

ISO Rules

Part 200 Markets

Division 207 Demand Curve Parameters

Section 207.2 Calculation of Net-CONE



External Consultation Draft
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Applicability

- 1 Section 207.2 applies to:
 - (a) the **ISO**.

Requirements

Establish Gross-CONE, Energy Offset and Net-CONE

- 2 The **ISO** must establish for each **obligation period**:
 - (a) a gross-CONE value in \$/kW-year in accordance with subsections 3 and 4, as applicable;
 - (b) an energy offset value in \$/kW-year in accordance with subsection 5; and
 - (c) a net-CONE value in \$/kW-year in accordance with subsection 6.

Initial Gross-CONE Value for 2021/2022 Obligation Period

- 3 The **ISO** must establish an initial gross-CONE value for the 2021/2022 **obligation period** of \$244.2/kW-year.

Calculation of Gross-CONE

- 4(1) The **ISO** must calculate the gross-CONE value for each **obligation period** following the 2021/2022 **obligation period** in accordance with the following formula:

$$\text{gross-CONE}_t = \text{gross-CONE}_{t=2021/2022} \times \text{composite index}_t$$

where:

- (a) t equals the **obligation period** for which the gross-CONE is being determined;
 - (b) $\text{gross-CONE}_{t=2021/2022}$ is the initial gross-CONE value in subsection 3 above; and
 - (c) composite index_t is the composite index value for **obligation period** t calculated in accordance with subsection 4(2) below.
- (2) The **ISO** must, in calculating the gross-CONE $_t$ value under subsection 4(1), calculate the composite index $_t$ using the following formula:

$$\text{composite index}_t = \frac{0.25 \times \text{labour index}_t}{60.7} + \frac{0.35 \times \text{materials index}_t}{118.5} + \frac{0.40 \times \text{turbine index}_t \times \text{exchange rate}_t}{268.7}$$

where:

- (a) t equals the **obligation period** for which the gross-CONE value is being determined;
- (b) composite index_t is the composite index value for **obligation period** t ;

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- (c) *labour index*_t is the most recent 12 **month** average of published Statistics Canada Construction Union Wage Rates (Electrician), Monthly for Edmonton Alberta, Table 18-10-0046-01;
- (d) *materials index*_t is the most recent 4 quarters average published Statistics Canada Gross National and Gross Domestic Income, Indexes and Related Statistics, Annual, Table 36-10-0105-01;
- (e) *turbine index*_t is the most recent 12 **month** average of published Federal Reserve Economic Data (St. Louis) Producer Price Index by Industry: Turbine and Turbine Generator Set Units Manufacturing (PCU333611333611); and
- (f) *exchange rate*_t is the most recent 12 **month** average of published Statistics Canada Monthly Average Exchange Rates in Canadian Dollars, U.S. Dollar monthly average, Table 33-10-0163-01.

Calculation of Energy Offset

5(1) The ISO must, for every **obligation period**, calculate the energy offset value in accordance with the following formula:

$$\frac{\text{energy offset}_t = (\text{forward power price}_t - \text{energy market expense}_t) \times \text{forward product energy}_t}{\text{maximum capability} \times 1000}$$

where:

- (a) *t* equals the **obligation period** for which the energy offset is being determined;
- (b) *forward power price*_t is the weighted average of the settlements matching the **obligation period** *t*, where the settlements are the average over a period determined by the ISO, for the published NGX forward power product in Appendix 1 that yields the highest energy offset _t for **obligation period** *t*;
- (c) *energy market expense*_t is the energy market expense value for **obligation period** *t* calculated in accordance with subsection 5(3);
- (d) *forward product energy*_t is the forward product energy value for **obligation period** *t* calculated in accordance with subsection 5(2); and
- (e) *maximum capability* is equal to 93 MW.

(2) The ISO must, in calculating the energy offset _t under subsection 5(1) above, calculate the forward product energy _t in accordance with the following formula:

$$\text{forward product energy}_t = \text{average capacity} \times (1 - \text{forced outage rate}) \times \text{forward product hours}_t$$

where:

- (a) *t* equals the **obligation period** for which the generation is being determined;

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- (b) *average capacity* is equal to 87 MW;
- (c) *forced outage rate* is equal to 2.5%; and
- (d) *forward product hours* t is the number of hours defined in the ICE NGX Contracting Party Agreement for the forward power product associated with the forward power price in subsection 5(1)(iii), for **obligation period** t .

(3) The **ISO** must, in calculating the energy offset t under subsection 5(1), calculate the energy market expense t in accordance with the following formula:

energy market expense t =

$$\begin{aligned} & [forward\ gas\ price_t \times (1 + commodity\ fuel\ charge_t)] \times heat\ rate_t \\ & + variable\ operations\ and\ maintenance_t \\ & + (emission\ intensity - established\ benchmark_t) \times carbon\ price_t \\ & + transmission\ losses_t + trading\ charge_t \end{aligned}$$

where:

- (a) t equals the **obligation period** for which the energy offset is being determined;
- (b) *forward gas price* t is the weighted average of the settlements matching the **obligation period** t , where the settlements are the average over the period determined by the **ISO** in subsection 5(1)(b), of NGX Phys, FP (CA/GJ), AB-NIT;
- (c) *commodity fuel charge* t is the most recent 12 **month** average of published NOVA Gas Transmission Ltd NGTL Fuel Usage and Measurement Variance;
- (d) *heat rate* is equal to 9.677 GJ/MWh;
- (e) *variable operations and maintenance* t is the variable operations and maintenance value for **obligation period** t calculated in accordance with subsection 5(4);
- (f) *emission intensity* is equal to 0.50 tonnes of CO₂/MWh;
- (g) *established benchmark* t is the weighted average of the calendar year values matching **obligation period** t for an established benchmark for electricity published by a public authority;
- (h) *carbon price* t is the weighted average of the calendar year values matching **obligation period** t for the carbon price published by a public authority;
- (i) *transmission losses* t is the transmission loss value for **obligation period** t calculated in accordance with subsection 5(5); and
- (j) *energy market trading charge* t is the most recent energy market trading charge published on the AESO website.

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(4) The **ISO** must, in calculating the energy market expense e_t under subsection 5(3), calculate the variable operations and maintenance vom_t value in accordance with the following formula:

$$vom_t = vom_{t=2021/2022} \times \frac{materials\ index_t}{118.5}$$

where:

- (a) t equals the **obligation period** for which the variable operations and maintenance is being determined;
- (b) $vom_{t=2021/2022}$ is equal to \$4.60/ MWh; and
- (c) $materials\ index_t$ is the value in subsection 4(2)(d).

(5) The **ISO** must, in calculating the energy market expense e_t under subsection 5(2), calculate the transmission losses tl_t value in accordance with the following formula:

$$tl_t = \frac{\sum_{i=1}^n loss\ factor_i}{n} \times forward\ power\ price_t$$

where:

- (a) t equals the **obligation period** for which the transmission losses is being determined;
- (b) $i...n$ are facilities located in the Fort Saskatchewan area identified in the most recent loss factors published on the AESO website;
- (c) $loss\ factor_i$ is the most recent published loss factor values published on the AESO website; and
- (d) $forward\ power\ price_t$ is the value in subsection 5(1)(b).

Calculation of Net-CONE

6(1) The **ISO** must, subject to subsection 6(2), calculate the net-CONE value for every **obligation period** in accordance with the following formula:

$$net-CONE_t = gross-CONE_t - energy\ offset_t$$

where:

- (a) t equals the **obligation period** for which the net-CONE value is being determined;
- (b) $gross-CONE_t$ is the gross-CONE value in subsection 3 or the gross-CONE value calculated in accordance with subsection 4 for **obligation period** t , as applicable; and
- (c) $energy\ offset_t$ is energy offset value calculated in accordance with subsection 5 for **obligation period** t .

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- (2) The **ISO** must, if the net-CONE value calculated in subsection 6(1) is:
- (a) below zero, set the net-CONE value at zero; or
 - (b) above the gross-CONE value in subsection 3 or 4, set the net-CONE value at the gross-CONE value.

Publication of Net-CONE, Data and Indices

7 The **ISO** must, publish the net-CONE value determined in accordance with this section 207.2 and the following data and indices in the *Capacity Market Auction Guidelines* for each **base auction** and **rebalancing auction**:

- (a) composite index $_{t=2021/2022}$;
- (b) composite index $_t$;
- (c) labour index $_t$;
- (d) material index $_t$;
- (e) turbine index $_t$;
- (f) USD/CAD Foreign Exchange Rate $_t$;
- (g) energy market expense $_t$;
- (h) forward power price $_t$;
- (i) forward product hours $_t$;
- (j) forward product energy $_t$;
- (k) the period determined by **ISO** refer to in subsections 5(1)(b), 5(2)(d) and 5(3)(b) ;
- (l) forward gas price $_t$;
- (m) commodity fuel charge $_t$;
- (n) variable operations and maintenance $_t$;
- (o) emission intensity;
- (p) established benchmark $_t$;
- (q) carbon price $_t$;
- (r) transmission losses $_t$;
- (s) loss factor $_t$; and
- (t) trading charge $_t$.

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Substitute Index or Benchmark

9 The **ISO** must, if any of the indices or benchmarks referred to in this section 207.2 are unavailable or not applicable for use in the calculation of the net-CONE value, use another comparable industry index or benchmark and publish the index or benchmark in the *Capacity Market Auction Guidelines* for each **base auction** and **rebalancing auction**.

Applicable Auctions

10 This section 207.2 is in effect for the following auctions:

- (a) the **base auction** and **rebalancing auction** for the 2021/2022 **obligation period**;
- (a) the **base auction** and **rebalancing auction** for the 2022/2023 **obligation period**;
- (a) the **base auction** and **rebalancing auction** for the 2023/2024 **obligation period**; and
- (a) the **base auction** and **rebalancing auctions** for the 2024/2025 **obligation period**.

Appendices

Appendix 1 – List of Forward Power Products

Revision History

Date	Description
xxxx-xx-xx	Initial release

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Appendix 1 – List of Forward Power Products

Forward Power Product Names on NGX:

- NGX Fin FUT FF, FP for AESO Flat
- NGX Fin FUT FF, FP for AESO Ext Off Peak
- NGX Fin FUT FF, FP for AESO Ext Peak
- NGX Fin FUT FF, FP for AESO Off Peak
- NGX Fin FUT FF, FP for AESO On Peak
- NGX Fin FUT FF, FP for AESO Super Peak
- NGX Fin FUT FF, FP for AESO Hourly