Market Approach to Behind the Generator Load (BGL)

MIC Special Session

October 13, 2022

IMM

BGL: Two Proposals

- Constellation proposal (focus of this presentation)
  - BGL not directly linked to grid
  - BGL linked only through generator
  - Load cannot be served if generator is offline
- Brookfield proposal (details not clear) (not addressed here)
  - BGL directly linked to grid
  - BGL linked through generator and around generator
  - Load can be served directly if generator is offline
- Two proposals are different
  - Proposals should be separately evaluated in detail

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Capacity Status

- Capacity available for sale in PJM Capacity Market should be equal to host generation ICAP net of peak load of BGL.

- Capacity available for sale in PJM Capacity Market from intermittent or storage resources should be equal to host generation derated capacity net of BGL.

- LSEs should pay only for net capacity offered into PJM Capacity Market. BGL should pay for the capacity used to provide reliable service to the BGL.

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Capacity Status

- Host generator should not be permitted to sell capacity MW in the PJM Capacity Market equal to the behind the generator load (BGL).

- Host generator should be able to retain CIRs only equal to the net capacity available for sale in PJM Capacity Market.
  - Gross MW net of BGL peak load

- Current ICAP test procedures should apply to net capacity.

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Capacity Status

- Capacity must offer requirement should apply to ICAP of generation net of peak load of BGL.

- All host generation resources (with BGL), regardless of technology, should be required to have a capacity market must offer requirement.

- Existing cost development rules for capacity should apply to ICAP of generation net of peak load of BGL. Costs associated with interconnecting/serving BGL should not be includable.

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Capacity Status: Energy Offers

- Host generators with a capacity commitment should be required to make a cost-based energy offer in the PJM DA and RT energy markets each day equal to the ICAP MW.

- Intermittent and storage resources should be required to make a cost-based energy offer in the PJM DA and RT energy markets equal to their forecast availability.

- Cost-based offers in the energy market should follow existing rules and should not include contract based strike price values.

- The language related to bilateral contracts should be removed from the tariff and should not apply for BGL.

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BGL Status

- Combination of host generation and BGL should not be eligible for uplift payments.

- Combination of host generation and BGL should not be eligible to be DR or EE or PRD in energy or capacity markets.

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Capacity Status: ISA

- ISAs should be modified to reflect all obligations of host generator as defined.

- PJM should be required to create a standard ISA for BGL applications so that it can be reviewed in advance and be applied equally to all BGL. Needs to address all ISA issues including CIRs and frequency and reactive.

- Review of the standard ISA should be part of the stakeholder review process.

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Interconnection Issues

- PJM must require that a BGL trip cannot have a negative impact on the grid, including other load and generation resources. PJM must explain in detail how this process would work, including all PJM control actions. A future study is not adequate. It should be a prerequisite.

- Host generator must provide equipment to ensure that a generator trip results in simultaneous BGL disconnection from grid. Must be verified by PJM.

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Interconnection Issues

- Real-time metering and telemetry should be required for BGL, including reactive.

- PJM should perform generator and load contingency modeling/analysis for all possible contingencies.
  - Input from TO and affected generation and load.
  - Should be done in advance, as a prerequisite to considering the option.

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OATT Applies

- Where existing OATT provisions are included, the rules should be included by reference so that any changes to the OATT rules are automatically incorporated in these rules. All OATT language required to implement the proposal should be provided in advance of stakeholder votes.

- OA Schedule 2 applies. Any changes to Schedule 2 apply.
  - Current rules apply, without exceptions.

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Grid Services

- All BGL is connected to the grid, by definition.

- Appropriate transmission costs should be defined. Participant host generator should pay for any transmission upgrades related to addition of BGL.

- Appropriate ancillary service requirements and costs related to addition of BGL should be defined, including reactive, black start, regulation and reserves and PJM supplied ancillary services.

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Ancillary Services: Reactive

- Reactive capability, D curve, of host generator is net of requirements of BGL. Reactive and frequency requirements of BGL should be defined and the source of the corresponding supply identified.

- Host generator is responsible to provide reactive capability to PJM. Reactive compensation to host generator should be only for available reactive net of reactive to BGL.

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Grid Services

- BGL should pay a share of default charges and PJM administrative charges.

- At least 12 months public notice should be required prior to proposed addition of any BGL.

- The PJM tests need to be defined and criteria for acceptance or rejection defined in advance. Study results should be available to IMM. Public version should be made available to PJM members.

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Capacity Status: Jurisdictional Issues

- It should be a requirement that the host generator provide evidence from all affected state and local jurisdictions that such jurisdictions have been fully informed of the nature of the proposed arrangement and agree that they do not and will not have jurisdiction of any kind.

- Distribution costs per state law/regulation.

- Need clear definition of whether the combination of host generation and BLS is FERC jurisdictional.

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Under Constellation Proposal

- The ability of PJM to call on the generating resource must be clearly defined.
  - PJM rights should be comparable to PJM's CEJA rights.
  - PJM can call on the generating resource for any reliability issue.
  - PJM can call on the generating resource for any type of emergency.
  - PJM authority to commit/schedule/dispatch must be clearly defined.
- PJM recall rights equivalent to energy exports from capacity resources. Recall should be instantaneous.

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Under Constellation Proposal

- The ELCC of any host generator should be evaluated based on providing service to BGL for most hours and therefore not providing energy to the system.

- The details of the modeling need to be explicitly defined and made available to IMM and PJM market participants.

- The impact on ELCC of all resources should be accounted for.

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Market Impacts

- Could the PJM market design continue to function if 20,000 MW of generation adopted the Constellation BGL proposal?

- Impact on energy market prices?

  - Removal of 20,000 MW of low cost generation for almost all hours of the year will increase energy market prices.

  - Even a relatively small impact on energy market prices could change total load payments by billions of dollars

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Market Impacts

- Could the PJM market design continue to function if 20,000 MW of generation adopted the Constellation BGL proposal?

- Impact on reliability?
  - Can system run reliably with significant amounts of energy removed from parts of grid for most hours?
  - Transmission upgrades required?
  - Impact on binding constraints?
  - Impact on congestion?
  - Impact on reserve prices?
  - PJM should perform retirement analysis for all such resources.

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Market Impacts

- Could the PJM market design continue to function if 20,000 MW of generation adopted the Constellation BGL proposal?

- Impact on the cost of transmission?

  - Will transmission upgrades be required to offset the impact of removal of significant amounts of energy for most hours?

- Impact on cost of ancillary services?

  - Is a significant level of ancillary service supply removed with relevant generation?

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Capacity Market Design (1)

- Forward looking (three years)

- Annual

- Locational
  - Transmission constraints modeled per CETO/CETL

- Sellers must offer all capacity resources
  - Capacity resources defined by deliverability test
  - Capacity resource MW based on CIRs
  - Does not apply to storage, intermittent, DR

- Load must buy to meet defined reliability goals
  - Administrative capacity market demand (VRR curve)

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Capacity Market Design (2)

- Definition of product
  - Homogeneous
  - Energy delivery for 8,760 hours per year
  - ELCC for conversion to homogeneous product
- Performance incentives
- Competitive
- Market power and market power mitigation
- Role of demand side resources
- Role of imports (pseudo tie rules)
- Retirements and RMRs

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Capacity Market Design (3)

- Must offer in energy market
  - Every day
  - Full capacity (ICAP)
  - With physical parameters (PLS)
  - Firm fuel not required
  - Follow PJM dispatch and commitment instructions
  - Must offer obligation should apply to all capacity resources without exception, including storage, intermittent, and DR.

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