



# CanSIA

CANADIAN SOLAR  
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ASSOCIATION

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INDUSTRIES SOLAIRES  
DU CANADA

## **Submission to Hydro One Networks Inc. on its Distributed Generation Technical Interconnection Requirements**

July 31, 2019

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## Introduction

The Canadian Solar Industries Association (CanSIA) is a national trade association that represents the solar energy industry throughout Canada. Solar electricity is a mainstream energy source and an integral part of Canada's diversified electricity mix. CanSIA offers feedback to Hydro One's consultation on its Distributed Generation Technical Interconnection Requirements Interconnections at Voltages 50 kV and Below, Rev3 (TIR) document. CanSIA's members actively provide services to support customers in managing their electricity services and provide value to the electricity grid. Members work with Ontario's residential, commercial and industrial customers to provide a suite of services including behind-the-meter solar generation (including net metering and non-exporting) and energy storage.

CanSIA appreciates this opportunity for input to Hydro One and encourages Hydro One to undertake a more formal and comprehensive stakeholder engagement effort in future to recognize the technological changes that are taking place in the distributed energy resource (DER) sector.

Many of our members actively engage with Ontario's distributors and Hydro One directly in partnership with end use electricity customers and therefore we offer insights into customer experiences in Ontario and lessons learned from best practices in other markets. We wanted to take this opportunity to offer specific recommendations for improvements to the TIR, and as well endorse a process for greater stakeholder engagement in a broader and more frequent consultation effort.

Our feedback is structured in the following manner and specific areas of input:

1. Requirements appropriate to the use, size and type of DER
2. Technical conference for information sharing and setting priorities
3. Specific recommendations for improvements to the TIR

## Requirements Appropriate to the Resource

In preparing this submission, CanSIA canvassed members for feedback to submit to Hydro One. Members stated they experience the connection process and requirements to be insensitive to the project technology characteristics, project size and the project impacts on the distribution grid. CanSIA recommends that the TIR adapt to clearly outline and define requirements specific to different generator technologies, connection arrangements, and operating characteristics. To better reflect the modern mix of technologies and services available to customers and HONI.

The OEB's Distribution System Code was drafted in the late 1990s in anticipation of market opening when new generation was expected to come on to the grid. Many of the requirements from the TIR may be appropriate for the MW scale generation from conventional generation technologies that include rotating

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electrical machines. However, the technological trends of today's electricity system are towards smaller sized resources that are inverter based. Thus, the TIR should include distinct requirements for the two types of generators:

- Rotating electrical machines
- Inverter based technologies

There are differences in the impact on the distribution system between generation or storage technologies that are directly connected to the grid, as compared to those that are load connected and designed operate behind the meter and manage electricity usage. Protection and control requirements should be distinct for the connection arrangement:

- A resource connected directly to the distribution system
- A resource designed to reduce customer usage and/or demand (behind the meter)

Finally, a third category of resource differentiation should take into account whether a resource is configured in a manner to return electricity to the grid or whether the resource is intended to never export electricity onto the distribution system. A customer that installs a technology that is intended to reduce consumption and NOT export power should be considered along the lines of a conservation technology not a merchant generation facility. The connection assessment and technical requirements should reflect the operating characteristic differences. Therefore, the TIR should have a third category that has appropriate specifications based on:

- Projects that export power to the grid
- A resource that is designed to be a zero-export generation – merely offsetting customer consumption

In support of the above three distinct categories, CanSIA recommends that the TIR include specific definitions of energy storage resources and non-exporting load displacement for clarity and certainty. CanSIA notes that members were pleasantly surprised at the updated cost schedule posted by Hydro One for CIA fees, in that the approach taken by Hydro One was to further refine CIA fees by project size and use case and this differentiated approach should be applied to every aspect of the TIR.

## Technical Conference for Information Sharing

CanSIA respectfully recommends that Hydro One use this TIR outreach effort as a beginning to engage stakeholders in a meaningful way on interconnection standards. The Hydro One TIR is for all intents and purposes the de facto interconnection standard for Ontario based on the transmission and distribution asset ownership structure in the province. CanSIA recommends that Hydro One arrange to host a technical conference where experts from Hydro One can raise the level of understanding of stakeholders on the

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rationale for and the application of the various standards in the TIR. Attendees can include service providers, customers and distributors. Engagement and consultation with stakeholders can assist Hydro One in identifying priority areas for refinement and evolution over time. Specifically, CanSIA recommends that a regular (e.g., annual) technical conference be arranged to ensure the interconnection standards is consistent with national and international standards. Further, stakeholder experience in other jurisdictions can be assessed and changes to the requirements made where appropriate. Finally, regular consultation on the TIR can inform all stakeholders about the Ontario context in the TIR and the unique requirements needed in the Hydro One electricity network.

In short, CanSIA recommends that Hydro One take feedback from stakeholders as input to areas where industry would be best benefit from greater background and consideration of areas for improvement and evolution of the TIR. An open stakeholder session would also create a forum for a discussion of global best practices and evolving international standards dealing with DERs in other markets. The approach to a technical conference should lead to a commitment to doing so on a regular and recurring basis.

## Specific Recommendations to the TIR

Members offer the following as specific areas of concern where additional consideration should be given to amendments to the TIR.

1. The 7% rule

*total generation must not exceed 7% of the annual line section peak load on F-class feeders or 10% for M Class feeders*

The concern regarding the application of this restriction is that the rule does not take into consideration the generation profile (i.e., seasonal and hourly) of the customers that contribute to the threshold limit.

2. The 40% minimum load rule

Hydro One assumes the worst-case scenario in applying this restriction without taking into account the potential use case for utilization and operation of the DER. Non-exporting load displacement resources, for example, would be expected to only offset customer demands and not inject into the grid. Energy Storage facilities do not discharge at minimum load times, they operate at times the feeder would be heavily loaded.

3. Breaker fail requirements

Hydro one specifies that if a generator breaker fails to open then a backup breaker is required to ensure safety and protection on the grid. This restriction is not necessary to apply to inverter-based generation as the inverter can perform the same function for the low probability breaker failure event. This requirement in section 2.3.4 of the TIR specifies that a second redundant disconnect is required in the next open zone, which some utilities interpret to mean on the high voltage side of the transformer. This is unnecessary and

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expensive. Clarification for other distributors and service providers would benefit customers. Furthermore, the requirement for an HVI is not implementable with behind the meter connections.

#### 4. Adoption of evolving international standards

Standards organizations worldwide such as CSA, UL and IEEE are advancing protection and control standards to keep pace with the rapid advancement and technological deployment of DERS. Reference to evolving standards in the TIR would ensure that Hydro One and its customers are up to date with best practices.

Table 10 of the TIR should more clearly reflect the requirements for protection and control for the various technologies and connection arrangements mentioned in this letter. Specifically, it should clearly outline instances where the certifications UL1741 etc., are insufficient and additional protection and control relays are required.

#### 5. Transfer Trip

There are many customer-DER configurations where transfer trip should not be a requirement. The equivalent treatment across resource types without distinguishing end use or configuration or technology results in high costs with little incremental benefit. In short, non-exporting DERS and front-of-the-meter DERS should be treated differently.

#### 6. The 15-minute Rule

The TIR section 2.4.7 requires that if a feeder is down for more than 15 minutes then the DER install control systems to keep the line down. This is another example where the inverter functionality will accomplish this protection and should be recognized as having this capability without the need to install redundant systems. Also, should not be applicable to ESS systems that do not automatically restart generation.

## **Conclusion and Summary of Recommendations**

CanSIA commends Hydro One for initiating this stakeholder outreach exercise and encourages its continuation in the form of a technical conference, and as well an ongoing commitment to the stakeholder engagement going forward. CanSIA strongly recommends a connection requirements philosophy that looks at ensuring that technical interconnection requirements are appropriate for the resource, taking into account size, configuration and impacts on the distribution grid.