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INFORMATION SHEET

PRESIDING: Commissioner Beatty; Chair Finley and Commissioners Brown-Bland, Bailey, Dockham and Patterson

PLACE: Dobbs Building, Raleigh, NC

DATE: February 8, 2016

TIME: 7:00 p.m. – 8:27 p.m.

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COMPANY: Duke Energy and Dominion

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WITNESSES

Please see attached Table of Contents.

EXHIBITS

McAfee Exhibit 1 (I/A)

COPIES ORDERED: E-mail: Gillam

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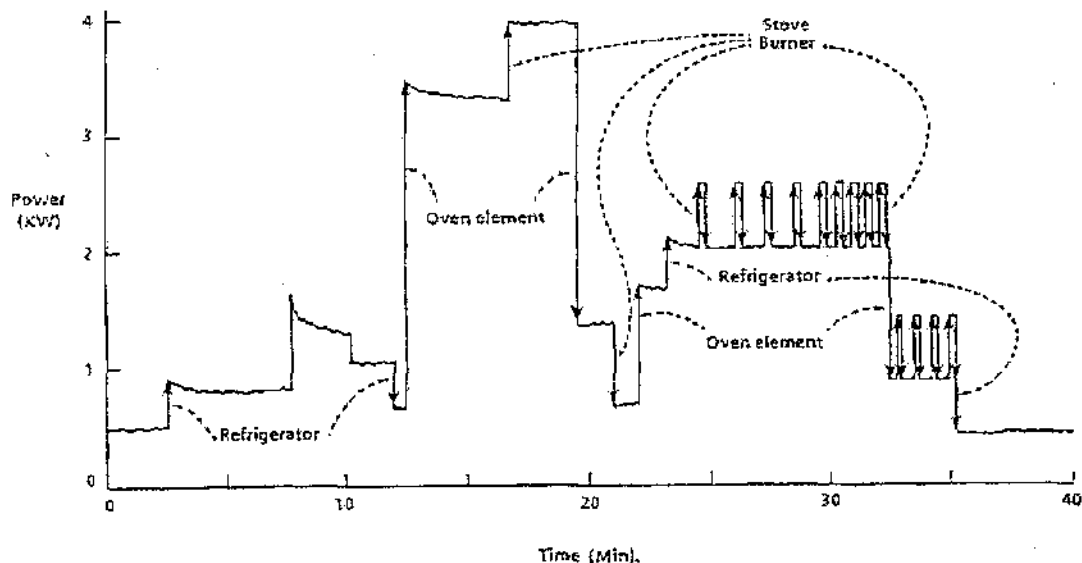
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EXECUTIVE SUMMARY

Advanced metering infrastructure (AMI or smart metering) is being installed throughout electric networks both in Colorado¹ and across the country.² From these smart meters, detailed information about consumer electricity usage will flow from residences and businesses to electric utilities. Instead of billing customers for their monthly draw, electric utilities will know what customers are using in half-hour, fifteen-minute, or even five-minute intervals.

Proper management of this new information pool could support energy efficiency efforts and demand-side management (DSM) initiatives.³ However, insufficient oversight of this information could also lead to unprecedented invasions of consumer privacy. Many intricate details of household life can be gleaned from information obtained via advanced metering infrastructure.



Example of an individual's load profile constructed using consecutive load measurements taken in small intervals with various appliance events identified.⁴

A complicated network of risks and concerns bears on this issue. The more information gathered, the better supported DSM initiatives, efficiency investments, and conservation efforts. Yet such efforts are antithetical to traditional utility incentive structures, which tie returns to electricity sales. The use and sale of this information might play a role in reforming the business model of electric utilities; indeed, smart grid information is a potential revenue stream heretofore unexplored.⁵ As such, the formulation of privacy regulations should be seen, not only as consumer protection, but as incentive regulation.

However, information control regimes that centralize smart grid information disclosures by giving principle control to the electric utility may work against innovation in service industries developing at the edge of the electric grid and provide new barriers to market entry. If privacy regulations make customer usage information is too difficult or expensive to obtain, the regulatory regime could dampen the rampant growth and evolution of a promising new sector for economic development. The balance struck among these various factors will define any privacy

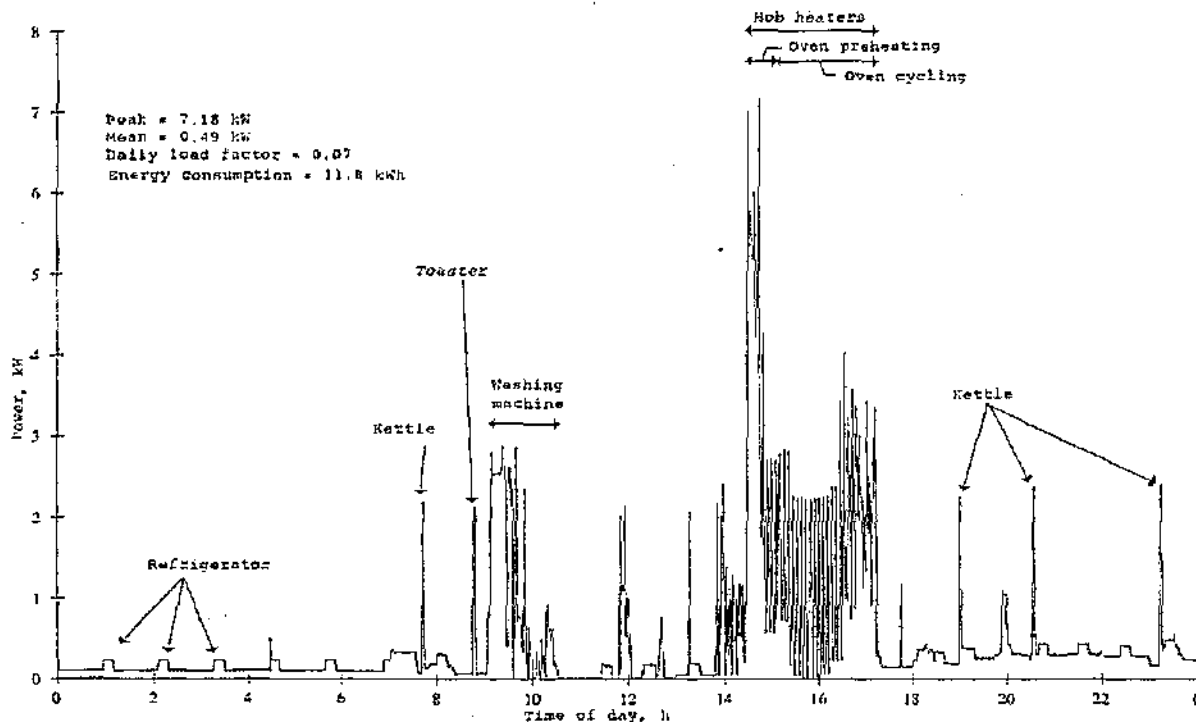


Figure 1: Household Electricity Demand Profile Recorded on a One-minute Time Base⁶

As analytic tools evolve, even information collected at significantly longer intervals—e.g. every fifteen or thirty minutes—can be used to pinpoint the use of most major household appliances.⁷ Such detailed information about the in-home activities of electricity customers can thus be used to piece together a fairly detailed picture of an individual's daily life or routine. Furthermore, as plug-in hybrid electric vehicles are deployed and customers engage in electricity sales on the grid outside of their homes, an electricity usage profile may become a one-stop-shop for tracking behaviors even outside the walls of the residence. Cataloging and analytic methods advance, and thus the huge volumes of data about electricity usage soon to be unleashed, rather than seen as overly burdensome and expensive to make use of, are likely to be found treasure troves of information.⁸ A more thorough treatment of the technological capabilities and development vectors surrounding smart grid information collection and analysis is set forth in Appendix A.

⁶ G. Wood & M. Newborough, *Dynamic Energy-consumption Indicators for Domestic Appliances: Environment, Behavior, and Design*, 35 ENERGY AND BUILDINGS 821, 822 (2003) (citing M. Newborough & P. Angood, *Demand-side Management Opportunities for the UK Domestic Sector*, IEE Proceedings of Generation Transmission and Distribution 146 (3) (1999) 283–293).

⁷ An Italian study published in 2002 used fifteen-minute interval data—the same resolution collected by most smart meters today—to identify heavy-load appliance uses within an electricity usage profile. Researchers there were able use artificial neural networks to pinpoint the use washing machines, dishwashers, and water heaters with accuracy rates of over 90 percent from within the noise of the aggregated load information. See A. Prudenzi, *A Neuron Nets Based Procedure for Identifying Domestic Appliances Pattern-of-Use from Energy Recordings at Meter Panel*, IEEE Power Engineering Society Winter Meeting 941, 942 col. 1, 946 col. 1 (2002).

⁸ See, e.g., Ashlee Vance, *Hadoop, A Free Software Program, Finds Uses Beyond Search*, N.Y. TIMES, Mar. 16, 2009, available at <http://www.nytimes.com/2009/03/17/technology/business-computing/17cloud.html?n=Top/News/Business/Companies/Google%20Inc> (discussing new breakthroughs in software managing internet advertising placement based on search queries and the ways in which these programs are being used in other contexts, such as photo-cataloging, facial-recognition software, and biotech applications). See

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Robert S. Gillam

Signature of Public Staff Member

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APPEARING FOR:

Duke Energy Carolinas, LLC Duke Energy Progress, LLC

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PROTESTANT	RESPONDENT	DEFENDANT	

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APPEARING FOR: Siema Club and Southern Alliance
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