

Connection of New Generation to Distribution Systems

**Stakeholders' Report and Recommendations
as Prepared by Board Staff**

November 18, 2003

Table of Contents

Context

1. Process
2. Technical Requirements
3. Costs
4. Contracts and Applications
5. Other Related Issues
 - 5.1 Queuing
 - 5.2 Cumulative Net-Metered Generation
 - 5.3 Dispute Resolution Process
6. Out of Scope Issues
7. Summary of Recommendations

Attachments

1. The Connection Directive
2. List of Stakeholders by Organization
3. Connection Process
4. Technical Requirements
5. Technical Requirements Reference
6. Micro-Embedded Load Displacement Generation Connection Agreement
7. Sub-Working Group Identification of Out of Scope Issues

Context

The previous Minister of Energy issued a Connection Directive (attachment 1) to the Ontario Energy Board directing the Board to:

- a. Promote the addition of new generation, which predominantly utilizes cleaner energy sources, including alternative and renewable energy sources.
- b. Facilitate the connection of new generation to local distribution systems.
- c. Review and enhance license conditions for the purposes of subsection 70 (6.1) of the Act, in a manner suitable for implementation by no later than November 30, 2003.
- d. Address the need for standardization, consistency and clarity of connection procedures and requirements, including technical requirements to address system operations issues, including reliability, power quality, safety and measurement; application requirements and procedures, including time lines for distributor actions; and any other requirements or procedures that the Board deems appropriate and which are consistent with this directive

Several factors seem to have contributed to the issuance of the Directive including stakeholders', especially generators', need for transparency, consistency and predictability of connection processes, costs and technical requirements and the need to promote new power supply in Ontario especially from cleaner energy sources. The Directive also calls for determining cumulative net metered generation levels.

The Board held public consultations to address the issues raised by the Directive. Preparation for stakeholder consultations started in July 2003 with consultations held throughout August - October 2003. There were four sub-working groups (SWG) which reported their findings to a Plenary Group. The SWGs addressed the following areas:

- Process
- Technical Requirements
- Contracts and Applications
- Costs

SWG memberships were self-selected at the first Plenary meeting. Members of SWGs were also members of Plenary. Representation at Plenary included generators (small and large, renewable and non renewable, etc.), distributors, related associations, Electricity Safety Authority, Canadian Standards Association, Measurement Canada, the IMO, and the natural gas industry (attachment 2).

Plenary deliberated and made recommendations on the proposals/recommendations made by SWG. Due to the scope and complexity of the issues related to the Connection Directive, stakeholders representing over 25 organizations met for some 30 full-day working group sessions to address these issues.

Consultations have revealed several issues including:

- The need for standardization of the connection process, technical requirements, costs and contracts and applications
 - LDCs supported standardization as it helps them better manage their resources and define expectations of connecting generators.
 - Generators supported standardization because it enhances transparency and addresses the potential for “gold plated” requirements by some LDCs.
- Several stakeholders’ concerns stemmed from codes, rules and standards that fall outside the OEB’s jurisdiction.
- Standardization of costs is not feasible within the scope of this Directive as this would be regarded as “setting a rate”. Distribution rate applications cannot currently be made to the Board without the approval of the Minister of Energy. This issue is further discussed below as part of the “out of scope issues”.
- There is a general need for education among stakeholders about the different roles and points of involvement of the various organizations involved in the connection process of generators to the distribution system including those of ESA (Electricity Safety Authority), CSA (Canadian Standards Association), the Ministries of Natural Resources and Environment (as applicable), the Transmitter/host distributor and the IMO. There is also a potential for streamlining the operations of these organizations to enhance the connection process, technical requirements and costs associated with connecting new generation to the distribution system.
- Stakeholders agreed that it is premature to determine the level of net cumulative generation in the absence of the related regulation referred to in section 70 (6.1) of the OEB Act. Net cumulative generation levels would need to be addressed once a regulation is issued.
- There was a general concern that disputes brought forward to the Board typically take a long time to settle which leads parties to seek alternative approaches. While this may minimize the need for Board involvement, it forces parties with less “deep pockets/negotiating power” to settle for unfavourable terms in order to contain their risk.

Amendments to the DSC will be subject to a formal notice and comment.

The following provides the highlights of stakeholders’ consultations and recommendations. Stakeholders requested that Board staff put forward their recommendations to the Board.

1. Process

Recommendations

- Amend the DSC to adopt the proposed standardized connection processes, size categories and time frames for connecting generators to the distribution system as per attachment (3).
- Allow, based on the distributor's and the generator's mutual agreement, a project to be subject to a connection process lower than that prescribed according to its size category.

Discussion

The proposed size categories are:

Micro	≤ 10 kW and for customer's own use
Small	(a) ≤ 500 kW connected on distribution system voltage < 15 kV (b) ≤ 1 MW connected on distribution system voltage ≥ 15 kV
Mid-sized	(a) > 500 kW connected on distribution system voltage < 15 kV (b) > 1 MW < 10 MW connected on distribution system voltage > 15 kV
Large	> 10 MW

The rationale behind the different size categories stems from the technical impact and requirements of each generation size category on the distribution system. This will be further discussed under technical requirements below.

Details about the connection process steps are provided in attachment (3). In developing the proposed processes, stakeholders were guided by the Directive and other guiding principles including:

- Connection processes should be simple, transparent and easy to understand;
- Connection processes should set out the generator's and distributor's responsibilities, obligations and expectations as early as possible;
- The connection process should be enforceable; and
- The connection process should reflect the differences inherent in connecting generators of different sizes.

In developing processes for the different size categories, stakeholders tried to address some of the current obstacles to connection of generation, such as the need to involve several critical players such as the ESA, the Transmitter or the IMO in a timely manner and the need for improved ongoing communication between the LDC and the generator.

Stakeholders recommended that the proposed amendments prescribe, where applicable, the time frame for distributors' deliverables and recognize the differences between generators of different sizes. Stakeholders were predominantly supportive of the processes and time frames associated with the different size categories as described in attachment (3). Stakeholders feel that the proposed processes meet the intent of the Directive.

The connection process for micro generation would take the distributor a total of 20 days to connect. As this size of generation is mainly renewable or alternative in nature, the micro connection process is expected to promote the addition of new generation, which predominantly utilizes cleaner energy sources, including alternative and renewable energy sources as specified by the Directive.

The proposed prescription and standardization of connection processes and associated time frames for micro, small, mid-sized and large generators to the distribution system aim at meeting the Directive's requirement to facilitate the connection of new generation to local distribution systems.

Stakeholder's proposed recommendations also aim at meeting the Directive's requirement to "address the need for standardization, consistency and clarity of connection procedures and requirements, including technical requirements to address system operations issues, including reliability, power quality, safety and measurement; application requirements and procedures, including time lines for distributor actions; and any other requirements or procedures that the Board deems appropriate and which are consistent with this Directive".

2. Technical Requirements

Recommendations

- Amend the Distribution System Code to include the proposed Technical Requirements (attachment 4) for connection of generators to the distribution system.
- Adopt and maintain the proposed Technical Requirements Reference (attachment 5) as a technical reference for connecting generators to the distribution system.

Discussion

The proposed technical requirements aim at addressing the Directive's objective for standardization of technical requirements including system operations, reliability, power quality, safety and measurement issues. In developing the proposed technical requirements, and to benefit from existing industry knowledge and experience, stakeholders have referenced, where applicable, the following existing codes and standards:

- CSA (Canadian Standard Association);
- OESC (Ontario Electrical Safety Code) enforced by ESA (Electrical Safety Authority);
- IEC (International Electrical Code);
- IEEE 1547 (Institute of Electrical and Electronic Engineers). Code 1547 governs interconnections of Distributed Resources with Electric Power systems and has been recently finalized; and
- IMO market rules.

Stakeholders viewed the reference to other existing codes and standards as a way to makes the proposed technical requirements consistent with the requirements of other governing bodies, and with other jurisdictions. For example, it is likely easier for Micro generator to connect its CSA-approved generator without having to comply with additional technical requirements. This approach aims at allowing for faster and less costly generation connections to the distribution system.

The above proposed connection processes recognize the impact of generator size on the distribution system. The rationale for developing the proposed four categories of generators (i.e.: micro, small, mid-sized and large) includes:

Size Category	Rationale
Micro ≤ 10 kW and for customer's own use	<ul style="list-style-type: none"> – “off the shelf” systems / ESA approved/certified – minimal impact on distribution system protection where typically there is no service/wiring changes required – no billing for injection (for own use only)
Small (a) ≤ 500 kW connected on distribution system voltage < 15 kV (b) ≤ 1 MW connected on distribution system voltage ≥ 15 kV	<ul style="list-style-type: none"> – the two sub-categories reflect the degree of impact on system (e.g.: cumulative system impacts and distribution system voltages considered) – minimum LDC involvement required for small (a) – small generators pay up front, with the option of being bumped down to a lower connection process upon mutual agreement of generator and distributor – potential involvement of the transmitter

<p>Mid-Sized (a) > 500 kW connected on distribution system voltage < 15 kV (b) > 1 MW < 10 MW connected on distribution system voltage > 15 kV</p>	<ul style="list-style-type: none"> - more significant impact on distribution system(e.g.: fault levels, potential need for system enhancement such as dedicated feeders, etc.) - need for protection devices and transformation - need for review of system assessments as connection at this level may impact transmitter, host LDC, customer, and distribution system - involves different time frames, costs, process, etc. - likely involvement of the transmitter
<p>Large > 10 MW</p>	<ul style="list-style-type: none"> - significant impact on distribution system - significant impact assessment where transmitter and IMO assessment is required - compliance with IMO requirements - large costs and diversity of options require negotiations - consistent with industry practices in other jurisdictions

3. Contracts and Applications

Recommendation

- Approve the proposed Micro-Embedded Load Displacement Generation Connection Agreement (attachment 6) as a standard contract agreement for connection of all micro generation of ≤ 10 kW and for customer’s own use to the distribution system.
- Commit to develop standardized contract templates for the connection application, impact assessment, estimate agreement/offer to connect and the connection agreement pertaining to all other (than micro) size categories.

Discussion

Stakeholders developed a two-page contract for micro generation connections (attachment 6). Stakeholders proposed that this standard contract be adopted by the Board for all micro generation connections.

Stakeholders have also recommended that the Board allow for the standardization and “codification” of the above noted contracts and applications in the near future. Stakeholders requested that the Board develop standardized terms to address the following areas:

- Liability and Insurance
- Dispute resolution
- Operating standards and reporting protocol
- Monitoring and telemetry
- Termination
- Disconnection/re-connection

4. Costs

Early in the consultations, stakeholders were keen to propose standardized application fees and connection costs for connecting generators to the distribution systems. Stakeholders viewed cost-standardization as a way of minimizing generation projects risks and increasing transparency. However, they recognized that standardization of costs is not feasible within the scope of this Directive as this would be regarded as “setting a rate”. Distribution rates are currently frozen until 2006. Rate-related decisions (unless otherwise referred to the Board) presently fall within the mandate of the Minister of Energy.

Given this regulatory context, stakeholders felt that the standardization of the technical requirements and the processes would help define the scope and scale of costs related to the connection of generators to the distribution system. Stakeholders emphasized the need for distributors to provide detailed cost estimates to generators. This would enhance transparency and, temporarily, mitigate the restriction on setting standardized fees and/or costs.

5. Other Related Issues

5.1 Queuing

Recommendations

- Determine a queuing process in the near future.

Discussion

Queuing refers to when the generator applies to be connected to the distributors’ systems and secures a position or a priority to connect over other future applicants. It also refers to the rights and obligations of this generator to hold their “position in the queue” and the treatment of other generators who are interested in connecting at that same point or elsewhere on the same feeder/line. Issues for consideration relate to the type of generation technology, gaming, costs of connection to subsequent generators, etc. Stakeholders briefly examined the IMO (recently revised) queuing process. Stakeholders felt that the issue of queuing is important and that it could not be thoroughly addressed within the time frame of these consultations. Stakeholders proposed that the Board allow for further consultation on the issue of queuing following the conclusion of the Connection

Directive work. Stakeholders proposed the following guiding principles for future deliberation on the queuing issue:

- First-Come First-Serve
- Need to recognize variable time lines required due to differences in technology
- Need to meet the need for new generation
- Limit opportunities for “gaming” to help control costs
- Simple queuing system that can be clearly understood
- Specific criteria for entry and exit
- Non transferable (i.e.: project specific)

The above proposed principles were developed on the basis of the following considerations:

- First come first served is a fair first principle and allows for “time stamping”.
- Generators are competing for space on the distribution system. Queuing may result in having one project block another or increase the cost to other projects by maintaining a position in the queue.
- Different projects require different time frames to develop (e.g.: hydroelectric vs. co-generation), others are location sensitive (e.g.: wind).
- Gaming may occur where a generator “blocks” a position on the queue without intentions to connect but for other financial benefits.
- Where key milestones and continued progress is being made, the generator would maintain their position in the queue.
- Cost changes may occur due to several factors including changes in the cost of resources and materials. As well, technical requirements specified by the distributor may change due to ongoing system changes that, over time, could change the required system modification and therefore costs. Cost issues may be addressed by contractually specifying a 'best before' date. Once this date passes, some validation may be required (which may also involve additional costs).

5.2 Cumulative Net Metered Generation

Recommendation

- Determine the level of net cumulative generation when the net metering regulation is issued.

Discussion

Section 70(6.1) of the OEB Act refers to the cumulative generation capacity which a distributor must allow to be connected to its distribution system:

“ the licence issued to a distributor shall contain conditions governing the connection of generation facilities to the distribution system, including the maximum cumulative generating capacity from generators to whom the regulations made under clause 88(1)(g. 1) apply that the distributor must allow to be connected to the distribution system.”

This regulation has not been issued to date. Stakeholders recommended that the development of cumulative net metering levels for distributors would likely have to be addressed once the regulation is issued or information on the requirements is made public.

Since the legislation requires quantification of the maximum cumulative generation capacity that a distributor must allow to be connected to its distribution system. Board Staff sought stakeholder’s input about how this amount should be derived. Distributors and generators agreed that:

- it would be premature to determine such levels in absence of a net metering regulation;
- distributors were opposed to discussing any net metering cumulative generation given the negative impact it would have on their revenue especially in light of the restrictions on distribution rates; and
- generators did not find this issue to be a pressing issue given the other Directive requirements.

5.3 Dispute Resolution Process

Recommendations:

- Determine an efficient and expeditious dispute resolution process in the near future.
- Standardize, as recommended earlier under Contracts and Applications, the dispute resolution terms and conditions for the purpose of standardizing contracts and applications used for connecting generators the distribution systems.

Discussion:

Distributors are required, as part of their conditions of service to set out a dispute resolution process. Conditions of service are filed with the Board and available for customers to review.

Stakeholders indicated that disputes occurring prior to entering into contractual agreements may be brought forward to the Board. On the other hand, disputes occurring after parties have entered into contractual agreements would be addressed

according to the terms and conditions of the contract as well as compliance with the DSC.

Stakeholders expressed concerns about the time it took the Board to resolve disputes which would lead parties to seek alternative approaches. While this process may minimize the need for Board involvement, it forces parties with less “deep pockets” to settle for unfavourable terms to contain their risk.

6. Out of Scope issues

Stakeholders identified a list of issues which they recognized fell outside of the scope of the Connection Directive consultations but which they wanted to present to the Ministry and/or the Board for future considerations. The following “Out of Scope Issues List” was prepared by stakeholders. Attachment 7 provides details about these issues.

Out of Scope Issues List

- Generic Pamphlet on Generator Connections
- Stand-by Charges
- Generator Location Tracking
- Public Communication on Load Displacement
- Rates impact of Load Displacement
- Reliability SQL's & “Gold Plating”
- Metering for Generators >1 MW
- Standardized Assessment Charges - Should LDCs charges for performing System Impact Assessments be standardized

7. Summary of Stakeholder Recommendations

Amend the DSC to:

- Standardize connection processes
- Standardize technical requirements
- Maintain Technical Requirements Reference
- Standardize the application/contract for connecting micro-generators (≤ 10 kW and for customer's own use) to the distribution system

Proposed Next Steps

- Standardize contracts and applications related to other (than micro) electricity generation categories
- Determine the level of net cumulative generation when the net metering regulation is issued
- Determine a queuing process
- Communicate the stakeholders' "Out-of-Scope" Issues List with government as appropriate
- Determine an efficient and expeditious dispute resolution process