BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION 

Pennsylvania Public Utility Commission  :  R-2016-2537349 

v.  

Metropolitan Edison Company  :  

ENVIRONMENTAL DEFENSE FUND &  
CITIZENS FOR PENNSYLVANIA’S FUTURE  

DIRECT TESTIMONY OF MICHAEL MURRAY  

DATE: JULY 21, 2016
I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.
A. My name is Michael Murray. I am a Chief Technology Strategist with the Mission:Data Coalition. My business address is 1020 16th Street, Suite 20, Sacramento, California 95814.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND YOUR RELEVANT PROFESSIONAL EXPERIENCE.
A. I received my B.A. from Bachelor of Arts with highest honors in Environmental Studies, Oberlin College, Oberlin, OH (2004), and I am a member of Phi Beta Kappa.

From 2004 to 2014, I co-founded Lucid, which offers cloud-based energy efficiency software products for commercial buildings to connect building automation systems, lighting controls, inverters and submeters into an online platform to better enable energy conservation. The company currently has approximately 60 employees and its customers include Google, Yahoo!, Starbucks, Fidelity Investments, and all eight Ivy League universities.

From December, 2013 through the present, I co-founded Mission:Data, a non-profit coalition of 40 companies (representing nearly $1 billion/year in energy management) to support electricity consumers’ access to data from smart meters, thereby enabling data-driven energy efficiency measures and dramatically reducing transaction costs (www.missiondata.org).

Q. ON WHOMSE BEHALF ARE YOU FILING THIS DIRECT TESTIMONY?
A. I am filing this direct testimony on behalf of the Environmental Defense Fund (“EDF”) and Citizens for Pennsylvania’s Future (“PennFuture”), intervenors in this case.
Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. I recommend that the Commission order Metropolitan Edison Company ("Met-Ed") as part of its advanced metering infrastructure ("AMI") deployment to embrace customer and authorized third party access to smart meter data for energy management services so customers can receive the significant energy savings made possible by advanced metering technology.

Q. ARE YOU FAMILIAR WITH THE COMMISSION'S RECENT ORDER ON THIRD-PARTY ACCESS TO ENERGY USAGE INFORMATION?

A. Yes. The Commission addressed this issue in Docket No. M-2009-2092655. The purpose of this docket was to develop a process for certain third parties to access customer usage data. I participated in this proceeding and filed comments on behalf of Mission:data. On June 30, 2016, the Commission issued a final order approving a process for third parties including electric generation suppliers (EGSs) and conservation service providers (CSPs) under contract to the utility to access energy usage data through the utilities’ web portals.

The Commission further stated:

The Respondents recommend that the Commission determine a process or pathway by which they could be granted, with customer authorization, access to the web portals. At this time, the Commission does not have enough information in order to implement such a request. Furthermore, we do not believe this proceeding to be the appropriate one for determining the manner in which a third party, with a customer’s consent, may utilize other avenues to access that customer’s data. As stated in our Sept. 15 Final Order, we reserve the right to revisit third party access at a future point in time.\(^1\) Additionally, as noted in our Sept. 2015 Final Order, third parties currently may access customer data through customer portals and/or

\(^1\) *Id.*
through their own equipment, so long as they have obtained customer consent.²

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

Mission: data recommends several low-costs steps to ensure that electricity customers have access to new data-enabled technologies and services to help them save energy and money, and otherwise realize value from the state’s advanced metering infrastructure deployments:

1. To promote open markets for consumer-side services such as advanced energy management, the Commission should require Met-Ed to provide customers easy access to the best available information about their energy use (including both “backhaul” information through the utility website and real-time information directly from the home/premise area network (“HAN”) radios typically found in advanced meters) and the ability to easily share that data with energy management service providers of their choice. This data should be provided in the best available granularity to support innovative new services (including machine-readable formats that are consistent nationwide and consistent with industry best practices) and without charge, as a component of basic utility service. Backhauling data should follow the best practices of Green Button Connect, a technical standard maintained by the North American Energy Standards Board and also referred to by its technical name, the Energy Services Provider Interface (ESPI). Met-Ed should provide binding cost estimates for implementing Green Button Connect, by doing the IT work to install this software functionality with internal staff and/or by licensing the technology from vendors. The HAN radios should be immediately enabled as meters are deployed so that customers will have real-time access

² Id.
to their energy usage data. The HAN radios installed should allow customers to easily connect any Zigbee-compliant device on a self-service website. Testing and certification of Zigbee devices should be inexpensive and standardized state-wide.

Illinois is considering an Open Data Access Framework intended to provide clear rules on enabling customers to conveniently obtain access to their usage data in an electronic format, using national standards, proposed by leaders in the consumer and environmental community. Mission:data supports this framework and urges the Commission to adopt it as a framework in Pennsylvania.

2. **Provide customers and authorized third parties with access to billing history and tariff data in an electronic format.** Access to tariff and bill data is important so that services can provide information to consumers on the exact bill impacts of their energy decisions. Consumers often about dollars, not kilowatt-hours. Tariffs and customer bills should be published in standardized, machine-readable forms. Giving third parties access to tariffs in a machine-readable format is important because it takes human beings out of the cost-calculation process and lets software do the work, regardless of how complex tariffs may be. Commissions should publish approved tariffs in a standardized XML format.³ Separately, historical bills should also be available for download in a standardized XML format, with third party access to whomever the customer authorizes.

I recommend that Met Ed develop a process, to be approved by the Commission, in which third parties could be granted, with customer authorization, access to a machine-to-machine interface.

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³ The same group that developed the ESPI standard, the UCA-IUG OpenADE Task Force, has developed an extension to ESPI that uses a standardized XML schema for tariffs: [https://github.com/energyos/OpenESPI-GreenbuttonDataSDK/tree/master/Greenbutton/Tariff](https://github.com/energyos/OpenESPI-GreenbuttonDataSDK/tree/master/Greenbutton/Tariff)
3. **Third party-led authorization processes should be allowed.** For customers with access to an online utility account, authorizing a third party to access his or her usage data should be easy and seamless. But as for the large number of consumers and businesses nationwide who do not have, or do not want, an online account, the friction associated with creating such an account is not trivial. One solution is for the Commission to require utilities to accept a third party-submitted form requesting access to usage data. That form does not have to be on paper, but can be electronic on a website or submitted automatically. With a paper form or website, the third party collects the customer account number and/or service address and submits this information (sometimes with a customer signature) to the utility as proof of the customer’s authorization. This “third party-led” process is placed in contrast with a customer-led authorization that requires the customer to interact directly with the utility, a process customers often find to be fraught with complexity. The third party-led process exists today albeit with paper forms, sometimes called customer information service requests (“CISR”) or letters of authorization (“LOA”).

4. **Met-Ed should have no liability for a third party’s breach of customer privacy.** Simply put, only a third party should be liable for acts committed by the third party. So long as Met-Ed has fulfilled certain obligations, it should not bear any responsibility for privacy breaches committed by third parties. The utility’s obligations include (i) receiving valid customer authorization to share energy data and (ii) sharing such data securely with the designated third party (using modern encryption such as Transport Layer Security, or TLS). Failure on the part of regulators to make explicit a utility’s

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limited liability will result in utilities policing third parties to avoid potential liabilities
and inevitably lead to significant delays in consumers making effective use of their data.

5. **If the Commission finds that a third party has engaged in a “pattern or practice” of**
**misusing customer data in violation of state or federal law, the Commission should**
**order Met-Ed to cease providing energy data to that party.** The question of
commission jurisdiction over non-EGS and non-CSP third parties arises frequently in the
context of privacy violations. What can a utility regulator do when a third party not
subject to commission jurisdiction breaches customer privacy? The simplest answer is:
order the utility to terminate data-sharing with the entity in question. Termination will not
prevent future breaches of usage data already transmitted, but it will prevent ongoing data
transfers from being put at risk. Termination will also effectively ban the third party from
operating in the state. The customer will have remedies against the third party under state
and federal law. In such cases, it is important to remember that third parties should be
entitled to due process before the Commission before data access is revoked.⁵

II. **BACKGROUND OF THE MISSION:DATA COALITION**

**Q. WHAT IS THE MISSION:DATA COALITION?**

A. The Mission:Data Coalition is national coalition of more than 35 technology companies
delivering consumer-focused, data-enabled energy savings for homes and businesses. Our
members – with sales in excess of $1 billion per year – have developed innovative
services leveraging smart meter and utility bill data that benefit consumers’ pocketbooks.
Our companies are focused on bringing energy efficiency solutions to a national market
and we encourage commissions to leverage this market-based innovation.

http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K191/77191989.PDF
To realize that objective, it is vital that we empower consumers with convenient access to their own energy data in a consistent manner from state to state. Mission: data works with industry and policymakers to advance customers’ ability to quickly and conveniently share their meter data with energy management companies of their choice. More information about Mission: data is available on our website at http://www.missiondata.org/.

The exciting new industry our companies represent is based on: (1) advances in computational capability and (2) the availability of personalized data that did not exist a decade ago. In energy efficiency, one fundamental problem has been the cost associated with simply evaluating how much a home or building is wasting energy and identifying the most cost-effective steps needed to reduce that waste. In the industrial and large commercial sectors, the amounts of energy consumed are large enough to justify significant investments in customer-owned submeters and IT systems to analyze energy use, even though those investments are often unnecessary in theory because the utility’s advanced meters collect the same information. In the residential sector, the loads are much smaller and diverse, meaning that efficiency solutions that depend on usage data have been severely limited to date because a multi-hundred-dollar cost in metering equipment, communications systems and installation is necessary at each home.

The real game changer in the residential sector is been the availability of ongoing energy usage information made available by AMI. Energy use varies greatly across households. The detailed understanding of each home’s energy use enabled by AMI opens the door to highly effective strategies for managing energy use and helping
consumers save money – particularly those on time-varying rates where the time period
of the consumption has a significant impact on bills.

A vibrant, competitive marketplace is developing to take advantage of these
opportunities. The key enabler is consumer access to their own usage data and the ability
to share that data with energy management providers, also known as “third parties,” of
their choice. Four states (Texas, New York, Illinois and California), representing a total
market of approximately 25 million data-enabled advanced meters, are on the forefront of
this development. While the results of data enablement are just beginning to come in,
they are impressive. Data-driven energy savings generated by our members are saving
consumers between 8% and 15% of their energy and reducing utility bills by up to $20
per month or more.

In many of these cases, harnessing competitive market forces has made our
member companies’ energy savings much more cost-effective than traditional energy
efficiency programs. In one case involving analytical software and weekly energy
reports in California, the energy savings achieved was comparable to a traditional
efficiency program but only 1/20th of the cost.

Q. HAS MISSION:DATA HELPED DEVELOP DATA ACCESS POLICIES IN
OTHER STATES?

A. Yes. Mission:data has filed comments or otherwise provided information for data access
proceedings in the following states: Arizona, California, Colorado, Illinois, Indiana,
Massachusetts, Michigan, Minnesota, New York, North Carolina, Pennsylvania, Texas
and Washington, D.C. Copies of our comments or other filings are available at the
“Activities” tab on our website at www.missiondata.org.
Q. HOW DOES MISSION:DATA'S PERSPECTIVE COMPARE WITH THE ROLE OF OTHER PARTIES IN DATA ACCESS PROCEEDINGS?

A. Mission:Data's perspective is different from other parties in data access proceedings. The utility typically will install advanced meters but does not always take the steps needed to provide timely energy usage data to customers; utilities are, understandably, so focused on AMI rollout matters that thoughtful consideration of how consumers will use their AMI data with new technologies such as smartphone apps may receive less attention. Consumer advocates may not be familiar with best practices nationally to provide usage data to customers to enable them to save energy, nor may they know about recent technological innovations such as inexpensive cloud computing and predictive analytics that can now be applied to customer energy data. In states with retail competition, retail electric service providers usually focus on getting access to energy usage data from the utility for themselves, but not for the customer. Mission:Data's perspective is different from these other parties because we focus on getting the customer access to timely energy usage data in a user-friendly way to help customers reduce their energy usage.

Q. HAS MISSION:DATA DONE ANY STUDIES OR REPORTS ON DATA ACCESS PRACTICES IN OTHER STATES?

A. Yes. In December 2015, Mission:Data release a report entitled *The EmPowered Consumer: How Consumer Access to Energy Data can Help Solve our Biggest Energy Challenge*. This is a case report highlighting the leadership of three states – Texas, Illinois and California – in ensuring that consumers reap the benefits of advanced meter deployments.
Earlier this year, Mission:Data also collaborated with More Than Smart in preparing *Got Data? The Value of Energy Data Access to Consumers*, which is a policy manual covering model regulatory approaches and best practices to animate market-based solutions and enable consumers to reduce their utility bills.

### III. REAL-TIME DATA ACCESS

**Q. WHAT METHODS CAN A UTILITY USE TO GIVE CUSTOMERS ACCESS TO THEIR ENERGY USAGE DATA FROM SMART METERS?**

**A.** There are two distinct interfaces by which utilities can provide customer energy usage data to customers for their own use:

1. Historic interval data (typically collected through the meter and conveyed through the utility’s fixed network) made available to customers or authorized third parties typically on a next-day basis by providing an automatic file transfer. Preferably, this data is formatted and transmitted according to a national standard such as “Green Button Connect My Data,” also known by its technical name, the Energy Services Provider Interface (“ESPI”) or the North American Energy Standard Board’s REQ21. A principal advantage of ESPI is that consumers can authorize third parties to automatically receive consumption data without having to purchase equipment.

2. Real-time data provided through the HAN radio contained in the advanced meter and provided directly to a device owned by the consumer, typically a gateway or other HAN device capable of receiving the signal from the meter. Real-time data access can unlock a host of new applications and services, but only if the utility enables the HAN radio on the advanced meter and makes it easy for a customer to pair their HAN device with his or her specific meter.
Q. DO YOU HAVE AN OPINION AS TO WHETHER CUSTOMERS' OWN USAGE DATA SHOULD BE PROVIDED TO THEM AS A COMPONENT OF BASIC UTILITY SERVICE?

A. Yes. Mission:Data strongly believes that a customer's own usage and billing data should be provided to that customer as part of basic utility service, without charge. A large part of the total value proposition of AMI – perhaps 40% of its total benefits -- represents consumer value from demand-side savings. The IT improvements needed to provide customers access to their data represent a small fraction of the total cost of an AMI deployment.

Charging consumers or third parties for access to data when ratepayers have already shouldered the cost of AMI will deter and discourage consumers from adopting data-enabled technologies that save energy and money -- essentially reintroducing costs and frictions that AMI technology is supposed to eliminate. It would also put third parties at a distinct market disadvantage compared to utility-provided offerings. States like California, Colorado, Illinois, New York and Texas require that usage information be provided to the customer or authorized third parties without charge.

The decision as to the granularity of data to be provided as basic utility service is critical to market animation and enabling the development and scale of very inexpensive energy management services for consumers. Mission:Data observes that Texas requires 15-minute meter intervals. As more granular data becomes available (such as 5-minute or 1-minute) it should also be made available to consumers without charge. There are several important considerations in establishing a required interval. First, the interval should enable a third party to reconstruct the customer bill. Second, it should match the
interval required to settle demand response transactions. Finally, it should be at least as granular as the interval used for demand charges. For example, if demand charges are based on 15-minute interval usage, interval data provided through the meter should be at least as granular as 15 minutes so that consumers can access affordable products to avoid or reduce demand charges.

An additional consideration is that the granularity provided should support techniques such as disaggregation – the use of algorithms to determine what specific devices in the home or building are being used. Disaggregation represents a key tool in supporting more powerful energy savings. Hourly data supports only the most basic disaggregation, whereas shorter intervals enable disaggregation of more appliances and at greater detail. 

Q. DO YOU HAVE AN OPINION AS TO WHETHER CUSTOMERS SHOULD RECEIVE REAL-TIME ACCESS TO DETAILED ENERGY USAGE DATA?

A. Yes. Customers should receive this information because they can use it to significantly reduce their energy usage. Neither utilities serving regional markets nor the firms administering traditional programs are likely to have the skills or the capital necessary to create the next generation of technology-enabled services on smartphones and the internet today – particularly as technology changes so rapidly over time. Customers have extremely high expectations in 2016: they expect seamless services, push notifications on their smartphones and an effortless interaction with service providers online such as banks and fitness trackers. Bringing similar experiences to the energy market will only occur at the pace it is needed by private sector technology companies operating across a

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http://web.stanford.edu/group/peecc/cgi-bin/docs/research/research/disaggregation-armel.pdf
national market. Companies providing innovative efficiency services can only operate in
a national market if the technological and policy environment is consistent amongst the
states and the utilities.

The exciting trend – made possible by ever cheaper computing power and
individual consumption data in standard electronic formats – is the development of
customer energy efficiency products and services that are specifically tailored to their
own energy use patterns and development of individual strategies.

These tailored offerings can be more effective than conventional efficiency
programs and produce greater energy savings. For example, customized energy audits
that address a customer’s specific energy use can be prepared without a visit to the
customer’s home. Audits used to cost hundreds of dollars with an on-site home visit but
now can be performed for a tenth of that cost, or less. Also, comparative benchmarking
can be performed to compare the energy use of the customer’s appliances against normal
energy use for the same appliances using statistical disaggregation and machine-learning
techniques.

Providing highly granular real-time usage data also enables: (a) diagnosis of large
energy loads in real time, by letting the customer turn off certain appliances and
immediately see their impact; (b) rapid and immediate verification of load reduction,
which is required for rapid demand response; and (c) disaggregation (or non-intrusive
load monitoring), which is the use of algorithms to differentiate energy loads without
measuring them directly and enable customers to understand how individual devices are
consuming energy. As previously discussed, disaggregation enables a virtual "itemized
bill" and the development of automated personalized recommendations and alerts, such
as “stove left on,” or “window AC unit left on with windows open.” Hourly interval data
can enable very basic disaggregation, but the most powerful disaggregation tools require
short-interval data.

Q. HAVE ANY STATES APPROVED GIVING CUSTOMERS ACCESS TO
ENERGY USAGE DATA IN THIS MANNER?

A. Yes. Regarding data access on a real-time basis from the HAN, Texas was the first state
to enable real-time access to data through the HAN\textsuperscript{7}, and California\textsuperscript{8} promulgated a HAN
implementation order in 2012 directing that the investor-owned utilities be capable of
supporting an unlimited number HAN deployments by January 1, 2015. Illinois is
moving forward with consideration of a comprehensive set of rules by which customers
can obtain access to their own usage data and share it with third parties of their choice --
the Open Data Access Framework -- and a related proceeding to simplify and standardize
the process under which consumers will provide informed consent to the sharing of their
data with third parties. Commonwealth Edison is already enabling use of the HAN radio
where it has deployed advanced meters.\textsuperscript{9} These states represent three of the largest four

\textsuperscript{7} Rulemaking Relating to Advanced Metering. Texas Public Utility Commission Project No. 31418 (Order) (May

\textsuperscript{8} Order Instituting Rulemaking to Consider Smart Grid Technologies Pursuant to Federal Legislation and on the
Commission’s own Motion to Actively Guide Policy in California’s Development of a Smart Grid System, California
Public Utility Commission Rulemaking No. 08-12-009 (Decision 11-07-056) (July 28, 2011), available at:
http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/140369.PDF

\textsuperscript{9} Investigation into the Customer Authorization Required for Access by Third Parties Other Than Retail Electric
Suppliers to Advanced Metering Infrastructure Interval Meter Data. Illinois Commerce Commission Case No. 15-
0073&docId=237768
states in energy consumption in the U.S.\textsuperscript{10} accounting for 25 million (or about 40\%) of
the 60 million smart meters that have been deployed in the U.S.

Q. **WHAT IS THE IMPACT OF GIVING CUSTOMERS TIMELY ACCESS TO
DETAILED USAGE DATA?**

A. Commercial and residential buildings make up approximately 41 percent of total energy
use in the U.S.\textsuperscript{11} - the single largest energy-consuming sector - and experts estimate that
20\% of this energy usage can be cost-effectively eliminated.\textsuperscript{12} In 2010, the American
Council for an Energy Efficient Economy's review of 36 studies concluded that timely
consumer access to granular energy data yielded household energy savings of between
4\% and 12\% or more.\textsuperscript{13} The larger savings enabled by granular, real-time data are an
order of magnitude larger than the savings that many customer engagement strategies are
attaining today. As new energy efficiency programs and services evolve and improve,
potential savings will increase. In our survey of more recent studies that followed the
ACEEE report, Mission: data found 12 studies in which the savings ranged from 8\% to
17\%.

It is important to note that even though real-time, highly granular data is most
powerful, backhauled data made available in intervals of between 15 minutes and 1 hour
is also proving to be very useful in saving energy. All three of California’s investor-

\textsuperscript{10} U.S. Energy Information Administration, State Energy Profiles, available at:

\textsuperscript{11} Energy Information Administration, U.S. Department of Energy, available at:
http://www.eia.gov/tools/faqs/faq.cfm?id=86&t=1

\textsuperscript{12} K. Carrie Armel, Abhay Gupta, et. al., *Is Disaggregation the Holy Grail of Energy Efficiency? The Case of Electricity*,

\textsuperscript{13} Karen Ehrhardt-Martinez, Kat Donnelly, et al. *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-
Review for Household Electricity-Saving Opportunities*, American Council for an Energy Efficient Economy (acce.org), Report
Number E105, June 2010, p. iii. The assumption is that actual savings across the entire population would be on the order of half
this amount, but these studies do not account for ongoing improvements in new energy management technologies
owned utilities have now activated consumer (and authorized third-party) access to
interval and real-time HAN usage data from their advanced meters.

Preliminary results from backhaul data are encouraging. For example, in
Alameda and Santa Clara Counties in California, the use of data-access functionality now
available has demonstrated significant household savings: a study in Alameda County
found electricity savings of 7.4% for electricity and 13% for natural gas and another in
Mountain View found 5.5% savings in electricity and 16.4% savings in gas – at a cost per
household a small fraction of the cost of traditional efficiency programs. In one
recently-implemented program in Livermore using Green Button Connect, consumer
utility bill savings are averaging about $20 per residential customer per month.

Moreover, these gains are extremely cost-effective because data analysis and presentation
inexpensively delivers an understanding of the individualized usage patterns of each
building, enabling strategies that specifically identify the most cost-effective
opportunities.

Q. **HOW WOULD PROVIDING REAL-TIME ENERGY USAGE DATA ALLOW
CUSTOMERS TO RECEIVE THE FULL BENEFITS OF SMART METERS?**

A. Customers pay for the full cost of smart meters in their rates, but they do not receive the
full benefits from smart meters unless they receive real-time energy usage data.

Approximately 40% of the total net benefits of AMI can be demand-side benefits for

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consumers. Customers need easy, real-time access to their energy usage data in order to get the full availability of these customized energy efficiency and demand response offerings. Furthermore, many AMI deployments across the country were predicated on the notion that customers would be “empowered” to use energy in the unique ways they wanted. It is difficult to see how customers could be empowered when an upgrade from a regular meter to a smart meter does not come with a tangible additional benefit for the user, such as the ability to use new data-driven services.

IV. INTERVAL DATA DELIVERED IN ELECTRONIC FORMAT (“GREEN BUTTON”)

Q. WHAT IS GREEN BUTTON?

A. Green Button is an industry-led standard, ratified by the North American Energy Standards Board (NAESB), for downloading and sharing customer usage and cost data. Green Button comes in a manual and an automated format – Green Button Download My Data and Green Button Connect My Data, respectively. Green Button uses common Internet web services methods and XML. More than 50 utilities nationwide have implemented Green Button "Download My Data." The automated version, called "Green Button Connect," has been deployed by investor owned utilities across the state of California and in Washington, D.C. and will be deployed by investor-owned utilities in Illinois. In New York, the commission recently required Con Ed to implement Green Button Connect with 5-minute intervals for commercial customers and 15-minute intervals for residential customers.

Q. PLEASE EXPLAIN THE DIFFERENCE BETWEEN GREEN BUTTON DOWNLOAD MY DATA AND GREEN BUTTON CONNECT MY DATA.

Green Button Download My Data allows customers to download their electricity usage information in an XML file. This data can be imported in third party software applications by manually uploading it. This is useful, but it requires customers to log into their utility’s website, download the Green Button XML file, and manually upload it. This is valuable for one-time uses, but is burdensome for ongoing data collection. The utility industry acknowledged that Download My Data would not be particularly useful.\textsuperscript{17} Most applications for energy efficiency require ongoing access; thus, “Download My Data” is considered very limited in terms of overall usefulness.

The real game changer, critical to enabling the kind of ongoing monitoring and control that consumers expect with apps, is Green Button Connect. The utility hosts an automated web service through which developers of energy management software can, with customer authorization, automatically retrieve and import meter data into their software. There is no need for the customer to repeatedly log in to their online utility account and download files every day. These authorizations are valid for an agreed upon time and can be revoked at any time by the consumer.

Q. **WHAT FORMAT SHOULD BE USED FOR CUSTOMER USAGE DATA?**

A. Green Button XML is formatted according to the NAESB Energy Services Provider Interface (ESPI) schema. Any implementation of Green Button should be compliant with the NAESB standard and documented best practices, and be subjected to annual independent certification by the Green Button Alliance. Non-compliant implementations should be promptly remedied, with fines or penalties imposed for prolonged non-compliance.

Q. IS GREEN BUTTON CONNECT MY DATA TOO COSTLY TO IMPLEMENT?
A. No. Commonwealth Edison ("ComEd") and PEPCO have licensed Green Button Connect technology from Schneider Electric, rather than build it with in-house information technology teams, saving considerable expense. Neither ComEd, Ameren nor PEPCO asked for cost recovery.

In addition to Schneider Electric, another utility vendor, Oracle, also offers Green Button Connect functionality for sale to its utility clients. Earlier this year, Public Service Company of Colorado, an Xcel subsidiary, documented that its cost to implement Green Button Connect across the state of Colorado was only $1.5 million to $2.0 million, or about $1.13 to $1.54 per customer.\(^{18}\) That is a one-time fee and included all aspects of Green Button Connect such as online registration and authentication of third parties.

Q. WHAT RECOMMENDATIONS DOES MISSION:DATA HAVE TO ENSURE CUSTOMER DATA PRIVACY?
A. Providing consumers access to their own individual usage information is consistent with the trend in privacy laws to give consumers more understand and control over the information collected about them. It is critical that consumers have confidence in the measures that utilities, their contractors or third parties take to protect their privacy and security.

Mission:Data urges the Commission to adopt similar approaches to protecting privacy while simultaneously empowering customers with access to their own information as has been adopted in other states like California, Colorado, Illinois or New York. With respect to enforcement, the Commission may wish to consider the approach

adopted by California which provides that any third party engaging in a “pattern and
practice” of violating privacy rules risks loss of its ability to access utility data by virtue
of the Commission’s oversight over utilities.

In California, an enforcement framework\textsuperscript{19} establishes that utilities and third
parties receiving data: (1) must provide consumers meaningful, clear, accurate, specific,
and comprehensive notice regarding the collection, storage, use, and disclosure of
individually identifiable energy usage information, (2) must disclose to consumers each
category of covered information collected, used, stored or disclosed by the covered
entity, and, the purposes for which it will be collected, stored, used, or disclosed, (3) must
provide to customers upon request access to their covered information, (4) may share,
with few exceptions, individually identifiable covered information only with customer
consent, or under a “chain of responsibility” approach whereby parties that receive
covered information may disclose such information without consent to another party only
for a primary purpose (e.g. grid operations) and only if the contract requires that party to
adopt restrictions no less restrictive than those adopted by the providing entity; and (5)
must ensure that the covered information they collect, store, use and disclose is
reasonably accurate and complete and use reasonable safeguards to protect it.

California’s rules do not regulate the consumer’s own decision as to with whom
to share data, and the rules do not hold the utility responsible for policing the acts of
entities who receive information. But the Commission holds a huge stick to ensure
compliance: the Commission can order utilities to terminate data sharing with third

\textsuperscript{19} California Public Utilities Commission (CPUC) Decision 11-07-056.
parties who the Commission has found exhibit a "pattern and practice" of violating
privacy rules.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.
VERIFICATION

I hereby verify under the penalties of perjury that the foregoing representations are true to the best of my knowledge, information and belief.

Signed: M & Murray    Dated: 7/14/2016

AFFIDAVIT

STATE OF WASHINGTON    )
COUNTY OF King     ) SS:

Michael Murray, being first duly sworn, deposes and says that he is Chief Technology Strategist and is testifying on behalf of the Environmental Defense Fund, an Intervenor in this proceeding; that as such he has executed the foregoing Verification and has authority to do so; that he has read said Verification and knows the contents thereof; and that the statements therein contained are true to the best of his knowledge, information and belief.

M & Murray

Subscribed and sworn to before me,
This 14th day of July, 2016.

Notary Public

My Commission Expires: 12-09-2019

My County of Residence: King County