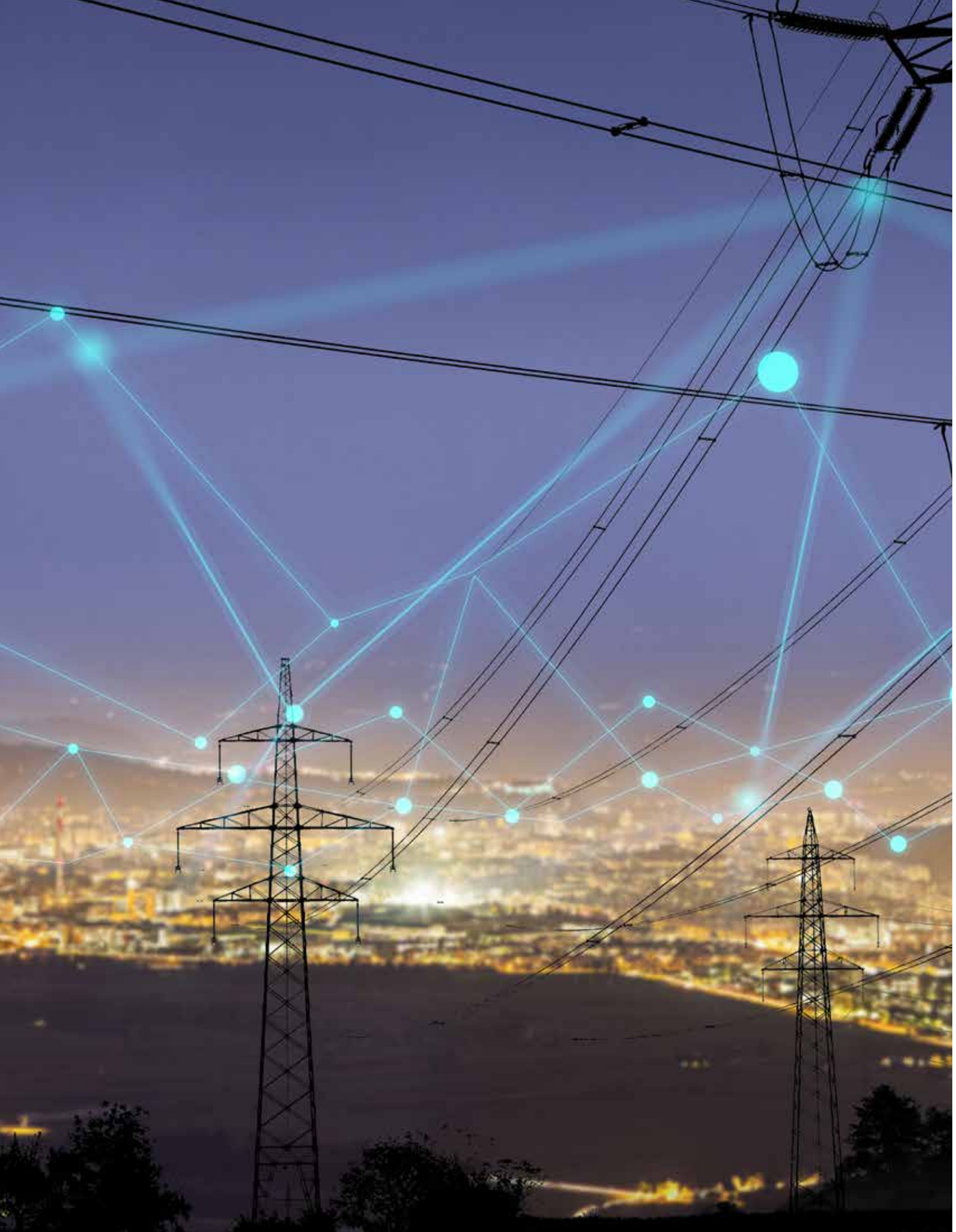
Canadian Electricity Association | Association canadienne de l'électricité

RECOMMENDATIONS

for Modernizing the Electricity & Gas Inspection Act (EGIA) and Associated Regulations



CONTENT

EXECUTIVE SUMMARY

With over 80% of Canada's electricity generation produced from non-greenhouse gas (GHG) emitting sources, and this number growing; the Canadian electricity sector is well-positioned to be a critical enabler of decarbonization via the electrification of other sectors.

In meeting this priority, CEA members are being challenged by a number of disruptive forces driven by technological advancements. Big data, digitalization, self-generation, energy efficiency, new energy markets and energy services are all resulting in a need for electric utilities to adapt and modernize the services they provide to consumers.

Figure 1: The traditional one-way flow of electricity. Source: Government of New Zealand

However, the current federal regulatory environment was developed, and evolved, to regulate one-way energy transactions (see *Figure 1*). It is not conducive to the emerging energy grid where energy is transacted bidirectionally, enabled by a host of digital applications and technologies and energy markets (see *Figure 2*).

Modernizing the Electricity and Gas Inspection Act (EGIA) and Regulations (EGIR)

Updating the EGIA and EGIR is an important long-term solution to address both markets and technologies that were not contemplated for approval under subsection 9(4) of the EGIA. This submission will begin by outlining these recommendations.

CEA's recommendations for modernization can broadly be grouped into two overarching categories - marketplace concerns and technological concerns. CEA is recommending two specific remedial actions to address each overarching area of concern.

Figure 2: The emerging electricity grid with multi-directional flow of energy and information. Source: KfW Group

1. Marketplace Recommendations

- Recommendation #1 - Revise the definition of Contractor, and all definitions dependent on Contractor
  - The current focus, which requires determinations of who constitutes "the contractor" etc., obscures the EGIA, and is becoming increasingly difficult to ascertain as technological advancements make such distinctions arbitrary and, or, irrelevant.

- Recommendation #2 - Clarify the distinction between retail and wholesale markets
  - There must be clarity added in terms of the distinction between retail and wholesale markets, and in turn, provincial versus Measurement Canada (MC) jurisdiction. This will enable flexibility for real-time transactions with non-traditional participants.

2. Technological Recommendations

- Recommendation #3 - Modernize the definition of Meter
  - Non-traditional meters will be required for innovation in electricity and energy markets. The EGIA should have a means of adopting non-traditional embedded meters. In parallel, the current device approval and auditing framework should be re-evaluated and modified. The adoption of the digital meter has eliminated the potential of mechanical failure or drift, thereby dramatically reducing the likelihood of meter measurement error and the need for a highly prescriptive monitoring process.

- Recommendation #4 - Revise the definition of Legal Units of Measurement (LUM)
  - To support innovation and achieve energy conservation objectives, MC should recognize that units-of-measure, which are defined under the EGIA as a LUM, may be used for both billing and non-billing purposes. When they are not used for billing on a particular meter, flexibility is required for them to be configured and re-configured on the meter to support power system optimization and efficiency management.

This will allow for emerging technologies that cannot be metered (or are not practical to be metered e.g. 5G routers) with traditional meters to be adopted more quickly, as well as a host of other benefits described below. Consumers will also benefit by having greater flexibility and incentives to engage in behind the meter energy efficiency and energy trading.

Short-Term Recommendations within the Scope of Current EGIA/EGIR

In the interim, some shorter-term actions, working within the existing EGIA, could include the potential to reinterpret GEN 25, GEN31, GEN33 and E-27, resulting in advancement towards the needs of the sector and consumers highlighted above. These would be in alignment with the work done on E-31 and S-E-11.

The reinterpretation would focus on allowing organizations to demonstrate due diligence defense in the use of LUM as allowed under existing Administrative Monetary Penalties (AMPs) and moving away from prescriptive requirements and specifications. The focus would be in making all data from the meter, billing and non-billing, available without constraints or conditions.

Suggested Next Steps

Thank you for the opportunity to provide feedback regarding potential areas of focus in terms of modernizing the EGIA and EGIR.

We look forward to proceeding with a follow-on conversation regarding how CEA can assist in moving forward on these recommendations.

Please contact: Justin Crewson, Director of Transmission & Distribution Policy, CEA (crewson@electricity.ca), with any questions, comments and/or follow-up.

INTRODUCTION

Why modernize the legislative framework for electricity metering?

Context – The electricity sector as an enabler of new public goods

Founded in 1891, the Canadian Electricity Association (CEA) is the national forum and voice of the electricity industry in Canada. CEA members generate, transmit, and distribute electrical energy to industrial, commercial, residential, and institutional customers in all provinces and territories in Canada.

Ensuring that Canadian lights stay on and that the country's businesses can operate 24/7 has long been an essential public good provided by the electricity sector. However, the electricity industry is increasingly being looked to as a key enabler for additional public goods, most notably the decarbonization of the country's economy via the electrification of other sectors.

In this regard, the sector is rising to the challenge. Today, over 80 percent of the electricity generation mix in Canada is greenhouse gas (GHG) free, making it one of the cleanest in the world. Moreover, the industry is within reach of an aspirational federal government goal of 90 percent emissions-free generation by 2030. But in order to reach this latter goal, Canadian electricity companies will need to utilize new technologies in order to maximize how clean electricity is generated, transmitted, distributed and stored.

Essential to this transition will be enabling the development and operation of new markets and methods for transacting energy that maximize consumer choice, environmental performance, efficiency and cost-effectiveness.

Disruptive forces are challenging federal regulatory frameworks

While the electricity sector positions itself to provide for new public goods, such as carbon emissions reductions, it is also increasingly being challenged by disruptive forces. These forces are largely driven by technological advancements and are enabling a range of new energy services and applications, and in turn, fueling an increase in consumer expectations of our sector. CEA members' experience has been that the federal regulatory framework, especially as it relates to the measurement and sale of electricity, is hindering the industry's ability to adapt to these emerging consumer preferences.

In this regard, there are 4 primary disrupting forces that were not contemplated by current federal regulatory frameworks governing electricity transactions:

i. **Data and digitalization** – New technological platforms and applications are emerging in the energy space and are challenging existing electricity markets and business models. Importantly, advanced communications networks, including 5G technology, are being deployed and will rapidly enable the widespread adoption of Internet of Things (IoT) devices by consumers, smart cities and utilities alike.

ii. **The emergence of the "prosumer"** – There is an increasing ability for consumers to cost effectively produce, store and utilize their own electricity generation to decrease their net usage, and/or to sell back onto the grid.

iii. **Energy efficiency** – In addition to self-generation, sensors are increasingly expected to be utilized, in everything from electric vehicles to home appliances, all connected by energy management devices. These devices will essentially seek to maximize self-generation, minimize purchases of electricity and allow consumers to participate in markets for a number of energy services.

iv. **Emerging energy markets and services** – Most importantly for the purposes of this paper, consumers are increasingly being enabled to participate (with growing ease) in new markets, driven by the above factors. Examples include, utilizing blockchain-enabled energy credit trading platforms to transact self-generated energy with neighbors and, automated participation in capacity markets, with energy companies incentivizing consumer activity based on real-time grid conditions.

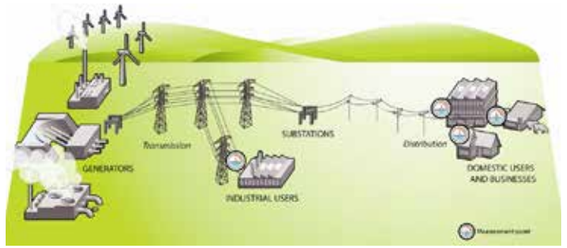


Figure 1: The traditional one-way flow of electricity. Source: Government of New Zealand

Figure 2: The emerging electricity grid with multi-directional flow of energy and information Source: KfW Group

In short, the current federal regulatory environment was crafted and evolved to regulate one-way energy transactions as depicted in *Figure 1*. However, regulatory frameworks will need evolve to account for the disruptive forces discussed above, and the new bidirectional scenarios depicted in *Figures 2 & 3* below.

Central Recommendation – Modernize the federal legislative framework regulating electricity metering

CEA would like to start a conversation with Measurement Canada (MC) and other Government of Canada (GoC) stakeholders regarding the need for a modernization of the federal legislative framework governing electricity metering - the Electricity and Gas Inspection Act (EGIA) and its regulations (EGIR).

CEA believes that updating the EGIA and EGIR is an important long-term solution to address both markets and technologies that were not contemplated for approval under subsection 9(4) of the EGIA. This submission will begin by outlining these recommendations.

CEA also believes that there are more immediate opportunities to incrementally improve the function of the EGIA and EGIR, that do not require legislative amendments. Specifically, reinterpretation of existing policies, namely GEN25, GEN31, GEN33 and E 27, in alignment with E-31 and S-E-11. These could enable short-term progress while a more long-term solution is developed. CEA describes these in the final section of this document.

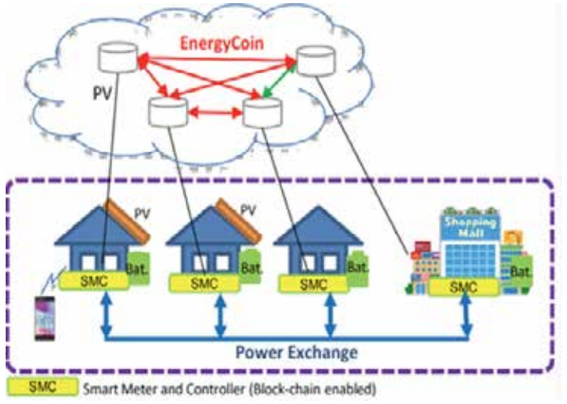


Figure 3: The electricity grid and energy markets of the future (at the community-level). Source: The European Physical Journal Special Topics

RECOMMENDATIONS

for modernizing the EGIA and EGIR

CEA's recommendations for modernization can broadly be grouped into two overarching categories - *marketplace concerns* and *technological concerns*. CEA is recommending two specific remedial actions to address each overarching theme:

1. Marketplace Recommendations

- **Recommendation #1** – Revise the definition of Contractor, and all definitions dependent on Contractor
- **Recommendation #2** – Clarify the distinction between retail and wholesale markets

2. Technological Recommendations

- **Recommendation #3** – Modernize the definition of Meter
- **Recommendation #4** – Revise the definition of Legal Units of Measurement (LUM)

MARKETPLACE RECOMMENDATIONS

Recommendation #1 – Revise the definition of Contractor, and all definitions dependent on Contractor

Rapid technological advancements and cost reductions in energy generation technologies such as photovoltaic (PV) solar panels have enabled residential, commercial and industrial customers to serve as electricity generators in energy transactions. This has obscured the concepts of sophisticated vs. unsophisticated parties and the definition of Contractor within the EGIA and EGIR.

Under the current EGIA framework, all generators are considered sophisticated customers, even if they are merely a single household with a rooftop PV solar panel. Moreover, the current legislative framework considers transactions to be unidirectional and between only two actors with defined roles for each. The EGIA also only technically recognizes a single transaction, from a single meter (one measurement point).

However, current and emerging electricity markets can have many transactions across many parties, including between generators, distributors, system operators, retailers and end-users, all at times based on one meter (see *Appendix A* for a demonstration of this). Thus, as community, regional and provincial/territorial renewable energy programs; and aggregation and energy trading technologies become more prevalent, many consumers will begin to transact electricity, in effect, similar to traditional utilities.

Therefore, there is a failure in the construct of Contractor within the EGIA and EGIR.

This results from the Act and regulations being developed at a time when distinctions between sophisticated and unsophisticated customers, and generators and non-generators, were much more clearly defined than they are today, i.e. *Figure 1*.

Case study example - Recommendation #1: Definition of Contractor and community renewable generation

Many classes and groups of energy consumers are piloting models of self, community, and regional generation, either for a single point of measurement (received and delivered) for billing; or for an aggregation[1] of loads to one generator for offset or sale back to the grid. These practices are all based on one or more meters (measurement points) for received or delivered energy. But they require transactions of Legal Units of Measurement (LUMs) between multiple parties, be it aggregation, settlement, totalization, or netting of multiple loads or generators.

The EGIA does not recognize this new spectrum of transactions in energy markets despite the reality that these transactions have been enabled in provincial transactional markets in Alberta and Ontario for more than 10 years[2] and are currently in various states of development in other Canadian provinces/territories.

Thus, the EGIA should focus exclusively on the trade of electricity where the transaction is based on measurement. The current focus, which requires determinations of who constitutes "the contractor" etc., obscures the Act, and is becoming increasingly difficult to ascertain as technological advancements make such distinctions arbitrary and, or, irrelevant.

[1] Please see Alberta microgeneration as an example of this behaviour http://www.qp.alberta.ca/documents/Regs/2008_027.pdf
[2] Rule 021 in Alberta is not envisioned in the EGIA http://www.auc.ab.ca/regulatory_documents/Consultations/2018-12-20-Rule021Version2.8.pdf but to claw back the market to EGIA compliance would cost billions and reduce grid effectiveness.

Specific Recommendations #1 - Revise the definition of Contractor, and all definitions dependent on Contractor

Applicable sections of the EGIA	2(1), 6(1), 14, 16(1),26(3), 39
Applicable sections of the EGIR	9(2), 9 (all)

The definition of Contractor, and other contingent definitions such as Transaction, Seller and Purchaser, should be either updated or removed.

Updating the definition of Contractor will not only recognize and better regulate existing transactions, but it will also facilitate the adoption of new types of transactions. If the designation of Transaction, Seller and Purchaser are kept, the updated definitions should at least be aligned with the Dispute Procedure that is currently defined in the EGIA and Part VI of the EGIR in order to ensure that responsibility and liability is properly assigned.

Recommendation #2 – Clarify the distinction between retail and wholesale markets

There is a lack of clarity regarding the EGIA's authority after the measurement is made, and there remains ambiguity and uncertainty to even the most informed industry leaders regarding where the retail market ends and where the wholesale market begins. Due diligence, market forces and provincial regulations over the last 20 years have filled this gap beyond the measurement of the meter, but clear and formal regulations are imperative to making sound business decisions, and for encouraging innovation in the metering space.

The retail vs. wholesale designation impacts load settlement, aggregation, totalization, virtual metering points and various other system-level trade transactions, both at the sophisticated and un-sophisticated customer level.

Much of this discussion is being driven by regional and provincial renewable energy programs, the role out of which could be accelerated with MC regulatory clarity.

The EGIA needs to be supportive of and enable provincial regulations particularly in terms of carbon offset initiatives.

The benefits to Canada of doing so are not limited to renewable energy generation, but also encompass energy efficiency programs, such as adaptive streetlighting, supporting the electrification of the transportation sector with extensive electric vehicle (EV) charging infrastructure, and allowing new generation opportunities through micro-generation programs. Each of these technologies will allow Canadians to more easily and cost-effectively access, sell, and use electricity as well as reduce GHG emissions.

Thus, one of the key goals of the EGIA amendments should be to clarify the distinction between retail and wholesale markets, and in turn provincial versus MC jurisdiction, in order to allow flexibility for real-time transactions with non-traditional participants.

Case study example - Recommendation #2: New and emerging transactions

Examples of new and emerging transactions include: bi-directional metering, distributed energy microgrids, and EV charging infrastructure. All of which can increasingly be done in real-time, as opposed to the current model where existing transactions are done long after the original measurement. Such real-time transactions are complicated by the EGIA and EGIR's lack of clarity in terms of retail and wholesale markets.

As a case in point, an EV customer could (and logically should) be billed by a parking authority that captures both parking rate time and energy used to charge the vehicle. The parking authority would then pay the utility for energy consumed. However, this setup is currently cost-prohibitive given the requirements of the EGIA and EGIR. For those that do deploy charging stations, they often do not charge based on kWh consumed. Instead, they charge a flat rate, or by time, which introduces market cross-subsidization due to system losses or unaccounted for energy, which is not equitable.

Related to this, line loss factors are important in electricity transactions. In terms of equity, loss factors help to maintain a balance between what is paid to the generator of electricity, and what is paid by the transmitter, distributer and/or end-consumer of that electricity; given that losses of electricity occur between the points of generation and final use.

Some provinces apply loss factors to the LUM rather than to the final value of the bill. For example, a 10 kWh meter reading with a 10% loss factor applied to the LUM becomes 11 kWh on the bill. This is in contrast to the practice of the transportation industry, where penalties are applied in the form of taxation on the final charge rather than on the volume of gasoline purchased.

The practice of adjusting the final measurement of electricity causes some provincial markets to operate in a regulatory 'grey area', as the requirements of MC (accurate and traceable measurement) and the equity concerns of provincial regulators (the incorporation of transmission losses) are in tension due to an unclear understanding of MC's role after measurement has occurred.

As a result, the provinces have been forced to develop sophisticated market rules, controls and dispute mechanisms to fill this regulatory gap.

Specific Recommendations #2 - Clarify the distinction between retail vs. wholesale markets

Applicable sections of the EGIA	2(1), 28(Q)
Applicable sections of the EGIR	2(1), 9 (2,c), 29(1)

In addition to the recommendations under the first point, the EGIA should also allow for flexibility in real-time transactions with non-traditional participants. It should seek to enable the full spectrum of markets between retail and wholesale, and accountability should directly escalate in proportion to the level of sophistication of the participant. Clarity should also be provided as to the role of the provinces in operationalizing market settlement needs, including dispute resolution at the wholesale level.

Finally, the EGIA could also be improved by better defining the boundaries of provincial and federal authority over the trade of electricity. MC needs to determine if the EGIA mandate extends to the final bill or ends once measurement has occurred. It is CEA's opinion that best practice in the industry is to delegate authority of the use of the LUM for billing purposes to the provincial regulators. This delegation of authority will make it easier for industry to make accurate business and market decisions.

TECHNOLOGICAL RECOMMENDATIONS

Recommendation #3 – Modernize the definition of Meter

The EGIA and EGIR legislative framework concentrates on placing restrictions on specific measurement devices. The electricity sector believes that a better point of focus would be the system of transactions that enable the larger market. As a case in point, while metering is fundamental to how the electrical market operates, as it exists today, the electrical market has gone (and each year goes further) outside of the meter.

From a metering perspective, the electricity sector faces challenges in facilitating emerging markets for electricity sales and services. Much of the cause for this is the fact that the sector has been using similar solid-state metering for over 35 years, in part due to the highly prescriptive nature of the EGIA and EGIR. The result is a reliance on American National Standards Institute (ANSI) electricity meters, the size, weight and cost of which are prohibitive in terms of deploying new technology dependant on, or interoperable with, these metering systems.

Moreover, since the EGIA and EGIR do not recognize IoT device measurements as a LUM, the electricity grid has had difficulty in incorporating and adapting to new commonplace technology and practises.

Thus, an updated EGIA should recognize the use of IoT technology such as smart phones, and enable them to provide real-time transactions, based on AC and DC meters that are not in traditional meter form. Advances in technology in recent years mean that a metering device could now realistically be a measurement chip on a circuit board.

Case study example - Recommendation #3: The increasingly widespread use of embedded metering technology to enable the equitable deployment of new technologies

The last 10 years have seen a significant rise in the use of IoT technologies. DC and AC measurement technologies are now being embedded in many devices (e.g. street lights, in home displays, EV chargers, all forms of solar/wind, re-generative drives, etc.). These devices do not resemble the traditional meter, and unlike traditional meters, are controlled in real time by networks and smart devices.

Not only are these devices becoming more and more widespread, but they are also increasingly accurate, enabling a whole host of new value-added services and applications for industry and end-consumers. As a case in point, single meters were traditionally used for single transactions in one direction (as discussed earlier). However, now multiple parties have been enabled to conduct multiple transactions, in both directions, using a single meter. New embedded metering technology will make this existing practise easier and allow greater traceability of these transactions.

Examples include: avoiding flat rates (kWh) that are cross-subsidized by some consumers (a practise which should be avoided), facility charges based on kWh, and application of energy profiles for settlements on devices that are themselves too small to practically meter with traditional meters but are numerous enough to have an impact on the grid. The prime example of the latter is the forthcoming 5G wireless routers that will proliferate but which are not currently cost effective to meter (e.g. $100 meter for metering a $100 device, with a marginal load) but the load of a thousand of such devices will be significant.

Thus, it is the electricity sector's view that non-traditional meters will be required for innovation in the electricity and energy markets. Use cases include: billing usage at individual points of sale for EV charging and metering otherwise un-meterable devices, recognition of traditional AC metering for differing customer classes that are no longer traditional ANSI forms, in addition to the recognition of DC metering.

Specific Recommendations #3 – Modernize the definition of Meter

Applicable sections of the EGIA	2(1), 9(1), 9(2), 12(1), 25, 28(1), 28(q)
Applicable sections of the EGIR	2(1), 5(1), 7 (a-d), 31 (1,a), 46

The EGIA should have a means of adopting non-traditional embedded meters. In parallel, the current and device approval and auditing framework should be re-evaluated and modified. The adoption of the digital meter has eliminated the potential of mechanical failure or drift, thereby dramatically reduced the likelihood of meter measurement error and the need for a highly cumbersome and prescriptive monitoring process. A relevant example of an alternative methodology is the onetime type approval of CSA devices, with random audits and assessment, as opposed to the current single device approval, verification and re-verification processes. MC could engage with the CSA to develop requirements for assessment of measurement circuits.

Recommendation #4 – Modernize the definition of Legal Units of Measurement (LUM)

Currently, the EGIA rigidly defines legal unit of measurement (LUM) as measured in an approved/verified meter, as stated in 9(4). This becomes problematic when the EGIR treats a metering system under the same rules as an individual meter and all classes of customers the same.

To support innovation and achieve energy conservation objectives, MC should recognize that legal-units-of-measure, which are defined under the EGIA as a LUM, may be used for both billing and non-billing purposes. When they are not used for billing on a particular meter, flexibility is required for them to be configured and re-configured on the meter to support power system optimization and efficiency management.

Case study example - Recommendation #4: Modernize the definition of Legal Units of Measurement (LUM)

This will allow for emerging technologies that cannot be metered (or are not practical to be metered e.g. 5G routers) with traditional meters to be adopted more quickly. It will also allow for configurable non-billing data to be used for utility operations such as transformer loading or power quality studies.

This will enable the use of billing and non-billing data from one or many different meters to make electricity systems more resilient and efficient, as well as realize cost savings from being able to use less expensive options to get similar measurement accuracies. There would also be benefit to consumers in that they will have greater flexibility and incentives to engage in behind the meter energy efficiency and energy trading.

Specific Recommendations #4 – Revise the definition of Legal Units of Measurement (LUM)

Applicable sections of the EGIA	2(1), 3(1), 9(1), 9(4), 12(1), 16(2), 17, 25
Applicable sections of the EGIR	5(1), 11(1), 31(1)A, 46

Significant changes should be considered to GEN25, 31, 33, as well as E-27, and on to the EGIR to allow industry to be able to realize the services that could be achieved through innovation and new measurement types from new non-traditional meters, and different classes of customers, including:

1. Measured LUM from approved/verified meter (conventional, only this is currently recognized);
2. Calculated LUM from approved/verified meter (expansion of E-27, Gen 25, E33 and E31);
3. Measured LUM from non-approved/non-verified meter (adaptive streetlights with a microchip meter); and
4. Calculated LUM from non-approved/non-verified meter (Net transaction for multiple adaptive streetlights or electric vehicle chargers, negative load payments (nega-watts): paying a customer to not use power).

Additionally, different types of measurements to include LUM for non-billing (no validation or restrictions) calculations outside of the meter, and recognition of Virtual LUM, AC LUM as well as DC LUM, will give industry the flexibility to use new technology to offer better services to Canadians.

In particular, CEA believes that DC LUM will be critical to support EVs where the consumer expects to be charged only for the DC energy consumed by their vehicle.

SHORT-TERM RECOMMENDATIONS

within the Scope of Current EGIA/EGIR

CEA believes that updating the EGIA and EGIR is a necessary longer-term solution that will address not only issues that the electricity industry is currently confronted with, but also emerging issues that will hinder future innovations.

In the interim, some shorter-term actions, working within the existing EGIA, could include the potential to reinterpret GEN 25, GEN31, GEN33 and E-27, resulting in advancement towards the needs of the sector and consumers highlighted above. These would be in alignment with the work done on E-31 and S-E-11.

The reinterpretation would focus on allowing organizations to demonstrate due diligence defense in the use of LUM as allowed under existing Administrative Monetary Penalties (AMPs) and moving away from prescriptive requirements and specifications.

The focus would be in making all data from the meter, billing and non-billing, available without constraints or conditions.

Furthermore, this reinterpretation could fast-track the enablement of non-traditional meters on small loads through a device type approval process, similar to the Canadian Standard Association (CSA). This process would have no verification, re-verification, or spot audits, and would use non-traditional meters in the form of embedded measurement chips.

However, given the long-term needs of the sector and consumers, and in the name of providing certainty for manufacturers, it is preferable that changes be made to the EGIA and EGIR that formalize these interpretations. But in the meantime, CEA believes that progress can be made by MC acting as an agile regulator within the confines of the current EGIA.

CONCLUSION & SUGGESTED NEXT STEPS

Thank you for the opportunity to provide feedback regarding potential areas of focus in terms of modernizing the EGIA and EGIR.

Ultimately any modernization of the EGIA and EGIR should better support the rapid evolution of metering technology, the sophistication of electrical loads, renewable energy, the increasing complexity of energy transactions in Canada, and reflect evolving best practices in the energy industry as they apply to all stakeholders.

We believe that the recommendations we have identified here are good starting points in an ongoing consultation, and we are enthusiastic about continuing to work with you on bettering the legislative framework for electrical metering in Canada.

CEA believes that the actions recommended in this document will enable favourable policy outcomes for the betterment of industry and consumers alike. We look forward to proceeding with a follow-on conversation regarding how CEA can assist in moving forward on these recommendations.

Please contact: Justin Crewson, Director of Transmission & Distribution Policy, CEA (crewson@electricity.ca), with any questions, comments and/or follow-up.

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Utility Members

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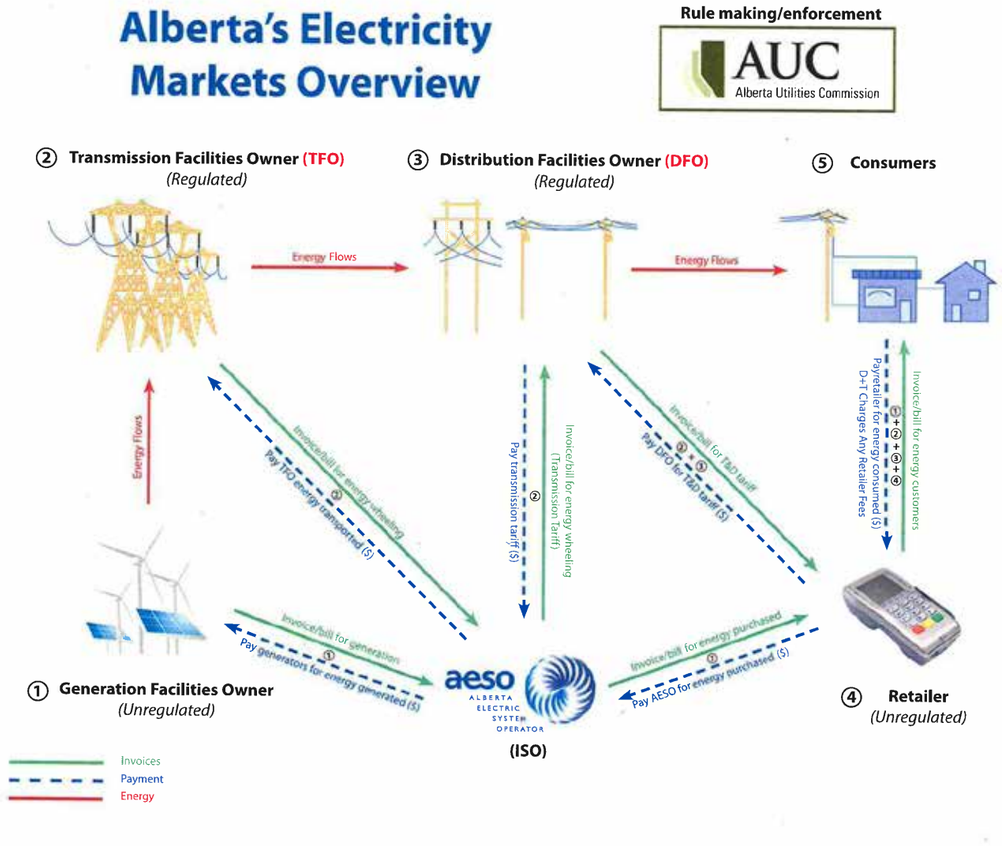
Appendix A



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