Smart Meters and Federal Law: What Is the Role of Federal Law in the United States in the Deployment of Smart Electricity Metering?

Federal engagement in support of advanced metering has expanded as part of a broader effort to support energy conservation and efficiency, particularly demand-side management. The federal measures provide incentives for states to deploy smart meters but do not violate state jurisdiction by avoiding strict legal mandates.

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The views expressed in this article are those of Mr. Rose, and not necessarily those of the U.S. Department of State or the U.S. Government.

I. Introduction

What is the role of federal law in the United States in the deployment of advanced (''smart'') electricity metering? In general, U.S. federal law applies to electricity generation and wholesale markets while state (and to a much lesser extent, municipal) laws regulate retail distribution. However, it is increasingly difficult to maintain this distinction. Constraints upon retail metering have a direct impact upon generation and wholesale markets while energy security, including the promotion of energy efficiency and environmental objectives, has become an increasingly important national policy priority.

Federal jurisdiction on energy, including with regard to electricity and metering, is expanding in response to the strong national interest in improving the efficiency of electricity markets. As the United States has restructured electricity markets to increase competition, the federal government has played an important role in all aspects of market design, despite the limits of jurisdiction by the Federal Energy Regulatory Commission (FERC) to wholesale transactions and interstate transmission. While metering might appear wholly within state jurisdiction at first glance, in fact the federal government is making a concerted effort to promote the deployment of smart meters.

This article reviews federal statutes, federal reports, academic legal articles, and technical guides to identify the ways in which federal law addresses the deployment of advanced metering (AM), or ''smart meters.'' The article describes ways in which federal law has sought to promote the deployment of AM. The author provides background on the role of meters in electricity markets, traces the legal basis for federal intervention in AM, and describes specific federal measures that directly address AM. The article finds that federal engagement in support of AM has expanded as part of a broader effort to support energy conservation and efficiency, particularly demand-side management. The federal measures provide incentives for states to deploy AM but do not violate state jurisdiction by avoiding strict legal mandates.

II. The Role of Meters in Electricity Markets

Meters provide a crucial link between electricity production, transmission, and distribution on one side, and the end-use consumer on the other. The technical limits of traditional meters require on-site reading by the local utility or retail provider. Because of the labor- and time-intensive nature of traditional meter reading, consumers often receive estimated monthly bills. The limits of traditional meters have forced utilities to base rates on estimated or average consumption levels.

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Because of this inability to provide dynamic or time-of-use rates, the market fails to take into account differences in the time that energy is produced and consumed (peak and off-peak loads). AM is now being deployed that provides service providers and customers with detailed and instant feedback about consumption and costs. Smart meters facilitate dynamic pricing based on time-of-use, so that consumers can pay less for baseload power and have the choice of paying more for peak load or saving money by reducing consumption. Smart meters can also enable ''net metering,'' through which producers of distributed generation can sell energy back to the grid. This innovation enables the implementation of dynamic pricing. AM deployment is thus a significant aspect in the effort to make electricity markets more efficient, promote conservation and efficiency, improve system reliability, and make rates more equitable – the central goals of U.S. electricity policy.[1]

The recent wave of AM deployment should improve the efficiency of retail and wholesale competition by making demand more responsive to price, especially marginal costs of demand at peak times. The federal government has emphasized the value of a ''smart grid'' as part of its ''clean energy'' policy. While simple images of a smart grid convey transmission lines, AM is an important part of the smart grid program. Smart meters may become an important tool for increasing demand response, promoting