

Comparing RTO Market Framework Rules In DER Context

Andrew Levitt
August 24, 2016

Definitions: RTO Market Framework Parameters

- **Injections:** unit is allowed to export power past applicable meter.
- **Aggregation:** multiple units may be combined into a single market entity. “Y” means aggregation is allowed over a relatively wide area or zone.
- **Comms to unit: public allowed vs. private:** communications with the unit can be by way of a public network (e.g., internet or cell phone), as opposed to mandating a private network. “Public” does not preclude requirement for private network communications between RTO and an intermediate aggregator or communications hub.
- **Settlement & real-time metering:**
 - **Technical:** acceptable metering system is specified by technical requirement. E.g.: must meet ANSI C12.1 standard, or must be +/- 1% accurate.
 - **List:** acceptable metering system is specified by a list of certified devices.
- **Minimum size:** minimum size threshold for participating in markets.
- **Storage may discharge for non-wholesale purpose:** E.g., storage may discharge for wholesale sale in one interval and for retail purpose (e.g., site emergency backup) in another interval.
- **Interconnect jurisdiction:** if there is an interconnection process for a new DER that intends to participate by way of the market framework, is the jurisdiction for the interconnection under the State or FERC.
- **RTO markets:** which RTO markets (including resource adequacy) are accessible by way of this market framework.
- **Participation as % peak:** approximate ratio of: the sum of unit MW participating in market framework to RTO peak demand.



RTO Market Framework Rules In DER Context

DR = Demand Response. PRD = Price Responsive Demand. PDR = Proxy Demand Resource. DERP = Distributed Energy Resource Provider. A/S = Ancillary Services

	PJM Gen Metered	PJM DR/PRD	CAISO Gen Metered	CAISO PDR	CAISO DERP	NEISO Gen Metered	NEISO DR
Injections	Y	N	Y	N	Y	Y	Y
Aggregation	Same loc'n	Y	Same loc'n	Y	Y	No except Reg	Y
Comms to unit: public allowed vs. private	Public	Public	Public	Public	Public	Private except Reg	Public
Settlement & real-time metering: technical vs. list	Technical	Technical	List (can certify new devices)	Technical	Technical	Technical	Technical
Minimum market size (for aggregate)	100 kW RPM 100 kW A/S	100 kW	500 kW	100 kW (500 kW A/S)	500 kW	~1,000 kW	100 kW
Storage may discharge for non-wholesale purpose*	Only if charge at retail	Y	All flows settled wholesale	Y	All flows settled wholesale	N	Y
Interconnect jurisdiction	FERC/State**	State	Case by case	State	Case by case	FERC/State**	FERC/State**
RTO markets	All***	All	All	Energy, spin, non-spin	All but resource adequacy	All	2018: All
Participation as % peak	100+%	7%	100+%	0%	0%	100+%	1-2%

* E.g., storage may discharge for wholesale sale in one interval and for retail purpose (e.g., site emergency backup) in another interval

** FERC if injections with wholesale sales, except (in general) State for distribution lines with no prior RTO wholesale sales

*** PJM's Tariff allows storage to be a Capacity Resource. PJM stakeholders need to develop rules for determining Capacity Injection Rights for storage.



RTO Market Framework Rules In DER Context

DR = Demand Response. PRD = Price Responsive Demand. PDR = Proxy Demand Resource. DERP = Distributed Energy Resource Provider

	PJM Gen Metered	PJM DR/PRD	NYISO Gen Metered	NYISO DR	NYISO BTM:NG
Injections	Y	N	Y	N	Y
Aggregation	Same loc'n	Y	Same owner & loc'n	Y	Same as gen
Comms to unit: public allowed vs. private	Public	Public	Public	Public	Same as gen
Settlement & real-time metering: technical vs. list	Technical	Technical	Technical	Technical List only for A/S	Same as gen
Minimum market size (for aggregate)	100 kW RPM 100 kW A/S	100 kW	1 MW	100 kW reliability, 1 MW economic	2 MW gen (1MW load)
Storage may discharge for non-wholesale purpose*	N	Y	N	Y	Same as gen
Interconnect jurisdiction	FERC/State*	State	FERC/ State*	State	FERC/State*
RTO markets	All	All	All	All but RT Energy	All. Reg & synch limited to single unit
Participation as % peak	100+%	7%	100+%	4%	0%

* * E.g., storage may discharge for wholesale sale in one interval and for retail purpose (e.g., site emergency backup) in another interval

** FERC if injections with wholesale sales, except (in general) State for distribution lines with no prior RTO wholesale sales