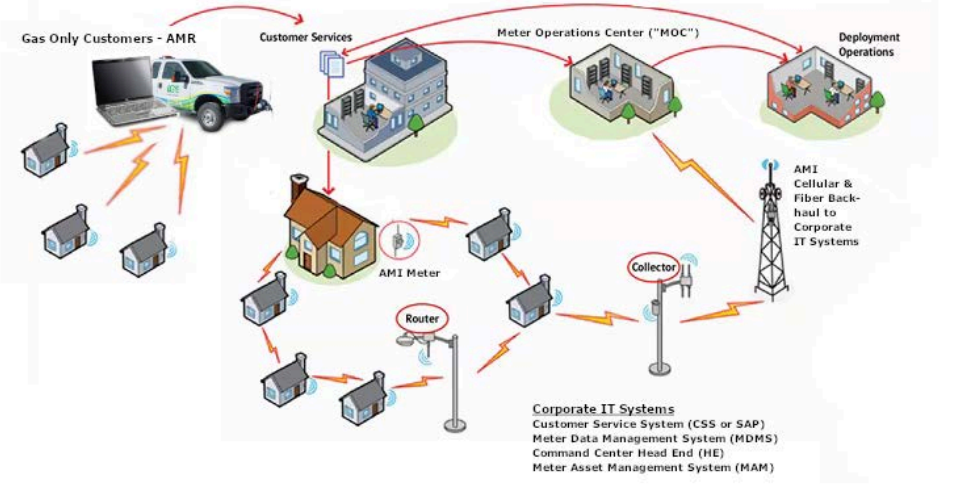
LG&E Gas Service Area* LG&E Electric Service Area KU Electric Service Area

* Note: Gas distribution service areas do not have legal boundaries, or legally designated service territories. Service area shown may overlap the service areas of other gas distribution utilities.
Source: Kentucky Public Service Commission.



LG&E
a PPL company

Metering Overview



Landis+Gyr
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Gridstream RF Mesh

Advanced Grid Communications Network

The Gridstream® RF network simply does more. Handles more messages. Connects to more sensors. Provides more control. And ultimately returns more to your bottom line. How? By supporting advanced multi-commodity metering, grid automation and home energy management applications – under a single network. Gridstream RF gives you the power to monitor and control, all while positioning your grid to meet future applications and standards requirements.

The innovative network is designed to support up to 5-minute interval data collections from residential and commercial meters, along with applications for advanced grid and load management.

Gridstream RF is a true mesh, peer-to-peer network where each endpoint, device and router extends the coverage and reliability of the network. It's also self-healing to provide dynamic routing of messages that automatically adjust for changes to endpoints and the introduction of obstructions such as foliage or new construction.

The system's routers are low power devices that extend network coverage and throughput. In addition, data collectors support up to 25,000 meters, which further minimizes infrastructure and maintenance costs.

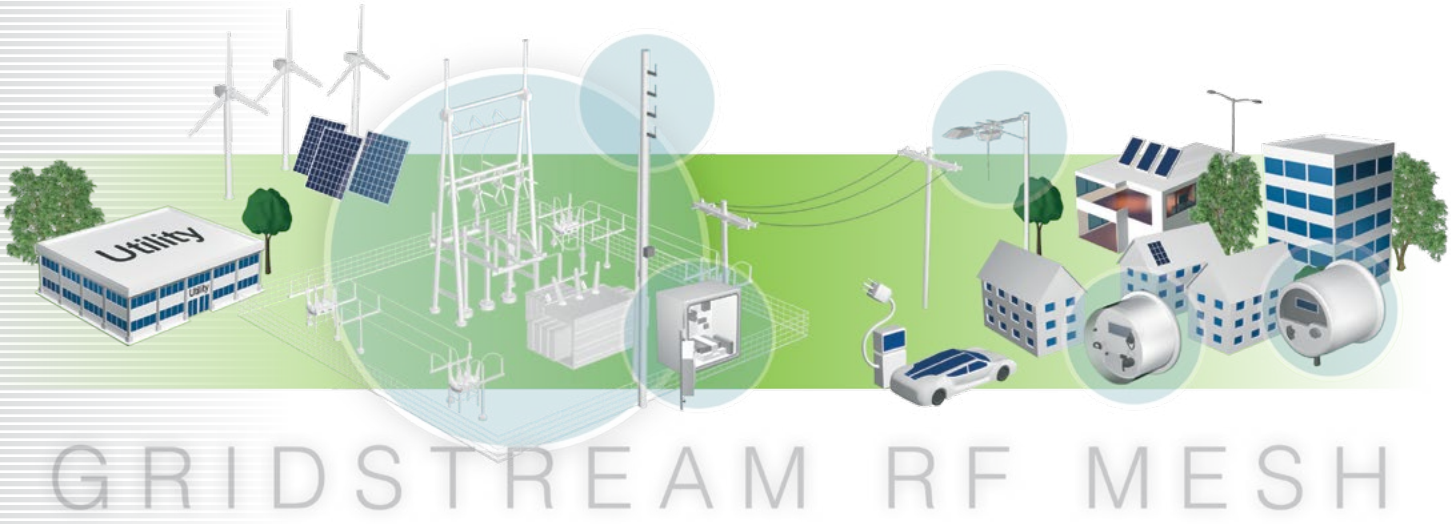
From operations and engineering to customer service and billing, Gridstream delivers the applications that best define smart grid value.

HIGHLIGHTS:

- Best-in-class security
- Remote configuration of endpoints
- "Plug-and-play" auto-registering endpoints and devices
- Outage and restoration notifications
- Variable payment options, such as prepay and time-of-use rates
- Remote disconnect/connect with advanced FOCUS® meters
- ZigBee®-enabled home area network
- Theft detection
- Direct load control and dynamic voltage management
- Standards-based network components, software and software integration

Gridstream

Gridstream RF Mesh Connects Utility Assets Across the Grid



Applications

Distribution System Analytics

Leverage voltage and power quality data to optimize performance and reliability and prevent outages before they occur.

Demand Response

Peak power management options include dynamic voltage management, time-based pricing programs and direct load control.

Remote Disconnect

Offset costs and improve operational efficiency through consumer-directed programs and the ability to perform immediate load-side disconnects.

Consumer Energy Management

Engaging the consumer through energy portals, home area networking and dynamic payment programs such as prepay, encourages energy efficiency and improves customer service.

Multi-Commodity and Scope

Two-way communication capabilities extend to water and gas modules, distribution devices and direct load control switches for a one-stop resource management package.

Outage Detection

Because endpoints are in continuous communication with the network, outage reporting and restoration detection are triggered automatically.

Integration with Most Applications

Realize secure and easy integration into existing utility operations. Utilizing a standards-based approach, Command Center (the operating software for the Gridstream system) and the Gridstream Meter Data Management solution enable interoperability with other utility applications like those used for CIS, billing, engineering, operations, analytics and data management.

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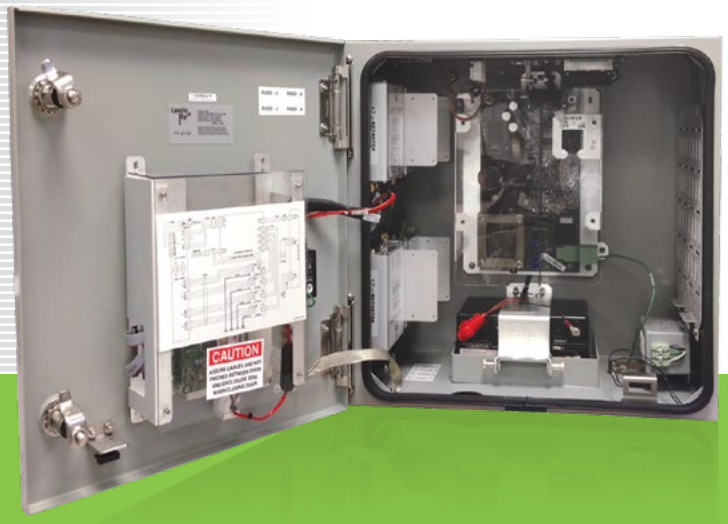

Gridstream C7500 RF Collector

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Extended Data Collection Capabilities for RF Mesh Systems

Overview

With enhanced on-board memory and faster communication speeds, the Gridstream® C7500 Collector is a powerful and flexible data collection and control center for users of Landis+Gyr's RF Mesh advanced metering systems.

The collector is designed to actively monitor up to 25,000 endpoints simultaneously to continuously communicate unique commands to individual endpoints, in both defined groups or across the entire network. Data is received from network routers and endpoints to provide a conduit for system hosting via Internet packets.

Installation options of the secure NEMA-4 collector include a distribution substation, wood utility pole, steel monopole, radio tower or in a rack. In addition, the C7500 is designed to support future applications and upgrades and can accommodate a variety of communications options to the utility including RF, fiber, cellular and microwave with the use of a WAN modem.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Simultaneously monitors to up to 25,000 AMI endpoints in Gridstream environments
- Auto-baud rates enable uninterrupted data communication regardless of RF link quality changes
- Maximizes bandwidth use with asynchronous spread spectrum frequency hopping
- Packet switching guarantees message transfer with automatic store and forward routing
- Auto-notification of power outage and restoration across entire AMI system

Product Specifications: **Gridstream C7500 RF Collector**

Specifications	
Collector Dimensions	18"H x 17.5"W x 11"D (excludes antennas)
Weight	51 lbs.
Antennas	Four (4), remote RF Mesh Antennas, Antenex FG 9023 (typical)
Input Voltage	Selectable: 120/240 +/-20%
Input Current	1A typical at 120V
Power Consumption	48W maximum, 20W typical
Operating Frequency Band	902-928 MHz, Unlicensed
Transmit Output Power	1W maximum for each IWR
Standards Compliance	FCC Part 15, Class B
Operating Temperature	-40°C to +85°C (maximum local internal ambient temperature)*
Storage Temperature	-40°C to +85°C
Color	Gray
Enclosure Material/Type	Aluminum/ NEMA-4, Lockable
Backup Battery	SLA, 12V, 13 Ah
Backhaul Data	Ethernet 10/100T
Mounting Options	Rack Mount, Utility Pole, Pad Mount, Roof Top, Unistrut Frame, other

*-40C to +60C outdoors, direct sunlight; -40C to +70C indoors or out of direct sunlight

Gridstream Series V Radio Specifications	
Electrical (General)	
Input Voltage Range	6 – 28 VDC
Input Current (in transmitting mode)	320 mA typical (12 VDC operation)
Input Current (in receiving mode)	38 mA typical (12 VDC operation)
RF Frequency Range	902-928 MHz
Channel Spacing	100, 300 or 500 kHz depending on the mode
RF Data Rate	9.6, 19.2, 38.4, 115.2, 300 kbps
Receiver	
Sensitivity (at 10% packet error rate)	-112 dBm (9.6 kbps) Typical
	-101 dBm (115.2 kbps) Typical
	-95 dBm (300 kbps) Typical
Co-channel Rejection	10 dB Typical
Adjacent Channel Rejection	30 dB Typical
Alternate Channel Rejection	45 dB Typical
Transmitter	
Output Power (at Antenna Connector)	21/25/30 dBm (user selectable)
Modulation Type	2-FSK, GFSK
Modulation Index	1
Out-of-band Spurious Emissions	<-70 dB

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Gridstream C6500 RF Collector

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C6500 RF Collector *Ethernet only*
C6550 and C6560 RF Collector *with LTE cellular modem*

Versatile and Cost-Effective Communication Solution

Overview

Ease of installation and dependable design make the Gridstream® C6500 Collector a cost-effective, workable option for efficient communication between Gridstream RF endpoints, routers and the Command Center server, while performing all necessary functions of the standard data collector.

The C6500 can be installed in a variety of locations and is configured to accept public backhaul communication options. The C6500 can be ordered with an internal cellular backhaul modem or without a modem in cases where an Ethernet connection is available.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Integrated wireless radio backhaul modem
- Data security and error-checking algorithms assure integrity and reliability
- Simpler and reduced installation time
- Dynamic routing by each radio in the mesh network
- Downloadable code for easy, over-the-air firmware upgrades and near real-time monitoring and control

Product Specifications: **Gridstream C6500 RF Collector**

Specifications	
Dimensions (excludes antennas)	5.04"H x 11.82"W x 9.30"D
Antennas	Two (2), one blackhaul (top) and one (1) Gridstream (bottom)
Antenna Height Minimum	20 ft.
Weight	9.6 lbs.
Standard Compliance	FCC Part 15, Class B
Operating AC Voltage	96-277 Vrms
Power Consumption	9W typical – batteries not charging
	18W typical – batteries charging
Operating Frequency Band	902-928 MHz, unlicensed
Transmit Output Power	1W maximum for single IWR radio
Baud Rate Range	9.6, 19.2, 38.4, 115.2, 300 kbps
Endpoint Capacity (initial)	4,500
Processing	CPU – ARM 9
	Internal Memory – 16 MB
	Flash – 8 MB
Operating Temperature	-40ºC to 60ºC, outdoors
Storage Temperature	-40ºC to 85ºC
Color	White
Enclosure Material/Type	Aluminum/NEMA-4, sealed
Battery	Backup Time – 8 hours, typical
	Backup – LiFePO4 cells in a 4s4p arrangement, 13.2V, 12800mAhrs nominal
	Life – 15 years, maintenance free
Backhaul Communications	Integrated LTE cellular modem or wired Ethernet connection
Supplied Cellular Carriers	C6550: Verizon, C6560: AT&T
Mounting Options	Utility poles and streetlights

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Network Gateway

Flexible and Interoperable Utility IoT Network Communications

Landis+Gyr's Network Gateway is an integral part of Gridstream® Connect, our industry-leading utility IoT platform. The Network Gateway is a powerful field data center that supports a variety of communications protocols. By enabling device and sensor interoperability, the Network Gateway provides unparalleled flexibility and limitless potential for growth.

FLEXIBLE COMMUNICATIONS

- Supports a wide array of communications technologies, including RF Mesh, Mesh IP, and cellular WAN backhaul
- Multiple radio options

BATTERY BACK-UP

- Maintenance-free Lithium Iron Phosphate battery

LAYERED INTELLIGENCE: INTELLIGENCE WHEN AND WHERE YOU NEED IT

- On-board Linux processor
- Distributed data processing lowers cost of data sharing and networking

FUTURE-READY AND SCALABLE

- Configurable, serviceable, and upgradeable
- Secure Wi-Fi for local configuration of radios or integrated sensor controller
- 2X Ethernet ports

FLEXIBLE COMMUNICATIONS | BATTERY BACK-UP | LAYERED INTELLIGENCE | FUTURE-READY AND SCALABLE

Network Gateway

PRODUCT SPECIFICATIONS

ELECTRICAL	
Input Voltage Range	120 to 240 VAC
Current	0.5A-0.25A
GATEWAY PROCESSING UNIT	
CPU	Cortex A5
RAM Memory	512 MB DDR2 RAM
FLASH Memory	2 GB NAND + 4 GB External
GATEWAY RADIO PROCESSING UNIT	
CPU	Dual-core Cortex M4
RAM Memory	304 Kbytes
FLASH Memory	2 MB + 4MB External
ROM Memory	8 Kbytes
SERIES 5 RADIO VARIANT	
Communication Protocol	IEEE 802.15.4g - SUN FSK PHY
RF Frequency Range	902-928 MHz
Channel Spacing	N2450 (RF Mesh IP): 400 KHz
	N2400 (RF Mesh): 100, 300 KHz
RF Data Rate	N2450 (RF Mesh IP): 50, 150, 200 Kbps
	N2400 (RF Mesh): 9.6, 19.2, 38.4, 115.2 Kbps
Modulation Type	2FSK, 2GFSK
SERIES 6 RADIO VARIANT	
Communication Protocol	IEEE 802.15.4 – 2015 SUNPHY
RF Frequency Range	902 – 928 Mhz 2400 – 2485 Mhz
Channel Spacing	400 KHz, 1200 KHz
RF Data Rate	50 Kbps to 600 Kbps (900 Mhz Band –Series 5 Compatibility Mode) 100 Kbps to 2400 Kbps (2400 Mhz Band)
Modulation Types	SUNFSK, O-QPSK, OFDM

TRANSMITTER	
Output Power (at Antenna Connector)	Up to 1W
ETHERNET & WIFI	
ETH 0 | ETH 1	10/100/1000 Ethernet | 10/100 Ethernet
WI-FI	Yes
LTE Cat6	Yes
MECHANICAL	
Enclosure	Aluminum / IP67
Dimensions	10.94" W x 5.31" D x 12.23" H (278mm W x 135mm D x 311mm H)
Weight	11.7 lbs
Operating Temp Range	-40°C to 60°C (-40 to 140° F)
Storage Temp Range	-40°C to 70°C (-40 to 158° F)
REGULATORY COMPLIANCE	
Safety & EMC, FCC Class A Device	

Kbps = Kilobytes per second

This information is provided on an "as is" basis and does not imply any kind of guarantee or warranty, express or implied. Changes may be made to this information.

GET IN TOUCH.

For more information and nationwide warranty terms, visit us at landisgyr.com or call us at 888-390-5733.

Landis+Gyr

LET'S BUILD A BRIGHTER FUTURE TOGETHER

Since 1896, Landis+Gyr has been a global leader of energy management solutions. We've provided more than 3,500 utility companies all over the world with the broadest portfolio of products and services in the industry. With a worldwide team of 1,300+ engineers and research professionals, as well as an ISO certification for quality and environmental processes, we are committed to improving energy efficiency, streamlining operations, and improving customer service for utility providers.

Gridstream RF Router

Landis+Gyr manage energy better

Advanced, Yet Cost-effective, Communication Solution

Overview

The Landis+Gyr RF Router helps form the powerful Gridstream® RF wireless mesh network used in Advanced Metering, Distribution Automation and Demand Response applications. Network performance and reliability are assured via the routers basic mesh functions including full two-way, peer-to-peer communication to all devices in the network, asynchronous spread spectrum frequency hopping and dynamic message routing.

The RF Router is designed to deliver enhanced on-board memory and communication speeds to support future application and development needs. In addition, advanced functionality enables individual message prioritization, automatic network registration and localized intelligence. The router can also provide distributed device control capabilities via programmable applets.

To provide critical network operations—even during small or widespread system power outages—a typical purchase includes battery backup integrated within the aluminum housing.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Individual message prioritization provides end device interfacing with other smart grid applications and functions
- Dynamic routing by each radio in the mesh network
- Data security and error-checking algorithms to assure integrity and reliability
- Downloadable code for easy, over-the-air firmware updates for near real-time monitoring and control

Product Specifications: **Gridstream RF Router**

Specifications

Size	11.82"W x 9.30"D x 4.07"H
Weight	Base – 5 lbs 8 oz (2.49 kg)
	Battery adds 2 lbs 8 oz (1.13 kg)
Operating Temperature	-40ºC to +85ºC (internal ambient of enclosure)
Power Supply	Operating AC Voltage – 96-317 VAC
	Input for Receive mode / 120VAC Operation – 15 mA (max)
	Input for Transmit mode / 120VAC Operation – 95 mA (peak), 25 mA (Avg)
	Input for Battery charging mode / 120VAC Operation – 30 mA (max)
RF Output Power	21, 25, 30 dBm (user selectable)
General Radio Items	Frequency Range – 902-928 MHz
	Channel Spacing – 100 kHz, 300 kHz, or 500 kHz (dependent on mode)
	Channels – 56, 80, 240 (dependent on mode)
	RF Baud Rates – 9.6, 19.2, 38.4, 115.2, 300 kbps
Battery	Backup Time – 8 hours, typical
	Backup – 12V SLA 2500mAhrs, nominal
	Life – 5–7 years, typical
Processing	CPU – ARM9
	SRAM – 16 MB
	Flash – 8 MB ANSI C12.1 Compliance
Approvals	FCC Certified Part 15.247
ANSI C12.1 Compliance	Operating vibration; operating shock; electromagnetic radiation emissions, electromagnetic susceptibility, surge withstanding capability, electrostatic discharge
Enclosure Material Type	Aluminum/NEMA-4, sealed
Standard Shipment Includes	White, die-cast aluminum all-weather enclosure
	Operation on DC (12/24 VDC) or AC power, with automatic switching between 120 VAC or 277 VAC when connected to power source
	RS-232/485 lines for both LPPx and transparent port communication
	Standard N-Female antenna connector
	Integrated filter for attenuation of out-of-band interference
	Mounting hardware

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Residential:
FOCUS AXe Metering Platform

E331 FOCUS AXe/AXRe/RXRe
E351 FOCUS AXe/AXRe/RXRe-SD

Landis+Gyr
manage energy better

Advanced Metering Performance and Safety

Overview

The FOCUS® AXe platform for advanced electric metering and smart grid applications is designed to enhance your sensor ecosystem with proven reliability and innovative features. Expanding on Landis+Gyr's industry-leading FOCUS AX platform, the FOCUS AXe adds increased memory and processing power to enable greater measurement, power quality, and data profiling capabilities. Furthermore, the FOCUS AXe incorporates a sensor to detect meter removal and insertion as a possible indication of tamper as well as increased power supply capacity to support more advanced AMI modules for expanded communications abilities.

Reliable disconnect service – for any type of residential installation

The E351 FOCUS AXe-SD provides reliable remote service disconnect and reconnect with a motor driven, cam action switch under the meter cover. Available in both CL200 and newly released CL320 UL certified models, the switches operate safely for thousands of iterations at full rated current. Along with direct switch actuation, the AXe-SD supports multiple load limiting features that initiate a disconnect when a specified instantaneous power or average demand level is reached.

The AXe-SD Form 2SE delivers precedent setting remote service disconnect capability to larger 320 amp installations, providing Landis+Gyr's unique solution to evolving utility requirements.

KEY FEATURES:

- Active Energy "kWh" meter: Optional Reactive Energy "kVAh or kVARh"
- Two, simultaneous demands: kW, kVA, and kVAR
- Motor driven, cam action service disconnect switches: 200 amp and NEW 320 amp
- All meters exceed ANSI requirements for meter accuracy (0.2%) and surge protection (10KV)
- Power Quality Metrics: Sag, Swell and Total Harmonic Distortion
- Up to 8 channels of Load Profile standard
- Independent 2nd 8-channel Load Profile Recorder (optional)
- Every S Base meter form is UL listed
- Meter removal and insertion detection to indicate possible tamper
- Magnetic and DC presence detection
- Over-the-air firmware and program updates[1]
- Dedicated Voltage Log
- Configurable optical port lockout[1]

SPECIFICATIONS

General Specifications	ALL models support demand billing and are time-of-use (TOU) Ready – Battery Optional	
	Third Generation processor runs 2x as fast as FOCUS AX	
	2x RAM, 2x ROM, and 4x the Non-Volatile Memory as FOCUS AX	
	Designed for 20+ years life	
	Utilizes ANSI protocol (for optical port and between meter and AMI device)	
	9-Digit LCD	
	Display scroll sequence programmable (factory or end user)	
	Configuration Port – standard plastic: Optional ANSI C12.18 optical	
Operating Temperature	-40C to +85C under cover	
Nominal Voltage	120V or 240V	
Operating Voltage	80% to 115% of Nominal Voltage	
Frequency	60Hz +/- 5%	
Humidity	5% to 95% relative humidity, non condensing	
Starting Load (Watts)	Class 20	0.005 Amp (0.6W)
	Class 100	0.030 Amp (3.6W)
	Class 200	0.050 Amp (12W)
	Class 320	0.080 Amp (19.2W)
	Class 480	0.120 Amp (28.8W)
Voltage Burden	< 1.9W Max	
Load Performance Accuracy	Accuracy Class 0.2% (reactive energy 0.5%)	
Available Forms	Self-Contained	1S, 2S, 2SE (320A), 12S, 25S
	Transformer Rated	3S, 4S
	K-Base	2K (480A)
Display Options	Energy Metrics: +kWh, -kWh, Net kWh, added kWh (Security), KVAh or kVARh	
	Metric Energy Display Format – 4x1, 4x10, 5x1, 5x10, 6x1 or 6x10	
	TOU, demand billing and two demands (selectable kW, kVA or kVAR)	
Communications[1]	Modular design - with or without AMI communication	
Selectable Meter Multiplier	Up to 4096 as result of PT ratio x CT ratio	
Applicable Standards	ANSI C12.1 for electric meters	
	ANSI C12.10 for physical aspects of watt hour meters	
	ANSI C12.18 Protocol specifications for ANSI Type 2 Optical Port	
	ANSI C12.19 Utility Industry End Device Data Tables	
	ANSI C12.20 for electricity meters, 0.2 and 0.5 accuracy classes	
	CAN3-C17-M84 Canadian specifications for approval of type of electricity meters	
	UL 2735 Standard for Electric Utility Meters	
Service Disconnect	200A disconnect - 10,000 operations at full rated current (disconnect/connect) Available forms: 1S, 2S, 12S, 25S	
	320A disconnect - 3,000 operations at full rated current (disconnect/connect) Available forms: 2SE	
International Certifications	Measurement Canada (MC) AE-1967 *Form 2SE-SD pending MC approval*	

1. Select features rely on a communications module. Meters that are AMI-enabled with communications are clearly labeled on meter face above digital display.

Commercial Industrial Metering

Choice for Demanding Polyphase Applications

With options to cover most metering challenges, Landis+Gyr's commercial and industrial meter family delivers performance and value. Both the E650 S4x and E330 FOCUS® AX Polyphase meters are designed to cover a wide range of requirements and applications – from light commercial to industrial metering – with proven reliability and unmatched features.

Landis+Gyr's polyphase meters eliminate the need to pre-program the service type. Simply install the meter, and it automatically detects the service type and voltage, displaying the information on the LCD and configuring the GyrBox for a complete diagnostic installation check. By continually performing diagnostics on the metering installation equipment, service wiring and load characteristics, GyrBox identifies issues with equipment, installation, wiring, load conditions, power quality and tampering.

Both platforms provide an ANSI Type 2 optical port for meter programming and firmware upgrades. They utilize advanced second generation over-the-air, flashable firmware, so when supported by the AMI network, they can be upgraded remotely without losing the meter configuration or billing data.

HIGHLIGHTS:

- Active and reactive energy measurement
- Demand, TOU and load profile
- ANSI C12.19 standard protocol
- Ease of AMI integration
- Over-the-air firmware updates
- Measurement accuracy class of 0.2%
- Unsurpassed 10KV surge protection for safety
- Extensive event logging
- Designed for a 20+ year life

Choice for Demanding Polyphase Applications

	The Family of Commercial Meters	
	E330 FOCUS AX Polyphase	E650 S4x
Metrics		
Delivered (+kWh) and received (–kWh) active energy	+	+
Delivered and received reactive energy, kVAh and kVARh	+	+
Voltage sag and swell per phase	+	+
Temperature sensing – record in LP, trigger event	+	+
Twelve self reads – all summations and demands	+	+
True four quadrant meter – all metrics in all quadrants		+
Delivered and received kW, kVA, and KVAR demands		+
Two alternate reactive and apparent energy algorithms		+
All data stored in engineering units for increased resolution		+
Security and Tamper Detection		
Optical port lockout – via AMI system	+	+
Cover removal switch – detects physical tamper		+
Tilt and vibration sensor – detects excessive force		+
Leading PF detection – senses potential DC presence	+	+
Magnetic tamper detection – via hall effect sensor		+
Hardware Options		
Gridstream® RF communication module	+	+
True three-phase power supply		+
Input/output (I/O) board for external sense, KYZ and load control		+
Support 480V line to neutral		+
Load Profile		
Channels	8	16
Standard memory	77 K	256 K
Increased memory (optional)		1 MB
Second recorder – different interval structure (optional)		16 Channels
Data resolution	16 Bit	32 Bit

E330 FOCUS AX Polyphase

Proven Platform

The AX Polyphase brings the same proven, solid-state performance utilities have come to expect from the FOCUS family in an AMI-ready platform for light commercial applications.

AMI Communications

Like all other FOCUS AX meters, the AX Polyphase supports multiple modular AMI solutions. Along with Gridstream RF, solutions are available from four other communications providers spanning RF mesh, cellular and power line carrier technologies.

Cost Effective

The FOCUS AX Polyphase is perfectly positioned alongside the full-featured S4x platform. The FOCUS AX Polyphase provides a cost effective alternative for light commercial metering applications not requiring the same level of functionality as the S4x.

E650 S4x

Metrics and Load Profile

The E650 S4x provides an extensive array of energy and demand metrics. With more data available, customers can utilize more load profile capability. Standard load profile memory of 256 KB is upgradable to 1 MB without adding metrology hardware. An optional second recorder provides dual structure load profile. Load profile can be configured for up to 16 channels (32 with dual structure) of information from a choice of over 70 different storage metrics.

Tamper Detection

The E650 S4x raises the bar on security features and tamper detection. Tilt and vibration sensing, magnetic field detection, and a cover removal switch are innovative new capabilities designed to reinforce revenue protection efforts.

Input/Output

An optional I/O board provides up to four solid-state relay outputs and up to two external inputs for recording pulses from remote sources. These relays can be programmed for end-of-interval, power factor alert, diagnostic alert, voltage alert, demand threshold alert, KYZ or load control. The I/O board can be used in conjunction with a Gridstream RF module for ultimate flexibility.

Phone: **678.258.1500**

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