Penn State Law Review

Volume 123 | Issue 2 Article 2

1-1-2019

Sharing Negawatts: Property Law, Electricity Data, and Facilitating the Energy Sharing Economy

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ABSTRACT

While the sharing economy has mostly focused on tangible assets or facilitating labor transactions, the potential to incorporate sharing—in the form of changes to behavior that create societal good—requires a different construct for electricity: one focused on an intangible asset, specifically data. With data access and sharing, it becomes possible not only to value negawatts—the decision not to use electricity at a given time—but to provide an incentive for load reduction, load shifting, and peak shaving, all three of which provide societal benefits by aiding reliability, decreasing capital requirements, and preventing greenhouse gas emissions.

While sharing data can itself have value and create a market that enables behavior change, the energy sharing economy around demand response is two-fold: the data are shared, which enables the market to value behavior changes, and, when that market indicates sufficient value, the demand response action is shared. By not using energy at that point in time—by removing electric load—sharing occurs, leading to system-wide and overall societal benefits.

However, none of this will occur without clear ownership of—and, therefore, the ability to monetize—electricity usage data. This article will discuss the sharing economy and how those concepts could be applied to electricity, survey how different states have approached the ownership of electricity data, classify and explore the ownership of electricity usage data through the lens of traditional property law concepts, and discuss how those various solutions affect the ability to value demand response

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behaviors. It will then discuss what changes are necessary to facilitate the energy sharing economy.

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Negawatt: a megawatt of power saved by increasing efficiency or reducing consumption.[1]

I. INTRODUCTION

With the advent of increased computer power and the ever-decreasing cost of storing data in the cloud, data analytics are impacting almost every facet of American life: the ads we see while we browse the internet, the offers sent to us in the mail, and what is recommended for us in a Netflix queue. This ability to analyze large amounts of data has enabled the sharing economy in addition to the capitalist one, leading to the creation of firms such as Airbnb and Lyft. Energy—and electricity specifically—has not escaped this trend, with, for example, analytics used to determine which buildings could see the most improvement from increased energy efficiency, new lighting, and even just an HVAC tune-up.[2]

However, unlike much of the commercial landscape, the monetary opportunities provided by using this electricity usage data are just starting to be recognized, such as creating value through demand response, where a consumer shifts electricity use away from high-demand times and generates "negawatts." As more companies find ways to monetize utility data—and as businesses and individuals are given the opportunity to either save money or make money using the insights provided—the legal aspects of utility data will become more important. This is especially true as some of the technologies and strategies that are developed and implemented based on the data can decrease grid expenditures, decrease global warming, and increase efficiency.

As recently noted by a leading clean tech news outlet, "[s]tates are leading policy developments in much of today's grid edge landscape,

1. Margaret Rouse, *Negawatt*, TECHTARGET (Mar. 2010), http://whatis.techtarget.com/definition/negawatt.

2. However, even this part of the energy transition needs more data sharing. *See* Alexandra B. Klass & Elizabeth J. Wilson, *Energy Consumption Data: The Key to Improved Energy Efficiency*, 6 SAN DIEGO J. CLIMATE & ENERGY L. 69, 73 (2015) ("These analytics rest on a foundation of energy consumption data . . . that is currently not available in any meaningful way to consumers, energy service companies, and government funders or researchers."); *see also* Yueming Qiu & Anand Patwardhan, *Big Data and Residential Energy Efficiency Evaluation*, 5 CURRENT SUSTAINABLE/RENEWABLE ENERGY REPS. 67, 67 (2018) ("Results reveal that the majority of existing energy efficiency evaluation frameworks and traditional statistical analysis are not sufficient enough to identify the causal impact of energy efficiency. In reality, households mostly self-select into energy efficiency installations and the observed changes in energy consumption after the installations may be due, at least in part, to certain factors that are generally time-variant and unobservable to the statistician . . . . Researchers can utilize emerging large-scale building energy datasets combined with high-frequency energy demand data to develop innovative computational energy efficiency evaluation frameworks.")

including policies on energy data—who owns it, who gets to share it with whom, and how to protect it."[3] Smart meters—the primary way data are collected—are now providing data on the electricity usage of more than half of U.S. households,[4] with more than ten million smart meters installed in California alone.[5] These meters record electricity data at least hourly (if not more frequently),[6] and report this usage data back to the utility company, typically over wireless communication technology.[7]

While regulators (and utilities) are attempting to determine how to approach the changing energy landscape,[8] more residential customers are starting to generate their own electricity, commercial customers are looking to procure additional renewables to meet sustainability pledges, and everyone wants to save money.[9] Business models aided by smart meter data can help with all three, as long as those business models are allowed to exist by regulators and the data is available from utilities. To explore this evolving area, this article will discuss the sharing economy and how those concepts could be applied to energy, survey how different states have approached the ownership of electricity usage data, classify and explore the ownership of electricity usage data through the lens of traditional property law concepts, and discuss how those various solutions affect the ability to value demand response behaviors. It will then discuss

3. Jeff St. John, *PJM Talks to Congress, While FERC Waits on Appointees & the DOE Grid Study*, GREENTECH MEDIA SQUARED (July 28, 2017), http://bit.ly/2AYculj [hereinafter St. John, *PJM Talks to Congress*].

4. ADAM COOPER, THE EDISON FOUND., ELECTRIC COMPANY SMART METER DEPLOYMENTS: FOUNDATION FOR A SMART GRID 1 (Oct. 2016), https://bit.ly/2ePKTZv. Approximately 200 million smart meters have been installed worldwide. *See* Heather Lovell et al., *How do meters mediate? Energy meters, boundary objects and household transitions in Australia and the United Kingdom*, ENERGY RES. & SOC. SCI., Dec. 2017, at 252, 252.

5. Jeff St. John, *US Smart Meter Deployments to Hit 70M in 2016, 90M in 2020*, GREENTECH MEDIA (Oct. 26, 2016), http://bit.ly/2Di6i9J [hereinafter St. John, *Smart Meter Deployments*]. Both PG&E and Southern California Edison have more than five million installed each. By number of meters installed per utility, this is followed in volume by 4.9 million installed by Florida Power & Light and 3.4 million by Oncor in Texas. *Id.*

6. *See Reports on Demand Response & Advanced Metering*, FED. ENERGY REGULATORY COMM'N, https://www.ferc.gov/industries/electric/indus-act/demand-response/dem-res-adv-metering.asp (last updated Nov. 7, 2018); *see also* Klass & Wilson, *supra* note 2, at 76.

7. St. John, *Smart Meter Deployments*, *supra* note 5.

8. Research in Australia and the United Kingdom found that the main issue with adoption of smart meter technology was the fact that households were not kept in the center of the transition, but that the transition was more successful when it ensured that "digital meters provide functionality aimed specifically at enhancing householders' capabilities to use the energy data collected in ways they find desirable." Lovell et al., *supra* note 4, at 257.

9. *See* Heather Payne, *Private (Utility) Regulators* (forthcoming 2019). The price of electricity has gone up faster than the average consumer price index over the last 10 years.

what changes are necessary to facilitate the energy sharing economy, including ownership structure and potential regulatory frameworks.

II. THE SHARING ECONOMY AND THE MARKET FOR NEGAWATTS

The sharing economy[10] can broadly be defined as "a socio-economic ecosystem built around the sharing of human, physical and intellectual resources. It includes the shared creation, production, distribution, trade and consumption of goods and services by different people and organisations."[11] Before applying the fundamentals of the sharing economy to energy, understanding these concepts more broadly is necessary.[12]

A. The Sharing Economy – and the Data that Drives it

There are three main participants in any transaction in the sharing economy—the entity with the good or service, the user who wants or needs that good or service, and the platform that connects the two of them.[13] The platform is the essential element that has come about recently. In contrast to traditional bartering systems where each individual had to know each other, platforms "allow service providers and users to connect to the benefit of both."[14] The platforms—which I term market facilitators—facilitate the transactions.

Platforms and market facilitation in the sharing economy have been most prevalent in the hospitality and dining, automotive and transportation, retail and consumer goods, and media and entertainment industries.[15] However, the concepts of the sharing economy—a provider,

10. Other terms for the sharing economy include "the Trust Economy, Collaborative Consumption, the On-Demand or Peer-to-Peer Economy." PRICEWATERHOUSECOOPERS, THE SHARING ECONOMY (2015), https://pwc.to/2qGxR4Y.

11. Benita Matofska, *What is the Sharing Economy?*, THE PEOPLE WHO SHARE (Sept. 1, 2016), http://www.thepeoplewhoshare.com/blog/what-is-the-sharing-economy/.

12. There are ongoing conversations around liability in the sharing economy, including in the energy sphere around demand response that may not occur. *See* Wayne Pales, *Who is accountable for reliability of the network with contracted demand response?*, ENERGYCENTRAL (Mar. 29, 2018), https://bit.ly/2EzR8P6. I am not addressing the potential liability issues in this paper.

13. Adam Hayes, *The Economic Fundamentals of the Sharing Economy*, INVESTOPEDIA, http://bit.ly/2PUCuGA (last visited Nov. 10, 2018) ("P2P marketplaces exist to bring together individual buyers and sellers directly. This two-sided marketplace is often maintained by a third party that charges a fee for facilitating transactions between buyers and sellers and reducing transaction risk.").

14. Bernard Marr, *The Sharing Economy - What It Is, Examples, And How Big Data, Platforms And Algorithms Fuel It*, FORBES (Oct. 21, 2016, 2:16 AM), http://bit.ly/2zHu6Ao.

15. PRICEWATERHOUSECOOPERS, *supra* note 10.

a user, and a market facilitator—can be applied to the energy sector as well, and specifically to electricity and the data associated with electricity usage.[16]

However, even with platforms or market facilitators to facilitate transactions in the sharing economy, data are necessary to value the transactions that occur.[17] As Forbes noted, the sharing economy is driven by data.[18] Essentially, "[t]hese companies don't just represent a new way of thinking or new services, but a new way to use data effectively to provide services to people when and where they want them."[19] Without the data, it is impossible for the market facilitator to understand how to appropriately value the goods or services.

Take an example that many of us may be familiar with—a ride facilitated by the Uber platform. Individuals need a ride somewhere, and Uber provides a price for the ride. That price is based on data. The relevant data used by the app in calculating the price includes: the time of day, the weather, the number of users, the destination, traffic, and how long it will take to reach my destination.[20] The platform, however, simply provides an easy way for individuals to make an offer to the Uber drivers available in

16. I define the term "electricity usage data" to include customer-specific data, aggregated, anonymized customer data, and utility system data. Usage data includes usage in kilowatt-hours and interval reads, also known as a load profile. System data includes "the customer assigned peak load contribution, energy and capacity loss factors, or other information needed for wholesale market participation." MICHAEL MURRAY ET AL., MISSION:DATA, ENERGY DATA: UNLOCKING INNOVATION WITH SMART POLICY 1, 6 (Dec. 2017), http://bit.ly/2Pl5qIl. The smart meter enables the change in identity from only a consumer of electricity to something more. *See* Lovell et al., *supra* note 4, at 254 ("[A] key change with the introduction of digital energy meters is in the role of the householder social world, for digital meters are a means to constitute novel forms of energy user identities among householders by enabling new activities in the home. The boundaries of the energy meter have thus expanded from traditional metrology functions to include a host of additional features mostly aimed at the householder, such as providing detailed feedback on energy consumption from digital devices and new types of energy tariff.").

17. This is necessary for all transactions besides those which are entirely altruistic; however, even some that would seem entirely altruistic have greater societal good, which can be valued, although that value does not necessarily flow to the individual providing the good or service.

18. Marr, *supra* note 14 ("Beyond a disillusionment with consumerism, what's driving this trend is data. Most — if not all — of these upstarts would not be viable businesses, certainly not on a large scale, without leveraging a platform and a foundation of big data.").

19. *Id.*

20. Uber uses "Dynamic Pricing, in which the price of a ride is determined based on constantly varying factors such as the estimated time and distance of the predicted route, estimated traffic, and the number of riders and drivers using Uber at a given moment." *Privacy Policy*, UBER, https://privacy.uber.com/policy/ (last updated May 25, 2018). The weather affects how man people will be asking for a ride, as does the time of day. *See* Neil Patel, *How Uber Uses Data to Improve Their Service and Create the New Wave of Mobility*, NeilPatel.com, https://neilpatel.com/blog/how-uber-uses-data/ (last visited Jan. 15, 2019).

the area—and they accept the offer by agreeing to drive the individuals to their preferred destination. Without the data, the Uber platform may significantly undervalue or overvalue the price of my offer—but having the data available ensures that the platform can accurately value the transactions it facilitates.

Data has been described as "the lifeblood of today's economy" for exactly that reason—because it facilitates transactions.[21] Specifically around energy, a leading national clean energy business association described it best:

> Timely and convenient access to granular customer and electricity system data is critical to support the development of a modern grid. Such access allows utilities and competitive suppliers to optimize offers and enables individual customers and their designated third-party providers to better manage energy use, consider distributed energy resource (DER) options, reduce costs, and participate in utility demand management programs and emerging transactive energy markets. In addition, providing third parties with access to anonymized, aggregated customer data and electricity system data is critical to enabling these companies to design and offer products and services that will benefit utility customers, and the electricity grid as a whole.[22]

Only with this granular data can customers have actionable insights—and participate in the sharing economy.[23] The lack of the ability to have this data, then, hampers the development of the sharing economy and the grid and environmental benefits that could come along with it.[24]

21. ADVANCED ENERGY ECON., ACCESS TO DATA: BRINGING THE ELECTRICITY GRID INTO THE INFORMATION AGE 2 (Sept. 2017), https://info.aee.net/hubfs/PDF/Access-to-data.pdf [hereinafter ACCESS TO DATA]. For a different opinion of the effect on regulatory law generally and environmental law specifically, see William Boyd, *Environmental Law, Big Data, and the Torrent of Singularities*, 64 UCLA L. REV. DISCOURSE 544 (2016).

22. ACCESS TO DATA, *supra* note 21.

23. Adrian Tuck, *3 Steps to Making Utilities Formidable Energy Providers in the On-Demand Era*, GREENTECH MEDIA (July 31, 2017), http://bit.ly/2RSRfr5 ("The fact is, energy is going the way of other service industries like entertainment and travel: more personalized, more customer-centric, more automated and more accessible.").

24. K Kaufmann, *Utility customers and complexity: What if Bonbright was wrong?*, SMART ELECTRIC POWER ALLIANCE (Oct. 12, 2017), http://bit.ly/2PPCKqh ("What all these programs have in common is that they require customers to weight monetary cost savings against their own comfort and the larger benefits demand reduction may have for their utility, the grid and, ultimately, other customers. In other words, they have to think both about how they use energy and how that affects others."). Furthermore, it has been shown that customers do make different energy decisions once they have data from their smart meters. *See* Jonny Bairstow, *Smart meters see 86% of people change energy behaviour*, ENERGY LIVE NEWS (Nov. 1, 2017), http://bit.ly/2qFPEJl.

Of course, there are reasons why utilities may not want to share this data.[25] With customers having more options rather than the traditional monopoly structure, their profits may be challenged unless they develop and offer more customer-centric products and services.[26] They may also hope to use the data themselves to gain a competitive advantage.[27] However, the data are being generated by infrastructure that utilities are

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25. As one article noted, "the more pragmatic approach recognizes certain undeniable realities of the electric utility industry, where highend disruption is hardly imminent, and change has always been, and will likely continue to be, more incremental than in other industries." Joel B. Eisen & Felix Mormann, *Free Trade in Electric Power*, 2018 UTAH L. REV. 49, 81–82 (2018). In an industry survey, over 80% of utility industry experts said the industry was not prepared for how distributed resources, including demand response, would change utility business models. *See* Nicholas Rinaldi, *Are Utilities Prepared for a Next-Gen Power Grid? Survey Says 'Not So Much'*, GREENTECH MEDIA SQUARED (Jan. 14, 2016), http://bit.ly/2QzjQ4r. Investor-owned utilities were one of the most pessimistic around the ability of the utility industry in terms of preparation. *See id.*

26. Of course, developing new products and services could be a possibility, *see* Eisen & Mormann, *supra* note 24, at 85, though such initiatives typically happen in response to changing circumstances like restructuring or regulations. *See* Chris Warren, *Utilities Have the Tools to Unleash the Power of Customers*, GREENTECH MEDIA (Dec. 4, 2017), http://bit.ly/2DxUK2Q ("There simply haven't been good regulatory incentives for utilities to seriously consider non-wires alternatives and incorporate demand-side management into how they plan their systems. That is finally starting to change, particularly in states like New York and California."). Nonetheless, a few utility companies are starting to become more customer-centric. Edward Klump, *Electricity: Thinking in megawatts? Look at customers, NRG says*, ENERGYWIRE (Mar. 27, 2018), http://bit.ly/2T2Nqkr ("'You shouldn't be thinking about how many megawatts we own,' Gutierrez [CEO of NRG Energy Inc.] said in an interview this month. 'You should be thinking about how many customers we serve going forward.'"). Other businesses are also attempting to profit off the data being generated by—or needed by—utilities. *See* Peter Behr, *Business: GE pulls profits from its 'Big Data' campaign*, ENERGYWIRE (June 18, 2018), http://bit.ly/2RKbLtC; Justin Gerdes, *Big Data Is Boosting Power Production, Reducing Downtime Across Wind Fleets*, GREENTECH MEDIA (Jan. 24, 2018), http://bit.ly/2FhiASa. Others in the industry are also suggesting that utilities should look at demand response as a revenue driver, specifically by using aggregated data. *See* Warren, *supra.*

27. This has already been done. *See Endesa reduces churn by 50 percent*, SAS, https://www.sas.com/en_us/customers/endesa.html (last visited Nov. 10, 2018). Utilities in the United States are planning on spending $20 billion on analytics in the next three years in attempts to engage customers and develop marketable insights and competitive advantage—enabled by smart meters and other systems deployed through rate-based programs. Olivia Chen, *US Utilities to Spend $20 Billion on Customer Analytics Through 2021*, GREENTECH MEDIA (Nov. 8, 2017), http://bit.ly/2zI2xGY. Utilities are starting to acknowledge that they need to provide more value-add products and services, and that data is key to that. Nick Lanyi, *DERs and the digital grid: No more pilots; full scaling ahead*, SMART ELECTRIC POWER ALLIANCE (July 12, 2018), http://bit.ly/2qDEiWb. Partnerships with those developing voice-controlled home devices are another way utilities are attempting to use data to gain insight and profit. *See* Jeff St. John, *Tracking Energy in the Connected Home That Amazon's Alexa Built*, GREENTECH MEDIA SQUARED (June 15, 2018), http://bit.ly/2DeQuUT. There is also the potential for utility participation to distort the market as it develops. Lacey Johnson, *Utilities, Grid Operators Tell FERC They Need Real-Time Data to Better Manage DERs*, GREENTECH MEDIA (Apr. 12, 2018), http://bit.ly/2Dc1By1.

already being compensated for through their rates.[28] Therefore, as the utility has already been compensated for its investment (and has received a profit on that capital investment), the data should be readily available to others.[29] Allowing the utility to profit otherwise from the data would be giving them the opportunity for double payment.

With data access and sharing, then, it becomes possible not only to value negawatts—the decision not to use electricity at a given time—but to more broadly apply the concepts inherent in the sharing economy.[30] However, to apply these concepts, it is first necessary to understand how negawatts are created: by demand response.

Demand response is "reducing or shifting . . . electricity usage during peak periods in response to time-based rates or other forms of financial incentives."[31] And the number of demand response actions are increasing, either in response to a regulatory requirement[32] or an incentive.[33] But then how do negawatts and demand response tie to the sharing economy?

The sharing economy provider, in the case of negawatts, is the person choosing not to use electricity at that given point in time. The user, unlike most other transactions in the sharing economy, is the electric grid—and,

28. ACCESS TO DATA, *supra* note 21. Utilities are also obtaining valuable operational information from devices like smart inverters, which are increasingly being required for distributed generation installations—paid for by the customer who installs it, rather than the utility who is gaining insights from the data. *See* Jeff St. John, *Smart Inverters as a Grid Resource: A Snapshot of the Latest R&D Out of California*, GREENTECH MEDIA SQUARED (July 20, 2018), http://bit.ly/2PO5L62.

29. Utilities not being obstructionist could also make them appear to be part of the solution. Wayne Pales, *The Utility of the future must support third party access to energy data*, ENERGYCENTRAL (Dec. 5, 2017), https://bit.ly/2q1ZiFO.

30. Coley Girouard, *The Top 10 Utility Regulation Trends of 2017*, GREENTECH MEDIA (Dec. 12, 2017), http://bit.ly/2AXWVdJ ("Timely and convenient access to energy data can help customers track and manage their energy use, empower third-party companies to animate the market for DERs, and enable utilities to transition to a more customer-focused culture and business model.").

31. *Demand Response*, U.S. DEP'T OF ENERGY, http://bit.ly/2AYLX7y [hereinafter ACCESS TO DATA] (last visited Nov. 10, 2018). Others describe what is occurring as including increases in addition to reductions and shifts to better allow load changes as more intermittent generation is deployed on the grid. Herman K. Trabish, *The new demand response and the future of the power sector*, UTILITY DIVE (Dec. 11, 2017), http://bit.ly/2T38Ei4 [hereinafter Trabish, *The new demand response*].

32. For instance, California will be moving to mandatory time-of-use rates in 2019. *See* Julia Pyper, *How to Make Dynamic Pricing Work for Everyone*, GREENTECH MEDIA SQUARED (Aug. 4, 2017), http://bit.ly/2QzTgrC ("In 2019, utilities in California will roll out time-of-use (TOU) rates at an unprecedented scale by making them the default for all residential electricity customers.").

33. A recent analysis found that "demand response programs are more likely to succeed in highly urbanized areas, in areas where economic growth rates are high, and in areas where the renewable energy policy is favorable." Aman Srivastava et al., *Assessing the success of electricity demand response programs: A meta-analysis*, ENERGY RES. & SOC. SCI., June 2018, at 110, 110.

by extension, all those who are either generating or consuming electricity at that point in time. The platform—or market facilitator—are the companies which aggregate demand response actions, and can be a utility provider in some cases.

Therefore, while sharing data can itself have value and create a market that enables behavior change, the energy sharing economy around demand response is two-fold: the data are shared, which enables the market to value behavior changes, and, when that market indicates sufficient value, the demand response action is shared. By not using energy at that point in time—by removing electric load—sharing occurs, leading to system-wide and overall societal benefits. These overall societal and grid benefits include load reduction, load shifting, and peak shaving, which lead to increased reliability, decreasing capital requirements leading to lower electricity rates for everyone, and preventing greenhouse gas emissions.

Parts of the sharing economy are focused on providing a societal good, rather than a purely capitalist response to unused or underutilized resources. This is also true for the sharing electricity economy, with a perfect example being the actions of demand response aggregator Nest during the total solar eclipse on August 21, 2017, when carbon-free solar energy was reduced in some parts of the United States[34] and more traditional power plants were brought on-line to make up the generation shortfall. Nest—a market facilitator who uses data to enable customers to save money by optimally setting temperatures—developed a "Solar Eclipse Rush Hour" program to help offset the drop in electricity production by shifting electricity usage to periods away from the eclipse.

Nest owners agreed to participate by hitting a button on their thermostats that had this message:

> So, we're encouraging people across the US to help offset this drop in energy production by pre-cooling their homes before the eclipse. If you don't own a Nest thermostat, you can manually adjust the temperature by one or two degrees during the eclipse. If you join, a few hours before the eclipse hits your area, your Nest Thermostat may automatically pre-cool your home so that you can save energy during

34. Nest estimated that more than 100 million solar panels would be impacted by the eclipse. Nest, *Nest's first Solar Eclipse Rush Hour*, YOUTUBE (Aug. 10, 2017), https://www.youtube.com/watch?v=2xKvVZj9QOY. Other estimates include around 1,900 utility-scale solar farms with a combined peak capacity of more than 20 gigawatts (GW). *See* Jeff St. John, *U.S. Utilities Ready Back-Up Power, Demand Response for August 21 Solar Eclipse*, THE ENERGY MIX (Aug. 14, 2017), http://bit.ly/2DgOewG.

> the eclipse. After the eclipse, your thermostat will go back to its regular schedule.[35]

The message to Nest owners is that they will be able to help in meaningfully reducing the amount of "dirty" energy that is necessary during the eclipse by sharing their negawatts. Additionally, the messaging explicitly noted how it was an easy way help the grid "that we all share."[36] The eclipse essentially provided an opportunity for electricity customers to actually think about where their power comes from.[37] And it worked: Nest reported after the fact that 750,000 Nest devices participated and shifted 700 MW of cumulative demand.[38] Even with 1900 utility-scale plants and thousands of residential solar installations not generating, the grid had no issues during the eclipse.[39]

While those with Nest thermostats gave negawatts to help the grid as a whole during the eclipse, the majority of the time right now, demand response actions are taken to either save money (or spend less) on electricity.[40] Therefore, it is necessary to understand the market for demand response and how negawatts are valued, especially in competitive energy markets.

B. The Market for Negawatts

The utility sector is changing. As customers and regulators turn to more intermittent and renewable resources that are decentralized, demand response[41] is becoming one tool to maintain a reliable, increasingly-

35. Mitchel Broussard, *Nest Will Automatically Pre-Cool Homes Participating in New 'Solar Eclipse Rush Hour' Program*, MACRUMORS (Aug. 11, 2017, 6:35 AM), https://www.macrumors.com/2017/08/11/nest-solar-eclipse-rush-hour/amp/.

36. Nest, *supra* note 34.

37. Julia Pyper, *Looking Beyond the Eclipse: How the Historic Event Tested Customer Engagement on the Electric Grid*, GREENTECH MEDIA (Aug. 21, 2017), http://bit.ly/2AZnIWT.

38. *See Nest's Solar Eclipse Rush Hour Rewards Program*, PEAK LOAD MANAGEMENT ALLIANCE (July 19, 2018), https://bit.ly/2Av5yfv.

39. *See* Peter Behr & Debra Kahn, *Grid operators take a stunning event in stride*, ENERRGYWIRE (Aug. 22, 2017), https://bit.ly/2Rkgi5N; *see also* Chris Wood, *No Problems for U.S. Power Grid as the Sun Goes Dark*, THE ENERGY MIX (Aug. 22, 2017), https://bit.ly/2O8y9KZ (noting that the amount of solar curtailed by the eclipse was approximately 12,000 MW).

40. As one commentator described it, the need for data sharing with third parties in the electricity space from a consumer's perspective is "the introduction of services that we as energy consumers don't know exist, and don't yet know we want. These new services will deliver value, be simple to use, and will come from sources we trust." Wayne Pales, *Access to Energy Data – A Consumer's Perspective*, ENERGYCENTRAL (Dec. 19, 2017), https://bit.ly/2OTKpVb.

41. For the purposes of this paper, I am not including energy efficiency as a demand response resource in the market context.

flexible grid.[42] Able to quickly balance demand and supply,[43] demand response also can decrease wholesale electricity prices, which then leads to lower retail prices as well.[44] In addition to balancing, peak reductions can lead to deferred capital expenditures, both for generation assets and transmission and distribution grid upgrades.[45] Peak shifting or peak shaving, then, can help drive many benefits for customers. The most straightforward way to obtain these benefits is through the competitive markets.[46]

Two-thirds of the electricity demand in the United States is regulated through regional transmission organizations (RTOs).[47] Along with independent system operators (ISOs), RTOs operate the transmission system, including managing it equitably and developing cost-sharing rules.[48] Both ISOs and RTOs have energy and ancillary service markets, where generators offer generation and other services,[49] and some also have capacity markets to ensure sufficient future generation capacity.[50] ISOs foster competition for electric generation, and use economic dispatch models to procure the least expensive generation that will meet the needs of the grid at that point in time. Often, the cheapest resources are renewable resources,[51] followed by "negawatts"—otherwise known as demand response.[52]

42. *See* DOE, *Demand Response*, *supra* note 31.

43. Customer demand response helped maintain grid reliability during the peak load in Electric Reliability Council of Texas (ERCOT) this summer. *See* Edward Klump, *'So Far, So Good' for Grid Operator as Records Fall*, ENERGYWIRE (Aug. 8, 2018), https://bit.ly/2SmobsR.

44. *See* DOE, *Demand Response*, *supra* note 31.

45. *Id.*

46. This is not to imply that vertically integrated utilities cannot implement demand response programs; they can, and do. However, without the ability to sell into a competitive market, the programs offered—and the accompanying compensation to customers—is limited to what the incumbent utility is willing to offer and pay. *See* Katherine Tweed, *Does the Midwest Need Demand Response?*, GREENTECH MEDIA (Apr. 18, 2016), https://bit.ly/2Av470I ("Utilities, most of which are vertically integrated in the Midwest, are simply uninterested in giving MISO more control of demand-response programs or allowing for aggregation of retail customers, at least for now.").

47. *See Electric Power Markets: National Overview*, FED. ENERGY REGULATORY COMM'N, https://www.ferc.gov/market-oversight/mkt-electric/overview.asp (last updated Apr. 13, 2017).

48. *Id.*

49. *Id.*

50. *See* Trabish¸ *The new demand response*, *supra* note 31.

51. *See Are Solar and Wind Really Killing Coal, Nuclear and Grid Reliability?*, THE CONVERSATION (May 11, 2011, 9:20 PM), https://bit.ly/2s079Th.

52. Demand response can be more comprehensive than load shifting. For an excellent discussion of demand response, see Joel Eisen, *Demand Response's Three Generations: Market Pathways and Challenges in the Modern Electric Grid*, 18 N.C. J. L. & TECH. 351 (2017).

C. *How Demand Response is Valued*

The amount of demand response on the U.S. grid has increased.[53] That increase will likely continue due to the clarity provided by the Federal Energy Regulatory Commission in Order 745 and the United State Supreme Court's decision in *FERC v. EPSA*[54] upholding Order 745.[55]

Order 745 mandated that, in areas served by an ISO or RTO, demand response providers were to be viewed as an alternative to generation that should be dispatched when economical, and that demand response resources should be provided the same price as a generator would be paid to put energy onto the system—the market price for energy.[56] So, essentially, a negawatt was to be paid the same as a megawatt, and was to be dispatched by the same rules based on price.

While the stated goal of Order 745 is to "help[] to ensure the competitiveness of organized wholesale energy markets and remove barriers to the participation of demand response resources,"[57] implementation since the order was finalized in 2011 has not necessarily been smooth. In addition to the *EPSA* litigation—in which the D.C. Circuit initially struck the order down before the U.S. Supreme Court reversed—the market manager of PJM Interconnection LLC, the ISO covering much of the mid-Atlantic and the largest wholesale electricity market,[58] called for tightening the rules on demand response providers, claiming that demand response "suppress[es] prices and inhibit[s] the construction of needed generation."[59]

53. Trabish¸ *The new demand response*, *supra* note 31 ("But there are now more than 13,600 MW of DR enrolled by utilities and about as much available to TSOs.").

54. Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760 (2016).

55. *Id.* at 773. The Electric Power Supply Association (EPSA) had argued that demand response was a retail sale, rather than a sale of electric energy at wholesale in interstate commerce or a practice affecting such sales, which is what FERC has the ability to govern under the Federal Power Act. *See id.* at 781. Additionally, EPSA argued that the rule was arbitrary and capricious. *See id* at 782. However, the Supreme Court found, in a 6-2 decision, that the Federal Power Act does give the FERC authority to set the compensation for demand response because the price of demand response is a practice which directly affects wholesale rates. *Federal Energy Regulatory Commission v. Electric Power Supply Association*, SCOTUSBLOG, https://bit.ly/2Q6fW2N (last visited Nov. 10, 2018).

56. *See* Demand Response Compensation in Organized Wholesale Energy Markets, 76 Fed. Reg. 16,658 (2011) (codified at 18 C.F.R. § 35.28(g)(1)(v)).

57. *Id.* at 16,658.

58. *See* Rod Kuckro, *PJM to Offer 'stop gap' Demand-Response Fixes by Year's End*, ENERGYWIRE (Oct. 24, 2014), https://bit.ly/2AuUe2P.

59. Rob Kuckro, *PJM Monitor Calls for Demand Response Market Reform*, ENERGYWIRE (Mar. 17, 2014), https://www.eenews.net/energywire/2014/03/17/stories/1059996218.

The capacity auction in May of 2014 cleared 11,000 MW of demand response, but PJM was allowed to change its rules in 2015,[60] making it more difficult for demand response to participate in the auction which occurred later in 2015. While approximately the same amount of demand response—more than 11,000 MW—cleared in 2015, it was in the "base capacity" category, which could not make up more than twenty percent of the auction results and cleared at a lower price.[61] In the 2016 auction, only 10,348 MW of demand response cleared—and the majority of that was again in the "base capacity" category, which had a lower clearing price than in 2015.[62] For the 2017 auction, the "base capacity" category was eliminated—leading to a further decrease to only 7,500 MW of demand response clearing the auction.[63] Experts concluded that the new rules would decrease the amount of both renewables and demand response clearing the auction, and that is exactly what happened.[64] This result—and the feeling among many, including Chair Norman Bay—that consumers were paying more but not necessarily getting additional reliability for the extra cost, shows that additional market changes may be needed.[65] As noted about the current market structure, "the key will be turning electricity capacity markets into demand-led flexibility markets . . . . The problem with capacity markets . . . is that they can lead to over-provisioning with inflexible load and are not incentivized to reduce peak demand."[66] And reducing peak demand is exactly what demand reduction is good at.

Therefore, while the current rules may not be especially helpful for demand response, the regulatory framework supporting the payment for

60. *See* Cynthia Dizikes, *New Power Rules Prompted by Polar Vortex May Hike Chicago-are Electricity Bills*, CHI. TRIBUNE (July 28, 2015, 5:02 AM), https://trib.in/2qhguap.

61. *See* Jeffrey Tomich, *PJM Auction Sees Power Prices Soar Under New Reliability Rules*, ENERGYWIRE (Aug. 24, 2015, 10:12 AM), https://bit.ly/2z61UGP.

62. *See* Jeffrey Tomich, *PJM Power Costs Fall by $4B on Efficiency, New Gas Plants*, ENERGYWIRE (May 25, 2016, 9:14 AM), https://bit.ly/2EN4SpV.

63. *See* Jeffrey Tomich, *Capacity Prices Dip for Most of PJM Despite Tougher Standards*, ENERGYWIRE (May 24, 2017), https://bit.ly/2ObIZ35.

64. *See* Jeff St. John, *PJM's Latest Capacity Auction: A Tough Market for Nuclear & Demand Response*, GREENTECH MEDIA (May 24, 2017), https://bit.ly/2AvDIQn.

65. *See* Rod Kuckro, *Bay Eschews Politics, Embraces Analytics as FERC Chairman*, ENERGYWIRE (Sept. 8, 2015), https://www.eenews.net/stories/1060024316 ("This auction will impose a considerable cost on consumers for no additional reliability benefit."); *see also* Indicated Market Participants v. PJM Interconnection, No. EL15-88-000, 2015 WL 5118643, at *10–11 (Fed. Energy Regulatory Comm'n Aug. 25, 2015) (order denying complaint) (Bay, Chairman, dissenting); Delia Patterson, *Bay's Dissent Highlights Flaws in Mandatory Capacity Markets,* MORNING CONSULT (July 2, 2015), https://bit.ly/2CGjxAF.

66. Katherine Tweed, *Clean Energy Investment Fell by 17% in 2016. Here's Why That's Fine*, GREENTECH MEDIA (Apr. 26, 2017), https://bit.ly/2D7syDL.

negawatts is in place. Additionally, FERC has proposed a rule that would require ISOs and RTOs to adjust rules so demand response aggregators "can compete in wholesale markets 'under the participation model that best accommodates the physical and operational characteristics of its distributed energy resource aggregation.'"[67] Those "distributed energy resources" being aggregated could include residential solar, battery storage, electric vehicles, hot water heaters, and home appliances—leading to different benefits to the grid.[68] While finalizing the rule and how it is implemented will determine its success from a demand response point of view, it certainly could help demand response aggregators thrive in the wholesale markets.

D. "Negawatt" Aggregators – The Market Facilitators

As noted above, the overall North American grid has an increasing amount of demand response; however, demand response will only develop where there is enough financial incentive for it to occur. Competitive markets provide this incentive by allowing demand response providers to monetize the actions of individual consumers (or their equipment) and bid this collectively into the market. PJM currently accounts for approximately 38% of the total demand response market, the same as MISO. ERCOT (Texas) accounts for seven percent, and the California market for six.[69]

While California has a smaller overall percentage, it is driving the most regulatory change in terms of how demand response aggregators can obtain value for their contributions to the grid, mainly through the Demand Response Auction Mechanism (DRAM).[70] California has transitioned from a utility-controlled demand response mechanism to a market-controlled one, allowing for the system operator to have better visibility into what demand response aggregators can offer at any time. This allows resources at the distribution level to be more visible at the wholesale transmission level.[71]

67. Julian Spector, *FERC Proposes to Open Up Wholesale Markets for Energy Storage & Aggregation*, GREENTECH MEDIA (Nov. 18, 2016), https://bit.ly/2fCVDu5.

68. *See* Herman K. Trabish, *How Aggregated DERs are Becoming the New Demand Response*, UTILITY DIVE (July 20, 2016, https://bit.ly/29WbV0L) [hereinafter Trabish, *Aggregated DERs*].

69. *See* Elta Kolo, *U.S. Wholesale DER Aggregation: Q2 2017*, GREENTECH MEDIA RESEARCH (May 2017), https://bit.ly/2Q1o5W0.

70. *See* Jeff St. John, *The Details Behind California's Demand Response Auction Mechanism,* GREENTECH MEDIA (Oct. 23, 2015), https://bit.ly/2AuxEYe. The Aliso Canyon gas leak also sped up the process, as natural gas plants were taken off-line due to a lack of supply, and demand response was one of the strategies CAISO turned to balance the grid. *See id.*

71. Trabish, *Aggregated DERs, supra* note 68.

Aggregators do exactly what the name implies—take many smaller demand response possibilities and build them into a portfolio.[72] In addition to potentially offering their load into a capacity market, many aggregators develop their products to be offered to a utility to balance intermittent renewables, system peaks, or other constraints, like transmission loads.[73] Demand responses—and, therefore, what aggregators are aggregating—fall into two categories: automated responses and behavioral responses.

1. Automated Responses

While some demand response growth has been outside the traditional utility structure, this should not be taken to indicate some utilities are not embracing the benefits that demand response can offer. More than nine million utility accounts were enrolled in incentive-based demand response programs in 2015.[74] Programs with automated responses are the most common in demand response, and have been traditionally seen as more sure—because they are based on equipment switches rather than a human being making a choice—and can often be done remotely. Larger, industrial loads often have a direct contract with the utility—but smaller, residential loads that can be reduced are often aggregated.

The most common type of residential program is the one where, in exchange for a bill credit, a utility can cycle residential air conditioners on and off during hot afternoons every summer.[75] These types of programs require either a thermostat with a wireless connection or a switch installed near the air conditioning unit, but not a smart meter, and are widely available to customers who would like to participate.[76]

However, even at 9 million accounts enrolled, this is a relatively small percentage of the available potential, given the more than 144 million metered accounts that exist in the United States. The average

72. For a more transformative proposition which allows the market to flourish both with and without aggregators, *see* Eisen & Mormann, *supra* note 24.

73. Robert Walton, *Why BPA Sees Aggregation as the Future of Demand Response*, UTILITY DIVE (June 24, 2015), https://bit.ly/2qcVqBV.

74. MICHAEL P. LEE ET AL., FED. ENERGY REGULATORY COMM'N, ASSESSMENT OF DEMAND RESPONSE & ADVANCED METERING 25 (Dec. 2017), https://www.ferc.gov/legal/staff-reports/2017/DR-AM-Report2017.pdf. The most recent available data is from 2015, having been published in December, 2017.

75. *See* ROADMAP FOR IMPLEMENTING MICHIGAN'S NEW ENERGY POLICY STEERING COMM., COMMON DEMAND RESPONSE PRACTICES AND PROGRAM DESIGNS 3, https://www.michigan.gov/documents/energy/Common_Practices_Feb22_522983_7.pdf (last visited Jan. 15, 2019). For Duke Energy Carolinas, the bill credit is $32 annually, and units can by cycled as often as every half hour during summer afternoons between May and September. *See Power Manager,* DUKE ENERGY, https://www.duke-energy.com/home/products/power-manager (last visited Aug. 20, 2017).

76. *See Residential Demand Response Programs*, CLEARLY ENERGY (Oct. 10, 2016), https://www.clearlyenergy.com/residential-demand-response-programs.

participation rate for these more traditional programs is less than five percent of customers for a given utility.[77]

One study found that fear of discomfort—of customers' concern for losing control—has hindered adoption.[78] A recent announcement stressed how technology is attempting to deal with that issue and encourage further participation:

> Under the residential demand response pilot project . . ., Whisker will enroll 3,000 customers of ComEd and Nicor Gas who already have a Honeywell Wi-Fi thermostat installed in their home.
>
> Whisker is one of several startups promising to collect "hyper-local" weather, building, demographic and energy usage data to build thermodynamic models of individual homes, and run it through algorithms that can fine-tune thermostats to shave energy during hours of peak grid demand without affecting customer comfort.[79]

While automated responses will help shave peak and reduce load at the times most needed, there is a limit to how much can be achieved using these technologies. Behavioral demand response will be needed to start shifting loads to meet available generation.

2. Behavioral Responses

Opower, now a division of Oracle, works with utilities to manage behavioral responses, rather than peak reductions that rely on equipment. They have found having specific words trigger larger actions (including "neighbor," which triggers a competitive reaction) and smiley faces.[80] Baltimore Gas and Electric (BGE), understanding that there was concern about regulatory structures like time of use rates which could dampen peak demand but which might penalize those who did not change behavior,

77. *See* Jeff St. John, *The Inside Story on Baltimore Gas & Electricity's Behavioral-Based Demand Response*, GREENTECH MEDIA SQUARED (Jan. 11, 2017), https://bit.ly/2D70U9R [hereinafter St. John, *Inside Story on Baltimore*].

78. *See generally* Xiaojing Xu et al., *Promoting Acceptance of Direct Load Control Programs in the United States: Financial Incentive Versus Control Option*, 147 ENERGY 1278–87 (2018). Interestingly, the authors found no relationship "between incentive amount and participation rate in [direct load control] programs," but instead found that "it is important to grant customers some level of control or restore some sense of control to keep them satisfied and accepting of [demand reduction] programs." *Id.* at 1279, 1285.

79. Jeff St. John, *Investment Watch: Grid Edge Companies Pull in More Money from Utilities*, GREENTECH MEDIA SQUARED (Aug. 4, 2017), https://bit.ly/2SpMuX4.

80. *See* Robert Walton, *'Game-ifying' Demand Response: How One Utility Tries to Keep DR Programs Fresh for Customers*, UTILITY DIVE (Mar. 9, 2016), https://bit.ly/1paKGkD.

decided to try a different approach—which they could do, based on their completed smart meter rollout.[81]

Rather than apply a standard process where customers sign up in advance for a program, BGE automatically enrolled every customer with a smart meter—and it has more than 1 million accounts with smart meters—in a program which provides a credit for every kilowatt a customer cuts on peak days, compared with that customer's average usage.[82] Most importantly, to aid customers in understanding how their behavior impacts their bill, the amount of the credit is texted or e-mailed to them shortly after the event, reinforcing the behavior change.[83] During the peak event, BGE can sell the aggregated "negawatts" into the PJM energy market, with both customers and the utility benefitting financially from the program.[84]

Interestingly, Opower has found that the average decrease in peak is around five percent—or, if behavioral demand response were deployed nationally, the country could shave 4,700 MW of demand[85]—equivalent to the four new nuclear units that were being built in South Carolina and Georgia for more than $40 billion, but without the risk or nuclear waste.

III. HOW STATES CURRENTLY ADDRESS OWNERSHIP OF ELECTRICITY USAGE DATA

As noted above, while sharing data can itself have value and create a market that enables behavior change, the energy sharing economy around demand response is two-fold: the data are shared, which enables the market to value behavior changes, and, when that market indicates sufficient value, the demand response action is shared.

The most fundamental requirement for demand response is electricity usage data, as this enables the market discussed previously to value the negawatts. Without data, market facilitators have no way to determine which sharing economy providers to approach to participate, and those providers cannot determine how much participating would save them on

81. *See* Ethan Howland, *How Opower and BGE are Pioneering Behavioral Demand Response*, UTILITY DIVE (Jan. 14, 2014), https://bit.ly/1aPQ13m.

82. Walton, *supra* note 80.

83. St. John, *Inside Story on Baltimore*, *supra* note 77.

84. *See id.*; Julia Pyper, *Some New Ideas for Redesigning Energy Efficiency Policies*, GREENTECH MEDIA SQUARED (July 21, 2017), http://bit.ly/2DjtHrl [hereinafter Pyper, *Some New Ideas*] ("For all DR that exceeds 200 MW in a given year, the utilities can bid the aggregated savings into the PJM capacity market and keep a portion of the earnings," it continues. "The total revenue from EE and DR over the last eight auctions exceeds $300 million. Customers retain most of the savings, while the utilities earn a portion, providing them more incentive to push for even deeper efficiency and cost savings.").

85. Robert Walton, *How Opower is Pushing Behavioral Demand Response into the Mainstream*, UTILITY DIVE (May 27, 2015), http://bit.ly/2POUthO.

their electricity bills. However, who has access to and ownership of electricity usage data will largely determine how successful such initiatives could be.

Data has neither value nor meaning without context or some other purpose attributed to the raw numbers and information.[86] Generally, the ownership of data depends on "what the data is, how it was generated, what devices were used, where it came from, and whether it is attributable to a person or thing."[87] The source of the data and who owns it defines "who gets to use it, and how or whether it gets used."[88]

The Federal Smart Metering Law of 2005 states that "[a]ll electricity purchasers shall be provided direct access, in written or electronic machine-readable form as appropriate, to information from their electricity provider."[89] Further, the law states that "[p]urchasers shall be able to access their own information at any time."[90] Then, regarding third parties, "[o]ther interested persons shall be able to access information not specific to any purchaser."[91] Taken together, these rules suggest that the utility company is the primary possessor of the data, but has to give access to customers and third-parties. Another federal law, the Energy Independence and Security Act of 2007 (EISA), discusses general policies for growing the smart grid and improving security.[92] Under EISA, utility data can be collected and used for analysis by the Department of Energy.[93]

However, state law is developing more quickly in some cases and lagging behind the federal mandate in others.[94] A recent scholarly work discussing electricity usage data stated that "[o]wnership of energy consumption data in the context of the Smart Grid presents a complex question that extends beyond 'ownership' as a property right, and pertains

86. John Sumser & Heather Bussing, *Who Owns Data 1 - Overview*, HR EXAMINER (Apr. 8, 2013), http://www.hrexaminer.com/who-owns-data-1-overview/ ("For example, if you have 3 digits of a phone number, you have data, but you don't have the phone number. Even if you have all 10 digits, they still have to be in the right order to reach the person you want to call. So you have to know the context of what you are trying to do with those numbers.").

87. *Id.*

88. *Id.*

89. 16 U.S.C. § 2621(d)(19)(A) (2012 & Supp. 2017).

90. *Id.* § 2621(d)(19)(B).

91. *Id.*

92. Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492.

93. 42 U.S.C. § 17384 (2012 & Supp. 2017). The federal government, however, has started the process to use other energy data to monetize data and drive change, like the orange button program, used in an attempt to reduce solar installation costs. *See* Aaron Smallwood, *The Orange Button Initiative: How Standardized Data Can Cut Solar Soft Costs*, SMART ELECTRIC POWER ALLIANCE (June 1, 2017), https://sepapower.org/knowledge/orange-button-initiative/.

94. *See* Klass & Wilson, *supra* note 2, at 69.

more to issues of data access and usage."[95] Under state law, customers have strong access rights but generally the utility company possesses, collects, records, or explicitly owns the data.

Interestingly, given the large amounts of data that are already being collected from smart meters—more than half of U.S. households had a smart meter by the end of 2015[96]—it is somewhat astonishing how few public utility commissions (or state legislatures) have addressed the issue of data ownership. Many states provide customers with a right to access information collected by their utility, with some variations, or have at least expressed a policy preference for such customer access.[97] However, only

95. H. Russell Frisby, Jr. & Jonathan P. Trotta, *The Smart Grid: The Complexities and Importance of Data Privacy and Security*, 19 COMMLAW CONSPECTUS 297, 330 (2011).

96. COOPER, *supra* note 4.

97. **Alabama**: GEN. R. ALA. PUB. SERV. COMM'N 5–9 (1998), http://www.psc.alabama.gov/Administrative/GenRules_01_10_05.pdf (providing customer with some rights to access information). **Alaska**: Consideration of Adoption of Regulations to Implement Amend. to the Pub. Utilities Regulatory Policies Act of 1978, 2010 WL 4655901, at *22 (Regulatory Comm'n Alaska Nov. 9, 2010) (order inviting public comment). **Arizona**: ARIZ. ADMIN. CODE § 14-2-1612 (LexisNexis 2018) ("[A]n Electric Service Provider who provides metering or meter reading services pertaining to a particular consumer shall provide appropriate meter reading data via standardized formats."). **Arkansas**: Oklahoma Gas & Elec. Co., 2011 WL 3675548 (Ark. Pub. Serv. Comm'n Aug. 3, 2011) (order approving settlement agreement) (providing information to customers "upon request"); ARK. PUB. SERV. COMM'N GEN. SERV. R. 19 (2016), http://www.apscservices.info/Rules/general_service_rules_2016.pdf. **California**: CAL. PUB. UTIL. CODE § 8381 (West 2018). **Colorado**: Smart Grid Data Privacy for Elec. Utilities, 2011 WL 5115728, at *1 (Colo. Pub. Util. Comm'n Apr. 14, 2011) (proposed rules) (providing usage information upon request). **Connecticut**: CONN. AGENCIES REGS. § 16-244h-4 (LexisNexis 2018) (permitting electric providers to release customer-specific information at will, with customers having an option to revoke permission). **Delaware**: Restructuring of Elec. Util. Indus., 183 Pub. Util. Rep. 4th (PUR) 340, 1998 WL 149031 (Del. Pub. Serv. Comm'n Jan. 27, 1998) (report to the Del. H.R.) (permitting customers to access historic load and bill information). **Florida**: FLA. ADMIN. CODE ANN. r. 25-6.093 (LexisNexis 2018) (allowing customers can request access to data). **Hawaii**: HAW. PUB. SERV. COMM'N, GEN. ORDER NO. 7 – STANDARDS FOR ELECTRIC UTILITY SERVICE IN THE STATE OF HAWAII, r. 4.1 (1968), http://puc.hawaii.gov/wp-content/uploads/2013/04/General-Order-7.pdf. **Iowa**: IOWA ADMIN. CODE r. 199-19.4 (LexisNexis 2018) (allowing customers access to data to verify billing). **Kansas**: Gen. Investigation Related to Smart Metering Tech., 2007 WL 9182288, at *1 (Kan. State Corp. Comm'n Aug. 8, 2007) (report and recommendations) (encouraging development of smart meter programs). **Louisiana**: Dixie Elec. Membership Corp., 2012 WL 5994667 (La. Pub. Serv. Comm'n Nov. 20, 2012) (order approving smart meter program) (noting that the utility "provide[s] real-time information to customers"). **Maine**: Elisa Boxer-Cook et al., 2011 WL 2521416 (Me. Pub. Util. Comm'n June 22, 2011) (order pt. II) (expressing support for improved customer access to usage information through smart metering, but providing customers with a right to opt-out). **Michigan**: Detroit Edison Co. v. Michigan Pub. Serv. Comm'n, 817 N.W.2d 630, 637 (Mich. Ct. App. 2012) (observing that the intent of smart meters is to allow customers to access the utility's collected data); DTE Elec. Co., 2016 WL 6778372, at *9 (order to file a report) (Mich. Pub. Serv. Comm'n Nov. 7, 2016). **Minnesota**: Comm'n Inquiry into Privacy Policies of Rate-Regulated Energy Utilities,

three jurisdictions have either clear decisions or clear regulations on ownership: the District of Columbia (the utility company owns the data when dealing with third parties);[98] Oklahoma ("[a]ll data generated,

2017 WL 282441, at *1 (Minn. Pub. Util. Comm'n Jan. 19, 2017) (order governing disclosure of customer energy use data to third parties) (implying that the utility owns usage information, but the customer has rights regarding the release of such information). **Mississippi**: Entergy Mississippi, Inc., 2017 WL 2000907, at *3 (Miss. Pub. Serv. Comm'n May 4, 2017) (order approving smart meter program). **Montana**: Montana-Dakota Utilities Co., 2008 WL 9894536, ¶¶ 37–41 (Mont. Pub. Serv. Comm'n Apr. 23, 2008). **Nevada**: NV Energy, 2012 WL 924359, at *12 (Nev. Pub. Util. Comm'n Mar. 2, 2012) (order approving smart meter program) (discussing access and security of data, including limits on the use of the data). **New Hampshire**: Pub. Serv. Co. of New Hampshire, 232 Pub. Util. Rep. 4th (PUR) 137, 2004 WL 980139, at *9 (N.H. Pub. Util. Comm'n Jan. 9, 2004) (providing data to customers upon request). **New Jersey**: Provision of Basic Generation Serv. for the Period Beginning June 1, 2016, 2015 WL 7423727, at *13 (order) (N.J. Bd. Regulatory Comm'rs Nov. 16, 2015). **New York**: Competitive Opportunities Regarding Elec. Serv., 250 Pub. Util. Rep. 4th (PUR) 437, 2006 WL 2346389 (N.Y. Pub. Serv. Comm'n Aug. 1, 2006) (order). **North Carolina**: 2016 Integrated Res. Plans & Related 2016 REPS Compliance Plans, 2017 WL 1209917, at *1 (N.C. Util. Comm'n Mar. 29, 2017) (order accepting smart grid technology plans) (discussing updates to customer and third-party access to usage data). **North Dakota**: N.D. ADMIN. CODE 69-09-02-28 (West 2018) (noting that meter records must be available to customers). **Ohio**: Consumer Privacy Prot. & Customer Data Access Issues Associated with Distribution Util. Advanced Metering & Smart Grid Programs, 2012 WL 1743583 (Ohio Pub. Util. Comm'n May 9, 2012) (finding and order). **Oregon**: OR. ADMIN. R. 860-021-0010 (West 2018); Portland Gen. Elec. Co., 2014 WL 4966347, at *6 (Or. Pub. Util. Comm'n Oct. 1, 2014) (order regarding Annual Smart Grid Report); Portland Gen. Elec. Co., 2005 WL 1313418 (Or. Pub. Util. Comm'n May 18, 2005) (order regarding investigation into Meter Information Services and E-Manager Program) (providing that customer data must be furnished upon request). **Pennsylvania**: Smart Meter Procurement & Installation, 2012 WL 6839305, at *1 (Pa. Pub. Util. Comm'n Dec. 5, 2012) (final order). **South Carolina**: Carolina Power & Light Co., 2004 WL 1637668 (S.C. Pub. Serv. Comm'n May 11, 2004) (order approving revisions to meter-related optional programs rider). **Texas**: 16 TEX. ADMIN. CODE § 25.130 (2018) (requiring easy access to data). **Vermont**: Investigation into Vermont Elec. Utilities' Use of Smart Metering & Time-Based Rates, 2009 WL 3159436, at *6 (Vt. Pub. Serv. Bd. Aug. 3, 2009) (order regarding memorandum of understanding). **Virginia**: 20 VA. ADMIN. CODE § 5-312-90 (LexisNexis 2018); Additional Implementation Efforts for Competitive Elec. Metering, 2002 WL 32875884, at *3 (Va. State Corp. Comm'n Aug. 30, 2002) (report of findings & recommendations). **Washington**: WASH. ADMIN. CODE § 480-100-103 (2018) (usage data must be provided upon request); Standards Pertaining to Smart Metering & Time of Use Rates, 2007 WL 2426799, at *8 (Wash. Util. & Transp. Comm'n Aug. 23, 2007) (interpretive and policy statement). **West Virginia**: Net Metering, Smart Metering & Interconnection Standards, 2006 WL 4569355 (W. Va. Pub. Serv. Comm'n Dec. 12, 2006) (commission order) (noting that customers should have access to data in accordance with the Federal Energy Policy Act of 2005). **Wisconsin**: Sturgeon Bay Utilities, 2015 WL 9266656, at *1, *3 (Wis. Pub. Serv. Comm'n Dec. 16, 2015) (final decision granting waiver of specific billing requirements). **Wyoming**: Cheyenne Light, Fuel & Power Co., 2011 WL 5026187, ¶ 60 (Wyo. Pub. Serv. Comm'n Sept. 30, 2011) (findings & conclusions) (noting that smart meters "advise" customers of energy usage data).

98. Elec. Supplier Access to Their Customers' Smart Meter Data, 2014 WL 576106, at *3 (D.C. Pub. Serv. Comm'n Feb. 6, 2014) (order); *Realizing the Full Potential of Advanced Metering Infrastructure (AMI)*, PUB. SERV. COMM'N D.C.,

recorded, stored or transmitted by Smart Meter and supporting technology and infrastructure is, and shall at all times be and remain, the sole and exclusive property of the Company.");[99] and Texas ("All meter data, including all data generated . . . by advanced meters . . . 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 to one or more retail electric providers . . . .").[100]

A Massachusetts decision seems to indicate that there may be a difference in ownership rights depending on who collects the data, either the utility or the consumer.[101] Maine[102] and Massachusetts[103] actually require utilities to provide customer information to a competitor upon request. Pennsylvania has a similar statute, requiring "[e]lectric distribution companies shall, with customer consent, make available direct meter access and electronic access to customer meter data to third parties, including electric generation suppliers and providers of conservation and load management services."[104] On the other hand, Ohio states that "the electric utility shall not disclose customer energy usage data that is more granular than the monthly historical consumption data . . . without the customer's written consent or without a court or commission order."[105]

Some states with high smart meter penetration have started thinking about this issue. In Illinois, which has more than 2.3 million smart meters installed already,[106] regulators recently finalized the Open Data Access Framework, a plan for sharing data between utilities, customers and third parties. According to a fact sheet, "[t]hese rules clarify the type of electricity data customers and authorized third parties have access to and how the data should be delivered."[107] The goal, in addition for customers to understand their own usage, is for utilities "to use price signals as a

http://www.dcpsc.org/Newsroom/HotTopics/Grid-Modernization/Realizing-The-Full-Potential-of-Advanced-Metering.aspx (last visited Nov. 11, 2018) (providing customer access to usage data).

99. Oklahoma Gas & Elec. Co., 2012 WL 3893112 (Okla. Corp. Comm'n July 9, 2012) (final order approving joint stipulation and settlement agreement).

100. TEX. UTIL. CODE ANN. § 39.107 (West 2017).

101. Elec. Distrib. Cos. at the Facilities & Homes of Their Distrib. Customers, 2001 WL 1149629 (Mass. Dep't Telecomm. & Energy May 18, 2001) (order regarding advanced metering proposal).

102. 65-407-322 ME. CODE R. § 9 (LexisNexis 2018).

103. 220 MASS. CODE REGS. 11.04 (LexisNexis 2018).

104. 66 PA. CONS. STAT. ANN. § 2807 (West 2018).

105. OHIO ADMIN. CODE 4901:1-10-12 (West 2018).

106. David J. Unger, *Michigan, Illinois Lead the Midwest in Smart-Meter Installations*, ENERGY NEWS NETWORK (Feb. 6, 2017), http://bit.ly/2OBQPDe.

107. *Energy Data: Unlock Innovation, Cut Pollution, Save Money*, ENVTL. DEF. FUND, https://www.edf.org/sites/default/files/data_access_factsheet_online_version.pdf (last visited Aug. 21, 2017).

motivator for behavioral change."[108] Among its provisions, the framework "include[s] access to billing and usage data for a 'reasonable fee' to any retail customer or their verifiable agent, and for REPs [retail energy providers] and local government agencies, access to 'generic information concerning the usage, load shape curve or other general characteristics of customers by rate classification,' as long as individuals' data is protected."[109] Utilities should also take the goals of the Open Data Access Framework into account as the develop new systems, including new technology and customer service improvements.[110]

Colorado, as part of a $612 million smart grid plan by Xcel Energy, required the utility "to provide customers with their energy data through a web portal and have that data in a standardized, nationally-used format called Green Button Connect My Data (CMD)."[111] Specifically, the "customer web portal shall include the ability for all customers to access their energy usage data and provide that data to third parties following required privacy waiver policies,"[112] including giving access in machine-readable form to the customer or customer authorized third-parties, and allowing customers to provide their data to anyone at no fee.[113] Xcel is also supposed to minimize the number of screens or clicks involved in obtaining the data, and minimize the time between when a customer indicates they want their data shared with a third party and when that sharing actually starts.[114] The Colorado PUC has also required Xcel to

108. *Id.*
109. St. John, *PJM Talks to Congress*, *supra* note 3.
110. *Id.*
111. *Colorado Utilities Commission Approves Xcel Grid Modernization Plan and Revenue Decoupling*, EUCI (June 27, 2017), https://bit.ly/2S6F0b5. The settlement did allow Xcel to implement a different nationally adopted standard if it concluded that the alternative would be superior to Green Button Connect My Data. *See* Unopposed Joint Settlement Agreement at 21, Pub. Serv. Co. of Colorado, No. 16A-05888E (Colo. Pub. Util. Comm'n May 8, 2017), http://bit.ly/2DAvKIq ("The currently accepted standard to achieve this is through a standard known as Green Button CMD, which has been ratified by the ANSI-accredited North American Energy Standards Board. The Company will implement Green Button CMD unless another standard is nationally adopted and the Company believes the new standard is superior to Green Button CMD."), *approved by* Pub. Serv. Co. of Colorado, 2017 WL 3263777 (Colo. Pub. Util. Comm'n July 25, 2017). Note that the Public Service Company of Colorado is a subsidiary of the Xcel public utility holding company. *See Profile: Xcel Energy Inc (XEL.O)*, REUTERS, https://www.reuters.com/finance/stocks/companyProfile/XEL.O (last visited Jan. 15, 2019).
112. Unopposed Joint Settlement Agreement, *supra* note 111, at 21.
113. *See* COLO. CODE REGS. § 723-3 (2018); Unopposed Joint Settlement Agreement, *supra* note 111, at 21–23; *see also Customer Self-Service Option*, XCEL ENERGY, https://www.xcelenergy.com/billing_and_payment/customer_data_&_privacy/customer_self_service_option (last visited Jan. 15, 2019). The cost to implement Green Button "is considered a prudent expenditure," so will be added to the rate base in the next rate proceeding, and recovered from customers as part of their electric bills.
114. Unopposed Joint Settlement Agreement, *supra* note 111, at 22.

ensure compliance by testing the system annually and publishing availability metrics.[115]

However, even while a right of access is almost universal, this can prove difficult in practice. Pepco, the utility serving the District of Columbia, claims that the utility provides real time data.[116] However, despite that claim, obtaining that data can be difficult. Sam Brooks, former director of the District of Columbia's sustainability division, recently detailed how it took almost two years with hundreds of meetings and conference calls to get workable data for city buildings, data that Pepco already had.[117] Interestingly, even with regard to data access, some states have taken no position, including no regulations to implement the federal law requiring access.[118]

115. *Id.* ("In order to ensure compliance with the technical specifications of the Green Button CMD standard, the Company will annually test its Green Button CMD system. In the Company's annual DSM [demand side management] report beginning the first calendar year after implementation of Green Button CMD, the Company shall present system availability metrics, the results of the annual test(s), information describing the test(s) conducted, as well as how any deficiencies will be remedied.").

116. Pepco, Maryland Elec. Tariff at 40.2 (Md. Pub. Serv. Comm'n Oct. 18, 2018), http://bit.ly/2zN2HwS.

117. *The Energy Gang: The Inconvenient Truth About Cities and Sustainability*, GREENTECH MEDIA (July 13, 2017), http://bit.ly/2qJJnMK (listen to embedded podcast at 23–24 minutes).

118. Including **Georgia** (although Georgia does provide some privacy protections for customer data, *see Consumer Corner*, GA. PUB. SERV. COMM'N, http://bit.ly/2z4uQQA (last visited Nov. 12, 2018)); **Idaho** (which only requires billing information to be available, *see* IDAHO ADMIN. CODE r. 31.21.01.201 (West 2018)); **Indiana** (although Indiana does specify how such data can be used by the utility, *see* 170 IND. ADMIN. CODE 4-7-1 (West 2018); for a discussion of how such data is used by utilities, *see* Investigation as to Meters for Time-Based Pricing & Other Demand Response Programs, 2007 WL 8420640, at *5 (Ind. Util. Reg. Comm'n Aug. 1, 2007) (order rejecting proposed smart meter standards)); **Kentucky**; **Maryland** (which at least acknowledges that such data is collected to enable customers to conserve energy, *see* Provision & Regulation of Elec. Serv., 2001 WL 1890253 (Md. Pub. Serv. Comm'n Dec. 11, 2001), but does not have universal data access rules; instead, it is left to the individual utilities to determine what they are going to furnish. For example, Delmarva provides historical data upon request, *see* Delmarva Power & Light Co., Maryland Elec. Tariff at 12 (Md. Pub. Serv. Comm'n Oct. 18, 2018), http://bit.ly/2PS8TxD; Easton provides one year of historic data to customers upon request, *see* Easton Utils. Comm'n, Maryland Elec. Tariff at 10 (Md. Pub. Serv. Comm'n July 1, 2017), http://bit.ly/2JXJAVz; Potomac Edison provides data in a "timely manner," Potomac Edison Co., Maryland Elec. Tariff at 4–9 (Md. Pub. Serv. Comm'n June 2, 2000), https://bit.ly/1FzlNTn; and Pepco claims they provide real-time data, *see* Pepco, Maryland Elec. Tariff, *supra* note 116 at 40.2); **Missouri** (which has found that the primary purpose of smart meters is to benefit utilities, *see* A Working Docket to Address Effective Cybersecurity Practices for Protecting Essential Elec. Util. Infrastructure, 2012 WL 3544932, at *1 (Mo. Pub. Serv. Comm'n July 17, 2012) (order directing notice and directing filing)); **Nebraska**; **New Mexico** (stating that smart meters are for "safety and reliability, Kit Carson Elec. Coop., 2016 WL 6600679, at *15 (N.M. Pub. Regulation Comm'n Oct. 31, 2016) (recommended decision), and that the data should be used "to improve customer service and utility operations and lower costs," 17 N.M. REG. 943, 944 (Oct. 16, 2006)); **Rhode Island** (although state law clarifies that utilities own the meters,

Access, while important, is different from ownership. The determination of who owns the data may actually be, in the long run, more important—as that will determine who can monetize the data.

IV. CLASSIFICATION AND OWNERSHIP OF ELECTRICITY USAGE DATA

Given the large number of states which have not made a determination of how to classify electricity usage data, who owns electricity usage data, or who is able to or how to access electricity usage data, the potential for market facilitators to develop demand response platforms and sharing economy providers to participate to the benefit of all society will be informed by traditional concepts of property law. This section will, therefore, discuss how data may be classified in property, how that relates to ownership of data, and what other data collection platforms may be able to aid in the understanding of how electricity usage data should be regulated.

A. Classification of Electricity Usage Data – Real, Personal, or Intellectual Property?

Traditionally, property is thought of as "a valued resource such as land, chattel, or an intangible."[119] Property resources are commonly divided into three categories: real, personal, and intellectual property.[120] Real property includes land and "anything growing on, attached to, or erected on it, excluding anything that may be severed without injury to the land."[121] Personal property is everything that is not real property, is movable or intangible, and is subject to ownership.[122] Property ownership includes the right to possess, use, control, or exclude others from the property.[123]

it does not specify ownership of the data, *see* Narragansett Elec. Co., 2014 WL 5793320, at *30 (R.I. Pub. Util. Comm'n Oct. 31, 2014) (report and order)); **South Dakota**; **Tennessee**; and **Utah** (which requires access to meters, but says nothing about data, *see* UTAH ADMIN. CODE r. 746-310-2 (West 2018)).

119. *Property*, BLACK'S LAW DICTIONARY (10th ed. 2014).

120. Todd Janzen, *What Makes Ag Data 'Ownership' Unique*, PRECISION FARMING DEALER (Feb. 1, 2016), https://www.precisionfarmingdealer.com/articles/1967-what-makes-ag-data-ownership-unique.

121. *Real Property*, BLACK'S LAW DICTIONARY (10th ed. 2014).

122. *Personal Property*, BLACK'S LAW DICTIONARY (10th ed. 2014).

123. Janzen, *supra* note 120.

The first two property categories existed under common law,[124] but intellectual property ("IP") was statutorily created.[125] IP is defined as "a category of intangible rights protecting commercially valuable products of the human intellect."[126] IP "comprises primarily trademark, copyright, and patent rights, but also includes trade-secret rights, publicity rights, moral rights, and rights against unfair competition."[127] The relationship between intangible property, such as IP, and tangible objects can be extremely close, but intangible property is distinct from tangible goods.[128]

Even within the category of IP, there are two specific forms. The first is "hard," industrial IP, "such as a patent, that excludes others from using the invention without the holder's consent even if others find the innovation independently."[129] The second is "soft," artistic IP, "such as a copyright, that does not preclude independent creation by third parties."[130] When a copyright is owned, an individual must acquire permission to use the copyrighted material or data.[131] Under the fair use doctrine, an individual may use a part of a copyrighted work without permission.[132] Fair use of copyrighted digital information can occur when it is used in a manner "fundamentally different than the use intended by" the original creator.[133]

Data is a unique form of property because it is intangible and can be "transferred at almost zero marginal costs."[134] Unlike tangible goods, where a property owner has "exclusive rights and control over the good,"

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124. Historically, the distinction between real and personal property comes from the "types of assets administered on death" by the king's courts. 1 RICHARD R. POWELL, POWELL ON REAL PROPERTY § 5.04, at 5-7 to -8 (Patrick J. Rohan ed., rev. ed. 1998).

125. *See* Janzen, *supra* note 120 (noting in the U.S. that Congress outlines protections).

126. *Intellectual Property*, BLACK'S LAW DICTIONARY (10th ed. 2014).

127. *Id.*

128. LIONEL BENTLY & BRAD SHERMAN, INTELLECTUAL PROPERTY LAW 1, 2 (4th ed. 2001) ("For example, when a person posts a letter to someone, the personal property in the ink and parchment is transferred to the recipient . . . . [T]he sender (as author) retains intellectual property rights in the letter.").

129. Robert Rankin, *Intellectual Property in 2017*, ACADEMIA, http://www.academia.edu/34890540/Intellectual_Property_in_2017.pptx (last visited Jan. 15, 2019).

130. *Id.*

131. Heather Bussing, *Who Owns Data 3: Intellectual Property*, HR EXAMINER (Apr. 10, 2013), http://www.hrexaminer.com/who-owns-data-3-intellectual-property/ [hereinafter Bussing, *Intellectual Property*].

132. *Id.*

133. Perfect 10, Inc. v. Amazon.com, Inc., 508 F.3d 1146, 1168 (9th Cir. 2007) (holding that Google indexing images by creating excerpts from a porn website was fair use).

134. Helena Uršič, *The Troublesome Concept of Data Ownership*, MULTUM IN PARVO BLOG (Mar. 3, 2016), http://multuminparvo89.blogspot.com/2016/03/the-troublesome-concept-of-data.html?m=1.

this rarely occurs with data.[135] Generally, digital information falls under soft IP rights and is available for fair use.[136]

While a few scholars have detailed their conception of data as property, there is little agreement about how data should be treated. Helena Uršič states that personal data has "been described as the new oil" and is becoming more commonly viewed in terms of property rights instead of privacy rights.[137] She claims that property rights in personal data refer to an "entitlement to exclude [others] from personal data by default."[138] Specifically, "there is no disclosure, collection or use of personal data by default."[139] Classifying data as property allows for strengthening personal rights, such as data privacy protections.[140] If consumers owned their personal information by default, then they "would be able to bargain with data users to determine when it would be advantageous to forfeit their privacy by selling their data."[141] Privacy rights over the data are fragile.[142] Additionally, Uršič declares that the most valuable asset in the information business may not be the data itself, but the technology and methods used to analyze and decipher the data.[143] These technologies are more commonly available to companies and businesses, and the owners of such technology may make the most productive use of the data.

Heather Bussing states that "indexing or data retrieval may not be something you can own."[144] Further, "when organized data is functional [instruction] instead of just [uniquely created] content, it's closer to common knowledge or a standard design that should not be owned by one company."[145]

Jacqueline Lipton states that, in the United States, "databases are [generally] not protected by copyright law,"[146] but the data management methods may be protected under hard IP law. Lipton is concerned that "large amounts of relatively mundane information could be locked away

135. *Id.*
136. Fair use of digital information can occur when it is used in a manner "fundamentally different than the use intended by" the original creator. *Perfect 10*, 508 F.3d at 1168.
137. Uršič, *supra* note 134.
138. *Id.*
139. *Id.*
140. *Id.*
141. *Id.*
142. Heather Bussing, *Who Owns Data 5: Privacy*, HR EXAMINER (Apr. 24, 2013), https://www.hrexaminer.com/who-owns-data-5-privacy/.
143. Uršič, *supra* note 134.
144. Bussing, *Intellectual Property*, *supra* note 131.
145. *Id.*
146. Jacqueline Lipton, *Information Property: Rights and Responsibilities*, 56 FLA. L. REV. 135, 143 (2004). The exception is when there is some originality to the management or arrangement of the information in the database. *Id.*

from society and may only be accessible through payment of prohibitive fees."[147] She believes that property rights for data should be granted but with "commensurate legal duties."[148] This avoids giving too much monopolizing power over information while providing adequate personal protections and benefits.[149] Specifically, she argues that the "legal and financial burdens of balancing information property rights against other competing interests in relevant information" should "be predominantly borne by the right holders themselves as legal duties attached to the privilege of property ownership."[150] Lipton further argues that "the state has a responsibility to monitor and control the performance of such duties, particularly where the state itself has supported the creation and commercial exploitation of the relevant property rights."[151] She prefers "balancing private rights against legal duties inherent in information ownership, drawing on theories of traditional Property ownership as a preferable framework for balancing competing interests in information."[152] Lipton generally discusses applying concepts and lessons from the fair use doctrine, real property, and IP law for identifying proper ownership and corresponding obligations to other interested parties.[153]

Jessica Litman focuses on different approaches to protecting data privacy. She disagrees with a property-based approach that "[p]eople should own information about themselves and, as owners of property, should be entitled to control what is done with it."[154] She concludes that "a property rights approach would be unlikely to improve [data privacy] matters; indeed, it would tend to encourage the market in personal data rather than constraining it."[155] Litman concludes that a tort based model of data privacy protections would be a modest improvement over a property based approach.[156] She notes that "[i]n Europe, it is illegal to release personal data to a third party, or even to use it for a purpose unrelated to the reason for which it was collected, without the subject's consent."[157] Further, most protections come from industry self-regulation.[158] Litman

147. *Id.* at 147.
148. *Id.* at 148–49.
149. *Id.*
150. *Id.* at 150.
151. *Id.*
152. *Id.* at 151.
153. *Id.* at 150–88.
154. Jessica Litman, *Information Privacy/Information Property*, 52 STAN. L. REV. 1283, 1287 (2000).
155. *Id.* at 1288.
156. *Id.*
157. *Id.* at 1286.
158. *Id.* at 1286–87.

laments that there are no federal privacy laws.[159] She believes that what "data privacy really needs is federal statutory protection" and "tort litigation is actually a plausible route to enactment."[160] Litman claims that a tort law strategy is "comparatively benign" versus property rights for data protection.[161]

Julie E. Cohen disagrees with "data processors and other data privacy opponents [who] argue that imposing restrictions on the collection, use, and exchange of personal data would ignore established understandings of property, limit individual freedom of choice, violate principles of rational information use, and infringe data processors' freedom of speech."[162] Cohen discusses two theories of ownership. The first is the labor-desert theory that "focuses on the right of self-determination and the acquisition of property through the investment of labor."[163] Under this theory, a person owns the data generated by their actions and can exclude others from it. She criticizes this theory because there is no way "I would have the right to control what another gathers through his or her own diligence, even if what is gathered is information about me."[164] The second theory is the utilitarian theory, which "takes as its primary purpose maximizing human satisfaction or benefit" and that this idea dominates property law.[165] She concludes that: "categorical arguments . . . mask fundamentally political choices about the allocation of power over information, cost, and opportunity. Each debate, although couched in a rhetoric of individual liberty, effectively reduces individuals to objects of choices and trades made by others."[166] Rather, the discussion "should be grounded in an appreciation of the conditions necessary for individuals to develop and exercise autonomy in fact, and that meaningful autonomy requires a degree of freedom from monitoring, scrutiny, and categorization by others."[167] To address data privacy protection, strong legal and technological tools should be designed.[168]

Gianclaudio Malgieri "aims to prove how trade secrets, rather than database *sui generis* rights, are the most interesting and flexible property right for coping with the challenge of customer data appropriation in the

159. *Id.* at 1291–92. (Since 2000, there have been some privacy protection laws passed, but those are focused on specific narrow industries and not the general economy.)
160. *Id.* at 1313.
161. *Id.*
162. Julie E. Cohen, *Examined Lives: Informational Privacy and the Subject as Object*, 52 STAN. L. REV. 1373, 1373 (2000).
163. *Id.* at 1381.
164. *Id.*
165. *Id.*
166. *Id.* at 1373.
167. *Id.*
168. *Id.*

new, collaborative economy 3.0."[169] He proposes reconceptualizing personal data into "a contextual, relational, trade-centered protection of personal data in the form of trade secrets."[170] Malgieri emphasizes:

> [A]s personal data are generally secret, economically valuable, and protected by security measures, we can affirm that consumers (though they are not companies) "hold" a trade secret right on their personal data. Moreover, trade secrets are used in "trade" relationships and in this case, consumers have a commercial interest to protect—re-balancing their trade asymmetry and their commercial vulnerability.[171]

He believes that "the traditional idea of property as absolute dominion is inappropriate for the information economy," and "a fluid and relational property right such as quasi-property" is an "interesting solution," "because (data) privacy depends widely on the 'context' where some information is produced."[172] Malgieri claims that trade secrets are the best solution to the issue of property alienability because "trade secret law has a number of default rules that might be useful for information privacy protection (*e.g.*, data cannot be used for other purposes without obtaining permission for the new uses; license rights are nontransferable unless the licensor grants a right to sublicense, etc.)."[173] Lastly, he claims that a trade secret solution gives the best chance of "global harmonization" for personal data protection.[174]

Jane Baron argues that talking about information control in property terms is misleading.[175] Contrary to Malgieri, she believes that "[b]ecause the degree to which property grants control is itself fundamentally contested within property law and theory, 'property' cannot tell us how much control individuals should have over their medical or personal information."[176] Baron concludes that "the concept of property alone cannot tell us how much, or what kind, of power" is granted to people to control their information.[177]

Two commentators focus on narrower issues related to data. Daniel Martin believes there should be a universal "right to destroy" digital

169. Gianclaudio Malgieri, *"Ownership" of Customer (Big) Data in the European Union: Quasi-Property as Comparative Solution?*, J. INTERNET L., Nov. 2016, at 1, 3.
170. *Id.* at 12.
171. *Id.*
172. *Id.* at 12–13.
173. *Id.* at 13.
174. *Id.*
175. Jane B. Baron, *Property as Control: The Case of Information*, 18 MICH. TELECOMM. & TECH. L. REV. 367, 417 (2012).
176. *Id.* at 418.
177. *Id.*

information and data.[178] Brenda M. Simon, when discussing data-generating patents, believes that the patents are highly valuable and criticizes people who believe the generated data should automatically belong to the patent owner.[179] Simon is concerned that providing default ownership rights for patent-generated data "may overcompensate inventors for their efforts."[180]

Finally, a treatise by Raymond T. Nimmer proposes defining data rights and privacy rights through a property law framework.[181] He "defines property rights in information [and data] by giving (or denying) the individual a right to control the use of the information even when that information is in the hands of another party."[182] Further, both privacy and trade secrecy law "create a right to restrict [the] disclosure or use by third parties of confidential information."[183] Nimmer's analysis focuses the inquiry on five policy and legal questions: (1) "What attributes describe private information that qualifies as property?,"[184] (2) "What actions did the purported owner take regarding disclosure of the information?,"[185] (3) "What is the scope of the right?,"[186] (4) "How does the location or source

178. Daniel Martin, Note, *Dispersing the Cloud: Reaffirming the Right to Destroy in a New Era of Digital Property*, 74 WASH. & LEE L. REV. 467, 473 (2017).

179. Brenda M. Simon & Ted Sichelman, *Data-Generating Patents*, 111 NW. U. L. REV. 377, 378 (2017) (discussing Myriad's genetic testing and Google's algorithms).

180. *Id.* at 414.

181. RAYMOND T. NIMMER, LAW OF COMPUTER TECHNOLOGY § 17:18 (West 2018).

182. *Id.*; *see also* Raymond T. Nimmer & Patricia Ann Krauthaus, *Information as a Commodity: New Imperatives of Commercial Law*, 55 L. & CONTEMP. PROBS. 103, 105 (1992).

183. NIMMER, *supra* note 181, § 17:18.

184. *Id.* ("The data must be specific, rather than general, and related to tangible events or facts, rather than ideas or general concepts. Additionally, the relevant attributes might include the relative secrecy, sensitivity, potential harmfulness, and the personal or commercial value to the owner. The property right under trade secret law attaches to information that derives commercial value from not being generally known. The analogy in personal information focuses more on the personal value of nondisclosure. 'Privacy' rights apply to information not widely and generally known regarding an individual and for which disclosure might cause risk of loss in terms of harassment, embarrassment, or similar consequences.").

185. *Id.* ("In trade secret law, this refers to the security efforts taken and the extent to which that owner limited (or permitted) general disclosure. A similar component exists in 'privacy' law, although not in 'data protection' law. Intimate details of a life disclosed in an autobiography are not private. The property interest is waived. On the other hand, personal information not revealed in an indiscriminate manner qualifies. To an extent, privacy law protects information in direct relationship to the owner's efforts to protect the information.").

186. *Id.* ("In both privacy and trade secret law, a recognized right exists to make conditioned or conditional disclosures that restrict the right of the information recipient. In commercial practice, the restrictions typically arise from the contract. In privacy law, the more normal source comes in law (statute or regulation) directly restricting the recipient's use or disclosure.").

of the information affect the right?,"[187] and (5) "Against which interests does the property right fail?"[188]

While there continues to be disagreement about how data is classified in terms of property law, it still may be possible to draw parallels between electricity usage data and other types of data to determine how regulators – and society at large – should legislate its ownership and govern its sharing.

B. How the Real/Personal/IP Classification Relates to Ownership of Data

There is a distinction between "owning something" and "just having a right to use it."[189] Absolute ownership is acquired in three ways. First, a person can give something as a gift that, once given, is entirely irrevocable.[190] Second, an exchange for value through a sale or trade.[191] Third, something created by a person is owned by that person.[192] Often, there is a question of who originally created the information, and ownership and use rights can be split amongst various interested parties.[193] When multiple parties create something together, they "usually make an agreement or exchange for value about who owns the end result."[194]

Contractual rights to use something are not property ownership.[195] The two most relevant contractual rights, for the purposes of this article,[196] are shared ownership and licenses. Shared ownership is when "more than one person owns something together."[197] Normally, there is a way to

187. *Id.* ("Privacy creates a nonexclusive property right. There exists a right of independent discovery. Information obtained from unprotected or published sources can be freely used independent of the underlying property interest. In contrast, obtaining the information from otherwise protected contexts may infringe the privacy right. A distinction exists among information sought from the home, a safe deposit box, a secure communications system, or, on the other hand, the visible outside of a home (e.g., street address or name) or from public records (e.g., court files).").

188. *Id.* ("The property rights in trade secrecy and privacy law involve a right not to disclose information and a right to enforce disclosure restraints against third parties. In some cases, these rights are dislodged by competing policy demands. In the U.S., this often occurs in reference to First Amendment issues.").

189. Heather Bussing, *Who Owns Data 4: Ownership Interests*, HR EXAMINER (Apr. 16, 2013), http://www.hrexaminer.com/who-owns-data-4-ownership-interests/ [hereinafter Bussing, *Ownership Interests*].

190. *Id.*

191. *Id.*

192. *Id.*

193. Uršič, *supra* note 134.

194. Bussing, *Ownership Interests*, *supra* note 189.

195. *Id.*

196. *Id.* Two other forms of rights are liens/security interests and options; both may lead to future ownership if specified conditions occur or do not occur. *Id.*

197. *Id.*

quickly convert one's ownership into cash, such as through selling a share of stock, land, or partnership interest.[198] The other contractual right is a license, which gives the "right to use someone else's stuff" while the owner maintains their ownership.[199] Licenses are flexible and are the most frequently applied contractual concept for digital information.[200] Especially under soft IP law, ownership is uncertain and is most often protected and designated via contract.[201]

Lastly, there are some things that do not belong to anyone.[202] Specifically, the categories that fall under non-ownership are people, contraband, natural forces, common knowledge and facts, works in the public domain, and ideas that have not been patented or copyrighted.[203] The non-ownership concepts of common knowledge, public domain, and ideas are also relevant to discussing data ownership.[204] If data falls into one these non-ownership categories, then there cannot be an ownership or property claim.[205] Often anyone can collect the same or similar data using basic observational abilities or by creating their own new process.[206] Under fair use, uniquely owned or copyrighted data can be repurposed or entirely transformed into something new, thus ending the original ownership rights.[207] Therefore, digital information frequently falls under a non-ownership doctrine, such as fair use, soft IP (copyrights) or contractual (licensing) rights.

However, ownership is a prerequisite to sharing and participating in the sharing economy "[o]nly if an individual owns something can she share it."[208] Therefore, the question of ownership is central.

198. *Id.*
199. *Id.* For example, "when you 'buy' software or a song on [iTunes], you don't really own it. You just have a right to use it according to the terms and conditions of the license." *Id*.
200. *Id.*
201. Uršič, *supra* note 134.
202. Heather Bussing, *Who Owns Data 2: What You Can't Own*, HR EXAMINER (Apr. 9, 2013), http://www.hrexaminer.com/who-owns-data-2-what-you-cant-own/.
203. *Id.*
204. *Id.* However, some "Big Data enthusiasts . . . will tell you that data is becoming a new natural force." *Id.*
205. *Id.*
206. *Id.* Although there may be unique ownable processes for obtaining data.
207. Perfect 10, Inc. v. Amazon.com, Inc., 508 F.3d 1146, 1168 (9th Cir. 2007).
208. Donald J. Kochan*, I Share, Therefore It's Mine*, 51 U. RICH. L. REV. 909, 910 (2017).

C. *Traditional Property Law Concepts Applied to Electricity Usage Data*

While none of the above commentators discussed electricity usage specifically, a few secondary sources discuss smart meter data access,[209] and others have focused on the privacy concerns inherent with electricity usage data.[210] However, none has resolved what structure of ownership or rights should be to enable the sharing economy with regard to electricity usage data. This section looks at traditional property law concepts and how they could be applied to electricity usage data to maximize the potential adoption of demand response and the maximum generation of negawatts.

1. Discovery Doctrine

Long the basis for the colonization of real property, the discovery doctrine supports a theory that property rights should go to the party that will use the disputed good in the most economically productive manner.[211] Economically speaking, market facilitators could make the most economically productive use of electricity usage data, as, with this data, they could determine which sharing economy providers would be both most willing and could benefit the most from participating in the market for negawatts. Being able to target sharing economy providers is only possible with the electricity usage data—and a modern-day application of the discovery doctrine to electricity usage data would suggest that states should determine how to provide that data to market facilitators.

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209. *See* Cheryl Dancey Balough, *Privacy Implications of Smart Meters*, 86 CHI.-KENT L. REV. 161, 173 (2011); Natasha H. Duarte, *The Home Out of Context: The Post-Riley Fourth Amendment and Law Enforcement Collection of Smart Meter Data*, 93 N.C. L. REV. 1140, 1157–58 (2015); John R. Forbush, Note, *Regulating the Use and Sharing of Energy Consumption Data: Assessing California's Sb 1476 Smart Meter Privacy Statute*, 75 ALB. L. REV. 341, 342 (2012). Alexandra B. Klass and Elizabeth Wilson describe "the lack of granularity of data for energy management" to improve energy efficiency in buildings as "striking." Klass & Wilson, *supra* note 2, at 71.

210. *See* Megan McLean, Note, *How Smart Is Too Smart?: How Privacy Concerns Threaten Modern Energy Infrastructure*, 18 VAND. J. ENT. & TECH. L. 879, 885 (2016); Sonia K. McNeil, Note, *Privacy and the Modern Grid*, 25 HARV. J.L. & TECH. 199, 207 (2011). *See generally* Dana B. Rosenfeld & Sharon Kim Schiavetti, *Third-Party Smart Meter Data Analytics: The FTC's Next Enforcement Target?*, ANTITRUST SOURCE, Oct. 2012 (discussing FTC regulation of third-party access).

211. *See* Steven T. Newcomb, *The Evidence of Christian Nationalism in Federal Indian Law: The Doctrine of Discovery, Johnson v. Mcintosh, and Plenary Power*, 20 N.Y.U. REV. L. & SOC. CHANGE 303, 322 (1993).

2. Adverse Possession

Adverse possession, today used only by those with the specialized knowledge to take advantage of it,[212] was historically one way for those who made productive use of the land to obtain title to it.[213] Similar to the discovery doctrine, adverse possession allows the transfer of ownership based on use—with an active non-owner trumping a non-active owner.

For electricity usage data, this doctrine, if applied to data, would again support the data going to a non-owner who would actively use the data, especially when that use would benefit society as a whole. In traditional adverse possession, the activity most often only benefited the person who took the land.[214] With electricity usage data, one individual making productive use of his or her data is rare—but market facilitators could certainly make more productive use of many individuals' data. Utilities, on the other hand, have not made use of this data—even as they have access to it, and the ability to use it currently. Their non-use provides another reason to ensure it does not remain potentially owned—and unused—by them.

3. Highest and Best Use

Used in eminent domain proceedings and to determine tax value, the highest and best use of a property is commonly defined as the "reasonable, probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value."[215] Most important to this analysis, the determination of the highest and best use value does not take the current uses into account, but instead looks at what might be (rather than what is).[216]

For electricity usage data in the energy sharing economy, the highest and best use could support market facilitators having a right of access to the data, as the highest and best use of the data—the use that would create the highest value—would be to have that data available.

212. *See* Tom McGhee, *Lawyers Awarded Property Next Door,* DENVER POST (Nov. 17, 2007, 1:35 PM), http://www.denverpost.com/2007/11/17/lawyers-awarded-property-next-door/.

213. *See* Jessica J. Shrestha, *Hey! That's My Land! Understanding Adverse Possession*, WIS. LAW., Mar. 2010, at 10, 10.

214. *See id.* at 12–13.

215. *Highest and Best Use*, DUNCAN & BROWN REAL ESTATE ANALYSTS, http://www.duncanbrown.com/highest-and-best-use (last visited Nov. 16, 2018).

216. *Id.*

4. Fair Use

Fair use provides an affirmative defense to the unlicensed use of copyright-protected works in certain circumstances, including "criticism, comment, news reporting, teaching, scholarship, and research."[217] The purpose, however, is mainly for freedom of expression, and traditionally has not been readily available to those activities with a commercial nature. However, those uses that are "transformative"—those uses that "add something new, with a further purpose or different character, and do not substitute for the original use of the work"—are more likely to be acceptable under fair use.[218]

For electricity usage data, it certainly could be argued that allowing a market facilitator to have access to the data is transformative, and that the individual data is being used with a further purpose—to obtain societal goods, not necessarily possible with only the original, dispersed data. By having a market facilitator able to aggregate the data, it is transforming the data from what one person has access to into the ability to animate the market and, by extension, the sharing economy.

D. What can electricity usage data be compared to?

Privacy is often a concern cited with smart meter data.[219] Framing information property through privacy law "defines property rights in information [and data] by giving (or denying) the individual a right to control use of information even when that information is in the hands of another party."[220] Both privacy and trade secrecy "create a right to restrict disclosure or use by third parties of confidential information."[221] Regarding data-protection, the legal system works to make "rules of behavior and operational limits" to protect individuals' personal information from becoming disclosed.[222] This concern around privacy is also present in other data-rich environments, including: agricultural data, medical records, and the information collected during use of the internet.

217. *More Information on Fair Use*, U.S. COPYRIGHT OFFICE, https://www.copyright.gov/fair-use/more-info.html (last visited Nov. 16, 2018).
218. *Id.*
219. Interestingly, for water smart meters, Hawaii allows full public disclosure of water consumption data, as the public interest in water use outweighs individual privacy. HAW. REV. STAT. ANN. § 92F-12 (West 2018). A federal appellate court has also ruled that a utility's collection of smart meter data—even under a mandatory program—is not an unreasonable search, and that the city's interests in smart meters outweigh any privacy concerns. Amanda Reilly, *Court Rules Smart Meter Data Search is 'Reasonable,'* GREENWIRE (Aug. 17, 2018), http://bit.ly/2Ka6qcD.
220. NIMMER, *supra* note 181, § 17:18.
221. *Id.*
222. *Id.*

1. Agricultural Data

Todd Janzen, when discussing the concept of agricultural ("ag") data "ownership," believes that United States law does not recognize ag data ownership and that ag data is a mix of real, personal and intellectual property.[223] Intellectual property law protects trade secrets, such as the formula for Coca-Cola, but there are no laws that specifically recognize ag data as a form of IP, although it may qualify for trade secret protection.

What does this mean for "ownership" of ag data? As a form of property, ag data is a mix of real, personal and intellectual property. Yield data, for example, is information inextricably linked to the land, like real property. Yield data is also highly portable, like personal property. But yield data also contains valuable information, like intellectual property or trade secrets. Those characteristics make ag data unique from other forms of property. Farmers can own real, personal and intellectual property, but ag data is hybrid of all three.

Actors up and down the agricultural supply chain want to "turn data into value"—specifically by enabling farmers to know which actions to take to improve efficiency.[224] This also provides information back to the company selling the technology—enabling agriscience and seed companies to sell more personalized service, equipment manufacturers to sell higher-value services, and providing commodity traders more accurate forecasts of yields and quality.[225]

Can we say the farmer owns his or her data? Yes, if the farmer owns the field, the farmer owns the equipment that creates the data and the farmer generates the data. But when others are involved in creating that ag data form of property, ownership becomes a more difficult question, such as when the farmer leases the equipment from a third party or uses a third-party sensors and database to collect and analyze the data.

As with energy, the other issue is one of monetization. With "[h]uge volumes of data about how crops grow . . . now easily available," the issue becomes analysis of that data.[226] If the farmer does not clearly own the data, but rather a third-party aids in its collection or analysis, it is "widely assumed that the data generated by farmers is free."[227]

223. Todd Janzen, *What Makes Ag Data 'Ownership' Unique*, PRECISION FARMING DEALER (Feb. 1, 2016), http://bit.ly/2Q0pvmP.
224. *Transforming Agriculture with Data-Driven Insights: How to Prosper in the Evolving Market for Digital Agritech*, PA CONSULTING GRP. 5 (Feb. 2018), http://bit.ly/2DsesMN.
225. *See generally id.*
226. *Id.* at 16.
227. *Id.* at 13. Farmers, however, have begun to sell the data they are generating. *See id.*

2. Medical Records

Medical records are another area where privacy has been deemed important, and, therefore, legislation has been enacted to protect it.[228] Of course, this is for multiple reasons, but one of the main reasons is the potential for prejudice—from insurance companies, should they know family medical history, and, therefore what you are more likely to need care for, and from employers, who pay at least a part of those expenses.

In single-payer systems, these privacy concerns are not as defensible, as the government is paying for your care, regardless of what your family history is, and your employer doesn't have anything directly to do with the costs—those are spread out among all taxpayers and employers, rather than an employer being more fiscally responsible for a certain group of employees. Given that situation, the healthcare system uses data to improve clinical care and foster clinical research and has been doing so for decades.[229]

Some states had attempted to collect data from all insurance programs to aid in the effective implementation of the Affordable Care Act,[230] but insurers sued to keep that data from states, and the Supreme Court ruled that was correct for certain self-insured employer insurance plans.[231] Almost twenty states have databases for insurance information,[232] and the federal government provides data on Medicare and Medicaid to the states

228. *See* Stacy-Ann Elvy, *Commodifying Consumer Data in the Era of the Internet of Things*, 59 B.C. L. REV. 423, 498–500 (2018).

229. *See* Peter Cnudde et al., *Linking Swedish Health Data Registers to Establish a Research Database and a Shared Decision-Making Tool in Hip Replacement*, 17 BMC MUSCULOSKELETAL DISORDERS 414, 414 (2016) ("Sweden offers a unique opportunity to researchers to construct comprehensive databases that encompass a wide variety of healthcare related data. Statistics Sweden and the National Board of Health and Welfare collect individual level data for all Swedish residents that ranges from medical diagnoses to socioeconomic information. In addition to the information collected by governmental agencies the medical profession has initiated nationwide Quality Registers that collect data on specific diagnoses and interventions. The Quality Registers analyze activity within healthcare institutions, with the aims of improving clinical care and fostering clinical research.").

230. *See* Lisa Schencker, *Who Owns Health Data? Supreme Court May Try Answering that Question*, MODERN HEALTHCARE (Dec. 18, 2014), http://bit.ly/2FpubPd. Vermont's data-collection law is specifically designed for the purposes of "identifying health care needs and informing health care policy," "evaluating the effectiveness of intervention programs on improving patient outcomes," "comparing costs between various treatment settings and approaches," "determining the capacity and distribution of existing resources," and "providing information to consumers and purchasers of health care." VT. STAT. ANN., tit. 18, § 9410(a)(1) (2018).

231. Ronald Mann, *Opinion Analysis: Justices Strike a Blow Against State Health-Care Data Collection*, SCOTUSBLOG (Mar. 2, 2016, 11:02 AM), http://bit.ly/2Do2qE1 (discussing Gobeille v. Liberty Mut. Ins. Co., 136 S. Ct. 936, 939 (2016)).

232. Schencker, *supra* note 230.

with healthcare databases.[233] Interestingly, despite a request from the insurance companies involved in the case, the Supreme Court did not hold who owned the data.[234] In addition to ownership, the insurance companies were also looking for a clear holding on the right to access the data.[235]

3. Active and Passive Internet Use

Similar to medical records, where patients are often asked for consent to share data without perhaps understanding what they are agreeing to, internet use often brings up similar privacy, property, and data issues. A study conducted by the International Institute of Communications identified two types of data collection: active and passive.[236] Actively collected data is information "voluntarily revealed to the [collector] by the user."[237] Because it requires their participation, users are typically aware this information is being collected. Sometimes, however, "much of the data collected occurs without the user being involved or aware that a data transmission has taken place."[238] This passively collected data is "information that is automatically revealed to the service provider and does not require active participation by the user."[239]

There is also a "subset of passively collected data called inferred data. Inferred data is information that is [generated or created] from existing data through analytic models."[240] Since both passive or inferred data occurs without active participation, "users generally are not aware" this data is being collected.[241]

Consent currently covers most active and passive internet use, which users often give by hitting a pop-up button in an app. "Google would like to use your location"—hit "allow" or "block." This could be seen as a form

233. Gobeille v. Liberty Mut. Ins. Co., 136 S. Ct. 936, 952 n.4 (2016) (Ginsburg, J., dissenting).

234. The insurance companies hoped the case made "clear that insurers own the data and should have the right to decide who may and may not access it." Schencker, *supra* note 230.

235. *Id.*

236. *See* J. Frazee et al., *Mhealth and Unregulated Data: Is This Farewell to Patient Privacy?*, 13 IND. HEALTH L. REV. 384, 396 (2016) (citing *Personal Data Management: The User's Perspective*, INT'L INST. OF COMMC'NS 12 (2012), https://www.iicom.org/images/iic/themes/Qual_Report_pdm_final.pdf).

237. *Id.* An example is "entering what one ate that day into a diet tracking app." *Id.*

238. *Id.*

239. *Id.* at 396. An example is "location metadata being sent to the service provider along with one's diet entry." *Id.*

240. *Id.* at 396. An example is "analyzing a user's dietary patterns to predict that this particular user will likely develop type 2 diabetes." *Id.* at 396–97.

241. *Id.* at 397. An example is cell-site location information. This data is passively created when a cell service provider identifies to what towers a cellphone user is connected. The actively created data might be the individual button presses on the phone.

of license—you are giving permission to access your data until you make an affirmative choice otherwise. However, who owns that data—you or the firm collecting your movements around the web—is unclear at this point in time. And whether it would be different for active versus passive data is also still yet to be determined.

V. WHAT CHANGES ARE NECESSARY TO ENABLE THE ENERGY SHARING ECONOMY?

The question then becomes—with these theories of property, traditional doctrines, and other examples, how should legislators and regulators think about the ownership of and access to electricity usage data? And how could those choices impact the energy sharing economy?

A. What classification and ownership structure would best enable the energy sharing economy?

As Janzen argues with ag data, electricity usage data also has aspects of real, personal, and intellectual property.[242] Electricity usage data is intimately tied to a physical location, implying real property. However, the electricity usage is due to individual actions of the inhabitants of the real property, some of which occurs away from the real property (like running down electronics when out and then charging them at home). Electricity usage data, like ag data, can also be portable—and, absent large variations in housing stock characteristics, is likely to be similar wherever a certain individual or group of individuals is living, because it is, to some degree, based on behavior. Electricity usage data, therefore, has some characteristics of personal property. As noted in the examples of the competitive electricity markets, however, it also contains valuable information, and therefore is characteristic of intellectual property. Like ag data, electricity usage data seems to be a hybrid, not able to be classified easily into a single area.

Even given the inability to easily classify electricity usage data, it would seem to make the most sense to use the structure associated with intellectual property, but adopting the reasoning behind more traditional property doctrines, like highest and best use, to inform valuation, ownership and a right of access. While that adopts parts of current scholarly thought on data ownership, it does not fit neatly into any articulation to date.

If personal data is "the new oil,"[243] a property right to exclude others by default would lead to society—and the individual sharing economy

242. *See Janzen*, *supra* note 223.
243. Uršič, *supra* note 134.

provider—not being able to benefit from the energy sharing economy. While a framework that allows consumers "to bargain with data users"[244] might sound, at an abstract level, to be the best, it has issues in practice, at least with electricity usage data. It may be easy to bargain for certain things, but currently, the data is held by utilities—who do not want to give it up, and with whom the sharing economy provider has little bargaining power. Disagreeing with the terms of your electrical service in many areas is impossible—unless you want to completely go off-grid. Additionally, the electricity usage data only becomes advantageous when utilized by a market facilitator—so, without the initial data access, it would be impossible for the sharing economy provider to understand when it would be advantageous. The right of access is needed before the understanding can occur. Uršič notes this herself, recognizing that the asset may not be the data itself, but the technology and methods used to analyze and decipher the data; the owner of that technology is the one able to make the most productive use of the data.[245]

After the access and understanding, then the sharing economy provider and the market facilitator can come to mutually agreeable licensing terms, which provide benefit to each. For example, the market facilitator could determine the likely number of negawatts a particular sharing economy provider could create at certain times, and the sharing economy provider can tell the market facilitator the price that would need to be paid to take the actions necessary to create the negawatts. This would also take Malgieri's perspective into account, as the sharing economy provider could have a commercial as well as societal benefit in sharing their actions.[246]

Lipton's concern that data useful to society may be locked away and only accessible through the payment of prohibitive fees[247] is something that is already occurring. Even where a right to access exists, some utilities or states require a fee payment, even when the data is only being requested by the individual sharing economy provider, not third parties. Other locations require payment for aggregated data to be accessed by third parties, even though this data is not granular enough for market facilitators to ensure they are contacting the correct sharing economy providers.[248]

244. *Id.*
245. *See id.*
246. *See* Malgieri, *supra* note 169, at 5.
247. *See* Lipton, *supra* note 146, at 137.
248. *See Data Access*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., https://database.aceee.org/state/data-access (last visited Jan. 15, 2019); Herman K. Trabish, *How utility data sharing is helping the New York REV build the grid of the future*, UTILITYDIVE (Feb. 8, 2017), https://www.utilitydive.com/news/how-utility-data-sharing-is-helping-the-new-york-rev-build-the-grid-of-the/434972/ ("[R]egulators could choose to allow utilities to require remuneration for a data analysis service that makes granular and

Lipton's argument that balancing is appropriate when determining access and ownership[249] would again point to fair use or highest and best use as the method that should be used.

In focusing on Nimmer's analysis, an interesting point is made immediately—under most concepts of data as property or trade secrets, the information is protected because the commercial value derives from the data not being known or disclosed.[250] With electrical usage data, that is not the case, unless looked at from the utility's perspective. For a utility, if a market facilitator cannot help a sharing economy provider determine value, then that is a commercial benefit, as the sharing economy provider will continue to consume more electricity at times of the day when more load requires more infrastructure, leading to an increase in capital spend for the utility and, therefore, a higher profit. In the majority of cases, utilities are not utilizing the data—instead, they continue to only use it for the traditional uses of basic customer service and billing.[251] For these reasons, from the perspective of the sharing economy provider, the market facilitator, and society at large, the benefits accrue to the data being shared—not kept secret.

Cohen's arguments focus on the value choices that need to be made around data access and ownership[252]—and, indeed, those choices are being made now, but without significant input from others outside the utility industry. By adopting a framework that allows market facilitators access, at a minimum, to electricity usage data, we, as a society, are acknowledging that this data can have significant societal benefits. As those benefits, in some cases, go against the interest of the utilities who now collect and keep the data,[253] it will be necessary to make a value

customized 'value-added' data, like aggregated customer usage information, available to DER providers"); Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Case No. 14-M-0101, at 41 (N.Y. Pub. Serv. Comm. May 19, 2016), https://on.ny.gov/2ROH61T (market-based services that could generate revenues for utilities include "data analysis . . . platform access fees; optimization or scheduling services that add value to DER").

249. *See id.* at 165–70.

250. *See* NIMMER, *supra* note 181, § 17:18.

251. Bob Champagne, *Seven Things Utilities Should do with Smart Meter Intel (that most aren't)*, ELEC. LIGHT & POWER (June 12, 2018), https://bit.ly/2J9wPXu ("Most organizations are still limiting the use of this intelligence to basic customer service and billing functions, while missing valuable pockets of the business where far more significant savings could be harvested.").

252. *See generally* Cohen, *supra* note 162.

253. *See supra* notes 24–26 and accompanying text. Societal benefits include reduced grid infrastructure costs, reduced peak demand, load shifting, and greenhouse gas emissions. Utilities add grid infrastructure costs into their rate base, which, in turn, determines their profits; therefore, the more they can build, the greater their profit. Shifting demand and reducing peak demand decreases the amount of money that needs to be spent on grid infrastructure, both on generation and on transmission and distribution. The

choice about how much we want those benefits to accrue to society and the greater electrical grid, and develop a framework that allows market facilitators to enable those societal benefits to occur.

B. How could legislators and regulators adopt that framework?

If we, as a society, are to embrace the highest and best use of electricity usage data to enable behavioral change and societal good maintaining reasonable privacy rights, states, at a minimum, need to enact regulations to enable market facilitator access to this data.[254] However, to achieve this goal, the access cannot be to electricity usage data in the aggregate—that does not provide market facilitators with what they need to animate the market. To animate the market, market facilitators need access to individual, identifiable records.

One way to manage this with the concern around privacy is to allow for an opt-out. This would address the various subsets of privacy concerns—that others might profit from one's personal data, that it is personal, that it could lead to price discrimination or invasive marketing, or just that someone is uninterested in helping the country move to a more efficient grid. And opt-out—rather than an opt-in—would allow those sharing economy providers who do not want to participate in the market to remove themselves and maintain their electricity usage data as private.[255] (It would still be available in non-identifiable, aggregate form for research and grid planning purposes, as it is today to utilities.) Given shifting privacy concerns around sharing all sorts of data, the amount of the population wishing to opt-out will likely decrease over time.[256] Having an opt-out, rather than an opt-in, has been used with electricity usage data before—everyone with a smart meter in BGE's territory is opted-in to their

generation assets which meet peak demand are typically those that are least efficient and most polluting; therefore, decreasing peak demand and load shifting to times of high renewable generation also decreases greenhouse gas generation. *See supra* Section I.A.

254. It is interesting to note that this discussion is not only happening in the United States, but other countries with smart meter rollouts as well. Australia, now a leader in energy regulation, is also struggling with data access, how that data can be monetized, and how incumbent utilities are attempting to stifle competition through preventing access to smart meter data. Sangeetha Chandrashekeran et al., *Smart electricity meters are here, but more is needed to make them useful to customers*, THE CONVERSATION (Feb. 26, 2018, 2:14 PM), http://bit.ly/2PBwOlP.

255. One group that historically has been interested in keeping their electricity usage data private is marijuana grow operations in states which have not legalized the practice. It is much easier to identify a grow operation using electricity usage data provided by smart meters than a traditional, once-per-month read. *See* Forum Discussion, *Cops use smart meter technology to bust*, ROLLITUP.ORG (Aug. 28, 2012), https://www.rollitup.org/t/cops-use-smart-meter-technology-to-bust.557758/.

256. Brian Bowen, *How Utilities Can Meet Millennials' Needs in a Data-Sharing Economy*, GREENTECH MEDIA (Nov. 9, 2017), http://bit.ly/2FstdBK.

behavioral demand response program, but individuals can choose to opt-out of the program. Legislators and regulators could, therefore, adopt an opt-out program of a right to access data for energy sharing providers and market facilitators. To ensure that everyone who wanted to opt-out could, regulators and legislators could also require opt-out through multiple channels—by phone call, with a bill insert, on a website and through an app.[257] An opt-out right of access also conforms to Malgieri's view that "absolute dominion is inappropriate for the information economy."[258]

Utilities—understanding that third parties may better understand what customers want and how to provide it for them—may be loath to provide data unless statutorily or regulatorily required to do so. Therefore, voluntary programs will be insufficient. Like medical records, states could develop databases to promote efficiency in the market, and ensure that demand response was being offered to those who had not opted-out and who could save the most money by being sharing economy providers, assuming they wanted to do so.

The opt-out is needed for another reason. Even if they are not averse to a program, few take the time to opt-in—as noted by the relatively low percentage of accounts that currently participate in utility demand response programs at around five percent.[259]

Rather than waiting and having policies develop piecemeal, PUCs should take action to promote consistency in data-sharing policies regarding usage and systems data. This will enable third party aggregators and others to flourish, providing products and services that benefit consumers, the grid, and the environment.

VI. CONCLUSION

Customers should be able to take advantage of their data, and legislators and regulators should be focused on ensuring that technologies that could be disruptive (in a good way) to the traditional utility model by allowing customers to use less electricity when they want to and control their energy use[260] are implemented efficiently and effectively. The utility industry has "more unused data at its disposal than any other industry."[261] And the amount available will only increase—ten large utilities are

257. The opt-out feature should be available to every customer, whether they pay the electric bill directly or not. While this may be more challenging for utilities to enable for customers of sub-metered accounts or those within assistance programs who do not pay their bill directly, if the data can be traced back to a particular residence, then those customers should be able to make the choice individually, and sufficient outreach should be mandatory to ensure that they know of and understand the choices available to them.

258. *See* Malgieri, *supra* note 169, at 12.

259. *See* St. John, *Inside Story on Baltimore*, *supra* note 77.

260. *See* Pyper, *Some New Ideas*, *supra* note 84.

261. *See* Tuck, *supra* note 23.

expected to undertake new meter deployments between now and 2020, in addition to the half of the country that already has smart meters.[262] This data can be the basis for the energy sharing economy, with sharing economy providers, market participants, and society as a whole benefiting from a framework that provides for the highest and best use of the data utilizing an opt-out method of privacy protection. Given how infrequently most customers think—and how few customers care—about their energy data, the overall societal good, both economic and environmental, from harnessing this data counsels for an opt-out program. Adequately balancing property and privacy, this framework would allow the energy sharing economy to thrive for as long as markets adequately value the shared action.

262. Stephen Lacey, *Here's a Forecast for Every Major Distributed Energy Technology*, GREENTECH MEDIA SQUARED (Feb. 2, 2018), http://bit.ly/2Q0G1mV ("In the U.S., where more than half the country's households have smart meters, activity will pick back up through 2020 as roughly 10 large utilities execute new meter deployments.").