

Maria Baitoiu
Lead Application Officer, Market Oversight and Enforcement
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May 30, 2017

Dear Ms Baitoiu,

RE: Evidence Submission (2/4) on “Community Solar” to AUC DCG Review (22534)

The Canadian Solar Industries Association (CanSIA) is the national trade association that represents the solar energy industry throughout Canada. We applaud the Government of Alberta’s decision to undertake a review of Distribution Connected Generation (DCG) in Alberta and welcome the opportunity to participate as an Intervenor therein.

Our vision for electricity in Alberta in 2030 is one with the following four characteristics: i) more energy efficiency, demand-side management and local electricity generation; ii) delivered by a cleaner and smarter grid; with iii) greater choice for consumers; and iv) more resilience to the impacts of climate change. We view “Community Solar” as central to each of these four characteristics.

With this in mind, this Evidence Submission provides details on the approach that CanSIA believes Alberta should take to enable more “Community Solar” in Alberta in future including a detailed overview of a proposed “Shared Solar Approach to Enabling Community Solar in Alberta”. Addendum 1 presents our response to the questions posed by the Alberta Utilities Commission (AUC) to registered participants in the Distribution Generation Review (Proceeding 22534) in Appendix B of the Process Letter relevant to enabling “Community Solar” in the province.

Answers are provided in the context that Alberta’s electricity market is changing rapidly and that many policies, regulations and rules are inter-dependent. CanSIA appreciates the opportunity to continue to participate as a stakeholder in the on-going consultations as decisions are made

and directions evolve. The questions responded to herein are listed as follows in the order that they are answered:

Question 10: Please identify any limitations in Alberta's current billing and load settlement systems that you consider may have an effect on the development of Community Solar. Please provide your suggestions or solutions regarding how these potential limitations could be addressed.

Question 11: Should an existing participant (i.e., retailer, distribution utility) or a new entity be responsible for managing billing and load settlement or is there a market solution for managing billing and financial settlement?

Question 39: Describe your understanding of what Community Solar would look like. Should a definition be adopted? How might the adoption of a definition affect incentives to invest and innovate? Please explain.

Question 40: Should there be a requirement that the property of participants in a Community Solar facility be adjacent, as that term is used in the Micro-Generation Regulation? Why or why not?

Question 41: Would it be necessary to change municipal franchise agreements with distribution companies, or the legislative provisions governing the establishment of service territories, in order for a Shared Solar facility to be established? Please explain.

Question 42: Would it be necessary to change municipal franchise agreements, or the legislative provisions governing the establishment of service territories, in order for small-scale community generation operations to be established in new subdivisions within municipal boundaries using their own distribution wires to connect their customers to one another? Please explain.

Question 43: Should all members of small-scale community generation communities have an option to be supplied by the incumbent distribution utility and who should bear the cost of providing stand-by service?

Question 44: Should an individual member residing among a small-scale community generation community have an option to be supplied by the incumbent distribution utility (i.e., not assimilated into the collective entity) rather than from the small-scale generation community?

Evidence Submissions detailing our responses to the questions relevant to Status & Outlook (1/4), Retail & Rate Design (3/4), Wires & Wires Owners (4/4) have also been submitted in parallel.

Definitions of Community Solar: Herein, Solar Distribution-Connected Generation (SDCG) is classified as either: i) “Behind-the-Meter” in which generation primarily serves a load directly; or ii) “Direct-Connect” in which all generation is exported to the grid. CanSIA understands “Community Solar” to be Behind-the-Meter or Direct-Connect SDCG in which a “Community” or “Communities” receive the resultant electricity and/or financial benefit.

CanSIA considers a Community to be comprised of one or more of the following entities:

- i) Local governments (i.e. aboriginal, rural and urban);
- ii) Not-for-profit sector (e.g. education, healthcare etc); and
- iii) Multiple residential and small business electricity customers; (e.g. non-associated or co-operative).

The current policy and regulatory framework for Community Solar limits the number of Communities who can receive the resultant electricity and/or financial benefit from SDCG. For Behind-the-Meter Community Solar under the Micro-Generation Regulation, reasons include:

- i) Capital restrictions: the capital available to the Individual or Community or their access to finance;
- ii) Siting restrictions: the suitability of the Individual or Community’s building or site or adjacent building or site (including shading, building structural or geo-technical constraints) and/or their right to amend the site (for reasons including whether they own or lease the site);
- iii) Sizing restrictions: economies-of-scale are limited by the requirement that the Individual or Community size their system such that generation does not exceed their on-site annual demand; and/or
- iv) A combination of some or all of the above.

In summary, the proportion of Communities that can benefit from Behind-the-Meter Community Solar is limited. However, Behind-the-Meter Community Solar enabled by the province’s Micro-Generation Regulation is a good option for Communities who are able to and wish to serve a single load with on-site electricity generation and for this reason should continue to have the option to do so.

Specific recommendations on enhancements to the Micro-Generation Regulation for all Behind-the-Meter generation (both Community and otherwise) are presented in parallel in Evidence Submissions “Retail & Rate Design (3/4)” and “Wires & Wires Owners (4/4)”

Receiving the resultant electricity and/or financial benefit from a Direct-Connect Community Solar could be an alternative for those eligible Communities who are unable to benefit from Behind-the-Meter Community Solar. The current policy and regulatory framework challenges for Direct-Connect Community Solar include the absence of certainty in long-term revenue streams against which investment decisions can be considered and made (i.e. merchant risk).

CanSIA’s proposal is to enhance the policy and regulatory framework for Community Solar with the introduction of a new “Shared” approach for Direct-Connect Community Solar.

This approach is guided by the following four principles:

- I. *Broaden Access:*** enable Individuals and Communities to overcome capital, siting and sizing restrictions so that a larger more diverse group of Albertans can receive the resultant electricity and/or financial benefit from Community Solar.
- II. *Leverage Consumer Demand:*** provide Individuals and Communities with avenues to exercise a preference for solar electricity while ensuring that investments in new Community Solar electricity generation capacity responds to and is proportionate with their demand.
- III. *Integrate into Market Structure:*** ensure that Community Solar can realize a fair market value for the electricity, system benefits and environmental attributes produced to enable it to become a meaningful part of the electricity supply over time.
- IV. *Allocate Risks Appropriately:*** do not require that Individuals and Communities own a majority stake in a generation asset so that facilities can be developed, constructed, owned or operated in partnership between Communities, Public Sector entities and/or Private Sector as each party sees fit.

The table presents a description of the key characteristics of the Shared Solar approach and compares it to that of Behind-the-Meter Community Solar.

	Behind-the-Meter Community Solar	Shared Community Solar
Changes Needed	Micro-generation Regulation continues to provide the regulatory basis.	Introduction of RRO for the non-solar load shape requirements of Communities and Solar Renewable Energy Certificate (SREC) for Environmental Attributes.
Purpose	A single generation facility directly serves a single load.	A single generation facility indirectly serves a single or multiple aggregated load(s).
Siting Requirements	On-site or adjacent to load.	In same settlement zone as load(s).
Sizing Requirements	$0 \leq 5$ MW. Annual output equivalent to annual demand.	$150 \text{ kW}^1 \leq \sim 20 \text{ MW}^2$.
Electricity Off-takers	Local government or not-for-profit (as per aforementioned CanSIA definition. Residential or Commercial Behind-the-Meter does not qualify as “Community” in this definition.)	A single local government in alignment with Electric Utilities Act (Section 95(9)) or not-for-profits; or multiple residential and small business electricity customers and/or local governments and/or not-for-profits.
Generation Facility Owners	Not Restricted. Options include sole proprietorship, partnership, corporation (for profit or not-for-profit or co-operative and can include combinations of full, partial or no ownership by a Community or Communities.	

¹ A minimum size threshold would be introduced to maintain Behind-the-Meter generation as the primary approach on sites where load is present. CanSIA recommends this minimum threshold to be 150 kW to align with the current division between small (<150 kW) and large (≥ 150 kW) Micro-generation.

² The upper limit is defined by that which can be safely and reliably integrated at the point of interconnection: typically no more than 20,000 kW; but frequently significantly less. The upper limit of $\sim 20,000$ kW is explained as follows. The standard distribution voltage in Alberta is 25 kV. A typical substation has a 600 amp breaker. In a simplification, this combination results in sizing of lines to accommodate a load of 15 MW ($25\text{kV} \times 600 \text{ A} = 15 \text{ MW}$). A double circuit system can also be used (2 overhead lines and 2 breakers) to effectively accommodate up to 30 MW. A direct connection in to a distribution substation can also be accommodated at industry standard collection system voltages of 35kV. With a standard 600 amp breaker, a 21 MW project can easily be accommodated ($P = V \times C$) with a single overhead line. This voltage can then be stepped down to 25 kV at the substation and into two parallel breakers. There are also other considerations on Dx transmission lines such as continuous loads that can offset the generation on the feeders to accommodate a generation of over 15 MW with a transfer trip arrangement so no over-voltage scenarios occur).

Shared Solar Concept Design for Consumers: The Shared Solar concept allows multiple Communities varying in size and location to have their loads served by single or multiple aggregated off-site solar electricity generation facilities.

In this approach, Communities would commit to enter into a solar-only contract for a predetermined amount of electricity up to 100% of their electricity needs for their peak consumption (i.e. if their estimated peak consumption is 1 kW, the Community would enter a contract for solar electricity that produce 1 kW during their peak consumption time period) for a period of 10 - 25 years. Solar only contracts with shorter terms would have higher prices to account for market risk while longer terms would result in lower prices. As there is significant demand from Communities to install Behind-the-Meter SDCG, which implies a willingness to commit to receiving a portion of their electricity for a period of 20 – 25 years, the expectation of this term is considered to be realistic).

For the Community's remaining electricity needs not provided by the solar-only contract, the Community would enter into a second short-term contract (i.e., ranging from real-time pricing to roughly 5-years, similar to the current retail contract term range). The two contracts would meet the entire Community's energy needs and as described in CanSIA's Evidence Submission "Retail & Rate Design" (3/4) Direct-Connect SDCG, subject to specific measures, there is potential that the cost of this electricity would be less than the RRO Cap of \$68/MWh for the full term of the contract.

The benefits to the Community or Communities as a consumer(s) of the solar electricity include low cost energy costs guaranteed for a long term helping to mitigate concerns with regard to the potential impacts of the coal phase-out and the escalating price on carbon (regardless of whether they experience the capital, siting and sizing restrictions mentioned above or not). Communities may also choose to reap additional financial benefit from the solar facilities by developing and/or hosting the facilities on their sites leading to visible demonstration projects that generate leasing revenues. Whether on their sites or otherwise, they may also seek to hold minority or majority stakes in the facilities as they deem fit.

Aggregating the loads of multiple Communities is critical to achieving the lowest costs. In addition, it assists to manage counter-party risk including credit-worthiness and decisions to break the contract before the term is complete.

Shared Solar Design for Retailers: The entity (or entities) providing the Retailer function would be responsible for providing the services of a Retailer to the Communities for both their Solar Block and Non-Solar Block electricity demand (see Figure 2) which could include (but would not be limited to) meter data management, verifying volumes, managing billing format, serving as the billing agent etc. They could also potentially facilitate calls for power (i.e. a brokerage model).

In order to meet those Community's electricity needs over the full 24 hour period, the portion of their needs that is not met with solar electricity would need to be met from other sources. Figure 2 shows an example consumer demand curve and how it could be filled with a "Solar Block" and a "Non-Solar Block". Solar retailers would be responsible for energy supply matching a pre-determine solar load profile similar to the residential load profiles used by the RRO and competitive retailers now.

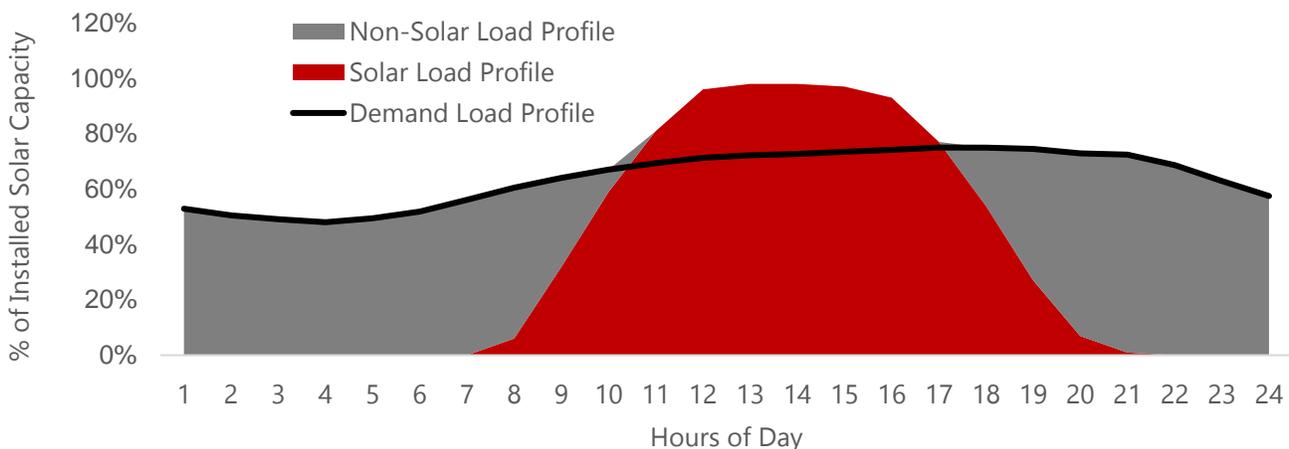


Figure 2: Solar Load Profile and Typical Demand Profile

The AESO and government would need to determine what this solar profile looks like and the solar supplier would need to bear the risk for solar production during this solar production period even when there was no solar irradiance. Solar generation output in excess of consumer needs could be sold into the pool as would be the case for Merchant Direct-Connect DCG. The second component would be a short-term contract for non-solar load profile needs. The customer could choose between a non-solar RRO for additional energy needs offered by a rate regulated provider or from a competitive retailer rate offering non-solar pricing.

A Solar Renewable Energy Certificate (SREC) would be paid with revenues from the Carbon Levy for the Environmental Attributes generated by the facility. The SREC could be paid to the

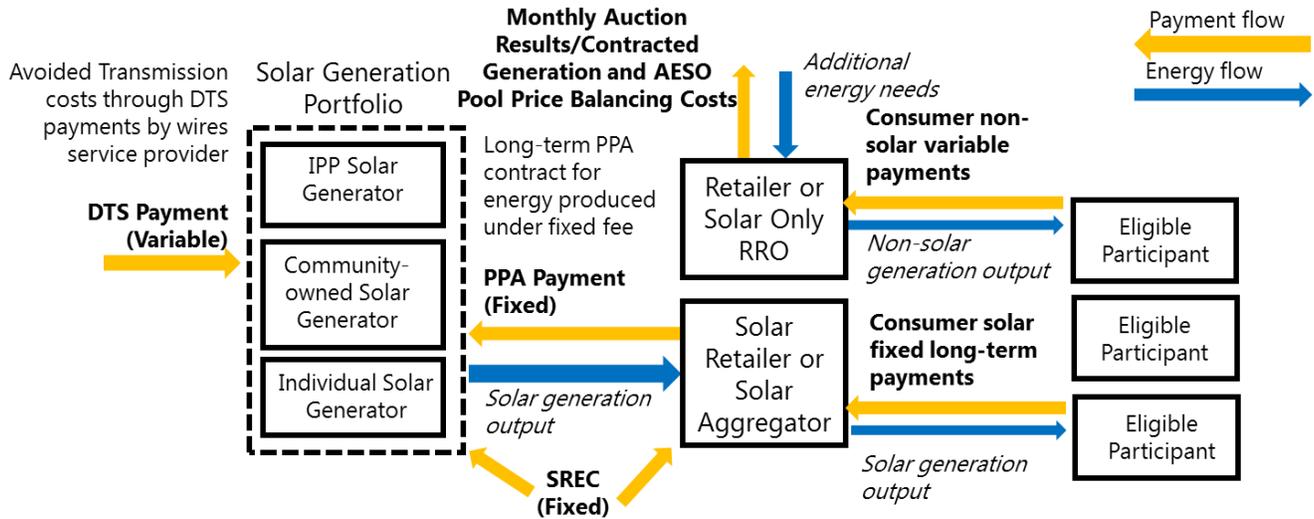
entity providing the Retailer function and would be reflected in the payment to the Generator. SREC payments to a retailer would require the AESO to share settlement data from the generator to confirm the SREC amount required. The benefit of SREC payment to the Retailer would be the ability to include a stipulation that the retailer adhere to certain conditions to ensure that the Shared Solar program is meeting specific objectives. The value of the SREC could be escalated for facilities that deliver on policy objectives such as equity participation from Communities. A potential condition for solar retailers to receive SRECs could include a requirement that solar retailers only offer contracts to eligible participants.

Shared Solar Design for Generators: As described in CanSIA's Evidence Submission "Retail & Rate Design" (3/4), rate design for Direct-Connect SDCG generates revenues for electricity, system benefits and environmental attributes. The extent to which these revenues are certain and adequate dictate whether a facility is economically viable or not. Under the Shared Solar approach, generators would be subject to the same rate design as all Direct-Connect SDCG for system benefits. They would enter into a long-term offtake agreement with an entity that fulfills the function of a Retailer for the Solar Blocks to the Communities (or they may choose to also fulfil this Retail function themselves).

The Solar Renewable Energy Certificate (SREC) could be paid to the Generator explicitly or implicitly (reflected in their off-take agreement). If the SREC payments are made directly to the Generator, the AESO, through the interval revenue meter, could provide the settlement data to confirm the amount of solar generation delivered to the Alberta electricity system. The value of the SREC could be escalated for facilities that deliver on policy objectives such as equity participation from Communities.

Figure 3 overleaf shows the payment and energy flow of the Shared Solar concept.

A risk that is not addressed in the shared solar concept is the development timeline to construct the solar generation and the start of the consumer contracts. A deposit could be required to secure funding for the solar generation development. In addition, early adopters could be offered lower rates to reflect higher risk as projects start. A diversified solar portfolio should be able to mitigate this risk, so in the long-term this issue may no longer be as high.



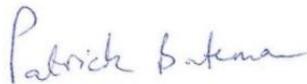
In addition, the Shared Solar concept presented does not offer the full benefits of Micro-Generation or Virtual Net-Metering (VNM). Micro-Generation and VNM can allow consumers to decrease their energy consumption which reduces some or all of their distribution tariff costs. Since the Shared Solar concept outlined in this memo is for electricity supply, the applicable distribution tariffs would still be applied to retailers and passed on to customers. VNM could be included in the Shared Solar concept but would likely require geographic restrictions. The geographic restrictions would need to link solar energy production into a distribution system at or near the consumption point (e.g., at the same POD or on the same distribution feeder). As discussed earlier, a geographic restriction may limit the pool of eligible participants or size of the solar generation portfolio, reducing the cost-effectiveness of the shared solar concept. It would likely be difficult to justify VNM for additional energy needs since the energy supply would need to come from generation located throughout to be cost-effective.

Summary: The Shared Solar concept effectively gives consumer's electricity rates that would be a mix of long-term fixed rates and short-term variable rates (either monthly through an RRO product, or longer through a competitive retailer product). The long-term fixed rate for solar generation would likely start higher than today's RRO (but potentially less than the RRO Cap) but over the length of the contract would provide a hedge against rising rates and could provide value during the later period of the contract term.

The combined electricity price should be at or below the stand-alone RRO monthly rate since energy in non-solar hours are primarily less expensive. The value of the SREC payment will determine the degree to which the solar component is cheaper than the pool-price for energy delivered in this period. The SREC value could be used as a lever to incent equity participation in facilities if that is a policy objective that the Government wishes to achieve. Matching solar generation development timelines and consumers contract time periods will need to be addressed as the shared solar concept starts.

We look forward to participating in the oral proceedings and to responding to additional questions that you may have throughout this process. Thank you for your consideration.

Best regards,



Patrick Bateman

Director of Policy & Market Development

Canadian Solar Industries Association (CanSIA)

CC

- Monica Curtis, CEO, Energy Efficiency Alberta
- Tim Weis, Special Advisor to the Minister - Climate Change, Environment & Parks
- Mike Fernandez, Assistant Deputy Minister, Environment and Parks
- Ben Thibault, Ministerial Assistant - Electricity, Energy
- Andrew Buffin, Executive Director, Generation and Transmission Branch, Alberta Energy
- Russell Andrews, Director, Generation and Transmission Policy, Alberta Energy

Addendum 1: AUC DG Review Q&A Relevant to “Community Solar”

Question 10: Please identify any limitations in Alberta’s current billing and load settlement systems that you consider may have an effect on the development of Community Solar. Please provide your suggestions or solutions regarding how these potential limitations could be addressed.

Question 11: Should an existing participant (i.e., retailer, distribution utility) or a new entity be responsible for managing billing and load settlement or is there a market solution for managing billing and financial settlement?

CanSIA Answer to Question 10 & 11: Billing, load settlement and financial settlement considerations for Behind-the-Meter Community Solar are considered by CanSIA to be universal to all facilities that are covered by the province’s Micro-Generation Regulation and are dealt with under separate cover in CanSIA’s Evidence Submission “Retail and Rate Design” (3/4).

The enclosed “Shared Solar Approach to Enabling Community Solar in Alberta” prepared for CanSIA details billing, load settlement and financial settlement that is implied under the Shared Solar approach proposed by CanSIA.

Question 39: Describe your understanding of what Community Solar would look like. Should a definition be adopted? How might the adoption of a definition affect incentives to invest and innovate? Please explain.

CanSIA Answer to Question 39: CanSIA understands Solar Distribution-Connected Generation (SDCG) is classified as either: i) “Behind-the-Meter” in which generation primarily serves a load directly; or ii) “Direct-Connect” in which all generation is exported to the grid. CanSIA understands “Community Solar” to be Behind-the-Meter or Direct-Connect SDCG in which a “Community” or “Communities” receive the resultant electricity and/or financial benefit.

CanSIA considers a Community to be comprised of one or more of the following entities:

- i) Local governments (i.e. aboriginal, rural and urban);
- ii) Not-for-profit sector (e.g. education, healthcare etc); and
- iii) Multiple residential and small business electricity customers; (e.g. non-associated or co-operative).

CanSIA believes a definition for Behind-the-Meter Community Solar is not necessary as the Micro-Generation Regulation currently defines the eligibility criteria adequately for both Community and non-Community Participants.

CanSIA believes that a definition for the Shared Community Solar approach proposed by CanSIA should be adopted with the following criteria:

- Eligible Facilities should be: i) Direct-Connect SDCG; and have ii) a nameplate capacity >150 kW. A minimum size threshold should be introduced to maintain Behind-the-Meter generation as the primary approach on sites where load is present. CanSIA recommends this minimum threshold to be 150 kW to align with the current division between small (<150 kW) and large (≥ 150 kW) Micro-generation.
- Eligible Electricity Offtakers should include single or multiple: i) local governments (i.e. aboriginal, rural, urban); ii) not-for-profits (e.g. education, healthcare); and iii) multiple residential and small business electricity customers; (e.g. non-associated or co-operative); and be located in the same settlement zone as the Eligible Facility.
- Eligible Facility Owners should include: i) sole proprietorships; ii) partnerships; iii) corporations (for profit or not-for-profit); and/or iv) co-operatives. Full, partial or no asset ownership or equity participation by a Community should be permitted.

Adopting this definition, and the other policy and regulatory framework design elements in the enclosed “Shared Solar Approach to Enabling Community Solar in Alberta” prepared for CanSIA, will maximize investment, minimize costs and encourage innovation in project and partnership structures in support of the following four guiding principles:

- I. **Broaden Access:** enable Individuals and Communities to overcome capital, siting and sizing restrictions so that a larger more diverse group of Albertans can receive the resultant electricity and/or financial benefit from Community Solar.
- II. **Leverage Consumer Demand:** provide Individuals and Communities with avenues to exercise a preference for solar electricity while ensuring that investments in new Community Solar electricity generation capacity responds to and is proportionate with their demand.
- III. **Integrate into Market Structure:** ensure that Community Solar can realize a fair market value for the electricity, system benefits and environmental attributes produced to enable it to become a meaningful part of the electricity supply over time.

- IV. Allocate Risks Appropriately: do not require that Individuals and Communities own a majority stake in a generation asset so that facilities can be developed, constructed, owned or operated in partnership between Communities, Public Sector entities and/or Private Sector as they see fit.

Question 40: Should there be a requirement that the property of participants in a Community Solar facility be adjacent, as that term is used in the Micro-Generation Regulation? Why or why not?

CanSIA Answer to Question 40: CanSIA's recommendation is that the principle of requiring that facilities are proximal to load remain in the Micro-Generation Regulation and that a Shared Solar approach as described in the enclosed "Shared Solar Approach to Enabling Community Solar in Alberta" prepared by CanSIA is introduced to overcome the barriers that that proximity presents to Community Solar in the existing Micro-Generation Regulation. Under this approach, the geographic limitation for the electricity customers of the Community Solar facility would be that they are required to reside in the same settlement zone as the generation facility.

Question 41: Would it be necessary to change municipal franchise agreements with distribution companies, or the legislative provisions governing the establishment of service territories, in order for a Shared Solar facility to be established? Please explain.

CanSIA Answer to Question 41: CanSIA's recommended Shared Solar approach in the enclosed "Shared Solar Approach to Enabling Community Solar in Alberta" prepared by CanSIA would require that electricity customers and generation facilities are located in the same settlement zone. For this reason, we do not believe that changes of the nature described would be required.

Question 42: Would it be necessary to change municipal franchise agreements, or the legislative provisions governing the establishment of service territories, in order for small-scale community generation operations to be established in new subdivisions within municipal boundaries using their own distribution wires to connect their customers to one another? Please explain.

Question 43: Should all members of small-scale community generation communities have an option to be supplied by the incumbent distribution utility and who should bear the cost of providing stand-by service?

Question 44: Should an individual member residing among a small-scale community generation community have an option to be supplied by the incumbent distribution utility (i.e., not assimilated into the collective entity) rather than from the small-scale generation community?

CanSIA Answer to Question 42, 43 & 44: Solar electricity generation is an integral component of micro-grids. CanSIA requests to be included in stakeholder engagement on the regulatory framework for micro-grid development in Alberta.