

Concept of Flexible and Inflexible Resources in the Synchronized Reserve Market

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Business Practice	Pre Shortage	Shortage Pricing Implementation
Market Bids	By close of energy rebid	By close of energy rebid
Availability & MW offer	One hour ahead	One hour ahead
Tier1 Estimation	One hour ahead of operating hour	One hour ahead (ASO) and 5-minute interval (RTSCED)
Resource Clearing	One hour ahead of operating hour	One hour ahead (inflexible resources) intra hour (flexible resources)
Lost Opportunity Cost Calculation	One hour ahead of operating hour	Every 5-minute interval in real-time (LPC)
Pricing	SRMCP from hour ahead solution	5-minute interval as energy LMP (LPC)
Settlements LOC	Large after-the-fact LOC	Small shoulder hours LOC

What are Flexible and Inflexible Tier 2 Resources?

Attributes	Inflexible Tier 2	Flexible Tier 2
Minimum Run Time	1 Hour	0 (already online for energy)
Start Up + Notification Time	30 Minutes	0 (already online for energy)
Dispatchable Range	EcoMin = EcoMax	EcoMin \neq EcoMax
Resource Types	<ul style="list-style-type: none"> • Offline CT and hydro that can operate in condense mode, • Tier 2 DSR 	<ul style="list-style-type: none"> • Online generating steam units, and • Some Tier 2 DSR (based on request by participant)
Assignment Communication	30 minutes ahead of operating hour via Market Gateway	In real-time via ICCP

- An hour-ahead market clearing engine (ASO) evaluates the system and clears reserve to meet the synchronized reserve requirement:
 - ❖ $\text{Req.}(1450) = \text{Tier1}(1000) + \text{Flex_Tier2}(300) + \text{Inflex_Tier2}(150)$
 - Only Inflex_Tier2 of 150 is committed and communicated via Market Gateway 30 minutes ahead of real-time
- The intra-hour engine (RT SCED) continuously re-evaluates the system and clears the balance of reserves to meet the synchronized reserve requirement:
 - ❖ $\text{Req.}(1450 - 150 \text{ Inflex_Tier2}) = \text{Tier1}(1100) + \text{Flex_Tier2}(200)$
 - The flex_Tier2 of 200 is committed and communicated via ICCP link continuously in real-time
 - The intra-hour engine continuously reevaluates the system, clears and commits flexible Tier2 as needed to maintain the synchronized reserve requirement

- Concept of intra-hour flexible Tier 2 commitment did not result in intra-hour offer update submittal by participants – no structural changes to Market Gateway;
 - Change did not present opportunities for gaming
- Flexible Tier 2 is procured at the tail of resource operating range – no notification time necessary and no additional operation intervention at the plant
- The change improved overall system production cost;