

Ontario Energy Board

Commission de l'énergie de l'Ontario



Ontario Energy Board

Filing Requirements For
Electricity Distribution Rate Applications
- 2018 Edition for 2019 Rate Applications -

Chapter 5

Consolidated Distribution System Plan

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5.0 Introduction

These Chapter 5 filing requirements set out the information required by the Ontario Energy Board (OEB) under the renewed regulatory framework (RRF) for electricity¹ and the subsequently released *Handbook for Utility Rate Applications* (Handbook) to assess distributor applications involving planned expenditures on distribution systems and other infrastructure. A Distribution System Plan (DSP) consolidates the documentation related to a distributor's asset management process and capital expenditure plan, as described in the Handbook.²

Good distributor planning is an essential pre-requisite to the performance-based rate-setting approaches established under the Handbook, and necessary to ensure that the four performance outcomes the OEB has established for electricity distributors, namely Customer Focus, Operational Effectiveness, Public Policy Responsiveness, and Financial Performance³, are being achieved.

5.0.1 Application and scope

These filing requirements apply to licenced, rate regulated electricity distribution utilities in Ontario when filing DSPs in accordance with the frequency set out by the OEB in section 5.1.3 of these requirements.

5.0.2 The OEB's evaluation of DSPs

DSP filings must address whether a distributor has achieved and will continue to achieve the four performance outcomes the OEB has established for electricity distributors. Section 5.4.3 explains the specific criteria the OEB will use to evaluate whether a DSP, and in particular the material⁴ projects/programs⁵ proposed for cost recovery in a DSP, addresses these four outcomes.⁶

¹ The renewed regulatory framework for electricity is a comprehensive, performance-based approach to regulation that is based on the achievement of outcomes that ensure that Ontario's electricity system provides value for money for customers. See [Report of the OEB – A Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach](#). (the RRF Report); p. 2.

² Handbook for Utility Rate Applications, p.13.

³ Handbook for Utility Rate Applications, pp. 2-3.

⁴ A project or program is "material" if the materiality threshold set out in Chapter 2 of the *Filing Requirements for Electricity Transmission and Distribution Applications* is met.

⁵ Previous version of Chapter 5 used activities instead of programs; these terms are interchangeable.

⁶ Handbook for Utility Rate Applications, pp. 9-22

5.1 General & Administrative Matters

These filing requirements introduce a standard approach to a distributor's filings of asset management and capital expenditure plan information in support of a rate application. Distributors are expected to include and clearly identify in their filings the information set out in these filing requirements, and to use the terminology and formats set out in these filing requirements.

5.1.1 Purpose of filing a Distribution System Plan

To implement the policy objectives of the RRF as set out in the Handbook, all filing requirements related to DSPs have been consolidated in Chapter 5 of the OEB's [Filing Requirements for Electricity Distribution Rate Applications](#).

Filing a DSP with an application to the OEB will provide information to the OEB and interested stakeholders including, but not necessarily limited to, a distributor's:

- Asset related performance objectives and approach to evaluating its performance relative to those objectives
- Approach to lifecycle asset management planning and the management of asset-related operational and financial risk
- Plan for capital-related expenditures over a five-year forecast period and the justification of these expenditures
- Planned investments related to accommodating the connection of renewable energy generation (REG)
- Planned investments for the development and implementation of the smart grid to support grid modernization and expenditures as required by legislation.⁷ Grid modernization involves investing in innovative solutions that make systems more efficient, reliable and cost effective and more prepared for technological changes, such as electric vehicles and distributed energy resources, and provide more customer choice.⁸

5.1.2 Investment Categories

A distributor's investment projects and programs must be grouped for filing purposes into one of the four investment categories listed below.

⁷ These Chapter 5 filing requirements replace the OEB's [Filing Requirements: Distribution System Plans – Filing under Deemed Conditions of Licence](#).

⁸ A more detailed description of a modernized grid can be found in Ontario's Long-Term Energy Plan 2017, pp. 63-65

Table 1 – Investment Categories & Example Drivers and Projects/Programs

	Example Drivers	Example Projects / Programs
system access	Customer service requests	<ul style="list-style-type: none"> – New customer connections – Modifications to existing customer connections – Expansions for customer connections or property development
	Other 3 rd party infrastructure development requirements	<ul style="list-style-type: none"> – System modifications for property or infrastructure development (e.g. relocating pole lines for road widening)
	Mandated service obligations (DSC; Cond. of Serv.; etc.)	<ul style="list-style-type: none"> – Metering – Long term load transfer
system renewal	Assets/asset systems at end of service life due to: <ul style="list-style-type: none"> – Failure – Failure risk – Substandard performance – High performance risk – Functional obsolescence 	<ul style="list-style-type: none"> – Programs to refurbish/replace assets or asset systems; e.g.: batteries; cable (by type); cable splices; civil works; conductor; elbows & inserts; insulators; poles (by type); physical plant; relays; switchgear; transformers (by type); other equipment (by type)
system service	Expected changes in load that will constrain the ability of the system to provide consistent service delivery	<ul style="list-style-type: none"> – Property acquisition – Capacity upgrade (by type); e.g. phases; circuits; conductor; voltage; transformation; regulation – Line extensions
	System operational objectives: <ul style="list-style-type: none"> – Safety – Reliability – Power quality – System efficiency – Other performance/functionality 	<ul style="list-style-type: none"> – Protection & control upgrade; e.g. reclosers; tap changer controls/relays; transfer trip – Automation (new/upgrades) by device type/function – Supervisory control and data acquisition (SCADA) – Distribution loss reduction
general plant ¹	<ul style="list-style-type: none"> – System capital investment support – System maintenance support – Business operations efficiency – Non-system physical plant 	<ul style="list-style-type: none"> – Land acquisition – Structures & depreciable improvements – Equipment and tools – Supplies – Finance/admin/billing software & systems – Rolling stock – Intangibles (e.g. land rights; capital contributions to other utilities)

Note: 1. Includes only 1900 series accounts.

- **System access** investments are modifications (including asset relocation) to a distributor’s distribution system a distributor is obligated to perform to provide a customer (including a generator customer) or group of customers with access to electricity services via the distribution system.

- **System renewal** investments involve replacing and/or refurbishing system assets to extend the original service life of the assets and thereby maintain the ability of the distributor's distribution system to provide customers with electricity services.
- **System service** investments are modifications to a distributor's distribution system to ensure the distribution system continues to meet distributor operational objectives while addressing anticipated future customer electricity service requirements.
- **General plant** investments are modifications, replacements or additions to a distributor's assets that are not part of its distribution system including land and buildings, tools and equipment, rolling stock and electronic devices and software used to support day to day business and operations activities.

A project or program involving two or more drivers associated with different categories should be placed in the category corresponding to the trigger driver. For example, a project triggered by the need to replace end of service life components in a distribution station should be considered a system renewal investment, even if in anticipation of future system requirements (a system service driver) the project includes assets rated for a higher voltage and/or capable of handling reverse flows. Note, however (as detailed in section 5.4.3), information on all drivers of a given project or program must be used to justify the need for, and quantum of proposed capital investments.

5.1.3 Timing of filing

All distributors are required to file a DSP when filing a cost of service application under a Price Cap IR or a Custom IR application (collectively referred to as rebasing applications). Distributors proposing to use the Annual IR Index method are not required to file a DSP when filing an application. However, any distributor using the Annual IR Index method must file a DSP within five years of the date of the most recent OEB decision approving its rates in a rebasing proceeding, and is required to do so at five year intervals thereafter while under the Annual IR Index method.

A distributor that has requested deferral of its cost of service application and received OEB approval will be notified in the approval letter as to the requirement for and timing of a DSP filing. The OEB may also require a DSP to be filed in relation to a leave to construct, an Incremental Capital Module or a Z-factor application.

5.2 Distribution System Plans

Distributors are encouraged to organize the required information using the section and subsection headings indicated from here onwards. If a distributor's application uses alternative section headings and/or arranges the information in a different order, the distributor shall provide a table that clearly cross-references the headings/subheadings

used in the application to the section headings/subheadings indicated in these filing requirements. Distributors are also encouraged to structure the application so that all DSP appendices and supporting materials are included after the main DSP body text, to facilitate review.

The DSP's duration is a minimum of ten years in total, comprising of an historical period and a forecast period. The historical period is the first five years of the DSP duration, consisting of five historical years, ending with the Bridge year. The forecast period is the last five years of the DSP duration, consisting of five forecast years, beginning with the Test year.

5.2.1 Distribution System Plan overview

The distributor must provide a high-level overview of the information filed in the DSP, including but not limited to:

- a) Key elements of the DSP that affect its rate proposal, especially prospective business conditions driving the size and mix of capital investments needed to achieve planning objectives
- b) An overview of how projects or initiatives address customers' preferences and expectations
- c) The sources of cost savings expected to be achieved over the forecast period through good planning and DSP execution
- d) The period covered by the DSP (historical and forecast years)
- e) The vintage of the information on investment drivers used to justify investments identified in the application (i.e. the information is considered current as of what date?)
- f) Where applicable, a summary of any important changes to the distributor's asset management process (e.g. enhanced asset data quality or scope, improved analytic tools, process refinements, etc.) since the last DSP filing
- g) Aspects of the DSP that relate to or are contingent upon the outcome of ongoing activities or future events, the nature of the activity (e.g. Regional Planning Process⁹) or event (OEB decision on Long Term Load Transfers) and the expected dates by which such outcomes are expected or will be known

⁹ A consultation involving distributors, transmitter(s), and the Independent Electricity System Operator convened for the purpose of exchanging information related to system planning, coordinating the modification of a regional electricity transmission system, and preparing and issuing a Regional Infrastructure Plan.

- h) Identification of projects related to cost-effective grid modernization, distributed energy resources, and climate change adaptation and how these projects address the goals of the Long-Term Energy Plan

Prior to filing, care must be taken to ensure that summary information is consistent with the detailed information filed in the following sections and elsewhere in the application.

5.2.2 Coordinated planning with third parties

A distributor must demonstrate that it has met the OEB's expectations in relation to coordinating infrastructure planning with customers, the transmitter, other distributors, the Independent Electricity System Operator (IESO) or other third parties where appropriate. A distributor must provide the following for any regional planning process, any REG related investments or any other planning initiatives that require coordination:

- a) A description of any consultation(s), including:
- The purpose of the consultation
 - Whether the distributor initiated the consultation or was invited to participate in it
 - The other participants in the consultation process (e.g. customers, transmitter, IESO)
 - The nature and prospective timing of the final deliverables (if any) that are expected to result from or otherwise be informed by the consultation(s) (e.g. Regional Infrastructure Plan¹⁰; Integrated Regional Resource Plan)
 - An indication of whether the consultation(s) affected the distributor's DSP as filed and if so, a brief explanation as to how
- b) Where a final deliverable is available, provide details of the final deliverable; or where a final deliverable is expected but not available at the time of filing, provide information indicating:
- The role of the distributor in any consultation
 - The status of the consultation process
 - Where applicable the expected date(s) on which final deliverables are expected to be issued

¹⁰ A document issued by the transmitter leading a Regional Planning Process that identifies forecast regional electricity service requirements, and describes and justifies the optimal infrastructure investments planned to meet those requirements

- c) Relevant material documents provided to the other participants in the process, for example:
- Forecast load at existing (and proposed, if any) points of interconnection
 - Forecast renewable generation connections and any planned network investments to accommodate the connections
 - Investments involving grid modernization equipment and/or systems that could have an impact on the operation of assets serving the regionally interconnected utilities
 - The results of projects or programs involving the study or demonstration of innovative processes, services, business models, or technologies, and on the projects or programs of this nature planned by the distributor over the forecast period
- d) For REG investments a distributor is expected to provide the comment letter provided by the IESO in relation to REG investments included in the distributor's DSP, along with any written response to the letter from the distributor, if applicable. The OEB expects that the IESO comment letter will include:
- Whether the distributor has consulted with the IESO, or participated in planning meetings with the IESO
 - The potential need for co-ordination with other distributors and/or transmitters or others on implementing elements of the REG investments
 - Whether the REG investments proposed in the DSP are consistent with any Regional Infrastructure Plan

5.2.3 Performance measurement for continuous improvement

Distributors are expected to use qualitative assessments and/or quantitative metrics to monitor the quality of their capital expenditure plans, the efficiency with which plans are implemented, and/or the extent to which planning objectives are met. This information should be used to continuously improve a distributor's asset management and capital expenditure planning processes.

A distributor must provide the following information:

- a) Identification and definition of the methods and measures (metrics) used to monitor distribution system planning process performance, providing for each a brief description of its purpose, form (e.g. formula if quantitative metric) and driver (e.g. consumer, legislative, regulatory, corporate). These measures and metrics are expected to address, but need not be limited to:

- Customer oriented performance (e.g. customer bill impacts, reliability, power quality)
 - Cost efficiency and effectiveness with respect to planning quality and DSP implementation (e.g. physical and financial progress vs. plan, actual vs. planned cost of work completed)
 - Asset and/or system operations performance (e.g. line losses)
- b) Unit cost metrics for capital expenditures and O&M per customer, kilometer of line, and peak capacity as outlined in Appendix 5-A.
- c) A summary of performance for the historical period using the methods and measures (metrics/targets) identified and described above, and how this performance has trended over the period. This summary must include historical period data on¹¹:
- All interruptions
 - All interruptions excluding loss of supply
 - All interruptions excluding Major Events and loss of supply for the following:
 - The distribution system average interruption frequency index (SAIFI)
 - System average interruption duration index (SAIDI)¹²

The applicant should also provide a summary of Major Events that occurred since the last Cost of Service (CoS) filing.

For each cause of interruption, a distributor shall, for the last five historical years, report the following data:

- Number of interruptions that occurred as a result of the cause of interruption
- Number of customer interruptions that occurred as a result of the cause of interruption
- Number of customer-hours of interruptions that occurred as a result of the cause of interruption

The applicant must also provide an explanation for any adverse deviations from trend of targets (including any established in a previously filed DSP) and any under-performance in SAIDI and SAIFI measures, and actions taken or to be taken to address the issues and any outcomes, if available.

¹¹ Note: The information in this section were originally from Chapter 2.2.2.8

¹² The data should be calculated as stipulated in section 2.1.4.2 of the OEB's [Reporting and Record Keeping Requirements](#).

As established in the *Report of the OEB: Electricity Distribution System Reliability Measures and Expectations*¹³, distributors' SAIDI and SAIFI performance is expected to meet the performance target set out in the Scorecard. A distributor who wishes to establish performance expectations based on something other than historical performance should provide evidence of its capital and operational plan and other factors that justify the reliability performance it plans to deliver. Distributors should also provide the results of consultation with their customers that identify the level of reliability desired by customers as part of justification for non-historical targets.

Distributors who wish to use SAIDI and SAIFI performance benchmarks that are different than the historical average must provide evidence to support the reasonableness of such benchmarks.

- d) An explanation of how historical performance has affected the DSP (e.g. objectives, investment priorities, and expected outcomes) and how it has been used to continuously improve the asset management and capital expenditure planning process.

5.2.4 Realized efficiencies due to smart meters

Since 2006, distributors have deployed smart meters for residential and small industrial and commercial customers. This initial deployment has been completed and smart meters have been in operation for a number of years. Distributors are also required to deploy metering inside the settlement timeframe (MIST) meters to applicable GS > 50 kW customers by December 31, 2020.

A distributor is required to document capital and operating efficiencies that it has realized as a result of the deployment and operationalization of smart meters and related technologies (e.g., Advanced Metering Infrastructure (AMI) communications networks, Operational Data Storage) in its networks, such as, for example, if smart meter and AMI "last gasp" technology enhances a distributor's SCADA system to assist in restoration response to service interruptions. Both qualitative and quantitative descriptions and support should be provided.

5.3 Asset Management Process

The asset management process is the systematic approach a distributor uses to collect, tabulate and assess information on physical assets, current and future system operating conditions and the distributor's business and customer service goals and objectives to

¹³ EB-2014-0189 issued August 25, 2015

plan, prioritize and optimize expenditures on system-related modifications, renewal and operations and maintenance, and on general plant facilities, systems and apparatus.

The purpose of the information requirements set out in this section is to provide the OEB and stakeholders with an understanding of the distributor's asset management process, and the direct links between the process and the expenditure decisions that comprise the distributor's capital investment plan.

5.3.1 Asset management process overview

The distributor must provide the OEB and stakeholders with a high level overview of the information filed on a distributor's asset management process, including key elements of the process that have informed the preparation of the distributor's capital expenditure plan. The information provided should include but need not be limited to:

- a) A description of the distributor's asset management objectives and related corporate goals, and the relationships between them, including an explanation of how the distributor ranks asset management objectives for the purpose of prioritizing investments.
- b) Information regarding the components (inputs/outputs) of the asset management process used to prepare a capital expenditure plan, including the identification and description of the data, primary process steps, and information flows used by the distributor to identify, select, prioritize and/or pace investments, for example:
 - Asset register
 - Asset condition assessment
 - Asset capacity utilization/constraint assessment
 - Historical period data on customer interruptions caused by equipment failure
 - Reliability-based 'worst performing feeder' information and analysis
 - Reliability risk/consequence of failure analyses

Use of a flowchart illustration accompanied by explanatory text is recommended.

5.3.2 Overview of assets managed

Assessment of DSPs requires an understanding of the scope and depth of the assets managed by a distributor. Distributors vary in terms of the types of assets managed (e.g. some own high voltage equipment and others do not). Detailed characteristics and data on the assets covered by the asset management process are to be filed, including but not necessarily limited to:

- a) A description and explanation of the features of the distribution service area (e.g. urban/rural; temperate/extreme weather; underground/overhead; fast/slow economic growth) pertinent for asset management purposes, highlighting where applicable expectations for the evolution of these features over the forecast period that have affected elements of the DSP. A distributor may provide more detailed geographic and/or engineering maps where these may help reviewers better understand specific application components, such as the distributor's capital expansion or replacement programs, its network assets such as transformer stations, and its interconnections with other transmitters, distributors and generators (e.g. such as for host or embedded distributor connection).
- b) A summary description of the system configuration, including length (km) of underground and overhead systems, number and length of circuits by voltage level, and number and capacity of transformer stations
- c) Information (in tables and/or figures) by asset type (where available) on the quantity/years in service profile and condition of the distributor's system assets, including the date(s) the data was compiled
- d) An assessment of the degree to which the capacity of existing system assets is utilized relative to planning criteria, referencing the distributor's asset related objectives and targets
 - Where cited as a driver of a material investment(s) included in the capital expenditure plan, distributors must provide a level of detail sufficient to understand the influence of this factor on the scope and value of the investment.

5.3.3 Asset lifecycle optimization policies and practices

An understanding of a distributor's asset lifecycle optimization policies and practices will support the regulatory assessment of system renewal investments and decisions to refurbish rather than replace system assets. Information provided should be sufficient to show the trade-off between spending on new capital (i.e. replacement) and life-extending refurbishment, and should include but need not be limited to:

- a) A description of asset lifecycle optimization policies and practices, including but not necessarily limited to:

- A description of asset replacement and refurbishment policies, including an explanation of how (e.g. processes, tools) system renewal program spending is optimized
 - A description of routine system operations and maintenance (system operating and maintenance (O&M)) activities carried out to sustain required distribution system performance to the end of the subject asset's service life. Including but not limited to preventative inspection and maintenance policies, practices and programs (can include references to the Distribution System Code (DSC))
 - A description of how asset replacements are prioritized and scheduled to align with budget envelopes and how the impact of system renewal investments on routine system O&M is assessed
 - A description of maintenance planning criteria and assumptions
- b) A description of asset life cycle risk management policies and practices, assessment methods and approaches to mitigation, including but not necessarily limited to the methods used, types of information inputs and outputs, and how conclusions of risk analyses are used to select and prioritize capital expenditures

5.3.4 System capability assessment for renewable energy generation

A distributor's investments to accommodate and connect REG (including connection assets, expansions and/or renewable enabling improvements) are integral to its DSP. This includes all costs to connect renewable generation facilities that will be the responsibility of the distributor under the DSC, and are therefore eligible for recovery through the provincial cost recovery mechanism set out in section 79.1 of the *OEB Act*. REG investments can be stand-alone or integrated into a project/program; and are to be categorized for the purposes of section 5.4 in the same way as any other investment.

This section provides information on the capability of a distributor's distribution system to accommodate REG, including a summary of the distributor's load and renewable energy generation connection forecast by feeder/substation (where applicable); and information identifying specific network locations where constraints are expected to emerge due to forecast changes in load and/or connected renewable generation capacity.

In relation to renewable or other distributed energy generation connections, the information that must be considered by a distributor and documented in an application (where applicable) includes:

- a) Applications from renewable generators over 10 kW for connection in the distributor's service area

- b) The number and the capacity (in MW) of renewable generation connections anticipated over the forecast period based on existing connection applications, information available from the IESO and any other information the distributor has about the potential for renewable generation in its service area (where a distributor has a large service area, or two or more non-contiguous regions included in its service area, a regional breakdown must be provided)
- c) The capacity (MW) of the distributor's distribution system to connect renewable energy generation located within the distributor's service area
- d) Constraints related to the connection of renewable generation, either within the distributor's system or upstream system (host distributor and/or transmitter)
- e) Constraints for an embedded distributor that may result from the connections

5.4 Capital Expenditure Plan

The capital expenditure plan should set out and robustly justify a distributor's proposed expenditures on its distribution system and (non-system) general plant over a five-year planning period, including investment and asset-related operating and maintenance expenditures.

A distributor's DSP details the program of system investment decisions developed on the basis of information derived from its asset management and capital expenditure planning process. It is critical that investments, whether identified by category or by specific project, be justified in whole or in part by reference to specific aspects of that process.

As noted above, a DSP must include information on prospective investments over a minimum five-year forecast period, beginning with the Test year (or initial Test year for certain Custom IR filings), as well as information on investments – planned and actual – over the five-year historical period prior to the initial year of the forecast period.

Distributors must provide a brief overview of the following:

- a) A description of customer engagement activities to obtain information on their preferences and how the results of assessing this information are reflected in the capital expenditure plan
- b) A description of how the distributor expects its system to develop over the next five years, including in relation to load and customer growth, climate change adaptation, grid modernization and/or the accommodation of forecasted REG projects

5.4.1 Capital expenditure planning process overview

The information a distributor must provide includes, but need not be restricted to:

- a) A detailed description of the analytical tools and methods used for risk management and its correlation to the capital expenditure plan. A distributor is responsible for managing its business risk in a manner to achieve its objectives through a comprehensive risk portfolio. These risks could include, but not limited to, system reliability, cyber-security, and climate change adaptation.
- b) A description of the process(es), tools and methods (including relevant linkages to the distributor's asset management process) used to identify, select, prioritize and pace the execution of projects/programs in each investment category (e.g. analysis of impact of planned capital expenditures on customer bills)
- c) If different from that described above, the method and criteria used to prioritize REG investments in accordance with the planned development of the system, including the impact, if any, of the distributor's plans to connect distributor-owned renewable generation project(s)
- d) The distributor's approach to assessing non-distribution system alternatives to relieving system capacity or operational constraints, including the role of Regional Planning Processes in identifying and assessing alternatives
- e) A distributor's strategy in taking advantage of opportunities that arise during system planning to implement cost-effective modernization of the distribution system such that it becomes more efficient, reliable, and provide more customer choice. This could include, but not limited to, the following:
 - The options a distributor has considered for facilitating customer access to consumption data in an electronic format
 - The mechanisms that facilitate real-time data access and behind the meter services and applications that a distributor has considered for the purpose of providing customers with the ability to make decisions about their electricity costs
 - The investments necessary to facilitate the integration of distributed generation, distributed energy resources and more complex loads (e.g., customers with self-generation and/or storage capability)
 - The technology-enabling opportunities a distributor has considered to increase operational efficiencies, improve asset management or enhance services to customers

- The distributor's adoption of innovative processes, services, business models, and technologies¹⁴
- f) Consideration of distribution rate funded CDM programs, that are not funded by the Global Adjustment Mechanism, to defer distribution infrastructure as described below

5.4.1.1 Rate-Funded Activities to Defer Distribution Infrastructure

On December 19, 2014 the OEB issued the [Conservation and Demand Management Requirement Guidelines for Electricity Distributors](#) (the CDM Guidelines)¹⁵. Section 4.1 of the CDM Guidelines outlines the OEB's guidance in support of the government's objective of putting conservation first in infrastructure planning. The OEB established a policy that allows electricity distributors to seek distribution rate funding for CDM programs and other initiatives for the purposes of avoiding or deferring infrastructure projects.

Any application for CDM funding to defer infrastructure must include a consideration of the projected effects to the distribution system on a long-term basis and the forecast expenditures. Distributors must explain the proposed program in the context of the distributor's five-year DSP or explain any changes to its system plans that are pertinent to the program. Distributors may apply to the OEB for funding through distribution rates for the following four types of activities, further details of which are in Section 4.1 of the CDM Guidelines.¹⁶

- a) CDM programs that target distributor-specific peak demand (kW) reductions to address a local constraint of the distribution system
- b) Demand response programs whose primary purpose is peak demand reduction in order to defer capital investment for specific distribution infrastructure. These programs are expected to save peak demand or enhance system integrity and reliability in a specific area of the distribution system.
- c) Programs to improve the efficiency of the distribution system and reduce distribution losses
- d) Energy storage programs whose primary purpose is to defer specific capital spending for the distribution system

¹⁴ *Smart Grid Report*, pp. 9 – 16.

¹⁵ EB-2014-0278 updated on August 11, 2016.

¹⁶ Conservation and Demand Management Requirements Guidelines for Electricity Distributors (EB-2014-0278)

5.4.2 Capital expenditure summary

The purpose of the information filed under this section is to provide a snapshot of a distributor's capital expenditures over a 10 year period, including five historical years and five forecast years. Despite the multi-purpose character a project or program may have, for summary purposes the entire cost of individual projects or programs are to be allocated to one of the four investment categories on the basis of the primary (i.e. initial or trigger) driver of the investment. For material projects/programs, a distributor must estimate and allocate costs to the relevant investment categories when providing information to justify the investment, as this assists in understanding the relationship between the costs and benefits attributable to each driver underlying the investment. In any event, the categorization of an individual project or program for the purposes of these filing requirements should not in any way affect the proper apportionment of project costs as per the DSC.

The distributor must provide the information described in Chapter 2, Appendix 2-AB. Appendix 2-AB illustrates how information filed under this section 5.4.2 includes a distributor's actual and forecast (i.e. proposed) capital expenditures and capital contributions over the historical and forecast periods. At a minimum, for historical years, applicants that have previously filed a DSP must provide the actual total expenditures in each DSP category. All years must be provided per the Chapter 5 investment categories. Plan expenditures over the historical period refer to a distributor's previous plan for capital expenditures filed in its last rebasing application, *after* adjustments (if any) resulting from the OEB's decision. If no previous plan has been filed, applicants are only required to enter their planned total capital budget in the plan column for each historical year and for the bridge year including the OEB-approved amount for the last rebasing year.

System O&M costs are also shown to reflect the potential impact, if any, of capital expenditures on routine system O&M. A distributor is expected to consider the reduction in O&M costs when planning capital projects. A description of the impacts of capital expenditures on O&M must be given for each year or a statement that the capital plans did not impact O&M costs. A distributor must consider the trade-offs between capital and O&M when assessing alternative options to a capital program.

Explanations should be provided if there are material changes in the percentage a given investment category is of the total investment over the forecast period relative to actual spending over the historical period. In addition to the Plan vs. Actual variances for individual investment categories, explanations must be provided for the following:

- Plan vs. Actual variances for the total plan for each year of the historical period
- Variances in a given investment category that are trending much higher or lower over the historical period

Applicants must also provide a completed Chapter 2 Appendix 2-AA along with the following information about capital expenditures on a project-specific basis:

- Explanation of variances by project or category, including that of actuals versus the OEB-approved amounts for the applicant's last OEB-approved CoS or Custom IR application and DSP, if available
- For capital projects that have a project life cycle greater than one year, the proposed accounting treatment, including the treatment of the cost of funds for construction work-in-progress

A statement should be provided that there are no expenditures for non-distribution activities in the applicant's budget.

5.4.3 Justifying capital expenditures

As indicated in Chapter 1, the onus is on a distributor to provide the data, information and analyses necessary to support the capital-related costs upon which the distributor's rate proposal is based. Filings must enable the OEB to assess whether and how a distributor's DSP delivers value to customers, including by controlling costs in relation to its proposed investments through appropriate optimization, prioritization and pacing of capital-related expenditures. A distributor should also keep pace with technological changes and integrate cost-effective innovative projects and traditional planning needs such as load growth, asset condition and reliability.

5.4.3.1 Overall plan

The OEB's assessment of DSPs includes the costs of material projects/programs included in the DSP, as well as how the overall DSP budget is allocated to each of the four investment categories. Information to be provided in this section pertains to the latter; the former is addressed in section 5.4.3.2.

To support the overall quantum of investments included in a DSP by category, a distributor should include information on:

- Comparative expenditures by category over the historical period
- The forecast impact of system investment on system O&M costs, including on the direction and timing of expected impacts
- The drivers of investments by category (referencing information provided in response to sections 5.3 and 5.4), including historical trend and expected evolution of each driver over the forecast period (e.g. information on the distributor's asset-related performance and performance targets relevant for each category, referencing information provided in section 5.2.3)

- Information related to the distributor's system capability assessment (see section 5.3.4)

5.4.3.2 Material investments

The focus of this section is on projects/programs that meet the materiality threshold set out in Chapter 2 of the *Filing Requirements for Electricity Distribution Rate Applications*. However, distributors are encouraged in all instances to consider the applicability of these requirements to ensure that all investments proposed for recovery in rates, including those deemed by the applicant to be distinct for any other reason (e.g. unique characteristics; marked divergence from previous trend) are supported by evidence that enables the OEB's assessment according to the evaluation criteria set out below. The level of detail filed by a distributor to support a given investment project/program should be proportional to the materiality of the investment.

A. General Information on the project/program

The following information is to be provided for any material project to support the quantum of the expenditure, timing, and contingencies associated with the project:

- Total capital and, where applicable, (non-capitalized) O&M costs proposed for recovery in rates
- Any capital contributions made or forecast to be made to a transmitter with respect to a Connection and Cost Recovery Agreement. Details to be provided include: initial forecast used to calculate contribution, amount of contribution (if any), true-up dates and potential true-up payments.
- Related customer attachments and load, as applicable
- Start date, in-service date and expenditure timing over the planning horizon
- The risks to the completion of the project or program as planned and the manner in which such risks will be mitigated
- If not evident from Chapter 2 Appendix 2-AA, comparative information on expenditures for equivalent projects/programs over the historical period, where available
- Information on total capital and OM&A costs associated with REG investment, if any, included in a project/program; and a description of how the REG investment is expected to improve the system's ability to accommodate the connection of REG facilities.
- Where a proposed project within the five year forecast period requires Leave to Construct approval under Section 92 of the OEB Act, the applicant must provide a summary of the evidence, to the extent that it is available, for that project consistent

with the requirements set out in Chapter 4 of these Filing Requirements (sections 4.3 and 4.4 in particular).

B. Evaluation criteria and information requirements for each project/program

The OEB evaluates material investments based on the outcomes set out in section 5.0.2. Efficiency, customer value, reliability and safety are the primary criteria for evaluating any material investment.

The OEB's investment evaluation criteria and the qualitative or quantitative evidence that a distributor can use to demonstrate that an investment is consistent with these criteria are set out below.

1. Efficiency, Customer Value, Reliability

- a) Identify the main driver (trigger) of the project/program, and where applicable any secondary drivers. Identify related objectives and/or performance targets, and by reference to the distributor's asset management process (section 5.3.1), the source and nature of the information used to justify the investment.
- b) Demonstrate good utility practice in reliability planning through designing a resilient distribution system that addresses existing reliability performance concerns and is capable of adapting to future challenges (e.g. grid modernization and climate change)
- c) Indicate the priority of the investment relative to others, giving reasons for assigning this priority that clearly reflect the distributor's approach to identifying, selecting, prioritizing and pacing projects in each investment category described in response to section 5.4.1.
- d) For each project and project alternative provide the following quantitative and/or qualitative analyses on the design, scheduling, funding and/or ownership options (e.g. whole or part ownership solely by or jointly with 3rd parties):
 - The effect of the investment on system operation efficiency and cost-effectiveness
 - The net benefits accruing to customers as a result of the investment
 - The impact of the investment on reliability performance including on the frequency and duration of outages

Where alternatives have been considered and the ranking of a proposed project relative to alternatives has been affected by the assessment of benefits and costs, these benefits and costs should be described and explained in relation to the proposed project and alternatives.

Where a distributor's choices for technical design, component characteristics, how the work is carried out, etc., have been affected by a decision to configure a

project to meet both a trigger driver and secondary drivers, the effect on costs and benefits must be explained.

2. *Safety*

Provide information on the effect of the investment on health and safety protections and performance for both the utility and the public.

3. *Cyber security, Privacy*

Where applicable, provide information showing that the investment conforms to all applicable laws, standards and good utility practices pertaining to customer privacy, cyber security and grid protection. Cyber security is expected to be incorporated into the distributor's risk management decision making and investment planning to form part of its business plans and DSP.¹⁷

4. *Co-ordination, Interoperability*

- a) Where applicable, explain how the investment reflects co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry.
- b) Describe how the investment potentially enables future technological functionality and/or addresses future operational requirements.

5. *Environmental Benefits*

Where applicable, describe the effect of the investment on the use of clean technology, conservation and more efficient use of existing technologies

6. *Conservation and Demand Management*

Where applicable, describe incremental conservation initiatives, over and above those established in cooperation with the IESO, to defer or avoid future infrastructure projects.

For proposed distribution rate funded CDM programs the following details are required:

- Where measurable, an assessment of the benefits of the project for customers in terms of cost impacts to customers
- The number of years the proposed CDM program would be in place and the number of years that the required infrastructure would be deferred

¹⁷ Notice of Amendments to Codes – Amendments to the Transmission System Code and the Distribution System Code to address cyber security for electricity transmitters and distributors (EB-2016-0032)

- A description of how advanced technology has been incorporated into the project (if applicable), including how standards relating to interoperability and cyber-security have been met

C. Category-specific requirements for each project/program

As set out below, category-specific information and analyses should be used to support a project/program (or elements thereof as applicable).

- a) System access – projects/programs in this category are driven by statutory, regulatory or other obligations on the part of the distributor to provide customers with access to its distribution system. Most frequently, investments relate to requests by customers for connections or connection modifications, but also include requests from municipal authorities for a distributor to relocate system assets in order to accommodate infrastructure development or modifications. Consequently, investment budgets for this category can vary from one DSP to the next DSP depending on business conditions.

In the event that the project involves replacing a distributor's system assets, there may also be asset life-cycle related considerations to the extent that infrastructure is taken out of service prior to the end of its service life and new infrastructure is commissioned.

Information on these issues should therefore be included in a distributor's justification of a project/program in this category, including (where applicable) but not restricted to:

- Factors affecting the timing/priority of implementing the project
- Factors relating to customer preferences or input from customers and other third parties
- Factors affecting the final cost of the project
- How controllable costs have been minimized
- Whether other planning objectives are met by the project or have intentionally been combined into the project and if so, which objectives and why
- Whether other project design and/or implementation options were considered and if not, why not
- Where such options were considered and project decision support tools and methods described in response to section 5.4.1 were used to help identify the proposed option, distributors must provide a summary of the results of the analysis, including where applicable:

- The least cost option: a comparison of the life cycle cost of all options considered (including the proposed project) – over the service life of the proposed project
 - The cost efficient option: a comparison of net project benefits and costs over the service life of the proposed project including:
 - A project configured solely to meet the obligation
 - The proposed project and other options to the proposed project that meet the same objectives
 - Where applicable, the results of the final economic evaluation carried out as per section 3.2 of the DSC
 - Where applicable (e.g. REG investment), information on the nature and magnitude of the system impacts of the project, the costs of any system modifications required to accommodate these impacts and the means by which these costs are to be recovered
- b) System renewal – projects/programs in this category are driven by the relationship between the ability of an asset or asset system to continue to perform at an acceptable standard on a predictable basis and the consequences for customers served by the asset(s) of a deterioration of this ability (i.e. failure).

A distributor's discretion over the timing and priority of projects in this category may lessen over time, such as where assets with high consequence of failure are consistently operating outside applicable operating limits. On the other hand, a distributor may have considerable discretion over timing and priority where deteriorating asset condition has little or no impact on performance and the consequences of an asset failure on customers and the system are relatively low.

A distributor's justification of each sustainment project/program must discuss these issues including (where applicable) but not restricted to:

- A description of the relationship between the characteristics of the assets targeted by a project and the consequences of asset performance deterioration or failure, referring to:
 - The distributor's asset performance-related operational targets and asset lifecycle optimization policies and practices (i.e. filings in relation to sections 5.2.3 and 5.3.3)
 - Information on the condition of the assets relative to the typical life-cycle and performance record of the assets targeted by the project
 - The number of customers in each customer class potentially affected by a failure of the assets included in the project

- Quantitative customer impacts (e.g. frequency or duration of interruptions or number of customers affected) with associated risk level(s)
 - Qualitative customer impacts (e.g. customer satisfaction, customer migration) with associated risk level(s)
 - The value of customer impact (e.g. high, medium, low) considering the characteristics of customers potentially affected by asset failure and the cost of failure
- Other factors that may affect the timing of the proposed project such as the pacing of investments and the priority relative to other projects
 - The consequences for system O&M costs, including the implications for system O&M of not implementing the project
 - The impact on reliability and safety factors
 - An analysis of project benefits and costs comparing alternatives to the timing of the proposed project, highlighting the trade-offs between rate of expenditure and mitigation of the consequences of asset performance deterioration. Where the ranking of the proposed project relative to the alternatives has been adjusted to account for significant benefits and costs, the value of which cannot readily be quantified, these should be described and explained in relation to the proposed project and all alternatives.
 - Where the proposed project is a 'like for like' renewal but has been configured at extra cost to address other distributor planning objectives, an analysis of project benefits and costs must be provided comparing a) a project configured solely to meet the requirement; b) the proposed project; and c) technically feasible alternatives to the proposed project that meet the same objectives as the proposed project. Where the ranking of the proposed project relative to alternatives has been adjusted to account for significant benefits and costs the value of which cannot readily be quantified, these should be described and explained in relation to the proposed project and all alternatives.
- c) System service – projects/programs in this category are driven by the distributor's expectations that evolving customer use of the system may create system capacity constraints or otherwise adversely impact operations and the delivery of quality distribution services. Distributor discretion in relation to investments in this category can be relatively high in terms of both initiating a project and determining the priority and timing of project-related expenditures.

Information used by a distributor to justify projects/programs in this category should include, but need not be restricted to:

- An assessment of both the benefits of the project for customers based on achievement of the project objectives and the cost impact to customers of the investment
- Where applicable, information on regional electricity infrastructure requirements identified in a regional planning process that affected the initiation or final configuration of the project; and on the corresponding distribution of the benefits and responsibility for project costs
- Description of how advanced technology has been incorporated into the project (if applicable), including how standards relating to interoperability and cyber-security have been met
- Identification of any reliability, efficiency, safety and coordination benefits or affects the project will have on the distributor's system
- Identification and explanation of the factors affecting implementation timing/priority
- An analysis of project benefits and costs comparing the proposed project to a) doing nothing and b) technically feasible alternatives to the proposed project considered that meet the same objectives as the proposed project.

Where the ranking of the proposed project relative to alternatives has been adjusted to account for significant benefits and costs the value of which cannot readily be quantified, information should be provided that describes these qualitative factors in relation to the proposed project and all alternatives, including how these factors affected the selection of the proposed project.

- d) General plant – projects/programs in this category are driven by the distributor's evolving requirements for capital to support day to day business and operations activities. Distributor discretion in relation to investments in this category can be relatively high in terms of both initiating a project and determining the priority and timing of project-related expenditures.

Information used by a distributor to justify material projects/programs in this category should include but need not be restricted to:

- The results of quantitative and qualitative analyses of the proposed project/program, including assessments of financially feasible options to the proposed project (including the 'do nothing option' where applicable), identifying the (net) benefits of the proposed investment in monetary terms where practicable
- Where the capital cost of a project substantially exceeds the materiality threshold, (e.g. CIS, GIS, new office building) the distributor shall file a thorough business case documenting the justifications for the expenditure, alternatives

considered, benefits for customers (short/long term), and impact on distributor costs (short/long term).