

1X Ramp Rate Myopic Pricing



Prior to market opening the pricing algorithm used a 1X multiplier for ramp rates compared with the 12X ramp rate used in the current real time market¹. During the last phase of market testing extreme real-time price volatility was observed during periods of large changes in market demand, during morning load pick-up and hour-to-hour changes in intertie transactions for instance. The price volatility resulted from a lack of ramp depth of scheduled lower priced resources within an interval as higher priced resources were dispatched to meet the demand. Some volatility in prices is to be expected during periods where demand is changing rapidly, however the level of volatility observed during market testing was considered unacceptable for a nascent market.

Utilizing 1 X myopic algorithm in the unconstrained sequence of the algorithm would return the pricing algorithm to the original design of the market. The market price will be calculated as the cost of the last MW dispatched to satisfy demand in the interval while respecting the actual physical ramp rates of the resources available to the algorithm.

An Example:

This example attempts to show the pricing impacts of a 1X Myopic algorithm. There are 3 generators, each with offers as seen in the table below. Demand in interval one is 1200 MW and increases to 1300 MW in interval two. In interval one demand is satisfied by generator A and B, with no need for Generator C. Demand increases in interval 2 and generator C is needed to meet demand. Generator C is the marginal generator and sets the market clearing price at \$100.

Offers:

Generator	Offer Price (\$)	Offer Quantity (MW)	Ramp Rate (MW/min)
A	30	1000	50
B	40	500	10
C	100	200	15

Market Schedule Results:

¹ There is not actually a ramp rate multiplier in the market software. There is an input parameter "Trading Period Length" which has the same effect as a ramp rate multiplier.

Interval	Demand	Generator	1X Myopic Market Schedule (MW)	1X Myopic MCP (\$)	12X RR Market Schedule (MW)	12X RR MCP (\$)
1	1200	A	1000	40	1000	40
		B	200		200	
		C	0		0	
2	1300	A	1000	100	1000	40
		B	250		300	
		C	50		0	

More Information

For detailed examples using multiple pricing methodologies please see the document “Temporal Optimization (ramp rates) - Background Information on Price Calculation Methods” published for the January 20th meeting of the Market Pricing Working Group.

http://www.ieso.ca/imoweb/pubs/consult/mep/MP_WG-20060120-price-calculation-methods.pdf

For a review of the documents provided to the Market Pricing Working Group on temporal optimization and pricing methodologies please see “Temporal Optimization (ramp rates) - Summary of Previous Meetings” published for the January 20th meeting of the working group.

http://www.ieso.ca/imoweb/pubs/consult/mep/MP_WG-20060120-ramp-rates-summary.pdf