

Planning Process Working Group Report to the Board

**The Process for Regional Infrastructure Planning
in Ontario**

February 5, 2013

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1 Introduction

1.1 Background and Context

On October 18, 2012, the Ontario Energy Board (the “Board”) issued its *Report of the Board – A Renewed Regulatory Framework for Electricity Distributors: A Performance Based Approach* (the “[RRFE Board Report](#)”). The RRFE Board Report concluded a consultation process aimed at promoting the cost-effective development of electricity infrastructure through coordinated planning on a regional basis between licensed distributors and transmitters.

In the RRFE Board Report, the Board concluded that infrastructure planning on a regional basis is required to ensure that regional issues and requirements are effectively integrated into utility planning processes. The Board also noted that the effective use of regional infrastructure planning and the inclusion of regional considerations in distributors’ and transmitters’ plans will be key in ensuring that the development and implementation of the smart grid in Ontario is carried out on a coordinated basis and that smart grid investments are made at the system level (distribution or transmission) that will best serve the interests of the region.

The Board indicated that distributors and transmitters will be expected to file evidence in rate and leave to construct (“LTC”) proceedings that demonstrates regional issues have been appropriately considered and addressed in developing the utility’s capital budget or infrastructure investment proposal. The Board also noted that it would not expect that a formal Regional Infrastructure Plan will be required in all instances to satisfy the filing requirements and, while the Board will consider Regional Infrastructure Plans in its regulatory processes, it will not formally approve Regional Infrastructure Plans.

The Board also concluded that effective regional infrastructure planning would be best achieved by allowing relevant stakeholders a further opportunity to build on their practical experience and on the input received through the RRFE consultation process.

The Board therefore convened a stakeholder working group to prepare a report to the Board (the “Working Group Report”) that sets out the details of appropriate regional infrastructure planning processes, that defines the outputs of the planning process and that identifies any changes to the Board’s regulatory instruments that may be needed to support the process. The RRFE Board Report set out the following expectations to be reflected in this Working Group Report:

- For regional infrastructure planning to be more structured, lead responsibility must be assigned and that there is merit in having this responsibility lie with the appropriate transmitter. The transmitter is to work with the Ontario Power Authority (“OPA”) to identify where conservation and demand management (“CDM”) or distributed generation (“DG”) options may represent potential solutions.
- Regions are to be identified to form the foundation for the process and so that all distributors will have an understanding of the regions that they reside in. The Board therefore indicated that predetermined regions should be established based on electrical system boundaries and suggested that the Independent Electricity System Operator’s (“IESO”) electrical zones be used by the working group as a starting point.
- Protocols should be established by the working group for sharing information amongst the relevant parties for regional infrastructure planning purposes.
- Distributors will be expected to participate in regional infrastructure planning processes.

In addition to the above expectations, the Board identified that the following key elements needed to be addressed in this Working Group Report in order to facilitate the move to a more structured regional infrastructure planning process:

- The information a distributor should be required to provide to the transmitter for regional infrastructure planning purposes and the frequency at which it should be updated;
- The appropriate evaluative criteria to compare potential solutions;
- The circumstances under which the OPA should participate;

- The form in which broader consultation should take place before a regional plan is finalized;
- The appropriate regional boundaries and the criteria to be used to establish them; and
- Any other key elements that the working group believes should be addressed in order to facilitate the move to a more structured regional infrastructure planning process.

In addition, as part of this Working Group Report to the Board, the Board noted that the working group was expected to provide input to Board staff in relation to filing requirements related to regional infrastructure planning to inform a Board staff proposal related to consolidated filing requirements that will be developed by a separate working group – the Distribution Network Investment Planning Working Group.

The Board indicated that, following receipt of this Working Group Report, it would determine the changes to its regulatory instruments that are required to facilitate the planning process established by the working group. The Board further indicated that those changes would be effected through one notice and comment process to amend the relevant codes (and other regulatory instruments) along with the cost responsibility changes related to the redefinition of line connection assets and those involving Transmission System Code (“TSC”) cost responsibility rule changes.

On October 30, 2012, the Board issued a [letter](#) to stakeholders announcing the selection of working group members to prepare this Working Group Report to the Board setting out the planning process for regional infrastructure planning. Appendix 9 identifies the members of the Planning Process Working Group (“PPWG”).

1.2 The Working Group Process

The PPWG held six full day meetings from November 14, 2012 to January 23, 2013 which were facilitated by Board staff.

Prior to the first working group meeting, Board staff circulated a Memorandum (the “Board staff Memorandum”) to the PPWG members which included the Board’s expectations and the process elements set out in the RRFE Board Report as well as additional planning process elements that were suggested by Board staff. The Board staff Memorandum also included suggestions associated with each element for the PPWG’s consideration to facilitate discussion in the meetings. The Board staff Memorandum is in Appendix 10.

The PPWG notes that all of the process elements identified in the Board staff Memorandum need to be addressed in order to facilitate the move to a more structured regional infrastructure planning process. Given the RRFE Board Report stated a more structured approach to regional infrastructure planning was key in ensuring that the development and implementation of the smart grid in Ontario is carried out on a regionally coordinated basis, the PPWG provides some discussion on the topic of smart grid in this report. A complete list of all the elements that were the focus of discussion during the working group meetings and are addressed in this report is provided in Chapter 3.

Over the first five meetings, the PPWG had extensive discussions in relation to developing a more structured regional infrastructure planning process and the elements discussed in Chapter 3 to support that regional infrastructure planning process. There was also extensive discussion regarding the relationship between the regional infrastructure planning process and the OPA’s integrated regional resource planning (“IRRP”) process. Drawing on the discussions during those meetings, the subsequent time including the final meeting of PPWG, focused on preparing this Working Group Report.

During the working group meetings, there was also discussion regarding transitional and implementation issues and the PPWG believes there is a need for a transition process to regional infrastructure planning implementation within the context of Board proceedings (i.e., applications). This report therefore includes a proposed transition

process for the Board's consideration. This report also identifies implementation issues that the PPWG believes the Board should consider.

Meeting summaries of all the PPWG meetings and the related materials are posted on the [OEB website](#).

The PPWG believes the regional infrastructure planning process set out in this report is consistent with the Board's expectations that were identified in the RRFE Board Report.

The PPWG notes that there was consensus amongst the members that it was important to obtain feedback from stakeholders before finalizing this report. Accordingly, the draft report was posted on the OEB website for public review with an opportunity for comments to be made to the PPWG. Comments received were considered by the PPWG before this report was finalized.

1.3 The Current Regional Planning Process in Ontario

As noted in the RRFE Board Report, regional planning is not a new concept in Ontario. The former Ontario Hydro, as the vertically integrated utility, had been conducting regional supply planning for the province up until the deregulation of the electricity industry in 2000. Following the demerger of Ontario Hydro, the regional planning for transmission infrastructure was conducted by the Transmitters on an "as need" basis.

Since its inception in 2005, the OPA has been carrying out regional planning activities to address local and regional supply adequacy and reliability needs. Joint regional planning studies have been carried out with distributors, transmitters and the IESO. The OPA began conducting regional planning activities outside the Integrated Power System Plan because it required a high degree of coordination with distributors, transmitters, the IESO, and other parties to develop integrated plans that examine conservation, generation (including DG) and infrastructure (transmission and distribution) options.

A number of regional planning projects are currently active. Appendix 6 provides a list of these areas and identifies the distributors involved.

1.4 Structure of the Report

The balance of this Working Group Report to the Board is organized as follows:

- Chapter Two provides an overview of the regional infrastructure planning process;
- Chapter Three discusses the key elements of the regional infrastructure planning process;
- Chapter Four discusses the need for a transition process and explains the approach the PPWG is proposing to the Board for its consideration; and
- Chapter Five identifies some implementation issues and provides associated recommendations for Board consideration.

This report also includes the following appendices:

- Appendix 1 – Detailed Description: Regional Planning Process
- Appendix 2 – Load forecast information required for regional planning
- Appendix 3 – Maps setting out the regions
- Appendix 4 – Table setting out the distributors in each region
- Appendix 5 – Description of OPA Integrated Regional Resource Planning (“IRRP”) process
- Appendix 6 – Currently active regional planning studies
- Appendix 7 – Scoping Process Outcome Report template
- Appendix 8 – Needs Screening Summary template
- Appendix 9 – List of PPWG members
- Appendix 10 – Regional Infrastructure Planning Process – OEB Staff Memorandum

2 Overview of Regional Infrastructure Planning Process

Before describing the Regional Infrastructure Planning process, the PPWG felt that it is important to clarify what 'regional' planning entails and what is meant by "Infrastructure" in the context of the Regional Infrastructure Planning. By doing so, the Board and other stakeholders will be provided greater clarity on what the PPWG believes is, and equally as important, what is not addressed by the Regional Infrastructure Planning process.

Planning for the electricity system in Ontario is done at essentially three levels:

1. Bulk system planning
2. Regional system planning
3. Distribution system planning

These levels differ in the facilities that are considered and the scope of impact on the electricity system. Planning at the bulk system level typically looks at issues that impact the system on a provincial level, while planning at the regional and distribution levels look at issues on a more regional or localized level.

Bulk system planning looks at typically the broader power system and considers largely the 230 kV and 500 kV network system. The bulk power system transfers large quantities of power between major systems in the province and neighbouring power systems external to the province via the interconnections. The bulk power system also connects major generation sources and delivers that power to major load centres in Ontario. Bulk system planning considers not only the transmission facilities ("wires") but also resources including generation and CDM needed to adequately supply the needs of the province. To ensure the reliability of the bulk power system, planning must consider both the adequacy and the security of wires and resources. Planning and operation of the bulk power system must comply with all applicable standards and criteria established by NERC, NPCC and the IESO Market Rules. Because of the major facilities typically involved, the planning horizon is typically in the medium to longer term. The OPA has the accountability for the integrated planning of the bulk power system.

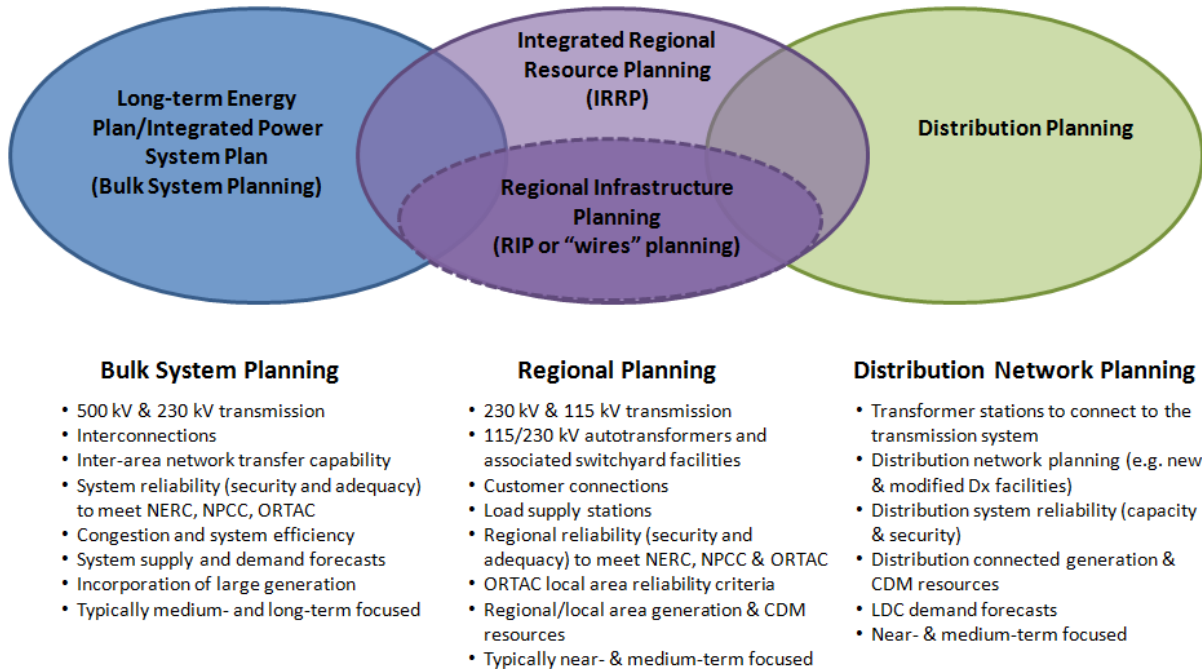
Regional planning looks at supply and reliability issues at a regional or local area level. Therefore, it largely considers the 115 kV and 230 kV portions of the power system that

supply various parts of the province. As described in Section 3.1 in greater detail, there are portions of the power system which can be electrically grouped together due to their common supply points with the bulk system and their electrical interrelationships where many connected customers can be impacted by common facilities. From a transmission or “wires” perspective, regional planning focuses on the facilities that provide electricity to the delivery points of the connected customers including distributors and large directly-connected customers, such as industrial loads. This typically includes the transformer load stations and the transmission supply circuits to these stations. It also includes the 115/230 kV auto-transformers and their associated switchyards. From a resource perspective, regional planning considers the local generation and/or CDM that could be developed to address supply and reliability issues in a region or local area. Typically, regional facilities may not require the same magnitude of investments or the same long lead times as bulk system facilities. The planning horizon of regional facilities are typically in the near to medium term; however, there may be situations where particular needs and issues may require a long term outlook at the regional level.

Regional planning can overlap with bulk system planning. For example, overlaps can occur at interface points such as at the 230/500 kV auto-transformer stations or where there may be regional resource options to address a bulk system issue. Regional planning can also overlap with distribution planning. Such overlaps largely occur at the transformer load stations which deliver power to distributors and large directly-connected customers. In the case of building transformer load stations, this planning can sometimes take place at the distribution level. Another example where regional planning may require coordination with distribution planning occurs when a distribution solution may address the needs of the broader local area or region. In this case, the distribution investment may not be driven in part or in whole by the needs of the distributor. Distribution investments can also in some cases be directly targeted at providing medium or even long term relief for transmission problems; for example, by building sub-transmission lines to enable load transfers between transformer stations.

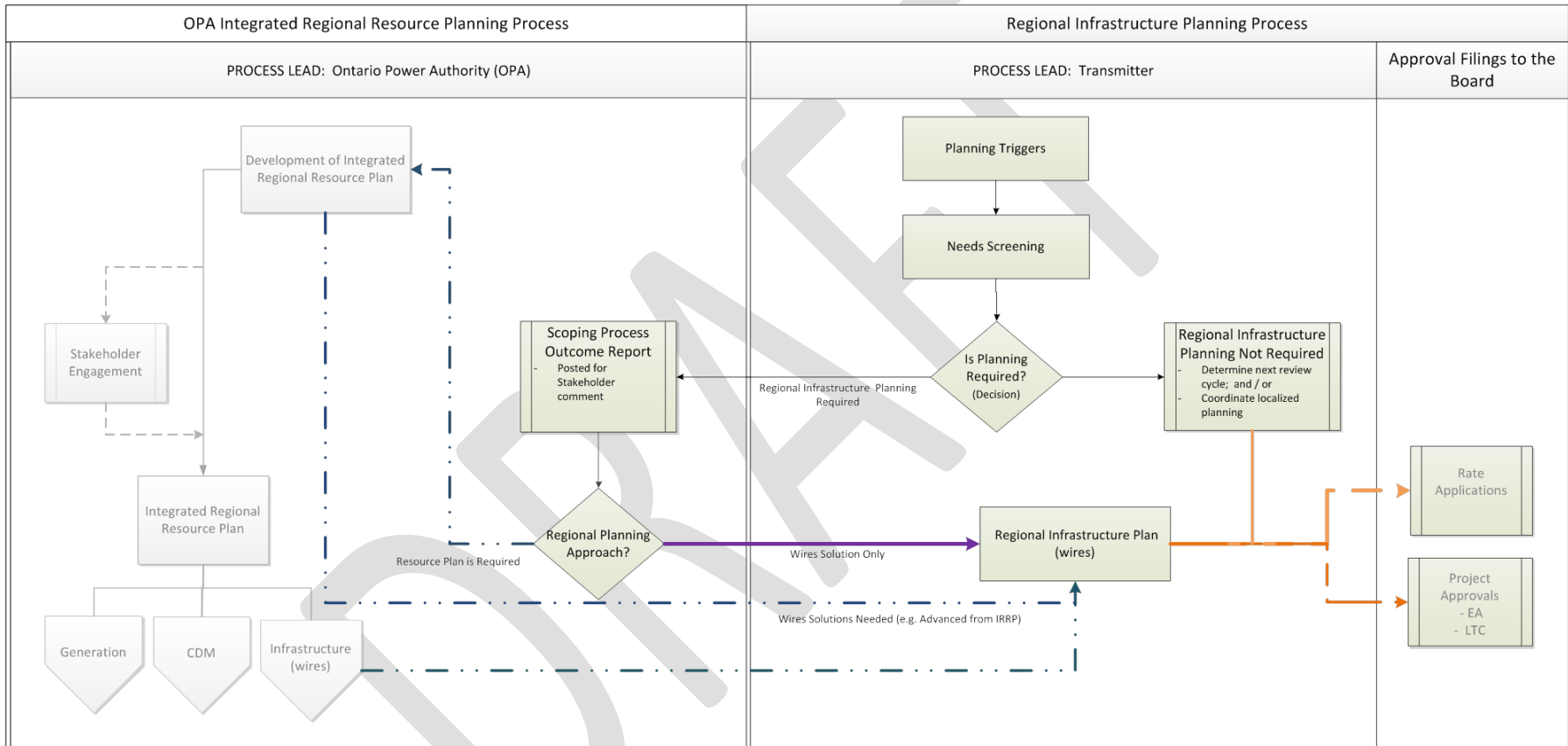
The diagram below illustrates at a generic level the three levels of planning and their potential interrelationships. The PPWG felt it was important to be clear that regional planning will seek to coordinate in a cost effective manner the planning of transmission-level investments that can provide supply to more than one distributor, but it was not meant to coordinate the breadth of distribution planning and investments among

distributors. From a regional planning perspective, the scope of planning for distribution-level investments will be confined to those distribution investments which can address a regional need more effectively in cost and/or performance than other transmission or resource options.



As conveyed to the PPWG by Board staff, the Board’s intent in relation to the reference to “infrastructure” is that “infrastructure” means “wires”, both transmission and distribution, and is not intended to reflect other types of power system infrastructure such as generation resources. As a result, the Regional Infrastructure Planning process will require close coordination with the OPA’s Integrated Regional Resource Planning (“IRRIP”) process. Where “wires” solutions are needed to address a regional need, the transmitters will lead the work with the respective distributors and the OPA to develop wires alternatives and recommend the best overall option.

The flowchart on the following page provides an overview of the regional infrastructure planning process that has been developed by the PPWG. The flowchart also illustrates its relationship with both the OPA’s IRRP process and the Board’s application process for transmitters and distributors. Following the flowchart is a high level description of the various stages in the process. Appendix 1 provides a more detailed explanation of each of the stages.



The regional infrastructure planning process begins with a planning trigger. Potential triggers include regularly scheduled needs screening by the transmitter, a scheduled review specified in an existing Regional Infrastructure Plan, a Government directive, or an emergent need brought forward by the transmitter, customers, the OPA or the IESO that cannot wait until the next scheduled review.

The next stage involves a Needs Screening process which is led by the transmitter to determine if regional planning is required to address a regional requirement and, if so, the geographic scope and which distributors should be involved in the development of a plan. The determination of which distributors need to be involved is based on the load forecasts provided by distributors and the issues (e.g., equipment end-of-life, reliability, etc.) brought forward in a predetermined region.

Following the Needs Screening process, a decision is required as to whether a regional plan is necessary to address some or all of the needs. If a regional plan is not necessary, the infrastructure investments are planned more directly by the distributor (or customer) or in conjunction with the transmitter. These types of investments would ultimately go directly through the Board approval process in the form of a rate or LTC application. If it is determined that a regional plan is necessary, the transmitter will identify that a Scoping Regional Planning Study is required which will be led by the OPA.

During the stage where the Scoping Regional Planning Study is undertaken, the OPA (with substantial participation from the Transmitter and impacted distributors) compiles the necessary information needed to support selection of the appropriate regional planning approach.

In some cases, a straightforward wires solution may be the only option. If that is the case, the regional infrastructure planning process is triggered immediately. If CDM and/or generation are potential solutions, the OPA's IRRP process is triggered prior to the regional infrastructure planning process, to determine the preferred mix of

infrastructure (i.e., wires), CDM and local generation. In support of this stage of the process, the OPA will produce a Screening Process Outcome Report. This report will include the results of the Needs Screening Process, a preliminary terms of reference (“ToR”) and identify the various sub-regions that require study. For each of the study areas, the Screening Process Outcome Report will indicate the proposed study approach and provide a list of the distributors to be involved. This report will be made available for public review with an opportunity for comments. Comments received will be considered by the study team prior to a final decision on the study approach for the various sub-regions.

As part of the development of an IRRP, there may be cases where it is determined that a transmission and/or distribution wires solution is necessary to address a near term need. In such cases, that wires solution may be advanced outside of the full IRRP process. Such infrastructure solutions ultimately become part of the Regional Infrastructure Plan. Other potential infrastructure needs (e.g., longer term) remain in the IRRP process until the optimal mix of infrastructure, CDM and generation is determined. Once that stage is completed, the infrastructure solutions identified in the IRRP process enter the regional infrastructure planning process led by the transmitter for more detailed planning before a Regional Infrastructure Plan is finalized.

It is generally expected that the IRRP process will assess options to infrastructure at a higher or more macro level but sufficient to permit an appropriate comparison of options. Once the IRRP process identifies that infrastructure options may best meet a need, the Regional Infrastructure Planning process will define the more detailed planning to identify and assess the specific wires solutions and recommend the preferred wires solution. Similarly, resource options which the IRRP identifies as best suited to meet a need are then further planned in greater detail by the OPA.

The finalized Regional Infrastructure Plan will then be referenced and submitted to the Board as supporting evidence in a rate or LTC application.

3 Elements of the Regional Infrastructure Planning Process

The PPWG decided that ten key process elements are required in order to facilitate the move to a more structured regional infrastructure planning process. This chapter describes the PPWG's approach in relation to each of those elements which are set out below.

1. Developing the appropriate predetermined regional boundaries and the criteria used to establish them;
2. Identifying the information distributors should be required to provide to the transmitter and the frequency it should be updated;
3. Determining the role of the OPA in the regional infrastructure planning process;
4. Identifying the appropriate evaluative criteria to compare potential solutions to address regional needs;
5. Establishing the form in which broader engagement should take place before a regional infrastructure plan is finalized;
6. Identifying how it should be determined if a distributor's involvement is needed in the regional infrastructure planning process;
7. Identifying whether the Board should "require" or "expect" distributors to participate in the regional infrastructure planning process where the transmitter determines their involvement is necessary;
8. Providing input on Filing Requirements related to regional infrastructure planning;
9. The approach to increase transparency in the regional planning process; and
10. Proposed changes to Board's regulatory instruments needed to support the process for Board's consideration.

Matters related to regional coordination of the smart grid amongst utilities was also discussed as a potential key element.

3.1 Appropriate Predetermined Regional Boundaries

This section describes how the appropriate predetermined regional boundaries were established and the basis used to establish those regional boundaries. The

predetermined regions will be used to bring structure to the process and to screen whether a Regional Infrastructure Plan is necessary. Where it is determined a Regional Infrastructure Plan is needed, a needs screen will identify the distributors that should be involved in a Regional Infrastructure Plan at a sub-regional level within a predetermined region.

The PPWG notes that the IESO zones, which were suggested as a starting point, are not appropriate to use as predetermined regional boundaries as the purpose of those zones is for planning the transmission network. The PPWG agrees with the Board that predetermined regions should be defined on the basis of electrical boundaries as the primary criterion. However, the boundaries for regional planning purposes need to be smaller in nature to be reflective of common supply systems, electrical interrelationships and shared supply and performance impacts. The PPWG felt that there should also be recognition of distributor boundaries (where practical). The smaller regions will also help with manageability and timeliness of completing the studies.

Hydro One and the OPA developed 21 predetermined regions for regional planning purposes on the basis set out above.

The PPWG notes that not all regions in Ontario are the same and the regional infrastructure planning process will need to be flexible to accommodate those differences. For example, the Northern region is uniquely different from the other provincial regions due to, among other reasons, the uncertainties related to changing industrial loads which makes planning infrastructure more difficult.

Appendix 3 includes maps that set out the predetermined regions to be used for regional infrastructure planning purposes. Appendix 4 includes a table that identifies which distributors are included in each of those predetermined regions.

3.2 Information Required from Distributors

This section identifies the information that distributors will need to provide to the transmitter and the frequency that information should be updated.

Distributors should provide 'gross' and 'net' peak demand forecasts for the short term (5 years) and medium term (10 years), as well as the 'unbundled' information used to show how they arrived at the 'net' peak demand forecast. The reason the 'unbundled' information is necessary is that all distributors do not use the same forecast methodology and it will be important for the transmitter to understand how each distributor arrived at their 'net' peak demand forecast.

However, the PPWG determined that distributors should only be required to provide 'gross' and 'net' peak demand forecasts at the needs screening stage and the 'unbundled' forecasts should only be required if it is determined the distributor is in an area where a regional plan is necessary. The rationale for this approach is that the 'gross' and 'net' peak demand forecasts alone will be adequate to determine if a Regional Infrastructure Plan is necessary and not initially requiring the 'unbundled' information underlying the forecasts from all distributors will minimize the burden placed on distributors.

The gross and net peak demand forecasts required for the needs screening stage need to be provided on the following basis in order to ensure consistency:

- In megawatts ("MW") with power factor assumptions provided;
- At the Transformer Station ("TS") level;
- For 'median' weather conditions; and
- For the local area coincident peak demand hour.

Other information, such as the end-of-life expectations for transmission assets owned by distributors, will also be required.

Appendix 2 provides a more detailed explanation of the “unbundled” information that will be necessary for regional infrastructure planning and integrated regional resource planning purposes which is not limited to information required from distributors. For regional planning purposes, information and input is also required from the IESO, the OPA and the transmitter, as set out in the document in Appendix 5.

The PPWG concluded that the transmitter should only receive the required information from distributors directly connected to the transmission system. As such, embedded distributors should provide the required information to their host distributor.

In relation to the frequency that the information discussed above should be updated, it was concluded that it should coincide with the regional study cycle or at a minimum, every five years. The minimum five year timeframe aligns with the five year planning horizon identified in the RRFE Board Report for distributors. In addition, as required by legislation, land use planning documents are updated every five years and any change to land use planning documents impacts the distributor load forecasts.

3.3 Role of the Participants

The Role of the OPA

The role of the OPA in the regional infrastructure planning process was described in the previous chapter. The OPA’s role primarily relates to the IRRP process, as well as leading the Regional Planning Scoping Process which determines the appropriate Regional Planning Approach.

The Role of the Transmitter

The transmitter takes the lead on the regional infrastructure planning process. In this role, the transmitter will identify the information / data required to carry out the assessment; ensure that the appropriate distributors have been informed of their requirement to participate in the process; complete the assessment and issue the

reports reflecting the results of the assessment for the purpose of supporting distributor applications.

The Role of the Distributor (including host and embedded)

All distributors are expected to participate in the initial stages of the regional planning process. The directly connected distributor's role is to provide the transmitter with information / data required to complete the assessment. The distributor is also expected to support regional planning by identifying any activity / elements on a sub-regional level that may impact a review cycle in a region to the transmitter.

Where the initial regional planning assessment results in no further planning required, the distributor, for the purposes of any current sub-regional needs, will complete its own distribution system review to determine any immediate distribution solutions.

The embedded distributor's role is similar except it provides the required information / data to the host distributor.

The lead and the roles of all the entities involved in the regional planning process are discussed in more detail in Appendix 1.

3.4 Evaluative Criteria to Compare Potential Solutions

This section identifies the evaluative criteria that will be used to compare the potential transmission and/or distribution solutions to address regional needs in the Regional Infrastructure Planning process.¹

The PPWG determined that the criteria for the purpose of comparing alternative solutions should be consistent with the criteria established by the Board for LTC applications. That is, a net present value ("NPV") calculation as well as other qualitative

¹ In some cases, this would entail a more detailed evaluation of infrastructure solutions following an assessment of the options including CDM and generation options in the IRRP process.

criteria such as consistency with long term strategy/direction, flexibility and robustness (i.e. operating, planning, meeting unforeseen conditions), opportunities for incremental future development, addressing risk scenarios (technology, high impact events, risk diversification), promoting standardization, etc.

The PPWG also determined that other qualitative criteria such as community acceptance should be used.

3.5 Form of Broader Engagement

This section describes the form of broader engagement that will be undertaken before a Regional Infrastructure Plan is finalized and submitted to the Board in support of rate and LTC applications.

The PPWG notes there are two types of outreach – ‘plan’ engagement and ‘project’ consultation. The former is undertaken *during* the IRRP and the regional infrastructure planning process and the latter occurs when projects move forward to develop and acquire approvals *after* the regional plan has been established. As such, the discussion below focuses primarily on ‘plan’ engagement.

During the regional planning process, input from affected and key parties (e.g., aboriginal groups, municipalities and key customers) will be sought prior to any broader engagement. Engaging municipalities is important because it will involve the exchange of information related to other infrastructure that is planned. Subsequently, the following documents will be posted for public review to provide an opportunity for comments: (1) the Screening Process Outcome Report (including the preliminary ToR), which is prepared prior to the decision being made on the regional planning approach (i.e., only wires infrastructure or an IRRP); and (2) the draft Regional Infrastructure Plan (and draft IRRP, where applicable) before it is finalized.

3.6 Determination of Distributor Involvement in the Process

This section explains the approach that will be used to identify the distributors within a predetermined region that need to be involved in the full regional infrastructure planning process.

A screening process will be performed based on the 'gross' and 'net' load forecasts provided by the distributors to the transmitter, as well as other needs identified in the area. Based on the screening process, a Needs Screening Summary report will be produced by the transmitter which will identify the distributors in a predetermined region that need to be involved as well as the distributors that do not need to be involved. See Appendix 8 for the Needs Screening Summary template.

3.7 Distributor Participation in the Process - "Required" or "Expected"

This section discusses whether the Board should "require" or only "expect" distributors to participate in the regional infrastructure planning process where the transmitter determines their involvement is necessary. It also explains the rationale for the PPWG's conclusion on this matter.

The PPWG believes that all distributors should be required by the Board to provide forecast information at the needs screening stage. The PPWG also believes that distributors should be required by the Board to participate in the regional infrastructure planning process where it is determined their involvement is necessary.

The reason the PPWG arrived at this conclusion is, if one or more distributors decides not to participate, the regional infrastructure planning process is unlikely to produce the optimal solution(s) that the Board desires to meet the needs of the region.

3.8 Filing Requirements related to Regional Infrastructure Planning

This section provides PPWG input in relation to the Filing Requirements that should apply to transmitters and distributors for the purpose of LTC and rate applications. The PPWG understands that this is advice to Board staff to be used in staff's proposal to the Board on a consolidated set of Filing Requirements.

In cases where the needs screening process determines it necessary for a distributor to be involved in the regional planning process, the distributor should be required to submit the final Regional Infrastructure Plan as part of its rate application. In such instances, the final Regional Infrastructure Plan should be provided whether or not it identifies that a distributor investment is necessary. When the plan identifies that no investment is necessary by the distributor, the plan should be provided by the distributor to demonstrate regional considerations were taken into account.

The PPWG expects there will be cases where a Regional Infrastructure Plan has not been finalized at the time a distributor involved in the plan submits their rate application to the Board. In such cases, the distributor should be required to submit a Supporting Letter from either the transmitter or the OPA and other supporting documentation requested by the Board.

Regional Infrastructure Plans that are submitted should include all of the potential solutions that were considered to demonstrate to the Board that an appropriate evaluation was carried out. In addition, in cases that involve an OPA IRRP, the IRRP should be provided in support of the Regional Infrastructure Plan to demonstrate to the Board that all options were evaluated including CDM and generation. The same filing requirements should also apply to transmitters.

In cases where the needs screening process determines a distributor does not need to be involved in a regional plan, the distributor should be required to submit the most recent Needs Screening Summary report as part of its rate application. The Needs

Screening Summary report will identify the distributors within a predetermined region that do and do not need to be involved in the development of a Regional Infrastructure Plan.

3.9 Increasing Transparency in the Regional Planning Process

This section sets out the approach that will be used in relation to increasing transparency in the regional planning process.

The PPWG believes that the regional planning process can benefit from additional transparency. In order to achieve that end, the Scoping Process Outcome Report (including the preliminary ToR) and the draft Regional Infrastructure Plan will be posted for comments. Those comments will be considered by the technical team involved in the development of the Regional Infrastructure Plan. Subsequently, the final Regional Infrastructure Plan will also be made public.

The PPWG also believes the posting of completed Regional Infrastructure Plans should be on the OEB website so that there is one central repository and that it would be useful to have notifications sent to interested stakeholders to facilitate the stakeholdering process (similar to notifications issued to stakeholders that subscribe to the OEB's "What's New").

As the lead, the transmitter is accountable to monitor the progress of the regional plan to meet the regional needs. In this regard, the transmitter will provide a Regional Infrastructure Planning [status](#) report to the Board as appropriate.

3.10 Proposed changes to the Board's Regulatory Instruments

In order to implement the regional infrastructure planning process set out in this report the PPWG proposes that the appropriate regulatory instruments of the Board be amended to:

- Require distributors to participate in the regional infrastructure planning process where the transmitter determines their involvement is necessary as identified in section 3.7 of this report.
- Require transmitters to lead the regional infrastructure planning process given the Board's expectation that the transmitter should lead the process.
- Require the OPA to provide the results of the Scoping Process Outcome Report to the transmitter in a reasonable amount of time so the regional infrastructure planning process is not held up.
- Require distributors to provide the information identified in section 3.2 of this report to the transmitter at least every five years and more frequently if planning studies need to be performed on a more frequent basis.
- Make changes to the Board's filing requirements for applications to the Board as proposed in section 3.8 of this report.
- Facilitate the proposed transition process described in the next chapter of this report.

3.11 Regional Coordination of the Smart Grid

As previously noted, this element was not identified in the Board Report or the Board staff Memorandum for this working group to address. However, the PPWG concluded it was an important matter to discuss during the meetings given the relationship between regional infrastructure planning and the Government directive to the Board in relation to regional coordination of the smart grid.

The PPWG believes that the areas for smart grid coordination likely need to be larger than the regions identified in this report for regional infrastructure planning purposes or be based on other considerations such as the nature of the distribution system (i.e., urban vs. rural or big vs. small). The PPWG also expects that smart grid investments will primarily be distribution focused and believes that transmitters may not be appropriately equipped to provide the coordination. The PPWG also believes that establishing a formal framework for regional coordination of the smart grid is premature at this time.

At the same time, the PPWG notes that the participation of distributors in a more structured regional infrastructure planning process provides an opportunity for distributors to exchange information on smart grid programs and development in their respective distribution systems. This will provide distributors, within a region, a chance to look for opportunities to co-operate and/or collaborate on smart grid development where synergies may exist. This is expected to become particularly important in situations where targeted CDM and/or generation are part of the preferred solution to meet the regional needs in which case an effective and coordinated smart grid may be a crucial component of that solution.

4 Transition process

This Chapter sets out a proposed transition process for the Board's consideration. While the Board did not identify in its RRFE Board Report that this working group was to provide a transition process, the PPWG believes a transition process is necessary for reasons which are described below.

The proposed transition process is staged based on the known and identified regional needs and their criticality. During the transition period, Regional Infrastructure Plans will be developed based on priority, which will result in some applications to the Board not being supported by a Regional Infrastructure Plan.

There are a number of factors underlying this proposal including the following:

1. A transition plan is required to confirm the order of priority that regions need to be assessed which will take some time to develop.
2. A typical Regional Infrastructure Plan can take a year or more to complete based on the complexity of the defined needs and whether an OPA IRRP needs to first be completed.
3. The urgency of any region plan development is not aligned with the application schedule for utilities. Aligning the regional plan sequence with the application schedule would not focus resources and effort on high priority regions that require early development of a regional plan. A transition process also recognizes that certain areas of the province are relatively flat or declining in terms of load growth and thus those regions have a low urgency to have those plans completed expeditiously.
4. In order for a distributor to take account of a Regional Infrastructure Plan as part of its rate application, the plan (or relevant parts of the plan) will need to be sufficiently developed in advance so the distributor can determine and incorporate its impacts.

5. Resource requirements constrain the ability to complete the regional infrastructure planning process for all of the distributors in Ontario within the next cycle of rate applications, particularly where it is determined that the OPA IRRP process needs to be completed prior to the completion of a Regional Infrastructure Plan.

The PPWG recommends that the following transition approach be considered by the Board:

1. Using existing and known information, a very cursory review be performed by the transmitter and the OPA (with feedback from the distributor community²), to develop a prioritized sequence of Regional Infrastructure Plans that need to be developed. We note that of the 21 regions, five already have OPA led initiatives in progress and the other tranches of regional plans will be prioritized.
2. Based on current experience, this transition is expected to take about four years to complete the first cycle.
3. The transition plan and schedule will be formally issued and will be used by distributors to support their application. Specifically, in cases where the Regional Infrastructure Plan is scheduled to be completed after the application is to be submitted, the transition plan will support the absence of a detailed Regional Infrastructure Plan.
4. Extraordinary events, such as a Government directive or the development of an unanticipated urgent need, may occur during this transition period (as would be the case once we are in a planned review cycle). As a result, distributors will be expected to inform the transmitter as soon as an extraordinary event occurs and, on a regular basis, the transmitter will examine these emergent issues with the OPA to determine if the planned transition schedule needs to be revised. When that occurs, the schedule noted above will be revised and posted to inform distributors making rate applications.

² Each distributor is to submit a letter indicating any anticipated major transmission requirement, such as needing a new Transformation Station.

5 Other Matters

This chapter discusses some implementation issues that the PPWG believes the Board should consider to facilitate a smooth transition to a more structured regional infrastructure planning process.

The first implementation issue involves the relationship between the regional infrastructure planning process and the Board's rate application process. For example, distributors involved in the development of a Regional Infrastructure Plan are likely to have rate applications being submitted to the Board in different years and some of those distributors may share a capital investment that represents the optimal solution. As a result, cost recovery for that solution may not be approved for up to four years, which may delay the project. There is also the potential for one Board Panel to approve an investment in a Regional Infrastructure Plan and a different Board Panel to not approve another investment in the same Regional Infrastructure Plan when hearings on applications are conducted simultaneously for distributors in the same region. The PPWG does not have a specific recommendation on this issue but feels it is important to bring this issue to the attention of the Board.

The PPWG also expects that, following implementation of the process set out in this report, there will be a need to monitor and refine it from time to time to make improvements, based on experience and lessons learned. The PPWG therefore recommends that the process be reviewed and updated at least every four years or earlier if needed. The PPWG also recommends that a similar working group process be facilitated by the OEB to undertake such a review and update.

Appendix 1

Detailed Description: Regional Planning Process

Appendix 1

Description of Regional Infrastructure Planning Process

This document provides further descriptions of the Regional Infrastructure Planning process described in Chapter 2 of the Planning Process Working Group Report to the Board, as well as descriptions of the Scoping Process and Regional Planning Approach portions of the Integrated Regional Resource Planning (IRRP) process.

Objective:

The Ontario Energy Board (the “Board”) has asked industry and other stakeholders to develop a structured Regional Infrastructure Planning process that considers regional needs and identifies “wires” solutions to address those needs. The outcomes of the Regional Infrastructure Planning process are expected to ensure:

- ✓ Rate applications submitted to the Board are informed by a Regional Infrastructure Plan where applicable
- ✓ Leave to Construct applications are informed by a Regional Infrastructure Plan where applicable
- ✓ Cost effective investments are proposed at the appropriate time
- ✓ Plans to meet future needs are implemented in a timely manner

The role and responsibility of the transmitter in the Regional Infrastructure Planning process is to:

- ✓ Manage the overall Regional Infrastructure Planning process
- ✓ Conduct the necessary studies to confirm regional needs, identify alternatives and recommend solutions that form the Regional Infrastructure Plan
- ✓ Regularly review information, such as the annual load forecast, and issues that affect regional and customer supply reliability
- ✓ Manage the cyclic review and development of Regional Infrastructure Plans for the regions responsible
- ✓ Monitor progress of the Regional Infrastructure Plans and provide status updates to the Board as appropriate

Role of Participants (OPA, Distributors & IESO)

- ✓ Provide information and planning study feedback in a timely manner
- ✓ Participate in regional planning activities including stakeholder engagement

Process Overview:

As described in Chapter 2 of the Planning Process Working Group Report to the Board, the Regional Infrastructure Planning process focuses on “wires” planning, mainly regional transmission and some distribution wires, whereas the IRRP process considers the broader regional needs in the context of provincial need, and the identification, evaluation and integration of available solutions (i.e. conservation, generation, and transmission and distribution options). The transmitter assumes the lead role for the Regional Infrastructure Planning process and the OPA assumes the lead role for the IRRP process. Together these processes comprise regional planning (see diagram on page 10 of the Planning Process Working Group Report to the Board).

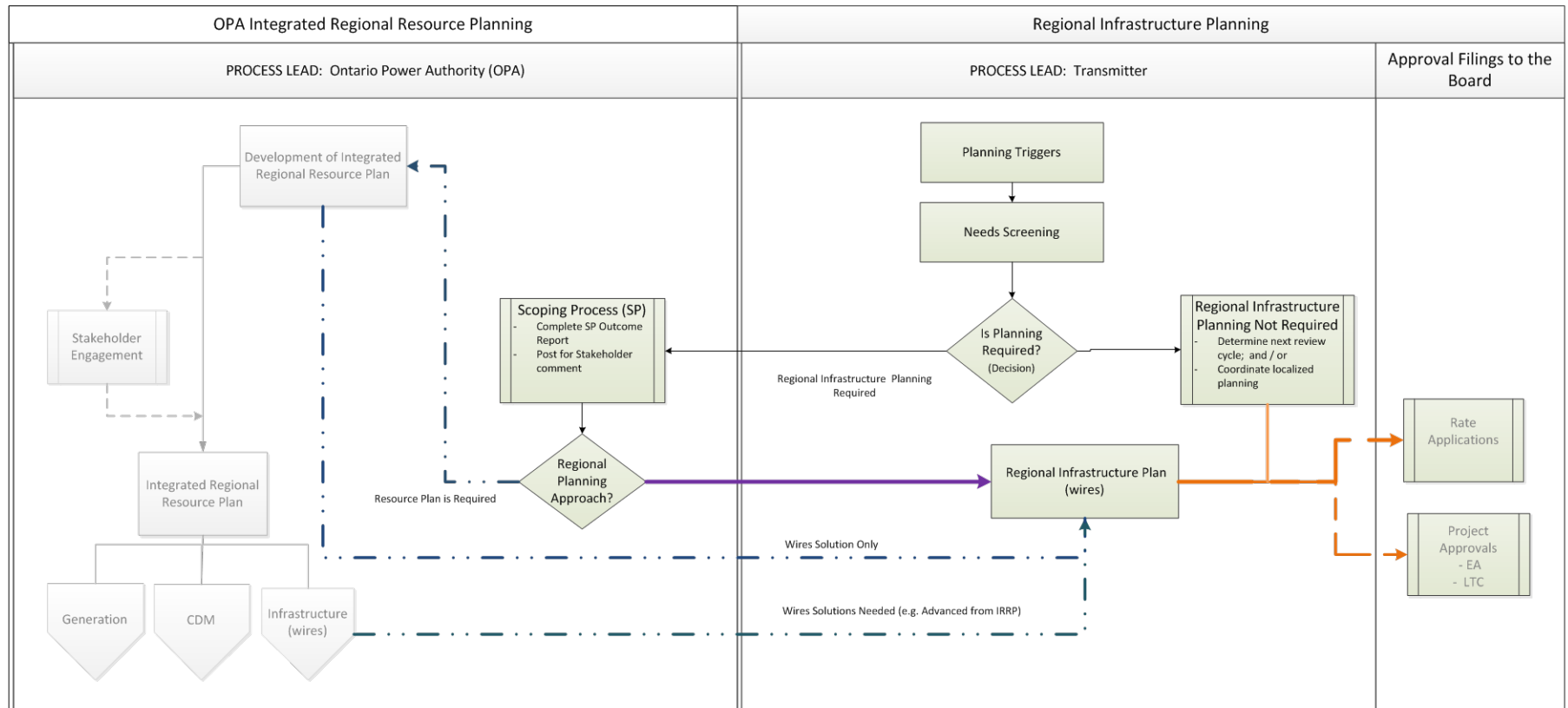
Given the two processes, close coordination between the transmitter and the OPA will be required to ensure effective and efficient exchange of information and study results. Figure 1, duplicated below for reference, outlines the key steps for each process and their corresponding interface points when conducting planning for each region. Figure 1 also depicts that the outcome of the Regional Infrastructure Plan is to provide, where applicable, support for rate submissions and Leave to Construct applications.

The following key steps in both the Regional Infrastructure Planning and the IRRP processes are further described in the following sections:

1. Planning Triggers
2. Needs Screening / Planning Decision
3. Regional Infrastructure Planning not Required
4. Scoping Process / Regional Planning Approach Decision
5. Regional Infrastructure Plan (wires)

Figure 1 - Planning Flowchart

REGIONAL PLANNING PROCESS



PLANNING PROCESS

1. Planning Triggers

While Regional Infrastructure Planning is expected to be conducted at intervals, there may be triggers that mark the start of the formal assessment of regional needs and issues. Triggers could take the form of the minimum review cycle, notionally 5 years or less to align with the distribution investment planning horizon. Triggers could also take the form of unexpected events beyond what was forecasted in the last planning cycle, which would require an assessment to determine if regional coordination or planning will be required.

Some examples of unexpected events could include, but are not limited to:

- a) Connection request of a large industrial customer at either the transmission or distribution level
- b) Government initiatives/directives or legislative changes
- c) Significant growth deviations from previous load forecasts
- d) Regional system reliability or delivery performance issues identified by the IESO or customers
- e) Resource or supply infrastructure retirements that affect regional reliability or supply
- f) New generation announcements that impact the region
- g) Generation or conservation resources do not materialize as expected
- h) Opportunities for joint development with other linear infrastructure planning agencies (e.g. MTO, Metrolinx)

Many of the above events or triggers will form part of the continuous flow of information that a transmitter receives from its connected customers or customers seeking connections, and from interactions with the OPA, the IESO and other planning agencies. While the transmitter can often identify a trigger to initiate regional planning activities, other parties involved in the Regional Infrastructure Planning process, such as distributors, the OPA and the IESO can also raise potential triggers for the transmitter's consideration and review.

Once triggers have been confirmed, the transmitter will then proceed to the Needs Screening stage of the Regional Infrastructure Planning process.

2. Needs Screening / Planning Decision

Following the identification of triggers to initiate Regional Infrastructure Planning, the transmitter, in collaboration with distributors, the OPA and the IESO will initiate a Needs Screening assessment for the region.

In order to conduct the Needs Screening, the transmitter will require information from relevant parties. The transmitter will identify the information that is required from those that may need to participate in the regional study, including distributors and the OPA. The transmitter will also contact the IESO regarding potential operational or reliability issues in the region, and to discuss the extent of the IESO's participation at this stage.

The information required by the transmitter includes, but may not be limited to, the following:

- 1) Gross and net load forecast from distributors and longer-term forecasts from the OPA

Distributor load forecasts are to be provided on the following basis:

- i) In megawatts (“MW”) with power factor assumptions provided;
 - ii) At the supply transformer station or bus level;
- 2) Load forecasts from other existing, or potentially new, transmission-connected customers
 - 3) Changes to ratings of distributor owned equipment
 - 4) Relevant generation and CDM program information from the OPA that may impact the region
 - 5) Regional system reliability and performance issues identified by distributors or the IESO
 - 6) Significant regional and customer supply transmission facilities identified as approaching end-of-life
 - 7) Significant regulatory, government or municipal initiatives/directives (if any)

For the purposes of the Needs Screening, preliminary load forecasts are required to identify significant changes in growth rates seen at the delivery points and generally at the regional level. More detailed load forecasts will only be required when it is determined that regional planning and coordination is necessary, whether it is for wires or resource planning studies.

Upon receipt and review of the required data from distributors and the OPA, the transmitter will confirm that adequate information has been submitted to initiate the Needs Screening. Once the appropriate data has been collected, the transmitter will perform an analysis of the new information in conjunction with a review of the previous Regional Infrastructure Plan (where applicable). The analysis will be conducted at the level necessary to identify those needs that will require further coordination at the regional level and those which can be met more directly by distributors or other customers and their respective transmitter. For example, in cases where adequate regional and local supply capacity exists to accommodate increased load at an existing or new station, where another distributor or customer would not be impacted, then the planning for that need would be more efficiently done between the transmitter and the specific distributor. There may also be sub-regional areas within a region where the Needs Screening can identify that regional coordination may not be required.

At the conclusion of the Needs Screening, the transmitter will produce a Needs Screening Summary that will identify the participants and summarize the data gathered, study assumptions and study findings. The study findings will identify those needs which will require further regional coordination and planning and those that do not. For those needs which will require regional planning, the transmitter will identify those participants in the Needs Screening that will likely need to participate in the regional planning effort.

In situations where identified needs require coordination at the regional or sub-regional levels, the OPA then initiates the Scoping Process. The Scoping Process will identify the degree to which the needs require integration with regional resource planning. Subsequent stages of the Regional Infrastructure Plan or IRRP will further refine the needs in order to develop their respective “wires” or resource options and recommendations.

3. Regional Infrastructure Planning Not Required

This stage of the Regional Infrastructure Planning process represents the outcome of the Needs Screening which determined that some or all of the needs identified do not require further regional coordination. As explained in Section 2 above, there may be some needs which will be more efficiently addressed between the transmitter and the specific distributor or transmission-connected customer. These situations are not expected to have a significant impact on other customers or on upstream regional transmission facilities.

In addition to the example provided in Section 2, many regional transmission or customer supply facilities involving investments for sustainment purposes may not require planning and coordination at the regional level. There may also be regions or sub-regions where no regional investments are foreseeable until possibly the next planning cycle. For example, in periods of significant resource capacity and/or flat or declining demand, there may be regions or sub-regions that do not require significant regional investments as the existing or already planned facilities will address the regional needs.

4. Scoping Process / Regional Planning Approach Decision

Once it is determined that planning coordination is required for a particular region or sub-region (see above description, “2. Needs Screening / Planning Decision”), the next step is to determine the scope of the planning required.

In this stage, the OPA, in collaboration with the transmitter and impacted distributors, reviews the information collected as part of the Needs Screening phase (e.g. load forecasts), along with additional information on potential non-wires alternatives, and makes a decision on the most appropriate regional planning approach. The approach is either a Regional Infrastructure Plan, which is led by the transmitter, or an IRRP, which is led by the OPA. If more than one sub-region was identified in the Needs Screening phase, it is possible that a different approach could be taken for different sub-regions.

Because the Regional Infrastructure Plan process focuses solely on wires solutions, a decision at this stage to develop a Regional Infrastructure Plan limits the assessment of alternatives to wires solutions. Therefore, whenever there is potential for non-wires alternatives to contribute to an integrated solution, an IRRP process should be initiated. If it is determined that a wires solution is the only feasible option, the rationale for not further examining non-wires alternatives should be provided. Examples of such situations may include: improvements to system performance or reliability; end-of-life replacement where no additional needs are forecast; or additional transformer station capacity needed in the near-term based on net demand forecasts and no other needs are forecast, etc.

The deliverable of this stage is a Scoping Process Outcome Report. This report includes the results of the Needs Screening process, a recommended study approach and a preliminary Terms of Reference for all sub-regions identified in the Needs Screening phase. The draft Scoping Process Outcome Report, which includes the preliminary Terms of Reference, will be posted on the OEB web site for stakeholder comment. The OPA, in collaboration with the transmitter and impacted distributors, will consider stakeholder feedback in finalizing the Scoping Process Outcome Report and Terms of Reference. Upon completion of the Scoping Process Outcome Report and Terms of Reference, any IRRP processes identified will be initiated by the OPA (see Appendix 5 for description of IRRP process), and any Regional Infrastructure Plan processes identified will be initiated by the transmitter (see description, “5. Regional Infrastructure Plan (wires)” below).

5. Regional Infrastructure Plan (wires)

Regional Infrastructure Planning begins when it is identified that a wires approach represents the best overall means to address the needs of a region or its sub-regions, and that coordination of the planning is needed at a regional level. This determination can occur at three points in the Regional Infrastructure Plan and IRRP processes:

- a) Following the Scoping Process / Regional Planning Approach Decision where it is assessed that the needs of the region, or one or more sub-regions, would not be likely be addressed by resources and therefore a resource plan need not be produced.
- b) Once the IRRP process has been initiated and the subsequent analysis has advanced to a sufficient stage for the OPA to advise that a wires approach represents the most feasible option.
- c) Upon completion of the IRRP process, where the OPA has concluded that for some or all the needs of the region or sub-region a wires approach is required.

Once it has been determined that a wires approach is needed, the transmitter, in collaboration with distributors and the OPA, may conduct further planning and analysis to confirm the needs and to identify the regional transmission and potential distribution options that will satisfy each of the needs in the region or its sub-regions. The transmitter will confirm which distributors and other agencies need to participate in the planning study(s). The transmitter may request from the participants further detailed information regarding load forecasts, generation changes (new and retirements), and CDM program changes that may impact the reliability needs of the region. The transmitter may request other information such as participant's equipment ratings and other municipal planning information that may be germane to the analysis and the proposed planning horizon. If some or all of this information was made available in the IRRP process, the transmitter will work with the OPA for the exchange of this data.

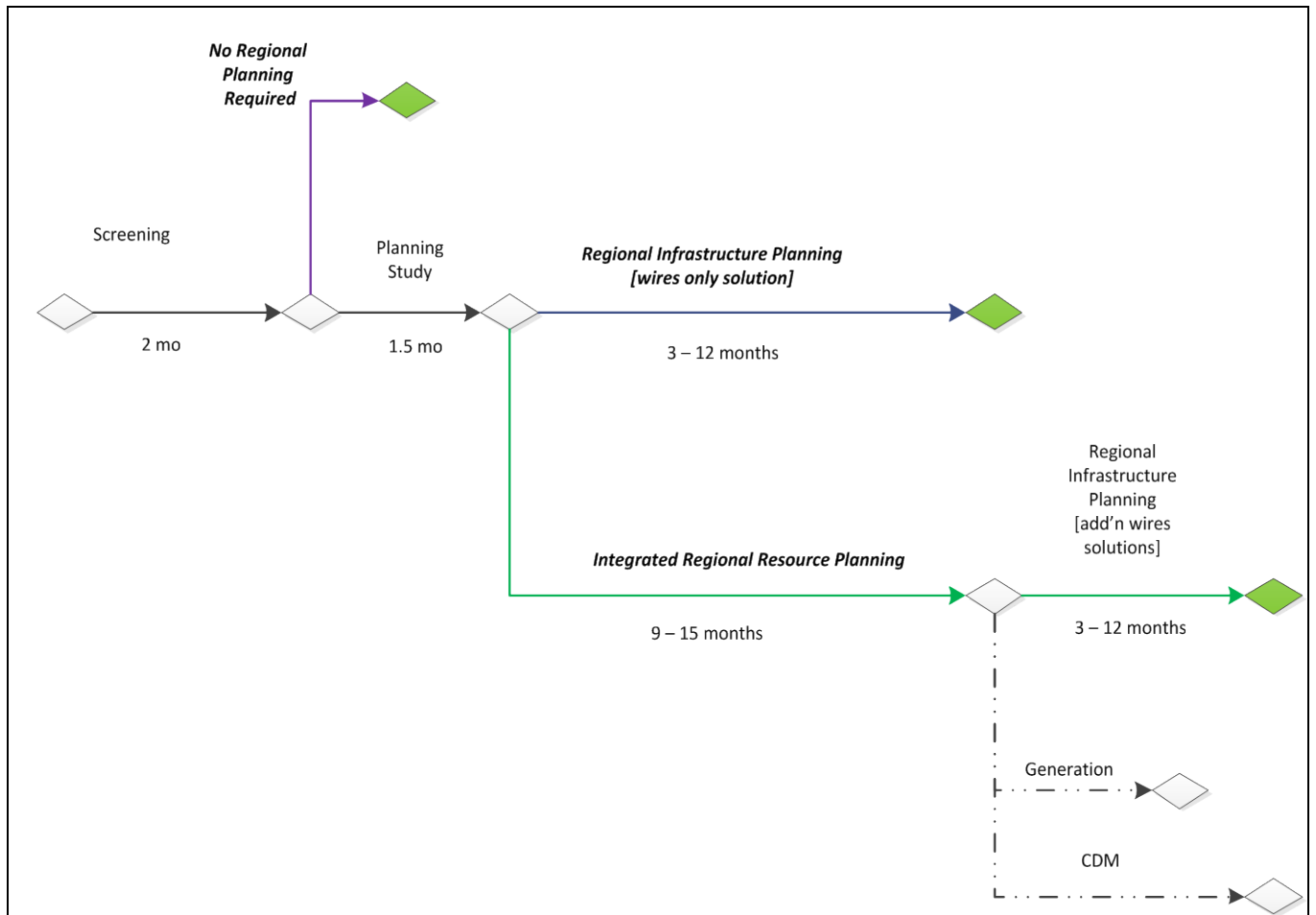
The deliverable of this stage is a finalized Regional Infrastructure Plan that can be referenced by rate submission or Leave to Construct applicants. The Regional Infrastructure Plan will outline the scope of study, describe key assumptions, confirm needs at the regional or sub-regional level, evaluate alternatives to address those needs, and explain the rationale for the wires solutions recommended. The final Regional Infrastructure Plan will be posted on the OEB website.

A Regional Infrastructure Plan can involve several wires solutions that in combination address all or part of the region's needs. A Regional Infrastructure Plan might evolve over a period of time with different elements of the overall plan being identified at various times. Distributors and transmitters may be able to rely on the elements identified prior to completion of the overall regional plan for the purposes of rate submissions or Leave to Construct applications. This reflects the evolving and dynamic nature of planning.

A region may have more than one Regional Infrastructure Plan depending on the planning horizon. It may be possible that a longer-term plan for a region may need to be developed separately to the near and/or medium-term plan. The longer-term plan may look at providing major regional transmission in areas where there is currently limited or no transmission to service an area where substantial future development with new communities is expected. This longer term planning is typically more strategic and opportunistic in nature. It may involve collaboration with other planning agencies that provide for other types of linear infrastructure such as roads, water and sewage. While distributors need to participate at a certain level in longer-term planning, they may not need to rely on it with respect to the five year distribution investment plan and associated rate submissions. Therefore, it may be more appropriate to separate the longer-term considerations from the typical near- and medium-term regional plan. The PPWG recognizes that this flexibility is needed in the Regional Infrastructure Planning process.

Conceptual Timeline for Regional Planning

Figure 2 below provides an illustration of the typical timeline envisioned for regional planning.



Appendix 2

Load forecast information required for regional planning

APPENDIX 2

OPA: Load Forecasting for Regional Infrastructure Planning

Introduction

An important consideration in any electricity supply study is the expectation for electricity demand in the region. As such, the development of a demand forecast is a key step in the regional planning process. Over the past few years, the OPA, working with transmitters, local distribution companies (LDCs), and the IESO, has undertaken a number of regional plans. Based on this experience, the following approach to the development of demand forecasts for the purpose of regional infrastructure planning is proposed.

Regional Infrastructure Planning Demand Forecast Scope and Development

Similar to provincial level forecasting, regional infrastructure planning requires a long-term projection (20 years or longer) for electricity demand in order to assess the adequacy and reliability of electricity supply. However, due to the local focus of regional infrastructure planning, the scope and process used for developing a regional forecast will differ somewhat from that used in provincial level forecasting. For example, unlike provincial level forecasts which include energy and peak demand components, regional infrastructure planning requires a peak forecast; local delivery infrastructure must be sized to meet the highest demand in the area, while energy requirements are met through system planning. Also, due to the unique characteristics of a local area (such as customer type and demand shape, and environmental factors related to the geographic location of the area) this peak demand may not occur at the same time as the Ontario system peak. Accordingly, it is important that the peak demand forecast is established on a local basis, using the best available local knowledge. Regional planning requires detailed information about the specific location expected demand. The capability of the delivery system

will vary across a local area, and the location of expected demand growth is an important component for assessing the reliability of electricity supply to the area.

LDCs are well positioned to assess the expectation of future gross electricity demand, particularly over the near- and medium-term. LDCs have local knowledge of the customer mix in the region, expected customer connections, and municipal/regional growth plans which are key demand drivers. The OPA, as the lead planning and contracting authority for new conservation and generation supply in Ontario, can add to this LDC information forecasts around the contribution of conservation and distributed generation resources to meeting local demand.

Additionally, the OPA has a mandate to forecast electricity demand for the medium- and long-term. To deliver on this mandate, the OPA uses an End Use Forecast approach that forecasts electricity demand in each of the ten IESO zones on an hourly basis. While this zonal level forecast will likely differ from the gross demand forecast developed by LDCs (due to differences in the distribution and make-up of customer types, and the rate of economic development etc. in local areas versus the larger regional and provincial level) this information can be used to help inform the development of the medium- and longer-term portion of the regional infrastructure planning forecasts. The OPA is able to work with regional planning teams to align forecasts in the medium- and longer-term.

Forecast Methodology and Requirements

The following section outlines the details of the proposed methodology and requirements for developing a regional infrastructure demand forecast. While this approach is expected act as a basis for the general process, in certain cases, where local circumstances warrant , variations may be agreed upon by the study team.

1. The OPA develops 5-year historical demand information based on actual electricity demand data from the IESO, LDCs, Transmitter and other sources. This information provides a starting point for forecast development and a “reality check” of growth trends.

2. A starting point for the forecast is selected by the study team based on the area's historical peak electricity demand.
3. Area LDCs prepare a 20 year gross peak electricity demand forecast (or longer if agreed). While the methodology used to develop this gross forecast may differ among LDCs, certain common features are required in order to ensure consistency:
 - Forecasts are in megawatts (MW) and power factor assumptions are provided;
 - Forecasts are to the transformer station or bus level;
 - Forecasts are for median weather conditions;
 - Forecasts are for the local area-coincident peak demand hour (the definition of this hour will need to be coordinated among LDCs in the region);
 - Forecasts include natural conservation, meaning that the forecast considers economic factors and includes forecasts of how customers will adopt energy efficient technologies and behaviours. (These natural levels of energy efficiency adoption are motivated by changes in energy prices and by minimum codes and equipment standards that exist and require compliance.)
 - Forecasts will exclude projected levels of additional energy efficiency beyond natural conservation resulting from policy decisions including projections of future regulations, time of use pricing, and incentive programs, as well as the contribution of distributed generation resources.
4. On a transformer station or bus level, the OPA will prepare a forecast of the contribution of additional energy efficiency beyond natural conservation, as well as distributed generation resources.

5. The study lead will compile the LDC and OPA forecasts to produce an area net demand forecast, making an adjustment for extreme weather conditions.
6. The study lead will prepare sensitivities of the net demand forecast to reflect both higher and lower growth scenarios.

Appendix 3

Maps setting out the regions

APPENDIX 3

REGIONAL ZONE MAPS

1. Planning Zones – Northern Ontario
2. Planning Zones –Southern Ontario
3. Planning Zones – GTA



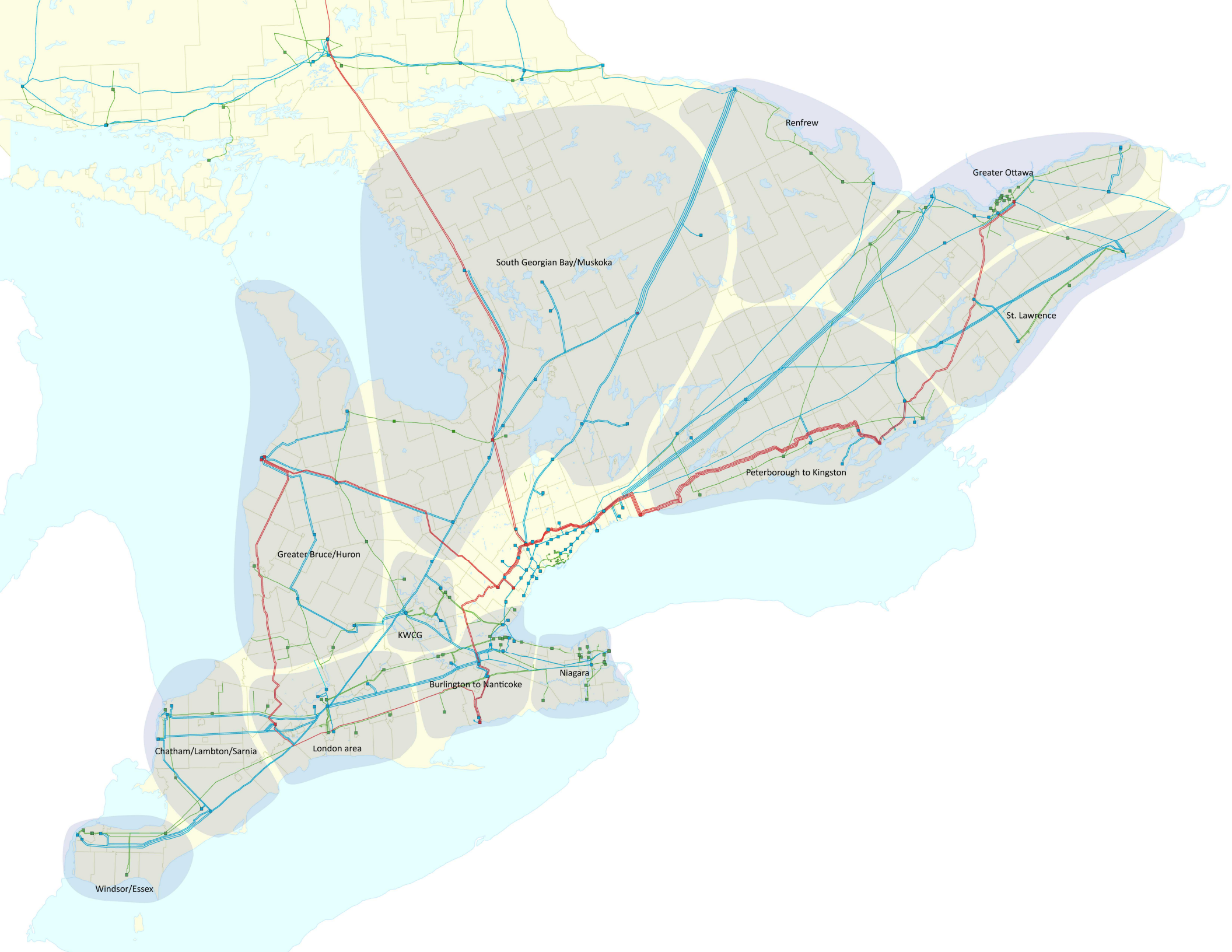
Northwest Ontario

North of Moosonee

North/East of Sudbury

East Lake Superior

Sudbury/Algoma



Windsor/Essex

Chatham/Lambton/Sarnia

London area

Greater Bruce/Huron

KWCG

Burlington to Nanticoke

Niagara

Peterborough to Kingston

St. Lawrence

Greater Ottawa

Renfrew

South Georgian Bay/Muskoka



GTA North

GTA East

GTA West

Metro Toronto

Appendix 4

Table setting out distributors in each region

Appendix 4

Distributors by Regional Zones

The table below identifies the LDCs supplied in each region, the type of connection (direct Tx or embedded Dx), the stations supplied and the number of delivery points.
Note that only Regions in the Hydro One Tx system and embedded connections in H1 Dx system are represented.

Zone	Distributor Name	Station Name	Connection	
North/East of Sudbury	Greater Sudbury Hydro Inc.	Crystal Falls TS	Dx	
	Hearst Power Distribution Company Limited	Hearst TS	Dx	
			Tx	
	Hydro One Networks Inc.		Abitibi Canyon GS	Tx
			Calstock DS	Tx
			Cochrane West DS	Tx
			Crystal Falls TS	Tx
			Dymond TS	Tx
			Fauquier DS	Tx
			Hearst TS	Tx
			Herridge Lake DS	Tx
			Hoyle DS	Tx
			Iroquois Falls DS	Tx
			Kapuskasing TS	Tx
			Kirkland Lake TS	Tx
			Laforest Road DS	Tx
			Monteith DS	Tx
			Moosonee DS	Tx
			Otto Holden TS	Tx
			Ramore TS	Tx
			Shiningtree DS	Tx
			Smooth Rock Falls DS	Tx
			Temagami DS	Tx
	Timmins TS	Tx		
	Trout Lake TS	Tx		
	Weston Lake DS	Tx		
	North Bay Hydro Distribution Ltd.		Trout Lake TS	Dx
				Tx
	Northern Ontario Wires Inc.		Cochrane MTS	Tx
			Iroquois Falls DS	Dx
Kapuskasing TS			Tx	
Northwest Ontario	Atikokan Hydro Inc.	Moose Lake TS	Tx	
	Chapleau Public Utilities Corporation	Chapleau DS	Dx	
		Chapleau MTS	Tx	
	Fort Frances Power Corporation	Fort Frances MTS	Tx	
	Hydro One Networks Inc.		Agimak DS	Tx
			Aguasabon GS	Tx
			Beardmore DS #2	Tx
			Burleigh DS	Tx
			Cat Lake MTS	Tx
			Chapleau DS	Tx
			Clearwater Bay DS	Tx
			Crow River DS	Tx
			Dryden TS	Tx
			Ear Falls TS	Tx
			Eton DS	Tx
			Fort Frances TS	Tx
			H2O Pwr SturgFls CGS	Tx
			Jellicoe DS #3	Tx
			Kenora DS	Tx
			Longlac TS	Tx
			Manitouwadge DS #1	Tx
	Manitouwadge TS	Tx		
	Marathon DS	Tx		

Zone	Distributor Name	Station Name	Connection
		Margach DS	Tx
		Minaki DS	Tx
		Murillo DS	Tx
		Nestor Falls DS	Tx
		Nipigon DS	Tx
		Perrault Falls DS	Tx
		Pic DS	Tx
		Port Arthur TS #1	Tx
		Red Lake TS	Tx
		Red Rock DS	Tx
		Sam Lake DS	Tx
		Sapawe DS	Tx
		Schreiber Winnipg DS	Tx
		Shabaqua DS	Tx
		Sioux Narrows DS	Tx
		Slate Falls DS	Tx
		Valora DS	Tx
		Vermilion Bay DS	Tx
		White River DS	Tx
		Whitedog Falls GS	Tx
			Kenora Hydro Electric Corporation Ltd.
Sioux Lookout Hydro Inc.	Sam Lake DS		Dx
Thunder Bay Hydro Electricity Distribution Inc.	Birch TS		Tx
	Fort William TS		Tx
Sudbury/Algoma	Espanola Regional Hydro Distribution Corp.	Port Arthur TS #1	Tx
		Espanola TS	Dx
	Greater Sudbury Hydro Inc.	Massey DS	Dx
		Clarabelle TS	Dx
			Tx
		Coniston TS	Dx
	Hydro One Networks Inc.	Martindale TS	Dx
			Tx
		Clarabelle TS	Tx
		Coniston TS	Tx
		Elliot Lake TS	Tx
		Espanola TS	Tx
		Larchwood TS	Tx
		Manitoulin TS	Tx
		Martindale TS	Tx
		Massey DS	Tx
		North Shore DS	Tx
		Sowerby DS	Tx
		Spanish DS	Tx
		Striker DS	Tx
	Verner DS	Tx	
Warren DS	Tx		
Wharnccliffe DS	Tx		
Whitefish DS	Tx		
Burlington to Nanticoke	Brant County Power Inc.	Brant TS	Dx
			Tx
		Brantford TS	Dx
	Brantford Power Inc.	Brant TS	Tx
		Brantford TS	Tx
	Brantford Power Inc. and Brant County Power	Powerline MTS	Tx
	Burlington Hydro Inc.	Bronte TS	Tx
		Burlington TS	Tx
		Cumberland TS	Tx
	Haldimand County Hydro Inc.	Caledonia TS	Dx
			Tx
		Dunnville TS	Dx
			Tx
	Horizon Utilities Corporation	Jarvis TS	Dx
			Tx
		Beach TS	Tx
Birmingham TS		Tx	
Dundas TS		Dx	
		Tx	
Dundas TS #2		Tx	
Elgin TS		Tx	
Gage TS	Tx		
Horning TS	Tx		
Kenilworth TS	Tx		

Zone	Distributor Name	Station Name	Connection	
		Lake TS	Dx	
			Tx	
		Mohawk TS	Tx	
		Nebo TS	Dx	
			Tx	
		Newton TS	Tx	
		Stirton TS	Tx	
		Winona TS	Tx	
		Hydro One Networks Inc.	Brant TS	Tx
			Caledonia TS	Tx
			Dundas TS	Tx
			Dundas TS #2	Tx
			Dunnville TS	Tx
			Jarvis TS	Tx
			Lake TS	Tx
		Nebo TS	Tx	
		Norfolk TS	Tx	
		Norfolk Power Distribution Inc.	Bloomsburg MTS	Tx
			Norfolk TS	Dx
				Tx
		Oakville Hydro Electricity Distribution Inc.	Bronte TS	Tx
Chatham/Lambton/Sarnia	Bluewater Power Distribution Corporation	Modeland TS	Tx	
		St.Andrews TS	Tx	
		Wanstead TS	Dx	
	Entegrus Power Lines Inc. [Chatham-Kent]	Kent TS		Dx
				Tx
		Wallaceburg TS	Dx	
	Hydro One Networks Inc.	Duart TS	Tx	
		Forest Jura DS	Tx	
		Kent TS	Tx	
		Lambton TS	Tx	
		Wallaceburg TS	Tx	
		Wanstead TS	Tx	
Greater Bruce/Huron	Entegrus Power Lines Inc. [Middlesex]	Centralia TS	Dx	
	Erie Thames Power Lines Corporation	Seaforth TS	Dx	
			Stratford TS	Dx
	Festival Hydro Inc.	Grand Bend East DS	Dx	
		Seaforth TS	Dx	
		St.Marys TS	Tx	
		Stratford TS	Tx	
	Hydro One Networks Inc.	Centralia TS	Tx	
		Douglas Point TS	Tx	
		Goderich TS	Tx	
		Grand Bend East DS	Tx	
		Hanover TS	Tx	
		Owen Sound TS	Tx	
		Palmerston TS	Tx	
		Seaforth TS	Tx	
		St.Marys TS	Tx	
		Stratford TS	Tx	
	Wingham TS	Tx		
	Wellington North Power Inc	Hanover TS	Dx	
	West Coast Huron Energy Inc.	Goderich TS	Tx	
Westario Power Inc.	Douglas Point TS	Dx		
	Hanover TS	Dx		
	Palmerston TS	Dx		
	Wingham TS	Dx		

Zone	Distributor Name	Station Name	Connection		
Greater Ottawa	Hydro 2000 Inc.	Longueuil TS	Dx		
	Hydro Hawkesbury Inc.	Hawkesbury MTS #1	Tx		
		Longueuil TS	Dx		
	Hydro One Networks Inc.	Almonte TS	Tx		
		Arnprior TS	Tx		
		Bilberry Creek TS	Tx		
		Clarence DS	Tx		
		Cumberland DS	Tx		
		Greely DS	Tx		
		Hawthorne TS	Tx		
		Longueuil TS	Tx		
		Manotick DS	Tx		
		Navan DS	Tx		
		Rockland DS	Tx		
		Rockland East DS	Tx		
		Russell DS	Tx		
		South Gloucester DS	Tx		
		South March TS	Tx		
		St.Isidore TS	Tx		
		Stewartville TS	Tx		
		Wendover DS	Tx		
		Wilhaven DS	Tx		
		Hydro Ottawa Limited	Albion TS	Tx	
	Almonte TS		Dx		
	Bilberry Creek TS		Tx		
	Bridlewood MTS		Tx		
	Carling TS		Tx		
	Centre Point MTS		Tx		
	Cyrville MTS		Tx		
	Ellwood MTS		Tx		
	Fallowfield MTS		Tx		
	Hawthorne TS		Dx		
			Tx		
	Hinchey TS		Tx		
	Kanata MTS #1		Tx		
	King Edward TS		Tx		
	Limebank MTS		Tx		
	Lincoln Heights TS		Tx		
	Lisgar TS		Tx		
	Manordale MTS		Tx		
	Marchwood MTS		Tx		
	Merivale MTS		Tx		
	Moulton MTS		Tx		
	Nepean Epworth MTS		Tx		
	Nepean TS		Tx		
	Overbrook TS		Tx		
	Richmond MTS		Tx		
	Riverdale TS		Tx		
	Russell TS		Tx		
	Slater TS		Tx		
	South Gloucester DS		Dx		
	South March TS		Dx		
			Tx		
	St.Isidore TS		Dx		
	Uplands MTS #2		Tx		
	Woodroffe TS		Tx		
	Ottawa River Power Corporation		Almonte TS	Dx	
	Renfrew Hydro Inc.		Stewartville TS	Dx	
	KWCG		Cambridge and North Dumfries Hydro Inc.	Cambridge NDum MTS#1	Tx
				Galt TS	Dx
					Tx
				Preston TS	Tx
		Wolverton DS		Dx	
		Centre Wellington Hydro Ltd.	Fergus TS	Dx	
		Guelph Hydro Electric System - Rockwood D	Fergus TS	Dx	
		Guelph Hydro Electric Systems Inc.	Arlen MTS	Tx	
			Campbell TS	Tx	
Cedar TS			Tx		
Hanlon TS			Tx		
Halton Hills Hydro Inc.		Fergus TS	Dx		
Hydro One Networks Inc.		Fergus TS	Tx		
		Puslinch DS	Tx		
		Wolverton DS	Tx		

Zone	Distributor Name	Station Name	Connection
	Kitchener-Wilmot Hydro Inc.	Kitchener MTS#1	Tx
		Kitchener MTS#3	Tx
		Kitchener MTS#4	Tx
		Kitchener MTS#5	Tx
		Kitchener MTS#6	Tx
		Kitchener MTS#7	Tx
		Kitchener MTS#8	Tx
		Kitchener MTS#9	Tx
		Milton Hydro Distribution Inc.	Fergus TS
	Waterloo North Hydro Inc.	Elmira TS	Dx
			Tx
		Fergus TS	Dx
		Rush MTS	Tx
		Scheifele MTS	Tx
		Waterloo North MTS 3	Tx
	Wellington North Power Inc	Fergus TS	Dx
	London Area	Entegrus Power Lines Inc. [Middlesex]	Longwood TS
St.Thomas TS			Dx
		Strathroy TS	Dx
			Tx
Erie Thames Power Lines Corporation		Aylmer TS	Tx
		Buchanan TS	Dx
		Constance DS	Dx
		Edgeware TS	Dx
		Ingersoll TS	Dx
		Tillsonburg TS	Dx
Hydro One Networks Inc.		Aylmer TS	Tx
		Buchanan TS	Tx
		Clarke TS	Tx
		Constance DS	Tx
		Edgeware TS	Tx
		Highbury TS	Tx
		Ingersoll TS	Tx
		Longwood TS	Tx
		St.Thomas TS	Tx
		Strathroy TS	Tx
		Tillsonburg TS	Tx
		Wonderland TS	Tx
		Woodstock TS	Tx
London Hydro Inc.		Buchanan TS	Dx
			Tx
		Clarke TS	Tx
		Edgeware TS	Dx
		Highbury TS	Dx
			Tx
		Nelson TS	Tx
		Talbot TS	Tx
Wonderland TS	Dx		
	Tx		
Norfolk Power Distribution Inc.	Tillsonburg TS	Dx	
St. Thomas Energy Inc.	Edgeware TS	Tx	
	St.Thomas TS	Tx	
Tillsonburg Hydro Inc.	Tillsonburg TS	Tx	
Woodstock Hydro Services Inc.	Woodstock TS	Tx	
Niagara	Canadian Niagara Power Inc. [Port Colborne]	Crowland TS	Dx
		Port Colborne TS	Tx
	Grimsby Power Inc.	Beamsville TS	Dx
	Horizon Utilities Corporation	Bunting TS	Tx
		Carlton TS	Tx
		Glendale TS	Tx
		Vansickle TS	Tx
	Hydro One Networks Inc.	Allanburg TS	Tx
		Beamsville TS	Tx
		Crowland TS	Tx
		Murray TS	Tx
		Thorold TS	Tx
		Vineland DS	Tx

Zone	Distributor Name	Station Name	Connection	
	Niagara Peninsula Energy Inc.	Allanburg TS	Dx	
		Beamsville TS	Dx	
			Tx	
		Kalar MTS	Tx	
		Murray TS	Dx	
			Tx	
		Stanley TS	Tx	
		Vineland DS	Dx	
		Niagara-On-The-Lake Hydro Inc.	N.O.T.L. MTS #2	Tx
			N.O.T.L. York MTS #1	Tx
Welland Hydro-Electric System Corp.	Crowland TS	Tx		
Peterborough to Kingston	Eastern Ontario Power Inc.	Frontenac TS	Dx	
	Hydro One Networks Inc.	Ardoch DS	Tx	
		Battersea DS	Tx	
		Belleville TS	Tx	
		Dobbin DS	Tx	
		Dobbin TS	Tx	
		Frontenac TS	Tx	
		Gardiner TS	Tx	
		Harrowsmith DS	Tx	
		Havelock TS	Tx	
		Hinchinbrooke DS	Tx	
		Lodgeroom DS	Tx	
		Napanee TS	Tx	
		Northbrook DS	Tx	
		Otonabee TS	Tx	
		Picton TS	Tx	
		Port Hope TS	Tx	
	Sharbot DS	Tx		
	Sidney TS	Tx		
	Kingston Hydro Corporation	Frontenac TS	Dx	
			Tx	
	Gardiner TS	Dx		
	Lakefront Utilities Inc.	Port Hope TS	Dx	
	Peterborough Distribution Inc.	Dobbin DS	Dx	
		Dobbin TS	Dx	
		Otonabee TS	Dx	
	Tx			
	Veridian Connections Inc.	Belleville TS	Tx	
		Port Hope TS	Dx	
	Renfrew	Hydro One Networks Inc.	Cobden DS	Tx
			Cobden TS	Tx
			Craig DS	Tx
			Deep River DS	Tx
Des Joachims DS			Tx	
Forest Lea DS			Tx	
Mazinaw DS			Tx	
Mountain Chute DS			Tx	
Pembroke TS			Tx	
Petawawa DS		Tx		
Ottawa River Power Corporation		Cobden TS	Dx	
	Pembroke TS	Dx		
Renfrew Hydro Inc.	Cobden TS	Dx		
South Georgian	Collingwood PowerStream Utility Services Co	Meaford TS	Dx	
		Stayner TS	Dx	
	Hydro One Networks Inc.	Alliston TS	Tx	
		Barrie TS	Tx	
		Beaverton TS	Tx	
		Bracebridge TS	Tx	
		Everett TS	Tx	
		Lindsay TS	Tx	
		Meaford TS	Tx	
		Midhurst TS	Tx	
		Minden TS	Tx	
		Muskoka TS	Tx	
		Orangeville TS	Tx	
		Orillia TS	Tx	
		Parry Sound TS	Tx	
		Stayner TS	Tx	
		Wallace TS	Tx	
		Waubashene TS	Tx	

Zone	Distributor Name	Station Name	Connection
	Innisfil Hydro Distribution Systems Limited	Alliston TS	Dx
		Barrie TS	Dx
		Everett TS	Dx
	Lakeland Power Distribution Ltd.	Muskoka TS	Dx
	Midland Power Utility Corporation	Waubashene TS	Dx
	Orangeville Hydro Limited	Orangeville TS	Dx
	Orillia Power Distribution Corporation	Orillia TS	Dx
	Parry Sound Power Corp.	Parry Sound TS	Dx
	Powerstream Inc. [Barrie]	Alliston TS	Dx
		Barrie TS	Tx
		Everett TS	Dx
		Midhurst TS	Dx
		Waubashene TS	Dx
	Tay Power	Waubashene TS	Dx
	Veridian Connections Inc.	Beaverton TS	Dx
	Veridian-Gravenhurst Hydro Electric Inc	Muskoka TS	Dx
		Orillia TS	Dx
	Wasaga Distribution Inc.	Midhurst TS	Dx
		Stayner TS	Dx
	St. Lawrence	Cooperative Hydro Embrun Inc. Hydro One Networks Inc.	Chesterville TS
Brockville TS			Tx
Chesterville TS			Tx
Crosby TS			Tx
Marionville DS			Tx
Morrisburg TS			Tx
Newington DS			Tx
Smiths Falls TS			Tx
St.Lawrence TS			Tx
Rideau St. Lawrence Distribution Inc.		Brockville TS	Dx
	Crosby TS	Dx	
	Morrisburg TS	Dx	
Windsor/Essex	E.L.K. Energy Inc.	Belle River TS	Dx
		Kingsville TS	Dx
		Lauzon TS	Dx
		Tilbury West DS	Dx
	Entegrus Power Lines Inc. [Chatham-Kent]	Kingsville TS	Dx
		Tilbury TS	Dx
		Tilbury West DS	Dx
	EnWin Utilities Ltd.	Chrysler WAP MTS	Tx
		Crawford TS	Tx
		Essex TS	Tx
		Ford Annex MTS	Tx
		Ford Essex CTS	Tx
		Ford Windsor MTS	Tx
		G.M.Windsor MTS	Tx
		Keith TS	Tx
		Lauzon TS	Tx
		Malden TS	Tx
	Essex Powerlines Corporation	Walker MTS #2	Tx
		Walker TS #1	Tx
Keith TS		Dx	
Kingsville TS		Dx	
	Lauzon TS	Dx	
	Malden TS	Dx	

Zone	Distributor Name	Station Name	Connection
	Hydro One Networks Inc.	Belle River TS	Tx
		Keith TS	Tx
		Kingsville TS	Tx
		Lauzon TS	Tx
		Malden TS	Tx
		Tilbury TS	Tx
		Tilbury West DS	Tx
Metro Toronto	Enersource Hydro Mississauga Inc.	Richview TS	Dx
		Agincourt TS	Tx
	Hydro One Networks Inc.	Fairchild TS	Tx
		Finch TS	Tx
		Leslie TS	Tx
		Malvern TS	Tx
		Richview TS	Tx
		Sheppard TS	Tx
		Warden TS	Tx
	PowerStream Inc.	Agincourt TS	Dx
		Fairchild TS	Dx
		Finch TS	Dx
		Leslie TS	Dx
	Toronto Hydro Electric System Limited	Agincourt TS	Tx
		Basin TS	Tx
		Bathurst TS	Tx
		Bermondsey TS	Tx
		Bridgman TS	Tx
		Carlaw TS	Tx
		Cavanagh MTS	Tx
		Cecil TS	Tx
		Charles TS	Tx
		Dufferin TS	Tx
		Duplex TS	Tx
		Ellesmere TS	Tx
		Esplanade TS	Tx
		Fairbank TS	Tx
		Fairchild TS	Tx
		Finch TS	Tx
		Gerrard TS	Tx
		Glengrove TS	Tx
		Horner TS	Tx
		John TS	Tx
		Leaside TS	Tx
		Leslie TS	Tx
		Main TS	Tx
		Malvern TS	Tx
		Manby TS	Tx
		Rexdale TS	Tx
		Richview TS	Tx
		Runnymede TS	Tx
Scarboro TS		Tx	
Sheppard TS		Tx	
Strachan TS		Tx	
Terauley TS		Tx	
Warden TS		Dx	
	Tx		
Wiltshire TS	Tx		
Veridian Connections Inc.	Malvern TS	Dx	
	Sheppard TS	Dx	
GTA East	Hydro One Networks Inc.	Cherrywood TS	Tx
		Thornton TS	Tx
		Whitby TS	Tx
		Wilson TS	Tx
	Oshawa PUC Networks Inc.	Thornton TS	Tx
		Wilson TS	Tx
	Veridian Connections Inc.	Cherrywood TS	Dx
			Tx
		Whitby TS	Dx
			Tx
	Whitby Hydro Electric Corporation	Wilson TS	Dx
		Thornton TS	Dx
		Whitby TS	Tx

Zone	Distributor Name	Station Name	Connection
GTA North	Enersource Hydro Mississauga Inc.	Woodbridge TS	Dx
	Hydro One Brampton Networks Inc.	Woodbridge TS	Dx
	Hydro One Networks Inc.	Armitage TS	Tx
		Brown Hill TS	Tx
		Holland TS	Tx
		Kleinburg TS	Tx
		Woodbridge TS	Tx
	Newmarket-Tay Power Distribution Ltd.	Armitage TS	Tx
		Holland TS	Tx
	PowerStream Inc.	Armitage TS	Dx
			Tx
		Buttonville TS	Tx
		Holland TS	Dx
		Kleinburg TS	Tx
		Markham MTS #1	Tx
		Markham MTS #2	Tx
		Markham MTS #3	Tx
		Markham MTS #4	Tx
		Richmond Hill MTS #1	Tx
		Richmond Hill MTS #2	Tx
Vaughan MTS #1		Tx	
Vaughan MTS #2		Tx	
Vaughan MTS #3		Tx	
Woodbridge TS		Dx	
	Tx		
Powerstream Inc. [Barrie]	Holland TS	Dx	
Toronto Hydro Electric System Limited	Woodbridge TS	Dx	
Veridian Connections Inc.	Armitage TS	Dx	
GTA West	Burlington Hydro Inc.	Palermo TS	Tx
	Enersource Hydro Mississauga Inc.	Bramalea TS	Dx
			Tx
		Cardiff TS	Tx
		Churchill Meadows TS	Tx
		Cooksville TS	Tx
		Erindale TS	Tx
		Lorne Park TS	Tx
		Meadowvale TS	Tx
		Oakville TS #2	Dx
	Tomken TS	Tx	
	Halton Hills Hydro Inc.	Halton TS	Dx
			Tx
		Pleasant TS	Dx
	Hydro One Brampton Networks Inc.	Bramalea TS	Tx
		Goreway TS	Tx
		Jim Yarrow MTS	Tx
		Pleasant TS	Tx
	Hydro One Networks Inc.	Bramalea TS	Tx
		Halton TS	Tx
		Oakville TS #2	Tx
		Palermo TS	Tx
		Pleasant TS	Tx
		Trafalgar TS	Tx
	Milton Hydro Distribution Inc.	Halton TS	Tx
		Palermo TS	Dx
	Oakville Hydro Electricity Distribution Inc.	Glenorchy MTS #1	Tx
		Oakville TS #2	Tx
		Palermo TS	Tx
Trafalgar TS		Dx	

Appendix 5

Description of OPA Integrated Regional Resource Planning process

APPENDIX 5

Description of Integrated Regional Resource Planning (IRRP) Process

Description

- IRRP is a comprehensive planning process for developing and selecting integrated solutions to address the electricity needs of regions in the near-, mid-, and long-term.
- This process is coordinated by the OPA, in collaboration with local distribution companies (LDCs), the Independent Electricity System Operator (IESO), Transmitter(s), and other parties as required. As appropriate and in particular, when expansion of major infrastructure is contemplated, the process intends to engage key stakeholders, elected representatives and communities, in the development of a recommended plan.

Information/Input Required (as appropriate for specific studies)

LDCs

- Unbundled gross demand forecasts by sub-areas, pockets, TSs, etc
- Relevant investment plans
- Future station requirements
- Relevant community energy plans
- Conservation plans

IESO

- Reliability standards
- Power System Simulator for Engineering (PSS/E) loadflow base cases if available

Transmitter(s)

- Transmission facility ratings
- Relevant investment plans
- Reliability statistics of equipment and delivery points
- Equipment end-of-life information
- Direct connect customer demand information
- Transmission option feasibility, timelines and cost estimates

OPA

- Historical electricity demand from the IESO, LDC, Transmitter and other sources
- Existing conservation achievement
- Existing and contracted generation resources (large and small)
- Long-term regional demand forecast (end-use modelling)
- Conservation forecasts
- Distributed generation forecasts
- System resource needs

- Government policy directions
- Incremental conservation potential and associated costs
- Incremental generation potential and associated costs

Process Steps

1. Preparation of detailed unbundled load forecasts
 - Historical coincident peak demand information provided by the OPA
 - Gross peak demand forecasts prepared by area LDCs (median weather conditions) and aligned with medium- and longer-term OPA forecasts as appropriate
 - Conservation and distributed generation forecasts prepared by the OPA with assistance from the LDCs
 - Compilation of LDC and OPA forecasts to produce a net demand forecast by TSs
 - Adjustments made for extreme weather conditions
 - Net demand forecast sensitivities prepared reflecting both higher and lower growth scenarios
2. Detailed technical studies and analysis
 - Load flow and other system analysis to determine the load meeting capability of the existing system; consideration of bulk system developments, changes, constraints and requirements.
 - Analysis of the security of supply and the impact of supply interruptions to customers in the local areas in consideration of the ORTAC criteria
 - Analysis of reliability performance of certain supply pockets, as appropriate
 - Consideration of end-of-life replacement needs of existing infrastructure
 - Consideration of generation connection needs
 - Consideration of prevailing operating constraints and mitigation
 - Consideration of short-circuit and reactive support requirements
 - Consideration of distribution system capabilities (eg. feeder back-up) and limitations
3. Establish needs
 - Near-, mid-, and long-term needs established based on above technical study results, updated demand forecasts and system requirements, as appropriate.
4. Development of the solution options
 - Potential options to meet the near- and longer-term needs are identified including conservation, generation (large and small scale), and representative wire options
 - Details of each option are established suitable to allow for comparison, for example:
 - generation options: generation type, size, operating characteristics, location, fuel cost, heat rate, asset life, etc.
 - wires options: voltage, ampacity, distance, capital cost, high level routing, etc. as provided primarily by the transmitter and/or distributor
5. Option screening
 - High level screening of options based on factors such as feasibility and cost comparisons (including net present value, cross-over point and initial capital considerations)

6. Alternative development and screening

- Remaining options are integrated to create comprehensive alternatives (ie., packages of integrated solution options) to address the near- and longer-term needs
- High level screening of alternatives based on factors such as feasibility and cost comparisons (including net present value, cross-over point and initial capital considerations) in order to identify the best set of options to take forward

7. Stakeholder engagement

- Stakeholder feedback is sought on need, and range of and preference for various integrated solution options

8. Alternative evaluation

- Alternatives are evaluated based on cost comparisons (including net present value, cross-over point and initial capital considerations), flexibility, reliability and technical performance, environmental performance, and societal acceptance

9. Recommendations and Implementation

- Choice is made regarding the preferred alternative for meeting the area's needs
- An implementation and monitoring plan is developed, including identification of opportunities for coordination with other infrastructure (e.g. highway corridors) as appropriate

Deliverables

- “Recommendation/Urge letter(s)” to the appropriate transmitter for the implementation of near-term wire options through the RIP process
 - Includes a discussion of the scope, timing and expected project cost
- IRRP report identifying the action plan for the region and any recommended wire options for development through the RIP process
- Monitoring and Re-Direction (Plan B) strategies

Risk

- Demand forecast risk– differences in electricity demand growth, conservation or distributed generation achievement compared to the forecast
- Cost allocation
- Policy changes
- Project cost changes
- Generation contracting risk
- Process timing – e.g. stakeholder engagement
- Risk mitigations as part of the plan (eg. off-ramps, triggers and plan “B”)

Appendix 6

Currently active regional planning studies

APPENDIX 6

EXISTING REGIONAL PLANS

REGION	DISTRIBUTORS
Existing Regional Plans	
Kitchener-Waterloo-Cambridge-Guelph (“KWCG”) area	Kitchener Wilmot Hydro, Waterloo North Hydro, Cambridge & North Dumfries Hydro, Guelph Hydro Electric Systems, and Hydro One Distribution
Central-Downtown Toronto	Toronto Hydro
York Region	Powerstream, Newmarket-Tay Power, and Hydro One Distribution
Windsor-Essex	EnWin Utilities, E.L.K. Energy, Essex Powerlines, Entegrus Powerlines, and Hydro One Distribution
Ottawa	Hydro Ottawa, and Hydro One Distribution

Appendix 7

Scoping Process Outcome Report template

APPENDIX 7

SCOPING PROCESS OUTCOME REPORT TEMPLATE

SCOPING PROCESS OUTCOME REPORT			
NAME			
LEAD			
REGION	ZONE XXX		
START DATE		END DATE	
1. INTRODUCTION			
2. OBJECTIVES			
3. SCOPE			
<ul style="list-style-type: none"> - KEY ASSUMPTIONS - ZONE MAPS – SEE ATTACHMENT “A” - STUDY SCHEDULE - PHASE 1 - PHASE 2 - CRITERIA TO BE USED FOR THE EVALUATION PROCESS 			
4. RESOURCES			
<ul style="list-style-type: none"> - THE TOR IDENTIFIES THE PARTIES THAT WILL BE INVOLVED TO CARRY OUT THE STUDY <ul style="list-style-type: none"> - 4A. STUDY TEAM (TECHNICAL, SUB STUDY TEAMS, ETC.) - 4B. AUTHORITY (EACH ENTITY INVOLVED IN THE STUDY WILL FOLLOW THEIR OWN INTERNAL PROCESS ON THE APPROVAL OF THE PROPOSED IMPLEMENTATION PLAN RESULTING FROM THIS STUDY). - 4C. FUNDING (FOR THE DURATION OF THE STUDY PROCESS, EACH PARTICIPANT IS RESPONSIBLE FOR THEIR OWN FUNDING AS NECESSARY, FOR THE STUDY WORK REQUIRED TO BE COMPLETED) 			
5. ACTIVITIES			
6. DELVIERABLES			
<ul style="list-style-type: none"> - TERMS OF REFERENCE - STATEMENT OF NEED - STAGE 1 STUDY REPORT FOR - STAGE 2 STUDY REPORT FOR - IMPLEMENTATION PLAN 			
7. COMMUNICATIONS / STAKEHOLDERING			
-			

SCOPING PROCESS OUTCOME REPORT

NAME			
LEAD			
REGION	ZONE XXX		
START DATE		END DATE	

8. CONCLUSION / RESULTS

9. PLANNING APPROACH SCHEDULE
 - SEE ATTACHMENT "B"

PREPARED BY:

PARTICIPANTS: LISTED BELOW

COMPANY	NAME	SIGNATURE

ATTACHMENT A:
REGIONAL ZONE - MAP

ATTACHMENT B:
STUDY SCHEDULE

Appendix 8

Needs Screening Summary template

APPENDIX 8

NEEDS SCREEN SUMMARY REPORT (TEMPLATE)

NEEDS SCREEN SUMMARY REPORT			
NAME			
LEAD	TRANSMITTER		
REGION	ZONE XXX		
START DATE		END DATE	
1. INTRODUCTION			
2. REGIONAL ISSUE / TRIGGER			
- UNFORESEEN – CONNECTION REQUEST FROM LARGE INDUSTRIAL CUSTOMER			
3. SCOPE OF NEEDS SCREENING			
- ZONE MAPS – SEE ATTACHMENT “A”			
4. INPUTS / DATA (INFORMATION REQUIRED TO COMPLETE ASSESSMENT)			
- LOAD FORECASTS			
5. ASSESSMENT			
- ASSUMPTIONS			
- RISKS			
- DATA MODELING			
6. RESULTS			
7. RECOMMENDATION			
- LOCAL PLANNING ONLY			
- REGIONAL PLANNING STUDY REQUIRED			
○ PARTICIPANTS REQUIRED			
○ PARTICIPANTS NOT REQUIRED			
PREPARED BY:			
PARTICIPANTS: LISTED BELOW			
COMPANY	NAME	SIGNATURE	

ATTACHMENT A:
REGIONAL ZONE - MAP

Appendix 9

List of PPWG members

APPENDIX 9

LIST OF MEMBERS

Member Organizations – Planning Process Working Group

- Association of Major Power Consumers of Ontario (AMPCO)
- Association of Municipalities of Ontario (AMO)
- Association of Power Producers of Ontario (APPrO)
- Consumers Council of Canada (CCC)
- Great Lakes Power Transmission Inc.
- Guelph Hydro Electric Systems Inc.
- Hydro One Networks Inc. (Distribution)
- Hydro One Networks Inc. (Transmission)
- Innisfil Hydro Distribution Systems Ltd.
- Milton Hydro Distribution Inc.
- Ontario Power Authority (OPA)
- PowerStream Inc.
- Thunder Bay Hydro Electricity Distribution Inc.

Appendix 10

Regional Infrastructure Planning Process – OEB Staff Memorandum

Appendix 10

Regional Infrastructure Planning Process – OEB Staff Memorandum

This working group differs from the other working groups in relation to implementation of the Board’s conclusions in the RRFE Board Report in that the outcome will be a working group report to the Board related to developing a more structured Regional Infrastructure Planning process. As such, Board staff’s role in this process is to facilitate the working group in relation to achieving that outcome.

The RRFE Board Report concluded *“that infrastructure planning on a regional basis is required to ensure that regional issues and requirements are effectively integrated into utility planning processes...¹”*. It further set the expectation that *“Distributors and transmitters will therefore be expected to file evidence in rate and leave to construct proceedings that demonstrates that regional issues have been appropriately considered....²”*

To achieve the stated desires of the Board, this working group has been assembled to develop a more structured Regional Infrastructure Planning process. The working group’s planning process contained within their report to the Board is expected to be used by the industry to support their future rate and leave to construct applications.

The table below sets out some suggestions for the working group’s consideration in order to facilitate working group discussion. The suggestions are associated with the elements of the Regional Infrastructure Planning process that were identified in the RRFE Board Report for the working group to address (as well as some other ‘potential’ elements). For the most part, those suggestions and additional ‘potential’ elements reflect stakeholder input provided during the RRFE consultation process (e.g., increase in transparency, broader stakeholder input, consistent information from LDCs, avoid unnecessary regulatory burden, etc.).

Board’s Expectations & Key Elements	Suggestions for Working Group Consideration
Board Expectations in Board Report (p. 40)	
	➤ Lead responsibility must be assigned. The Board believes there is merit in having this responsibility lie with appropriate transmitter. Transmitter will work with the OPA to identify where CDM or DG options may represent potential solutions.
	➤ Predetermined regions will be identified to form foundation for process and so all LDCs will have an understanding of regions they reside in. The Board sees merit in having those predetermined regions based on electrical system boundaries and suggests that the IESO’s electrical zones be used as a starting point.
	➤ Protocols will be in place for sharing information among relevant parties.

¹ Renewed Regulatory Framework for Electricity 2012, Pp. 39

² Renewed Regulatory Framework for Electricity 2012, Pp. 39

Board's Expectations & Key Elements	Suggestions for Working Group Consideration
<p>➤ LDCs will be expected to participate in regional infrastructure planning processes.</p>	
<p>Key Elements in Board Report (p. 52-53)</p>	
<p>1) Appropriate predetermined regional boundaries and criteria to be used to establish them (and how those predetermined regional boundaries are used)</p>	<ul style="list-style-type: none"> ➤ IESO zones used as starting point by working group in relation to establishing predetermined regions ➤ Identify if regional plan(s) needed in a predetermined region based on information provided by LDCs to the transmitter (within predetermined region) ➤ Within a predetermined region, regional plan(s) developed at <i>sub-regional</i> level based on need
<p>2) Information an LDC should be required to provide to the transmitter and frequency it should be updated</p>	<ul style="list-style-type: none"> ➤ Information LDCs should be required to provide <ul style="list-style-type: none"> ▪ Load forecast (minimum 5 year horizon) ▪ LDC's most recently-approved GEA Plan ▪ All relevant land use planning documents (including those indicating pace & probability future development likely to occur - long term in nature and identify expected future development; e.g., new subdivisions) ▪ <i>Anything else?</i> ➤ Frequency <ul style="list-style-type: none"> ▪ Updated every 5 years at a minimum <ul style="list-style-type: none"> - Consistent with distribution planning and rate plan horizon in RRFE Board Report - Also consistent with "required" updates to land use planning documents as set out in legislation
<p>3) Circumstances under which OPA should participate (and related process)</p>	<ul style="list-style-type: none"> ➤ Potential "optimal" solutions not limited to infrastructure in all cases ➤ Information provided to transmitter by LDCs is then provided to the OPA by the transmitter ➤ Initial meeting of transmitter and the OPA to determine whether CDM and/or DG options are viable potential

Board's Expectations & Key Elements	Suggestions for Working Group Consideration
	<p>solutions</p> <ul style="list-style-type: none"> ▪ If yes, OPA continues to participate in process ▪ If not, OPA does not continue to participate in process <p>➤ Where OPA is not involved, final regional plan provided to OPA given its responsibilities related to planning the provincial transmission network</p> <p>➤ Following initial meeting(s) between OPA and transmitter, transmitter (and OPA, where appropriate) meet with all LDCs in a broad predetermined region to determine which LDCs have regional requirements and should therefore participate in regional planning process at <i>sub-regional</i> level</p>
<p>4) Appropriate evaluative criteria to compare potential solutions</p>	<p>➤ Net present value (NPV) calculation for each option, determined in manner consistent with requirements related to leave to construct (LTC) applications where alternative investments are evaluated.³</p> <ul style="list-style-type: none"> ▪ Provides objective determination of solution(s) that meet the needs of LDCs in a region at lowest overall system cost over long term ▪ Criterion already adopted by the Board for purpose of assessing alternative solutions ▪ <i>Other criteria?</i>
<p>5) Form in which broader consultation should take place before Regional Plan is finalized</p>	<p>➤ Broader consultation includes applicable municipal representatives and consumers group(s) as well as generator(s) and industrial customer(s) where applicable; e.g., generator(s) and/or industrial customer(s) that share line connection to be upgraded with LDC(s)</p> <p>➤ Draft regional plan includes all options considered (i.e., infrastructure upgrades, CDM and DG) and the associated analysis including assumptions (based on assessment</p>

³ The NPV related requirements in relation to leave to construct applications are identified in the Board's [Filing Requirements for Transmission and Distribution Applications, Chapter 5, page 35.](#)

Board's Expectations & Key Elements	Suggestions for Working Group Consideration
	<p>criteria identified by working group)</p> <ul style="list-style-type: none"> ➤ Questions and concerns regarding validity of CDM or DG assumptions addressed and resolved during broader stakeholder consultation phase of regional plan development process. Any unresolved concerns would be noted in regional plan (or accompanying documentation) filed with the Board in support of an application
Other 'potential' key elements for working group consideration	
<p>6) How should it be determined if an LDC's involvement is needed or not in the regional planning process?</p>	<ul style="list-style-type: none"> ➤ LDC involvement determined based on information provided by LDCs to transmitter. Where upgrades to line connection assets are determined to be needed to serve two or more LDCs with contiguous service areas, those LDCs involved in the regional planning process ➤ Where LDC does not require line connection upgrade or LDC requires upgrade but neighbouring LDC(s) do not, LDC not involved in the regional planning process <ul style="list-style-type: none"> ▪ Avoids placing unnecessary regulatory burden on LDCs whose involvement in process is determined not be necessary
<p>7) Where transmitter determines that involvement of specific LDCs is necessary in regional planning process, should the Board "require" or "expect" those LDCs to participate?</p>	<ul style="list-style-type: none"> ➤ It may be necessary for the Board "require" LDCs to participate in the regional planning process for the following reasons: <ul style="list-style-type: none"> ▪ If LDC is determined by transmitter to be integral in process but opts not to participate, the Board's objectives may not be achieved; e.g., cost-effective development of electricity infrastructure, ensuring development and implementation of smart grid is carried out on coordinated basis and smart grid investments made at system level (distribution or transmission) best serve interests of region ▪ Optimal investment may not be an upstream transmission connection upgrade. Instead, it could be an investment within the distribution system that

Board's Expectations & Key Elements	Suggestions for Working Group Consideration
	<p>crosses LDC boundaries</p> <ul style="list-style-type: none"> ➤ It may <u>not</u> be necessary for the Board “require” LDCs to participate in the regional planning process for the following reason: <ul style="list-style-type: none"> ▪ The Board set out in the Board Report that LDCs will be expected to file evidence (i.e., Regional Infrastructure Plan) in rate proceedings (i.e., application) that demonstrates regional issues have been appropriately considered and, where applicable, addressed in developing the utility's capital budget or infrastructure investment proposal. That Board expectation may be adequate.
<p>8) Input on Filing Requirements related to Regional Infrastructure Planning that will feed into Board staff proposal in relation to ‘consolidated’ planning Filing Requirements</p> <ul style="list-style-type: none"> • LDCs and transmitters expected to file evidence (i.e., Regional Infrastructure Plan) in rate and leave to construct proceedings (i.e., application) that demonstrates regional issues have been appropriately considered and, where applicable, addressed in developing the utility’s capital budget or infrastructure investment proposal 	<ul style="list-style-type: none"> ➤ Where transmitter determines an LDC’s involvement is necessary, regional plan submitted as part of LDC’s rate application whether or not optimal solution(s) in plan includes infrastructure investments by LDC ➤ Where transmitter determines an LDC’s involvement in process is not necessary, LDC obtains letter from transmitter to submit as part of their rate application ➤ Any regional plan submitted in support of an application includes all options considered and associated assessment / analysis used to determine optimal solution (e.g., NPV calculation) for each option including CDM and DG; i.e., not only the option(s) determined to be optimal solution(s) <ul style="list-style-type: none"> ▪ Any CDM and/or DG assumptions in regional plan would provide context for infrastructure investments proposed in application and inclusion of all options would demonstrate to the Board that all potential viable options were considered and objectively assessed in developing the regional plan
<p>9) Increase in process</p>	<ul style="list-style-type: none"> ➤ All draft regional plans posted on applicable transmitter’s website at the broader stakeholder phase and

Board's Expectations & Key Elements	Suggestions for Working Group Consideration
transparency	subsequently replaced by final regional plans
10 Changes to Board's regulatory instruments that may be needed to support the process	➤ TBD (based on working group's ultimate recommendations related to the various elements)
Any other elements?	