8 June 2025

To: Alberta Utilities Commission
Re: Rule 024 and micro-generation application processes questionnaire

Thank you for the opportunity to comment on proposed changes to AUC Rule 024, and the effectiveness of the current regulatory framework for Micro-Generation in Alberta. The replies below are my own.

Best Regards,
Steven Fahey

1. Should there be a standardized methodology or minimum information requirements for utilities' calculation of the estimated annual consumption at a customer's existing or new site and the calculation of the micro-generation unit's output? Please provide an explanation.

An assumption has been made by the AUC, that a limit must be placed upon a micro-generator's output, other than the physical limit already in place due to the service entrance capacity at the site. The reasons for making this assumption have not been provided, and cannot be inferred by reading Rule 024 or other materials published by the AUC. The need for the utility, AUC, or Micro-generation applicant to calculate annual consumption or generation has not been demonstrated.

When the owner of a site seeking consumer connection to the utility's lines makes an application, the utility will assess the site's future consumption and determine a suitable service entrance size. The site owner has a say in the determination based on future needs that can be substantiated. The sizing and design of the service entrance is based on safety, which may be limited by the capacity of the distribution network. Similar criteria should be employed for the sizing and connection permit of a Micro-generator.

The AUC does not substantiate the claim that a Micro-generator's annual consumption and production has an effect on safety or quality of electrical power on the utility lines. When a Micro-generator is importing from the utility due to net demand or exporting due to net excess, in both conditions the transaction is limited by the interconnection service capacity (the circuit breaker). The service capacity is an adequate limit to both consumption and production to ensure safety in all cases.

Back-feeding occurs regularly on utility distribution lines, particularly when large dynamic loads such as motors, blowers, pumps are switched on- and off-line by agricultural and industrial producers. This back-feeding is witnessed by all customers of the utility, evidenced by measurable brown-outs and over-voltages. Given that these frequent events are allowed in rural Alberta, it must be inferred that substantial back-feeding of the utility lines by switching of heavy loads is not a safety issue. The degradation of power quality also appears to be within AUC

and ISO/AESO acceptable guidelines, otherwise corrective action would have been taken against the industrial and agricultural consumers by the AUC, AESO or the utility. It is hard to understand why, in comparison, Micro-generators require additional regulation when larger agricultural and industrial units, that do have measurable effects on power quality during seasons of irrigation and drying of crops, do not.

The comparison between Micro-generation and industrial/agricultural consumers is relevant because agricultural producers may also be Micro-generators themselves. Agricultural businesses that apply to be Micro-generators are saddled by regulatory criteria that are contradicted by regulations related to all other equipment installations. Agricultural businesses are consumers and residents of Alberta, too, therefore it is incumbent upon the AUC to provide fair, consistent and rational regulation to all Albertans who may interact with utilities in many ways. If agricultural producers are a hazard to the electrical system when their equipment back-feeds exceed 150 kW, in which case the AUC can validate that such production can be a hazard if exceeded by Micro-generators, then the AUC has failed to provide enforcement. If the inadvertent back-feeds from agricultural and industrial equipment is acceptable to the AUC, despite their adverse effect on rural Alberta residents, then exports from Micro-generators, which miniscule in comparison, are also acceptable.

It is equally incumbent on the utility(ies) to provide a robust electrical distribution system that is not vulnerable to degradations of power quality when consumers and producers operate normally and within established safe operating limits. It is my belief that if the utility(ies) build and improve suitable infrastructure, then Alberta's citizens will be served by reliable electricity, including in rural areas. Limiting Micro-generators with arbitrary limits will not change this, because their outputs are inherently orders of magnitude smaller than the demands and back-feeds of agricultural and industrial consumers.

a. Please identify and justify the best historical timespan for accurately assessing a customer's historical energy usage (for existing sites).

Given the above comments, an assessment of a consumer's historical energy usage is of little value. It is granted that a consumer's usage is relevant to some engineering calculations and should not be withheld from the utility. It is noted that the consumer's energy use is normally recorded by the retailer, not the utility.

It is also understood that the utility company becomes the "customer" of the Micro-generator when the micro-generator is producing excess electricity and exporting it to the utility's lines. The utility has a right to ensure the Micro-generator will do so in a safe and reliable manner, consistent with the utility's needs.

The utility expects to assess the effect of a Micro-generator's production upon the adequate provision of electricity to all of their other customers. This extends to ensuring power quality in the area of the Micro-generator. A determination of the Micro-generator's effect on the local distribution network is reasonable, and data should be made available to allow it.

Once the effect of a microgeneration system on the utility's local distribution system has been determined by the utility – calculations that would also be employed to determine a consumer's service rating – then a suitable limit can be established for a Micro-generator. Such a determination is normally already available to the utility because the service entrance rating has already been determined at every site. No additional process is necessary as far as the Micro-generation applicant is concerned.

b. Please identify and justify the best way for accurately projecting a customer's future energy usage (for new sites).

The data currently being provided to utilities by Micro-generation applicants is inadequate to asses anything but approximate annual consumption. There is no means to predict instantaneous effects on the local distribution network, nor would such an analysis provide reasonable results without enormous expense to the utility. However it is at the instantaneous level that most power-quality issues are observed. Brown-outs and over-voltages occur in seconds and minutes, not in months or years. These effects occur due to momentary changes in system loading, and normally are quickly cleared by tap-changing auto-transformers installed in the utility's network. The utility must make a safety and reliability assessment for all consumers and producers. In the case of Micro-generators (and particularly mini-micro-generators, less than 10 kW), these effects are small to negligible. From this it can be concluded that a Micro-generator applicant's annual consumption data is not of value in determining the safe introduction of their system into the distribution network.

For most consumers, increased consumption is not assessed by the utility until the power demand increases above the service entrance capacity. The process to increase the rating of the service (and other associated equipment such as step-down transformer) is a well-established procedure that all utilities support. The process to upgrade an existing service may be harmonized with the Micro-generation application by the utility if they are concerned about burdening themselves with bureaucracy.

Reviewing past AUC determinations of micro-generator compliance or non-compliance, it appears that the establishment of a consumer's previous 3 to 5 years of consumption is not a suitable limit of a Micro-generator's output. Limits set this way are difficult to substantiate and monitor. Also, no party to the AUC proceedings has established that generation beyond a consumer's historical consumption can create a safety risk. While the rule is in place, and agreed to by contract, then micro-generator production above the historical consumption can be

shown to be non-compliant to the rule, but the justification of the rule is not provided. If the rule is difficult to apply and substantiate on the part of micro-generator applicants and utilities alike, then the AUC should consider other rules that are simpler to apply without compromising safety or reliability of the electrical system.

For an example, a utility may install a 25 kW service and equally sized transformer at a consumer's site once the site's needs are evaluated. This allows consumption of up to 25 kW at the site at any time. The utility must install this correctly to be in compliance with ISO standards. Given the statement that consumption is safe at such a site, then it is equally valid to say that 25 kW of production at the same site is safe. The AC electrical equipment providing service to the majority of sites in Alberta does not discriminate between consumption or production, and the equipment can safely handle electricity flowing in either direction. A claim that micro-generation over 10 kW is unsafe, at a site provided with 15, 25, or 50 kW of supply is disingenuous, at best.

The AUC will find a simpler and more efficient regulatory instruments by permitting Micro-generation limits based on service entrance capacity. Given the installation cost of solar, wind and other renewable sources, and the goals of most residential home owners, only in rare cases will applicants apply to interconnect micro-generation systems that rival the capacity of the service entrance. Note that bank financing and government grants to micro-generators are also limited to balancing annual consumption. Without an AUC rule to limit Micro-generator production to equal consumption, other institutions may make this remain a common system sizing rule. Micro-generators that apply for systems of greater capacity than their service entrance capacity will reasonably be required to purchase at their cost upgraded service entrance, transformer and supply lines, from the utility.

c. Please specify and justify the minimum level of proof that utilities should accept if a customer explains that they intend to increase their electricity consumption shortly after installing a micro-generation system (such as electric vehicle proof of purchase, etc.)

It appears that the utility companies themselves have difficulty employing the AUC rule(s) as a means to determine a suitable size for a Micro-generation system. As suggested above, if the rule is not producing realistic results, a new rule can be considered that still ensures safety and reliability of Alberta's electrical grid.

Normally, the utility is not concerned by the purposes to which a consumer consumes electricity. When such loads added by the consumer could back-feed and/or degrade power quality, the utility has a responsibility to prevent this, as I've already noted above. When such loads exceed the service capacity installed at the site, both the customer and utility will recognize the overload and can upgrade the service capacity as a result. Therefore there are cases where the

utility is rightfully concerned by additions of load at a site. I also recognize that during Export, the Utility becomes the Customer of the Micro-generator. As a purchaser of the Micro-generator's electricity, the Utility then benefits from rights accorded to any party that purchases a good or service. These rights are enshrined in the contract between the utility and consumer/micro-generator.

Consumers of electricity and micro-generators enjoy contractual relationships with the utility company. Their interactions are mediated by the normal agreement by the customer to purchase electricity from the utility and/or the utility to purchase electricity from the Micro-generator. By the most mundane means, both of these choices by the utility and the customer have already been agreed upon. As indicated earlier, the utility has the right to limit the amount of electricity they purchase from any given Micro-generator. Again, the existing agreements are sufficient to mediate these transactions and apply limits when necessary.

As a consumer, and as a private citizen, I object to the utility's intrusion into my decision to purchase large electrical loads, such as an electric vehicle, when such loads are within the capacity of my service from the utility. That is an assessment that I am responsible to make. The charging of the EV is a consumption of electricity, and like any other load, I will pay the utility for the energy consumed. My responsibility to the utility is fulfilled when they are paid for the electricity I have consumed. The suggestion that the utility may have any means to dictate when, how, or how much I may charge my electric vehicle is very disagreeable and, in my view, an invasion of my right to determine how I use property that I own. A contract exists between every site owner and the utility that provides them electricity. This contract does not govern my choice of vehicle.

d. Please explain how a new micro-generation unit's yearly energy output should be calculated, including accommodation for any partial shading or coverage of rooftop solar photovoltaic system.

The utility is not a participant in the operation solar photovoltaic panels. The utility played no part in the purchase or installation of the equipment, therefore they have no privilege to dictate its mode of operation, efficiency, or functionality. Only at the point of interconnection to the service entrance does the utility have a justified and reasonable claim to determine the technical standard of safety and reliability of electricity they purchase from the Micro-generator. These are two distinct functions within a Micro-generator's system, among many others.

From the Micro-generator's perspective, export to the utility is one of several end-uses of the electricity produced by the PV system. A Micro-generator's home or business may consume the PV-generated electricity locally, rather than export it. The proportion of self-consumed versus exported electricity is passively determined by physical laws (Ohm's Law) not by regulation or rule.

The utility should not expect nor demand any fraction of the Micro-generator's electrical production. It is out of the utility's jurisdiction how much a Micro-

generator's PV system can or should generate, and how much of its output should be used on-site or exported. In all cases, a contract exists that mediates this exchange.

If the utility seeks a conservative and safe metric to determine the limit a Micro-generator's production, they may readily determine it based on the capacity of the service installed. The equipment interfaced to the utility service connection is the device that determines the quality, condition, and quantity of energy being exported to the utility. The safety and compliance of this equipment has been reasonably determined by the technical standards and installation conditions of this "grid-tie" equipment. The operation of other equipment in the Micro-generator's system does not affect the safety and reliability of power provided to the utility, only the quantity. The quantity is governed by the contract between the Micro-generator and the utility company.

2. There are currently no specified mechanisms for monitoring the compliance of micro-generation systems with the Micro-Generation Regulation (i.e., the micro-generation system generates all or a part of, but not more than, the customer's yearly electricity consumption) after the system is approved. How important is post-approval compliance monitoring to ensure micro-generators are remaining aligned with the Micro-Generation Regulation? Please provide an explanation.

No evidence of non-compliance by Micro-generators has been offered by the AUC. https://www.auc.ab.ca/regulatory_documents/micro-generation-decisions/

Without evidence, then out of respect to Alberta citizens, we must assume the majority, if not all, Micro-generators who complete the application and approval process have done so in good faith. People who do not intend to comply with rules tend to avoid making applications to comply with the rules, especially when such applications cost them money. The AUC should respond to suggestions that Micro-generators will become non-compliant in the future by demanding utilities provide substantiation of the claim, before taking action. Furthermore, a non-compliant Micro-generator, if found, should be addressed as an individual in non-compliance first. If multiple cases of non-compliance are found, the AUC could then consider regulation or enforcement to address it. Until evidence of systemic non-compliance by Micro-generators has been shown, the AUC should not assume that compliance needs to be monitored.

The definition of "compliance" has been expanded by the utilities to a degree that concerns me. Where the AUC uses compliance to refer to the limitation of the Micro-generators annual production, I disagree with this criterion because it is not based on the safety or reliability of the distribution system. If the utility lacks any other criterion to set a reasonable limit on a micro-generator's production, and the micro-generator agrees with a contract, then at least this agreement is a reasonable means to mutually determine the expectations between the two

parties. However, it is incumbent on the AUC to establish fair and transparent rules that both the utilities and Micro-generation applicants can use.

Normally, "compliance" refers to safety, such as safety of utility personnel who service utility lines, and safety of consumers who have equipment in their homes, and I am strongly in favour of maintaining compliance to safety requirements. The AUC rule has conflated the goal of safety with its determination of compliance to arbitrary limits upon a Micro-generator's production. The AUC rule related to annual consumption and production is not based on safety or reliability. This rule invents conditions where "non-compliance" may be shown, for which there is no adverse consequence to the parties of the contract.

a. Please identify and justify the best way to structure mechanisms for post-approval compliance monitoring, particularly regarding which party (or parties) should assume primary responsibility (such as the AUC, the AESO, utilities, etc.).

As stated in my response to question 2. above, I do not believe post-compliance monitoring is justified, because AUC has not provided evidence that non-compliance is likely or has been found to be a problem. I would reconsider my position if such evidence were provided. The consequences of non-compliance may or may not be negligible, therefore the impact of such non-compliance must also be evaluated.

If one were to speculate that a certain Micro-generator may over-produce relative to their contractual limit in any given year, then theoretically the utility may believe that a contractual non-compliance may exist. However this non-compliance may not concern the AUC, because the consequence of this non-compliance is only between the parties of the contract (the utility and the Micro-generator) and can be resolved without their input.

It is a separate concern that the non-compliance could possibly affect other consumers on the utility's distribution network. As I've already substantiated in my answer to 1.a. above, if degradations to power quality in rural Alberta by agricultural irrigation, natural gas distribution, pipeline pumping, and crop drying are acceptable to the AUC/AESO, then the effects of Micro-generators, even those contractually non-compliant to the utility, are unlikely. This is because the limits to Micro-generators are much lower than the exceedances allowed to industrial and agricultural producers.

Note that over-production from multiple Micro-generators can result in distributed generation that reduces load on transmission and distribution networks. If this happens, then the AUC's mandate to reduce losses in Alberta's electricity grid is being fulfilled, even if such over-production is otherwise seen as a contractual non-compliance. As the popularity of Micro-generation grows, the AUC may

review or reconsider any inherent contradictions in their policies or how these policies are carried out.

With any concerns over compliance, the AUC should proceed by first determining if the compliance issues are related to safety, reliability or quality. These are in the AUC mandate (see Electric Utilities Act of Alberta). The probability that non-compliant over-production from a Micro-generator affects either safety or power quality is shown to be very small, by comparison to other large consumers that regularly back-feed the lines. If non-compliance is only a contractual issue, then the utility can take up the matter with the Micro-generator, without recourse to the AUC.

3. What type of inverter de-rating, and associated evidence of this de-rating, would ensure that a micro-generation facility will not later increase its system capacity beyond the micro-generation system size approved by the utility? Please provide an explanation.

Any Micro-generator that chooses to increase the size of their system capacity (or decrease it, for that matter) can address the issue with the utility. The Micro-generator and the utility have a contractual agreement governing these transactions. If the AUC upholds the utility's right to have a contractual agreement with their customers (which they obviously do) then the AUC has already enabled the utility and the Micro-generator to use reasonable means to ensure each party executes their responsibilities under the contract.

There is no reason for a Micro-generator to be restricted to a single, unchangeable system capacity if they can (a) substantiate the necessity of changing the system and (b) agreeably change the contract with the utility. Conversely, there is no reason for the utility to be unwilling to amend the contract with the Micro-generator if they (a) can safely accept the added (or decreased) input of energy and (b) the micro-generator substantiates compliance with the utility's safety standards. Once again, a contractual agreement exists between these parties, therefore the AUC may not need to be involved.

   a. Should micro-generators be permitted to de-rate their inverters, subject to the previously described limitations? Please provide an explanation.

Evidence has not been provided that action on the AUC's part is necessary. The reasons for de-rating a Micro-generator's production should be based on safety and reliability, not on the convenience of the utility company. If the basis to limit a Micro-generator's production is the consumer's previous consumption, but in fact there is no safety or reliability impact to the Micro-generator producing more than this, then the Micro-generator has a reasonable justification for generating more than their previous consumption would indicate. The service entrance capacity, as provided by the utility, is more likely to be a reasonable indication of the maximum safe and reliable output of the Micro-generation system. Whatever limit

is set, it will be determined by the contract between the Micro-generator and the utility.

If the utility's distribution lines and transformers in a given local area are unable to accept the maximum input from a Micro-generator's production, then a limit on the output of a given inverter (de-rating) is understandable. This should be included in the contract between the utility and Micro-generator.

In cases where the utility requires de-rating the inverter, the utility should substantiate their claim that the distribution network is vulnerable to a Micro-generator's excess production. The utility should also substantiate that the reason for this vulnerability is not due to neglect or non-compliance with ISO standards on the utility's part, to maintain their distribution system. The AUC is equally responsible for the utility's compliance to safety and reliability requirements as they are for the Micro-generator's compliance. As a public body reporting to government, the AUC is responsible for transparency when regulating utilities and Micro-generators alike. If a Micro-generator application size reveals a utility's non-compliance with ISO/AESO standards, the AUC has a duty to report it and enforce compliance upon the utility.

4. The City of Medicine Hat's micro-generation application process includes an initial step to determine a potential micro-generation system's maximum permissible size, which has been found to reduce the number of full applications received. Would it be useful for the micro-generation application process to include an initial sizing determination phase, where a utility first determines a customer's maximum permissible micro-generation system size before the customer makes a decision to proceed to a full application? Please provide an explanation.

This could be beneficial to both utility and Micro-generator.

The utility should recognize that numerous Micro-generators in close proximity will provide similar patterns of generation and therefore export into their distribution network. The utility can then make reasonable preparations or changes to their distribution system to ensure compliance with AUC and ISO rules.

The Micro-generator benefits from an estimated system capacity because is allows them, as an applicant, to understand their potential impact on the distribution system and any reasons that a limit should be imposed upon their generation capacity. The greatest benefit would be a process which demonstrates that the utility could suffer from power quality issues if the Micro-generator capacity exceeds a certain amount. The applicant and the neighbouring consumers of electricity would all be better informed by this information, if released publicly. I believe the City of Lethbridge already provides some of this information through its website.

A process established by the AUC or ISO to provide transparency to Micro-generator applicants would be beneficial to all Albertans. Many Albertans are reluctant to consider Micro-generation installations because they are untrusting of the utility companies, or institutions like AUC. Increased transparency is a means to increase trust with the community.

5. The AUC has heard from stakeholders that inverter standards for micro-generation systems often change, creating temporary misalignment with some AUC guidance documents and contributing to some confusion among micro-generation applicants. Would it be helpful for the AUC to facilitate a working group of relevant parties that reviews technical standards (for inverters, etc.)? Please provide an explanation.

It is normal for institutional agencies like the AUC and corporations like the major electric utilities of Alberta to adopt standards based on the latest published versions. Technology evolves, therefore it is normal to observe technical standards change in step. That does not mean, however, that institutional agencies or electric utilities are compelled to follow. However this is the easiest path, and common in North America to do so.

A consequence of applying only the latest in technical standards is the imposition of increased cost to install any form of generating equipment (whether a micro-generation system, mini-micro, or larger-scale). The cost is normally justified by the increased safety, efficiency, and performance that can be achieved with equipment that is designed and tested to comply with the latest standards.

I am not certain that it is in the AUC's mandate to select and approve specific items of equipment for use in Micro-generation systems. If the AUC chooses to engage in this activity, they will have discretion to "pick winners and losers". I am concerned about arbitrary political choices made against exporting countries or persons rather than safety, reliability and compliance with technical standards.

Given the direction taken by the technical standards, the simplest process for the AUC to adopt may be to examine technical standards currently applied in Alberta Micro-generation systems and determine which are of benefit to safety and reliability, and under which circumstances. It would then be in the AUC's purview to ensure this list of technical standards is updated when necessary. The AUC might also have discretion to make exceptions in circumstances where compliance with other standards has equal safety and reliability benefit.

If the AUC is willing to consider exceptions, it may be justifiable on both safety and economic grounds for mini-micro-generators in Alberta. In some cases, the use of older technical standards can be shown to have no measurable bearing on safety, performance, or reliability of the equipment due to the very small scale of mini-micro-generators. These applicants can demonstrate that the interconnected equipment does in fact comply with the earlier standard, and that it has not been modified in any way that would invalidate its compliance. The burden to

demonstrate this should be applied to the micro-generation system applicant, not the utility or AUC. Again, the details of this substantiation can be included in the contract between the utility and the Micro-generator.

a. If yes, how often should the working group meet? (e.g. monthly, quarterly, bi-annually). Please provide examples of technical requirements, other than inverters, that should be included in the discussions.
b. If no, please suggest a different way that the AUC can keep abreast of changing technical standards.

The applicable technical standards do not change regularly. For example, CSA 22.2 No 107.1 was updated in 2016 and only "reaffirmed" in 2021, which means no substantial changes were made. It is impractical for a technical working group to be regularly convened if the revision cycle occurs only once every 5 years, and even so may not conclude any technical changes.

Alternatively, the AUC could convene a group to oversee the value of technical standards with respect to the needs of Albertans, especially if these needs are changing. If the AUC believes that Albertans are adopting Micro-generation for other than residential installations, such as agricultural businesses, or remote site back-up power, then different standards may apply. Oversight of utilities and their application of suitable standards to these situations is one way the AUC can ensure benefit to Albertans.

Previous questions in this questionnaire reveal that the AUC is concerned about both Micro-generation system growth and electric vehicle usage. These are growing trends in electricity generation and consumption patterns, especially among private citizens at residential properties. If the AUC remains concerned about these trends, then a working committee may provide some insight into how to balance them. A means to avoid increased demand on centralized power generation (and the associated transmission losses) could be offset by distributed generation. Such a working group could look at technical standards as one of many ways to foster growth in this direction, because adherence to technical standards is a means to ensure reliability and access for all Albertans. The output of such a WG would then be available to utilities as they build and improve their distribution networks. Only once the scope of the WG mandate has been determined, should a frequency of the meetings be chosen.

Lastly, an AUC working group charged with studying the future of Alberta's electricity consumption and supplies would be a valuable offset to the politically-motivated and frequently unrealistic forecasts published by provincial and federal governments. Providing non-biased information would be welcomed by most Albertans in this time of fanciful predictions and promises.

6. Please identify, and provide justification and details for any other high priority micro-generation issues that should be addressed to ensure the effective and efficient functioning of the micro-generation landscape.

Issue 1)
Other jurisdictions in North America and Europe are experimenting with novel means to add micro-generation at small and large scales. For instance, in some US states, it is now legal to plug in an inverter to a regular wall outlet with solar panels as a supply, without a micro-generation permit nor consent of the utility. Whether the AUC currently wants or expects these devices to enter Alberta, they do not have the jurisdiction to control or stop them if they become popular and widespread. See Utah law, H.B. 340 S1. To review an example: https://pv-magazine-usa.com/2025/03/05/balcony-solar-gains-unanimous-bipartisan-support-in-utah/

Given that these have already grown in popularity in the US, and enjoy widespread popularity in some European countries, it is unlikely the AUC will be able to stop their spread into Alberta. It is hard to predict how the AUC will respond if these become popular. It would be preposterous for the AUC to attempt enforcement by confiscating these devices from thousands of Albertans' homes, on the grounds that they are unsafe, despite labeling by Underwriter's Labs and other certifications, and the assurances from other North American jurisdictions that they are safe.

Issue 2)
Recently, the meaning of "compliance" has drifted to include digital communication protocols, remote control operations, and internet connectivity. Significant problems are created by this. Firstly, digital technology can change quickly, but solar PV systems and associated inverters and hardware will be installed and operate for decades. If a utility or a regulator like the AUC creates rules requiring communication and connection protocols that it refers to as "compliance", then they are setting up Alberta citizens and businesses for future compliance issues that have no bearing on safety, yet undermine the value of costly investments. AUC's primary goal is the safety and reliability of Alberta's electricity grid, and internet connectivity does not advance this goal, especially with poorly-secured, undocumented devices commonly known as "internet of things".

Issue 3)
The Electric Utilities Act of Alberta requires compliance with safety rules, however the utilities impose other requirements. In order to comply with the utility's rules, the Micro-generator must install specific "newest" equipment that is compliant with only the most recent of grid-tie standards (e.g. CSA 22.2 No 107.1 dated 2021 or later). However, these grid-tie equipment standards have existed for decades, and equipment compliant with these standards will certainly demonstrate safety such as "anti-islanding" and other protective functions. CSA 22.2 No 107.1 -95 was first issued in 1995, defining for the first time safety, quality, anti-islanding and grid-interactive standards for power supply equipment. This standard has been expanded and improved many times since then, but the basic

principles have been in force for 30 years. Some such equipment was even designed and built in Canada for a time, compliant with these standards.

A closer examination of these technical standards shows that the recent changes only address functions such as device communication by internet, not safety. The electric utilities of Alberta are not making use of the internet communication protocols included in the power conversion equipment installed by Micro-generators. It is not known why the utilities demand compliance with communication protocol standards, when they do not access the data. The imposition of these standards causes an economic dis-incentive to Micro-generator applicants by raising the installation costs.

Issue 4)
There is currently no means to "grandfather" an existing system, meaning that when a homeowner sells their home with a Micro-generation system, the utility is at liberty to deny a connection permit because the equipment is not compliant to the current version of the safety standard. The equipment actually is compliant to the previous version of the safety standard that was in force at the time of installation, however the utility may force the homeowner to discard safe and functional equipment for this reason. The utility's stance suggests that the equipment is no longer safe in some way, without demonstrating that the equipment has been changed, and was, in fact, deemed acceptable by the utility before. The utility companies themselves accept grand-fathering of standards in other equipment they own in their operations unrelated to Micro-generators. Given society's general acceptance of grand-fathering (including the courts) in residential and commercial buildings, automobiles, and aircraft, it is not consistent to deny grand-fathering of micro-generation equipment.