DER Examples and Discussion Points

MIC DER Session

August 18, 2017

Agenda

- Five simplified examples of market issues created by current rules.
- How Icetec's market proposal addresses these issues.
- Discussion on distribution studies.
- Request for input on visibility and telemetry.

Review Icetec Straw Proposal

At the last meeting we proposed DER rules where:

- Sites approved for injection under retail tariffs would only require minimal transmission study to be approved for wholesale participation.
- Interconnections requiring transmission upgrades would not fall under these rules.
- Registration and market participation follow DR model.
- DER and DR assets behind a retail meter generalaly treated as one integrated resource for PJM.

Example 1: Solar and Storage

- Summer peaking commercial site. Summer daytime load 3.0-5.0MW depending on weather, non-summer 3.0-3.5MW, nighttime load about 1.5MW lower.
- 2MW of solar and 2MW of storage behind the meter.
- Result is loss of regulation capability under many circumstances.

Conditions	Sun	Load	Solar Output	Net Load	Regulation Range
Warm	Average	3.5	1	2.5	0.5-4.5
Hot	Sunny	5	2	3	1.0-5.0
Mild	Nightime	1.5	0	1.5	-0.5-3.5
Mild	Sunny	3	2	1	-1.0-3.0

Example 2: BTMG

- Hospital with load 4.0 – 4.5MW summer, 3.0-3.5MW winter.
- 4MW of behind the meter generator. Generator can provide 500kW of regulation in range 3.5MW +/- 0.5MW.
- Result is that generator can only provide regulation when site would rather run to avoid higher energy prices.

Season	Load	Regulation Range	Opportunity Cost of Regulating
Summer	4.0	0.0-1.0	High
Winter	3.0	-1.0-0.0	Low

Example 3: BTMG and DR

- Campus with peak summer load 7.5MW, 3.0-3.5MW winter.
- 2MW BTMG, generally run in summer, reducing PLC to 5.5MW.
- Site can drop 1.5MW of HVAC load in summer.
- Result is site only qualifies for CP if gen and DR aggregated.

Season	Load	Generation Headroom	Available DR (Capacity)	Net Capacity
Summer Peak	7.5	0	1.5	1.5
Winter	3.5	2.0	0	2.0

Example 4: Cogen and DR

- Industrial with flat 4.0MW load.
- 4.0MW Cogen, base steam load produces 2.0MW.
- Cogen offers remaining 2.0MW based on fuel cost.
- Site can drop all load at high energy prices.
- Result is lower priced cogen prevents DR from participating.

Condition	Load	Generation Output	Available DR (Energy)	Lost DR Energy Opportunity
Routine	4.0	2.0	2.0	2.0
Cogen Struck	4.0	4.0	0	4.0

Example 5: Storage and DR

- Industrial with baseline load 1.5MW, offering 1MW DR as energy and capacity.
- 1MW battery providing regulation.
- Result is site can not meet regulation commitments when energy is struck or capacity DR called.

Situation	Load	Regulation Range
Normal	1.5	0.5 – 2.5
Energy Struck/Capacity Called	0.5	-0.5 – 1.5

- Potential future opportunity to use load to manage battery charge

Justification for Icetec Market Proposal

- All examples may frequently switch between net load and net injection.
- Examples 2, 3, 4 and potentially 5 benefit from treating DER and DR as single integrated resource.
- Underlying interests are:
  1. DERs not limited by underlying load.
  2. DERs and DR at the same site do not interfere with each other, but can complement.
  3. Whole settlements coexist with existing retail tariffs.
- "Negative load" solution proposed based on these interests. We are open to any alternative proposals.

Distribution Interconnection

- Icetec opposes requiring second distribution study for sites that are already injecting retail and wish to become wholesale.
- Main justification offered for second distribution study was possible impact of regulation service on distribution system.
  - What studies of regulation impact do EDCs actually do?
  - Why are protections on impacting power quality in existing retail tariffs insufficient?
  - How is the impact of a site providing service through DERs different from a site providing regulation through DR?
  - Can these studies be done at time of first distribution study?
- Icetec is also concerned that EDCs have no mandate to complete non-retail distribution studies in a timely manner.

Visibility and Telemetry

- We understand PJM and EDCs would like greater visibility into DER operations.
- Icetec is not positioned to propose these rules. Asking parties with interests in visibility to provide more details for possible inclusion in proposal.
- Issues of concern to Icetec:
  - Requirements should be applied fairly with no regard to ultimate purchaser of energy/AS/Capacity.
  - Cost