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Introduction

The Canadian Solar Industries Association ("CanSIA") is a national trade association representing more than 300 solar energy companies, the majority of which are located in Ontario. Our mission is to develop a strong, efficient, ethical and professional Canadian solar industry that is able to provide innovative solar energy solutions and play a major role as the world transitions to a sustainable future.

On February 23rd 2009, the Ontario Government introduced Bill 150 – The Green Energy Act. Its vision is to make Ontario a global leader in the development of clean, green energy; creating jobs, economic prosperity and energy security. The Green Energy Act requires a series of coordinated actions on the part of several ministries.

The Ontario Ministry of Environment ("MOE") invited CanSIA to discuss changes to the proposed content for the Renewable Energy Approval Regulation under the Environmental Protection Act that will help streamline the approval of PV solar system installations thereby encouraging more renewable energy generation and economic growth in Ontario.

CanSIA has reviewed the MOE's proposed content document with its members and has identified key items listed in Table 1 that will have a pronounced impact on solar developers and their projects. The remainder of this submission discusses the identified key items in more detail and discusses the implications and recommendations in terms of both large ground mounted solar PV projects and rooftop, wall-mounted and small ground mounted solar PV projects where applicable.

Table 1 – Impact of Proposed REA Regulation on solar PV projects

Item	MOE's Proposed REA Requirements	Impact
A	**Transition Provisions**	**High**
B	**Noise Requirements**	**High**
C	**Decommissioning & Financial Assurance**	**High**
D	**Public Notification**	**Medium**
E	**Timing & Third Party Appeals**	**Medium**

A	**Transition Provisions**	**High**

In consultations between the MOE and CanSIA that were held on June 19, 2009, it was indicated that under the draft EBR posting, only developments holding all approvals would be exempt from new EPA act amendments. This means that virtually ALL solar PV RESOP contracted projects would be required to go through the new REA process. This represents a significant midstream shift in the requirements for existing solar PV RESOP projects. Under the Environmental Assessment Act, Electricity Projects (Ont. Reg. 116/01), the MOE itself classified solar PV projects as Category A - minimal environmental effects - not requiring approval under the EAA. Therefore, solar RESOP contract holders have diligently developed their projects in accordance with other applicable existing legislative requirements. This abrupt change puts at risk the efforts that solar developers have made over the past eighteen months to obtain Official Plan ("OP") and zoning amendments, and complete site plan agreements. They now face the prospect of altered requirements and a new and untested REA process that, in spite of the best efforts of the MOE, will likely experience difficulties and delays as the process is fine tuned.

The MOE requested information regarding the impact of using this particular REA transition mechanism for the solar industry. Responses from solar developers holding RESOP contracts indicate that at least 400 MW of RESOP projects representing approximately $1.8 billion in investments would be thrown back into the REA process. Wording of the REA regulation, as drafted, injects a significant amount of risk for projects that were issued contracts under the OPA's RESOP program and have completed a large portion of the existing approvals process. The proposed MOE transition mechanism is expected to stall financing and precludes the creation of 2000 construction jobs in the next two years.

It is CanSIA's position that solar PV developers with RESOP contracts should be allowed to elect to remain in the existing municipal planning process in order to complete their project approvals. These projects are under strict deadlines for completion by the Ontario Power Authority and a robust planning process already provides for the sound development of these solar PV projects.

In the event that the EPA amendments force all projects that are not completely permitted into the REA process, CANSIA proposes that the Table 2 (below) be used as a transition guideline. The table specifies sections of the REA that developers should be exempted from as they resubmit their projects under the REA process. The matrix was constructed by looking at the studies and planning criteria that have been required of solar PV projects at different stages of approvals. For example, solar PV projects that have obtained approval for a zoning-bylaw amendment have already satisfied municipal planning requirements for cultural heritage, natural heritage, water features, noise, and zoning setbacks; conservation authorities and the MNR must have been consulted for fish and wildlife concerns; public consultation are already completed as part of the re-zoning process. All that remains is for site planning issues such as road access location, traffic management, parking, site safety and servicing to be completed (Part III, Section 2 of the proposed REA).

Table 2 – Guidelines for Transition of Solar PV Projects into the REA Process

Type of Project	RESOP contracted Project	No RESOP contract
	Service guarantee: **2 months**	Service guarantee: **6 months**
1) *No zoning applications made*	No exemptions from REA	No exemptions from REA
2) *ZB/OP applications made (no approval)*	Exempt from Part III, section 1 if Public Meetings have already been held. Exempt from: Part III, section 3, 4, 5, 6, 7, Part IV	Exempt from Part III, section 1 if Public Meetings have already been held. Exempt from: Part III, section 3, 4, 5, 6, 7, Part IV
3) *OP/ZB approval received*	Exempt from: Part III, sections 1,3,4 (except as required through municipality), 5, 6, 7 and Part IV	Exempt from: Part III, sections 1,3,4 (except as required through municipality), 5, 6, 7 and Part IV
4) *OP/ZB and site plan approval received* *or* *Projects taking place in municipalities that have no requirements for OP/ZB amendments and/or site plans*	Exempt from all sections of REA	Proponent provides proof of site plan approval and receives REA (REA is required to obtain FIT contract).

Large Ground Mounted Solar Recommendation:

Allow solar PV projects with RESOP contracts a one-year transition period in which to obtain a site plan agreement, otherwise they may elect to move into the REA process. (No solar PV RESOP project can go ahead without either a site plan agreement or an REA.)

B	Noise Requirements	High

The MOE has proposed that *"all solar photovoltaic facilities (e.g. ground mounted, rooftop, and wall-mounted) solar projects with a name plate capacity greater than 10 kW would have to submit a study demonstrating noise levels at the nearest Point of Reception are consistent with the Ministry of the Environment's noise guidelines".*

Although CanSIA recognizes the importance of minimizing noise pollution, we feel that these requirements place an unnecessary burden and cost on the development of rooftop, wall-mounted PV solar installations, particularly in urban areas (Noise Guidelines: Class 1 & 2 Areas) and certainly in instances where inverters will be enclosed.

As defined in MOE's NPC-232 or NPC-205 Noise Guidelines, Class 1 Areas have an acoustical environment *"typical of a major population centre, where the background noise is dominated by the urban hum."* It would therefore seem redundant to require equipment with minimal noise levels, such as inverters, to the cost and time associated with a noise study.

Our concern with requiring noise studies in Class 2 Areas is similar. NPC-232 or NPC-205 Noise Guidelines define Class 2 Areas as those having an *"acoustical environment that has qualities representative of both Class 1 and Class 3 Areas, and in which a low ambient sound level, normally occurring only between 23:00 and 07:00 hours in Class 1 Areas, will typically be realized as early as 19:00 hours."* The key distinction being the lack of an "urban hum" during evening hours, a time-frame when solar PV production is near its lowest and, as such, already limited inverter noise is further reduced.

Additionally, it is expected that the majority of PV solar installation will have inverters that are enclosed, either within the building structure (rooftop and wall-mount) or in a constructed enclosure (ground mounted).

CanSIA does recognize the need for the PV solar installations to operate within the guidelines of the MOE's noise guidelines. Nevertheless, we also feel that it is important that MOE requirements be consistent with other regulatory processes related to renewable energy, specifically the OPA's and OEB's process of streamlining "queue-exempt" distributed generation projects (i.e. 250kW connecting at less than 15kV or 500kW connecting at greater than 15kV). These "queue-exempt" projects are considered by the OPA and OEB to have a minimal impact and should not be subject to unnecessary regulatory processes so that there development can be encouraged.

Rooftop, wall-mounted and Small Ground Mounted Solar Recommendation:

To ensure consistency with the other regulatory processes and the MOE's noise guidelines and reasonableness of its application, CanSIA proposes that: "unless inverters are contained within an enclosed structure, all solar photovoltaic facilities (e.g. ground mounted, rooftop, and wall-mounted) solar projects with a name plate capacity greater than 500 kW and installed in a Class 3 Area as defined within the MOE's noise guidelines (NPC-232 or NPC-205 Noise Guideline) would have to submit a study demonstrating noise levels at the nearest Point of Reception are consistent with the MOE's noise guideline.

C	**Decommissioning & Financial Assurance**	**High**

The MOE has proposed that *"proponents will be required to submit a decommissioning plan, which would address, among other matters, procedures for equipment/building, dismantling and demolition, site restoration and final residue disposal."*

It is also proposed that *"Financial Assurance will be required for future clean-up and remediation of the site. Consideration will be given for the recycling value of the photovoltaic components. The Ministry of the Environment will develop a streamlined approach to this calculation."*

In terms of decommissioning, the MOE has mentioned concern regarding some thinfilm modules (CdTe, CIS) which contain small amounts of cadmium compounds (CdTe, CdS). It is important to note that researchers have conducted experiments and determined that there is no risk posed by cadmium leaching from broken modules. Steinberger conducted outdoor leaching experiments on CdTe and CIS modules that had been broken into small fragments (~1cm^2). This scientific paper has been attached to this submission. Steinberger estimated that, in a worst case scenario, materials leached from the fragments into rainwater would result in concentration levels that are no higher than the German drinking water concentration limit for cadmium (5μg/l). Note that Ontario Drinking Water Standards also define the Maximum Acceptable Concentration (MAC) for cadmium as 5μg/l (0.005mg/l)[9]. He stated that for broken CIS and CdTe modules on the ground, "no critical increase of natural element concentration is observed after leaching into the soil for 1 year." This is partly due to the fact that the CdTe is encapsulated and not readily available to leach.

Ground mounted solar PV systems are expected to operate for 30+ years, and after decades of operation, they are easily decommissioned. Panels are taken down and the balance of system is removed. The aluminum and steel components of the racking and wiring can be recycled and concrete components, if used in the original installation, can be crushed or re-used. Some concrete ballasts are even designed to be re-used as concrete retaining wall components. The removal of the solar panels and underground cables will leave the land in the same condition as it was before the solar energy system was constructed. Drainage

systems will be intact and minimal additional remediation may be required to restore small areas to their original condition.

In terms of the disposal of modules, the ultimate solution being adopted by the PV industry is recycling of the modules. The industry recognizes the environmental and economic advantages of recycling. Reclamation of exotic metals such as telluride and selenium from spent modules is essential to continued production, as these elements are relatively scarce.

Recent studies have shown that recycling based on current collection/recycling infrastructure as well as proven PV recycling technologies is both technologically and economically feasible. The estimated cost of recycling technologies for both monocrystalline and thin film technologies is $0.04-0.05/Watt. Given these circumstances, the EU has chosen not to regulate solar PV modules under the Waste Electrical and Electronic Equipment (WEEE) Directives, but is opting for a Voluntary Agreement with the PV manufacturers acting together under PVCycle. In fact, First Solar, the largest manufacturer of CdTe thin film modules, has developed the PV industry's first comprehensive pre-funded module collection and recycling program (http://www.firstsolar.com/recycle_modules.php). At the time each module is sold, sufficient funding is set aside in an independent "recycling trust" to meet the estimated collection and recycling costs of each module at the end of its useful life.

PVCycle (http://www.pvcycle.org): To provide a bit of background, the PVCycle Association was founded in Brussels in July, 2007. PVCycle () currently has 41 members, covering 31 countries and representing roughly 75% of the European PV market. It is a voluntary industry body created in order to establish a reliable recovery system for end-of-life PV modules. This includes both crystalline silicon modules as well as thinfilm modules. The PV industry recognizes that, although proven full-scale module recycling processes have been developed, their effectiveness hinges on a comprehensive collection and transportation program. In May 2007, Germany's renewable energy agency, the BSW, and the European Photovoltaic Industry Association (EPIA), commissioned a study on the development of a take-back and recovery system for photovoltaic products (see link). Completed in March 2008, this study on the relevant technical, ecological, economic, legal and political parameters is the basis for the work of the European PV Cycle Association.

The association has worked to an aggressive schedule. This Spring 2009, PVCycle completed the detailed design of the recycling model and has documented this model through a voluntary agreement that includes the commitment of the PV industry producers. Invitations to tender for the collection and transport of end-of-life PV modules have started to be issued (e.g. Germany). The intention is to begin implementing the program throughout Europe in 2009, together with annual monitoring and auditing. This will allow the association to fully test and troubleshoot the detailed design before 2015, when many of the modules installed in the 1990's will reach the end of their predicted 25-year life (see also http://www.pvworld.com/pvworld/en-us/index/articles/display.articles.PhotovoltaicsWorld.equipment-and_materials.general.light-cycle__recycling.html).

Large Ground Mounted Solar Recommendation:

CanSIA recommends that all large ground mounted solar PV projects (500 kW +) be exempt from the MOE's suggested financial assurances requirements. It represents an arbitrary and inequitable measure. Firstly, it does not give due consideration to the benign nature of solar PV technology which has been scientifically documented and which is evidenced in installations around the globe. Secondly, it does not give due regard to existing reclamation programs, the enormous salvage value, or the minimal remediation that solar PV projects will entail. The scrap value of all the copper and aluminum in these projects alone is enormous and certainly places PV projects in a completely different category than other projects that require financial assurance such as private landfills, sewage treatment facilities, pits and quarries. In sharp contrast to solar PV projects, these latter projects have no residual value that could be realized. Finally, financial assurance is not required for wind or hydro projects.

Rooftop, Wall-mounted and Small Ground Mounted Solar Recommendation:

CanSIA recommends that all rooftop, wall-mounted, and "queue-exempt" (under 500 kW) ground mounted systems be exempted from the MOE suggested decommissioning plan and financial assurance requirements. This is consistent with the OPA and OEB regulatory processes for encouraging the development of small-scale low impact distributed generation.

D	**Public Notification**	**Medium**

The MOE has proposed that *"renewable energy project proponents will be required to provide public notice within no less than a 1.5 km radius of the proposed renewable energy generation facility at a preliminary stage of project planning. Proponents will also be required to post notice of the proposed project in a local newspaper of general circulation within the municipality where the project is located."*

CanSIA agrees that public notification and consultation is an important part of renewable energy development, but feels that the radius of notification is not appropriate for solar PV projects and is inconsistent with the impact this technology has on surrounding areas.

In terms of large ground mounted projects there is virtually no impact outside the project boundaries while a visual buffer can be easily added. In terms of rooftop, wall-mounted and small ground mounted projects do not have impacts to HVAC and other equipment that have a similar footprint and are not subject to the same requirements. Additionally, notification requirements would expose smaller projects to potentially unnecessary appeals.

In relation to small-scale ground-mount, it is important that building/property owners have the flexibility to install these small-scale solar PV systems in instances where access to rooftops is not possible (i.e. shading, structural issues, etc). CanSIA therefore considers it to be important that the MOE requirements be consistent with other regulatory processes related to renewable energy, specifically the OPA's and OEB's process of streamlining "queue-exempt" distributed generation projects as discussed in the recommendations above.

Large Ground Mounted Solar Recommendation:

CanSIA recommends that the public notification radius be reduced to 400 m for large ground mounted solar PV projects (500 kW +) due to the fact that large ground mounted systems have low visibility and almost no impact outside the project boundaries. This recommendation is consistent with existing typical zoning requirements throughout municipalities in Ontario.

Rooftop, Wall-mounted and Small Ground Mounted Solar Recommendation:

CanSIA recommends that all rooftop, wall-mounted, and "queue-exempt" (under 500 kW) ground mounted systems be exempted from the MOE suggested public notification process. This is consistent with the OPA and OEB regulatory processes for encouraging the development of small-scale low impact distributed generation.

E	**Timing & Third Party Appeals**	**Medium**

In relation to third party appeals, the MOE has proposed that "*the time period be 9 months from the date that a hearing is requested to the issuance of a decision by the Tribunal."*

CanSIA agrees that a right to third party appeal and sufficient time to render a decision is an important component of an approval process. However, we are concerned with the time lag between the request for a hearing and a final decision by the Tribunal, specifically in relation to low-impact projects such as ground mounted and rooftop, wall-mounted and small ground mounted solar PV projects. Due to solar's benign nature these projects are low impact with limited grounds for appeal.

Joint Large Ground Mounted and Rooftop, Wall-mounted and Small Ground Mounted Solar Recommendation:

CanSIA proposes that the time period for the issuance of a decision by the Tribunal be reduced to 30 days for all solar PV projects.

Closing

CanSIA appreciates this opportunity to provide input regarding the Renewable Energy Approval Process and looks forward to working cooperatively with the MOE to ensure this process is streamlined and effectively structured. Furthermore, CanSIA requests the opportunity to meet with the Ministry of Environment in order to discuss this submission in further detail.