Monitoring and mitigation of market power in the energy market

Graduated Scarcity and Reference Price Proposal – for discussion

This paper provides an overview of a concept for discussion with industry. The numbers provided in the graduated scale are examples and may be changed based on feedback and further evaluation of data. The AESO is interested in your feedback to this concept by the end of day Monday.

Proposal Concept:

An *ex ante* market power mitigation test is a three-part test of offer prices, applied separately in each delivery hour.

a) No-look scarcity test: If the market is very tight in a delivery hour, the ASRP will reflect market conditions;

b) Market power screen: Determine whether the firm's that control energy offers have structural market power (inclusive of obligations); and

c) Asset-specific reference price (ASRP): Calculates the price level that a generator would be expected to offer energy at if it had no market power. The associated asset specific reference price will be determined based on the supply cushion in the market noting that:

- The default ASRP reflects non-scarce conditions and is base estimate of operating costs as a multiple of SRMC
- The possibility of false positives increases as the supply cushion is impacted by contingencies
- The screen may impact offer behaviour as firms on the margin that were not identified as having market power may want to reflect scarcity pricing, but may be limited by the mitigation screen
- An enhanced ASRP designed to recognize the value of scarcity – as reflected by estimates of price responsive load levels

The default asset-specific reference price is intended to ensure that operating costs, including carbon and cycling, can be priced into the energy market as part of a single-part offer or bid and self-commitment energy market design. A participant would continue to be able to submit actual costs if above the reference price (CMD3, 10.7.21).

The graduated ASRP reflects that, at some level of sufficiently low supply cushion, prices should reflect scarcity. This enables a price signal to incentivize generation to invest in the flexibility and reliability to capture higher prices in these instances. This also provides a price signal for loads to

respond to market conditions. A graduated ASRP approach relies on offers and offer caps to achieve this pricing dynamic. Applying the graduated scarcity ASRP at some supply cushion level ensures that the market does not artificially clear at the default ASRP during scarcity conditions.

Proposal details (for discussion – to be tested and finalized):

ASRP – Default ASRP is estimated based on historic run times and acceptable operating costs. The data used represents industry standards. However, given the possibility that the costs are low because of a specific asset cost or because of increased cycling in the future, a range of costs are considered.

- Default ASRP reflects non-scarce conditions

- Examining a range of cost estimates for start-up, cycling, and evaluating the historic mean and median run times, the cost estimates for ASRP vary significantly. Based on the median run time and the annual revenue modelling we have conducted, we have landed at 2 x costs for industry.

Scarcity screen – multiples of single largest contingency.

- Recognizes that merit order becomes tight as supply cushion (SC) decreases and the impact of these volume changes on the RSI screen is non-linear and therefore may be overstated as the SC decreases

- Propose measuring SC as multiples of SLC (est 466 or rounded to 500)

Graduate scarcity and pricing screen - Designed to allow for competitive outcomes.

- Unmitigated/non pivotal assets can continue to offer throughout the merit order

- Mitigated companies must offer below the ASRP

- As market reaches scarcity levels, assuming the RSI stays at 1.0, the ASRP increases reflecting

    o Scarce conditions

    o Increase in range of costs to offset the potential for false positives for mitigation screen. (At extreme, the SC goes to zero and all companies fail). While increasingly additional companies do become pivotal, want to ensure test is not in the way of competitive priced outcomes

    o Equivalent value of scarcity load measured by Alberta price responsive levels historically denoted at for example $200, $300 in the merit order

- Concept Examples for discussion:
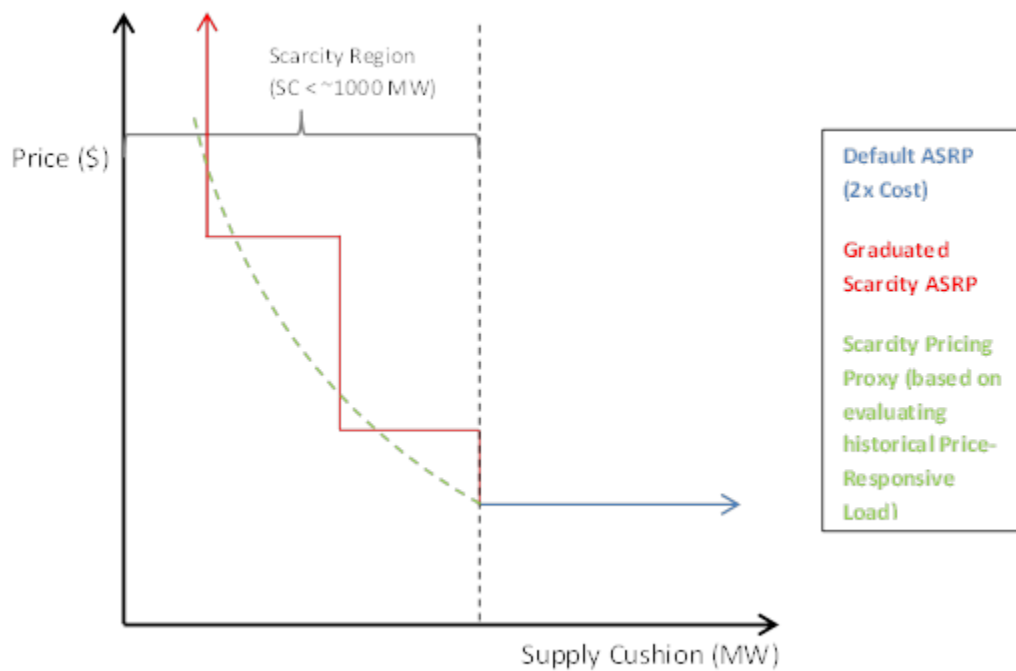
    o Refer to figure 1 and table 1 below.

Figure 1: Scarcity pricing proxy: Default and graduated scarcity ASRP levels

Table 1: Supply cushion and ASRP multiple range

Supply Cushion	ASRP Multiple
>1000	2x
500 – 1000	3x
250 – 499	6x
<250	Screen is lifted

*The concept, ranges and multiples are all for discussion.

- The basis for the default ASRP will be an evaluation of unit costs, cycling expectations, and runtimes as denoted in table above.

- The basis for scarcity (graduated) ASRP should reflect the competitive level absent market power. A proxy for a price limit may be associated with historical price responsive load levels.

Rationale

<u>Asset specific reference price:</u>

- The data in table 2 below estimate the required multiple of marginal costs to reflect additional operating costs in a single part bid market. Based on historic run times at the low end of near to an hour, the default ASRP is 2.0.

- The source of the original data is from a Brattle report, Appendix B, which is found in attachment 4.2 to the EAS working group material. The cost estimates noted are industry standard.

Table 2: Run Time and Cost Sensitivity Analysis

Plant Type	Start-up Cost	Cost Sensitivity	Shut-down Cost	No-load Cost	Total Commitment Cost	Marginal Cost	Output @ Full Load	Average Incremental Output	Assumed Run Time @ Full Output	Assumed Run Time @ Full Output	Total Cost	Average Cost	Ratio of Average to Marginal Cost
	$/cycle	ratio	$/cycle	$/cycle	$/cycle	$/MWh	MW	MW	hours	minutes	$/cycle	$/MWh	
CT	$2,146	-	$0	$0	$2,146	$24.88	100	100	0.50	30	$3,390	$67.80	2.73
CT	$2,146	-	$0	$0	$2,146	$24.88	100	100	2.17	130	$7,545	$34.77	1.40
CT	$2,147	-	$0	$0	$2,147	$24.88	100	100	4.52	271	$13,393	$29.63	1.19
CT	$3,219	1.5	$0	$0	$3,219	$24.88	100	100	0.50	30	$4,463	$89.26	3.59
CT	$2,146	-	$0	$0	$2,146	$24.88	100	100	0.50	30	$3,390	$67.80	2.73
CT	$1,073	0.5	$0	$0	$1,073	$24.88	100	100	0.50	30	$2,317	$46.34	1.86
CT	$3,219	1.5	$0	$0	$3,219	$24.88	100	100	2.17	130	$8,618	$39.71	1.60
CT	$2,146	-	$0	$0	$2,146	$24.88	100	100	2.17	130	$7,545	$34.77	1.40
CT	$1,073	0.5	$0	$0	$1,073	$24.88	100	100	2.17	130	$6,472	$29.82	1.20
CT	$3,219	1.5	$0	$0	$3,219	$24.88	100	100	4.52	271	$14,465	$32.00	1.29
CT	$2,146	-	$0	$0	$2,146	$24.88	100	100	4.52	271	$13,392	$29.63	1.19
CT	$1,073	0.5	$0	$0	$1,073	$24.88	100	100	4.52	271	$12,319	$27.25	1.10

*2013/14 historical run time data was used as natural gas levels during this period were moderate. Run times shown are the base 30 minute data from Brattle plus Alberta's historical median and mean run time values.

- Row 1 is derived from the Brattle report from CMD2 depicting an estimated run time of half an hour with an ASRP of 2.73

- Row 2-3 are based on Alberta historical run times using the mean (271 minutes) and median (130 minutes)

- Rows 4 - 8 shows various cost sensitivities based on Brattle start-up costs and a range of run times

Scarcity screen

- As noted in CMD2, the original scarcity screen of 500 was based on a contingency. The AESO recognizes that this threshold is somewhat arbitrary and is binary as it may limit competitive outcomes and at the extreme when the supply cushion is zero would result in false positives as all firms would be identified in the screen.

- The original CMD2/3 proposal would conduct a "no look scarcity screen" at 500 and if the market was tight, the market power pivotal supplier test would not be conducted. Given the tightness of the market, the market is least competitive and excessive mark ups could occur. However, it could be argued that the market would result in high prices regardless and no further action is required.

- The revised proposal would raise the ASRP at graduated levels, introduce additional mitigation levels based on supply cushions and only release the screen is extreme tight conditions. In this model, the AESO would be more assured that any resulting high prices were not as a result of market power but competitive forces. Additionally the graduated screen allows for competitive scarcity offers in order to recognize the possibility of false positives as the supply cushion starts to tighten.

The AESO is interested in your feedback on this concept by the end of day Monday (June 18, 2018).