BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of the Dayton Power and Light Company for Approval of its Plan to Modernize its Distribution Grid.	)))	Case No. 18-1875-EL-GRD
In the Matter of the Application of the Dayton Power and Light Company for Approval of a Limited Waiver of Ohio Adm. Code 4901:1-18-06(A)(2).	))))	Case No. 18-1876-EL-WVR
In the Matter of the Application of the Dayton Power and Light Company for Approval of Certain Accounting Methods.	)))	Case No. 18-1877-EL-AAM
In the Matter of the Application of the Dayton Power and Light Company for Administration of the Significantly Excessive Earnings Test Under R.C. 4928.143(F) and Ohio Adm. Code 4901:1-35-10 for 2018.	)))))	Case No. 19-1121-EL-UNC
In the Matter of the Application of the Dayton Power and Light Company for Administration of the Significantly Excessive Earnings Test Under R.C. 4928.143(F) and Ohio Adm. Code 4901:1-35-10 for 2019.	)))))	Case No. 20-1041-EL-UNC
In the Matter of the Application of The Dayton Power and Light Company for a Finding that its Current Electric Security Plan Passes the Significantly Excessive Earnings Test and the More Favorable in the Aggregate Test in R.C. 4928.143(E).	))))))	Case No. 20-680-EL-UNC

DIRECT TESTIMONY OF MICHAEL MURRAY
ON BEHALF OF MISSION:DATA COALITION

November 30, 2020

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

A. My name is Michael Murray. I am the President of Mission:data Coalition ("Mission:data"). My business address is 1752 NW Market Street #1513, Seattle, WA 98107.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND YOUR RELEVANT PROFESSIONAL EXPERIENCE.

A. I co-founded Mission:data in 2013 and have led our efforts to intervene at public utility commissions on issues of data access, data privacy, advanced meters and the benefits of electronic access to energy usage data. In 2013 I intervened at the California Public Utilities Commission to successfully institute the first state-wide implementation of Green Button Connect My Data among the state's electric investor-owned utilities. I have authored publications and presented at conferences on the value of "energy data portability," a term I define in greater detail below. In 2019, I published a report titled "Energy Data Portability," which discusses lessons learned from flawed exchanges of customer energy data. I have presented at dozens of conferences on state developments in energy data access, such as the National Association of Regulatory Utility Commissioners' summer and winter meetings. In 2012, I presented at the White House with former Secretary of Energy Steven Chu and former U.S. Chief Technology Officer Aneesh Chopra on Green Button.

I began my career in 2004 as co-founder and CEO of Lucid, an energy management software company for commercial buildings, where I grew the company from zero to 40 employees and raised $10 million in venture capital. Lucid offers a cloud-based service that analyzes real-time meter data from thousands of commercial buildings across North America to support energy efficiency. Lucid's customers include over 350 organizations, eight of the eight Ivy League universities and others. I hold two U.S. patents relating to energy data collection, sharing and analysis, #8,176,095 and #8,375,068. I earned a B.A. with highest honors from Oberlin College in 2004.

Q. HAVE YOU TESTIFIED BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO?

A. Yes. I testified in consolidated Case Nos. 17-0032-EL-AIR et al., involving Duke Energy Ohio's Energy Security Plan and distribution rate case applications. This testimony was on behalf of Environmental Defense Fund and Ohio Environmental Council.

Q. IN WHAT OTHER STATES HAVE YOU TESTIFIED BEFORE A PUBLIC UTILITY REGULATOR?

A. I have testified before the commissions of California, Colorado, Georgia, New York, New Hampshire, North Carolina, and Texas.

Q. ON WHOSE BEHALF ARE YOU FILING THIS TESTIMONY?

A. I am filing this testimony on behalf of Mission:data, an intervenor in this case.

Q. WHAT IS THE MISSION:DATA COALITION?

A. Mission:data Coalition is a national coalition of approximately 30 technology companies delivering data-enabled distributed energy resources ("DERs") for residential, commercial and industrial customers. Our members – with sales in excess of $1 billion per year – have developed innovative services leveraging meter data and utility bill data that help customers reduce their bills. Our companies are focused on bringing energy management solutions to a national market, and 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 energy-related data with energy management companies of their choice.

Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?

A. The purpose of my testimony is to support the Stipulation and Recommendation ("Stipulation") filed in this docket October 23, 2020 on behalf of Dayton Power and Light Company ("DP&L").

II. DISCUSSION

Q. WHY DO YOU SUPPORT THE STIPULATION IN THIS CASE?

A. I support the Stipulation's provisions concerning data portability for several reasons. First, the Stipulation provides significant opportunities for customers to more economically manage their monthly utility bills. Second, the data portability provisions

are consistent with nationally-recognized standards and best practices, and they align with Ohio statutes and the Commission's objectives for grid modernization. Third, the Stipulation provides important opportunities for Commission oversight to ensure that customers derive the maximum value from investments in advanced metering infrastructure ("AMI") and related information technology ("IT") systems. For these reasons, I believe the Stipulation benefits DP&L ratepayers and the public interest and should be adopted.

A. BACKGROUND ON DATA PORTABILITY

Q. WHAT IS DATA PORTABILITY?

A. Data portability refers to the ability of a consumer to seamlessly move or "port" his or her data held by one corporation to another service provider. The driver behind data portability is twofold: a desire to encourage competitive markets by using the internet, and to prevent formation of "data monopolies" in the information economy. Whereas the phrase "data access" pertains to a customer obtaining his or her own information from a utility – such as through a utility's web portal – portability refers to the *direct* transfer of customer-specific data from the utility to a third party directly, without passing through the hands of the customer. The transfer of customer data is initiated upon the consent of the customer.

Q. IN WHAT SECTORS IS DATA PORTABILITY BEING ADOPTED?

A. Data portability is being adopted in the U.S. and around the world in sectors including banking, healthcare, social media and energy. In the U.S., several federal and state laws promote data portability. For example, in banking, the Gramm-Leach-Bliley Act promotes the sharing of personal financial information among banks upon the request of a customer. In healthcare, the Health Insurance Portability and Accountability Act similarly enables the sharing of medical information between healthcare providers and insurance companies. In social media, the Data Transfer Project is an initiative led by Google, Facebook, Microsoft, Twitter and Apple to allow individuals to move their online data between different platforms, without the need for users to download and re-upload data. In addition, several bills are being discussed on Capitol Hill that would enhance data portability, such as the Augmenting Compatibility and Competition by Enabling Service Switching (ACCESS) Act[1] and the Access to Consumer Energy Information Act (E-Access).[2]

In the utility sector, energy data portability has been mandated in five (5) states: California, Colorado, Illinois, New York and Texas. It is enabled by Green Button Connect My Data and the Home Area Network, which I describe below.

[1] *Augmenting Compatibility and Competition by Enabling Service Switching (ACCESS) Act*, S. 3456, 116th Congress, 2d Session (2020).

[2] *Access to Consumer Energy Information Act (E-Access)*, H.R. 5796, 116th Congress, 2d Session (2020).

Q. WHAT IS GREEN BUTTON CONNECT MY DATA?

A. Green Button Connect My Data ("GBC") is a technical standard, ratified by the ANSI-accredited North American Energy Standards Board ("NAESB"), for sharing customer usage, cost, and other related data. The standard was developed by the National Institute of Standards and Technology ("NIST"), the Smart Grid Interoperability Panel and industry over several years. GBC has its roots in the American Recovery and Reinvestment Act of 2009, which directed the Federal Communications Commission to develop a national broadband plan to include digital strategies for "energy independence and efficiency." Goal #6 of the National Broadband Plan states, "To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption."[3]

With GBC, a utility provides an application programming interface ("API") for machine-to-machine communication that third party developers of energy management software can, with customer authorization, automatically and securely retrieve energy data. These authorizations are valid for an agreed upon time and can be revoked at any time by the consumer. The data received can then be accessed and analyzed by the third party, using web-based software tools or mobile device applications.

Q. WHERE HAS GREEN BUTTON CONNECT MY DATA BEEN IMPLEMENTED?

A. GBC has been deployed by numerous investor-owned utilities, both gas and electric. California's electric investor-owned utilities; Commonwealth Edison and

[3] Federal Communications Commission (2010). "Connecting America: The National Broadband Plan," p. xiv-xv. https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf.

Ameren in Illinois; Pepco in Washington, D.C.; Consolidated Edison (both gas and electric) in New York; and the Texas utilities in the Electric Reliability Council of Texas ("ERCOT") market have all implemented GBC. GBC deployments are underway at other utilities in Colorado, Michigan and New York. Of the approximately 90 million electric smart meters in the U.S., over 36 million currently have, or will soon have, portable data via the GBC standard.

Q. HOW IS GREEN BUTTON CONNECT MY DATA DIFFERENT FROM ELECTRONIC DATA INTERCHANGE?

A. Electronic Data Interchange ("EDI") is the long-standing method by which competitive retail energy suppliers ("CRES providers") access their customers' energy usage data and transact certain billing-related functions, such as adding or dropping customers, communicating move-outs, etc. EDI is only usable by licensed CRES providers. GBC, in contrast, is a standardized method for exchanging energy-related information with any customer-authorized third party. GBC does not facilitate billing functions such as adding or dropping customers.

While there are some small areas of overlap between EDI and GBC – namely, they can both be used to transfer customer energy usage data – it is important to recognize that one cannot be substituted for the other. In other words, they are not duplicative investments. For example, it would be inappropriate for non-licensed entities to use EDI to change a customer's supplier relationship.

Q. WHAT IS THE HOME AREA NETWORK?

A. The Home Area Network ("HAN") is a common feature of advanced meters that allows customers to wirelessly and securely connect devices to their meter and receive real-time energy usage information. Customers could use this capability to diagnose high-use devices or appliances in their home or business; they could use smartphone "apps" to help reduce consumption during peak periods on time-of-use rates; or they could use smart devices in their house – such as the "Internet of Things" – to automatically measure and control individual devices.

B. DATA PORTABILITY WILL HELP CUSTOMERS MANAGE THEIR UTILITY BILLS

Q. WHAT PROVISIONS OF THE STIPULATION WILL HELP CUSTOMERS MANAGE THEIR UTILITY BILLS?

A. Sections 11(b) and 11(d) of the Stipulation require DP&L to provide GBC and offer HAN compatibility, respectively. These are the primary methods by which customers can directly benefit from smart meters in terms of energy savings by leveraging the competitive market of energy management providers.

Q. WHAT ENERGY OR COST SAVINGS SHOULD BE EXPECTED?

A. It is difficult to predict energy savings that result from GBC and HAN because GBC and HAN are enablers of energy savings. In other words, customers that use GBC or HAN will be empowered to tap into the competitive market of businesses positioned

to help them manage their monthly bills through products or services. The actual cost savings realized over time is dependent upon customer utilization rates, the types of offerings available in Ohio, and other factors such as the prevalence of time-of-use pricing. Nevertheless, I note that substantial energy savings are possible. In a 2016 report I co-authored, we reported that 12 studies from 2011-2015 found 6% to 18% energy savings were possible if customers were exposed to various forms of information feedback about their energy usage.[4]

Q. CAN GREEN BUTTON CONNECT MY DATA AND HOME AREA NETWORK CAPABILITIES PROVIDE OTHER BENEFITS BESIDES ENERGY OR COST SAVINGS?

A. Yes. Once these tools are in place, they will promote innovation in the competitive market to provide services that use energy data to satisfy a range of customer needs and preferences. For example, customers who choose to share energy usage data with CRES providers through GBC may be able to receive unique offers that use customer data as a basis for providing individualized fixed rates or other contracts. A customer could likewise get tailored estimates of how energy technologies such as behind-the-meter solar or storage might impact their monthly bills.

[4] *Got Data? The Value of Energy Data Access to Consumers*. Michael Murray and Jim Hawley. January, 2016. Available at http://www.missiondata.io/s/Got-Data-value-of-energy-data-access-to-consumers.pdf.

Q. WHAT IS THE DIFFERENCE BETWEEN CUSTOMERS HAVING ACCESS TO THEIR OWN INFORMATION AND DELEGATING ACCESS TO THIRD PARTIES?

A. This is a critical distinction to realizing customer benefits. Section 11(a) of the Stipulation ensures that customers have direct access to their own historical usage and billing information. Such direct access is both necessary and appropriate for obvious reasons – for example, a customer might want to inspect their billing history, view or download their interval energy usage data, or assess energy usage trends before and after efficiency improvements have been made. Since customers are paying for AMI, it is obvious that they should have direct access to information about them held by DP&L.

However, a customer's direct access to his or her own data is insufficient for AMI to reach its full potential and deliver maximum benefits to ratepayers. This is because the typical residential customer is not an energy analysis expert; merely having access to detailed interval usage data – even in a downloadable spreadsheet form – does not translate into energy savings. Customers need their energy usage information to be analyzed and synthesized with information about their home or building in order to be actionable. It is very similar to receiving results from a blood test: While it is helpful for individuals to receive their own results from a laboratory, the individual relies on a doctor to interpret the information for them. Thus, patients should be able to easily direct the testing laboratory to securely send their test results to their doctor for interpretation. The provisions of Section 11(b) ensure that customers will have the ability to securely delegate access to a third party service provider of their choice, using the GBC standard, at no additional charge. Similarly, Section 11(d) ensures that customers will

be able to connect their own HAN device to their meter and access energy management software applications of their choosing.

Q. WHAT ARE THE LESSONS LEARNED FROM OTHER JURISDICTIONS PERTAINING TO CUSTOMER BENEFITS OF ADVANCED METERING?

A. A major lesson from prior state deployments of AMI is that full realization of consumer benefits from energy management or other innovative uses of detailed energy data will not occur unless consumers have the ability to easily share that energy data with third parties in the competitive marketplace. It is also critical that such policies are timely and consistently implemented. For example, in California, energy data portability was only established many years *after* AMI deployment. Southern California Edison ("SCE") submitted its application for AMI to the California commission in 2007, but it was not until 2016 that GBC was implemented. In 2007, SCE estimated that consumer benefits of AMI would total $816 million, or about $160 per customer. However, it took many years for energy-savings benefits to materialize because the California commission did not ensure that data portability was established up front. The Stipulation addresses this lesson learned by requiring GBC and HAN offerings as part of AMI deployment.

C. THE STIPULATION'S DATA PORTABILITY PROVISIONS ARE CONSISTENT WITH NATIONALLY-RECOGNIZED STANDARDS AND BEST PRACTICES

Q. WHAT NATIONALLY-RECOGNIZED STANDARDS AND BEST PRACTICES ARE PERTINENT TO ENERGY DATA PORTABILITY?

A. In my experience, there are several standards and best practices that are critical to customers realizing the benefits of advanced metering. The first is adherence to the GBC standard. Many utilities outside of Ohio have claimed they support the Green Button standard when, in fact, they do not. The result is that energy software applications cannot work across utilities due to each utility's technical idiosyncrasies, reducing choices available to Ohio ratepayers. Sections 11(b)(i) and (ii) of the Stipulation address this problem by requiring testing and certification of DP&L's GBC implementation by an independent entity according to the latest version of the standard.

The other best practices from across the country that are incorporated into the Stipulation include: (1) providing a complete data set (Section 11(b)(iii)); (2) providing publicly-available technical documentation to third parties for registering and troubleshooting (Section 11(b)(v)); (3) meeting certain performance requirements, such as 99% uptime (Section 11(b)(vi)); (6) providing a streamlined customer experience for granting a data-sharing authorization on websites or mobile devices (Section 11(b)(vii)); and (7) ensuring certain customer protections, such as informed consent and annual notices (Section 11(b)(vii)(1) and (2)). In my experience, ignoring these items in other jurisdictions has proven to lead to poor quality GBC deployments and low utilization rates.

Q. HOW DO THE STIPULATION'S DATA PORTABILITY PROVISIONS ALIGN WITH OHIO STATUTES AND THE COMMISSION'S GRID MODERNIZATION OBJECTIVES?

A. In 2019, the Ohio legislature updated state policy codified in R.C. 4928.02 to require the Commission to "(O) Encourage cost-effective, timely, and efficient access to and sharing of customer usage data with customers and competitive suppliers to promote customer choice and grid modernization" and "(P) Ensure that a customer's data is provided in a standard format and provided to third parties in as close to real time as is economically justifiable in order to spur economic investment and improve the energy options of individual customers." Section 11(b) of the Stipulation is clearly consistent with the plain language of these provisions of state policy.

Furthermore, the Commission's August, 2018 report, "PowerForward: A Roadmap to Ohio's Electricity Future" (the "Roadmap"), made the following declarations:

> …standardized access to customer energy usage data (CEUD) for CRES [competitive retail electric service] providers **and other third parties** should be viewed as a fundamental and core component of the platform, along with the deployment of advanced customer metering" (emphasis added)…
>
> As foundational grid architecture investments are planned, designed and implemented, the data generated needs to be used to better enable customer choice to inform customers of their energy consumption and costs so they can manage their energy usage, adopt technologies that provide benefits and drive systemic benefits for the grid (page 31). [5]

[5] PUCO, PowerForward: A Roadmap to Ohio's Electricity Future (Aug. 29, 2018). Available at https://www.puco.ohio.gov/industry-information/industry-topics/powerforward. Page 31.

I believe the Stipulation is consistent with the vision expressed in the Roadmap because GBC and HAN allow customers to choose from a wide variety of energy management technologies and software applications.

Finally, I note that the Commission, in closing out the PowerForward Data and Modern Grid Workgroup on April 22, 2020, stated:

> The Commission believes that timely and efficient access to and sharing of customer usage data with customers and competitive suppliers is necessary to promote customer choice and grid modernization, subject to appropriate consumer privacy protections. Thus, we anticipate that the pursuit of this goal will continue through the issuance of staff recommendations in appropriate dockets, along with staff recommendations on implementation of other specific measures that are directed at broadening the opportunity for customers to act on their supply side and demand side preferences regarding the delivered price, mix and availability of innovative competitive and non-competitive products and services.[6]

The data portability provisions of the Stipulation support the above conclusion of the Commission.

D. THE STIPULATION ENABLES COMMISSION OVERSIGHT OF CERTAIN KEY RATEPAYER BENEFITS

Q. HOW DOES THE STIPULATION ENABLE COMMISSION OVERSIGHT OF RATEPAYER BENEFITS?

A. In addition to requiring GBC and HAN consistent with nationally-recognized standards and best practices, the Stipulation provides two important mechanisms for

[6] Case Nos. Case No. 18-1595-EL-GRD *et al.*, Entry (Apr. 22, 2020) at 4.

the Commission to ensure that customers receive the benefits of the advanced metering investment. First, the terms and conditions under which third parties may access GBC will be articulated in a tariff subject to Commission approval, per Section 11(b)(ii). This is critically important because in other states without sufficient oversight, utilities have unilaterally imposed terms and conditions on third parties that were onerous, unreasonable or conflicted with commission orders. DP&L has a *de facto* monopoly on customer energy data, and the Commission must restrain DP&L's impulse to use its monopoly power to impose unfair or unreasonable terms and conditions upon third parties. Section 11(b)(ii) ensures the Commission has the opportunity to review this important contractual interface between regulated and unregulated providers, ensuring that terms and conditions imposed by DP&L will not hinder the development of the competitive energy management market in Ohio.

Second, if DP&L plans to use a new type of advanced meter with "distributed intelligence" capabilities, further described below, Section 5(c)(ii) requires DP&L to file a description of its plans and allow for stakeholder comment 180 days prior to implementation.

Q. WHAT IS "DISTRIBUTED INTELLIGENCE" AND WHAT DOES IT MEAN FOR CUSTOMER BENEFITS?

A. "Distributed Intelligence" or "DI Capabilities" are terms for certain smart meters that have an on-board computer capable of running software applications. DI Capabilities are relatively new, and very few utilities nationwide have adopted DI-capable meters; nevertheless, major meter manufacturers are promoting them now, and

it is possible that DP&L will select advanced meters with DI Capabilities. These software "apps" can have utility-facing or customer-facing benefits. For example, apps could detect unusual voltages or broken neutral lines, or they could statistically analyze usage patterns and disaggregate power consumption into individual appliances or devices to better inform customers of the contributors to their utility bills. The ability to analyze voltage and current flows thousands of times per second and accurately disaggregate household electric load could provide significant new opportunities for cost-effective energy management in Ohio. Should the Commission be dissatisfied with DP&L's written plan to utilize DI Capabilities, the Commission will receive six months of advance notice prior to this technology's use, providing the opportunity to exercise oversight if the Commission feels it is appropriate.

III. CONCLUSION

Q. WHAT IS YOUR CONCLUSION?

A. The Stipulation helps ensure that DP&L's customers will be able to receive the benefits of the advanced meters. Many of those benefits will come not from DP&L directly, but rather indirectly through new energy management tools and technologies. Data portability via GBC and HAN ensure that DP&L ratepayers are positioned to take advantage of new technologies as they evolve over time. Not only are GBC and HAN required in the Stipulation, but important details of their implementations for the benefit of customers are specifically called for, such as user experience requirements and customer protections. In my experience, these details are important to a successful

implementation and ensure that customer benefits will not be delayed or forgotten after deployment. For the reasons stated above, I recommend the Commission approve the Stipulation.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

CERTIFICATE OF SERVICE

The e-filing system of the Public Utilities Commission of Ohio will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to this case. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons listed below via electronic mail on November 30, 2020.

/s/ Madeline Fleisher
Madeline Fleisher

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Summary: Testimony - Direct Testimony of Michael Muurray on behalf of Mission:Data Coalition electronically filed by Ms. Madeline Fleisher on behalf of Mission:data Coalition