



Distribution Point-of-Delivery Interconnection Process Guideline

Economic Evaluation

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Revision 0: Tuesday, March 22, 2005

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1.0 Introduction

1.1 Purpose

This document presents the recommended approach to economic evaluation of the alternatives for AIES interconnection projects.

This document outlines only the basic methodologies and the data requirement for the economic evaluation of the interconnection alternatives. Consideration of the feasibility of the alternatives and any contractual, tariff, market, ancillary service, operating agreements or other requirements to complete the interconnection are not covered within this document.

The intent of this guideline is to present a consistent methodology of evaluation of interconnection alternatives that result in cost effective solutions for the customers.

This guideline is intended solely for the purpose of supporting the AESO's customer interconnection process to arrive at proposed interconnection concepts that are optimized on a technical and economic basis. It will not in any way address or determine the AESO's facility cost allocation between system and customer, nor will it be used in any way as a guideline in applying the AESO approved tariffs and investment policy.

This guideline is intended to facilitate documentation of the project need and the evaluation done to support the need, in alignment with the interconnection process. The interconnection process has a requirement for AESO endorsement and AEUB approval of the project need.

1.2 Application of Guideline

This guideline is applicable to transmission interconnection projects that have clearly defined alternatives. This is not applicable to projects such as the addition of a breaker within an existing substation that have limited alternatives or are confined to a limited change of an existing facility.

This guideline applies only to projects that are amenable to analysis on an incremental basis to an existing system.

It should be understood that while the least cost alternative is preferred from an economic analysis perspective, the final selection of an alternative may be decided by other considerations such as reliability, customer requirements, operational issues, potential for future development, economic benefits or avoided future costs, and/or regulatory compliance.

1.3 Modifications

In respect to this guideline the AESO will:

- a) seek and consider the input and feedback of affected parties prior to making changes or additions to the guideline;
- b) make and manage all changes to this guideline;
- c) make this guideline publicly available via the AESO website;
- d) periodically and within five (5) years of the effective date shown on the cover page review this guideline.

2.0 Study Objective and Methodology

2.1 Objective

The objective of the economic analysis is to determine the relative economics of viable alternatives considering both the transmission and distribution supply options. It is assumed that only those alternatives that meet the basic system performance criteria will be evaluated.

Analysis based on the Net Present Value (NPV) of revenue requirement method is preferred. The Net Present Value of capital and operating expenditures is an acceptable alternative if so desired.

2.2 Methodology

The following principles will apply:

- e) The cost analysis shall be based on either the NPV of the revenue requirement of the alternatives or on the NPV of the capital and operating expenses of the alternatives.
- f) For multi-year projects the AFUDC shall be included in the evaluation. The weighted cost of capital as noted in section 3.1 shall be used.
- g) The study period shall be consistent with the life of the proposed projects.
- h) The discount rate to be used in this analysis shall be calculated in accordance with Section 3.1.
- i) Assumptions and forecasts such as those related to pool price, cost escalation etc. shall be stated explicitly and rationalized.
- j) Sensitivity analysis relating to capital cost estimates, escalation factors etc. shall be carried out when the net present value of the alternatives are similar.
- k) To the extent possible, all the factors shown in Section 3.0 are to be included.

3.0 General Data Requirements

Typical data requirements are outlined in this section. Specific data requirements for a project may vary depending on the nature of the project. Since the objective is the determination of the relative economics of options, some elements of data can be omitted under certain situations. This is discussed below. As noted in section 1.2, other considerations such as reliability, operational issues, etc. may be the determining factor in the selection of the preferred alternative.

3.1 Cost of Capital and Discount Rate

The AEUB approved capital structure and the rate of return for debt, equity and preferred shares and rate for income taxes (if applicable) for the respective Transmission Facilities Owner (TFO) and Distribution Facilities Owner (DFO) should be used. If a project timeline is such that approved rates are not available then the last rates approved by the AEUB on a final basis should be used.

The discount rate to be used to discount the costs of a project will be a nominal weighted average societal opportunity cost of capital of 8.0%. This rate is based on a one third blend of 12% as an appropriate opportunity cost of capital for commercial interests and a two thirds blend of 6% for non-commercial interests. 6.0% is based on the long term risk free rate as defined by the Bank of Canada's Long Term Benchmark Bond yield plus one percent.

If this Benchmark yield plus one percent is greater than 6.5% or less than 5.5%, then the nominal rate should be adjusted as follows: The nominal 8.0% rate would be decreased by the amount the Benchmark yield plus one percent is less than 6.0% and increased by the amount the Benchmark yield plus one percent is greater than 6.0%.

3.2 Capital Cost and Depreciation

To the extent possible, capital cost of facilities shall be separated to reflect functions such as Transmission Facilities, Distribution Facilities, Transmission Communication, Distribution Communication, Transmission Protection and Distribution Protection, etc. For multi year projects, timing of capital expenditures should be taken into account.

If the revenue requirement methodology is utilized then the depreciation rates as approved by the AEUB for each class of equipment should be used. If this rate is not available it can be estimated on the basis of life expectancy (physical or economic) of the asset under consideration.

3.3 Operation and Maintenance Cost

Annual operations and maintenance costs must be available either as a percent of original capital cost or as an annual dollar estimate. In either case, changes to the cost over time must be accounted for either by using an escalation factor or developing year by year estimate of these costs. Any operating or maintenance savings shall be treated as a negative cost.

3.4 Cost of Losses

Both transmission and distribution system losses should be taken into account. Changes to the losses over time should be factored in the analysis. I²R losses should be evaluated in terms of future pool price. The rationale for the pool price forecast must be provided. The cost impact of any reduction of transmission system demand should also be included if material.

Cost of losses can be ignored provided the losses are small or the interconnection alternatives have nearly similar losses.

3.5 Insurance and Property Tax

Unless specific information is available these taxes should be calculated as a percent of the capital cost of installed equipment and escalated thereafter. Estimates for property tax should also include consideration of linear and business taxes as applicable.

Insurance and property taxes can be ignored if these costs are similar in all the alternatives considered.

3.6 Salvage and Early Retirement

If the cost of salvage is included as a component of the depreciation expense then net salvage cost, when incurred, should be added to the accumulated depreciation. Otherwise, net salvage cost for an asset will be added to the cost of the replacement asset.

Salvage and early retirement can be ignored providing that these costs do not exceed 5% of the capital cost of the alternatives being considered.

3.7 Cost Escalation

Cost escalation factors such as the increase in Consumer Price Index (CPI) should be used for items of cost that have not been forecast on a year by year basis. These cost escalation factors should be the net of any productivity offset factors.

4.0 Definitions

“Regulatory Compliance” means carrying out and/or adhering to AEUB decisions, directives, and orders; applicable legislative and regulatory frameworks; and the AESO rules.