

Information Documents are not authoritative. Information Documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an Information Document and any Authoritative Document(s)¹ in effect, the Authoritative Document(s) governs.

1 Purpose

This Information Document relates to the following Authoritative Document:

- Section 207.2 of the ISO rules, *Calculation of net-CONE* (“Section 207.2”).

The purpose of this Information Document is to provide details to market participants of how, for each obligation period, the gross-CONE is established, the energy and ancillary services offset value is established, and the net-CONE is established.

2 Gross-CONE

CONE stands for cost of new entry. CONE (or gross-CONE) represents the total annual net revenue (net of variable operating costs) that a new generation resource would need to earn in the Alberta wholesale electricity market to recover its capital investment and fixed costs, given reasonable expectations about future cost recovery over its economic life.

2.1 Initial Gross-CONE Value for 2021/2022 Obligation Period

The initial gross-CONE value of \$244.2/kW-year is based on a 93 MW aeroderivative (2x0 GE LM6000PF SPRINT) simple cycle plant with an online date of November 1, 2021. More information on the gross-CONE value is available here: <https://www.aeso.ca/assets/Uploads/CONE-Study-2018-09-04.pdf>

2.2 Gross-CONE Value for Other Obligation Periods

The AESO updates gross-CONE estimates for every subsequent obligation period using a composite index computed by weighting component indices by their relative contribution to installed costs. The formula for the composite index value incorporates component indices that factor major cost components of a new aeroderivative power plant: 25% is attributed to labour; 35% to materials and other equipment; and the remaining 40% to turbine costs. For each obligation period, the formula updates component indices from the initial 2021/2022 value calculated by Brattle/S&L. These initial values (represented in the denominator of the formula in subsection 3(2) of Section 207.2) are the value of each index as of the time of the publication of the Brattle/S&L CONE report.

The AESO updates these component indices in the following manner:

- Labour Index ι is the most recent 12 month average of published Statistics Canada *Construction Union Wage Rates, Monthly* including selected pay supplements, for electricians in the Edmonton census metropolitan area, monthly, Table 18-10-0046-01 ([link](#));
- Materials Index ι is the most recently published 4 quarters average Statistics Canada *Gross National and Gross Domestic Income, Indexes and Related Statistics, Quarterly*, Table 36-10-0105-01 ([link](#));
- Turbine Index includes:
 - (a) Turbine US Cost Index ι is the most recent 12 month average of published Federal Reserve Economic Data (St. Louis) *Producer Price Index by Industry: Turbine and Turbine*

¹ “Authoritative Documents” is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and associated regulations, and that contain binding legal requirements for either market participants or the AESO, or both. AESO Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

Generator Set Units Manufacturing (PCU333611333611) ([link](#)); and

(b) Foreign Exchange Rate, is the most recent 12 month average of published Statistics Canada *Monthly Average Exchange Rates in Canadian Dollars, Bank of Canada* U.S. Dollar monthly average, Table 33-10-0163-01 ([link](#)).

3 Calculation of Energy and Ancillary Services Offset

The energy and ancillary services offset represents the margins that the reference aeroderivative power plant can be expected to earn outside the capacity market.

The AESO estimates the energy and ancillary services offset based on forward market data (particularly, power and natural gas settlements) as well as cost and operational parameters from Brattle/S&L's CONE study. This approach provides transparency, allows replicability, and incorporates the collective market outlook. The forward market methodology does not at this time include margins from ancillary services due to a lack of forward pricing mechanism.

A number of inputs are required to calculate energy and ancillary services offset values. Inputs include future-looking market conditions (forward gas prices and transportation fees, carbon pricing, trading charges), operational characteristics (generation capability given turbine performance under changing ambient conditions, heat rates, loss factors) as well as financial hedging behaviour (locking in a positive cash-flow via a spark spread in the forward market by selling financial power and buying financial gas). Nameplate capacity is applied to convert estimates expressed in \$/MWh (an energy-centric metric) into \$/kW (a capacity-based metric).

3.1 Selection of Forward Power Product

The values corresponding to forward power price and forward product energy depend on the forward product the AESO selects for each obligation period. The AESO conducts a liquidity and profitability assessment to determine which forward product type is suitable for each obligation period. This assessment remains an internal AESO business process and is not disclosed to market participants to prevent undue influence in forward trades. The *Capacity Market Auction Guidelines* released for each auction specify the forward product used for the obligation period in question.

3.1.1 Average Sample Period

The AESO calculates the forward power price using a weighted average of the settlements matching the obligation period in question. Specifically, the AESO estimates a weighted average of November and December of calendar year n with January to October of calendar year $n+1$.

The data collection process is continuous and ongoing. The selection of the sample period of collection remains an internal AESO business process and is not disclosed to market participants to prevent undue influence in forward trades. The *Capacity Market Auction Guidelines* released for each auction provides post hoc details on the sample period and the calculation of forward power price.

3.2 Calculation of Energy Market Expense

The energy market expense value is a proxy for the cost for each MWh that a reference aeroderivative power plant would hypothetically generate. The calculation relies on multiple sources, including:

- fuel costs and transportation charges, from forward markets and NGTL respectively;
- operational parameters and costs (e.g., heat rate, variable operations and maintenance costs, emission intensity) derived from the Brattle/S&L CONE report;
- carbon price and output-based allocation from relevant regulations;
- transmission loss charges, which are proxied by loss factors applicable to existing power plants within Fort Saskatchewan – this location is chosen to align with the Brattle/S&L's

- CONE report; and
- other relevant costs such as trading charges.

4 Calculation of Net-CONE

Net-CONE represents the annual revenues that a new resource would need to earn specifically in the capacity market, after netting out energy and ancillary services margins from gross-CONE. The net-CONE essentially represents the missing money, which is the amount of revenues that the capacity market is designed to compensate generators for, and therefore it is the key parameter for setting the administratively-set demand curve. The net-CONE will not be a negative number because, at a minimum, a plant operator could avoid generating to avoid any negative margin.

The net-CONE is set to zero if the calculation yields an estimate below zero. The net-CONE is set to gross-CONE if the calculation yields an estimate greater than gross-CONE.

Revision History

Posting Date	Description of Changes
	Initial release

DRAFT