CanSIA
CANADIAN SOLAR INDUSTRIES ASSOCIATION | L'ASSOCIATION DES INDUSTRIES SOLAIRES DU CANADA

150 Isabella St., Suite 605, Ottawa, ON, CANADA K1S 1V7 | T 613-736-9077 • TF 1-866-522-6742 • F 613-736-8938 • E info@cansia.ca • www.cansia.ca

May 5th, 2017

Maria Gray
Regulatory Services Team Lead
Transmitted electronically to: rules_comments@aeso.ca

Dear Ms Gray,

RE: Proposed Wind, Solar, Aggregated Generation Facilities and Distributed Energy Resource Rule Amendments

CanSIA welcomes the Alberta Electric System Operator (AESO)'s consultation on the proposed Wind, Solar, Aggregated Generation Facilities and Distributed Energy Resource Rule Amendments. With the Connection Project List displaying 45 proposed solar electricity generation facilities greater than 5 MW with a combined capacity of more than 2,200 MW as of May 2017, it is clear that solar electricity facilities will begin to play an increasingly more significant role in Alberta's electricity supply-mix.

The functionality that is being specified (i.e. ramp management, technical and operating requirements delivered by advanced inverter functionality) demonstrate that variable solar electricity generation can be both reliably integrated and provide grid support and services in similar ways to conventional electricity generators. In addition, they will enable higher penetrations of solar electricity in Alberta's supply-mix through greater visibility and control.

California's Rule 21[1] requires the most advanced inverter functions of any Northern American jurisdiction. There are several products currently being tested and certified to UL 1741 Supplement A[2] for grid support functionality and IEEE 1547[3] Standard for Interconnecting Distributed Resources will soon provide a uniform standard for interconnection of distributed resources with electric power systems with regard to the performance, operation, testing, safety considerations, and maintenance of the interconnection.

While it is uncertain when the first solar electricity generation facilities to which these ISO Rules will apply will be in-service, it is likely that they will fall into one of two categories:

I. **2017 – 2019**: The "GTE Solar Brooks #1" (15 MW) facility which received approximately $15 million in funding from Emissions Reduction Alberta (formerly the Climate Change and Emissions Management

[1] The California Public Utilities Commission "Electric Rule 21" is a tariff that describes the interconnection, operating and metering requirements for generation facilities to be connected to a utility's distribution system, over which the California Public Utilities Commission (CPUC) has jurisdiction.
[2] UL 1741 Supplement A (SA) tests and certifies inverters and other utility interconnected distributed generation (DG) equipment for grid support functions enabling smarter, safer, reactive grid interconnection.
[3] IEEE 1547 (Standard for Interconnecting Distributed Resources with Electric Power Systems) is a standard of the Institute of Electrical and Electronics Engineers meant to provide a set of criteria and requirements for the interconnection of distributed generation resources into the power grid.

CanSIA
CANADIAN SOLAR INDUSTRIES ASSOCIATION | L'ASSOCIATION DES INDUSTRIES SOLAIRES DU CANADA

150 Isabella St., Suite 605, Ottawa, ON, CANADA K1S 1V7 | T 613-736-9077 • TF 1-866-522-6742 • F 613-736-8938 • E info@cansia.ca • www.cansia.ca

Corporation) and the facility (or facilities) that could be contracted through an Alberta Infrastructure Request for Proposals for 135,000 MWh of solar electricity per year could both be potentially in-service before 2020. ***CanSIA recommends that AESO work closely with the proponents of solar electricity generation facilities being brought online in the period 2017 – 2019 to ensure the successful implementation of these new ISO Rules in practice, affording flexibility where necessary.***

II. **Post-2019**: While there will be up to 400 MW of renewable electricity generation facilities in-service in 2019 contracted through the Renewable Electricity Program (REP), CanSIA does not expect that solar electricity generation facilities will be contracted until rounds in or following 2018 (with an in-service date of 2020 or subsequent years). This outcome would be dependent upon the implementation of policy decisions that would assess response to the RFP in a way that differentiates the regional and temporal market values of electricity as opposed to contracting on lowest cost alone. CanSIA also expects that there is potential for facilities to begin to be brought in-service in this time frame enabled by policy and regulatory framework enhancements from the Alberta Utilities Commission's Distributed Generation Review (currently underway and to conclude in December 2017) and a potential Alberta Energy consultation on "Community Solar" (anticipated later in 2017). It is also possible that a number of these facilities are brought in-service in 2019. ***By 2020, these advanced inverter functions are expected to be offered as standard industry-wide for facilities of this scale. Changes to the Ancillary Services market or approaches to compensating generators for services such as reactive power should be targeted to be in place for facilities that are brought in-service post-2019.***

Finally, CanSIA has included conference sessions on control and visibility of solar electricity generation facilities in Alberta in both our 2016 and 2017 conference programs with participation from AESO Staff and in early 2017 hosted a webinar for our Members on this topic. We would like to extend an invitation to AESO to continue to partner with CanSIA to communicate about opportunities and challenges integrating solar electricity generation at the transmission and distribution-levels through our communication channels to the solar industry and our stakeholders as and when that would be of value to you.

Thank you for your consideration of our responses to the Market Participant Comment Matrices.

Best regards,

Patrick Bateman

Patrick Bateman
Director of Policy & Market Development

Enclosed: Market Participant Comment Matrices for comments 202.5, 304.3, 304.9, 502.1 and 502.8.

Date of Request for Comment: April 7, 2017	**Contact:** Patrick Bateman
Period of Comment: April 7, 2017 through May 5, 2017	**Phone:** 613 290 9818
Comments From: Canadian Solar Industries Association	Email: pbateman@cansia.ca
Date [yyyy/mm/dd]: 2017/05/05	

Listed below is the summary description of changes for the proposed amended Section 202.5. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the actual proposed content changes to the ISO rules. Please place your comments/reasons for position underneath (if any).

1. ISO Rules	Market Participant Comments and/or Alternate Proposal
Amended The AESO is seeking comments from market participants with regard to the following matters: 1. Do you agree or disagree with the proposed amended Section 202.5? If you disagree, please provide comments. 2. Are there any subsections where the language does not clearly articulate the requirement for either the AESO or a market participant? If yes, please indicate the subsections and suggest language that would improve the clarity.	*Comment # 1: In the event of a "State of Supply Surplus and Multiple Inflexible Blocks of Zero Dollar ($0) Offers" with respect to "Dispatching the Markets", the procedure curtails imports, maximizes exports then curtails generators. How will the dispatch of storage and demand response interact with this procedure?*

Date of Request for Comment: April 7, 2017	**Contact:** Patrick Bateman
Period of Comment: April 7, 2017 through May 5, 2017	**Phone:** 613 290 9818
Comments From: Canadian Solar Industries Association (CanSIA)	Email: pbateman@cansia.ca
Date [yyyy/mm/dd]: 2017/05/05	

Listed below is the summary description of changes for the proposed amended Section 304.3. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the actual proposed content changes to the ISO rules. Please place your comments/reasons for position underneath (if any).

1. ISO Rules	Market Participant Comments and/or Alternate Proposal
Amended The AESO is seeking comments from market participants with regard to the following matters: 3. Do you agree or disagree with the proposed Amended Section 304.3? If you disagree, please provide comments. 4. Are there any subsections where the language does not clearly articulate the requirement for either the AESO or a market participant? If yes, please indicate the subsections and suggest language that would improve the clarity.	*Comment # 1: Clause (6): It may be clarified that such ramp rate must ensure that there are no ensuing voltage or power oscillations or power quality issues created in the grid as a result of the ramp up of power from the generating facility.*

Date of Request for Comment: April 7, 2017	**Contact:** Patrick Bateman
Period of Comment: April 7, 2017 through May 5, 2017	**Phone:** 613 290 9818
Comments From: Canadian Solar Industries Association	Email: pbateman@cansia.ca
Date [yyyy/mm/dd]: 2017/05/05	

Listed below is the summary description of changes for the proposed new Section 304.9. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the actual proposed content changes to the ISO rules. Please place your comments/reasons for position underneath (if any).

1. ISO Rules	Market Participant Comments and/or Alternate Proposal
New The AESO is seeking comments from market participants with regard to the following matters: 5. Do you agree or disagree with the proposed new Section 304.9? If you disagree, please provide comments. 6. Are there any subsections where the language does not clearly articulate the requirement for either the AESO or a market participant? If yes, please indicate the subsections and suggest language that would improve the clarity.	*Comment # 1: Is the following a typo? "one (1) set of meteorological data collection equipment and related devices per 100 square kilometers of surface area within the facility". This appears to be a very large surface area.*

Date of Request for Comment: April 7, 2017	**Contact:** Patrick Bateman
Period of Comment: April 7, 2017 through May 5, 2017	**Phone:** 613 290 9818
Comments From: Canadian Solar Industries Association (CanSIA)	Email: pbateman@cansia.ca
Date [yyyy/mm/dd]: 2017/05/05	

Listed below is the summary description of changes for the proposed amended Section 502.1. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the actual proposed content changes to the ISO rules. Please place your comments/reasons for position underneath (if any).

1. ISO Rules	Market Participant Comments and/or Alternate Proposal
Amended The AESO is seeking comments from market participants with regard to the following matters: 7. Do you agree or disagree with the proposed amended Section 502.1? If you disagree, please provide comments. 8. Are there any subsections where the language does not clearly articulate the requirement for either the AESO or a market participant? If yes, please indicate the subsections and suggest language that would improve the clarity.	*Comment # 1:* *Reactive Power Requirements:* *Voltage Ride Through Requirements:* *Voltage Regulation* *It is advisable that these requirements be made consistent with the presently being updated IEEE P1547 Full revision criteria for Voltage Ride Through, Volt-Var and other real/reactive power functions, etc. This is requested especially in terms of voltage limits, time duration, speed of response, etc.*

Date of Request for Comment: April 7, 2017	**Contact:** Patrick Bateman
Period of Comment: April 7, 2017 through May 5, 2017	**Phone:** 613 290 9818
Comments From: Canadian Solar Industries Association (CanSIA)	Email: pbateman@cansia.ca
Date [yyyy/mm/dd]: 2017/05/05	

Listed below is the summary description of changes for the proposed amended Section 502.8. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the actual proposed content changes to the ISO rules. Please place your comments/reasons for position underneath (if any).

1. ISO Rules	Market Participant Comments and/or Alternate Proposal
Amended The AESO is seeking comments from market participants with regard to the following matters: 9. Do you agree or disagree with the proposed amended Section 502.8? If you disagree, please provide comments. 10. Are there any subsections where the language does not clearly articulate the requirement for either the AESO or a market participant? If yes, please indicate the subsections and suggest language that would improve the clarity.	*Comment # 1: Naming the Signal Types in second column of the Appendix 2 Table "Status" and "Analog" may prove confusing if "Analog" signal here means "Continuous" signal, which can be provided to ISO dispatchers as a digitalized signal via DNP3, Modbus TCP, … protocols.* *Comment #2: Please consider whether the AESO should also measure the extent of curtailment in addition to the Market Participant.* *Comment #3: Instead of "Air Temperature" consider requesting "back of module temperature" and "plant-of-array irradiance".* *Comment #4: Appendix 2. 0 = Normal, 1 = Alarm.* *Comment #5: It has been common practice in Canada to mount weather stations, including an anemometer, at the top of a table or on an inverter house, both of which tend to be between 3-4m high. Please clarify why a height of 10m would be specified.*