

Energy Consumption Data: The Key to Improved Energy Efficiency

ALEXANDRA B. KLASS*
ELIZABETH J. WILSON**

TABLE OF CONTENTS

I.	INTRODUCTION	69
II.	THE PROMISE OF ENERGY CONSUMPTION DATA AND CURRENT BARRIERS TO USE	73
	A. <i>Energy Consumption Data Today</i>	74
	B. <i>The Promise of Energy Consumption Data</i>	77
III.	EXISTING LAW GOVERNING ENERGY CONSUMPTION DATA	79
	A. <i>Federal Policies and Initiatives on Energy Consumption Data and Privacy</i>	81
	1. <i>Federal Energy Use Surveys</i>	82
	2. <i>ENERGY STAR Portfolio Manager, Green Button, and the Uniform Methods Project</i>	84
	3. <i>Privacy and the Fourth Amendment</i>	86
	B. <i>State Policies on Energy Consumption Data</i>	89
	1. <i>Cusomer and Building Owner Access to Energy Consumption Data</i>	90
	2. <i>Third Party Access to Energy Consumption Data: Third Party Energy Efficiency Providers, State Aggregation Rules, and Other Privacy Protections</i>	91
	a. <i>Colorado</i>	93
	b. <i>California</i>	94
	c. <i>New York</i>	96

* © 2015 Alexandra B. Klass. Distinguished McKnight University Professor, University of Minnesota Law School. Sam Andre provided valuable research support for this project

** © 2015 Elizabeth J. Wilson. Associate Professor of Energy and Environmental Policy and Law, Humphrey School of Public Affairs, University of Minnesota.

	d. Texas.....	97
	e. Oklahoma.....	98
	f. Other PUC Proceedings: Michigan, Minnesota, and Illinois.....	98
	3. Post-Disclosure Safeguards.....	101
	4. Data Centers and Public Websites.....	101
	C. Local Government Policies on Energy Consumption Data: Building Efficiency and Benchmarking.....	102
IV.	MOVING FORWARD: SHAPING FUTURE STATE AND LOCAL ENERGY CONSUMPTION DATA POLICIES.....	110
V.	CONCLUSION.....	114

I. INTRODUCTION

One of the overarching goals of the future energy system is to use less energy and to use it more efficiently. In order to meet this goal, the United States must use less electricity more efficiently because electricity makes up 40% of total U.S. energy consumption.¹ Moreover, buildings account for 39% of total U.S. energy use and 68% of electricity use. As a result, increasing the efficiency of electricity use in buildings has the potential to reduce overall U.S. energy use, which leads to decreased energy costs, reduced need to build more power plants, greater energy security, greenhouse gas reductions, and significant environmental protection benefits.

Energy efficiency, distributed generation like rooftop solar, and demand-side management² all have the opportunity to link with electricity markets and meet these energy system goals. But deploying energy management technologies over multiple industrial sectors in 100 million buildings and billions of end use devices requires tremendous scale up in both project size and investments. Certainly, all levels of government as well as the private sector are attempting to meet the challenge. By 2015, a wide range of federal, state, and local funding mechanisms such as tax exemptions, tax

1. *Clean Energy*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (Feb. 19, 2014), <http://www.epa.gov/cleanenergy/energy-and-you/>.

2. “Demand-side management” or “DSM” involves reducing electricity use through activities or programs that promote electric energy efficiency or conservation, or more efficient management of electric energy loads. These efforts can include greater energy efficiency in buildings, using more energy efficient products, encouraging customers to shift their use of electricity from high demand to low demand periods, and giving utilities limited control over customer equipment such as air conditioners to shift or reduce electricity use. *See, e.g., PacificCorp., Demand Side Management*, <http://www.pacificcorp.com/env/dsm.html>; Brandon DaVito, Humayun Tai, & Robert Uhlander, *The Smart Grid and the Promise of Demand Side Management, McKinsey on Smart Grid* (2010), available at https://www.smartgrid.gov/sites/default/files/doc/files/The_Smart_Grid_Promise_DemandSide_Management_201003.pdf (describing the load shifting programs and energy efficiency and conservation programs that make up DSM).

deductions, tax rebates, grants, and loans for “green” construction efforts will total \$122 billion.³ Additionally, over 1,000 municipalities have adopted greenhouse gas reduction targets, often focusing on energy efficiency measures. Experts conclude that even more investment in building energy efficiency would pay significant dividends. For instance, McKinsey estimates that \$520 billion invested in non-transportation energy efficiency by 2020 could generate energy savings worth over \$1.2 trillion, reduce end use energy demand by 23% of current projections, and as a co-benefit provide over 1.1 billion tons of greenhouse gas reductions.⁴

But in spite of over thirty years of local, state, and federal programs offering energy efficiency incentives and educating residential, commercial, and industrial customers about cost-effective energy saving opportunities, the impacts of these programs consistently fall short. One of the critical barriers standing in the way is adequate data on energy consumption. While emissions and electricity generation data is available at the boiler or plant level on an hourly basis through numerous government agencies like the Energy Information Administration (EIA), the U.S. Environmental Protection Agency (EPA), and the Federal Energy Regulatory Commission (FERC), energy consumption data is available only as estimates through quadrennial surveys. But even these estimates do not always happen as regularly scheduled. Additionally, the surveys only sample thousands of buildings nationwide, making evaluation or comparison of specific programs impossible due to the lack of a representative sample. Given today’s electricity system, where extensive interconnected transmission grids embedded with information communication technologies communicate real-time synchronized data, and large regional electricity markets engage in real-time electricity sales, the lack of granularity of data for energy management is striking.

This lack of data creates important information asymmetries and high transaction costs and represents a serious market failure. This market failure causes several problems:

3. Thomas Frank, “Green” Growth Fuels an Entire Industry, USA TODAY (Nov. 14, 2012), <http://www.usatoday.com/story/news/nation/2012/10/25/green-building-big-business-lead-certification/1655367/>.

4. McKinsey & Co., *Unlocking Energy Efficiency in the U.S. Economy* iii (Jul. 2009), available at http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy.

- *Evaluation of existing programs:* Lack of energy consumption data makes it impossible to comprehensively evaluate and compare the success of current efforts across jurisdictions. In 2012, utilities spent over \$7 billion on energy efficiency programs (nearly \$6 billion on programs for electricity efficiency and an additional \$1.3 billion for natural gas efficiency programs), saving an estimated 23 million Megawatt hours (MWh) in 2011, the most recent year for which data is available.⁵ These investments are projected to increase to \$15-17 billion per year by 2025.⁶ But assessing, evaluating, and comparing programs effectiveness is often stymied by lack of energy use data and different evaluation, monitoring, and verification programs.⁷
- *Targeting Future Energy Management Opportunities:* Lack of energy consumption data makes energy management program targeting, design, planning, implementation, and evaluation much more difficult. Federal, state, and local governments encourage energy efficiency through a wide variety of different policies such as tax incentives, building standards, and appliance efficiency standards. However, evaluating the efficiency of these investments and the effectiveness of the programs often focuses on larger industrial projects. Meanwhile, smaller residential projects rely on modeled data, making evaluation of smaller efforts or program comparison difficult.
- *Scalability of Energy Management:* Lack of energy consumption data makes targeting new opportunities and scaling up energy efficient projects challenging and unable to benefit from large-scale investments. This lack of publicly available energy consumption data in the industrial, commercial, residential, municipal, university, school, and hospital sectors creates high project-specific transaction costs and hinders future investment and scalability of energy management programs. Most banks and private investors

5. *The 2013 State Energy Efficiency Scorecard*, AMERICAN COUNCIL FOR AN ENERGY EFFICIENT ENVIRONMENT (ACEEE) vi (Nov. 2013), <http://www.aceee.org/sites/default/files/publications/researchreports/e13k.pdf>.

6. ACEEE, *supra* note 5, at 17.

7. *About the Uniform Methods Project*, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, <http://energy.gov/eere/about-us/uniform-methods-project-determining-energy-efficiency-program-savings/about-uniform-methods> (last visited Apr. 6, 2015); *Evaluation, Measurement and Verification*, SEE ACTION, <https://www4.eere.energy.gov/seeaction/topic-category/evaluation-measurement-and-verification> (last visited Apr. 6, 2015).

only invest in projects of a certain scale, making individual small-scale energy management projects hard to finance.

Developing energy management to its potential requires both new analytics to evaluate and target opportunities, and also new mechanisms to scale and leverage financing. These analytics rest on a foundation of energy consumption data (also referred to as customer energy usage data) that is currently not available in any meaningful way to consumers, energy service companies, and government funders or researchers. The benefits associated with collecting energy consumption data include: (1) giving consumers the data they need to manage energy use based on real time price signals; (2) allowing distributed generation (DG) developers such as solar companies to size systems based on the energy use in buildings; (3) helping state regulators determine whether utilities are meeting their state-mandated energy efficiency targets; (4) allowing cities to quantify their actual greenhouse gas emissions and determine whether they are reaching self-imposed reduction goals; and (5) allowing more large industrial electricity customers to play a more active role in energy markets, participate in aggregated demand side management programs, and invest in DG.

This Essay explores recent efforts that federal, state, and local governments have taken to create regulatory frameworks to collect energy consumption data and make it available to consumers and, in some cases, to the public. Part II explains the nature of energy consumption data, the problems with not having such data readily available to consumers and policymakers, and the benefits associated with making it available to a wider range of potential users. Part III explores developing federal, state, and local policies governing energy consumption data, including how policymakers have attempted to address some of the privacy and other concerns associated with such data. Part IV evaluates these efforts and attempts to provide guidance to policymakers on how to develop more robust regulatory frameworks to help capitalize on the potential energy efficiency benefits associated with increased collection, evaluation, and disclosure of energy consumption data.

II. THE PROMISE OF ENERGY CONSUMPTION DATA AND CURRENT BARRIERS TO USE

Today, most detailed energy consumption data is held privately by utilities. The federal government also surveys energy consumption, but these surveys are scheduled only once every four years and cover a small

subset of buildings. This Part covers past and current practices in energy use data and discusses how this data could transform the management of the electric system.

A. Energy Consumption Data Today

While high-profile regional blackouts affecting the high-voltage transmission system have led to massive investments in technology and management to ensure system reliability, advancements and investments in the low-voltage distribution network that connects utility substations to customers have not always kept pace.⁸ This is starting to change as advances in information and communication technology (ICT) have enhanced the capabilities of electric “smart” meters and are potentially changing how electricity will be managed and consumed.

Historically, all utilities used meter readers to collect energy use data from every household and business each month. The utility then calculated the amount of electricity used, multiplied it by the rate (cents per kilowatt hour) and billed the customer. Non-payment of the bill meant the meter reader was sent to the premises to shut off the electricity. While some utilities still use this approach, many have upgraded their metering infrastructure to reduce system costs and eliminate the meter reading job. In the 1990s utilities began to widely install the first generation of automatic meter reading (AMR) meters, which often required the utility personnel to drive a truck through the neighborhood or walk by the residence to automatically collect the data. Information flowed from the meter to the collector through energy consumption data that was collected monthly. The customer was billed only after the energy had been used.⁹

In the mid-2000s utilities began to invest in advanced meter infrastructure (AMI), which allows for two-way communication between the utility and the consumer through wireless or fiber networks. These advances in ICT meters allowed for automatic sub-hourly data collection. Also, the two-way communication could allow consumers to have real time information on their energy consumption and its cost. Further, AMI can allow utilities and customer to remotely monitor real time energy use, power quality, and identify any system failures. One of the great promises of the smart meter, as AMI is called, is that it can help to bridge the information

8. Poyan Pourbeik, et al., *The Anatomy of a Power Grid Blackout*, 4 IEE POWER & ENERGY MAG. 22 (Sept.–Oct. 2006), available at http://www.eeh.ee.ethz.ch/fileadmin/user_upload/eeh/studies/courses/modelling_and_analysis_of_power_networks/Documents/PSA_Anatomy_of_blackouts.pdf.

9. Jim Roche, *AMR vs AMI*, ELECTRIC LIGHT & POWER (Oct. 1, 2008), http://www.elp.com/articles/powergrid_international/print/volume-13/issue-10/features/amr-vs-ami.html.

asymmetry between how much energy a customer uses and what they pay. Real-time energy use consumer options promise a better alignment of consumer energy use and electricity market signals. Energy demand varies with the time of day, and the marginal cost of providing electricity also changes throughout the day, depending on which generators are producing electricity. However, most electric consumers still pay a flat price per kilowatt hour, even though the actual market price can vary by two orders of magnitude and shifts over time and space. Advocates imagine a world where consumers are sent price signals that reflect actual market prices and can adjust their behavior accordingly. This could be through the consumer actively shutting off of electric devices when prices are high or relying on pre-programed “set and forget” commands. For example, a subset of consumer appliances like air conditioners, water heaters, or refrigerators could be programed to automatically cycle in response to system signals or pre-set price points. Ideally, this would not affect appliance performance, but it would allow the system to more efficiently and economically manage resources. In an energy system with high levels of variable renewable resources, it could also allow for more active use of demand management.

In 2013, U.S. utilities installed over 50 million smart meters (89% for residential customers),¹⁰ though the installations vary significantly by state. Some states like Texas and Arizona have smart meter installations of over 50 percent of customers, while others like Minnesota and Iowa have installations below 15 percent.¹¹ The EIA tracks smart meter installations on Form EIA-861.¹² While consumers have opposed some smart meter programs and installations because of concerns associated

10. *Frequently Asked Questions, How Many Smart Meters Are Installed in the U.S. and Who Has Them?*, U.S. ENERGY INFORMATION ADMINISTRATION (Apr. 3, 2015), <http://www.eia.gov/tools/faqs/faq.cfm?id=108&t=3>; *Utility-Scale Smart Meter Deployments*, THE EDISON FOUNDATION (Sept. 2014), http://www.edisonfoundation.net/iei/Documents/IEI_SmartMeterUpdate_0914.pdf.

11. *See Smart Meter Deployments Continue to Rise*, U.S. ENERGY INFORMATION ADMINISTRATION (Nov. 1, 2012), <http://www.eia.gov/todayinenergy/detail.cfm?id=8590>; *Electric Power Sales, Revenue, and Energy Efficiency Form EIA-861 Detailed Data Files*, U.S. ENERGY INFORMATION ADMINISTRATION, <http://www.eia.gov/electricity/data/eia861/index.html>; *Utility-Scale Smart Meter Deployments*, *supra* note 10, at 2, and Fig. 2.

12. *Id.*

with health, privacy, and safety, most smart meter rollouts have proceeded relatively smoothly.¹³

Smart meters can collect and store data in different ways and efforts to standardize the data formats are at a very early stage (see *infra* Green Button Program Part III). Utilities can collect sub-hourly data (e.g., 15 minute intervals), hourly data, daily data, or monthly data. They can choose whether or not to share these data with customers, how to share it, and what format it will be available. While real-time energy use data may allow customers to manage their immediate energy use, historical data could help to inform decisions in energy efficient upgrades. While real time plug-level data can reveal occupancy patterns, legacy hourly or monthly data may not have the same privacy concerns. Who owns the data collected from smart meters is discussed in Part III, but today the utilities are the primary parties that collect, analyze, and have access to energy consumption data.

While smart meters can collect copious quantities of energy consumption data, linking them to better system management or helping consumers save money has been difficult in some jurisdictions. Not all of the installed smart meter projects come with consumer interface devices or allow consumers to manage their electricity use in real time. Most U.S. consumers still pay a flat per kilowatt charge, and state public utility commissions have often been slow to approve time-based rate-tariffs like time of use pricing, real-time pricing, variable peak pricing, or critical peak pricing.¹⁴ Currently, about 5.3 million U.S. residential utility customers have access to price-responsive programs and 3.3 million to time-responsive programs.¹⁵ Additionally, demand devices used to link consumer energy use with the smart grid have been slow to sell. While consultants estimate that worldwide “smart appliance” sales will top \$35 billion by 2020, these are still sold at a premium price and market penetration has been low.¹⁶ Evaluating the benefits of these technologies and programs also requires uniform evaluation methods, which currently are not often used or available.

13. See *Stop Smart Meters!*, <http://stopsmartmeters.org/> (last visited Apr. 6, 2015); Felicity Barringer, *New Electricity Meter Stirs Fears*, N.Y. TIMES, Jan. 30, 2011, http://www.nytimes.com/2011/01/31/science/earth/31meters.html?_r=0.

14. See *Time Based Rate Programs*, SMARTGRID.GOV, https://www.smartgrid.gov/recovery_act/deployment_status/time_based_rate_programs.

15. See Form EIA-861, *supra* note 11.

16. See *Smart Appliances: Intelligent Control, Power Management, and Networking Technologies for Household Appliances on the Smart Grid: Global Market Analysis and Forecasts*, NAVIGANT RESEARCH, available at <http://www.navigantresearch.com/wpcontent/uploads/2012/09/SAPP-12-Executive-Summary.pdf>.

B. The Promise of Energy Consumption Data

Energy consumption data could help consumers by giving them better information on how they use energy, both for real-time management and for long-term planning. Hourly or intra-hourly information could allow consumers to manage energy use based on real-time price signals. This data could also assist in planning by allowing people to evaluate the financial impacts of different rate structure programs like dynamic pricing, time of use pricing, or a flat rate structure. Customers have often been reluctant to switch to dynamic pricing programs and PUCs have been slow to approve them because customers do not know what the costs will be beforehand. Generating more data to evaluate the costs to individual consumers could close this information gap and reduce these cost-related concerns. Hourly data could also allow consumers to size solar PV modules to their business or residence, target energy efficiency retrofits and investments, and better understand and manage how energy is used in their building. This data could also help commercial tenants, real estate investors, and lending institutions understand the energy costs of a site when investing in or financing a property.

Distributed generation (DG) developers could use energy consumption data to target new opportunities and size systems based on energy use in buildings. New GIS software allows for hourly estimation of solar energy production at a specific location; matching this to energy consumption would reduce the transaction costs of DG development.¹⁷ While hourly data would be fine for fixed solar PV installations, DG technologies like micro-turbines and solar with tracking could also use sub-hourly data and potentially provide back-up reserves to the grid. This data would allow developers to tailor system size, develop technologies to match consumer load, and potentially play an important role in the future electricity system. Likewise, energy consumption data would allow energy service companies to target opportunities within a geographic area and lower the transaction costs associated with their services.

Energy consumption data could also assist states in evaluating compliance with energy efficiency targets for utilities. For example, utilities in Minnesota

17. Dan Thiede, *Solar Dream Team Wins National Award for MN Solar Suitability App*, Univ. of Minnesota (Jul. 17, 2014, 1:07 PM), <https://uspatial.umn.edu/solar>.

are required to reduce their electricity by 1.5% of average retail sales.¹⁸ State regulators at the Department of Commerce are tasked with approving the energy efficiency programs that utilities propose and then evaluating their results. In practice, state regulators rely on third-party analysis using sub-metered data for large industrial projects, which claim savings of over 1 million kilowatt hours (kWh).¹⁹ For smaller residential programs, regulators currently use modeled data that have embedded assumptions about technology adoption and use.²⁰ Minnesota has also adopted methods for evaluating energy efficiency proposed by the Uniform Methods Project, discussed in more detail in Part III.²¹ While actual energy consumption data could allow the evaluation to be more accurate, it would also require new methods, analytics, and staff to manage, assess, and interpret the data. They could also compare programs across utilities, evaluate programmatic effectiveness within their state, and compare their results with other states. Many states also give tax rebates to encourage green building programs. These programs use modeling to estimate energy use in buildings before they are built, but very few conduct post-occupant surveys to evaluate actual energy use. Additionally, many states have energy efficient building construction standards, but they are not always able to assess if buildings meet the standards. Energy consumption data could help to close this gap. Likewise, over 1,000 mayors have joined the U.S. Conference of Mayor's Climate Protection Agreement and vowed to reduce greenhouse gas emissions from their municipalities.²² However, unless the city also has a municipal utility, it may have a hard time measuring any change in energy use and related greenhouse gas emissions.²³

Energy consumers could also play a more active role in energy markets with energy consumption data. While some utilities already arrange with large industrial customers to curtail their power during emergency situations,

18. *Database of State Incentives for Renewable Energy and Efficiency, Minnesota, Energy Efficiency Resource Standard*, DSIRE, <http://programs.dsireusa.org/system/program?state=MN> (last visited Apr. 6, 2015).

19. Sub-metered data examines the energy use of specific processes or industrial devices like pumps to allow for a more accurate energy use accounting.

20. Jessica Burdette, Minnesota Department of Commerce, Presentation to Wilson Research Group, Oct. 7, 2014.

21. *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings*, NREL (Apr. 2013), available at http://energy.gov/sites/prod/files/2013/07/f2/53827_complete.pdf.

22. *Mayor's Leading the Way on Climate Protection*, THE U.S. CONFERENCE OF MAYORS CLIMATE PROTECTION CENTER, <http://www.usmayors.org/climateprotection/revise/> (last visited Apr. 6, 2015).

23. Cities can use energy consumption data to target carbon reduction programs. For example, a city could analyze which customers used higher than average natural gas. They could then cross-reference this with a list of buildings that had not pulled a permit for a furnace in the last 20 years and then target this subset for furnace upgrades.

and some residential customers are on programs that reduce their air conditioning use during peak demand times, energy consumption data could open up new possibilities to create a more responsive electric load. Energy consumption data plus investments in smart grid technologies could allow a greater segment of aggregated demand to participate in energy markets and potentially provide some ancillary services to enhance distribution network reliability.

Finally, energy consumption data could also be used to create new products. For example, the Tennessee Valley Authority has worked with large industrial customers to help them manage their Scope II carbon emissions. By providing the estimated carbon intensity of the electricity they use for all 8,760 hours of the year, these facilities are able to more accurately report emissions associated with their electricity use.²⁴

Thus, across all of these areas, energy consumption data could help benchmark energy use and create a comparable context for best practice energy management. But there is presently no means for consumers, energy service companies, DG developers, or local or state governments to obtain meaningful and comparable energy consumption data. When efforts have been made to require utilities and other power providers to make energy consumption data publicly available, utilities and some consumer groups have raised privacy and other concerns that states have begun to address.

III. EXISTING LAW GOVERNING ENERGY CONSUMPTION DATA

Despite the clear benefits associated with increased access to energy consumption data, it is often difficult for consumers and third parties like energy efficiency program administrators, energy efficiency service providers, and researchers, to access meaningful energy consumption data. The majority of states have no policies in place governing the disclosure of energy consumption data to customers or third parties.²⁵ In those states, customers and third parties must negotiate with individual electric utilities to obtain whatever information the utility makes available—either on an ad hoc

24. *Pollution Prevention and Reduction: Carbon Dioxide*, TENNESSEE VALLEY AUTHORITY, <http://www.tva.com/environment/air/co2.htm> (last visited Apr. 6, 2015); *Scope 2 Accounting: Clarifying the Treatment of Green Power Instruments*, GREENHOUSE GAS PROTOCOL, <http://www.ghgprotocol.org/feature/ghg-protocol-poweraccounting-guidelines>.

25. *A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency*, SEE ACTION, Dec. 2012.

basis or under a public utility's individual privacy policy. The state and local government policies that do exist vary significantly. Before discussing the existing policies, it is important to provide some additional detail on the needs of different parties that seek access to energy consumption data.

First, consumers may wish to obtain data in a usable form from their utility to track their own energy consumption trends, or provide that information to energy efficiency service providers or other third parties (like solar providers or researchers), or use their own energy data in management applications. The privacy issues associated with providing energy consumption data to consumers consist primarily of ensuring that the means of providing the information to the consumer is secure, and that the data is provided in a format that is useful to the consumer or third parties with whom the consumer chooses to share the data.

Second, third-party energy efficiency program administrators may obtain energy consumption data either with or without the consent of the customer. In some states, regulatory agencies such as public utility commissions or state energy offices, manage energy efficiency programs and contracts with private energy efficiency program administrators, to meet state energy efficiency policy goals.²⁶ In order to track the success of such programs, these entities need access to energy consumption data. With delegated authority from the state, these entities, whether public or private, should be entitled to any data that the government would have the right to obtain. Thus, so long as sufficient security measures are employed to avoid data breaches, these entities should be able to obtain such data without customer consent.

Third, energy efficiency service providers (EESPs) are not affiliated with a state or local agency, but are private companies that offer energy efficiency services and products such as energy audits; energy efficiency consulting services; installation of energy efficient heating, air conditioning, and lighting systems; and energy consumption tracking systems.²⁷ EESPs may be able to obtain energy consumption data for existing clients if the utility makes such information available to the customer and the customer consents to the release of the data to the EESP. But in many states, nothing requires the utility to make the data available to the customer or to make it available in a form useful to the customer or the EESP. Moreover, in most states the EESP cannot obtain customer data in any form for prospective clients because it is not in a position to obtain consent from parties who

26. According to the State and Local Energy Efficiency Action Network (SEE ACTION), utilities administer energy efficiency programs in approximately 40 states while state agencies or profit or nonprofit companies manage programs in eight states. *See id.*

27. *What is an ESCO?*, NAT'L ASS'N OF ENERGY SERVICES COMPANIES, <http://www.naesco.org/what-is-an-esco> (last visited Apr. 6, 2015).

are not yet clients. According to EESPs, such data would allow the EESP to offer energy efficiency services to new customers more effectively by showing them, based on individualized or aggregated energy consumption data, how they could increase the efficiency of lighting, heating, cooling, and other energy systems in their homes, businesses, commercial buildings, or industrial facilities.²⁸

Finally, researchers at universities and non-profit entities seek access to energy consumption data in connection with scholarly work and to support policy development in the area of energy efficiency. Researchers could use energy consumption data to model and develop new technologies, evaluate different interventions and market products, and provide more nuanced research on the linkages between energy use and energy production.

The remainder of this Part discusses federal, state, local, and utility policies currently in place governing energy consumption data. These include (1) federal policies to support consumer access to energy consumption data and potential federal privacy limitations on disclosure of such data, (2) state policies governing privacy of energy consumption data and aggregation of such data, and (3) local government efforts to create “benchmarking” for commercial building efficiency.

A. Federal Policies and Initiatives on Energy Consumption Data and Privacy

Under the Federal Power Act, the federal government, through FERC, regulates the wholesale sale of electricity in interstate commerce and the transmission of electricity in interstate commerce.²⁹ By contrast, state legislatures and state public utility commissions (PUCs) regulate retail sales of electricity.³⁰ As a result, the collection and disclosure of energy

28. See SEE ACTION, *supra* note 25, at 5.

29. 16 U.S.C. § 813 (describing the power of the federal government to enter into interstate commerce and to regulate rates and charges); 16 U.S.C. § 824s (“Not later than 1 year after August 8, 2005, the Commission shall establish, by rule, incentive-based (including performance-based) rate treatments for the transmission of electric energy in interstate commerce by public utilities for the purpose of benefitting consumers by ensuring reliability and reducing the cost of delivered power.”); 16 U.S.C. § 824e (“[T]he Commission shall determine the just and reasonable rate, charge, classification, rule, regulation, practice, or contract to be thereafter observed and in force, and shall fix the same by order.”).

30. 16 U.S.C. § 824 (“Federal regulation [is] . . . to extend only to those matters which are not subject to regulation by the States.”); SEE ACTION, *supra* note 25, at 1 (“State legislatures and public utilities commissions (PUCs) are uniquely positioned to

consumption data for energy efficiency and other purposes is primarily an issue of state law.³¹ Nevertheless, there are several federal initiatives designed to promote better access to and use of energy consumption data. For instance, the American Recovery and Reinvestment Act of 2009 provided over \$4.5 billion in new funding for smart grid and electric grid investments, including money designed to facilitate the installation of nearly 20 million new smart meters.³² Such smart meters have the potential to dramatically increase the flow and granularity of data on energy consumption from the consumer to the utility, from the utility to the consumer and, ultimately, to EESPs and energy efficiency research centers. This Section discusses federal actions to date related to energy consumption data.

1. Federal Energy Use Surveys

In addition to the electricity sales data collected by utilities, the U.S. Department of Energy's Energy Information Administration (EIA) collects energy consumption data as part of several energy consumption surveys. Residential and commercial energy use surveys are supposed to take place at least every four years and are authorized under the Federal Energy Information Act of 1974,³³ with the first surveys beginning in the late 1970s. For example, the Commercial Buildings Energy Consumption Survey (CBECS), which was first run in 1979, collects energy use data from a sample of buildings and commercial energy users; the Residential Energy Consumption Survey (RECS), developed in 1978, samples residential housing energy use and expenditures; and the Manufacturing Energy Consumption Survey (MECS),³⁴ developed in 1985, surveys energy

support energy efficiency and protect customer data because of their jurisdiction over retail electric utilities.”).

31. Adam Schira, *Protecting Progress and Privacy: The Challengers of Smart Grid Implementation*, 61/S: A JOURNAL OF LAW AND POLICY 629, 642 (2011) (evaluating multiple federal legal doctrines that may be relevant to energy consumption data but are not used compared to state regulations); See SEE ACTION, *supra* note 25, at 13 (describing how the federal government has not restricted access to energy consumption data, leading to state regulation of access).

32. See *Transforming the American Economy Through Innovation: Executive Summary*, THE WHITE HOUSE, <http://www.whitehouse.gov/recovery/innovations/executive-summary> (providing an overview of Recovery Act programs, including smart meter and electric grid improvements); *Recovery Act: Smart Grid Investment Grants*, U.S. DEP'T OF ENERGY, <http://energy.gov/oe/technology-development/smart-grid/recovery-act-smart-grid-investment-grants>; *Recovery Act*, U.S. DEP'T OF ENERGY, <http://energy.gov/oe/information-center/recovery-act> (last visited Apr. 6, 2015).

33. 15 U.S.C. § 790a(a) (2015).

34. 42 U.S.C. § 7135 (2015).

consumption in the manufacturing sector.³⁵ These quadrennial surveys are supposed help track changes in energy use across the country and project future growth.

The RECS survey is voluntary for households and mandatory for energy suppliers and targets 15,400 respondents.³⁶ It has been run in 1980, 1981, 1982, 1984, 1987, 1990, 1993, 1997, 2001, and 2005 and 2009. For example, the 2009 RECS collected data from 12,083 households, which were chosen to represent the 113.6 million primary residence housing units in the United States.³⁷ The survey was 96 pages long and included information on resident demographics, housing unit characteristics, kitchen and home appliances, electronics, space and water heating, air conditioning, and miscellaneous information. Miscellaneous information included how many windows the residence had, if the residence had high ceilings, pools or hot tubs, outdoor and indoor lighting habits, and if the resident had received any aid for weatherization or other services. The survey asked about any direct use and payment for fuels like natural gas, propane, wood, and distributed generation like small-scale solar or wind. The survey also included a few questions on residential transportation.³⁸

The CBECS survey targeted 9,700 commercial building owners and occupants to provide information on building characteristics, building energy consumption, and expenditures for the nation's commercial buildings.³⁹ The 241-page 2012 CBECS asked about the building age and size; how it was used and occupied; how it operated its energy use and equipment; electricity and natural gas use; other fuel use (e.g. oil, diesel, kerosene);

35. See *About the Commercial Buildings Energy Consumption Survey*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/consumption/commercial/about.cfm> (last visited Apr. 6, 2015); *Residential Energy Consumption Survey*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/consumption/residential/> (last visited Apr. 6, 2015); *Manufacturing Energy Consumption Survey*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/consumption/manufacturing/> (last visited Apr. 6, 2015).

36. *Survey Forms*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/survey/#eia-457> (last visited Apr. 6, 2015).

37. *About the RECS*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/consumption/residential/about.cfm> (last visited Apr. 6, 2015).

38. *2009 Residential Energy Consumption Survey*, U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., http://www.eia.gov/survey/form/eia_457/form.pdf (last visited Apr. 6, 2015).

39. See H.R. 3781, 93rd Cong. §§ 5(a), 5(b), 13(b) (1974), CONG US HR 3781 (Westlaw).

district steam, hot, and chilled water use; total water use; and monthly energy bills.⁴⁰

While these surveys allow for national and regional comparisons of energy use, they are not detailed enough to allow for evaluation or comparison of different utility or state energy efficiency initiatives or compare programmatic effectiveness across jurisdictions. Additionally, recent analyses suggest that when compared to actual energy use, the estimates derived from the surveys might not accurately estimate energy use.⁴¹

2. *ENERGY STAR Portfolio Manager, Green Button, and the Uniform Methods Project*

Beyond government surveys, the federal government, sometimes in cooperation with private parties, has begun to develop uniform data collection protocols to make energy consumption data more accessible. First, the U.S. EPA has created a program called the ENERGY STAR Portfolio Manager.⁴² The program is a survey that analyzes a building's attributes, such as building type, space attribute data, and energy consumption by fuel type. Based in part on the Commercial Buildings Energy Consumption Survey, Portfolio Manager scores buildings on a scale between 1 and 100, with fifty being an average score. After entering a building's data into the program, the building owner can compare the building's rating with national medians or similar buildings. The building owner can also obtain an ENERGY STAR performance document that summarizes the building's energy consumption data. Thus, the goal of Portfolio Manager is to increase consumer access to energy consumption data to spur improvements in building energy use.⁴³

Second, the energy industry has developed the "Green Button" initiative in response to a challenge by the White House in 2011 for electricity providers

40. See EIA, 2012 CBECS Building Questionnaire Form EIA-871A, available at http://www.eia.gov/survey/form/eia_871/2012/cbecs-buildings-871a.pdf.

41. See Brock Glasgo, Inês Lima Azevedo & Chris Hendrickson, *Drivers of Home Energy Consumption from the Bottom Up and How Much Electricity Can We Save by Using Direct Current Circuits in Homes?* (Working Paper) (on file with the Eng'g and Pub. Policy Program, Carnegie Mellon Univ.), available at <http://www.pecanstreet.org/wordpress/wp-content/uploads/2014/06/Pike-Powers-Glasgo.pdf>; see Brinda A. Thomas, Inês L. Azevedo & Granger Morgan, *Edison Revisited: Should We Use DC Circuits for Lighting in Commercial Buildings?*, 45 ENERGY POLICY 399–411 (2012).

42. See *About ENERGY STAR*, ENERGY STAR, at <http://www.energystar.gov/about/> (last visited Apr. 6, 2015).

43. See *Federal, State, and Local Governments Leveraging ENERGY STAR*, ENERGY STAR (Jan. 30, 2103), http://www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf.

to give customers easier access to uniform and more usable energy consumption data.⁴⁴ Using Green Button, customers can securely download their own energy usage by clicking a “Green Button” on their electric utilities’ websites. The Green Button Program launched officially in 2012 and more than 35 utilities and electricity suppliers have adopted it. Green Button is based on the Energy Service Provider Interface data standard released by the North American Energy Standards Board. The standard consists of a common XML format for energy usage information and a data exchange protocol which allows the automatic transfer of data from a utility to a third party based on customer authorization. The standard means that utilities can follow a uniform approach to data collection and presentation, allowing EESPs to develop software more easily to analyze the data and recommend efficiency improvements to consumers, rather than develop software specific to each utility’s data set.⁴⁵ Green Button data can be provided in 15-minute, hourly, daily, or monthly intervals depending on what the utility decides to make available and the level of detail it is able to provide.⁴⁶

Utilities can make available the Green Button *Download My Data* feature, which allows the utility customer to download their energy consumption data to their own computer and then, if they choose, upload that data to a third party application.⁴⁷ Utilities can also offer Green Button *Connect My Data*, which allows utility customers to request the secure transfer of their energy consumption data directly to a third party, after express authorization and consent by the customer.⁴⁸ While many utilities have adopted the Green Button Program, not all utilities provide the service and currently there is no federal law that requires utilities to implement Green Button or any other energy consumption data program.

44. See *Green Button*, ENERGY.GOV <http://www.energy.gov/data/green-button> (last visited Apr. 6, 2015) [hereinafter *Green Button*]; see also *Green Button*, PACIFIC GAS & ELEC., <http://www.pge.com/myhome/addservices/moreservices/greenbutton/> (last visited Apr. 6, 2015); see also Nick Sinai & Matt Theall, *Expanded “Green Button” Will Reach Federal Agencies and More American Energy Consumers*, THE WHITE HOUSE (Dec. 5, 2013, 10:31 AM), <http://www.whitehouse.gov/blog/2013/12/05/expanded-green-button-will-reach-federal-agencies-and-more-american-energy-consumers> (explaining Green Button Program, listing participating utilities, and describing new expansion of the program).

45. SEE ACTION, *supra* note 25.

46. See *Green Button*, *supra* note 44.

47. *Id.*

48. *Id.*

Finally, uniform standards for energy efficiency evaluation, monitoring, and verification (EMV) are helpful to calculate savings, and ensure program transparency, comparability, and credibility. With energy efficiency mandates in 26 jurisdictions, the State and Local Energy Efficiency Action Network (SEE Action) sought to develop a standardized set of protocols to calculate savings from energy efficiency projects.⁴⁹ While other protocols exist, they had often been developed for other purposes.⁵⁰ See Action developed the Uniform Methods Project (UMP), to expand upon the International Performance Measurement and Verification Protocol (IPMVP), and provide additional procedural steps for implementation. The DOE Offices of Electricity Delivery and Energy Reliability and Energy and Renewable Energy managed the UMP by contracting with the Cadmus Group to develop a set of standardized protocols for consistent evaluation, monitoring, and verification of energy efficiency programs. Focused on commercial and residential programs, the first phase of the protocols covers residential and commercial lighting and controls, refrigerator recycling, residential air conditioning units, furnaces and boilers, and building retrofits.⁵¹ The second set will cover a larger set of technologies, which will allow for more complete measurement, monitoring, and evaluation of energy efficiency programs.

3. *Privacy and the Fourth Amendment*

Notably, neither Congress nor any other federal agency has created specific privacy policies governing energy consumption data. The U.S. Supreme Court has not addressed whether energy consumption data is protected by the Fourth Amendment, which protects “[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures.”⁵² It has, however, decided cases involving efforts by law enforcement officials to obtain access to cellular telephone data, GPS device data, and other modern technological information that contains personal information regarding the user.⁵³ At least one lower

49. NREL, *supra* note 20, at 1–3.

50. *Id.* at 1–6.

51. *Id.* at 1–5.

52. U.S. CONST. amend. IV.

53. *See, e.g.,* Smith v. Maryland, 442 U.S. 735, 745–46 (1979) (telephone numbers a person dials are not subject to Fourth Amendment protection and do not require a warrant because caller voluntarily conveys the dialing information to the telephone company and thus obtaining the numbers is not a “search”); Riley v. California, 134 S. Ct. 2473, 2494–95 (2014) (Fourth Amendment protects cellphone information and thus law enforcement officers need a warrant to search the cellphones of people they arrest and cannot obtain such information without a warrant under exception for searches incident to arrest because

court has held that electricity customers cannot object to installation of smart meters on Fourth Amendment grounds under the “third-party doctrine,” which denies protection to information a customer gives to a business as part of their commercial relationship.⁵⁴ But recent Supreme Court case law in the context of GPS monitoring has raised the question of whether the third party doctrine should continue to apply to the vast array of new digital communications that contains significant personal information.⁵⁵ Thus, the question of Fourth Amendment protection for smart meter data will continue to develop as such data becomes more pervasive and has the potential to be of use to law enforcement personnel, potential criminals who can more easily monitor household activities, and potential marketers who can evaluate appliances for purposes of direct marketing.⁵⁶

concern for officer safety is not present in such a situation and modern cellphone contains significant personal information).

54. *Naperville Smart Meter Awareness Program v. City of Naperville*, No. 11 C 9299, 2013 WL 1196580, at *11-12 (N.D. Ill., Mar. 22, 2013) (citing *Smith v. Maryland*, 432 U.S. 735 (1979)); BRANDON J. MURRILL ET AL., CONG. RES. SERVICE, SMART METER DATA: PRIVACY AND CYBERSECURITY (Feb. 3, 2012) (discussing third party doctrine).

55. *United States v. Jones*, 132 S. Ct. 945 (2012) ((holding that attaching a GPS tracking device to a vehicle was a “search” within the scope of the Fourth Amendment and required a warrant); *id.* at 957 (Sotomayor, J., concurring) (“... [I]t may be necessary to reconsider the premise that an individual has no reasonable expectation of privacy in information voluntarily disclosed to third parties . . . This approach is ill suited to the digital age, in which people reveal a great deal of information about themselves to third parties in the course of carrying out mundane tasks. People disclose the phone numbers that they dial or text to their cellular providers; the URLs that they visit and the e-mail addresses with which they correspond to their Internet service providers; and the books, groceries, and medications they purchase to online retailers.”); OFF. OF THE PRESIDENT, BIG DATA: SEIZING OPPORTUNITIES, PRESERVING VALUES 32–34 (2014) (discussing continued application of the third party doctrine).

56. See, e.g., Katrina Fischer Kuh, *Personal Environmental Information: The Promise and Perils of the Emerging Capacity to Identify Individual Environmental Harms*, 65 VAND. L. REV. 1565, 1624–28 (2012) (discussing potential law enforcement and other government uses of smart meter data); *United States v. Kyllo*, 190 F.3d 1041, 1043 (9th Cir. 1999), *rev’d on other grounds*, 533 U.S. 27 (2001) (describing how a federal agent subpoenaed monthly electricity records usage records, compared it to average electrical use, and concluded that the suspect’s electrical usage was abnormally high and indicated a possible indoor marijuana grow operation); Armand La Barge, *Indoor Marijuana Grow Operations*, POLICE CHIEF MAG. (Mar. 2005), http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=print_display&article_id=534&issue_id=32005; Mikhail A. Lisovich, et al., *Inferring Personal Information from Demand-Response Systems*, IEEE SECURITY AND PRIVACY (Jan./Feb. 2010), http://wisl.ece.comell.edu/wicker/SWicker_Lisovich (describing

But even if smart meter data is not subject to Fourth Amendment protection, energy consumption data may still be protected from unauthorized disclosure or access under the Stored Communications Act (SCA), the Computer Fraud and Abuse Act (CFAA), and the Electronic Communications Privacy Act (ECPA).⁵⁷ These statutes appear to allow law enforcement to access smart meter data for investigative purposes under procedures provided in the SCA, ECPA, and the Foreign Intelligence Surveillance Act (FISA), subject to certain conditions.⁵⁸

Outside the law enforcement context, how utilities use and distribute energy consumption data may be subject to Section 5 of the Federal Trade Commission Act (FTC Act).⁵⁹ In March 2012, the FTC issued a report that outlines “best practices” for businesses that collect, maintain, and use consumer data. The FTC limited the standard’s applicability to data that that can be “reasonably linked to a specific consumer, computer, or other device,” by stating that companies do not need to obtain consumer consent before collecting and using consumer data for practices that are consistent with the company’s relationship with the consumer, or that are specifically authorized by law. The FTC recommended that companies obtain affirmative express consent before using customer data “in a materially different manner than claimed when the data was collected” or when collecting “sensitive data.” Thus, although the FTC report does not prohibit the collection and use of energy consumption data for efficiency purposes, utilities may be concerned about FTC enforcement for violation of federal privacy policies if they make such data available to third parties, or do not fully disclose to customers how the data will be used and with whom it may be shared.⁶⁰

In sum, there are federal policies that encourage utilities, consumers, and third parties to better collect and utilize energy consumption data for energy efficiency purposes, but there are also more general federal privacy laws that may cause utilities to oppose greater third-party access to such data. Federal law in this area will undoubtedly continue to develop as smart meters become more common and consumers look for new ways to reduce energy use and save money. In the meantime, however, some states, local governments, and utilities have created more specific policies that govern the use, aggregation, and sharing of energy consumption data. The next sections explore these policies. But at both the federal and state

potential use of new residential smart meter data for law enforcement, criminal, and marketing purposes).

57. MURRILL ET AL., *supra* note 54, at 22–28.

58. *Id.* at 22–28.

59. *Id.* at 29–40.

60. See, e.g., Dana B. Rosenfeld & Sharon Kim Schiavetti, *Third-Party Smart Meter Data Analytics: The FTC’s Next Enforcement Target?*, THE ANTITRUST SOURCE (Oct. 2012).

levels, as smart meters and other modern technologies develop for the collection, use, and disclosure of energy consumption data, privacy concerns will continue to shape the applicable regulatory frameworks.⁶¹

B. State Policies on Energy Consumption Data

Several states have enacted a variety of policies to make energy consumption data available to customers and third parties to promote energy efficiency. Some of these policies relate to customer access to their own data and others apply to third party access to data. In all the proceedings establishing these policies, particularly those involving third-party or public access, concerns have been raised regarding the risks associated with the disclosure of energy consumption data. Some fear that third parties, including potential criminals, could determine from such data whether a residence is occupied at certain times, how many occupants there are, and their daily schedules and activities.⁶² In response to such concerns, Texas has created a right to “privacy of customer consumption” information for all retail utility customers,⁶³ and Washington courts have held that their state constitution creates a right of privacy in residential electricity consumption information and requires “authority of law” to disclose it.⁶⁴ More states will undoubtedly take up this issue as smart meters allow even more detailed information on consumer energy use. This may make it more difficult for third parties to access such data for purposes of research and energy efficiency analysis, even if the states have created programs for customers to access their own data. The remainder of this section discusses existing state policies on both customer and third-party access to energy consumption data.

61. Kuh, *supra* note 56, at 1613–28 (discussing developing privacy protections for government and third party access to smart meter data).

62. See MURRILL, ET AL., *supra* note 54, at 6; Lisovich, et al., *supra* note 56 (describing potential use of new residential smart meter data for law enforcement, criminal, and marketing purposes).

63. TEX. UTIL. CODE ANN. § 17.004(a) (2009) (describing various protections that buyers of retail electric services are entitled to, including privacy of customer consumption information); Sara Mattern, Note, *Municipal Energy Benchmarking Legislation for Commercial Buildings: You Can't Manage What You Don't Measure*, 40 B.C. ENVTL. AFF. L. REV. 487, 496, 505 (2013).

64. *In re Maxfield*, 945 P.2d 196, 199 (Wash. 1997); Mattern, *supra* note 63, at 507–08.

1. Customer and Building Owner Access to Energy Consumption Data

With regard to customer access to their own data, the states that have enacted statutes or rules on the subject have generally provided that customers should have access to their own data. These states include California, Colorado, Illinois, New York, Oklahoma, Pennsylvania, Texas, and Washington.⁶⁵ Moreover, Washington state law requires utilities to maintain energy consumption data for nonresidential customers for at least 12 months in a format compatible with ENERGY STAR Portfolio Manager and also requires utilities to upload that data into Portfolio Manager at the building owner's request.⁶⁶ The lack of a uniform format

65. 4 COLO. CODE REGS. § 723-3:3026(d) (2012) (“As part of basic utility service, a utility shall provide to a customer the customer’s standard customer data, access to the customer’s standard customer data in electronic machine-readable form, in conformity with nationally recognized open standards and best practices, in a manner that ensures adequate protections for the utility’s system security and the continued privacy of the customer data during the transmission. Such access shall be provided without additional charge.”); OKLA. STAT. tit. 17, § 710.4(A) (2011) (“An electric utility shall provide customers with reasonable access to and shall maintain the confidentiality of customer information.”); CAL. PUB. UTIL. CODE § 8380(b)(4) (2012) (“An electrical or gas corporation that utilizes an advanced metering infrastructure that allows a customer to access the customer’s electrical and gas consumption data shall ensure that the customer has an option to access that data.”); ILL. ADMIN. CODE. tit. 83, § 410.210 (2014) (discussing how the customer’s utility bill should disclose how much energy the customer used during the billing period, how a utility must provide a statement of energy consumption up to the preceding twelve months at the customer’s request, and how this information must be clear and concise); 66 PA. CONS. STAT. ANN. § 2807(d)(2) (2008) (“The commission shall establish regulations to require each electric distribution company, electricity supplier, marketer, aggregator and broker to provide adequate and accurate customer information to enable customers to make informed choices.”); 2 TEX. UTIL. CODE ANN. § 39.107(b) (2013) (“All meter data, including all data generated, provided, or otherwise made available, by advanced meters and meter information networks, shall belong to a customer.”); 16 TEX. ADMIN. CODE § 25.130(j)(1) (2014) (“An electric utility shall provide a customer, the customer’s REP, and other entities authorized by the customer read-only access to the customer’s advanced meter data, including meter data used to calculate charges for service, historical load data, and any other proprietary customer information. The access shall be convenient and secure, and the data shall be made available no later than the day after it was created.”); WASH. ADMIN. CODE § 480-100-153(1) (2014) (“An electric utility may not disclose or sell private consumer information with or to its affiliates, subsidiaries, or any other third party . . . unless the utility has first obtained the customer’s written or electronic permission to do so.”); SEE ACTION, *supra* note 25, at 24.

66. WASH. REV. CODE § 19.27A.170(1) (2009) (“[Q]ualifying utilities shall maintain records of the energy consumption data of all nonresidential and qualifying public agency buildings to which they provide service. This data must be maintained for at least the most recent twelve months in a format compatible for uploading to the United States environmental protection agency’s energy star portfolio manager.”); WASH. REV. CODE § 19.27A.170(2) (2009) (“[A] qualifying utility shall upload the energy consumption data for the accounts

for such data is a common complaint because even when a utility does make such data available to a customer or third party, such data is “often out of scope, aggregated beyond what is necessary to protect customer privacy and not useful to the requesters, and outdated.”⁶⁷ And, as discussed in Part II, customers of utilities that have adopted the Green Button program can access their energy consumption data in a uniform format, and make that data available to third parties with customer consent.

Thus, at least some states have provided expressly that customers should have access to energy consumption data and some, like Washington, have created policies that require utilities to make such data available in a uniform format that can be more easily analyzed for energy efficiency purposes. However, as noted earlier some states like Texas and Washington have also created additional privacy protections beyond federal law, which may have the purpose of making it more difficult for third parties to access energy consumption data for energy efficiency or research purposes.

2. Third Party Access to Energy Consumption Data: Third Party Energy Efficiency Providers, State Aggregation Rules, and Other Privacy Protections

At least two states, Vermont and Wisconsin, have created formal third-party energy efficiency program administrators and formal agreements with program implementation contractors. Under these circumstances, since the contractors are working directly for the state, the contracts allow for access to customer data to perform the services required.⁶⁸ Such services

specified by the owner or operator for a building to the United States environmental protection agency’s energy star portfolio manager.”); Mattern, *supra* note 63, at 507.

67. AUDREY LEE & MARZIA ZAFAR, ENERGY DATA CENTER BRIEFING PAPER, CALIFORNIA PUBLIC UTILITIES COMMISSION 1 (Sept. 2012).

68. See SEE ACTION, *supra* note 25, at 22. For information on Vermont’s third-party contractor access to customer data, see VERMONT PUBLIC SERVICE BOARD, *Investigation into Dispute Regarding the Provision of Customer Information to Efficiency Vermont by the Village of Hyde Park Electric Department*, Docket No. 6379 (2000) (discussing how the EEU Efficiency Vermont has access to customer data but must follow state confidentiality guidelines); VERMONT PUBLIC SERVICE BOARD, *Investigation into the Department of Public Service’s proposed Energy Efficiency Plan Re: Phase II*, Docket No. 5980 (1999) (ordering the creation of a Vermont EEU to implement efficiency programs). For information on Wisconsin’s third-party contractor access, see WISCONSIN PUBLIC SERVICE COMMISSION, *Provision of Energy Utility Customer Information to Focus on Energy*, Docket No. 9501-GF-101 (2009) (detailing Wisconsin EEU Focus On Energy’s confidentiality requirements for access to customer data).

include providing efficient home designs, financial assistance for building upgrades, and smart meter installation and maintenance, all through programs such as Vermont’s “Efficiency Vermont” and Wisconsin’s “Focus on Energy.”⁶⁹ In Vermont, the Public Service Board created the nation’s first “Energy Efficiency Utility” (EEU) known as “Efficiency Vermont.”⁷⁰ Efficiency Vermont is administered by Vermont Energy Investment Corporation (VEIC), an independent nonprofit energy services organization under an appointment by the Vermont Public Service Board.⁷¹ Vermont utilities or customers themselves share customer data with Efficiency Vermont, which can share it with other third parties for energy efficiency purposes after the information is aggregated or the third party signs Efficiency Vermont’s Privacy Policy.⁷² However, such data must be aggregated at a level no smaller than the “town” level.⁷³ In Wisconsin, the administrator enters into individual agreements with utilities detailing how the data will be handled and used, including specifying that the administrator will protect the confidentiality of the customer data, how long the data will be retained, that the administration will destroy the information at a particular time, and that it will pay a penalty for unauthorized release of the data.⁷⁴

Other states that have not created such formal energy efficiency programs have nevertheless enacted laws governing the ability of third parties to obtain access to customer data. In Colorado, Texas, and Washington, third parties cannot obtain individual customer data without express customer consent.⁷⁵ Some of these states, however, have allowed EESPs to obtain

69. For information regarding Efficiency Vermont and its services, see *General Energy Efficiency Utility Information*, VT. PUB. SERV. BD., <http://psb.vermont.gov/utility/industries/eeu/generalinfo> (last visited Apr. 6, 2015) (providing general information on Efficiency Vermont’s program, services, and accomplishments). For examples of services provided by Focus on Energy, see *Residential*, FOCUS ON ENERGY, <https://focusonenergy.com/residential> (listing various services offered by Focus on Energy to residencies); see also *Business*, FOCUS ON ENERGY, <https://focusonenergy.com/business> (last visited Apr. 6, 2015) (providing examples of various energy services Focus on Energy provides to businesses and their buildings).

70. *FAQs*, EFFICIENCY VERMONT, <https://www.encyvermont.com/About-Us/Oversight-Reports-Plans/FAQs> (last visited Apr. 6, 2015).

71. See *id.*

72. *Efficiency Vermont Privacy Policy*, EFFICIENCY VERMONT, <https://www.encyvermont.com/About-Us/Privacy-Policy> (last visited Apr. 6, 2015).

73. See SEE ACTION, *supra* note 25, at 11.

74. LEE & ZAFAR, *supra* note 67 (describing Vermont and Wisconsin programs).

75. 4 COLO. CODE REGS. § 723-3:3030 (“Except as outlined in paragraphs 3026(b) and 3029(a), a utility shall not disclose customer data to any third-party unless the customer or a third-party acting on behalf of a customer submits a paper or electronic signed consent.”); 2 TEX. UTIL. CODE ANN. § 39.107 (“All meter data . . . shall belong to a customer, including data used to calculate charges for service, historical load data, and any other proprietary customer information. A customer may authorize its data to be provided

aggregated data without customer consent since such aggregated data does not pose the same privacy concerns as individualized data.⁷⁶ Moreover, aggregated data can provide valuable information on commercial and industrial building benchmarking and target energy efficiency opportunities in particular neighborhoods, counties, or geographic regions of the country.⁷⁷ But the ability to obtain even aggregate data without customer consent is uncertain in most states and, even where a state policy exists, it is often subject to numerous requirements making the aggregate data difficult to obtain and analyze.⁷⁸ The state policies that exist are discussed below.

a. Colorado

The Colorado PUC was the first PUC to adopt a firm rule of customer aggregation to address privacy issues associated with energy consumption data. In 2012, it adopted a “15/15” rule that governs the release of aggregated customer data to building owners and other third parties.⁷⁹ This rule provides that at a minimum an aggregated data report must contain at least 15 customers or premises, and that within any customer class, no single customer’s data or premise may comprise 15 percent or more of the data aggregated in the report.⁸⁰ If a third party or building owner requests a report that does not ensure customer privacy, the utilities

to one or more retail electric providers under rules and charges established by the commission.”); WASH. ADMIN. CODE § 480-100-153 (“An electric utility may not disclose or sell private consumer information with or to its affiliates, subsidiaries, or any other third party . . . unless the utility has first obtained the customer’s written or electronic permission to do so.”).

76. 4 COLO. CODE REGS. § 723-3:3031 (describing acceptable aggregated data in Colorado); WASH. ADMIN. CODE § 480-100-153(7) (“The utility may collect and release customer information in aggregate form if the aggregated information does not allow any specific customer to be identified.”).

77. SEE ACTION, *supra* note 25, at viii (“Aggregated data . . . allows program administrators, PICs, or EESPs to determine trends and evaluate results so that they, for example, can identify specific geographic areas or demographic groups that may have a higher ability to benefit from energy efficiency programs or services.”).

78. See, e.g., 4 COLO. CODE REGS. § 723-3:3031(a)–(f) (LexisNexis 2014) (outlining Colorado’s 15/15 Rule, a state regulation of the release of aggregated data).

79. 4 COLO. CODE REGS. § 723-3:3031(a)–(f) (LexisNexis 2014) (providing the rules for aggregated data disclosure from Colorado utilities, including what customer and energy usage information can and cannot be provided in utility reports); Regulatory Assistance Program, *Driving Building Efficiency With Aggregated Customer Data* at 8 (July 2013) [hereinafter RAP].

80. *Id.*

must revise the report by including additional customers, expanding the geographic area, or taking other measures to ensure the report meets the rule.⁸¹ Although Colorado has taken steps to create a program for third party access to energy consumption data, critics complain that the transfer of aggregate data from utilities to local governments and others is slow and often inadequate.⁸² This problem has, for instance, resulted in Boulder, Colorado being unable to evaluate its greenhouse gas emissions since 2010.⁸³

b. California

In May 2014, the California PUC adopted rules providing for access to energy consumption data by local governments, researchers, and government agencies in an order titled “Decision Adopting Rules to Provide Access to Energy Usage and Usage-Related Data While Protecting Privacy of Personal Data.”⁸⁴ The decision created different categories of protection based on which entity was seeking the data and the character of the data in question. Thus, the decision created different rules for energy consumption data sought by local governments, building owners seeking building energy usage data, researchers, and other third parties, like solar PV installers. The decision also established separate aggregation levels for public release of data without the consent of residential customers, commercial and agricultural customers, and industrial customers.

With regard to third-party requests for energy consumption data “this decision requires the consent of the person to whom the usage or usage-related data pertains before the release of that data to a third party,” but permits the disclosure of aggregated data to any party, with no personally identifiable information without customer consent.⁸⁵ For residential

81. *Id.*

82. *Possible Revisions and Additions to Electric and Gas Rules: Comments of the Southwest Energy Efficiency Project Before the Colo. Pub. Util. Comm’n*, Docket no. 13M-1052EG, at 4 (2014) (“While the current 15/15 rule is an opt-in process, it is administratively burdensome, and has resulted in a slow and sometimes insufficient transfer of aggregated data from utilities to local governments in the state.”).

83. *Possible Revisions and Additions to Electric and Gas Rules: Comments on the City of Boulder on Data Access and Privacy Before the Colo. Pub. Util. Comm’n*, Docket no. 13M-1052EG, at 11–12 (2014).

84. Decision Adopting Rules to Provide Access to Energy Usage-Related Data While Protecting Privacy of Personal Data, 2014 WL 1931946 at *2 (Cal. P.U.C., May 1, 2014) (summarizing the purpose of the decision).

85. *See id.* at *11 (describing how access to data depends on the characteristics of the data sought); CAL. P.U.C., Decision Adopting Rules to Protect the Privacy & Security of the Elec. Usage Data of the Customers of Pacific Gas and Elec. Company, Southern California Edison Company, & San Diego Gas & Electric Company, Decision 11-07-056, at 87 (2011) (allowing the third party use of “aggregated data that is removed of all

customers, data stripped of personal identifying information, aggregated to a monthly time period, and aggregated to the zip code level, can be made publically available. The only exception is if the zip code lacks 100 residential customers, in which case the zip code data must be combined with neighboring zip code data to equal 100 customers.⁸⁶ For commercial, agricultural, and industrial customers, the decision imposed a 15/15 rule, similar to Colorado, for public disclosure.⁸⁷ According to the PUC, using these aggregation rules allows parties to bypass traditional information gathering practices of contracts between utilities and third parties, awaiting an order from the PUC, or gaining the direct consent of the customer.⁸⁸ The PUC also set a timetable to make such data available and required that it be made available in a common format to be developed by the utilities and PUC staff.⁸⁹ The PUC allowed more extensive data to be released to local governments, allowing residential, commercial, and agricultural data to be aggregated using a 15/20 rule, and imposing a 5/25 rule for industrial customers, but local governments requesting such data may not release it to third parties.⁹⁰ Local governments can also obtain more individualized residential data, so long as the data is anonymized and aggregated over time to at least a monthly level.⁹¹ Researchers can obtain even more

personally-identifiable information to be used for analysis, reporting or program management provided that the release of that data does not disclose or reveal specific customer information.”); *see also* CAL. PUB. UTIL. CODE § 8380(e)(1) (allowing aggregated consumption data to be disclosed if all personal identification is removed); RAP, *supra* note 79; Nadav Malin & Tristan Roberts, *Energy Reporting: It’s the Law*, BUILDINGGREEN.COM (July 30, 2012), <http://www2.buildinggreen.com/article/energy-reporting-its-law> (“The problem became more manageable after the California Public Utilities Commission ruled in July 2011 on data privacy issues related to smart meters. That ruling clarified when and how this kind of data can be used, and who can have access to it.”).

86. Cal. P.U.C. Decision, *supra* note 85, at *82.

87. *Id.* at *82. *See also supra* notes 79–80 (describing 15/15 aggregation rule).

88. *See* CAL. PUB. UTIL. CODE § 8380(e)(2) (“provided that, for contracts entered into after January 1, 2011, the utility has required by contract that the third party implement and maintain reasonable security procedures and practices appropriate to the nature of the information.”); CAL. PUB. UTIL. CODE § 8380(e)(3) (“This section shall not preclude an electrical corporation or gas corporation from disclosing electrical or gas consumption data as required or permitted under state or federal law or by an order of the commission.”); *id.* § 8380(b)(1) (“An electrical corporation or gas corporation shall not share, disclose, or otherwise make accessible to any third party a customer’s electrical or gas consumption data, except as provided in subdivision (e) or upon the consent of the customer”).

89. Cal. P.U.C. Decision, *supra* note 85, at *83.

90. *Id.* at *84.

91. *Id.*

granular data but must adhere to requirements regarding the scope of research, data handling, and privacy assurances.⁹²

For any issues that arise between a requesting party and the utility, the PUC created the Energy Data Access Committee “to advise the utilities on process improvements and best practices related to data access and help mediate disagreements.”⁹³ In addition to this measure, the 2014 decision discusses the potential for creating an “Energy Data Center” that would collect and retain some level of aggregated energy consumption data for public and third party access.⁹⁴ In a 2012 briefing paper, the CPUC explored current challenges to accessing aggregated data and found that “[c]onsolidating that information in one location, such as a data center, should help improve state energy policies and create new market opportunities to save energy.”⁹⁵ Such a data center could help address concerns surrounding “over-aggregated” data devoid of any helpful customer consumption data, as well as differing interpretations of the Commission’s data rules by different utilities. The 2012 CPUC briefing paper concluded that creation of an Energy Data Center would aggregate data to a point where it would protect personal information while allowing for viable use by the public and facilitating the transfer of information from utilities to third parties, like governmental entities.⁹⁶ In its 2014 decision, the CPUC declined to create an Energy Data Center at that time but agreed to study the issue in subsequent agency proceedings.⁹⁷

c. New York

Starting in 2010, the New York PUC established a process for providing Consolidated Edison (Con Edison) building owners customers access to their tenants’ energy consumption data.⁹⁸ Under that policy, within 15

92. *Id.* at *85 (discussing access to data by researchers and various limitations).

93. *Id.* at *1.

94. *Id.* at *3 (“Finally, the workshops, which also explored issues relating to an Energy Data Center, anticipated that these steps might ameliorate the immediate need for a data center.”).

95. LEE & ZAFAR, *supra* note 67, at 1.

96. *Id.* at 2–3 (listing possible roles for an Energy Data Center and how those roles would correct issues within the current data accessibility framework).

97. Decision Adopting Rules to Provide Access to Energy Usage and Usage-Related Data While Protecting Privacy of Personal Data, 2014 WL 1931946 at *16 (Cal. P.U.C., May 1, 2014) (“[T]he Commission continues to see the importance of exploring the value of a dedicated energy data center in the future to increase access to data while developing reasonable protections on customer privacy.”).

98. Proceeding on Motion of the Comm’n as to the Rates, Charges, Rules & Regulations of Consol. Edison Co. of New York, Inc. for Elec. Service and Comprehensive Mgmt. Audit of Consol. Edison Co. of New York, Inc., 2010 WL 1255789 (N.Y.P.S.C. Mar. 26, 2010); RAP, *supra* note 79, at 8.

days of receiving a written request from a multifamily or commercial building owner or manager, Con Edison must provide aggregate building energy usage (measured in kWhs) and demand (measured in kW) for up to 24 months prior to the request.⁹⁹ If such a request requires a manual review of billing information, Con Edison will be allowed to recover the costs from the requesting party.¹⁰⁰ The data must be provided in aggregate form without revealing identifying customer information.¹⁰¹ As discussed in the next section, several municipalities also have specific energy consumption data disclosure and reporting requirements for commercial buildings. As such, the New York PUC policy facilitates the ability of building owners in New York City to obtain the data necessary to comply with local government building efficiency and benchmarking laws.

d. Texas

In contrast with New York, the Texas Public Utilities Commission created additional protections for energy consumption data through a 2014 Order with accompanying regulations, but did not enact new rules for access to aggregated data. The new regulations prohibit utilities from selling or disclosing information from advanced metering systems.¹⁰² Under § 25.44 of the Public Utility Regulatory Act, “[a]n electric utility shall not sell, share, or disclose information generated, provided, or otherwise collected from an advanced metering system or meter information network,” including energy consumption data, with an exception for third parties affiliated or contracted with the utility and using that information for

99. *Id.*

100. *Id.* (“[W]here the Company’s compliance with a building owner’s or manager’s request requires it to perform a manual review of historical usage or billing information, Con Edison will be allowed to impose a charge to the requesting party to recover the costs associated with such effort.”).

101. *Id.* (This information will be provided “in aggregate form and shall not reveal particularized or identifiable customer information.”).

102. PUC Rulemaking Related to the Implementation of PURA, 2014 WL 1826803, at *1 (Tex. P.U.C., Apr. 17, 2014) (“The Public Utility Commission of Texas (commission) adopts new § 25.44, relating to Privacy of Advanced Metering System Information, and new § 25.500, relating to Privacy of Advanced Metering System Information, with changes to the proposed text as published in the January 3, 2014 issue of the Texas Register.”). For information on the Public Utility Regulatory Act, see TEX. UTIL. CODE ANN. § 39.107 (West) (outlining metering and billing service requirements for Texas utilities).

customer approved services.¹⁰³ Similarly, under § 25.500 “[a] transmission and distribution utility shall not sell, share, or disclose information generated, provided, or otherwise collected from an advanced metering system or meter information network,” unless allowed by a customer.¹⁰⁴ Therefore, under these new regulatory provisions, a utility may not release any energy consumption data to third parties without customer consent.

e. Oklahoma

Under Oklahoma law, utilities may disclose “aggregate usage data” to third parties and the public without customer consent for energy assistance and conservation purposes.¹⁰⁵ “Aggregate usage data” is defined as “data from which all identifying information has been removed such that the individual usage data of a customer cannot without extraordinary effort and expertise be associated with the identifying information of that customer.”¹⁰⁶ The law also provides that aggregate usage data “shall contain a sufficient number of similarly situated customers within a particular geographic area so that the daily usage routines or habits of an individual customer could not be reasonably deduced from the data.”¹⁰⁷

f. Other PUC Proceedings: Michigan, Minnesota, and Illinois

The Michigan PSC, the Minnesota PUC, and the Illinois Commerce Commission (ICC) have begun proceedings to establish rules governing disclosure of energy consumption data aggregation levels appropriate for disclosure to third parties for energy efficiency purposes without customer consent.¹⁰⁸ In the meantime, customer energy use data in those states is generally disclosed only pursuant to utility privacy policies and tariffs.

In Michigan, in a 2013 order on energy consumption data, the PSC directed participating utilities to “file in this docket proposed customer data privacy tariffs for gas and electric service.”¹⁰⁹ This order came after the PSC ordered

103. TEX. UTIL. CODE ANN. § 25.44 (Vernon 2013).

104. TEX. UTIL. CODE ANN. § 25.500 (Vernon 2013).

105. OKLA. STAT. tit. 1, § 710.7 (describing how utilities may disclose aggregated information to third parties and the public, and the restrictions on how the information must be disclosed); For more information on Oklahoma laws protecting electricity usage data, *see generally* *id.* at §§ 710.1–710.8 (providing definitions and a framework for the use and disclosure of electricity usage information); RAP, *supra* note 79, at 8.

106. *Id.* at § 710.3(1).

107. *Id.* at § 710.7(B)(2).

108. RAP, *supra* note 79, at 11.

109. Customer Info. and Data Privacy, Case No. U-17102, 2013 WL 3355856 at *11 (Mich. P.S.C. June 28, 2013) (directing certain energy utilities to adopt data privacy tariffs).

utilities to comment on a PSC proposed customer privacy framework.¹¹⁰ The proposed policy required customer consent for disclosure of energy consumption data, but also contained provisions for aggregated data with utility options for using a 15/15 standard of aggregation or a standard that is similarly protective of customer privacy.¹¹¹

As for Minnesota, the Minnesota PUC undertook an investigation into the collection, storage, and dissemination of customer data to determine appropriate use of such data pursuant to a 2013 order requesting further comments on proposed privacy policies of rate-regulated energy utilities.¹¹² The PUC’s stated purpose was to balance customer privacy and meet state energy efficiency goals.¹¹³ To facilitate the identification of desired energy consumption data practices, the PUC created a workgroup to address the scope and definitions of energy consumption data and a framework to collect and maintain it.¹¹⁴ The workgroup issued a final report for public comment in September 2014, setting forth a framework to address the various privacy and data access goals of numerous parties. The report recommended components of any adopted state standard, set a range of “use cases,” including requests for individual customer data, whole building data, geographic data, research requests, and government requests, and provided various options for aggregation levels.¹¹⁵

In 2013, the ICC began proceedings to create a new framework in Illinois to guide utilities in administering new data systems required under the state’s smart grid law, called the Energy Infrastructure Modernization

110. *Id.* at *1 (describing the background of Michigan PSC’s order).

111. *Id.* at *12 (“Providers may opt to include “15/15 rule” here, or other method of data aggregation.”); *see also id.* at Appendix A (defining aggregated data).

112. Comm’n Inquiry into Privacy Policies of Rate-Regulated Util., Docket No. E, G-999/CI-12-1344, 2013 WL 3009192 at *5 (Minn. P.U.C., June 17, 2013) (“The Commission will proceed in this docket to investigate the collection, storage, and dissemination of customer data, focusing the inquiry as informed by the responses to the Commission’s initial questions.”).

113. *Id.* (“However the Commission seeks to identify and, to the extent appropriate, enact utility customer data practices that strike an appropriate balance between the interests of customer privacy and pursuit of state energy goals, while ensuring adequate and reliable services at reasonable rates.”).

114. *Id.* (describing the MPUC’s delegation of authority to the Executive Secretary to further investigate energy consumption data-related issues and framework).

115. MINN. PUB. UTIL. COMM’N, CUSTOMER ENERGY USAGE DATA: BALANCING CUSTOMER PRIVACY AND MINNESOTA’S ENERGY GOALS, FINAL REPORT OF THE CEUD WORKGROUP (Sept. 15, 2014), <https://www.edockets.state.mn.us/EFiling/edockets/search/Documents.do?method=viewDocument&documentId={E73ECFE2-6CC9-4934-8364-6AE4F2EDE59D}&documentTitle=20149-103119-01&userType=public>.

Act.¹¹⁶ Under the Act, electricity providers must maintain records and report annually their total number of net metering users as well as promote the state's electric utility infrastructure through investments in economic and infrastructure development, including use of tools like smart meters.¹¹⁷ In addition to the expansion of modern energy practices, the purpose of the Act is to secure the privacy of personal information and the right of customers to their usage information. It also outlines the process of information disclosure between customers, utilities, and third parties.¹¹⁸ Because of this, the ICC began to investigate and explore the privacy issues associated with energy consumption data and began to develop methods for third-party disclosure consistent with Illinois law.¹¹⁹

In a January 2014 order, the ICC concluded that adopting a 15/15 rule for aggregated data disclosure would help promote the state's energy efficiency goals, would protect privacy interests under state law, and would not overly burden utilities.¹²⁰ This order (and a subsequent order on rehearing) left open several issues, including: how to promulgate specific rules to implement the law and inform utilities how to comply with it, determining who "owns" a household's energy use data, and determining how this information should be accessed by third parties.¹²¹ In connection with these questions, the Citizens Utility Board and the Environmental Defense Fund, two non-profit organizations, filed a proposed Open Data Access Framework containing a detailed framework for the ICC to consider.¹²²

116. Energy Infrastructure Modernization Act of 2012, Pub. Act 097-0616, 220 ILCS 5/16-107.5(h) (2012) ("Within 120 days after the effective date of this amendatory Act of the 95th General Assembly, the Commission shall establish standards for net metering"); Kari Lydersen, *Illinois Grapples with Question of Who Owns Energy Data*, MIDWEST ENERGY NEWS (Aug. 28, 2013), <http://www.midwestenergynews.com/2014/08/28/illinois-grapples-with-question-of-who-owns-energy-data/> (outlining Illinois's actions regarding the use and growth of new data systems).

117. See Energy Infrastructure Modernization Act, §§ 16-107(k), 16-108.5 (describing the process and purpose of improving energy infrastructure).

118. *Id.* at § 16-108.6(c)-(d) (providing the rules regarding data access).

119. See, e.g., Illinois Commerce Commission on its Own Motion, Order, 2014 WL 580077 (Ill. C.C., Jan. 28, 2014); Illinois Commerce Commission on its Own Motion, Order on Rehearing, 2014 WL 3890904 (Ill. C.C., July 30, 2014).

120. See Illinois Commerce Commission Order, 2014 WL 580077, at *16.

121. Lydersen, *supra* note 116 ("These issues are being debated in Illinois before the Illinois Commerce Commission, which will in coming months adopt a framework.").

122. Verified Petition of the Citizens Utility Board and Environmental Defense Fund to Initiate a Proceeding to Adopt the Illinois Open Access Data Framework, Illinois Commerce Commission, Aug. 15, 2014, at http://www.smartgridlegalnews.com/CUB_EDF_Joint_Petition_ICC_0814.pdf; *Open Data Access Framework*, Ex. 1.1 to Verified Petition of the Citizens Utility Board and Environmental Defense Fund to Initiate a Proceeding to Adopt the Illinois Open Data Access Framework, No. 14-0507 (Ill.C.C. Aug. 15, 2014) (providing guidance to the ICC for customer energy data access issues).

3. *Post-Disclosure Safeguards*

In order to further ensure that customer privacy in non-aggregated data is protected even after a customer consents to third-party access, certain states have established post-consent safeguards for customer data. For instance, Colorado requires third parties to destroy customer data after the intended purpose is accomplished while California and Vermont require third parties to maintain specific security measures regarding the data.¹²³ In California, even though a utility may freely disclose customer usage information for purposes like energy efficiency, demand management, or utility administration, the utility must “use reasonable security procedures and practices to protect a customer’s unencrypted electrical or gas consumption data from unauthorized access, destruction, use, modification, or disclosure” for all disclosures.¹²⁴ In Vermont, the EEU and any third party must adhere to the rules of the Confidential Information Management System (CIMS), a state program developed to identify what information is confidential and how best to prevent disclosures of data to unauthorized parties.¹²⁵

4. *Data Centers and Public Websites*

In addition to these state initiatives and programs, several other states are currently considering laws that would require energy rating and disclosure, and Massachusetts is considering a public website for energy

123. 4 COLO. CODE REGS. § 723-3:3029 (“A utility may disclose customer data to a contracted agent provided that the contract meets the following minimum requirements: . . . Destroy any customer data that is no longer necessary for the purpose for which it was transferred.”); CAL. PUB. UTIL. CODE §§ 8380–8381 (listing how electric utilities must safeguard consumption data); Investigation into Dispute Regarding the Provision of Customer Information to Efficiency Vermont by the Village of Hyde Park Electric Department, No. 6379 (Vermont Public Services Board May 3, 2000) (introducing third party adherence to the privacy guidelines of the Confidential Information Management System).

124. CAL. PUB. UTIL. CODE § 8380(d); *see also id.* § 8380(e)(2) (describing how a utility may disclose information for its contract’s primary purpose, as long as it protects personal information from unauthorized access, use, or disclosure).

125. Investigation into Dispute Regarding the Provision of Customer Information to Efficiency Vermont by the Village of Hyde Park Electric Department, No. 6379 (Vermont Public Services Board May 3, 2000). For more information on CIMS guidelines, *see* EFFICIENCY VERMONT, CONFIDENTIAL INFORMATION MANAGEMENT SYSTEM (2011) (listing the criteria for identifying confidential information, and the confidentiality procedures to protect that information).

consumption data.¹²⁶ Specifically, utilities in Massachusetts would utilize a web portal to access energy consumption data in order to meet the state PUC requirements for its ten-year grid modernization plan.¹²⁷ Through a 2014 order regarding the modernization of the electric grid, the PUC requires all electric distribution companies to submit a ten-year grid modernization plan to meet grid modernization goals, including reducing customer and system costs as well as improving asset management.¹²⁸ Utilities can meet these goals through monitoring customer energy usage with customer permission.¹²⁹ Also, “the Department intends to address privacy, data access, and the use of aggregated interval data in more detail well before any wide-scale collection of interval data takes place” through this plan.¹³⁰ Such measures include increased cyber-security, as well as the need for customer consent for energy consumption data.¹³¹ According to one commentator, “[a]lthough tracking the information is a step in the right direction, if it never gets into the market, it could be a missed opportunity.”¹³²

C. Local Government Policies on Energy Consumption Data: Building Efficiency and Benchmarking

In addition to the federal and state policies discussed above, many local governments have created energy consumption data policies aimed at allowing building owners and potential building owners to better utilize energy consumption data to increase energy efficiency of buildings and better inform potential purchasers of a building’s current level of energy efficiency. Many of these policies are referred to as commercial building

126. Katherine Tweed, *Energy Benchmarking Picks Up Steam in the US*, GREENTECH MEDIA (May 24, 2011), <http://www.greentechmedia.com/articles/read/energy-efficiency-benchmarking-pushes-retrofits-to-the-limelight> (describing various benchmarking programs in U.S. states and cities).

127. Modernization of the Electric Grid, D.P.U. 12-76-B (Mass. D.P.U. June 12, 2014) (providing information on how utilities may fulfill their requirements for the grid modernization plan).

128. *Id.* at 2 (describing the requirement for grid modernization plans and how these plans will be used).

129. *Id.* at 11 (“Through mechanisms such as TVR and, with customers’ permission, monitoring and control of customer appliances or equipment, a modernized grid will facilitate the reduction of peak demand by allowing retail customers to respond to price signals, as they currently do for airline tickets, hotel reservations, and other purchases.”).

130. *Id.* at 5.

131. *Id.* at 36 (“[I]n their GMPs, electric distribution companies should address: (1) how customers will be provided access to consumption data that can be easily understood; (2) the procedures for allowing an authorized third party to access customer usage data with the customer’s permission; and (3) procedures for making aggregate usage data available to third parties and ensuring that it cannot be linked to any individual customer.”).

132. Tweed, *supra* note 126.

“benchmarking” programs. Benchmarking tracks and summarizes the energy used by an entire building on an annual basis, enabling building owners, potential building owners, municipalities, and others to track trends and comparisons of similar buildings under similar conditions on a local, state, or national level.¹³³

Austin, Seattle, Minneapolis, and New York all impose some form of benchmarking requirements on commercial buildings, and some information disclosure to local governments or prospective buyers to increase demand for energy efficient buildings.¹³⁴ Most building owners comply using ENERGY STAR Portfolio Manager, which allows owners and others to track building performance over time and compare similar buildings.¹³⁵ The municipal policies differ as to which buildings are covered, the timing of disclosure, and the role of utilities in assisting with benchmarking.¹³⁶ Benchmarking is particularly difficult in situations where tenants pay

133. Mattern, *supra* note 63, at 488, 498.

134. AUSTIN, TEX., CODE OF ORDINANCES ch. 6–7 (2011) (Austin benchmarking program); SEATTLE, WASH., MUN. CODE tit. 22, ch. 22.920 (2012) (Seattle benchmarking program); MINNEAPOLIS, MINN., CODE OF ORDINANCES tit. 3, ch. 47, § 47.190 (2013), available at <http://www.minneapolismn.gov/www/groups/public/@regservices/documents/webcontent/wcms1p-101277.pdf> (Minneapolis benchmarking program); N.Y.C., N.Y., ADMIN. CODE §§ 28–309.3, 309.4 (2009) (New York City benchmarking program).

135. SEATTLE, WASH., MUN. CODE § 22.920.030 (2012) (“Building owners of each building subject to annual benchmarking requirements shall provide to the Director, using the Energy Star Portfolio Manager . . . an initial energy benchmarking report.”); MINNEAPOLIS, MINN., CODE OF ORDINANCES tit. 3, ch. 47, § 47.190 (2013), available at <http://www.minneapolismn.gov/www/groups/public/@regservices/documents/webcontent/wcms1p-101277.pdf> (“*Energy Star Portfolio Manager* means the tool developed and maintained by the United States Environmental Protection Agency to track and assess the relative energy performance of buildings nationwide.”); N.Y.C., N.Y., ADMIN. CODE § 28-309.5 (2009) (“Information shall be directly uploaded to the benchmarking tool.”); AUSTIN, TEX., CODE OF ORDINANCES ch. 6–7, art. 2, § 6-7-13(B)(3) (2011) (“This article does not apply to a residential facility if one or more of the following apply: . . . (3) the facility participated in the Austin Energy Home Performance with Energy Star program, or an equivalent Austin Electric Utility program, not more than ten years before the time of sale.”).

136. AUSTIN, TEX., CODE OF ORDINANCES ch. 6–7 (2011), available at <https://austinenergy.com/wps/wcm/connect/c8814cf7-e1a4-4d6f-8257-88445444f40c/ECADChap6-7EnergyConservation.pdf?MOD=AJPERES> (providing requirements for covered buildings, when information must be submitted, and how the utility may facilitate reporting); SEATTLE, WASH., MUN. CODE § 22.920.030 (2012) (same); MINNEAPOLIS, MINN., CODE OF ORDINANCES tit. 3, ch. 47, § 47.190 (2013), available at <http://www.minneapolismn.gov/www/groups/public/@regservices/documents/webcontent/wcms1p-101277.pdf> (same); N.Y.C., N.Y., ADMIN. CODE §§ 28-309.2, 309.3, 309.5 (2009) (same).

electricity bills directly to the utility, thus requiring a mechanism for building owners to obtain access to customer utility data.¹³⁷

For instance, New York City's benchmarking program, Local Law 84, requires owners of single buildings 50,000 square feet and larger, owners of two or more buildings on the same tax lot exceeding 100,000 square feet, and owners of city buildings 10,000 square feet or more, to annually report their energy and water consumption data.¹³⁸ If the building owner does not have access to aggregated building information from its meters, this information can be requested from utilities like ConEdison,¹³⁹ or from individual building tenants.¹⁴⁰ To increase access to aggregated information from utilities, the city encourages utilities to directly upload consumption information to the benchmarking tool, bypassing the need to get this information from building owners and tenants.¹⁴¹ In late 2012, the New York City Mayor's Office presented improvements to the benchmarking program to increase the amount and accuracy of consumption reports, such as obtaining aggregated information from utilities directly, instead of requiring building owners to gather data from multiple tenants.¹⁴² Such recommendations were meant to increase the effectiveness of the program by allowing for more direct uploading of energy consumption data from

137. N.Y.C., N.Y., ADMIN. CODE § 28-309.4.1 (2009) (describing the process for how a building owner must acquire tenant consumption data when the tenant is separately metered by the utility).

138. *Id.* at §§ 28-309.3, 309.4 (2009) (listing the benchmarking requirements for city and privately-owned commercial buildings); SEATTLE, WASH., MUN. CODE § 22.920.030 (2012) ("Each tenant located in a building subject to this chapter shall, within 30 days of a request by the building owner, provide in a form that does not disclose personally-identifying information, all information that cannot otherwise be acquired by the building owner and that is needed by the building owner to comply with the requirements of this chapter.").

139. *Aggregated Consumption Frequently Asked Questions*, CONEDISON, <http://www.coned.com/energyefficiency/PDF/FAQ-Aggregated-Consumption.pdf> (last visited July 11, 2014) (discussing how a building owner may request consumption data from the utility).

140. N.Y.C., N.Y., ADMIN. CODE § 28-309.4.1 (2009) ("Where a unit or other space in a covered building, other than a dwelling unit, is occupied by a tenant and such unit or space is separately metered by a utility company, the owner of such building shall request from such tenant information relating to such tenant's separately metered energy use.").

141. *Id.* at § 28-309.5.1 (2009) (describing the direct upload process of ECD by utilities within the NYC benchmarking program).

142. PLAN NYC, N.Y. CITY LOCAL LAW 84 BENCHMARKING REPORT 38 (Sept. 2013), available at http://www.nyc.gov/html/planyc/downloads/pdf/publications/1184_year_two_report.pdf ("[S]ince LL84 went into effect, both companies have made aggregated whole building data available. Consequently, sending the letter to tenants is now an unnecessary burden. The Mayor's Office will remove this requirement from the law."). Other recommendations include the creation of automatic upload systems for consumption information, more accurate gross floor area measurements for buildings, and improving benchmarking reporting through updates to the Portfolio Manager tool and creation of a National Energy Efficiency Data System. *Id.* at 39–40.

utilities and building meters. This possibly decreases the use of third-party consultants by city building owners to gather and submit this information.¹⁴³

Once all building information is submitted through the benchmarking tool, consumption information is annually posted on the Internet for the public to view and building owners to compare consumption with other buildings.¹⁴⁴ Currently, “[o]f the five cities that have active legislation, only New York City, San Francisco and Washington, D.C. will require buildings to disclose the information on a public website.”¹⁴⁵ Yet Local Law 84 has exempted buildings with ten percent or more of their floor space devoted to data centers, trading floors, or television studios from receiving and posting benchmarking ratings.¹⁴⁶ Although these exemptions were created to avoid penalizing building owners hosting such high-energy businesses, the city recognized that “the energy consumed by these uses cannot continue to be ignored as they represent a sizable share of energy utilization.”¹⁴⁷ In 2014, EPA released a score range for data centers and thus the city planned to remove the exemption for data centers in the fall of 2015 while continuing to study how to accurately report energy consumption for trading floors and television studios.¹⁴⁸

Local Law 84 falls within NYC’s Greener, Greater Buildings Plan, which is designed to make 15,000 properties that are 50,000 square feet and larger to be more energy efficient, through access to energy consumption data and the use of cost-effective efficiency practices.¹⁴⁹ Created in 2009, this overall energy plan includes four regulations that include the benchmarking within Local Law 84, the NYC Energy Conservation Code

143. Malin & Roberts, *supra* note 85 (describing the use of consultants by NYC building owners to submit their building benchmarking reports and comparing it with Seattle’s direct upload program).

144. N.Y.C., N.Y., ADMIN. CODE § 28-309.8 (2009) (providing the process for disclosure of benchmarking information to the public).

145. Tweed, *supra* note 126 (discussing energy benchmarking programs in various U.S. cities).

146. N.Y.C., N.Y., ADMIN. CODE § 28-309.8 (2009) (“Ratings generated by the benchmarking tool for a covered building that contains a data center, television studio, and/or trading floor that together exceed ten percent of the gross square footage of any such building shall not be disclosed until the office of long-term planning and sustainability determines that the benchmarking tool can make adequate adjustments for such facilities.”).

147. PlaNYC, *supra* note 142, at 40.

148. PLANYC, N.Y. CITY LOCAL LAW 84 BENCHMARKING REPORT 33 (Sept. 2014).

149. *Greener, Greater Buildings Plan*, PlaNYC, <http://www.nyc.gov/html/gbee/html/plan/plan.shtml> (last visited July 15, 2014) (providing background information on NYC’s Greener, Greater Buildings Plan).

within Local Law 85, energy audits and retro-commissioning through Local Law 87, and lighting upgrading and sub-metering through Local Law 88.¹⁵⁰ The plan's goal is to reduce greenhouse gases by five percent, save NYC buildings seven billion dollars, and create thousands of jobs.¹⁵¹ Together, these four regulations constituted the first effort by an American city to create a mandatory program to reduce emissions from large buildings.¹⁵² Since its inception, the program has resulted in the benchmarking of 2,730 buildings, 130 building energy retrofits stemming from data reporting, and a reduction of 10–15% of city energy usage.¹⁵³

Seattle requires owners of all non-residential and multifamily buildings 20,000 square feet and larger to report energy benchmarking data to the city by April 1 of each year, while buildings smaller than 20,000 square feet may voluntarily report this data.¹⁵⁴ These reports must be submitted using the ENERGY STAR Portfolio Manager, or a similar system.¹⁵⁵ The building owner may either collect energy usage data directly from tenants, or may request this information from the utility. If a building owner cannot obtain a current tenant's energy usage information, the tenant is required to submit the data to the owner without personally identifying information.¹⁵⁶

150. *Id.* (listing the four regulations included in the Greener, Greater Buildings Plan). For a definition of "retro-commissioning," see N.Y.C., N.Y., ADMIN. CODE § 28-308.1 (2009) ("A systematic process for optimizing the energy efficiency of existing base building systems through the identification and correction of deficiencies in such systems, including but not limited to repairs of defects, cleaning, adjustments of valves, sensors, controls or programmed settings, and/or changes in operational practices.").

151. *Greener, Greater Buildings Plan*, *supra* note 149 ("These laws will reduce greenhouse gas emissions by almost five percent, have a net savings of \$7 billion, and create roughly 17,800 construction-related jobs over 10 years.").

152. Press Release, The City of N.Y., Mayor Bloomberg Signs Landmark Package of Legislation to Create Greener, Greater Buildings in New York City (Dec. 28, 2009) (on file with NYC.gov) ("The first four of twelve bills before me today are Introductory Numbers 476-A, 564-A, 967-A and 973-A, which together form a landmark package of legislation that will make New York the first American city with a comprehensive, mandatory effort to reduce emissions from existing large buildings.").

153. Don Knapp, *New York City Leads on Benchmarking Building Energy Efficiency*, ICLEI USA SUSTAINABLE CITIES & COUNTIES BLOG (Dec. 20, 2011), http://www.icleiusa.org/blog/archive/2011/11/mount_iclei/iclei/blog/archive/2011/12 (highlighting results from NYC's Greener, Greater Buildings Plan).

154. SEATTLE, WASH., MUN. CODE § 22.920.030 (2012) ("For buildings smaller than 50,000 square feet and larger than 20,000 square feet and having an initial occupancy date before January 1, 2012, reports and ratings pertaining to benchmarking for the year 2012 shall be submitted by April 1, 2013, and thereafter, annual reports and ratings for each subsequent year shall be due each April 1st.").

155. *Id.* at § 22.920.040 (detailing how the building owner will submit energy information to the city).

156. *Id.* at § 22.920.050 ("Each tenant located in a building subject to this chapter shall, within 30 days of a request by the building owner, provide in a form that does not disclose personally-identifying information, all information that cannot otherwise be acquired

Utilities must also maintain energy consumption data for benchmarked buildings for the most recent twelve months, in a form compatible with the reporting system used, to allow for easy access to this information by a building owner for reporting or for the utility to directly upload to the city system at the request of the owner.¹⁵⁷

Also, the building owner must provide an energy disclosure report to a current tenant, prospective tenant, or lender involved with a real estate transaction upon his or her request.¹⁵⁸ This requirement allows the real estate market to make energy and efficiency comparisons between buildings, which can lead to disparate costs. However, the information to date that has been collected and submitted to the city is not made public, but instead can only be disclosed for certain transactions like leasing or purchasing a building.¹⁵⁹ Thus, critics of the Seattle program claim that compared to the New York City benchmarking program, which discloses data to the public, the Seattle plan is less effective at instigating consumption changes. This is in part because highly visible information is more likely to encourage building owners to increase energy efficiency.¹⁶⁰

In Austin, Texas, the benchmarking program applies to commercial facilities with a gross floor area of 10,000 square feet or more by 2014.¹⁶¹ Covered commercial facility owners must perform an annual energy use rating through an approved audit or rating system.¹⁶² Any buildings with less than 10,000 square feet of gross floor area are exempt. Covered commercial building owners need only disclose their building's rating to

by the building owner and that is needed by the building owner to comply with the requirements of this chapter.”).

157. *Id.* at § 22.920.060 (“Utilities providing energy service to an annual or three-year-benchmark building shall maintain energy consumption data for each building for at least the most-recent twelve months in a format capable of being uploaded to the United States Environmental Protection Agency’s Energy Star Portfolio Manager.”).

158. *Id.* at § 22.920.080 (describing requests for benchmarking reports by tenants and lenders).

159. Malin & Roberts, *supra* note 85 (“Seattle won’t make the data it collects public other than by releasing it to tenants and buyers.”).

160. *Id.*

161. AUSTIN, TEX., CODE OF ORDINANCES ch. 6-7, art. 4 § 6-7-31 (2011), available at <https://austinenergy.com/wps/wcm/connect/c8814cf7-e1a4-4d6f-8257-88445444f40c/ECADChap6-7EnergyConservation.pdf?MOD=AJPERES> (describing the benchmarking requirements for each type of building).

162. *Id.* at art. 4, § 6-7-31(D) (“The owner of a commercial facility required to calculate an energy use rating for the facility under subsection (A), (B), or (C) must calculate an energy use rating for the facility by June 1 of each year following the First rating required for the facility using an audit or rating system approved by the director.”).

any prospective buyers while also submitting it to the city program director to be benchmarked.¹⁶³ With regard to data collection for the rating, the building owner is solely responsible for acquiring the entire building data from either individual tenants or directly from the utility, as Austin Energy does not provide automatic uploads to ENERGY STAR.¹⁶⁴ Yet, difficulties may arise with collecting this information, as data from Austin Energy must be aggregated from at least four separate utility meters with one meter unable to account for 80% or more of the collected information.¹⁶⁵

Minneapolis and Philadelphia have adopted benchmarking programs where commercial building owners must submit energy consumption data to the city for buildings over a certain size.¹⁶⁶ Similar to New York City, building information in both Minneapolis and Philadelphia is available online for general public access.¹⁶⁷ Also, similar to Austin and Seattle,

163. *Id.* at art. 4, § 6-7-32 (“The owner of a commercial facility must make a copy of the energy rating calculation required under this article available to a purchaser or prospective purchaser of the facility before the time of sale and must provide a copy to the director not later than 30 days after the audit is complete.”); *see also* Malin & Roberts, *supra* note 85 (“In Austin, the information only has to be disclosed to buyers.”); *see also* Tweed, *supra* note 126 (“In Austin, the information only has to be disclosed to buyers.”).

164. Frequently Asked Questions, ECAD for Commercial Buildings, AUSTIN ENERGY, <http://www.austintexas.gov> (select “Austin Energy”; then select “ECAD Ordinance & Energy Audits”; then “For Commercial buildings”; then select “FAQS”) (last visited Apr. 6, 2015) (providing answers for how commercial building owners should comply with Austin’s benchmarking program).

165. Amy Jewel, *Energy Benchmarking and Disclosure: Challenges for Building Owners and Managers*, DNVGL (May 14, 2013), <http://www.dnvkemautilityfuture.com/energy-benchmarking-and-disclosure-challenges-for-building-owners-and-managers> “[W]hen data for an entire building is provided by Austin Energy (the utility serving the City of Austin), data from at least four separate meters must be aggregated together, and energy data from one single meter cannot account for 80 percent or more of the aggregated energy consumption.”)

166. MINNEAPOLIS, MINN., CODE OF ORDINANCES tit. 3, ch. 47, § 47.190 (2013), *available at* <http://www.minneapolismn.gov/www/groups/public/@regservices/documents/webcontent/wcms1p-101277.pdf> (explaining the Minneapolis commercial benchmarking requirements, exemptions, and enforcement); Commercial Building Rating and Disclosure Policy, CITY OF MINNEAPOLIS, <http://www.minneapolismn.gov/environment/energy/WCMS1P-105433> (last updated Sept. 3, 2014) (listing the Minneapolis benchmarking disclosure policy); For a background on Philadelphia’s benchmarking program, *see* Philadelphia, Pa., Bill No. 120428-A § 9-3402 (outlining the benchmarking program requirements); ANDREA KRUKOWSKI & CLIFF MAJERSIK, INSTITUTE FOR MARKET TRANSFORMATION, UTILITIES’ GUIDE TO DATA ACCESS FOR BUILDING BENCHMARKING 5 (2013), *available at* http://energycodesocean.org/sites/default/files/resources/IMT_Report_-_Utilities_Guide_-_March_2013.pdf providing a summary of Philadelphia’s benchmarking initiative); INSTITUTE FOR MARKET TRANSFORMATION, GUIDE TO STATE & LOCAL ENERGY PERFORMANCE REGULATIONS VERSION 3.0, 12 (Aug. 2013) (listing exempted buildings under the Philadelphia Bill).

167. CITY OF MINNEAPOLIS, 2012 ENERGY BENCHMARKING REPORT: PUBLIC BUILDINGS (2013); CITY OF PHILADELPHIA, ENERGY BENCHMARKING REPORT (2014).

Philadelphia building owners are required to provide energy performance information to prospective buyers and tenants.¹⁶⁸

In some circumstances, municipalities have created programs to track residential buildings in addition to commercial buildings. For instance, Gainesville, Florida established the “Gainesville Green” program, which allows residential property owners, prospective purchasers, and third parties to determine the electricity, water, and natural gas use of residential properties throughout the city.¹⁶⁹ This program was created by EnergyIT.com, a technology group producing software to aid in the use of energy consumption data, along with various government and university groups.¹⁷⁰ The purpose of the Gainesville Green database is to provide comparisons between home energy use that can then be used by homeowners to understand their own energy use compared to their peers.¹⁷¹ Unlike other benchmarking programs that require building owners to submit data to the city, Gainesville Green compiles data from three different energy databases made available by the Gainesville Regional Utility (a municipal utility), allowing for residential building owners to find their own data, and compare it to other properties. The program also allows the public to access such data.¹⁷²

Individual utilities, such as PECO in Philadelphia and PEPCO in Washington, D.C., have worked with municipalities to improve benchmarking programs and reporting. For instance, PECO, the Department of Energy Efficiency Building Hub, the Pennsylvania PUC, and Philadelphia adopted the Green Button standards and created the PECO Smart Energy Usage Data Tool to make it easier for customers to upload energy

168. PHILA., PA. CODE § 9-3402(5)(b) (2012) (“The Council calls on the Administration to implement a Citywide program to provide for the reporting of Citywide benchmarking data online and in a manner that permits owners and tenants of Covered Buildings, prospective purchasers and lessees, and the public to view and compare Energy and water usage among comparable buildings and uses.”); GUIDE TO STATE & LOCAL ENERGY PERFORMANCE REGULATIONS, *supra* note 166, at 12 (listing benchmarking disclosure requirements).

169. Gainesville Green, <http://gainesville-green.com/>.

170. Gainesville Green, *Frequently Asked Questions*, <http://gainesville-green.com/faq> (last visited Apr. 6, 2015) (answering who created the Gainesville Green site).

171. *Overview*, GAINESVILLE GREEN, <http://gainesville-green.com/overview> (last visited Apr. 6, 2015 (“This site calculates relevant comparisons for home energy use and displays detailed information about household performance. Users are given various options to view, analyze, and understand how they use energy and compare with their peers.”)).

172. *Frequently Asked Questions*, *supra* note 170 (“This represents the combination of three databases.”).

consumption data.¹⁷³ Such initiatives allow building owners to directly upload data from PECO to ENERGY STAR Portfolio Manager.¹⁷⁴ In the District of Columbia, PEPCO created the Building Electricity Consumption Data Request Form to assist building owners in complying with the Green Building Act of 2006 and the Clean and Affordable Energy Act of 2008.¹⁷⁵ Upon completion of this form by the owner, PEPCO provides aggregated consumption data by month and year for the accounts provided.¹⁷⁶ This process allows building owners to bypass obtaining consumption data separately from each account, instead providing the aggregated total for the entire building without the need for individual collection.¹⁷⁷

IV. MOVING FORWARD: SHAPING FUTURE STATE AND LOCAL ENERGY CONSUMPTION DATA POLICIES

A review of the growing number of policies governing energy consumption data shows that there have been helpful developments at the federal, state, and local levels of government. Notably, each level of government has focused on different aspects of the issue.

At the federal level, the Green Button program and the Uniform Methods Project encourage utilities to collect and make data available in a uniform format and evaluate it using consistent and comparable standards. This allows multi-state utilities to create a uniform system of data collection and program evaluation for all their customers in multiple states and eases burdens on EESPs attempting to work with clients on energy efficiency efforts. These programs can also help state and local governments collect,

173. KRUKOWSKI & MAJERSIK, *supra* note 166, at 1 (describing PECO's work with state and federal organizations to improve electronic uploading of consumption data to benchmarking programs); *see also Benchmarking for Buildings, PECO*, <https://www.peco.com/Savings/ProgramsandRebates/Business/Pages/PECOsmartEnergyUsageDataTool.aspx> (last visited Apr. 6, 2015) (providing background information on PECO's new uploading program that is currently in development).

174. PECO, *supra* note 173 ("This system also allows for easy data export into the ENERGY STAR® Portfolio Manager, enabling owners and operators to benchmark their buildings' energy performance to similar buildings throughout the country.").

175. *Energy Benchmarking*, PEPCO, <http://www.pepco.com/my-business/energy-benchmarking/> (last visited Apr. 6, 2015) (describing the creation of the Building Electricity Consumption Data Request Form); *see also* D.C. CODE § 6-1451.03 (c)(2)(A)(i) ("The owner or a designee of the owner shall annually benchmark the building using the Energy Star® Portfolio Manager benchmarking tool."); D.C. CODE § 34-1553(d) (2008) ("A building owner, operator, or manager shall maintain adequate records regarding energy submetering equipment or energy allocation equipment.").

176. PEPCO, *Energy Benchmarking*, *supra* note 175 ("We will provide consumption data, in the aggregate, by month and year, for service points and/or account numbers that are provided and will work to respond to these requests within thirty (30) calendar days.").

177. *Id.* (describing how the Form assists building owners in collecting building data for benchmarking).

evaluate, and make public some forms of aggregated energy consumption data and allow individual app developers to create energy management products. The federal level is the ideal place for this type of standardization because it creates a nationwide, uniform format that states, local governments, and utilities can use to make certain data available to customers, EESPs, and the public, depending on the level of granularity of data they deem appropriate to balance disclosure and privacy. Indeed, the lack of a uniform format for energy consumption data is what has caused utilities to complain about the costs associated with making such data available because each party that seeks such data requires a different format. Likewise, without uniformity in data format, customers do not find the data helpful in energy efficiency decision making, EESPs cannot use standardized evaluation methods to assist their customers, and local governments cannot determine which efficiency measures are working or whether they are meeting their GHG reduction targets.

Although Green Button is a good start, only a few utilities have embraced and adopted the program. In order for Green Button or the Uniform Methods Project to effectively provide the standardization necessary to make energy consumption data more widely available, comparable, and, importantly, more useful, the EPA, DOE, or FERC should consider using their regulatory authority to require rather than encourage utility adoption of Green Button, the UMP standardized protocols, or another similar framework. In the alternative, EPA, DOE, or FERC could provide a regulatory framework that states could adopt to impose such requirements on utilities through legislation or PUC order.

By contrast, the federal government has focused very little on determining levels of aggregation for energy consumption data disclosure or privacy concerns. Certainly, there is concern among utilities and others that the 2012 FTC report addressing consumer data in general can impose potential liability for disclosure of certain types of energy consumption data. And it is likely that Fourth Amendment privacy concerns will arise as energy consumption data becomes more in demand for energy efficiency purposes. But at least at the present time, the federal government is not attempting to set specific standards regarding privacy and levels of aggregation for energy consumption data.

Meanwhile, at the state level, legislatures and PUCs are much more focused on issues relating to energy consumption data privacy, aggregation, and disclosure. Those state legislatures that have addressed the issue have declared that customers should have access to their own data, which

certainly helps the efforts of consumers to obtain such data for energy efficiency purposes. But many state legislatures have not addressed the issue at all. More importantly, no state has yet created a comprehensive framework to facilitate third party access to energy consumption data by third party researchers or EESPs for energy efficiency purposes with safeguards in place regarding levels of aggregation, other means of de-identifying the data, and records security. There is significant work to be done to develop appropriate models that address these issues. What levels of aggregation are sufficient to protect customer privacy? Is customer privacy even a real concern in the context of energy consumption data? To the extent consumers feel that disclosure of energy consumption data is an invasion of privacy at all, is the concern really the same with regard to 15-minute interval data versus weekly or monthly data? Or between real-time data and data which is several months or years old? State PUCs need to address these questions and put them on their dockets.

States must also consider whether the same levels of aggregation are appropriate for commercial and industrial data as compared to residential data. To the extent privacy is a concern at all with regulating the disclosure of energy consumption data, it would appear to be less of a concern with commercial and industrial electricity use than it would be for residential electricity use. Indeed, in its initial efforts on this issue, the California PUC has created different levels of required aggregation for commercial and industrial electricity users than it has for residential electricity consumers. This level of specificity regarding levels of aggregation, who can receive the data, and the security measures third parties must have in place to receive data will be critical to efforts by states to require utilities to disclose greater levels of energy consumption data and assure customers that such data will be used to benefit them and will be secure.

To the extent state legislatures, energy offices, and PUCs can require utilities to adopt the Green Button program, standardized evaluation metrics, or other national standards for the collection, disclosure, and evaluation of energy consumption data that will go a long way toward creating the frameworks necessary for consumers, cities, and states to reduce energy costs and GHG emissions. As discussed in Part III, both New York and Washington have taken helpful steps in this area. The New York PUC established a process for building owners to obtain data for multi-family and commercial buildings from utilities to meet local building efficiency benchmarking laws. Washington law requires utilities to maintain energy consumption data for 12 months in a format compatible with Green Button Portfolio Manager and requires utilities to upload that data into Portfolio Manager at the building owner's requests. These state requirements regarding the collection and maintenance of data in a uniform format will be critical to improve energy efficiency through greater use of energy

consumption data. Energy data centers and public websites will also be an important component of any statewide effort to better utilize energy consumption data. California has taken the first steps in considering an energy data center and Massachusetts is considering a public website. Such initiatives can create a centralized repository for valuable data and may provide additional security and quality control for data because one entity—a state agency—can control access to the data.

Notably, not all of the policy developments at the state level have been helpful in terms allowing increased access to energy consumption data for energy efficiency purposes. For instance, The Texas PUC's 2014 order makes it difficult, if not impossible, for third parties not affiliated with a utility to obtain energy consumption data without customer consent. It is critical for states to provide a forum, through PUC hearings and orders, along with legislation, to address these issues in sufficient detail to give direction to utilities, assurances to consumers, and make data available for third parties in an aggregated or de-identified format.

Then there are local governments. Local governments are in a unique position with regard to energy consumption data. On the one hand, local governments are just like other third parties seeking energy consumption data from utilities that is available only subject to state law and individual utility data policies. On the other hand, local governments are also regulators themselves, imposing collection and disclosure requirements on building owners through commercial building benchmarking programs. As a result, local governments have, in many ways, been more focused and innovative with regard to energy consumption data as compared to state legislatures, state PUCs, and the federal government. Cities have created benchmarking programs, public websites, and firm GHG reduction goals that far exceed efforts of the state or federal governments. At the same time, however, local government initiatives are necessarily more limited in that they can apply only to a single city and are circumscribed by state law and sometimes individual utility policies on data collection and disclosure when the electricity provider is not a municipal utility. Even beyond these outside limits on municipal policies, most cities have mandated disclosure of energy consumption data only in limited circumstances. Most city policies cover only commercial and municipal buildings, and only a handful make such data available to the public as opposed to potential buyers. Even New York City excludes some commercial buildings with significant electricity use, such as television studios.

In sum, different levels of government have been addressing different issues with regard to energy consumption data and, at least for now, that seems appropriate. The federal government may be in the best position to encourage or require standardized data collection practices that utilities can implement across the country. This will allow states, cities, customers, researchers, and EESPs to all use a uniform data format, which will streamline the type of comparative analysis that is critical to determining the levels of success of various energy efficiency programs. States can experiment with varying levels of privacy, data aggregation, and collection of data into data centers, thus acting as “laboratories of democracy” in the best sense. States like New York, California, and Massachusetts have already started this process and other states will look to them as their PUCs open dockets on this issue to guide and direct utilities and consumers. Additionally, local governments, like New York City, can be even more nimble than states and engage in targeted efforts to significantly reduce electricity use in various commercial sectors. To do so, however, local governments need the support of states to force utilities to provide the data and the support of the federal government to help ensure that the data is in a usable format.

V. CONCLUSION

In recent years, all levels of government, as well as private parties, have placed significant focus on developing policies and programs to collect, manage, and make public energy consumption data and have attempted to implement policies to address any privacy concerns associated with the data. A review of these developments shows that each level of government is focused on different aspects of the problem, with the federal government focused on standardization issues, the state governments focused on privacy and access, and the local governments focused more directly on building efficiency and benchmarking. But all levels of government, in conjunction with private parties, must take steps to create more certainty regarding what type of data can be made available, how it should be made available, and ensure that the right third parties have access to the data to improve energy efficiency outcomes.