

ISO Rules

Part 200 Markets

Division 207 Demand Curve Parameters

Section 207.1 Resource Adequacy Model



Draft Version
Posted January 2019

Applicability

1(1) Section 207.1 applies to:

- (a) the **ISO**.

(2) This section 207.1 applies to the following auctions:

- (a) the **base auction** and **rebalancing auction** for the 2021/2022 **obligation period**;
- (b) the **base auction** and **rebalancing auction** for the 2022/2023 **obligation period**;
- (c) the **base auction** and **rebalancing auction** for the 2023/2024 **obligation period**;
- (d) the **base auction** and the **rebalancing auctions** for the 2024/2025 **obligation period**;
- (e) the **base auction** and the first **rebalancing auction** for the 2025/2026 **obligation period**;
- (f) the **base auction** for the 2026/2027 **obligation period**; and
- (g) the **base auction** for the 2027/2028 **obligation period**.

Requirements

Gross Minimum Procurement Volume

2 The **ISO** must, for each **base auction** and **rebalancing auction**, establish the gross minimum procurement volume as the volume that meets the **resource adequacy standard**.

Probabilistic Model

3(1) The **ISO** must, for the purposes of establishing the gross minimum procurement volume referred to in subsection 2, perform a probabilistic model of resource adequacy.

(2) The **ISO** must consider the following variables that impact supply and demand fundamentals in Alberta when developing the inputs for the probabilistic model referred to in subsection 3(1):

- (a) the load forecast referred to in subsection 4;
- (b) the **available capability** or available generation from all individual **generating units** and **aggregated generating facilities** in Alberta that the **ISO** anticipates will have, for the **obligation period**, a:
 - (i) **maximum capability** greater than or equal to 5 MW; or
 - (j) **uniform capacity value** that is greater than or equal to 1 MW;
- (c) historical outages of thermal assets, including **automatic forced outages**, **delayed forced outages**, **planned outages** and ambient temperature derates, and any projected changes the **ISO** determines;
- (d) historical performance of existing intermittent resources, including wind and solar, and any projected changes the **ISO** determines;
- (e) anticipated performance of new intermittent resources, including wind and solar;
- (f) historical performance of hydroelectric generation and any projected changes the **ISO**

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- determines;
- (g) historical performance of cogeneration sites in Alberta and any projected changes the **ISO** determines;
 - (h) the correlation of load and generation at cogeneration sites in Alberta where the **ISO** determines correlation exists;
 - (i) historical performance of a load asset supplying **capacity** in the capacity market and any projected changes the **ISO** determines;
 - (j) the **available transfer capability** and import **offers**; and
 - (k) the amount of **regulating reserves** required during energy emergency events as defined in **ISO rules** or **reliability standards**.

(3) The **ISO** may make assumptions as necessary about the model variables identified in subsection 3(2) in order to minimize model error and the risk of over procuring or under procuring **capacity** to the extent practicable.

(4) The **ISO** must add or subtract volumes of **capacity** from the probabilistic model referred to in subsection 3(1) to determine the gross minimum procurement volume that meets the **resource adequacy standard**.

Load Forecast

4 The **ISO** must, for the purpose of performing the probabilistic model in subsection 3, complete a forecast of load for a 5-year forward looking period that considers the following variables:

- (a) economic growth indicators in Alberta including real gross domestic product, population, employment, and natural resource production;
- (b) weather and temperature data selected from multiple locations across Alberta;
- (c) load variations in Alberta based on calendar variables, including **month** of the year, **day** of the week, **hour** of the **day**, daylight savings, and holidays;
- (d) historical load behaviour in Alberta and any projected changes the **ISO** determines;
- (e) performance data from load assets that:
 - (i) are qualified to participate in the capacity market to supply **capacity** and any projected changes the **ISO** determines; or
 - (ii) have historically demonstrated price responsive behaviour and any projected changes the **ISO** determines;
- (f) load forecast uncertainty reflecting variability in the load forecast due to weather and economic forecasts; and
- (g) any other variables that, in the **ISO**'s determination, may improve the accuracy of the load forecast model.

Filing of Gross Minimum Procurement Volume

5 The **ISO** must, no later than 4 **months** prior to the commencement of the qualification process for a **base auction** or **rebalancing auction** file the gross minimum procurement volume for such **base auction** or **rebalancing auction** that is determined in accordance with this section 207.1 with the **Commission** for approval.

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Revision History

| Date | Description |
|------------|-----------------|
| yyyy-mm-dd | Initial release |

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Section 207.2A Gross Minimum Procurement Volume



Draft Version
Posted January 2019

Applicability

- 1(1)** Section 207.2A applies to:
- (a) the **ISO**.
- (2)** This section 207.2A applies to the **ISO** for the following auctions:
- (a) the **base auction** for the 2021/2022 **obligation period**; and
 - (b) the **base auction** for the 2022/2023 **obligation period**.

Requirements

Base Auction Gross Minimum Procurement Volumes for 2021/2022 and 2022/2023 Obligation Periods

- 2** The **ISO** must establish the gross minimum procurement volumes as follows:
- (a) 18,305 MW of **maximum capability** for the **base auction** for the 2021/2022 **obligation period** based on the assets listed in Appendix 1; and
 - (b) 18,400 MW of **maximum capability** for the **base auction** for the 2022/2023 **obligation period** based on the assets listed in Appendix 2.

Revision History

| Date | Description |
|-------------|--------------------|
| yyyy-mm-dd | Initial release |

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Section 207.2A Gross Minimum Procurement Volume



Appendix 1 – 2021-2022 Obligation Period Gross Minimum Procurement Volume Asset Breakout

| Capacity Resource Asset | Technology Type | Maximum Capability (MW) |
|-------------------------|-----------------|-------------------------|
| AFG1 | Other | 131 |
| AKE1 | Wind | 73 |
| ALP1 | Simple Cycle | 7 |
| ALP2 | Simple Cycle | 10 |
| ALS1 | Cogen | 96 |
| ANC1 | Simple Cycle | 63 |
| APS1 | Cogen | 195 |
| ARD1 | Wind | 68 |
| BCR2 | Cogen | 36 |
| BCRK | Cogen | 64 |
| BIG | Hydro | 120 |
| BOW1 | Hydro | 320 |
| BR4 | Coal | 155 |
| BR5 | Coal | 385 |
| BRA | Hydro | 350 |
| BSC1 | Solar | 15 |
| BSR1 | Wind | 300 |
| BTR1 | Wind | 66 |
| BUL1 | Wind | 13 |
| BUL2 | Wind | 16 |
| CAL1 | Combined Cycle | 320 |
| CCMH | Other | 42 |
| CHIN | Hydro | 15 |
| CL01 | Cogen | 100 |
| CMH1 | Combined Cycle | 255 |
| CNR5 | Cogen | 203 |
| CR1 | Wind | 39 |
| CRG1 | Cogen | 10 |
| CRR1 | Wind | 77 |
| CRS2 | Simple Cycle | 39 |
| CRS3 | Simple Cycle | 48 |
| CRW1 | Wind | 20 |
| DAI1 | Other | 52 |
| DKSN | Hydro | 15 |
| DOWG | Cogen | 326 |
| DRW1 | Simple Cycle | 6 |
| EAGL | Other | 25 |
| EC01 | Combined Cycle | 120 |
| EC04 | Cogen | 98 |
| EGC1 | Combined Cycle | 860 |
| ENC1 | Simple Cycle | 48 |
| ENC2 | Simple Cycle | 101 |
| ENC3 | Simple Cycle | 101 |
| FH1 | Cogen | 199 |
| FNG1 | Combined Cycle | 73 |

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| | | |
|----------|----------------|-------|
| GEN5 | Simple Cycle | 15 |
| GEN6 | Simple Cycle | 15 |
| GN1 | Coal | 400 |
| GN2 | Coal | 400 |
| GN3 | Coal | 466 |
| GPEC | Other | 27 |
| GWW1 | Wind | 71 |
| HAL1 | Wind | 150 |
| HMT1 | Cogen | 45 |
| HSM1 | Simple Cycle | 6 |
| ICP1 | Hydro | 7 |
| IEW1 | Wind | 66 |
| IEW2 | Wind | 66 |
| Intertie | Intertie | 1,263 |
| IOR1 | Cogen | 180 |
| IOR2 | Cogen | 195 |
| IOR3 | Cogen | 84 |
| JOF1 | Cogen | 474 |
| KH1 | Coal | 395 |
| KH2 | Coal | 395 |
| KH3 | Coal | 463 |
| KHW1 | Wind | 63 |
| ME02 | Simple Cycle | 8 |
| ME03 | Simple Cycle | 7 |
| ME04 | Simple Cycle | 6 |
| MEG1 | Cogen | 202 |
| MFG1 | Simple Cycle | 16 |
| MKR1 | Cogen | 202 |
| MKRC | Cogen | 207 |
| NAT1 | Simple Cycle | 20 |
| NEP1 | Wind | 82 |
| NPC1 | Simple Cycle | 11 |
| NPC2 | Simple Cycle | 9 |
| NPP1 | Simple Cycle | 105 |
| NRG3 | Other | 16 |
| NX01 | Combined Cycle | 120 |
| NX02 | Cogen | 220 |
| OMRH | Hydro | 32 |
| OWF1 | Wind | 46 |
| PEC1 | Cogen | 16 |
| PH1 | Simple Cycle | 48 |
| PR1 | Cogen | 100 |
| PW01 | Cogen | 5 |
| RB5 | Simple Cycle | 50 |
| REP Wind | REP Wind | 1,296 |
| RL1 | Cogen | 47 |
| RYMD | Hydro | 21 |
| SCL1 | Cogen | 510 |
| SCR1 | Cogen | 899 |

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| | | |
|------|--------------|-----|
| SCR2 | Wind | 30 |
| SCR3 | Wind | 30 |
| SCR4 | Wind | 88 |
| SD3 | Coal | 368 |
| SD4 | Coal | 406 |
| SD5 | Coal | 406 |
| SD6 | Coal | 401 |
| SH1 | Coal | 400 |
| SH2 | Coal | 390 |
| SHCG | Cogen | 19 |
| SLP1 | Other | 9 |
| TAB1 | Wind | 81 |
| TAY1 | Hydro | 14 |
| TC01 | Cogen | 95 |
| TC02 | Cogen | 46 |
| TLM2 | Cogen | 13 |
| UOA1 | Cogen | 39 |
| UOC1 | Cogen | 12 |
| VW1 | Simple Cycle | 50 |
| VW2 | Simple Cycle | 50 |
| WCD1 | Simple Cycle | 20 |
| WEY1 | Other | 48 |
| WST1 | Other | 18 |
| WWD1 | Other | 50 |

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Appendix 2 – 2022-2023 Obligation Period Gross Minimum Procurement Volume Asset Breakout

| Capacity Resource Asset | Technology Type | Maximum Capability (MW) |
|-------------------------|-----------------|-------------------------|
| AFG1 | Other | 131 |
| AKE1 | Wind | 73 |
| ALP1 | Simple Cycle | 7 |
| ALP2 | Simple Cycle | 10 |
| ALS1 | Cogen | 96 |
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| FH1 | Cogen | 199 |

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| | | |
|----------|----------------|-------|
| FNG1 | Combined Cycle | 73 |
| GEN5 | Simple Cycle | 15 |
| GEN6 | Simple Cycle | 15 |
| GN1 | Coal | 400 |
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| GN3 | Coal | 466 |
| GPEC | Other | 27 |
| GWW1 | Wind | 71 |
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| HMT1 | Cogen | 45 |
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| JOF1 | Cogen | 474 |
| KH1 | Coal | 395 |
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| MFG1 | Simple Cycle | 16 |
| MKR1 | Cogen | 202 |
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| NPP1 | Simple Cycle | 105 |
| NRG3 | Other | 16 |
| NX01 | Combined Cycle | 120 |
| NX02 | Cogen | 220 |
| OMRH | Hydro | 32 |
| OWF1 | Wind | 46 |
| PEC1 | Cogen | 16 |
| PH1 | Simple Cycle | 48 |
| PR1 | Cogen | 100 |
| PW01 | Cogen | 5 |
| RB5 | Simple Cycle | 50 |
| REP Wind | REP Wind | 1,296 |
| RL1 | Cogen | 47 |
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|---------------|---------------|-----|
| SCR1 | Cogen | 899 |
| SCR2 | Wind | 30 |
| SCR3 | Wind | 30 |
| SCR4 | Wind | 88 |
| SD3 | Coal | 368 |
| SD4 | Coal | 406 |
| SD5 | Coal | 406 |
| SD6 | Coal | 401 |
| SH1 | Coal | 400 |
| SH2 | Coal | 390 |
| SHCG | Cogen | 19 |
| SLP1 | Other | 9 |
| TAB1 | Wind | 81 |
| TAY1 | Hydro | 14 |
| TC01 | Cogen | 95 |
| TC02 | Cogen | 46 |
| TLM2 | Cogen | 13 |
| UOA1 | Cogen | 39 |
| UOC1 | Cogen | 12 |
| VW1 | Simple Cycle | 50 |
| VW2 | Simple Cycle | 50 |
| WCD1 | Simple Cycle | 20 |
| WEY1 | Other | 48 |
| WST1 | Other | 18 |
| WWD1 | Other | 50 |
| Generic Build | Generic Build | 38 |

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Section 207.3 Calculation of Net-CONE



Draft Version
Posted January 2019

Applicability

- 1(1)** Section 207.3 applies to:
- (a) the **ISO**.
- (2)** This section 207.3 applies to the **ISO** for the following auctions:
- (a) the **base auction** and **rebalancing auction** for the 2021/2022 **obligation period**;
 - (b) the **base auction** and **rebalancing auction** for the 2022/2023 **obligation period**;
 - (c) the **base auction** and **rebalancing auction** for the 2023/2024 **obligation period**;
 - (d) the **base auction** and **rebalancing auctions** for the 2024/2025 **obligation period**;
 - (e) the **base auction** and **rebalancing auctions** for the 2025/2026 **obligation period**; and
 - (f) the **base auction** and **rebalancing auctions** for the 2026/2027 **obligation period**.

Requirements

Gross-CONE Value for 2021/2022 Obligation Period

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

Calculation of Gross-CONE for Subsequent Obligation Periods

3(1) The **ISO** must calculate a gross-CONE value for each **obligation period** following the 2021/2022 **obligation period** in accordance with the following formula:

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

where:

- (a) $\text{gross-CONE}_{t=2021/2022}$ is the initial gross-CONE value in subsection 2 above; and
 - (b) escalation rate_t is the escalation rate for **obligation period** t calculated in accordance with subsection 3(2).
- (2)** The **ISO** must, in calculating the gross-CONE _{t} value under subsection (1), calculate the escalation rate for the **obligation period** in accordance with the following formula:

$$\text{escalation rate}_t = \frac{0.25 \times \text{labour index}_t}{60.7} + \frac{0.35 \times \text{materials index}_t}{108.8} + \frac{0.40 \times \text{turbine index}_t \times \text{exchange rate}_t}{268.7}$$

where:

- (a) labour index_t is the average of the most recent 12 **months** of construction union wage rates, including selected pay supplements, for electricians in Edmonton, Alberta from Construction

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Section 207.3 Calculation of Net-CONE



union wage rates, monthly, Table 18-10-0139-01 most recently published by Statistics Canada;

- (b) *materials index_t* is the average of the most recent 4 quarters of gross final domestic expenditure, implicit price index 2012=100 from Gross national income and gross domestic income, indexes and related statistics, quarterly, Table 36-10-0105-01 most recently published by Statistics Canada;
- (c) *turbine index_t* is the average of the most recent 12 **month** of the Producer Price Index by Industry: Turbine and Turbine Generator Set Units Manufacturing (PCU333611333611), Index June 1982=100 most recently published by Federal Reserve Bank of St. Louis; and
- (d) *exchange rate_t* is the average of the most recent 12 **month** of U.S. dollar, monthly average from Monthly average foreign exchange rates in Canadian dollars, Bank of Canada, Table 33-10-0163-01 most recently published by Statistics Canada.

Calculation of Energy Offset

4(1) The **ISO** must, for each **obligation period**, calculate an energy offset value for each **obligation period** in accordance with the following formula:

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

where:

- (a) *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**;
- (b) *forward product energy_t* is the forward product energy value for **obligation period t** calculated in accordance with subsection 4(2);
- (c) *energy market expense_t* is the energy market expense value for **obligation period t** calculated in accordance with subsection 4(3); and
- (d) *maximum capability* is 93 MW.

(2) The **ISO** must, in calculating the energy offset_t under subsection 4(1), calculate the forward product energy 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) *average capacity* is 87 MW;
- (b) *forced outage rate* is 2.5%; and
- (c) *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 4(1)(a), for **obligation period t**.

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(3) The **ISO** must, in calculating the energy offset t under subsection 4(1), calculate the energy market expense $_t$ in accordance with the following formula:

$$\text{energy market expense}_t =$$

$$[\text{forward gas price}_t \times (1 + \text{commodity fuel charge}_t)] \times \text{heat rate}$$

$$+ \text{variable operations and maintenance}_t + \text{greenhouse gas exposure}_t$$

$$\times \text{carbon price}_t + \text{transmission losses}_t + \text{trading charge}_t$$

where:

- (a) *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 4(1)(a), of NGX Phys, FP (CA/GJ), AB-NIT;
- (b) *commodity fuel charge $_t$* is the average of the most recent 12 **months** of total usage plus MVAR from the NGTL Fuel Usage and Measurement Variance table from NOVA Gas Transmission Ltd;
- (c) *heat rate* is 9.677 GJ/MWh;
- (d) *variable operations and maintenance $_t$* is the variable operations and maintenance value for **obligation period t** calculated in accordance with subsection 4(4);
- (e) *greenhouse gas exposure $_t$* is the greenhouse gas exposure to a carbon price levied by a public authority, based on 0.50 tonnes of CO₂ equivalent/MWh for **obligation period t** ;
- (f) *carbon price $_t$* is the weighted average of the calendar year values matching **obligation period t** for the carbon price relevant to Alberta published by a public authority;
- (g) *transmission losses $_t$* is the value calculated in accordance with subsection 4(5) for **obligation period t** ; and
- (h) *trading charge $_t$* is the energy market trading charge most recently published on the AESO website.

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

$$\text{variable operations and maintenance}_t =$$

$$\text{variable operations and maintenance}_{t=2021/2022} \times \frac{\text{materials index}_t}{108.8}$$

where:

- (a) *variable operations and maintenance $_{t=2021/2022}$* is \$4.60/ MWh; and
- (b) *materials index $_t$* is the value in subsection 3(2)(b) for **obligation period t** .

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Section 207.3 Calculation of Net-CONE



(5) The **ISO** must, in calculating the energy market expense under subsection 4(3), calculate the transmission losses_{*t*} value in accordance with the following formula:

$$\text{transmission losses}_t = \frac{\sum \text{loss factor}_i}{n} \times \text{forward power price}_t$$

where:

- (a) *loss factor*_{*i*} is the final **loss factor** for asset *i* that is located in the Fort Saskatchewan area most recently published on the AESO website;
- (b) *n* is the number of assets in the Fort Saskatchewan area identified in the most recent **loss factors** published on the AESO website; and
- (c) *forward power price*_{*t*} is the value in subsection 4(1)(a).

Calculation of Net-CONE

5(1) The **ISO** must, subject to subsection 5(2), calculate the net-CONE value for each **obligation period** in accordance with the following formula:

$$\text{net-CONE}_t = \text{gross-CONE}_t - \text{energy offset}_t$$

where:

- (a) *gross-CONE*_{*t*} is the gross-CONE value:
 - (a) in subsection 2 if **obligation period** *t* is the 2021/2022 **obligation period**; or
 - (ii) calculated in accordance with subsection 3 if **obligation period** *t* is an **obligation period** subsequent to the 2021/2022 **obligation period**;and
- (b) *energy offset*_{*t*} is energy offset calculated in accordance with subsection 4 for **obligation period** *t*.

(2) The **ISO** must, if the net-CONE value calculated in subsection 5(1) is:

- (a) below zero, set the net-CONE value at zero; or
- (b) above the gross-CONE value in subsection 2 or 3 for the **obligation period**, as applicable, set the net-CONE value at the gross-CONE value.

Publication of Net-CONE, Data and Indices

6 The **ISO** must publish the net-CONE value determined in accordance with this section 207.3 and the following data and indices in the *Capacity Market Auction Guidelines* for each **base auction** and **rebalancing auction**:

- (a) escalation rate_{*t*};
- (b) labour index_{*t*}
- (c) material index_{*t*};
- (d) turbine index_{*t*};
- (e) exchange rate_{*t*};

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- (f) gross-CONE_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 the **ISO** referred to in subsections 4(1)(a)
- (l) forward gas price_t;
- (m) commodity fuel charge_t;
- (n) variable operations and maintenance_t;
- (o) *greenhouse gas exposure*_t;
- (p) carbon price_t;
- (q) transmission losses_t;
- (r) trading charge_t;
- (s) energy offset_t.

Substitute Index or Benchmark

- 8** The **ISO** must, notwithstanding this section 207.3:
- (a) use another comparable industry index or benchmark if any of the indices or benchmarks referred to in this section 207.3 are unavailable or not appropriate for the calculation of net-CONE; and
 - (b) publish the index or benchmark for each **base auction** and **rebalancing auction**.

Appendices

Appendix 1 – List of Forward Power Products

Revision History

| Date | Description |
|------------|-----------------|
| xxxx-xx-xx | Initial release |

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Division 207 Demand Curve Parameters

Section 207.3 Calculation of Net-CONE



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

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Section 207.4 Shape of Demand Curve



Draft Version
Posted January 2019

Applicability

- 1(1)** Section 207.4 applies to:
- (a) the **ISO**.
- (2)** This section 207.4 is in effect for the following auctions:
- (a) the **base auction** and **rebalancing auction** for the 2021/2022 **obligation period**;
 - (b) the **base auction** and **rebalancing auction** for the 2022/2023 **obligation period**;
 - (c) the **base auction** and **rebalancing auction** for the 2023/2024 **obligation period**;
 - (d) the **base auction** and **rebalancing auctions** for the 2024/2025 **obligation period**;
 - (e) the **base auction** and **rebalancing auctions** for the 2025/2026 **obligation period**;and
 - (f) the **base auction** and **rebalancing auctions** for the 2026/2027 **obligation period**.

Requirements

Establish Preliminary Demand Curve

- 2(1)** The **ISO** must, for each **base auction** and **rebalancing auction**, establish a preliminary downward-sloping convex demand curve with the following parameters:
- (a) a horizontal section from 0 MW to the estimate of the net minimum procurement volume in subsection 3(1), at a price cap that is the greater of:
 - (i) 1.75 times the adjusted net-CONE in subsection 4; or
 - (ii) 0.5 times gross-CONE established for the **obligation period** in accordance with Section 207.3 of the **ISO rules**, *Calculation of Net-CONE* divided by the performance factor in subsection 4(b);
 - (b) a downward-sloping section from the estimate of the net minimum procurement volume in subsection 3(1) at the price cap in subsection 2(1)(a) to an inflection point set at a multiple of 0.875 times the adjusted net-CONE in subsection 4 at a quantity 7% above the estimate of the net minimum procurement volume in subsection 3(1); and
 - (c) a downward sloping section from the inflection point in subsection 2(1)(b) to a price floor of zero dollars at a quantity 18% above the estimate of the net minimum procurement volume in subsection 3(1).
- (2)** The **ISO** must publish the preliminary demand curve for the relevant **base auction** or **rebalancing auction** prior to the commencement of the qualification process for such **base auction** or **rebalancing auction**.

Net Minimum Procurement Volume

- 3(1)** The **ISO** must, in establishing the preliminary demand curve under subsection 2(1), calculate an estimate of the net minimum procurement volume in accordance with the formula in subsection 3(2) using the best estimate of **uniform capacity values** that the **ISO** determines.
- (2)** The **ISO** must, after **uniform capacity values** are assigned in accordance with Section 206.3 of the **ISO rules**, *Uniform Capacity Value Determination*, adjust the gross minimum procurement volume

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established for each **base auction** or **rebalancing auction** to a net minimum procurement volume in accordance with the following formula:

$$\text{Net minimum procurement volume}_t = \sum (\text{maximum capability}_i \times \text{performance factor}_i)$$

where:

- (a) *maximum capability_i* is the **maximum capability** of asset *i* modelled in the probabilistic model for the **obligation period *t***;
- (b) *performance factor_i* is for asset *i* modelled in the probabilistic model:
 - (i) the average availability factor or the average capacity factor of asset *i* calculated in accordance with Section 206.3 of the **ISO rules**, *Uniform Capacity Determination* for asset *i* modeled in the probabilistic model;
 - (ii) the best estimate of the performance factor for asset *i* modelled as determined by the **ISO** in the event that a performance factor was not calculated for asset *i* pursuant to Section 206.3 of the **ISO rules**, *Uniform Capacity Determination*;
 - (iii) 0, for:
 - (A) assets modelled in the probabilistic model that are not eligible to participate in the capacity market; and
 - (B) for a **generating unit** or an **aggregated generating facility** connected to the **interconnected electric system** that supplies electric energy for one or more onsite load assets, and where such site has an associated **source asset**.

Adjusted Net-CONE

4 The **ISO** must adjust the net-CONE established for each **obligation period** pursuant to Section 207.3 of the **ISO rules**, *Calculation of Net-CONE* in accordance with the following formula:

$$\text{adjusted net-CONE}_t = \frac{\text{net-CONE}_t}{\text{performance factor}}$$

where:

- (a) *net-CONE_t* is the net-CONE value established pursuant to Section 207.3 of the **ISO rules**, *Calculation of Net-CONE* in \$/kW-year for **obligation period *t***; and
- (b) *performance factor* is 0.8.

Establish Final Demand Curve for Base Auction and Rebalancing Auction

5(1) The **ISO** must, for each **base auction** and **rebalancing auction**, establish a final downward-sloping convex demand curve with the following parameters:

- (a) a horizontal section from 0 MW to the net minimum procurement volume in subsection 3(2), at a price cap that is the greater of:
 - (i) 1.75 times the adjusted net-CONE in subsection 4; or
 - (ii) 0.5 times gross-CONE established for the **obligation period** in accordance with Section 207.3 of the **ISO rules**, *Calculation of Net-CONE* divided by the performance factor in subsection 4(b);

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- (b) a downward-sloping section from the net minimum procurement volume in subsection 3(2) at the price cap in subsection 5(1)(a) to an inflection point set at 0.875 times the adjusted net-CONE in subsection 4 at a quantity 7% above the net minimum procurement volume; and
- (c) a downward sloping section from the inflection point referred to in subsection 5(1)(b) to a price floor of zero dollars at a quantity 18% above the net minimum procurement volume in subsection 3(2).

(2) The **ISO** must publish the final demand curve no later than 1 month prior to the opening of the offering window for each **base auction** or **rebalancing auction**.

Revision History

| Date | Description |
|------------|-----------------|
| yyyy-mm-dd | Initial release |