Improving Access to Data Recommendations

DECEMBER 2020

ENERGY TRANSFORMATION NETWORK OF ONTARIO

1.Introduction

The Energy Transformation Network of Ontario (ETNO) includes representation from Ontario's utility sector, non-utility solution providers, non-profit organizations, public agencies and universities working together to propose a vision for a smart grid in Ontario and examine the many components that comprise it. ETNO is also supported by the Corporate Partners Committee (CPC), with representatives from more than 50 private sector organizations active in the smart grid space – including, electric vehicle interests, energy retailers, energy management companies, systems integrators and equipment manufacturers.

ETNO's primary objective is to help guide the transformation taking place in Ontario's energy sector and to seek to optimize outcomes for the benefit of all Ontarians by providing recommendations for tangible policy, market and regulatory enhancements with near and long term benefits. To help ensure this advice reflects the diversity of opinions within the electricity sector, ETNO acts as a platform for dialogue between key stakeholders, seeking consensus positions for delivery to decision makers.

The energy sector in Ontario is undergoing significant change. ETNO's work is driven by a recognition that Distributed Energy Resources (DERs), advanced distribution management platforms and new structural models for organizing the distribution sector are all challenging foundational notions of market boundaries, industry roles and responsibilities. Enhanced data and analytical capabilities, advanced transportation technology, environmental policy and other technological changes outside of the electricity sector are also having an increasing impact on the electricity system. To ensure that these innovations are integrated into existing electricity systems in a way that enhances consumer choice, reliability, cost-effectiveness, new approaches to policy-making, regulation and electricity markets will be needed.

In keeping with the objective of providing tangible recommendations to decision makers to optimize outcomes for all Ontarians, ETNO intends to focus its work on discrete topics in order to make measurable progress on key sector level challenges. The first of these topics for which ETNO is providing recommendations is improving access to data.

This paper represents the advice of ETNO as a whole. It is not meant to represent the position or opinions of individual members or their organizations. Accordingly, the positions and opinions of members and their organizations may not be reflected in the report, which is without prejudice.

2. Improving Access to Data

Data is widely recognized as a key resource supporting grid modernization efforts. This data can be used to develop consumer applications and services, customized rate structures, facilitate the deployment and integration of smart building products, develop software, support building energy management, DER deployment and encourage enhanced energy system planning and operations. All of these applications can ultimately result in benefits to energy customers and the enhancement of customer choice.

The value of data in any sector is, in part, a function of who has access to that data and the products and services that they can provide by harnessing it. In order for data to be usable by a wide variety of stakeholders, data should be standardized to the extent possible and access to that data should be efficient, cost effective and secure.

Improving access to data in Ontario is a subject that ETNO has dealt with extensively in the past. From a high-level perspective, ETNO has consistently supported improving access to data in a secure manner and removing barriers to competition in the energy products and services marketplace. In monitoring the province's progress towards achieving these goals since ETNO's creation in 2009, it has become clear that fundamental pieces of an access to data framework have yet to be put in place. Further, ETNO believes that the potential for positive impacts to consumers associated with deeper, more structural transformations of the energy sector would be undermined if the gaps in the access to data framework remain unaddressed.

In general, ETNO sees Ontario's current framework for access to data in the energy sector as incomplete and piecemeal. The main examples of this relate to the framework for accessing customer energy usage data and data from DERs. The process for accessing customer energy use data lacks standardization across distributors and customer types. Similarly, there is a lack of standardization for what data should be provided to distributors from DERs in order to better allow them to plan, monitor and operate their distribution systems. Having data standards, and a standardized process for data access will help with compliance and enforcement of any related policies as well as stakeholder access to information. It will also ensure that stakeholders involved are treated fairly and makes the data sharing process easier to understand for the general customer. In assessing whether and to what extent to pursue access to data at this time, ETNO recognizes the need to ensure that the costs of doing so are commensurate with the potential benefits, and that these efforts are prioritized among the suite of policy priorities and reflect customer preferences.

In keeping with the objectives described above, ETNO is providing the following recommendations intended to improve access to customer energy usage data and data from DERs.

3. Recommendations

3.1 Implement Green Button Province-Wide

3.1.1 Issue and Background

The primary category of data to which energy sector stakeholders require better access in order to offer innovative products and services to customers is customer energy usage data. At its most basic level, this data takes the form of interval readings from meters including quantities of energy consumed and the time period over which the quantity was consumed. This basic information can also be supplemented by other data points including customer class and

applicable rate structure which further enhances the value of usage data and allows more actionable insights to be gleaned.

In Ontario, customer electricity usage data is held by local distribution companies (LDCs) and the IESO's Smart Metering Entity (SME). Customer natural gas usage data is held by natural gas distributors. The current framework for accessing this data involves individual requests to LDCs and distributors for data from a subset of customers. This process can be cumbersome, time consuming and, due to a lack of standardization across LDCs and distributors, the data is generally provided in different formats and at different levels of granularity. The existing framework has proven challenging for both third parties trying to access data for client customers, as well as for customers themselves. This is especially true of large multi-site businesses who often have facilities located within the service territories of multiple LDCs.

3.1.2 Recommendation and Rationale

The Government of Ontario should enact regulation to require the implementation of the Green Button data standard by all Local Distribution Companies and natural gas distributors

ETNO believes that the implementation of a standardized approach to enable better access to customer energy usage data is a building block for future grid modernization efforts. While some progress has been made, Ontario needs to make significant strides in this area in order lay the required foundation for a data and technology focused energy sector that promotes greater consumer choice, competition, and value. To do this, ETNO recommends that the Government of Ontario enact regulation to require the implementation of the Green Button data standard across the province's LDCs and natural gas distributors.

Green Button is a data standard owned by the North American Energy Standards Board (NAESB), which includes a common format for energy data, called Download My Data (DMD), and a sharing protocol for that data, called Connect My Data (CMD). Using the Green Button standard, energy data from the distributor's systems can be leveraged in a user-friendly format in an effort to both help customers better understand and manage their energy consumption, and to allow authorized third parties to access that data in a secure manner.

Implementing Green Button province-wide would address many of the key barriers to improving access to data (standardization, efficiency, cost-effectiveness and security) by:

 Enabling electricity and natural gas customers in Ontario to access their energy consumption more quickly to support efforts in demand management

- Provide a standard format that third-party developers can use to develop and offer customers innovative solutions to help better understand and manage consumption patterns to reduce energy bills
- Securely transferring energy data from utilities to customer-authorized third party entities and applications and allowing customers to define the length of data access authorization and revoke authorization at any time
- Enabling distributors to work with developers who can offer standardized solutions that give customers access to information on a variety of platforms from online to mobile
- Providing a platform for distributors to use for internal data exchange needs and as a development platform for internal business processes requiring time series data input

In addition to the benefits of Green Button related to standardization, ease and security of customer and third-party access and cost-effectiveness, the data standard provides a solid platform upon which future grid modernization efforts can be built. For example, as the prevalence of energy-related smart home and industrial devices grow, customers will demand a seamless relationship between their energy data and these devices, including DERs; something that can be accomplished via a data standardization method such as Green Button. Green Button could also assist large energy consumers in meeting provincial energy reporting requirements established under the Energy and Water Reporting Benchmarking (EWRB) initiative in the future as current platforms are enhanced to accept data in new formats

The government of Ontario has considered regulation to enact Green Button in the past and on October 8 issued a new regulatory proposal on the Environmental Registry of Ontario which again considers proposing regulation to require the standard to be implemented province-wide across electricity and natural gas distributors. Past efforts to implement Green Button were put on hold for two main reasons: 1) the version of the Green Button standard in effect at the time was under revision to incorporate a schema for retail customers, and 2) the lack of an established certification process to validate compliance with the standard. Both of these issues were addressed in 2019, paving the way for a full-scale implementation across Ontario's electricity and natural gas distributors. ETNO recognizes that the implementation of Green Button would entail costs being incurred by LDCs and distributors (and by extension, their customers). As such, ETNO further recommends that distributors be allowed to recover implementation costs when they arise and that the beneficiaries of Green Button bear the cost of implementation and operation, consistent with general regulatory principles. This could mean, for example, that some portion of costs for the Connect my Data standard are borne by the third parties that would use it. As was previously determined when the Ontario Ministry of Energy, Northern Development and Mines examined the implementation of Green Button in 2017, the overall cost benefit for implementation was seen to be net positive for electricity and natural gas data even after accounting for implementation costs. Further, ensuring that implementation of Green Button is applicable across all LDCs and natural gas distributors may

provide opportunity for cost reductions. London Hydro, for example, has made significant process with the rollout of Green Button and has engaged other LDCs including Festival Hydro and Whitby Hydro (now Elexicon) in a utility consortium in order to use a shared service model that reduced the one-time implementation costs per customer by 50%. This experience points to the benefits that can come from a coordinated approach to implementing Green Button across multiple entities simultaneously.

ETNO members highlighted that the business case for the implementation of Green Button in their service territories was not likely to be equal in all cases. For example, for an LDC with a high volume of residential customers and a low volume of commercial industrial customers may realize less immediate benefits or uptake from the implementation of Green Button. ETNO believes the government should be cognizant of this fact and consider the allowance of a phased implementation of Green Button, potentially allowing LDCs and natural gas distributors flexibility in determining which classes of customers should be included and timing of deployment. Any flexibility incorporated into requirements should be balanced with the understanding that the benefits of a data standardization approach like Green Button are necessarily reduced as implementation moves away from universal application.

Some ETNO members highlighted the value of refreshing the cost-benefit analysis that was previously conducted by the Ministry. These members also identified supplementary research and analysis, including a business case and assessment of customer preferences, as being required to ensure that both the fact and timing of regulation to implement Green Button is appropriate at this time. The need for this additional analysis was not agreed to by all ETNO members.

3.2 Develop Policies to Enforce Standards for Third Parties Accessing Customer Data

3.2.1 Issue and Background

As customer energy usage data becomes more integrated into system analysis and operations, and is accessed and used more regularly by third party businesses, it will become more important to ensure that customers and their data are adequately protected once access to that data has been given.

Data security and consent issues are being wrestled with economy-wide, especially as these relate to customer data. Locational information, purchasing habits, search engine history etc. are all valuable pieces of information for companies to access and analyze. Generally, a customer is required to provide consent to any entity accessing their data. This is an aspect of any access to data framework that ETNO fully supports. However, while a customer may give their consent to a company to access and use their information, those same customers rarely fully understand the implications of what a company is able to do with their data. Media stories

about customers downloading a mobile application and later discovering their location and purchasing decisions have been tracked are becoming more frequent, even when involving large established companies. Moreover, in today's data-driven world, it is not only the customer data but also the insights generated using that data that are of significant interest to organizations and companies due to its high-value. This value is comprised understanding customer behavior, informing customer behavior, changing and sometimes manipulating customer behavior to further benefit an organization's financial goals and business models — all of which can be harnessed to generate revenue. These business models can put customer privacy at risk and require attention to address the potential for data privacy violations.

While similar situations have been rare in Ontario regarding the access of customer energy usage data thus far, ETNO sees these types of actions as unacceptable violations of customer privacy and believes that mechanisms should be put in place to avoid them occurring in the energy sector. ETNO believes it is critical to get ahead of potential misuse or illegal use of customer data and that action on this front will become more important over time as access to customer energy data is enhanced.

3.2.2 Recommendation and Rationale

The Government of Ontario should work with the Ontario Energy Board to develop and enforce requirements on third parties regarding the use, retention, disclosure and disposal of customer data

ETNO believes that the legal framework surrounding a third party accessing customer energy usage data should be robust and in line with the requirements placed on LDCs. This framework can be adapted to suit the needs of large commercial entities that also require data protections to be in place to protect competitively sensitive information but who may prefer more flexibility in the implementation of data protections given their level of sophistication and capabilities. Customers will be more willing to participate if they know their data is protected and only being used in a way they agree to. To a certain extent, the implementation of Green Button would address some of these concerns by giving the customer the ability to revoke a third parties' ability to access their data. However, putting the onus on customers to monitor third parties and determine their comfort with how their data is being used, shared, retained etc. creates risk that data may be used inappropriately or in ways outside of a customer's comfort zone, potentially without them knowing. ETNO believes that there needs to be requirements in place to ensure that customer data and information is protected.

These requirements could take the form of minimum standards to which third parties accessing customer energy usage data will be held. Similar to LDCs, the third parties should be required to follow strict, clearly defined policies for data usage, ability to perform data mining and insights generation, data retention, disclosure of data or insights generated through the data, and appropriate disposal of data and or any information derived/generated through it. Third parties should be required to protect data and information/insights generated through the data from any unacceptable use within or outside the organization preventing scenarios resulting from cyber-theft or insider-theft of the data or generated information/insights. As a starting point, the government and OEB could look to the basic standards to which LDCs and natural gas distributors are held (via their license requirements) regarding customer data and modify as appropriate for application to private sector entities and unregulated distributor affiliates.

ETNO members have rightfully raised that many companies active in Ontario's energy sector have existing internal policies related to the use, retention, disclosure and disposal of customer data that are likely more comprehensive than minimum standards applicable to distributors. This recommendation is not intended to suggest that distributors have more robust data policies than other businesses in the private sector. Instead, ETNO believes that minimum standards regarding customer data should be in place for all relevant entities in order to guard against inappropriate use and to maintain customer confidence in the value and practice of sharing data. Clarifying and standardizing the requirements also carries inherent benefits and reduces the cost of compliance for companies.

3.3 Using Smart Meter Data to Facilitate Wholesale Market Participation for Demand Response

3.3.1 Issue and Background

Green Button is ideally suited to making customer energy usage data available to customers and customer designated approved third parties. However, the Independent Electricity System Operator's (IESO) Smart Metering Entity (SME) also has access to customer electricity usage data, for residential and general service <50 kW customers, through their Meter Data Management and Repository (MDMR) system. Having this data accessible to the IESO via the SME provides a unique opportunity to address access to data related barriers to wholesale market participation currently faced by residential and small business demand response aggregators.

A central requirement for demand response aggregators participating in the IESO-administered markets (IAMs) is to be able to demonstrate that they reduced their demand when called upon to do so by the IESO. In order to demonstrate their response, aggregators must submit meter data from the individual loads that comprise their demand response capacity. The meter data is compared to a baseline measurement for what demand was expected to be, thereby showing

the level of actual demand response compared to the required amount. This process is referred to as measurement and verification (M&V).

In order to demonstrate compliance with IESO dispatch signals, demand response aggregators must currently work with LDCs in whose service territories the contributor loads are located to access meter data for each of those contributor loads. As discussed previously, this involves making individual requests to the relevant LDCs for a subset of customers. Making these requests often come at a cost to the aggregator and the LDC which must devote staff time to fulfilling the request. Absorbing these costs impedes the ability to scale demand response aggregations, especially when contributor loads are located in the service territories of multiple LDCs which incurs additional costs to work with each. Further, demand response aggregators have signaled that it is sometimes not even possible to access the data due to the associated cost or long timelines. When agreements can be reached, the data that is supplied can differ across LDCs with regards to accuracy, format and granularity.

These issues leave demand response aggregators in a difficult position whereby they may be unable to comply with the IESO's requirements to supply accurate meter data in a timely fashion for the purposes of performing M&V. Not complying with these requirements can result in penalty charges being levied against the aggregators which has the run-on effect of discouraging future demand response participation in the IAMs, or, increasing the offer price of demand response capacity in the wholesale market. Both of these impacts can increase the wholesale price of capacity applicable to all Ontario electricity consumers.

3.3.2 Recommendation and Rationale

The Independent Electricity System Operator should use smart meter data to perform measurement and verification for aggregated demand response resources participating in the IESO-administered markets

If implemented, this recommendation would involve demand response aggregators obtaining the meter identification number and LDC name from participating residential customers and providing that information to the IESO or SME. Identifying information, such as the customer's name or physical address would not be provided. This would help address potential customer privacy issues. The SME would use the meter ID and LDC name and match it with the corresponding electricity consumption data for residential consumers for the specified period of time over which the IESO's dispatch signal was applicable. The SME could then share the electricity consumption data with the IESO, which could perform the required M&V evaluation to verify that the aggregation complied with the dispatch instruction.

Since 2009 ETNO has advocated for the expansion of opportunities for demand response in Ontario by maximizing the ability for all customer types to participate, including in the wholesale markets. Addressing access to data barriers for demand response in the IAMs would empower more residential customers to contribute flexible load into the market. Ultimately, this would help to address customer needs around affordability and utilizing enabling technologies to help reduce the cost of energy. Additionally, a streamlined approach to data access for M&V purposes can lower the cost of capacity from added demand response participants in the market. Cost and time efficiencies would also be created by avoiding the need to collect meter data samples across different LDCs, and because the M&V would be done in-house by the IESO and SME, customer privacy and data security would not be compromised.

3.4 Enhancing Access to Data from Distributed Energy Resources

3.4.1 Issue and Background

An additional aspect of access to data currently handled in a non-standard fashion in Ontario is the access to data from DERs. DERs are energy resources connected to the distribution system and generally include technologies such as solar PV, energy storage, natural gas generators (and combined heat and power), and aggregations of those technologies. In the past, ETNO has made high-level recommendations regarding the need for policy makers to develop requirements for and propose sufficient monitoring of distribution-connected generation, energy storage and responsive load.

Past DER deployment in Ontario has been largely policy driven (e.g. the Feed-in Tariff (FIT) and microFIT programs). These programs were focused on specific objectives and did not contemplate the provision of DER operational data to LDCs. Future deployments of DER are expected to be largely driven by economics, customer rate structures and opportunities to provide value to wholesale markets and distributors. While forecasting future DER uptake in Ontario is difficult, experience from other jurisdictions (and in Ontario with regards to the Industrial Conservation Initiative) points to the likelihood of future increases in the volume of DERs.

In order for LDCs to plan, monitor and operate their distribution systems effectively, they need to be able to access data from DERs including their real-time operational behaviours. While certain LDCs (e.g. Hydro One) have included requirements within their technical interconnection requirements for connected DERs to supply them with real-time operational data, many LDCs have not yet adopted similar requirements.

3.4.2 Recommendation and Rationale

The Ontario Energy Board should consult on and make amendments to the Distribution System Code to require the provision of operational data from DERs to LDCs

LDC access to DER data would yield greater efficiencies in system operations at both the distribution and bulk level (e.g. peak shaving). In turn, this can help contribute to lower system costs. It would also help maximize the value and experience of DER ownership by customers, and support higher levels of DER penetration. Finally, codification of data requirements would yield the transparency and consistency that is needed by DER proponents and LDCs alike.

An additional benefit from requiring the provision of operational data from DERs to LDCs includes the potential in the future to use that data to supply the IESO with the telemetry required for wholesale market participation. This could occur, for example, by having LDCs, LDC affiliate, or other third party telemetry providers aggregate the telemetry collected for LDCs and provide it also to the IESO for market participant DERs. While the opportunities for DERs to participate in the wholesale market are currently limited, ETNO believes these opportunities will expand in the future.

It is acknowledged that, depending upon the specific circumstances and configuration, the requirement for DERs to provide real-time data to LDCs may be impactful from a cost perspective. Although monitoring equipment and communication links can help ensure the flow of accurate and high-quality data from DERs to LDCs, the associated costs may be prohibitive for certain small DERs. ETNO appreciates that, like the implementation of Green Button, the value of the data to be collected must be balanced with implementation costs. In this respect, any insights and best practices from existing arrangements in place between DER providers and LDCs will be instructive. Additionally, this issue may serve as an occasion for pursuing pilot projects with support from the IESO's Grid Innovation Fund, the OEB's Innovation Sandbox, and/or other relevant external sources to determine approaches to data provision that balance the cost of implementation with the accuracy and quality of data feeds.

In a similar vein, it is recognized that there may be limitations on some LDCs' ability to accept and leverage such data (e.g. limitations in system or operational technology and equipment, or constraints on staff resources, whether budgeted headcount or available skills and expertise). Here again, best practices and pilot projects may be able to play a role, while a standardized, codified approach could assist LDCs in developing business cases for additional resourcing.

Finally, requirements to provide operational data should consider the potential system impact of the types of DERs, as well as the existence (or lack thereof) of a commercial or market

arrangement related to the DER. For example, for DERs that inject into the distribution system (e.g. solar PV, energy storage, natural gas) the potential for system impacts is greater than generally attributed to demand response resources which only modify load. That said, to the extent that demand response resources are participating in wholesale markets or distributor programs, ETNO believes that the potential for the coordinated use of those resources would justify the provision of operational data to LDCs.

It should be noted that the OEB's DER Connections Review and Responding to DERs initiatives provide ideal forums through which to stakeholder proposed data points that should be made available to LDCs, and, to further consider and implement Distribution System Code changes to require the provision of the data.

3.4.2.1 Data from DERs that Should be Provided to LDCs

ETNO has assembled a list of data points from DERs that should be provided to LDCs as a reference for decision makers. ETNO recommends engaging stakeholders on these suggested data points in order to determine a final list.

- DER kVA / MVA rating
- Real and reactive power output (or consumption)
- Real-time generation (kVA / MVA)
- DER operating power factor
- DER point of common coupling voltage
- Power quality data (e.g. voltage, frequency)
- Generator status (on / off / standby / faulted)
- Directionality of power flow
- Curtailment setting
- State-of-charge / state-of-charge as percentage of energy storage capacity (for storage resources)

4. Conclusion

ETNO has developed these recommendations with the aim of making tangible progress on addressing access to data issues in Ontario. Before larger scale and more transformative changes can be implemented in Ontario's energy sector, fundamental building blocks like standardized, efficient, cost effective and secure access to data must be in place.

While certain technical details of some of the recommendations would require further specification and stakeholder engagement, ETNO strongly believes that Government of Ontario, OEB, and IESO can significantly improve the framework for access to data in Ontario by implementing the recommendations outlined in this document:

- 1. The Government of Ontario should enact regulation to require the implementation of the Green Button data standard by all local distribution companies and natural gas distributors
- The Independent Electricity System Operator should use smart meter data to perform measurement and verification for aggregated demand response resources participating in the IESO-administered markets
- 3. The Government of Ontario should work with the Ontario Energy Board to develop and enforce requirements on third parties regarding the use, retention, disclosure and disposal of customer data
- 4. The Ontario Energy Board should consult on and make amendments to the Distribution System Code to require the provision of operational data from DERs to LDCs

While not a focus of these recommendations, ETNO also wishes to voice support for the IESO/SME's efforts to make aggregate de-identified electricity meter data available to third parties through the MDM/R. ETNO recognizes the high potential value that could be created by making aggregate de-identified data available to entities including, government, agencies, distributors, academia, and the private sector in order to perform system level analysis or examine customer classes as a whole. The IESO/SME is in the process of revising their application to the OEB in order to address concerns that were raised regarding stakeholder/customer support and ensuring that data is sufficiently de-identified to protect customer privacy. ETNO believes work in this area should continue to be prioritized by the IESO/SME in order to address the OEB's concerns and conclude this important initiative.

ETNO also notes that both the provincial and federal government are beginning to turn greater attention to post COVID-19 recovery efforts, including funding programs and capital deployments. Strategic investments, such as supporting distributors in the implementation of Green Button, could serve to speed the roll-out of the data standard and reduce the impact on affected capital budgets.

5. Appendix

5.1 ETNO Members

- Brad Carr
- Chris Carradine
- David Collie
- Carlyle Coutinho
- Ron Dizy
- Mark Fernandes
- Paul Grod
- Anthony Haines
- Tyler Hamilton
- Cynthia Hansen
- Chris Ireland
- David Lebeter
- Jeff Lehman
- David McFadden
- William Milroy
- Steven Muzzo
- Dr. Jatin Nathwani
- Nicholas Pender
- Alexandre Prieur
- Matthew Sachs
- Neetika Sathe
- Katherine Sparkes
- Linda Wainewright
- Terry Young
- Observer Brian Hewson
- Observer Mike Smith

5.2 Corporate Partner Committee Members

- 129 Group
- Aird & Berlis
- Alpha
- Aztech Inc.
- Certicom
- Clear Result
- Climate Action Services
- CSI Software
- Direct Energy
- Ecobee
- Electrovaya
- Elster
- Enbala
- Enel X
- Energate
- Energent
- ERTH Corp
- General Electric
- GM
- Honeywell
- Hydrogenics
- Hydrostar
- IBM
- IESO
- iGen Technologies
- Kaihen
- Kangaroo Group
- Landisgyr
- MaRS Discovery District
- NRCan
- OEA
- Ontario Centres of Excellence
- Ontario Ministry of Energy, Northern Development and Mines
- Opus One Solutions
- Ortech
- Peak Power Energy
- Peel Region
- Power Advisory LLC

- Prolucid
- PwC
- QUEST Canada
- RIM
- S & C Electric Company
- Sault Ste. Marie Innovation Centre
- Siemens Canada
- Soft Grid Analytics
- Summitt Energy
- Sustainable Environmental Solutions
- Toronto and Region Conservation Authority
- Total Energy Advice & Management Ltd. (TEAM)
- University of Toronto Rotman
- Util-Assist
- Z3 Controls
- Zero Footprint