

Rule 024: Rules Respecting Micro-Generation

Stakeholder comment matrix - November 2025

Form A		
Page/Section	Proposed change	Rationale
Page 2, Section 3	Do the inverters comply with the appropriate UL1741 Supplement Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources?	Inverter standards may change quickly, especially with regard to different service areas. To avoid situations where AUC documents are technologically out-of-date, the specific reference to UL1741 was made general. (Also present in Micro-generation notice submission guideline).
Stakeholder Comments: Action Electrical Ltd (John Andrus): It should be required for WSP to send effective notices well in advance of new standards. Action Electrical is still in possession of equipment that is no longer allowed to be installed because of a lack of notice sent. Utilities Consumer Advocate (Steven Wilson): Given the pace of technological change, the UCA agrees with adopting a generalized approach with respect to the UL1741 reference. However, the AUC should consider establishing a technical standards working group, as recommended by the UCA, to ensure ongoing alignment between regulatory guidance and evolving inverter standards. This would reduce confusion and ensure applicants are working with current expectations. EPCOR Distribution & Transmission Inc (EDTI) (Brenna Haber): Yes. Inverters need to comply with the most up-to-date standards, codes, and regulations. EDTI agrees with this statement being generic to comply with technological changes. FortisAlberta Inc (Elizabeth von Engelbrechten): FortisAlberta Inc. (FortisAlberta or the Company) supports maintaining a flexible, general reference to the standards in Form A, and the Micro-generation notice submission guideline. The Company further supports the Micro-generation notice submission guideline's recommendation to consult with the wires owner for the specific relevant standard as it recognizes that distribution utilities, in their capacity as the local distribution system operators, are best positioned to provide specifications, such as for applicable inverter and synchronous generation standards, that maintain the safety and reliability of the distribution system. To ensure that the MG documents remain technologically relevant – and recognizing that MGs may include small synchronous generating units in addition to inverter-based resources, FortisAlberta recommends that, rather than making specific reference to inverter standards, the documents should refer to “applicable standards”. All references to applicable standards should be accompanied with direction to customers that they must consult with the distribution system owner to confirm standards and requirements. This		

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will support streamlining MG interconnections and will ensure that each MG project is prepared with the correct standards required by the distribution system owner. For further clarity, please see **Appendix A** attached to this comment matrix for the Company's suggested amendments to Form A.

ATCO Electric (Greg Marghella):

ATCO Electric supports the change. ATCO Electric suggests that "appropriate" should be replaced with "latest" to ensure the latest version of UL 1741 is being applied. This will enable the greatest flexibility and have caused confusion in the past.

Howell Mayhew Engineering (Gordon Howell):

This may well be a reasonable short-term change, but then what will happen when (not if ?) the standard changes yet again to a different standard number or standard name... will the Form A then become obsolete again?

Could the AUC not have a web site page such as www.auc.ab.ca/requiredinverterstandards, which itself points to a consistent web site for each WSP (such as www.fortisalberta.ca/requiredinverterstandards, www.epcor.ca/requiredinverterstandards, etc.) where the WSP will maintain the list of standards to which inverters need to comply... and then this Form A question could merely reference the AUC's pointer list.

ENMAX Corporation (Andrew Davison):

As suggested in ENMAX's submission on June 26, 2025, regarding Bulletin 2025-05, inverter requirements should not be specified in the AUC documentation but instead should be identified in each wires owner's technical requirements. The following (image below) should be removed, and customers should be directed to the applicable wires owner's micro-generator technical interconnection requirements and terms and conditions. Industry standards for micro-generator interconnections are changing rapidly, and each wires owner may have unique requirements. Directing customers to the requirements for a wires owner would provide the flexibility needed to accommodate rapidly changing technologies and differences between distribution networks.

Do the inverters comply with CSA Standard C22.2 107.1 – Power Conversion Equipment in particular standards respecting Anti-Islanding?

Yes ☐ No ☐

Do the inverters comply with UL1741 Supplement A - Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources?

Yes ☐ No ☐

Form B

Page/Section	Proposed change	Rationale
Pages 1-2	If dispute is related to Section 2(2) or 2.1(2): Has the wires owner served the customer with notice within 14 days? Yes No Please provide the following information, if available:	The <i>Micro-generation Regulation</i> does not specify information requirements for disputes but enables the AUC to set them as part of its process. In the event of a dispute, this information would be requested. Requesting it upfront encourages standardization in wires owner's

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	• The maximum acceptable system size for the customer's actual past or projected future consumption, as determined by the wires owner. • The customer's annual electricity consumption for the past 12 months (for existing sites). • The customer's average annual electricity consumption for the past three and five years (if available). If the customer does not have consumption data dating back to three or five years, please provide the average annual electricity consumption for the maximum amount of time available and specify the time period used. • The report or energy projections that the wires owner used to project future annual consumption (for new sites). • Please attach document(s) separately. • The approximate percentage discrepancy between the customer's annual electricity consumption and the expected generation of the proposed system (e.g., if consumption is 100 kW and generation is expected to be 200 kW, respond with '200%'). • Any calculations representing the output of the proposed microgeneration unit, either conducted by the wires owner or provided by the customer's installer. Please specify all known assumptions and variables. • Please attach document(s) separately. • If the customer has requested a system size that is expected to generate well in excess of annual consumption due to future load increases, the evidence that the customer has supplied to the utility to justify the load increases. • Please attach document(s) separately. • Manufacturer documentation relating to any proposed inverter derates, attached separately.	processes and makes disputes more efficient. Note that the information is requested <i>if available</i>, allowing some flexibility for various situations.
Stakeholder Comments: Action Electrical Ltd (John Andrus):		

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It is VITALLY important that this information is shared quickly and without bias or modification.

It would be recommended that the AUC set a standard of 'acceptable prior consumption considered' for microgeneration applications. Requiring the highest level of consumption within 5 years would be an excellent step in the right direction. This would limit back and forth arguments as we have had issues on several of our applications due to a drop of only a couple hundred kwh after applying using bill totals.

It is also VITALLY important that Wire Service Providers are required to adhere to timetables so that customers are not getting angry, waiting for a response. We have noticed 50 business day waits for responses for several of our clients in only 2 Wire Service Provider regions. Other WSPs can maintain timelines, why can these others not comply? Is their regional monopoly of services not good enough to hire staff? We have taken the side to talk the customer down and make sure everyone looks good, but it's getting harder and harder to appear to be the good guy when the WSP has these delays.

What this means is that 'poor solar installation companies' are now installing without prior approval and then making their customers wait for approval to turn it on. This should not be incentivized but it is with these crazy long delays. As an 'honest solar installer' we do not install until we have final approval, but we have personally lost files to poor competitors installing even before Permits are closed (saying "we can install this weekend" to clients etc)

Is there no way to 'name and shame' these 'queue jumpers'?

Utilities Consumer Advocate (Steven Wilson):

The inclusion of detailed consumption and sizing information is a positive step toward standardizing dispute resolution. To further improve transparency and consistency, Rule 024 should explicitly reference these requirements – not just Form B. Additionally, the rule should clarify how future load increases will be evaluated and what constitutes sufficient evidence. This would align with existing UCA feedback advocating for standardized methodologies, as well as minimum information requirements to ensure fairness and transparency for consumers.

ATCO Electric (Greg Marghella):

Bullet 1: ATCO Electric recommends that the proposed wording "The maximum acceptable system size for the customer's actual past or projected future consumption, as determined by the wires owner" be altered to "The maximum annual generation in kWh the customers unit can produce, as provided by the customer". The wires owner will not have visibility to the system size absent being provided by the customer, rather the wire owner can provide the maximum consumption as outlined in Bullet 4.

Bullet 6: The description compares energy amounts (consumption vs generation), while the example compares capacities (100 kW vs 200 kW). ATCO Electric recommends aligning the units on both for consistency (e.g., using kWh instead of kW).

UTILITYnet (Darren Chu):

No comments on the notice period.

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We recommend that the wording be updated to: "The maximum acceptable system size for the customer's actual past or projected future consumption (whichever is larger), as determined by the wires owner."

No comments on the customer's annual electricity consumption for the past 12/36/60 months.

How will the AUC ensure standardization across wires owners when projecting future annual consumption?

No comments on the percentage discrepancy.

How will the AUC ensure standardization across wires owners when calculating the output of the proposed microgeneration unit?

Please quantify "well in excess". The Regulation stipulates "all or a portion of" but anecdotal reports suggest allowances of 105% of a customer's average annual consumption. The variability needs to be quantified and explicitly outlined.

No comments on manufacturer documentation.

SolarNinjas Energy Solutions (Michael Thomas):

See attached Marked up Form B with comments indicated at the end of this PDF.

Howell Mayhew Engineering (Gordon Howell):

the term "owner" has been defined in the MGR as "owner of an electric distribution system", so I would think that we do not need to say "wires owner" because "owner" is already defined, and is also used successfully previously in this document.

// The approximate percentage discrepancy between the customer's annual electricity consumption and the expected generation of the proposed system (e.g.: if consumption is 100 kW and generation is expected to be 200 kW, respond with '200%'). //

no...the issue is ****never**** "kW" of consumption or generation, it is "kWh" of consumption or generation, which is substantially different.

the % discrepancy between 100 kWh and 200 kWh is not at all "200%" using accepted rules of mathematics – instead it is a 100% difference, 200 is a 100% increase from 100, 200 is 2 times 100, which means 200% times 100, and is 200% of 100, but "increase" and "times" are two completely-different concepts.

If you want "discrepancy" then the answer is 100% increase.

// Any calculations representing the output of the proposed **microgeneration** unit, either conducted by the wires owner or provided by the customer's installer. Please specify all known assumptions and variables. //

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note that "micro-generation" is ****always**** hyphenated because that is how the Micro Generation Regulation uses it.

// Manufacturer documentation relating to any proposed inverter derates, attached separately. //

I have never heard of a manufacturer derating their inverter except in of theoretical operating temperature, and which are very minor.

ENMAX Corporation (Andrew Davison):

ENMAX does not support the question "Has the wires owner served the customer with notice within 14 days? Yes or No." Discussion between the utility and the customer or contractor may continue for more than 14 days from the initial submission. Rather than rush the owners to submit a notice of dispute to the customer, ENMAX suggests a more appropriate question is "Has the owner served the customer with notice within 14 days of receipt of final connection proposal?"

ENMAX proposes an additional question for the information to be provided:

Is the proposed microgeneration design "standard", in that it meets industry standards and best practices including those outlined by the wires owner, or is the design considered "non-standard?"

Micro-generation notice submission guideline

Page/Section	Proposed change	Rationale
Page 3	Future load additions may be considered if there is sufficient evidence acceptable to the wires owner (proof of purchase, stamped engineering drawings, inspection reports, etc.) that consumption will increase.	This is intended to provide greater clarity upfront to microgeneration customers and wires owners.

Stakeholder Comments:

Utilities Consumer Advocate (Steven Wilson):

The submission guideline is a positive step in creating flexibility for potential future load additions. However, The AUC should consider implementing standardized forms of evidence (e.g., EV purchase receipts, building permits) that all utilities would be expected to apply consistently. As is, the proposed change leaves too much room for interpretation, as well the potential for inconsistent affordability outcomes, levels of service, and customer experiences.

EPCOR Distribution & Transmission Inc (EDTI) (Brenna Haber):

Future load conditions require strict and acceptable guidelines to avoid artificially increasing of production and/or "gold-plating" of the utility grid. The examples of evidence acceptable to the wires owners should be specific to ensure fair practice across wires owners.

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EDTI accepts stamped engineering reports and calculations for future loads. The reasoning for the authentication and review by a professional engineer is to verify the validity of the future loads and ensure that it meets practicable and realistic consumption while ensuring predicted loads are not artificially inflated in an effort to over produce.

EDTI does not accept proof of purchase as sufficient justification of future load. The reasoning for not accepting proof of purchases is the replication of receipts by customers and/or contractors for the purpose of artificially inflating load.

UTILITYnet (Darren Chu):

The wording “may be considered” and “sufficient evidence” is still too vague. How do the various wires owners determine what is “acceptable”? The list of evidence should be more exhaustive. For example, data requirements for heat pumps (with auxillary natural gas) to be accepted are not clearly outlined.

SolarNinjas Energy Solutions (Michael Thomas):

Agreed as necessary. Add language that the examples given are not exhaustive.

Howell Mayhew Engineering (Gordon Howell):

it is really good to clarify this. note that "micro-generation" is ****always**** hyphenated because that is how the Micro Generation Regulation uses it.

Page 4	Information about the <i>Small Scale Generation Regulation</i> added to the comparison table.	Some proposed microgeneration projects would be better classified as small scale generation. The table aims to provide a quick way for customers and wires owners to compare the features of various kinds of generation.
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Stakeholder Comments:

EPCOR Distribution & Transmission Inc (EDTI) (Brenna Haber):

This table provides important information to ensure that customers make an informed decision on what type of generation (e.g., distribution generation, small scale generation microgeneration) they require.

Alberta Electric System Operator (AESO) (Fatima Shariff):

1) The AESO agrees with the need to update the comparison table to include a category for small-scale generation. In addition to the proposed changes, consider adding a row identifying the revenue intention of the generation type such as follows:

- Micro-generation: for self-supply or load-offsetting; not primarily revenue-generating.
- Small-scale generation: primarily revenue-generating.
- Distributed generation: primarily revenue-generating.

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2) In the row titled 'Pool Participant', for small-scale generation, we suggest clarifying that registration with the AESO is still required for the AESO to act as agent for the small-scale generator.

3) The remaining feedback is administrative and being suggested to either add clarity, or increase consistency:

- Reverse the order of the columns so that micro-generation is the first column, small-scale generation is the second, and distributed generation is the third, consistent with their ordering in the title of the section.
- In the row titled "Relationship with energy retailer" replace "no change" with "N/A" as small-scale generation and distributed generation do not have a relationship with energy retailers.
- Consistently refer to 'metering cost' by replacing references to 'cost of installing the required meter' to 'metering cost'.
- Consistently refer to 'metering data management' by replacing 'collection of the electricity data' with 'metering data management'.

SolarNinjas Energy Solutions (Michael Thomas):

This is useful information, not relevant to small micro gen customers but begins to become very interesting in the several MW range.

Howell Mayhew Engineering (Gordon Howell):

it is really good to clarify this. note that "micro-generation" is ****always**** hyphenated because that is how the Micro Generation Regulation uses it.

Pages 4-5

Note that small scale generation units, despite some similarities to both distributed generation units and micro-generation units, are distinct from both. The *Small Scale Generation Regulation* is unique in that it contains provisions for community generation units, which are subject to a community benefits agreement (see Section 3 of the *Small Scale Generation Regulation*).

If you intend to operate a renewable or alternative energy generation unit for profit (as micro-generation unit generation is intended to cover all or a portion of the customer's total annual energy consumption, per Section 1(h)(ii) of the *Micro-generation Regulation*), or one that is larger than five MW, you should discuss how to apply to be a small scale generator with your wires owner.

This expands upon the information added to the table, providing additional detail on the unique features of small scale generation.

Stakeholder Comments:

EPCOR Distribution & Transmission Inc (EDTI) (Brenna Haber):

EDTI agrees that, in either scenario, it is important to engage with the wires owner to discuss how to apply to be a small scale generator.

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SolarNinjas Energy Solutions (Michael Thomas):

See above, useful context. While we still have a lack of clarity regarding the details of “for profit”... and serious concerns about abuse and manipulation by wires owners shrouding industry interference as “safety concerns” or “meeting the requirements of the MG Regulation” by shifting goalposts and relying on a lack of provided clarity. There is the intent and the letter of any law, regulation, or rule. These are often at odds when large private industry and small consumer interests do not align. This was a missed opportunity to offer guidance around the concepts of appropriate timelines for historical data, grace for variation in conditions year over year in modeling, and other things that have either been settled by industry or remain problematic depending on which wires owner is being dealt with.

Howell Mayhew Engineering (Gordon Howell):

// If you intend to operate a renewable or alternative energy generation unit for profit (as micro-generation unit generation is intended to cover all or a portion of the customer's total annual energy consumption, per Section 1(h)(ii) of the Micro-generation Regulation), or one that is larger than five MW, you should discuss how to apply to be a small scale generator with your wires owner. //

----- it is "1(1)(h)(ii)", not "1(h)(ii)"

Page 10	Wires owners are encouraged to provide milestone and project completion timelines to customers at the beginning of a microgeneration project and whenever changes occur during the process. Where timelines are unpredictable or unknown, wires owners are encouraged to provide customers with regular updates and respond to customer inquiries promptly. Customers are also encouraged to respond to wires owner's questions or requests promptly, and to provide all requested information and documentation to the best of their knowledge and ability.	To encourage efficient completion of projects, this provides a framework for communication expectations throughout the microgeneration application and commissioning processes.
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Stakeholder Comments:

Action Electrical Ltd (John Andrus):

Yes. There should be effective, timely updates required by the Wire Service Provider. This should have MAXIMUMS defined to make sure that realistic timelines are met.

Utilities Consumer Advocate (Steven Wilson):

While the encouragement of milestone timelines is appreciated, the absence of standardized connection timelines remains a significant concern for the UCA. As indicated in our original feedback submission, the UCA proposes incorporating minimum connection timeline expectations directly into Rule 024. This would ensure procedural fairness and reduce consumer uncertainty. The UCA believes a regulatory foundation for such standardization is appropriate, and may help to lay the groundwork for the potential inclusion of any similar legislative changes to the Microgeneration Regulation.

UTILITYnet (Darren Chu):

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The wording “regular updates” is too vague. We recommend that the AUC establish a standard for project completion timelines and then set a minimum number of communication touchpoints with customers relative to their specific project. We also recommend the wording be amended to include reference to Consultants who may be acting on behalf of customers. “Customers (or their Consultants) are also encouraged to respond to wires owner’s questions or requests promptly, and to provide all requested information and documentation to the best of their knowledge and ability.”

SolarNinjas Energy Solutions (Michael Thomas):

This is vague and unclear. The wires owner has no place outlining project timelines, they only need to be accountable for project application processing timelines. Your language should be very clear not to mix up “project application” timelines (WSP responsibility) and “project timelines” (a contractor/municipal permit issuer/customer responsibility). Since certain wires owners have a multi year record of being dramatically in violation of the law and guidelines by adding phantom stages to the application process, requesting clarity or corrections where none are logically required, or changing standards on the whim of anyone at any time without any authority to do so, and by not following professional industry norms regarding the updating and dissemination of standardized information, we should focus these comments on simply providing a clear expectation of timelines for processing applications “and for responding to concerns, complaints, adjustments and other communications by customers and their solar industry consultant partners during an active application submission & review”. This stage has almost nothing to do with the customer and is primarily managed by the solar contractor or other responsible consultant. This is a missed opportunity to add clarity regarding the responsibility of wires owners to meet timelines for processing and for prompt handling of active files.

Howell Mayhew Engineering (Gordon Howell):

this text is really good. note that “micro-generation” is ****always**** hyphenated because that is how the Micro Generation Regulation uses it.

Pages 12-13, Section 14

If the wires owner determines that the costs of connecting a particular micro-generating unit are extraordinary, and the Commission agrees, then the wires owner may require the proponent to reimburse the extraordinary portion of the costs.

The original wording has been revised to improve clarity around the potential process for wires owners classifying interconnection costs as “extraordinary.”

Stakeholder Comments:

Utilities Consumer Advocate (Steven Wilson):

The revised wording improves clarity, but the rule should go further by defining what constitutes “extraordinary” costs and establishing thresholds or examples. This would reduce ambiguity and ensure consumers are not subject to arbitrary or inconsistent cost assessments.

EPCOR Distribution & Transmission Inc (EDTI) (Brenna Haber):

EDTI considers “extraordinary” as costs that are required as a result of utility grid assets that need to be relocated, removed, modified and/or upgraded due to the microgeneration requirement.

EDTI requests that the AUC provide or confirm if this definition of “extraordinary” is the same for all wires owners.

ATCO Electric (Greg Marghella):

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ATCO Electric generally supports the change as it provides clarity. ATCO Electric has two recommendations:

(1) Add wording to include costs incurred to study extraordinary/complex micro-generation applications. Currently the wording is restrictive to “connecting a particular micro-generating unit”. However, as experienced, the utilities are undertaking significant efforts in evaluating certain microgeneration applications.

(2) Remove the wording “and the Commission agrees”, possible replace with a sentence at the end “if the customer and utility cannot agree to the extraordinary costs a Dispute can be filed”. For efficiency, the utility and customer should first look to agree to the extraordinary costs, if not the dispute mechanism can be used.

UTILITYnet (Darren Chu):

The wording “extraordinary” is still too vague. Do wires owners have upper and lower boundaries for what is considered a reasonable connection cost, if so how is “extraordinary” quantified relative to said upper/lower boundaries?

SolarNinjas Energy Solutions (Michael Thomas):

Fair clarification. Remains open for a great deal of discussion.

General

Please provide any other feedback you have on the AUC documents, including other proposed changes. Please be specific and provide rationale for all suggestions. Note that the AUC cannot consider changes proposed to the *Micro-generation Regulation* or government policy.

Stakeholder Comments:

Action Electrical Ltd (John Andrus):

It has been seen in the past that the AUC is a good advocate for all parties, and I would like to commend the AUC in this regard and ask that the ‘little people’, which would be the home owners, installers and other stakeholders with less power to effect change, would be given a high standing in new rules that the AUC looks for. It is easy to have power as a wire service provider, it is more difficult and costly to do the same as another party.

Thank you for the ability to comment on the new rules.

Utilities Consumer Advocate (Steven Wilson):

The UCA appreciates the AUC’s efforts to improve Rule 024 and associated guidance documents. However, as discussed in the comments above, several of the UCA’s key concerns remain either unaddressed or only partially addressed:

- The absence of standardized connection timelines continues to pose risks to procedural fairness and consumer certainty. As noted in our original submission, the UCA recommends incorporating minimum connection timeline expectations directly into Rule 024.
- While the submission guideline introduces flexibility for future load additions, the lack of standardized evidence requirements may result in inconsistent affordability and customer experience outcomes across utilities. The AUC should consider codifying acceptable forms of evidence to ensure greater equity.

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- The revised rule does not include any mechanism for post-approval compliance monitoring, which the UCA feels will be an important tool to prevent cost shifting and maintain grid integrity. The UCA recommends threshold-based reporting (e.g., when generation exceeds consumption by more than 10%) as a balanced approach.
- The rule would benefit from a clearer framework for inverter de-rating, including documentation and notification protocols, to support future-ready installations while maintaining compliance.

Additionally, the UCA notes the inclusion of information on small scale generation in the guideline. While helpful, the AUC should ensure that utilities clearly communicate these distinctions to applicants to avoid confusion and misclassification. Further stakeholder engagement may be warranted to explore how small scale generation processes interact with microgeneration pathways, particularly in edge cases.

Alberta Electric System Operator (AESO) (Fatima Shariff):

While no changes to Form C are currently contemplated, the AESO suggests considering some minor updates to Form C to reflect its extended scope as provided in the guideline's description to include other issues such as type of meter or installation concerns.

FortisAlberta Inc (Elizabeth von Engelbrechten):

FortisAlberta recommends that the language in Appendix C of the Micro-generation notice submission guideline be clarified as follows:

Appendix C – Single-line diagram samples

- The two single-line diagram formats, shown below, are examples only. You may refer to these example diagrams for guidance with respect to developing a single-line diagram specific to your micro-generation unit. However, you must consult with the owner of the distribution system to confirm the acceptable engineering standards and format of single-line diagram they will accept for your micro-generation unit project.

This clarification will benefit customers and expedite the receipt and processing of MG applications.

It would also be beneficial for the examples of single-line diagrams to recognize that installations for large MG involve more technical complexity than small MG. To that end, FortisAlberta recommends that there be example single-line diagrams for both a large MG and small MG installation. Alternatively, a clarification could be added that the example provided is representative of small inverter-based MG only.

ATCO Electric (Greg Marghella):

Price Signal for Incomplete Applications - Based on ATCO Electric's experience, as the volume of Micro-Generation increases the utility is spending extended amounts of time addressing incomplete applications & revised re-submissions. To send a price signal to micro-generation applicants, ATCO Electric would suggest a penalty for applications that are incomplete, or revised applications with design changes, and require resubmission. On average, ATCO Electric spends about an hour on each incomplete file, working with the customer/consultant. A fair penalty or price signal would be approximately \$100 per resubmission. ATCO Electric views this as reasonable, fair for all utility customers and provides an appropriate price signal to applicants.

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System Sizing Requirement - Permitting is different for Micro-Generations amongst the various municipalities, where some municipalities do not require sizing in the permit, when the sizing is not in the permit this requires the wires owner to verify the size. ATCO Electric recommends that an inclusion in Rule 024 would bridge the differences in permitting practicing by requiring “a stamped SLD where the permit does not include the sizing be required for all units under 150 kW as required by the wire owner at the time of reviewing the Application.”

Further Engagement – Further engagement is required for virtual power plants. These are new and would have a customer collect interval meter data from multiple sites. ATCO Electric suggests getting ahead of this prior to the increase in requests, including clarifying things such as who pays for the meter when a cumulative meter is defined as the standard meter in the service area and additional service charges given that virtual power plants will require additional time spent by the utility versus a normal micro-generation.

SolarNinjas Energy Solutions (Michael Thomas):

1. Page 11 MG Application process summary top section. Consider adding language advising that “This process is available to the customer but is most often navigated on behalf of the end-user by a professional contractor, engineering consultant, or other entity experienced and qualified to do so.” Or some similar context, as the current language implies the customer can do this themselves, and in the case of many trades that would be illegal or ill advised. Further commentary may be added indicating “communications and requests from the wires owner may be technical in nature and customers should ensure they have or are working with a representative who has the required level of trust, education, experience and/or skill to manage the process.”

Since the blackline suggested language adds advice regarding wires owners and customers communication behavior, it would be logically congruent and helpful to warn about the nature of that communication and clarify the value of assistance or representation. In small MG it is almost unheard of for a customer to be doing this process themselves.

2. Superceding the following comments, the order of operations in the process is wrong, step 5 should be part of step 1 for example, as customers can't do steps 1 through 4 without first having engaged the relevant professional. While step 5 is specific to electrical and in the case of larger MG that may be a correct stage, within step 1 should be more universal language as indicated in comment 3 (below) as in the case of most (if not all) small MG, the entire process would/should be managed by the relevant electrical contractor from start to finish anyways.
3. Page 11 section 1 “plan your mg installation” may add language advising “Following best consumer practices, it may be advisable to engage a professional in the relevant field for your application (installation contractor, designer, engineer, etc) to assist with planning and executing your micro generator installation who will assist with part or all of the remaining steps and the resulting MG installation project. Section 16 clearly states this only in the context of installation, so adding it softly to this point at the beginning establishes it more clearly in industry-wide terms at the appropriate stage, as the final electrical installer may be different from the sales/engineering/solar/other contractor or consultant who plans it and guides the application process.
4. Page 11 section 4 “information requirements by wires owners” should be updated to include an appendix entry or additional language that “wires owners online requirements must (or if unable to be enforced, use language such as ‘should’) be up to date and applications must match their posted standards and requirements” indicating that the practice of certain Wires Owners of changing standards, document requirements, and other things “on the fly” without sufficient technical merit or need

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is discouraged. It is entirely plausible that they adhere to a simple policy that “the standards posted are the standards enforced, changes will be posted online, dated, and come into effect 30 days after that date. The update is then communicated out to stakeholders (master electricians, contractors, anyone signed up to the newsletter used for such notices) promptly (within a week). While this may not be enforceable directly by AUC, inferring language would encourage something along its lines to be implemented. Where such systems are in use, they are effective at streamlining processes, reducing workload on authorities, reducing admin overhead on contractors, and encouraging a clean business environment with significantly less frustration and resentment than we are currently seeing.

5. Page 13 section 5 change point 2 language to read: “It is required that all electrical work be done by certified and experienced electrical professionals.” The remainder of the text is fine as it is. “Installing a micro-generation unit is beyond the scope of most do-it-yourself projects. Safety is imperative. Refer to local electrical authority and Canadian Electrical Code for further requirements”. There is no need for mention of engineering firms here since the engineering firm would be using electrical professionals. It is a legal requirement not a suggestion or recommendation. Where people bend/abuse the law for DIY purposes under the authority of a local municipality, it is already covered by the final comment regarding local electrical authority (AHJ) and Canadian Electrical Code. It is therefore responsible to strengthen that language. Where AUC is not the enforcing party and stating “required” may not be palatable (though it should be) alternate weaker language might be “strongly advised” as a second choice.
6. Correct mislabeled page numbers. i.e. Page 13 containing summary steps 5 through 10 is mislabeled as 11 despite coming immediately after page 12 and further pages are misnumbered accordingly.
7. Page 14 (marked as page 12 incorrectly) point 11 should include an additional note. “Some municipalities may not permit or have special additional requirements regarding ground mounted solar installations on residential properties in urban locations” which is the case in areas such as Edmonton.
8. Page 14 point 14 “project review” change first point language to:

During the review process, the wires owner may contact the micro-generation applicant requesting additional information for clarification **within reason. This may be for correction, clarification, or additional justification but should be complete in one request wherever possible by assessing applications in their entirety to avoid applications returning multiple times.** If the application is **approved accepted**, then the wires owner will proceed with the micro-generation meter installation and grid connection **as soon as reasonably practicable.** This may help to address the practice of certain wires owners to reject an application for “clarification” or “correction” when nothing additional is needed or nothing is wrong. Upon resubmission or update of the application, it is then subjected again to the same process, resulting in months of delays that could have been in a single request or assessment. This is particularly noticeable when the wires owner is facing a busy season and may be under stress due to attempting to meet processing timelines, and applications that are not “accepted as complete” do not negatively impact internally kept statistics used for reporting. This is often how certain wires owners with a 2 to 4 month backlog claim to be processing applications very close to legislated timelines of 14 days. This additional language acts as firm but flexible guidance encouraging good behavior and best practices. Changing the wording from “approved” to “accepted” reinforces the logical statement of section 14 point 2 “cannot reject”.

9. Page 15 section 15 “wires owners approval” – change language to read “acceptance” throughout, congruent with section 14 point 2 above.

Rule 024: Rules Respecting Micro-Generation

Stakeholder comment matrix - November 2025

10. Page 21 (incorrectly labelled page 17) "MG Unit nameplate AC capacity" add language "Where multiple inverters or micro inverters the AC Nameplate capacity will be specified by the electrical contractor or responsible electrical professional and may be different from any single piece of equipment label or sum of ratings. Multiple AC Nameplate ratings may exist and should be explained." We must end the illegal practice of certain wires owners to ignore Canadian electrical code, manufacturers instructions, and electrical engineers by failing to recognize adjusted nameplate capacities in cases such as un-used ports of microinverters for calculating total output. If this is not the correct place to address the issue, it is at least a logical one. It also corrects the incomplete statement "your MG equipment will have a label identifying its nameplate kW capacity" which is only partially true and is written to best suit only installations with a single piece of equipment.
11. Page 21 Change "Estimate customer annual energy consumption" language. Your energy consumption in kilowatt hours (kWh) will be indicated on each electricity utility bill & is available by historic meter data accessible by the wires owner over extended periods of time. ~~Add the kilowatt hours amount indicated on each monthly bill for a year to determine total annual consumption.~~ Establish an annual consumption pattern using billing data, historical meter data, or other supportable means where the above is not available or acceptable. Annual consumption used for sizing MG installations may be immediately recent or historic over time intended to establish a realistic annual consumption where "most recent" year may not be representative or accurate for the purposes of meeting "all or a portion" of consumers energy consumption. While this may require additional consideration, the intent here is to inject reason where it is desperately needed when certain wires owners may (and do) unduly restrict this items interpretation when assessing applications. While settled disputes have established 3 and 5 year historic terms being permissible and different land uses as being acceptable justification to establish more realistic 12 month (annual) consumption patterns, certain wires owners illogical policies such as "most recent 12 months of consumption from time of application" are not only inaccurate, but destructive and tantamount to malicious interference with industry, when their own application processes can take several months, following potentially several months to even a year of customer activity shopping, and then engineering after selecting a provider to built their MG unit. Here we have a non regulatory manner to insert guidance and permission to consider wider data and meet the true intent of a poorly worded regulation being manipulated by a primary stakeholder to restrict industry and act against consumers best interests.
12. Page 21 Change language ~~Based on the nameplate capacity of the microgeneration unit,~~ The micro-generation proponent should calculate or estimate how much alternating current electric energy can be generated from the generating unit per year. (The first part is not accurate technically or relevant.)
13. Page 21 "section four supporting documents required" Add language at the top "Supporting documents should not be overly complicated beyond what is required to meet all relevant codes, safety standards, and to provide the information required for stakeholders to meet their obligations under the MG Regulation, and should meet or exceed posted wires owners documentary requirements as appropriate" Again encouraging posted standards and gently discouraging the current practice of certain wires owners to move goalposts many times per year regarding information requirements as pedantic and silly as wanting a certain data point on a certain page displayed a certain way, which was already included in submissions and other documents according to best industry practices. The practice of inventing a new information request and then requesting correction/clarification on entire groupings of already submitted applications because of something with no real bearing on the wires owners need to meet their obligations under the MG Regulation has been a long standing practice at certain wires owners, particularly when they are failing to meet timelines for processing or when they do not have sufficient trained staff who can read project documents competently. This has been an issue for hundreds of applications per calendar year, and compounds the issue of there being no posted document standards, and no notice/posting of updated requirements with adequate lead time. Legitimate and important standards and changes are lost in the mix of nonsense and the entire experience begins to resemble malicious industry interference, particularly when the wires owner is unable and / or unwilling to clarify the changes or how to meet new requirements promptly, causing significant additional delays.

Rule 024: Rules Respecting Micro-Generation

Stakeholder comment matrix - November 2025

This and other issues of a similar type encourage industry corruption, data manipulation, and efforts to circumvent what is considered by professionals nearly universally to be incompetent, unfair, and/or manipulative interference by manner of process abuse with little recourse.

14. Page 25 “compensation” Remove language ~~The cost of delivering energy is largely fixed and, therefore, cannot be reduced by generating your own electricity.~~ As this is factually inaccurate. Change language Electricity generated and supplied to the site must be offset settled over a 12-month period. (indicating a once annual payout as a minimum requirement which is the current norm). The financial compensation portion is not the correct place to use improper language of offset which refers to units of energy and MG system sizing.

The remainder of this section requires additional revision at some future date.

15. Page 25 & 26 OBLIGATIONS

Add context language above referring to the obligations being exhaustive, or that they are core. Meaning that these obligations MUST be met by the relevant stakeholders but add that once met, an application and project will proceed.

It is important that we limit the tendency of certain wires owners to invent layers and levels to these obligations. Once met, MG applications should proceed.

This minor clarification, supported by enhanced definitions, will help to establish more long lasting respectful relations between industries by curtailing scope creep and wires owners exceeding their needs dramatically to gatekeep the MG industry.

16. Glossary Page 29 Change language

Generator rated capacity

17. Basic measurement unit for the ability of a customer’s generating unit to generate electrical power. This is the rate at which electrical power is generated by a generating unit at a defined set of operating conditions. Such unit of capacity include watt (W), thousand or kilowatt (kW), or million or megawatt (MW). **This rating supplements or replaces a “nameplate” capacity as appropriate and is provided by an MG Proponent as the realistic measured output capacity in AC of their system.** This rating should be provided in addition to Nameplate Capacity in cases where it differs from manufacturer provided labeling, and be supported by additional documentation as needed.

18. Add language

Generator Nameplate Capacity. Nameplate capacity is the rate at which electrical power is generated by a generating unit according to manufacturer provided labeling when fully utilized. Such unit of capacity include watt (W), thousand or kilowatt (kW), or million or megawatt (MW). This rating should be provided in addition to Rated Capacity.

Rule 024: Rules Respecting Micro-Generation Stakeholder comment matrix - November 2025

19. Pages 34 onwards correct formatting.. yellow and blue highlighted data input example areas are badly overlapping, contain issues with headers and footers, and generally unprofessional/poor document formatting.

There are many other notes and comments however time restraints prohibit their inclusion here at this time.

Howell Mayhew Engineering (Gordon Howell):

I was on the team that developed this Notice Submission Guideline in 2008. I drew the diagrams in Appendix C. They are desperately in need of updating.

Please contact me so that we can discuss how I could update these diagrams.

I have also annotated all these review document pdf files with many comments, and have attached them to this e-mail message.

I welcome any discussion about any of this.

ENMAX Corporation (Andrew Davison):

ENMAX has the following suggested changes.

Form A – Micro-generation notice

ENMAX proposes the following changes to Form A:

Preamble:

- The question relating to existing generation capacity and increasing or decreasing generation capacity should be expanded to include, “What is the existing **approved** generation capacity in kW AC?” and “**If you are an existing microgeneration customer**, what is the proposed generation capacity in kW AC?” (bold added to identify the suggested changes).

Table, Section 3:

- The request for “Customer annual alternating current energy consumption in kilowatt-hours (information should be requested from retailer for 12 months)” should be reworded to “information should be requested from retailer for the **previous** 12 months” (bold added to identify the suggested change). This would remove ambiguity around which 12 months to use.

Microgeneration Notice Submission Guidelines

The following comments align with ENMAX’s response to Form A, where ENMAX suggests inverter requirements should not be specified in the AUC documentation but instead should be identified in each wires owner’s technical requirements.

Rule 024: Rules Respecting Micro-Generation Stakeholder comment matrix - November 2025

- Page 16 the question, “Do the inverters comply with the appropriate UL1741 Supplement...” should be replaced with “Do inverters comply with the interconnection requirements outlined by the respective wires owner.”
- Page 41 the statement, “Micro-generation units must also include documentation confirming that they meet the appropriate...” should be replaced with “Micro-generation units must also include documentation confirming that they meet the appropriate industry standards outlined by the interconnection requirements of the respective wires owner.”

Click to upload wires owner logo here

Form A – Micro-generation notice

If you have questions on how to fill in the form, refer to the micro-generation notice submission guideline posted on the AUC website under “Micro-generation” for detailed information.

Some small micro-generation projects may require utility engineering consultation.

Large micro-generation (greater than or equal to 150 kilowatts) project requirements:

- Utility engineering consultation required.
- Stamped single-line diagram required.

Check the appropriate boxes to identify your micro-generation project:

Does the project meet the micro-generation generating requirements?

Yes ☐

No ☐

Are you an existing micro-generation customer?

Yes ☐

No ☐

If yes, please state:

Existing capacity (in kilowatts): _____

Project number (if available): _____

Are you increasing or decreasing the generation capacity?

Yes ☐

No ☐

If yes, please state:

Change in generation capacity (increase or decrease) in kilowatts: _____

Is this notice being used for aggregating multiple sites?

Yes ☐

No ☐

1. Customer identification

Name:		Company name (if applicable):	
Address:		City:	
Province:	Postal code:	Phone:	Fax:
Email address:		Preferred method of contact: Email ☐ Mail ☐ Fax ☐	
Other interested parties:			

2. Consultant identification, if applicable

Third-party authorization form may be required by the wires owner to share customer information and/or sign this form on the customer's behalf.

Consultant name:		Consultant phone number:	
Address:		City:	
Province:	Postal code:	Phone:	Fax:
Consultant email address:		Preferred method of contact: Email ☐ Mail ☐ Fax ☐	

3. Project description

Complete the following information for the generation site. If the project involves aggregated sites, list the sites in the following table with Site 1 as the micro-generator and others as load. Expand the list in separate sheets of paper if required.

Legal land description(s)	Site ID(s)
Site 1 (micro-generator):	Site 1 (micro-generator):
Site 2:	Site 2:
Site 3:	Site 3:
Site 4:	Site 4:
Service address(s):	Retailer name:
Site 1 (micro-generator):	Site 1 (micro-generator):
Site 2:	Site 2:
Site 3:	Site 3:
Site 4:	Site 4:

Energy source of the generator: Solar ☐ Wind ☐ Hydro ☐ Biomass ☐ Fuel cell ☐ Geothermal ☐
Combined heat and power ☐ Other ☐

If other, please specify: _____

Comment: Suggested to add an additional option for "other" to allow flexibility in responding to the possibility that the application is for a hybrid combination of synchronous generation plus inverter. Inclusion of an "other" box is also forward thinking to allow for emerging new technologies.



Type of generator connected to the utility interface: Inverter-based ☐ Induction ☐ Synchronous ☐ Other ☐

Number of units/inverters: _____



~~Do the inverters comply with CSA Standard C22.2 107.1 – Power Conversion Equipment in particular standards respecting Anti-islanding?~~

Comment: The content in box 2 below encapsulates anti-islanding standards and so it is recommended to remove this information to avoid redundancy. The suggested changes are to support compliance in general rather than specific technical requirements.

Yes ☐ No ☐

Do the inverters comply with UL1741 Supplement A – Standard **applicable standards** for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources?

Yes ☐ No ☐

Have you reviewed the applicable wires owner's micro-generator interconnection requirements and terms and conditions?

Yes ☐ No ☐

Micro-generation generating unit total nameplate alternating current capacity in kilowatts:

Site 1: _____

Customer annual alternating current energy consumption in kilowatt-hours (information should be requested from retailer for 12 months).

Site 1: _____

Site 2: _____

Site 3: _____

Site 4: _____

Voltage level of connection:

Phase: Single ☐ Three ☐

Projected total net alternating current annual energy production (kWh) from the micro-generation generating unit(s):

4. Supporting documents required:

Submit the following supporting documentation:

- electrical single-line diagram of the micro-generation system
- site plan or pictures to illustrate the micro-generation unit location
- equipment specification from manufacturer
- applicable certification document(s)
- electrical permit
- electrical inspection report (to be submitted after installation of the micro-generator(s) is completed and inspected)
- documentation verifying that the generator meets the less than or equal to 418 kilograms per megawatt hour limit specified in the Micro-Generation Regulation (combined heat and power unit)
- other supporting document(s), if any, please specify: _____

Have you met all applicable municipal and zoning requirements, including noise rules and by-laws? Yes ☐ No ☐

Please specify: _____

Have you completed the participant involvement program stated in AUC Rule 007? * Yes ☐ No ☐

Please specify: _____

Have you met the requirements stated in AUC Rule 012 Noise Control?* Yes ☐ No ☐

Please specify: _____

Have you met all applicable environmental requirements?* Yes ☐ No ☐

Please specify: _____

Are you aware of any outstanding objections from any person regarding your project?* Yes ☐ No ☐

Please specify: _____

Requested in-service date (YYYY-MM-DD) for connection:

Micro-generation generating unit owner signature:

Submission date:

Consultant signature (if signing on behalf of the customer):

Submission date:

If signing on behalf of the customer, the utility may require a third party authorization to be signed by the customer.

**The micro-generation customer must ensure that the criteria for an exemption from filing an application with the Commission as stated in Section 2 of Rule 007 are satisfied.*

To receive electricity generation credits, the micro-generation customer must notify its retailer or regulated rate provider once the notice is accepted by the owner or in the event that the Commission decides that a disputed unit is a micro-generation generating unit.

5. Electric distribution system wires owner use only:

Owner's notice reference number:	Alberta Electric System Operator asset ID (if any):
Date the complete application was received (YYYY-MM-DD):	Interconnection line:
Accepted: Yes ☐ No ☐ Reason(s) for dispute:	
Interconnection agreement signed? Yes ☐ No ☐ Not applicable ☐	
Meter type: Interval ☐ Cumulative ☐	Substation number at time of interconnection:
Meter installed date (YYYY-MM-DD):	
Remarks:	

Form B – Notice of dispute

To be completed by owner when there is a dispute with respect to the customer's eligibility to become a micro-generator or on the question of extraordinary costs.

~~Information required must include the following~~ The following information is required:

Contact person for the dispute notice:	
Name:	Phone:
Is owner represented by another person?	
Yes ☐ No ☐	
If yes, provide name and contact information (if no, leave blank):	
Name:	Phone:
Is a copy of the micro-generation project notice (Form A) attached?	
Yes ☐ No ☐	
Type of dispute:	☐ Qualification (see below) (Micro-Generation Regulation - Sections 2(2) or 2.1(2)) ☐ Extraordinary costs (Micro-Generation Regulation - Sections 4(3) or 4(3.1))
Dispute rationale:	
"Dispute Rationale (May be attached as additional pages if required):"	
Include comment "If No, explain in rationale"	
If dispute is related to Section 2(2) or 2.1(2), has owner served notice on customer within 14 days?	
Has the wires owner served the customer with notice within 14 days? ☐ Yes	
Please provide the following information, if available:	
1: The maximum acceptable system size for the customer's actual past or projected future consumption, as determined by the wires owner.	
2: The customer's annual electricity consumption for the past 12 months (for existing sites).	
3: The customer's average annual electricity consumption for the past three and five years (if available). If the customer does not have consumption data dating back to three or five years, please provide the average annual electricity consumption for the maximum amount of time available and specify the time period used.	

include "highest 12 consecutive months period in past 3 and 5 years" if available. this has been the standard for previous disputes won by customers/solar industry and we will always seek it from HUF data.

include email

include email

be aware that there are no such forms in existence anymore, wires owners portals replace them. The provided Form A notice is becoming obsolete but their portals should generate some kind of summary of the application which meets the same information requirements.

remove "if available". language already in specific points below "if available" where relevant. It must not be optional to provide these answers, when relevant.

4: The report or energy projections that the wires owner used
Please attach document(s) separately.

incorrect language, use KWH not KW. Also, say "approximate ESTIMATED percentage discrepancy". example to be 5,000kwh and 10,000 kwh for example, not 100 and 200 (more realistic).

5: The approximate percentage discrepancy between the customer's annual electricity consumption and the expected generation of the proposed system (e.g.: if consumption is 100 kW and generation is expected to be 200 kW, respond with '200%').

6: Any calculations ~~representing the output of the proposed~~ microgeneration unit, either conducted by the wires owner or provided by the customer's installer. Please specify all known calculations and variables.
Please attach document(s) separately.

include BOTH conducted by the wires owner and provided by installer. important we identify how inaccurate they are in establishing generation output at the time they decide to dispute

7: If the customer has requested a system size that is expected to generate well in excess of annual consumption due to future load increases, the evidence that the customer has supplied to the utility to justify the load increases.
Please attach document(s) separately.

8: Manufacturer documentation relating to any proposed inverter derates, attached separately.

Yes ☐ No ☐

Dispute rationale:

Please list any ~~Other~~ information attached:

remove "other" and indicate "any and all", best practice is to list all attached info, including answers to above, in one place for reference. this includes "other" information or supporting documents not specifically noted in above points.

Date of submission:

use clearer language "Date of Dispute Submission" so it isnt confused with Date of PV Microgen Submission.

Include second date line: "Date of Micogen submission" so in one place we can see the gap between wires owners claimed original submission date and the date of their dispute submission

Form A – Micro-generation notice

If you have questions on how to fill in the form, refer to the micro-generation notice submission guideline posted on the AUC website under “Micro-generation” for detailed information.

Some small micro-generation projects may require utility engineering consultation.

Large micro-generation (greater than or equal to 150 kilowatts) project requirements:

150 kW DC or AC ??? -- please clarify the MGR and make it AC

- Utility engineering consultation required.
- Stamped single-line diagram required.

Check the appropriate boxes to identify your micro-generation project:

Does the project meet the micro-generation generating requirements?

Yes ☐

No ☐

Are you an existing micro-generation customer?

Yes ☐

No ☐

If yes, please state:

Existing capacity (in kilowatts):

kW DC or AC ??? -- please clarify and make it AC

Project number (if available):

Are you increasing or decreasing the generation capacity?

by "generation" do you mean AC conversion capacity for inverters or DC generation capacity for PV arrays? Please clarify and make it "AC inverter capacity".

If yes, please state:

Change in generation capacity (increase or decrease) in kilowatts:

Is this notice being used for aggregating multiple sites?

Yes ☐

No ☐

1. Customer identification

Name:

Company name (if applicable):

Address:

City:

Province:

Postal code:

Phone:

Email address:

Preferred method of contact: Email ☐ Mail ☐ Fax ☐

Other interested parties:

2. Consultant identification, if applicable

Third-party authorization form may be required by the Wires Owner to share customer information and/or sign this form on the customer's behalf.

Consultant name:		Consultant phone number:	
Address:		City:	
Province:	Postal code:	Phone:	
Consultant email address:		Preferred method of contact: Email ☐ Mail ☐ Fax ☐	

3. Project description

Complete the following information for the generation site. If the project involves aggregated sites, list the sites in the following table with Site 1 as the micro-generator and others as load. Expand the list in separate sheets of paper if required.

Legal land description(s)	Site ID(s)
Site 1 (micro-generator):	Site 1 (micro-generator):
Site 2:	Site 2:
Site 3:	Site 3:
Site 4:	Site 4:
Service address(s):	Retailer name:
Site 1 (micro-generator):	Site 1 (micro-generator):
Site 2:	Site 2:
Site 3:	Site 3:
Site 4:	Site 4:
Energy source of the generator: Solar ☐ Wind ☐ Hydro ☐ Biomass ☐ Fuel cell ☐ Geothermal ☐	
Combined heat and power ☐ Other ☐	
If other, please specify: _____	

does this mean urban lot block and plan, or Alberta Township System (ATS) position of corner of quarter section, section #, township #, range #, meridian #, legal subdivision, feet west of position and feed north of position ?

CHP is not an energy source, it is an energy generation technology...

just like for PV systems, solar is the source, but PV is the technology.

Type of generator connected to the utility interface: Inverter-based ☐ Induction ☐ Synchronous ☐

Number of units/inverters: _____

Do the inverters comply with CSA Standard C22.2 107.1 – Power Conversion Equipment in particular standards respecting Anti-islanding?

what is this grammar supposed to mean?

Yes ☐ No ☐

Do the inverters comply with the appropriate UL1741 Supplement A – Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources?

Yes ☐ No ☐

no... a "micro-generator" is defined by the MGR as a customer who has provided the owner with the MG Notice. MGs don't have interconnection requirements -- only MGGUs and DERs have those requirements. This should say "MGGU" instead.

Have you reviewed the applicable wires owner's micro-generator interconnection requirements and terms and conditions?

Yes ☐ No ☐

Micro-generation generating unit total nameplate alternating current capacity in kilowatts:

Site 1: _____

Are two MGGUs permitted to feed the same consumption site as an aggregated site? For example if one consumption site uses 100 MWh per year, could two MGGU PV sites each generating 40 MWh per year feed that one consumption site?

Customer annual alternating current energy consumption in kilowatt-hours (information should be requested from retailer for 12 months).

Site 1: _____

Site 2: _____

Site 3: _____

Site 4: _____

Voltage level of connection:

Phase: Single ☐ Three ☐

Projected total net alternating current annual energy production (kWh) from the micro-generation generating unit(s):

4. Supporting documents required:

Submit the following supporting documentation:

- electrical single-line diagram of the micro-generation system
- site plan or pictures to illustrate the micro-generation unit location
- equipment specification from manufacturer
- applicable certification document(s) certification of what?
- electrical permit
- electrical inspection report (to be submitted after installation of the micro-generator(s) is completed and inspected)
- documentation verifying that the generator meets the ~~less than or equal to 418 kilograms per megawatt hour limit~~ specified in the Micro-Generation Regulation (combined heat and power unit) emissions limit
- other supporting document(s), if any, please specify: _____

why is the term "production" used instead of "generation", since we are speaking of "micro-generation generating units" and not "micro-production producing units"? this is the only example of the use of the term "production" in this document. The original questionnaire about Rule 024 never used the word "production". Rule 024 itself never uses the word "produce".

no... a "micro-generator" is defined by the MGR as a customer who has provided the owner with the MG Notice. MGs don't get installed and inspected -- only MGGUs get installed.

no... the MGR requires that ALL MGGUs have to meet this requirement or be EcoLogo certified.

Have you met all applicable municipal and zoning requirements, including noise rules and by-laws? Yes ☐ No ☐

Please specify: _____

Have you completed the participant involvement program stated in AUC Rule 007? * Yes ☐ No ☐

Please specify: _____

Have you met the requirements stated in AUC Rule 012 Noise Control?* Yes ☐ No ☐

Please specify: _____

Have you met all applicable environmental requirements?* Yes ☐ No ☐

Please specify: _____

Are you aware of any outstanding objections from any person regarding your project?* Yes ☐ No ☐

Please specify: it is very easy to not be aware, when we don't ask and don't tell anyone

Requested in-service date (YYYY-MM-DD) for connection: thank you very much for using Canada's format for calendar dates. I use it all the time too.

Micro-generation generating unit owner signature:

Submission date:

Consultant signature (if signing on behalf of the customer):

Submission date:

If signing on behalf of the customer, the utility may require a third-party authorization to be signed by the customer.

when it says "customer" here, how does "customer" relate to "MGGU owner" in the previous box? Shouldn't the reference be the same?
or should the previous box say "MGGU Customer" instead of "MGGU Owner", since the the generator has not been accepted as a MGGU at the time of the submission of this MGN.
or should this Form A only say "customer" and not even "MGGU customer'...?

**The micro-generation customer must ensure that the criteria for an exemption from filing an application with the Commission as stated in Section 2 of Rule 007 are satisfied.*

To receive electricity generation credits, the micro-generation customer must notify its retailer or regulated rate provider once the notice is accepted by the owner or in the event that the Commission decides that a disputed unit is a micro-generation generating unit.

It would be really helpful if all of these questions on the form were assigned a sequential ID number so that they could easily be referenced when speaking on the telephone or by e-mail.

5. Electric distribution system wires owner use only:	
Owner's notice reference number:	Alberta Electric System Operator asset ID (if any):
Date the complete application was received (YYYY-MM-DD):	Interconnection line:
Accepted: Yes ☐ No ☐ Reason(s) for dispute:	
Interconnection agreement signed? Yes ☐ No ☐ Not applicable ☐	
Meter type: Interval ☐ Cumulative ☐	Substation number at time of interconnection:
Meter installed date (YYYY-MM-DD):	
Remarks:	

Form B – Notice of dispute

To be completed by owner when there is a dispute with respect to the customer's eligibility to become a micro-generator or on the question of extraordinary costs.

~~Information required must include the following~~ The following information is required:

Contact person for the dispute notice:

Name:

Phone:

Is owner represented by another person?

Yes ☐ No ☐

If yes, provide name and contact information (if no, leave blank):

Name:

Phone:

Is a copy of the micro-generation project notice (Form A) attached?

Yes ☐ No ☐

Type of dispute:

- ☐ Qualification (see below)
(Micro-Generation Regulation - Sections 2(2) or 2.1(2))
- ☐ Extraordinary costs
(Micro-Generation Regulation - Sections 4(3) or 4(3.1))

Dispute rationale:

the term "owner" has been defined in the MGR as "owner of an electric distribution system", so I would think that we do not need to say "wires owner" because "owner" is already defined, and is also used successfully previously in this document.

If dispute is related to Section 2(2) or 2.1(2), ~~has owner served notice on customer within 14 days?~~

~~Has the wires owner served the customer with notice within 14 days?~~ ☐ es ☐ No

Please provide the following information, if available:

- 1: The maximum acceptable system size for the customer's actual past or projected future consumption, as determined by the wires owner.
- 2: The customer's annual electricity consumption for the past 12 months (for existing sites).
- 3: The customer's average annual electricity consumption for the past three and five years (if available). If the customer does not have consumption data dating back to three or five years, please provide the average annual electricity consumption for the maximum amount of time available and specify the time period used.

the issue is ****never**** "kW" of consumption or generation, it is "kWh" of consumption or generation.

4: The report or energy projections that the wires owner used to project future annual consumption (for new sites). Please attach document(s) separately.

5: The approximate percentage discrepancy between the customer's annual electricity consumption and the expected generation of the proposed system (e.g.: if consumption is 100 kW and generation is expected to be 200 kW, respond with '200%').

the % discrepancy between 100 kWh and 200 kWh is not at all "200%" using accepted rules of mathematics -- it is 100%.

6: Any calculations representing the output of the proposed microgeneration unit, either conducted by the wires owner or provided by the customer's installer. Please specify all known assumptions and variables. Please attach document(s) separately.

note that "micro-generation" is ****always**** hyphenated because that is how the *Micro_Generation Regulation* uses it.

7: If the customer has requested a system size that is expected to generate well in excess of annual consumption due to future load increases, the evidence that the customer has supplied to the utility to justify the load increases. Please attach document(s) separately.

8: Manufacturer documentation relating to any proposed inverter derates, attached separately.

I have never heard of a manufacturer derating their inverter except in of theoretical operating temperature, and which are very minor.

Yes ☐ No ☐

Dispute rationale:

Please list any Other information attached:

Date of submission: _____

Micro-generation notice submission guideline

Version 2.0 issued May 2019

this version number and date desperately need to be updated !!! this has not changed notwithstanding that many changes have been made to this document.

I was on the 3-person team that developed this MG Notice Submission Guideline in 2008. This document is desperately in need of updating.

I have annotated this document with many of the changes that need to be made to it.

I welcome any discussion about any of this.

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► Introduction

This guideline provides specific safety, electrical and procedural aspects and a summary of the processes required to obtain approval for micro-generation connection to the grid. It also outlines obligations of micro-generation applicants, electrical contractors, energy retailers and wires owners with information about connecting micro-generation to the electrical grid.

Installation must be done with careful consideration to legal matters, safety, equipment and installation.

► Background

The *Micro-Generation Regulation*, enacted in 2008, simplifies the process by which Albertans using renewable resources or alternative energy, obtain approval to generate their own electricity and receive credit for the electricity they generate but do not consume.

When the regulation was passed, the Alberta Utilities Board developed processes to simplify approvals for micro-generation owners. More detailed information on the process is available in [Rule 024: Rules Respecting Micro-Generation](#).

“Micro-generation generating units are those that produce more energy than is consumed on-site for their own use, are considered commercial and are eligible to be a micro-generator.”

Micro-generation generating units that produce more energy annually than has been historically consumed at the customer site are not eligible and will be denied by the wires owner. Future load additions may be considered if there is sufficient evidence acceptable to the wires owner ([proof of purchase, stamped engineering drawings, inspection reports, etc.](#)) that consumption will increase.

Micro-generation generating units that are found to be not in compliance with the wires owner's terms and conditions and interconnection operating agreements may be disconnected.

► Disclaimer

This document does not provide installation guidance nor is it intended as legal advice. All measures have been taken to provide sound advice and procedures. However, it is the micro-generation owner's responsibility to ensure all legal, health, safety, insurance and municipal requirements are adhered to. Concerns should be directed to your wires owner, electrical contractor, equipment supplier, insurance company and any governing body where safety codes and conduct are in question.

Note:

The terms applicant, micro-generation owner, micro-generation project proponent, micro-generation customer, you and your, are interchangeable throughout this document for ease of readability.

why is the term "production" used instead of "generation", since we are speaking of "micro-generation generating units" and not "micro-production producing units"? this is the only example of the use of the term "production" in this document. The original questionnaire about Rule 024 never used the word "production". Rule 024 itself never uses the word "produce". We have the common term "genset" meaning "engine-generator set", but we never have "prodset" !

the word "produce" is typically used by the oil and gas industry to indicate what they extract from the ground, as in the production of oil, gas and brine. Electricity generators "generate".

sadly the MGR uses the word "produce" 3x and "generate" only once -- it needs to consistently use "generate" when it comes to electricity.

► Differences between micro-generation, small scale generation and distributed generation

It is necessary to distinguish the differences between micro-generation, small scale generation and distributed generation to ensure that a project proponent is applying for the correct classification for his or her their generating unit.

The major differences are listed below:

	Distributed generation	<u>Small scale generation</u>	Micro-generation
Fuel sources	Can use renewable or non-renewable resources	<u>Must use renewable resources or alternative energy</u>	Must use renewable resources or alternative energy
Generation capacity	Up to the limit specified by the wires owner	<u>Up to the limit of the electric distribution system hosting capacity at the interconnection point</u>	Less than five megawatts or the hosting capacity?
Compensation method	Receive cash (based on pool prices) from the Alberta Electric System Operator for electricity generation	<u>Receive cash (based on pool prices) from the Alberta Electric System Operator for electricity generation</u>	Receive credits from retailer which are applied to monthly electricity bill. (Please refer to Section 7 of the <i>Micro-Generation Regulation</i>)
Metering	Distributed generation owner is responsible for the metering cost and metering data management	<u>Wires owner is responsible for the costs of metering data management. Small scale generation owner is responsible for the metering costs (except in the case of community generation, where the wires owner is responsible).</u>	Wires owner is responsible for the cost of installing the required meter and the collection of the electricity data
Pool participant	Must register with the Alberta Electric System Operator to become a pool participant	<u>The Alberta Electric System Operator, unless requested otherwise, acts as pool participant on the small scale generator's behalf.</u>	Not required to register with the Alberta Electric System Operator
Relationship with energy retailer	No change	<u>No change</u>	Need to notify retailer of becoming a micro-generation customer

I believe that the correct term is "meter data management"... this is how the AUC Rule 021 (system settlement code) uses the term. Strict adherence to defined terms is very important in order to reduce confusion.

Note that small scale generation units, despite some similarities to both distributed generation units and micro-generation units, are distinct from both. The *Small Scale Generation Regulation* is unique in that it contains provisions for community generation units, which are subject to a community benefits agreement (see Section 3 of the *Small Scale Generation Regulation*).

If you intend to operate a renewable or alternative energy generating unit for profit (as micro-generation unit generation is intended to cover all or a portion of the customer's total annual energy consumption, per Section 1(h)(ii) of the *Micro-generation Regulation*), or one that is larger than five MW, you should discuss how to apply to be a small scale generator with your wires owner.

Proponents seeking approval for distributed or small scale generation need to follow Rule 007: Applications for Power Plants, Substations, Transmission lines, ~~and~~ Industrial System Designations, ~~and~~ Hydro Developments and Gas Utility Pipelines.

Proponents seeking approval for micro-generation need to follow Rule 007 in regard to the participant involvement program.

In order to be classified as a micro-generation customer, the generating unit must meet the provisions stated in the *Micro-Generation Regulation*, Section 1(1)(h), restated as follows:

“micro-generation generating unit means a generating unit of a customer that:

- i. exclusively uses sources of renewable or alternative energy, the MGR also says “to supply electric energy” here.
- ii. is intended to meet all or a portion of the customer’s total energy consumption at the customer’s site or aggregated sites,
- iii. has a total nameplate capacity that does not exceed the lesser of five megawatts or the rating of the customer’s service,
- iv. supplies electric energy only to a site that is located on property that the customer owns or leases, and
- v. is located
 - a. on the property referred to in subclause (iv), or
 - b. on property that the customer owns or leases that is adjacent to the property referred to in subclause (iv).”

► Legal and related matters

Electrical installations are subject to strict legal and municipal regulations including relevant health and safety legislation. Micro-generation applicants need to be aware of the requirements of relevant municipal permitting regulations, installation obligations, electrical safety and manufacturer compliance. Before commencing work, it is advisable to consider the matters covered below and throughout the document.

Building regulations

Applicants need to contact their municipal permitting department to determine if a development permit is required. Before installing micro-generation equipment to a home or building, the applicant needs to consider the structural condition of the building. The micro-generation project proponents should check with their local municipal building safety authority to confirm any building regulations and to determine whether their micro-generation generating unit requires a building permit.

Compensation for exported electricity

Applicants must notify their electricity retailer once their application is approved by their wires owner. This will ensure applicants are registered so that the retailer can apply credit for exported electricity from the micro-generation generating unit.

Electrical safety

Installing a micro-generation generating unit brings unique considerations for electrical safety. Extreme caution must be taken to avoid any electric shocks. A certified electrical contractor is required to install a commercial micro-generation unit. Some municipalities prohibit homeowners from installing their own micro-generation unit, and it is highly recommended that homeowners in all municipalities hire an electrical contractor to install their residential unit. It is also advised that the micro-generation proponents consult with their insurance company regarding the micro-generation unit insurance policy matters.



Equipment certification

The installer must refer to the specifications of the micro-generation equipment and the manufacturer's installation document to confirm the ~~micro-generating~~ micro-generation unit complies with all relevant local and provincial electrical safety requirements or standards. Micro-generation applicants are strongly encouraged to contact their wires owner to discuss the micro-generation equipment intended to be installed.

Additional requirements for wind micro-generation units

Development of a wind-powered micro-generation unit requires specific approval from NAV CANADA, Transport Canada and Alberta Transportation. Approval ensures that micro-generation installations comply with requirements of air navigation, aeronautical safety and highway development control.

Micro-generation approval processes

Approval for micro-generation installation is provided as follows:

kW DC or AC ??? -- please clarify and make it AC

- i. For small (i.e. less than 150 kilowatts) and large micro-generation units (i.e. between 150 kilowatts and five megawatts), the micro-generation proponent needs to submit a micro-generation notice ~~application~~ to their wires owner for assessment. The ~~application form~~ is available on the AUC's and wires owner's websites. Once it is determined that the micro-generation project meets all requirements, the wires owner will notify the applicant and install the required meter.

it is specifically called a "Form A - MG Notice".
referring to it as something other than the text on its own title creates confusion.
- ii. If the micro-generation project fails to meet all the criteria as set out in the *Micro-Generation Regulation*, Section 1(1)(h), the wires owner would file a notice of dispute to the AUC for decision. The notice of dispute form is available on the AUC's and wires owner's website. The wires owner can use the same form on the dispute of extraordinary costs (such as transformer upgrade, protection relay, etc.) for micro-generation projects. The notice of dispute must be submitted through the AUC's eFiling System. Follow the links below to access and learn how to use the eFiling System:

[eFiling System](#)
[How to use the eFiling System](#)

"Form B - Notice of Dispute" as it is known

- iii. For issues such as metering costs, type of meter to be installed, etc., the micro-generation applicant should file a notice of complaint to the AUC for decision. The notice of complaint is available on the AUC's and wires owner's website.

"Form C - Notice of complaint" as it is known

Applicable AUC Rules

All micro-generation project proponents must comply with requirements stipulated in [Rule 007](#), [Rule 012](#), [Rule 024](#). Although micro-generation applicants are not required to file applications with the AUC for approval to connect to the grid, micro-generation applicants are required to demonstrate their compliance to the *Micro-Generation Regulation* and applicable AUC rules to the wires owner.

AUC Rule 012: Noise Control

Combined heat and power units or wind turbine noise output can vary widely across different products.

Most products sold today come with a noise rating. It is important to consider the noise rating when installing a wind turbine or other micro-generation equipment.

For example, for wind turbine projects, the permissible sound level requirements stated in Rule 012 should be met. Noise complaint issues for micro-generation projects will be dealt with in accordance with Rule 012.

► Micro-generation generating units – types and size

Types

A range of simple, safe and reliable micro-generation technologies are available for domestic use. These primarily include solar, wind, hydro, fuel cell, geothermal, biomass or other generation sources, if the greenhouse gas intensity of the electric energy produced, or the total energy produced from the simultaneous generation of electric energy and production of thermal energy from the same fuel source is less than or equal to 418 kilograms per megawatt hour.

Size

In Alberta, micro-generation size is defined as being a generating capacity less than five megawatts. This document deals with two categories of micro-generation units as follows:

Generating unit classification	Capacity size
Small micro-generation	<150 kW
Large micro-generation	> = 150 kW but < 5 MW

kW DC or AC ??? -- please clarify and make it AC



Example micro-generation system

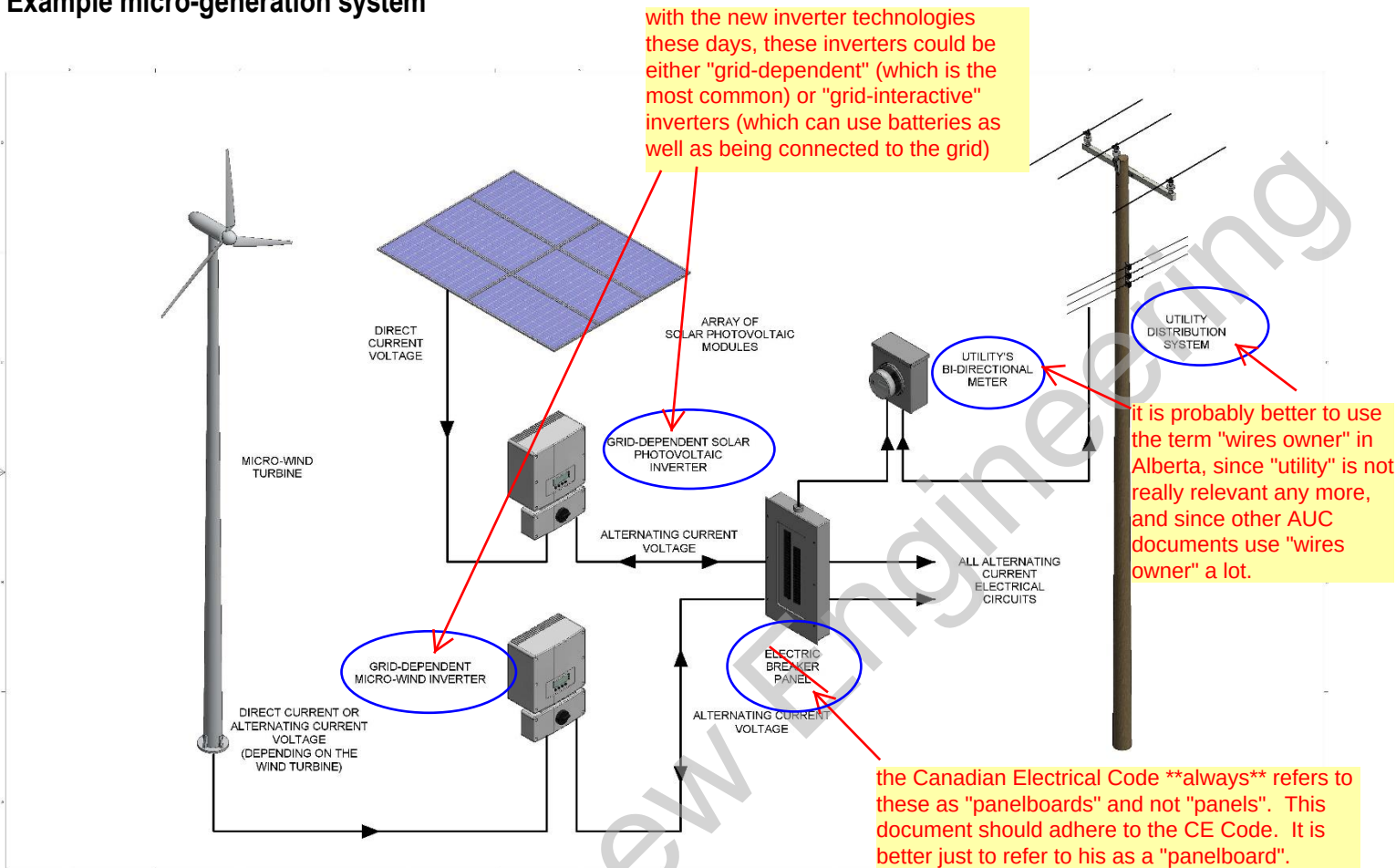


Figure 1. Example of wiring connections and devices for a grid-connected micro-generation wind and solar photovoltaic system.

Notes:

- Figure 1. is not representative of a single-line diagram to be used for application submission.
- The solar photovoltaic and micro-generation wind systems illustrated above are included only to show how they are configured. Having both systems is not typical.
- These systems can operate in parallel with each other, but are otherwise not interconnected.
- A battery bank may also be included.
- Excess electricity is exported to the grid. ~~Additional~~ ^{Deficit} electricity is supplied from the grid.
- Refer to local electrical authority and *Canadian Electrical Code* for further requirements.
- See steps three and four of the micro-generation application process summary for further details.

when you say electrical authority, do you mean wires owner and / or municipal electrical permitting department?

► Principal stakeholders

Since the micro-generation unit will be connected to the electrical distribution grid, several governing bodies are involved in ensuring system safety, the processing of approvals and managing the administration. These include:

Alberta Utilities Commission:

Sets out requirements for micro-generation sites and specifications. Make decisions about micro-generation if a dispute arises.

Alberta Electric System Operator:

Reports on the number of micro-generation sites and installed capacity.

Energy retailer:

Provides credits to micro-generation customers on a monthly basis and manages the administration requirements.

Electrical inspectors:

Ensure *Canadian Electrical Code* standards are met for all micro-generation installations.

Wires owner:

Provides metering and connection of the micro-generation generating unit to the distribution system.

See the glossary in [Appendix A](#) for descriptions of each principal stakeholder.



► Micro-generation application process summary

This section provides a quick summary of the steps that need to be taken to become a micro-generator. The steps are not necessarily in sequential order as many need to happen in parallel.

Wires owners are encouraged to provide milestone and project completion timelines to customers at the beginning of a microgeneration project and whenever changes occur during the process. Where timelines are unpredictable or unknown, wires owners are encouraged to provide customers with regular updates and respond to customer inquiries promptly. Customers are also encouraged to respond to wires owner's questions or requests promptly, and to provide all requested information and documentation to the best of their knowledge and ability.

The MGR ****always**** shows micro-generation with a hyphen, and so should we always.

1



Plan your micro-generator installation

- Consult with your neighbours and any landowners or residents that will be affected by your project. For example, there may be visual concerns for solar installations and visual and noise concerns for wind turbine installations.
- Check municipal permit requirements and noise bylaws.

2



Contact your electric energy retailer

- In order to obtain compensation for electrical energy exported onto the electricity distribution system, a micro-generator must notify the electricity energy retailer that they intend to become a micro-generator. It is also recommended to notify the retailer of the micro-generation unit's connection date.
- Refer to the Retailers and Distributors page of ucahelps.alberta.ca for a list of all [energy retailers](#).

3



Contact your wires owner

- Micro-generation project proponents must contact their wires owner and inform them of plans to install a micro-generation unit. The micro-generation proponent must provide all required information to the wires owner. It is important to communicate your project plan prior to any micro-generation unit construction. See [Appendix B](#) for contact information.
- If the micro-generation capacity is less than five megawatts and complies with all requirements as stated in [Rule 024](#), the wires owner will assess the application for metering and connection. Micro-generation project proponents are required to meet the wires owner's terms and conditions for connection and sign an interconnection and operating agreement with the wires owner.

4



Micro-generator information requirements by wires owner

- Download and read the wires owner's technical requirements from their website. All required documents must be submitted to the wires owner for review. The information requirements consist of equipment safety and information. It is advised that micro-generation project proponents also download and read the wires owner's

terms and conditions document for connecting their generation unit.

- [Appendix D](#) provides samples of interconnection and operating agreements. It is also important for micro-generation proponents to communicate their generation plan with the wires owner prior to any generation equipment purchase or start up.

if a PV system is turned off or removed (as I did after 28 years), does the MG need to communicate anything to the Wires Owner?

5



Electrical consultation

- ▶ Consult with one or more certified electrical contractors and/or engage engineering consulting firms.
- ▶ It is recommended that all electrical work be done by certified and experienced electrical contractors and/or engineering firms. Installing a micro-generation unit is beyond the scope of most do-it-yourself projects. Safety is imperative. Refer to local electrical authority and *Canadian Electrical Code* for further requirements.

electrical work can only be done by electricians, and in some cases by homeowners -- and never by engineering companies. Engineering companies can only do design and development work, and not installation work.

6



Confirm your legal land description

- ▶ Your legal land description is required when filling out a micro-generation notice application form.

- ▶ If you do not know this information, contact an Alberta Registry agent or local municipal taxation office for help.

does legal land description mean urban lot block and plan, or Alberta Township System (ATS) position of corner of quarter section, section #, township #, range #, meridian #, legal subdivision, feet west of position and feed north of position ?

7



Additional requirements for wind micro-generation units

- ▶ Wind micro-generation units require approval from additional regulatory bodies including NAV CANADA, Transport Canada and Alberta Transportation.
- ▶ Wind-turbine micro-generation proponents also need to be aware of [Rule 012](#). Micro-generation proponents are required to comply with the noise bylaws of their municipality as well as Rule 012.

8



Prepare site plan

- ▶ Prepare a site plan or picture to illustrate where the micro-generation unit will be located.
- ▶ A site plan may be required for the municipal development permit.
and also an elevation drawing

9



Prepare a single-line diagram

- ▶▶ Micro-generation applicants need to submit an electrical single-line diagram with a micro-generation notice application form to the wires owner. Samples of single-line diagrams are provided in [Appendix C](#).
- ▶▶ Large micro-generation notice applications (greater than or equal to 150 kilowatts) will require a single-line diagram stamped by a professional as designated by The Association of Professional Engineers and Geoscientists of Alberta (APEGA) or The Association of Science and Engineering Technology Professionals of Alberta (ASET).

Form A - Micro-Generation Notice

Form A - Micro-Generation Notice

10



Confirm equipment certification

- ▶ Physically check the electrical certification mark on all equipment to ensure it is meeting the appropriate Canadian standards.
- ▶ Contact the wires owner or local electrical inspector for questions on equipment certification. Refer to applicable wires owner interconnection requirements for certification details.

yes, very important -- and the certification mark is not well understood by PV installers. The certification mark is the logo of the certifying company -- the certification mark is **not at all** the standard to which the product is certified. See Alberta Standata LEG-ECR-2 for all the details about the acceptable certification marks.

11



Obtain municipal permits

- ▶ Contact your local ~~municipality~~ permit office to confirm whether a development permit, building permit and emergency response plan are required. It is very important to obtain permits prior to installation of any micro-generation equipment.
- ▶▶ Note: some municipalities may not permit wind turbines to be installed on residential properties in urban locations.

12



Complete the micro-generation notice application form

Form A - Micro-Generation Notice

Form A - Micro-Generation Notice

- ▶▶ Complete the micro-generation notice application form along with all applicable documents. [Rule 024](#) and wires owner websites have the micro-generation notice application form available for download.

Form A - Micro-Generation Notice

- ▶ Applicable documents may include:

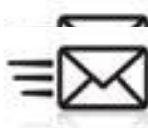
- electrical single-line diagram of the micro-generation system
- site plan or pictures to illustrate the micro-generation unit location
- equipment specification from manufacturer
- applicable certification document(s)
- electrical permit
- ~~electrical inspection report (to be submitted after micro-generation installation on micro-generator(s) is completed and inspected)~~
- documentation verifying that the generator meets the less than or equal to 418 kilograms per megawatt hour limit specified in the *Micro-Generation Regulation* (combined heat and power unit)
- development permit
- building permit
- noise documents related to wind turbine generator
- environmental impact assessment documents
- proof of existing site consumption and any new site consumption additions (including calculations, proof of purchase and proof of installation)

who asks for this?	municipal electrical permit office	wires owner
	x	x
	x	x
	x	x
...		

people consider that this list is mandatory ... so it might be good to put this into a table that indicates where to find out who to ask for each of these

~~on micro-generator(s) is~~

13



Submit the micro-generation notice application form

Form A - Micro-Generation Notice

- ▶ Submit the micro-generation notice application form to your wires owner along with the related documents.

14



Micro-generation project review

- ▶▶ During the review process, the wires owner may contact the micro-generation applicant requesting additional information for clarification. If the application is approved, then the wires owner will proceed with the micro-generation meter installation and grid connection.

- ▶ A wires owner cannot reject a micro-generation notice application. If they don't consider the micro-generation project meets the micro-generation criteria as stated in the *Micro-Generation Regulation*, they are required to file a notice of dispute with the AUC. The AUC will then determine whether or not the micro-generation unit meets the criteria. "Form C - Notice of complaint"

- ▶ A Wires owner may require upgrades to applicable ~~customer-owned~~ equipment, their service or ~~the wires~~ owner's system to ensure ~~their~~ micro-generation unit can be safely connected to the grid. [If the wires owner](#) ~~the~~ ~~customer-owned~~ ~~their distribution~~

determines that the costs of connecting a particular micro-generation unit are extraordinary, and the Commission agrees, then the wires owner may require the proponent to reimburse the extraordinary portion of the costs. ~~The proponent may be responsible for costs as determined by the wires owner.~~

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15



Wires owner approval

- ▶ The wires owner will provide the micro-generation applicant with a confirmation when the micro-generation project is approved and arrange appropriate meter installation and grid connection.
- ▶▶ For micro-generation dispute or complaint notices, the AUC will follow the application review process and make a decision. The micro-generation project proponent and the wires owner are responsible for the required actions as stated in the AUC's decision.

16



Install your micro-generation unit

- ▶ It is strongly advised that micro-generation project proponents engage certified and experienced electrical contractors or engineering firms for installation of a micro-generation unit.

electrical work can only be done by electricians, and in some cases by homeowners -- and never by engineering companies. Engineering companies can only do design and development work, and not installation work.

17



Application for electrical inspection

- ▶▶ After the micro-generation unit is installed, a final electrical inspection must be done prior to operating the generating unit. The inspection will be done by the municipality's electrical inspector, and perhaps also by staff from the wires owner.
- ▶ An electrical inspection report is to be submitted to the wires owner after the micro-generation unit is installed.

make sure to obtain and keep

- ▶▶ Note: ~~consider obtaining~~ copies of the certificate of inspection and all related documents.

18



Meter or service line modifications

- ▶ The wires owner makes any modifications that may be required to the meter or ~~the wires owner's~~ ^{their distribution} system to ensure their micro-generation unit can be safely connected to the grid. The proponent may be responsible for costs as determined by the wires owner.
- ▶ Where necessary, micro-generation applicants will be offered either a bi-directional cumulative meter or a bi-directional interval meter. The wires owner will install the required meter in accordance with the micro-generation unit classification specified in the *Micro-Generation Regulation*.
- ▶ The wires owner will only connect the micro-generation units that meet all safety and connection requirements.
- ▶ Large micro-generation applications will have additional requirements that typically require further time prior to compensation.

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► Guidelines for filing a micro-generation notice application form

Micro-generation proponents can access the micro-generation notice application form from [Rule 024](#). The following guidelines provide detailed information to help applicants complete the ~~micro-generation application notice form~~.

this is not at all what it is called... !!! it is called the "Form A - Micro-Generation Notice".

this submission guideline document needs to be creating clarity and not confusion in its use of terms and descriptions.

Section one: Customer identification

Name

Enter the name you want to appear in legal documents.

Company name (if applicable)

Enter the company name you want to appear in legal documents if a company is responsible for owning and operating the micro-generation unit.

Customer contact information

Enter your address, phone number, fax number (optional) and email address.

Other interested parties

Enter the names and contact information of any other parties who may have a say in the functioning, legalities or aesthetics of the micro-generation unit. This could include a property owner or a business partner.

Section two: Consultant identification

Consultant name

Enter the name of the person or company who has aided you in completing your micro-generation notice application form, if applicable. The consultant will be regarded as the second line of contact in the event the wires owner cannot reach you if further clarification is needed.

Consultant contact information

Enter your consultant's phone number, email address and current business mailing address.

Section three: Project description

If the micro-generation project involves aggregated sites, make sure you identify each site's details individually. Expand the aggregated sites list on a separate sheet of paper, if required.

Address options, enter one of the following:

These addresses are described fully in [Rule 021](#): *Settlement System Code Rules* found in Table 5. titled "Site ID catalogue transaction (SID)" [on page 62](#).

Civic address

Format: unit number, house number, street name, street direction, city/town name

Lot/block/plan

Format: legal lot, block, government plan ID

Rural address (also known as “911 address” or “blue sign address”)

Format: address lot ID, address pre-road number, address road type, address post road number

Example: “54 26540 Range Road 11”

Legal land description

Format: legal subdivision (LSD), LSD quadrant, quarter section, section, township, range, meridian

Unformatted address

(If no other address format available)

Legal land description(s)

For aggregated sites provide for each site the legal land description as described under the site legal land description section.

Site ID(s)

Enter your site identification number. Site identification numbers are required for each electrical installation in Alberta.

You can find your site ID number on your electricity utility bill. If you are aggregating sites, please enter all the site IDs.

New utility installations require a new site ID. Contact your wires owner and inform them of your plans to install a micro-generation site and be assigned a site ID.

Service address(s)

Enter the service address where you plan on installing the micro-generation unit, in the first line.

Examples:

Home installation

If you want to install a solar photovoltaic system on your home, you would enter your home address.

Rural/farm installation

If you want to install a wind turbine on your farm, enter the address of where your turbine will be placed on your property including the location latitude and longitude.

For aggregated sites

If the project involves aggregate sites, enter the address for each site. Micro-generation proponents should indicate which site ID has the physical micro-generation generating unit attached.

Retailer name(s)

Enter the energy retailer name for the site where you plan on installing the micro-generation unit. If the project involves aggregated sites, enter the energy retailer name corresponding to each site to be aggregated. Note the retailer’s name must be the same for all the sites being aggregated.

Energy source(s) of the generating unit

Select the type of micro-generation unit you are installing. If your micro-generation energy source is not listed select ‘Other’ and provide specific details on the generating unit type.

Micro-generation notice applications are limited to one type of micro-generation unit. If you are installing more than one type of micro-generation technology, you must submit a separate micro-generation notice application form for each.

this doesn't make any sense at all... this isn't on the MG Notice document at all !!! what are you trying to say?

Type(s) of generating unit(s) connected to the utility interface

Electrical equipment, appliances, tools, machines and lights connected to the wiring in your home, farm or business use alternating current power supplied by your energy retailer and delivered by your wires owner.

Interconnection of a renewable or alternative energy system to the utility grid will require a particular type of interface. The type of interface you choose will depend upon your type of generating unit.

The majority of small micro-generation generate

This is not quite right. UL 1741 is the standard. UL1741 has some supplements to it, the latest one of which is Supplement B. Supplement C is also under development. You have the correct name for the 1741 standard, but it should be worded a bit differently:

Answer yes or no to the following questions:

- Do the inverters comply with "CSA Standard C22.2 No. 107.1" respecting "Anti-islanding"?
- Do the inverters comply with the appropriate UL1741 Supplement – Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources? Consult with your wires owner for the specific relevant standard. ~~"UL1741 Supplement A – Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources."~~
- Have you reviewed the applicable wires owner's micro-generator interconnection requirements and terms and conditions?

"Do the inverters comply with the 1741 standard ("Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources") and its specific Supplement that is required by the wires owner. Consult with your wires owner for the specific required standards."

If you have inverter(s) in your micro-generation unit(s), does it comply with Canadian Standards Association anti-islanding requirements?

In order to meet the Canadian Standards Association (CSA) anti-islanding requirements, your micro-generation unit must meet specific electrical safety codes and product performance standards. Safety and performance standards are required to ensure the safety, power quality and interconnection character of your micro-generation unit so it does not compromise the safety and electrical power quality of the utility grid.

The nameplate on your micro-generation equipment and its installation manual should identify the following standard: CSA C22.2 No. 107.1. If this standard is labelled on your equipment, select "Yes." If this standard is not labelled, select "No."

What is islanding?

An electrical island is where a portion of the wires owner's electrical distribution system is isolated from the remainder of the distribution system, but remains energized and operational.

The principal concern is that a wires owner's power line technician will come into contact with a line that is unexpectedly energized. Although power line technicians are trained to test all lines before working on them, all measures and precautions must be taken to ensure removal of risk.

What is anti-islanding?

Anti-islanding is an electrical function that shuts down the operation of a micro-generation unit during a utility electrical outage. Its purpose is to protect the wires owner's power line technicians from accidentally working on energized electrical distribution lines.

How does anti-islanding work?

Technology developed for micro-generation units is specifically designed so there is practically no chance of an island stemming from a micro-generation unit. Grid-connected inverters monitor the distribution line and cease to deliver electrical energy to the grid in the event that an outage occurs.

Large micro-generation units need to follow additional electrical codes and technical interconnection requirements. Contact your wires owner for details.

Micro-generation generating unit(s) total nameplate alternating current capacity

Enter the rated alternating current capacity of your generating unit. Your micro-generation equipment will have a label identifying its nameplate kilowatt (kW) capacity.

Estimate alternating current demand

This is the maximum amount of apparent electrical power consumed by the site as measured in kilovolt amperes (kVA).

Estimate customer annual energy consumption

Your energy consumption in kilowatt hours (kWh) will be indicated on each electricity utility bill.

Add the kilowatt hours amount indicated on each monthly bill for a year to determine total annual consumption.

Based on the nameplate capacity of the micro-generation unit, the micro-generation proponent should calculate or estimate how much alternating current electric energy can be generated from the generating unit per year.

Voltage level of connection

Micro-generators are responsible for ensuring the voltage levels at the point of interconnection are meeting wires owner's connection requirements and maintained at all times.

Single or three-phase

Single or three-phase relates to how electric power is delivered to your site. Enter whether your electrical energy is delivered using single or three-phase voltage.

In most cases small micro-generation units will select single-phase and large micro-generation units will select three-phase. Contact your wires owner for confirmation.

Section four: Supporting documents required

Indicate if you have attached the following supporting documents:

Electrical single-line diagram

An electrical single-line diagram provides a basic connection configuration between the electrical components of your micro-generation unit and your wires owner's electric distribution system.

where is the question from the MG Notice:
Projected total net alternating current annual energy generation (kWh) from the micro-generation generating unit(s):

For larger micro-generation projects, professional engineers or technologists may be required to stamp the single-line diagram drawings, certifying that the connection has been correctly designed and could be connected safely. This has to be provided to the wires owner prior to connecting the micro-generation unit to the grid.

Site plan

A site plan is a drawing of your property showing the property lines, any structures that currently exist on your land (house, garage, fence, etc.) and where the proposed micro-generation unit is to be located.

A site plan should include:

- arrow indicating north
- scale of the drawing (for example, one centimetre to 10 metres)
- property lines
- adjacent streets
- distance between buildings and between buildings and property lines
- dimensions of existing buildings
- location of your micro-generation unit
- other relevant items or information for your project

Existing engineering or aerial drawings can be used. You can also submit a photo of your site with information suitably marked on it.

where are the questions from the MG Notice:
-- item 4c, equipment specs from the mfr? and
-- item 4d, applicable certification documents?
-- item 4g, re 418 emissions limit?

Electrical permit

An electrical permit is required for any electrical work. An electrical permit is a legal document that ensures your micro-generation unit is inspected to meet the electrical code. Micro-generation proponents may apply for the electrical permit and do the electrical work if they own and live in their home and if their municipality permits homeowners to do this work. If micro-generation project proponents have no training or knowledge about electricity, it is recommended they engage certified electrical workers on the micro-generation project.

Electrical inspection report

Prior to any interconnection to the distribution system, you need to provide your wires owner with an electrical inspection report indicating your micro-generation unit has passed all the electrical inspections.

Other supporting document(s)

In most cases municipal and zoning requirements and guidelines will be identified in your development permit. If you do not have a development permit at the time of application, you must provide the permit prior to your micro-generation unit installation or indicate why your municipality does not require it.

the municipality never lets us know this.

Answer the following five questions:

- Have you met all applicable municipal and zoning requirements, including noise rules and bylaws?
- Have you completed the participant involvement program stated in Rule 007?
- Have you met the requirements stated in Rule 012?
- Have you met all applicable environmental requirements?
- Are you aware of any outstanding objections from any person regarding your project?

Requested in-service date

Identify the anticipated date to have the micro-generation generating unit in service.

Additional wind power requirements

Developing wind power micro-generation projects requires specific approval from agencies such as NAV CANADA, Transport Canada and Alberta Transportation.

The following steps must be taken in order to receive approval from these agencies:

1

NAV CANADA

Wind turbine towers and blades can adversely affect air navigation in some locations. Applicants must complete NAV CANADA's Land Use Proposal Submission Form and obtain their approval for a wind micro-generation unit. For more information, visit NAV CANADA's website at navcanada.ca.

2

Transport Canada

Wind turbines can be an aircraft hazard in some locations. Applicants must complete Transport Canada's Aeronautical Obstruction Clearance Form and obtain their approval for a wind micro-generation unit. For more information, visit Transport Canada's website at tc.gc.ca.

3

Alberta Transportation and Economic Corridors

Approval is required for wind turbines or any other development located within 300 metres of a numbered highway or 800 metres of an intersection of the numbered highway with another public road. Applicants must complete Alberta Transportation's "Roadside Development Application for Development Near a Primary Highway" form and obtain their approval for a wind micro-generation unit or other micro-generation unit located close to a road. For more information, visit Alberta Transportation's website at alberta.ca/transportation-and-economic-corridors

Section five: Electric distribution system wires owner use only

This section is to be filled out by the electric distribution system wires owner. Micro-generation applicants should leave this section blank.

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► Electricity compensation

When a micro-generation site generates more electric energy than is being consumed, the surplus electric energy will be supplied out of the micro-generation site into the wires owner's electrical distribution system. Micro-generators are paid by their energy retailer for this ~~surplus of energy~~. Micro-generation applicants must notify their energy retailer they are becoming a micro-generator. ~~exported energy~~

Small micro-generation units will be paid for their electrical energy supplied out of the micro-generation site based on the same price of the electrical energy that is supplied into the site from their energy retailer. For example, if the retailer's retail energy consumption price is 10 cents per kilowatt hour, the micro-generation unit owner will be credited 10 cents for each kilowatt hour supplied out of their micro-generation site. All fees including distribution charges, transmission charges, local access fee, delivery charges and balancing pool allocations will still be incorporated in the proponent's monthly bill. ~~All delivery fees~~

The cost of delivering energy is largely fixed and, therefore, cannot be reduced by generating your own electricity. You will also pay normal energy prices if you do not produce enough energy from your ~~micro-generating~~ micro-generation system and have to take from the grid. ~~Electricity generated and supplied to the site must be offset over a 12-month period.~~

import

whatever is this supposed to mean?

Details of the micro-generation compensation can be found in Section 7 of the *Micro-Generation Regulation*.

The wires owner will provide the micro-generation proponent with either a bi-directional cumulative meter (in most cases) or a bi-directional interval meter (which records cumulative electrical energy every 15 minutes) in order to be able to measure electric energy supplied into and out of the micro-generation site. For large micro-generation units that are equipped with a bi-directional interval meter, the micro-generator will be paid at the hourly pool prices.

For more information on the pool prices, visit the AESO's website at aeso.ca.

► Obligations

Micro-generator obligations

- All costs of operating the micro-generation unit are the responsibility of the micro-generator as per the wires owner interconnection and operating agreement.
- Contact your neighbours and those affected by your proposed installation and notify them of your intent to install micro-generation equipment.
- ~~Contact and submit the micro-generation notice application form to~~ notify the wires owner of your intent to install a micro-generation unit. ~~Prepare and submit the Form A - Micro-Generation Notice and related documents ...~~
- Contact your energy retailer to inform them of the micro-generation unit's installation date.
- Micro-generation notice applications are limited to one generating unit type per site. If you are installing more than one type of ~~micro-generating~~ micro-generation unit you must submit a separate notice form for each type.
- ~~Update the micro-generation application or provide updated documents to the wires owner.~~

Alberta Electric System Operator obligations

- Determine hourly pool prices to be used in compensating large micro-generation units.
- Receive micro-generator generation claims submitted by retailers.
- Provide generation credits to retailers that have micro-generation customers.

Retailer obligations

- Act as a participant in Alberta's electricity market by crediting the micro-generator for electric energy supplied out of the micro-generation site.
- Ensure the electric energy supplied out of the micro-generation site will incur a credit on the micro-generator's bill.
- Ensure unused credits are paid to micro-generator once every 12 months.
- Retailer may notify AUC if there is an excess credit of generation. **what does this mean?**

Wires owner obligations

- Responsible for determining whether a micro-generation unit qualifies under all five requirements stated in Section 1(1)(h) of the *Micro-Generation Regulation*.
- Provide applicants with an interconnection and operating agreement upon approval of micro-generation project.
- Provide applicants with a notice confirming their micro-generation approval and grid connection.
- Ensure application meets the safety and technical requirements for interconnection with the wires owner's system.
- Install appropriate meter that separately measures the imported and exported electricity.
- Cover all metering, meter data handling and any meter installation costs incurred for the micro-generation unit.



Appendix A – Glossary

Alberta Utilities Commission

Independent, quasi-judicial agency of the government of Alberta that regulates Alberta's electric utilities to ensure safe and reliable delivery of utility services.

Alberta Electric System Operator

Independent not-for-profit company established by the government of Alberta to govern the safe, reliable and economic planning and operation of Alberta's electrical transmission system, offer open transmission system access for large companies, develop and administer transmission tariffs and operate the wholesale electricity market.

Alternating current

Electric current that regularly reverses its direction of flow, which in Canada is at 60 times per second.

Anti-islanding

Technology in a micro-generation generating unit that prevents it from feeding electricity into a distribution system during a utility electrical outage. Its purpose is to protect power line technicians from working on a live distribution system.

technicians

Approved electrical equipment

Electrical equipment that bears an approved certification mark from one of the accredited certification organizations and is affixed to the nameplate on the electrical equipment.

Note: The presence of such a mark indicates that the equipment is in compliance with an appropriate product standard in Part 2 of the Canadian Electrical Code. If the equipment does not have one of these certification marks it is not legal to sell or use it. (Refer to Electrical Safety Information Bulletin STANDATA [LEG-EGR-218-LEG-002\(REV 1\)](#) from Alberta Municipal Affairs for examples of accepted legal certification marks.)

Bi-directional cumulative meter

Electricity-measuring device that measures ~~at two separate data points~~ the total electrical energy that has flowed in a circuit ~~from one reading date to the next~~. One data point shows the amount of electrical energy that has been exported to the grid. The other data point shows the amount of electrical energy that has been imported from the grid.

The meter displays the cumulative energy as two separate data points.

these do not measure "at" two separate data points at all, that doesn't make any sense at all. it measures at the same position, but the data that it collects is stored and presented in two separate ways -- one showing total export and one showing total import

Bi-directional interval meter

Electricity-measuring device that measures ~~at two separate data points~~ the total electrical energy that flows in a circuit ~~between intervals of usually 15 minutes~~. One data point shows the amount of electrical energy that has been exported to the grid. The other data point shows the amount of electrical energy that has been imported from the grid.

The meter displays the cumulative energy as two separate data points for every 15 minutes of time.

Biomass generator

Generating unit that uses biomass products such as wood logs, wood chips, wood pellets, miscanthus (elephant grass) or straw as its energy source.

Canadian Electrical Code (CE Code or CSA C22.1)

Standard published by the Canadian Standards Association addressing the electrical safety, shock, and fire hazards of electrical installations (part I, C22.1), equipment (part II, C22.2), utility distribution and transmission circuits (part III, C22.3), industrial or institutional installations (part IV, C22.4) and electrical inspection (part VI, C22.6) in Canada.

Combined heat and power generator

A form of generation where both electric power and thermal energy (typically for heating) are produced from a single energy source. This allows heat that would normally be lost in typical power generation to be recovered to provide heating. This is often also referred to as cogeneration.

A thermal-electric generating technology where the heat from the electricity generating process is recovered instead of being wasted, and is used to provide heat for another process, such as heating a building. This is also referred to as co-generation.

Commission

Common reference to the Alberta Utilities Commission

Direct current

Electric current that flows in one direction.

Disconnect

To turn off the electrical current in a circuit. Device that provides a disconnecting function.

Disconnecting means

Electrical components such as switches that provide a disconnecting function.

Distributed generator

Customer who owns a generating unit that is connected to a utility's electrical distribution system. See page four of this guideline for more information on how distributed generation differs from micro-generation.

Distribution panel board

panelboard

Electrical box that contains over-current protection devices connected to a number of branch circuits.

Distribution system

Electrical lines and equipment typically operating at less than 25,000 volts that manage and distribute electrical energy from a substation to end-use customers.

or less

electricity

the distribution system provides a lot more than electric energy... it also provides voltage, current, phase, frequency, active power, reactive power, power factor, blackstart +++ so that is why I recommend that the term "electricity" is used instead of just electric energy

Electrical inspectors

Ensure *Canadian Electrical Code* standards are met for all micro-generation installations.

Electrical wiring

Components that are intended to carry electric current.

electric

Electrical single-line diagram

Basic drawing consisting of lines and symbols that show the electrical equipment and the electrical circuits that connect them.

Energy retailer

Either an independent government-licensed electricity marketing company that supplies electrical energy at unregulated prices to its customers, or an entity appointed by the wires owner to provide a regulated price option to customers. In both these options, the energy retailer bills the customer for the purchase and delivery of the energy they have consumed, for the billing administration and for wire charges (grid operations and maintenance) in addition to compensating the customer for energy exported to the grid.

Fuel cell generator

Customer that owns a generating unit that generates electricity from hydrogen using a non-combustion electrochemical reaction.

Generator

Customer who owns a device that converts energy from one form into electrical energy.

Generator rated capacity

Basic measurement unit for the ability of a customer's generating unit to generate electrical power. This is the rate at which electrical power is generated by a generating unit at a defined set of operating conditions. Such unit of capacity include watt (W), thousand or kilowatt (kW), or million or megawatt (MW).

Inverter

Electronic device that converts direct current electricity into alternating current electricity and acts as the interface between a direct current generating unit and the wires owner's electrical distribution system. Electricity from the generating unit (solar photovoltaic, fuel cells, wind turbine, etc.) is converted to a form that can be supplied to the utility grid.

Independent system operator

Company responsible for the safe, reliable and economic planning and operation of the Alberta Interconnected Electric System. In Alberta this service is provided by Alberta Electric System Operator.

Induction generator

Customer who owns a generating unit that converts the rotational energy into electrical energy using principles of electromagnetic induction.

Islanding

Portion of the electrical distribution system that contains both loads and generating units that is isolated from the remainder of the distribution system, and remains energized during an electrical outage in the main system. Islanding is not permitted in Alberta except downstream of the point of common coupling.

Micro-generator

Customer who owns a micro-generation generating unit.

Micro-generation generating unit

a generating unit that is intended to generate electricity for solely for person or business use.

~~The micro-generation generating unit is typically a residential or small commercial unit. Its capacity is less than five megawatts that is connected to an electrical distribution system. The intent is to generate electricity for personal use and for the amount of energy to be less than the annual site consumption.~~

don't go into the regulatory limits of this because this section is solely a glossary and is not part of the regulation.

NAV CANADA

A private, non-share capital corporation that owns and operates Canada's civil air navigation service.

Over-current protection device

Electrical fuse or circuit breaker.

Point of common coupling

The point at which the wires owner's infrastructure is connected to the customer's facilities or conductors, and where any transfer of electric energy between the customer and the wires owner takes place.

Renewable or alternative energy

Electrical energy generated from solar, wind, hydro, fuel cell, combined heat and power, biomass or other energy source where the greenhouse gases produced by its generation have an emission rate less than or equal to 418 kilograms of greenhouse gases per megawatt hour of energy.

Single-phase inverter

Inverter that changes direct current to alternating current single-phase electricity.

Solar photovoltaic generator

Customer who owns a generating unit that uses solar radiation as its energy source.

Stand-alone inverter

Inverter that supplies a load not connected to a distribution system.

Three-phase (multi-phase) inverter

Inverter that changes direct current to alternating current three-phase electricity.

Wind generator

Customer who owns a generating unit that uses moving air as its energy source.

Wires owner

owns

Company that ~~operates and maintains~~ an electric distribution system.

no... this is the definition of
a wires service provider



Appendix B – Contact and source information

Alberta Energy alberta.ca/energy-and-minerals

alberta.ca/ministry-energy.aspx

Alberta Electric System Operator

aes0.ca

Alberta Municipal Affairs

municipalaffairs.gov.ab.ca

alberta.ca/municipal-affairs

Alberta Safety Codes Council

safetycodes.ab.ca

Alberta Utilities Commission

auc.ab.ca

Electrical Codes and Standards Safety Information Bulletin

STANDATA LEG-ECR-2 from Alberta Municipal Affairs

alberta.ca/electrical-codes-and-standards.aspx?utm_source=rediretor

alberta.ca/electrical-codes-and-standards

Government of Alberta

alberta.ca

Micro-Generation Regulation

https://kings-printer.alberta.ca/1266.cfm?page=2008_027.cfm&leg_type=Regs&isbncln=9780779849581

NAV CANADA

navcanada.ca

Retailer and wires owner list

The Office of the Utilities Consumer Advocate, created by the Government of Alberta, provides a comprehensive list of energy retailers and distributors in Alberta.

ucahelps.alberta.ca/retailers.aspx

ucahelps.alberta.ca/residential/retailers-and-distributors/

AUC Rule 007: Applications for Power Plants, Substations, Transmission Lines, and Industrial System Designations, and Hydro Developments and Gas Utility Pipelines

auc.ab.ca/rules/rule007/

AUC Rule 012: Noise Control

auc.ab.ca/rules/rule012/

AUC Rule 024: Rules Respecting Micro-Generation

auc.ab.ca/rules/rule024/

The Office of the Utilities Consumer Advocate

ucahelps.gov.ab.ca

ucahelps.alberta.ca/

Appendix C – Single-line diagram samples

The following two single-line diagram forms are examples only. You may use the form for your micro-generation unit. Otherwise, draw your own single-line diagram to show the connection of your micro-generation unit.

Single-line diagram sample one:

Notes:

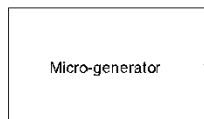
1. Wiring arrows indicate direction of electrical energy flow.
2. Grid-connection safety requirements are given by the Canadian Electrical Code Section 84, and the wires owner.
3. All components shall meet Canadian electrical product certification standards.
4. All components shall contain nameplate labels indicating the acceptable certifying organization.
5. An inverter with a Canadian certification mark thus meets the CSA's standard C22.2 No. 107.1 and UL1741 SA as updated regularly for utility grid-connection.
6. Separate grid disconnect is optional and may or may not be required by the wires owner.
7. If installed, grid disconnect shall comply with Canadian Electrical Code Rule 84-024 (2018).

Micro-generation source

- ☐ Solar photovoltaic
☐ Micro-wind
☐ Combined heat and power
☐ Micro-hydro
☐ Biomass
☐ Fuel cell
☐ Other: _____

Type of generator interface

- ☐ DC to AC inverter
☐ AC to DC to AC inverter
☐ Non-inverter with anti-islanding protection (equivalent to inverter)



Generator disconnect

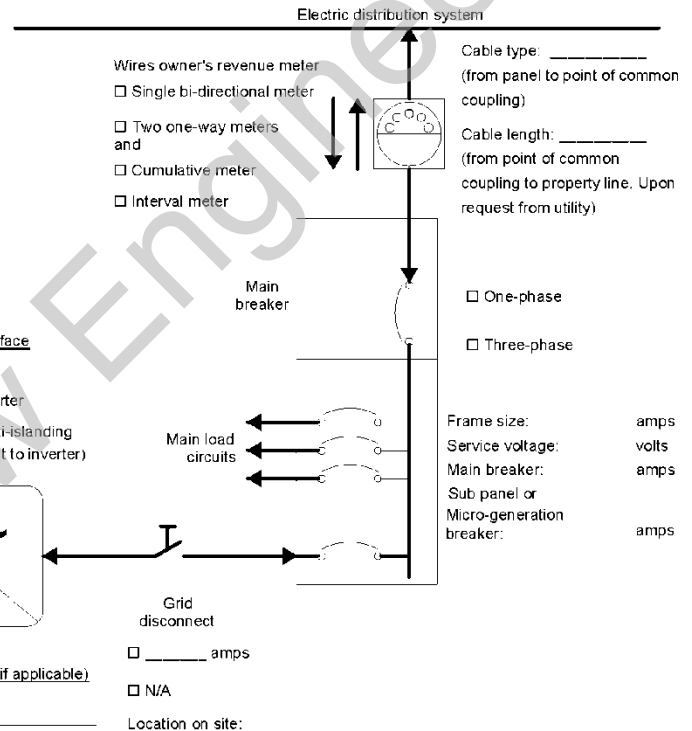


Grid interactive inverter (if applicable)

Micro-generator
 Brand: _____
 Model: _____
 Rated capacity: _____ kW_{ac}
 Number of units: _____
 Certification mark: _____
 Location on site: _____

Grid interactive inverter (if applicable)
 Brand: _____
 Model: _____
 Rated capacity: _____ kW_{ac}
 Number of units: _____
 Certification mark: _____
 Location on site: _____

Wires owner: _____



This single-line diagram is intended for use in permitting and grid-connection approvals. It is not intended to be used for system design or installation.	Site name: _____ Single-line diagram for grid-dependent, micro-generator connected to the wires owner's electrical distribution system		Drawn by: _____ Drawing date: _____ Site description: _____ Site location: _____
	Drawing NO. _____	Rev _____	
	Scale: Not to scale		

I was on the team that developed this Notice Submission Guideline in 2008. I drew these diagrams. They are desperately in need of updating.

Please contact me so that I can discuss what would be needed for updating these diagrams.

Gordon Howell, P.Eng.
 Howell Mayhew Engineering
 Edmonton
 +1 780 484 0476
 ghowell@hme.ca

Single-line diagram sample two:

I was on the team that developed this Notice Submission Guideline in 2008. I drew these diagrams. They are desperately in need of updating.

Please contact me so that I can discuss what would be needed for updating these diagrams.

Gordon Howell, P.Eng.
Howell Mayhew Engineering
Edmonton
+1 780 484 0476
ghowell@hme.ca

Notes:

1. Wiring arrows indicate direction of electrical energy flow.
2. Grid-connection safety requirements are given by the Canadian Electrical Code Section 84, and the wires owner.
3. All components shall meet Canadian electrical product certification standards.
4. All components shall contain nameplate labels indicating the acceptable certifying organization.
5. An inverter with a Canadian certification mark thus meets the CSA's standard C22.2 No. 107.1 and UL1741 SA as updated regularly for utility grid-connection.
6. Separate grid disconnect is optional and may or may not be required by the wires owner.
7. If installed, grid disconnect shall comply with Canadian Electrical Code Rule 84-024 (2018).
8. Energy storage unit rated capacity should be in kilowatt hour alternating current (kW_{ac}) and kilowatt hour direct current (kW_{dc}) units as required.

Micro-generation source

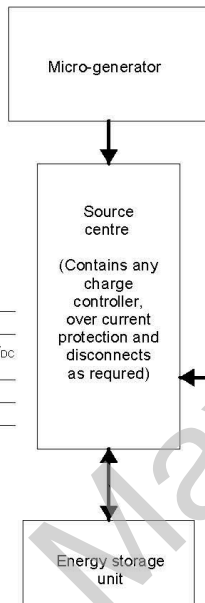
- ☐ Solar photovoltaic
☐ Micro-wind
☐ Combined heat and power
☐ Micro-hydro
☐ Biomass
☐ Fuel cell
☐ Other: _____

Micro-generator

Brand: _____
Model: _____
Rated capacity: _____ kW_{dc}
Number of units: _____
Certification mark: _____
Location on site: _____

Energy storage unit(s)

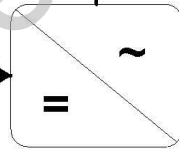
Storage capacity (kWh): _____
Rated capacity (kW_{dc}): _____
Certification mark: _____



Essential
load
circuits

Grid interactive inverter (if applicable)

Brand: _____
Model: _____
Rated capacity: _____ kW_{ac}
Number of units: _____
Certification mark: _____
Location on site: _____



Wires owner: _____

Electric distribution system

- Wires owner's revenue meter
☐ Single bi-directional meter
☐ Two one-way meters and
☐ Cumulative meter
☐ Interval meter

Cable type: _____
(from panel to point of common coupling)

Cable length: _____
(from point of common coupling to distribution system. Upon request from utility)

- ☐ One-phase
☐ Three-phase

Main
breaker

Main
load
circuits

Grid
disconnect

- ☐ _____ amps
☐ N/A

Location on site: _____

Frame size: _____ amps
Service voltage: _____ volts
Main breaker: _____ amps
Sub panel or Micro-generation breaker: _____ amps

Site name:

Single-line diagram for grid-dependent, micro-generator connected to the wires owner's electrical distribution system

This single-line diagram is intended for use in permitting and grid-connection approvals. It is not intended to be used for system design or installation.

Drawing NO. _____

Rev _____

Scale: Not to scale

Drawn by:

Drawing date:

Site description:

Site location:

Appendix D – Interconnection and operating agreement sample (up to 150 kilowatts)

Wires owner's logo

Wires owner's logo

This interconnection and operating agreement is for MGGUs that are greater than 150 kW AC, and not for those that are "up to" 150 kW AC. You don't find any homeowner who would have a clue about what the text in this agreement means, regardless of whether they sign anything.

The agreement for less than 150 kW AC is far simpler than this, and is in common use around the province. Why was it not included here?

150 kilowatts AC

This agreement between _____ (the "micro-generation customer") and _____ (the "wires owner") is intended to provide for the safe and orderly operation of the electrical facilities interconnecting the micro-generation customer's generation facility at (land location, Site ID number and description of project) and the electrical distribution system owned by the wires owner. It is the intent of the micro-generation customer to generate electricity primarily for its own use sized to the customer's load or portion thereof, and to be reimbursed for any excess generation. It is the intent of the wires owner to operate its distribution system to maintain a high level of power quality and service for its customers. It is the intent of both parties to operate their respective facilities in a way that ensures the safety of the public and their respective employees.

1. Relation to other documents:

This agreement does not supersede any requirements outlined in any government regulations, including (but not limited to) the Alberta Electrical Utility Code, the *Canadian Electrical Code* and the *Alberta Occupational Health and Safety Act*, nor does it supersede the wires owner's safety policies and procedures or the terms of any electric service agreement between the micro-generation customer and the wires owner or any of its affiliates.

2. Operating authority:

The operating authority for each of the parties hereto is the person identified by name or job title responsible to establish operating procedures and standards within their organization. The operating authorities for the micro-generation customer and for the wires owner shall ensure that timely updates are made to this document to reflect any changes to system operating characteristics, disconnect devices and single line diagrams referenced in this agreement. The operating authorities for the micro-generation customer and for the wires owner shall ensure that the operators of the generation facility and the distribution system are competent in the respective operation thereof and are aware of the provisions of any operating agreements, laws, regulations and rules relating to the safe operation of electrical power systems.

The operating authority for the micro-generation customer is:

Name, Title
Address
City, Alberta XXX XXX
Office: xxx-xxx-xxxx
Email: xxxxxx@xxxxxx

The operating authority for the wires owner is:

First name Last name, job position
Address
City, Alberta XXX XXX
Office: xxx-xxx-xxxx
Email: xxxxxx@xxxxxx

3. Operator in charge:

The operator in charge for each of the parties hereto is the person identified by name or job title responsible for the real time operation of all electrical facilities related to the interconnection between the micro-generation customer's generation facility and the wires owner's distribution system.

The operator in charge for the micro-generation customer is:

Name, Title
Address
City, Alberta XXX XXX
Office: xxx-xxx-xxxx
Email: xxxxxx@xxxxxx

The operator in charge for the wires owner is the wires owner's control centre system operator. This individual can be reached via the wires owner's contact center number.

Phone: 1-XXX-XXX-XXXX
Phone: 1-XXX-XXX-XXXX
Email: xxxxxx@xxxxxx

4. Description of facilities:

The point of common coupling is designated as the low voltage side of the wires owner's XX kVA transformer and is identified on the attached single-line diagram (description of single-line diagram, rev number, date).

The (select breaker, switch etc.) (breaker or switch number) will be used as the main disconnect point (visible/lockable) for the micro-generation customer's generation facility, and is owned and operated by (specify owner/company/operator here). This switch (does or does not) have load-break capability and therefore (can or cannot) be operated while the generation facility is producing or consuming power.

The micro-generation customer's generation facility consists of a (size), (type), (connection) generator.

The micro-generation customer owns and is responsible for the maintenance and operation of all facilities on the generator side of the point of common coupling.

The wires owner's distribution system consists of (distribution size voltage 14.4 or 25) kV line (line number) and a (transformer size) in kVA, (transformer connection designation enter ex. wye-wye) transformer. The wires owner owns and is responsible for the operation of all facilities on the distribution side of the point of common coupling.

The micro-generation customer's generation facility is designed to operate while connected to the Alberta electricity grid, with synchronizing facilities provided on the micro-generation customer's breaker (breaker number). In the absence of outstanding clearances between the operators in charge, notice will not be required to be given to the wires owner prior to synchronization of the micro-generation customer's generation facility and the wires owner's distribution system taking place. It is recognized by the micro-generation customer that there are no synchronization schemes in place on the wires owner's distribution system, and that the (upstream distribution facility – enter sub#/name) contains automatic equipment that will provide for voltage regulation or automatic re-closure under some conditions. (Insert description of any special blocking or protection schemes or remove this comment.)

(voltage or power factor)

(Insert description of any special

Howell Mayhew Engineering

The micro-generation customer's generation facility is capable of controlling either voltage or power factor, and is normally set to control (voltage or power factor) to (setting, tolerance) at the generation facility's terminals. Remove this paragraph if photovoltaic, leave in if not photovoltaic.

5. Suspension of interconnection:

The operation of the micro-generation customer's generation facility and the quality of electric energy supplied by the micro-generation customer shall meet both the standards and anti-islanding requirements as specified in Part 2 of the *Alberta Distributed Generation Interconnection Guide* and any further standards identified by the wires owner. If the operation of the micro-generation customer's facilities or quality of electric energy supplied does not meet the above standards or, in the event the wires owner determines, in its sole opinion, acting reasonably, that the micro-generation customer's generation facility is or is reasonably likely to: (i) cause damage to; and/or (ii) adversely affect other distribution system customers or the wires owner's assets, the wires owner will notify the micro-generation customer of same and the micro-generation customer shall promptly take all reasonable corrective action at its sole cost and expense. The wires owner may, in its sole discretion and without notice, disconnect the micro-generation customer's facilities from the wires owner's distribution system until all such correction action and/or compliance with the above standards is reasonably demonstrated.

Additionally, the wires owner may, in its sole discretion and without notice, disconnect the micro-generation customer's generation facility from the wires owner's distribution system in the event of: (a) a planned or unplanned power outage on the wires owner's distribution system, (b) any abnormal operation of the wires owner's distribution system, (c) a direction from the independent system operator ("ISO") or other governmental authority, or (d) any other event that requires such disconnection pursuant to: (i) the wires owners' terms and conditions of service (the "terms of service"), which are filed with, and approved by, the Alberta Utilities Commission from time to time; (ii) applicable law, or (iii) good electricity practice.

6. Safe work planning:

Safe work planning practices such as pre-job plans and tailboard conference procedures shall be followed whenever both parties are involved in work on the interconnected distribution system. Nothing in this agreement shall be interpreted as altering the intent of the wires owner's safe practices manual or safe operating procedures. Safe work routines described in Division D of the Alberta Electrical Utility Code shall be followed when providing isolation for work on any part of the interconnected system.

7. Technical requirements:

Micro-generation customer covenants and agrees that it will not make any alteration to the design and operation of its generation facility, including, but not limited to, the total generation capacity, voltage and frequency of its generation facility, without the prior written approval of the wires owner.

8. Maintenance outages:

Maintenance outages will occasionally be required on the wires owner's distribution system and the micro-generation customer's generation facility. Both parties hereto are required to provide reasonable notice, given the circumstances, and plan to minimize downtime. It is recognized that in some emergency cases, such notice may not be possible. Outages shall be coordinated by the operators in charge.

9. Liabilities:

The micro-generation customer will indemnify and hold the wires owner harmless from and against all costs, expenses, damages, claims, liabilities and adverse effects resulting from the micro-generation customer's breach of this agreement, negligence or willful misconduct in connection with the operation of the micro-generation customer's generation facility or the interconnection between the micro-generation customer's generation facility and the wires owner's distribution system.

Notwithstanding the foregoing, the micro-generation customer shall not be liable to the wires owner under any circumstances whatsoever for any loss of profits or revenues, business interruptions losses, loss of contract or loss of goodwill, or for any indirect, consequential, incidental or special damages, including but not limited to punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, tort or otherwise. For purposes of this agreement, damages claimed by third parties shall not be considered indirect, consequential, incidental or special damages, regardless of the type of damages being claimed.

The wires owner's liability to the micro-generation customer, whether pursuant to contract, tort or otherwise, shall be limited to the liability imposed on the wires owner pursuant to the terms of service.

Nothing in this agreement is intended to abrogate, alter or diminish the statutory liability protection granted to the wires owner under the *Electric Utilities Act* (Alberta) and the *Liability Protection Regulation* (Alberta).

10. Access:

The wires owner shall have access to the micro-generation customer's generation facilities, including for purposes of inspection, maintenance, operation and meter reading. Access and inspections shall be arranged by the operators in charge.

11. Termination:

The micro-generation customer may terminate this agreement at any time by: (a) disconnecting its generation facility from the wires owner's distribution system, and (b) thereafter giving the wires owner 30 days written notice of such termination.

The wires owner may terminate this agreement on 30 day's notice upon the occurrence of any of the following: (a) the micro-generation customer's disposition of its generation facility or its interest in the property on which it resides; (b) the micro-generation customer's breach of this agreement; (c) the retirement of the wires owner's distribution system; and (d) any change in law that affects the wires owner's rights or obligations under the *Micro-Generation Regulation* (Alberta) or AUC Rule 024.

12. Assignment:

The micro-generation customer agrees that this agreement constitutes an interest in land with respect to the lands on which the micro-generation customer's generation facility is located, and that the wires owner may register this agreement at the appropriate land titles office against title to the lands on which the micro-generation customer's generation facility is located.

The micro-generation customer covenants and agrees that it will not sell, assign, transfer, convey or otherwise dispose of its generation facility or its interest in the property on which its generation facility resides without giving:

- a) written notice to the wires owner of such disposition, and
- b) confirmation to the wires owner that the new owner of the micro-generation customer's generation facility, or the micro-generation customer's interest in the property on which the generation facility resides, has agreed to assume the micro-generation customer's rights and obligations by entering into a new agreement with the wires owner, each such notice and confirmation to be given prior to the completion of such disposition. The wires owner may assign its rights and obligations under this agreement without the micro-generation customer's consent.

In addition, the micro-generation customer agrees that if its rights and obligations under this agreement are not assigned to the new owner of its generation facility or its interest in the property on which its generation facility resides, the wires owner may send a micro generation decommission notification (GRN transaction) to the micro-generation customer's retailer prohibiting any further generation credits to be processed with respect to the micro-generation customer's generation facility until a new agreement is reached between the wires owner and the new owner of the micro-generation customer's generation facility.

ACCEPTED BY:

Customer:

Micro-generation customer name: _____
(please print)

Micro-generation customer signature: _____ Date: _____

APPROVED BY:

Wires owner:

Wires owner representative name: _____
(please print)

Wires owner representative signature: _____ Date: _____

Wires owner reference: project reference # _____, Site ID xxxx

Appendix E – Electrical safety

Any system that generates electricity can be potentially dangerous, creating the possibility of electrocution and fire hazards. Improperly installed systems will create serious safety hazards to property owners, families and wires owner workers.

All precautions must be taken to ensure the installation and operation of the applicant's micro-generation unit is governed by health and safety standards. This includes ensuring that all safety information is kept up-to-date.

Before a micro-generation unit is installed, it is imperative to understand and follow the safety requirements including but not limited to:

- Equipment approved by the *Canadian Electrical Code*. Manufacturers of all electrical products are required to certify their products to the appropriate Canadian product safety standards. Compliance to these standards is indicated by a mandatory certification mark located on the micro-generation equipment's nameplate.
- Alberta's STANDATA Electrical Safety Information Bulletin [LEG-ECR-218-LEG-002\(REV 1\) \[Rev 16\]](#) indicates the acceptable certification marks. Equipment that does not carry the appropriate certification mark is not permitted to be sold or installed. Visit the [Electrical Codes - STANDATA](#) page on [alberta.ca](#) for more details.
- Grid-connected inverters are required to be approved to the Canadian Standards Association power supply standard C22.2 No.107.1 Clause 15 of this standard ensures that the inverter will properly cease to energize the electricity distribution system during a power outage. This shut down is called 'anti-islanding' and is of utmost importance to wires owners.
- Inverters are required to carry a ~~Canadian Standards Association~~ certification mark to be certified by inverter standard C22.2 No.107.1, as well as a ~~Underwriters Lab~~ certification mark to be certified by ~~the appropriate~~ UL-1741 Supplement A- Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources.

no they are not... as per the STANDATA 18-LEG-002, they are required to carry a certification mark of a certifying organisation certified by the Standards Council of Canada.

"to", not "by"
- For certification concerns or inquiries, contact the equipment manufacturer, wires owner or the Canadian Standards Association directly at certinfo@csa-international.org or 1-416-747-2661 or 1-866-797-4272.
- All electrical work needs to be designed and installed according to the minimums laid out by the *Canadian Electrical Code*. The electrical work on your micro-generation unit is required to be done by certified electrician. Note Sections ~~6, 14, 64 and 84~~ of the *Canadian Electrical Code* and its rules regarding the need for warning notices and disconnects on micro-generation units.

Sections 2, 6, 12, 14, 26, 36, 64, 84
- Extreme caution must be exercised to avoid electric shock. Your installer must conform to the equipment manufacturer's installation instructions to ensure all necessary safety precautions are applied at all times.
- Most small micro-generation units use inverter interfaces. Grid-connected inverter-based units are certified to cease energizing the circuits of the electricity distribution system during electrical outages. Wires owners may require that micro-generation units have a direct visible means to indicate the connection status (i.e. either connected or disconnected), though typically this is not required.

Equipment documentation

The equipment installation and operating instructions should contain the contact details for the manufacturer, equipment supplier and the installer.

Micro-generation units must also include documentation confirming that they meet [the appropriate](#) Underwriters Lab (UL1741) standard ~~UL 1741 SA~~ and Canadian Standards Association C22.2 No. 107-1 standard. For small micro-generation units, a certification mark will suffice.

Micro-generation owners must maintain a quality control and inspection program according to the manufacturer's recommendations. Micro-generation owners must provide to their wires owner a complete set of detailed drawings which the wires owner will use to assist in the micro-generation inspection.
~~and the electrical inspector~~

Maintenance

Routine maintenance of micro-generation units is the full responsibility of the micro-generation owner. The complete system, control and protective equipment must be in accordance with the manufacturer's recommendations. Maintenance records should be kept for warranty and insurance purposes.



Appendix F – Electrical contractor and electrical inspection

Electrical contractor

It is highly recommended that you hire an electrical contractor ~~or engage an engineering firm~~ to install your micro-generation unit. Some municipalities prohibit home owners from installing their own micro-generation unit. Extreme caution must be exercised to avoid electric shock.

or engage an engineering
firm to design and manage

Reference must be made to the manufacturer's instructions to ensure all necessary safety precautions are applied at all times. Applicants are advised to ensure that their electrical contractor also has the following:

- municipal business and/or contractor licence (where required)
- adequate liability insurance
- references

Ask about the amount of experience the electrical contractor has in installing micro-generation units. These systems are relatively new and not many electrical contractors have experience installing these. The electrical contractor will need to install your micro-generation unit according to all regulations and standards.

Electrical inspection

Before the micro-generation unit can be connected to the wires owner's electrical distribution system it must be inspected by an electrical inspector. The inspection provides assurance that the installation meets the safety requirements of the *Canadian Electrical Code* and does not pose a hazard to micro-generation owners, their families, friends, or employees. It also provides an assurance that the installation will not be a hazard to wires owner workers who may be required to service or repair the electrical supply to the micro-generation owner's farm, home or business.

The inspector will ensure that approved equipment is used (as shown by the labels on its nameplate) and that the equipment is installed and labelled as per Part 1 of the *Canadian Electrical Code* and any requirements of the wires owner or the municipality.





Howell Mayhew Engineering

Howell Mayhew Engineering