ISO Rules
Part 200 Markets
Division 207 Demand Curve Parameters
Section 207.2 Calculation of Net-CONE

External Consultation Draft
August 31, 2018

Applicability

1 Section 207.2 applies to:

(a) the **ISO**.

Requirements

Establish Gross-CONE, Energy and Ancillary Services 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 and ancillary services 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 every **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:

(i) *t* equals the **obligation period** for which the gross-CONE is being determined;

(ii) gross-CONE_t is the gross-CONE value for **obligation period** *t*;

(iii) $\text{gross-CONE}_{t=2021/2022}$ is the initial gross-CONE value in subsection 3 above; and

(iv) 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) above, calculate the Composite Index_t using the following formula:

$$\text{Composite Index}_t = 0.25 \times \frac{Labour\ Index_t}{60.7} + 0.35 \times \frac{Materials\ Index_t}{118.5} + 0.40 \times \frac{Turbine\ US\ Cost\ Index_t \times Foreign\ Exchange\ Rate_t}{268.7}$$

where:

(i) *t* equals the **obligation period** for which the gross-CONE value is being determined;

(ii) Composite Index$_t$ is the composite index value for **obligation period** *t*;

(iii) 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;

(iv) Materials Index$_t$ is the most recently published Statistics Canada Gross National and Gross Domestic Income, Indexes and Related Statistics, Annual, Table 36-10-0105-01;

(v) Turbine US Cost 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

(vi) USD/CAD Foreign 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 and Ancillary Services Offset

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

$$\text{EAS Offset}_t = \frac{(\text{Forward Power Price}_t - \text{Energy Market Expense}_t) \times \text{Forward Product Energy}_t}{\text{Nameplate Capacity} \times 1000}$$

where;

(i) *t* equals the **obligation period** for which the energy and ancillary services offset is being determined;

(ii) EAS Offset$_t$ is the energy and ancillary services offset for **obligation period** *t*;

(iii) 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 EAS Offset$_t$ for **obligation period** *t*;

(iv) Energy Market Expense$_t$ is the energy market expense value for **obligation period** *t* calculated in accordance with subsection 5(3) below;

(v) Forward Product Energy$_t$ is the forward product energy value for **obligation period** *t* calculated in accordance with subsection 5(2) below; and

(vi) Nameplate Capacity is equal to 93 MW.

(2) The **ISO** must, in calculating the EAS Offset $_t$ under subsection 5(1) above, calculate the Forward Product Energy $_t$ using the following formula:

$$\text{Forward Product Energy}_t = \text{Average Capacity} \times (1 - \text{Forced Outage Rate}) \times \text{Forward Product Hours}_t$$

where:

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

(ii) Average Capacity is equal to 87 MW;

(iii) Forced Outage Rate is equal to 3.0%; and

(iv) 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) above, for **obligation period** *t*.

(3) The **ISO** must, in calculating the EAS Offset $_t$ under subsection 5(1) above, calculate the Energy Market Expense $_t$ using the following formula:

$$\begin{aligned}\text{Energy Market Expense}_t &= [\text{Forward Gas Price}_t + (1 + \text{Commodity Fuel Charge}_t)] \times \text{Heat Rate}_t \\ &+ \text{Variable Operations and Maintenance}_t \\ &+ (\text{Emission Intensity} - \text{Established Benchmark}_t) \times \text{Carbon Price}_t + \text{Transmission Losses}_t \\ &+ \text{Trading Charge}_t\end{aligned}$$

where;

(i) *t* equals the **obligation period** for which the energy and ancillary services offset is being determined;

(ii) Energy Market Expense $_t$ is the energy market expense value for **obligation period** *t*;

(iii) 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)(iii), of NGX Phys, FP (CA/GJ), AB-NIT;

(iv) Commodity Fuel Charge $_t$ is the most recent 12 **month** average of published NOVA Gas Transmission Ltd NGTL Fuel Usage and Measurement Variance;

(v) Heat Rate is equal to 9.677 GJ/MWh;

(vi) Variable Operations and Maintenance $_t$ is the variable operations and maintenance value for **obligation period** *t* calculated in accordance with subsection 5(4) below;

(vii) Emission Intensity is equal to 0.50 tonnes of CO2/MWh;

(viii) 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;

(ix) 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;

(x) Transmission Losses $_t$ is the transmission loss value for **obligation period** *t* calculated in accordance with subsection 5(5) below; and

(xi) Energy Market Trading Charge $_t$ is the most recent energy market trading charge published on the AESO website.

(4) The **ISO** must, in calculating the Energy Market Expense $_t$ under subsection 5(3) above, calculate the Variable Operations and Maintenance $_t$ value using the following formula:

$$\text{Variable Operations and Maintenance}_{\text{t}} = \text{Variable Operations and Maintenance}_{t=2021/2022} \times \frac{\text{Materials Index}_t}{118.5}$$

where:

(i) *t* equals the **obligation period** for which the variable operations and maintenance is being determined;

(ii) Variable Operations and Maintenance $_{t=2021/2022}$ is equal to $4.60/ MWh; and

(iii) Materials Index $_t$ for **obligation period** *t* is the value in subsection 4(2)(a)(iv) above.

(5) The **ISO** must, in calculating the Energy Market Expense $_t$ under subsection 5(2) above, calculate the Transmission Losses $_t$ value using the following formula:

$$\text{Transmission Losses}_{\text{t}} = \frac{\sum_{\text{i=1}}^{\text{n}} \text{Loss Factor}_{\text{i}}}{\text{n}} \times \text{Forward Power Price}_{\text{t}}$$

where:

(i) *t* equals the **obligation period** for which the transmission losses is being determined;

(ii) *i…n* are facilities located in the Fort Saskatchewan area identified in the most recent Loss Factors published on the AESO website;

(iii) Loss Factor $_i$ is the most recent published loss factor values published on the AESO website; and

(iv) Forward Power Price $_t$ for **obligation period** *t* is the value in subsection 5(1)(a)(iii) above.

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:

$$\text{net-CONE}_{\text{t}} = \text{gross-CONE}_t - \text{EAS Offset}_t$$

where:

(i) *t* equals the **obligation period** for which the net-CONE value is being determined;

(ii) gross-CONE $_t$ is the gross-CONE value in subsection 3 above or the gross-CONE value calculated in accordance with subsection 4 above for the **obligation period** *t*, as applicable; and

(iii) EAS Offset $_t$ is energy and ancillary services offset value calculated in accordance with subsection 5 above for **obligation period** *t*.

(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.

(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 US Cost 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)(iii), 5(2)(iv) and 5(3)(iii);

(l) Forward Gas Price $_t$;

(m) Commodity Fuel Charge $_t$;

(n) (o) Variable Operations and Maintenance $_t$;

(o) (p) Emission Intensity;

(p) Established Benchmark $_t$;

(q) Carbon Price $_t$;

(r) Transmission Losses $_t$;

(s) Loss Factor $_i$; and

(t) Trading Charge $_t$

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

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