

PJM Status Quo for Capacity Storage

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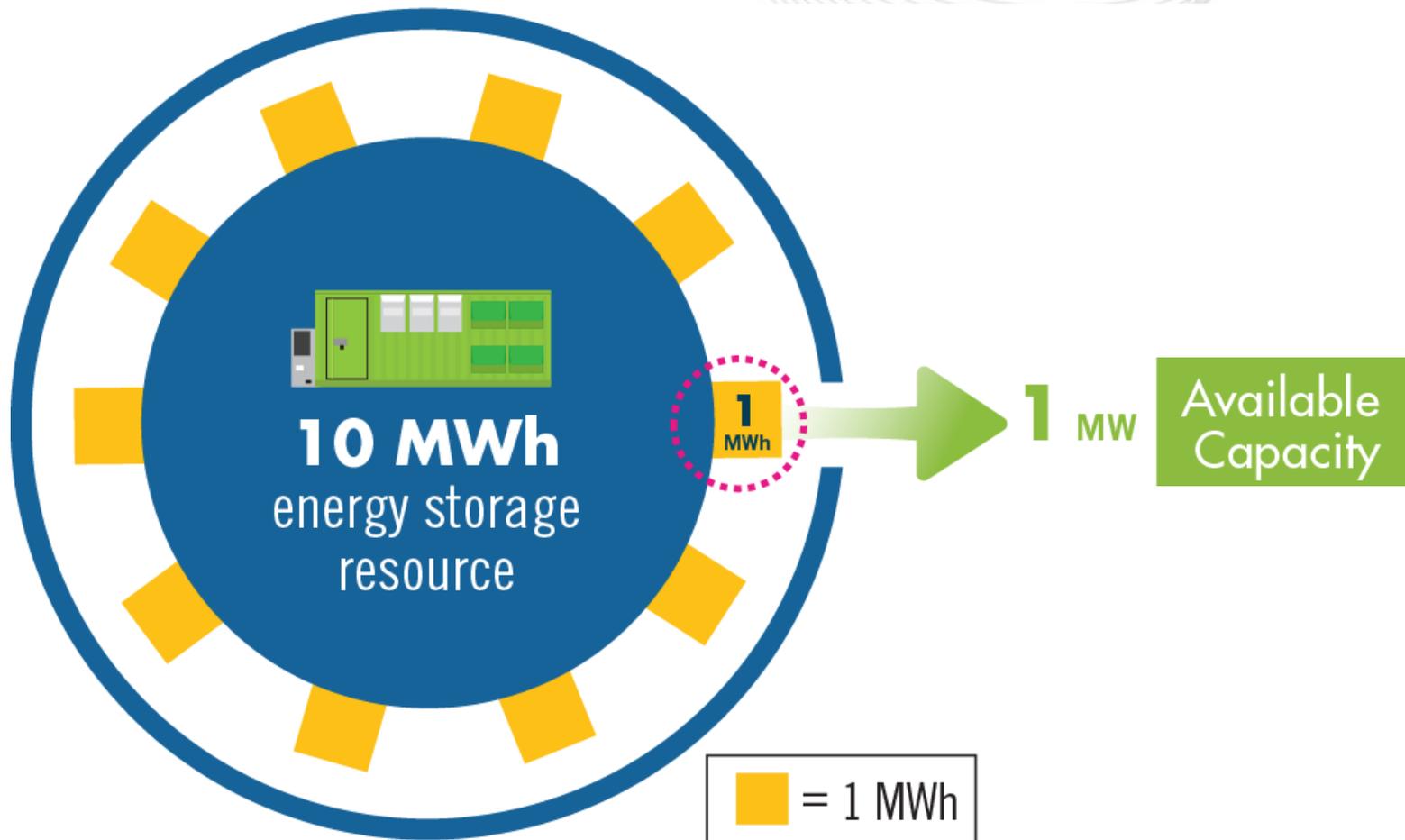
Advanced Analytics

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Market Implementation Committee: Special Session on
Capacity Market Capability of Energy Storage Resources

- Capacity Market “10 hour rule”
 - Role of Capacity Interconnection Rights
 - Annual Verification of capability
 - Capacity Market Must Offer Obligation
 - Performance Assessment Interval Obligation
- Daily Operations
 - Capacity Storage day-ahead must offer obligation
 - Outages
 - EFORd

What is the ten hour rule?



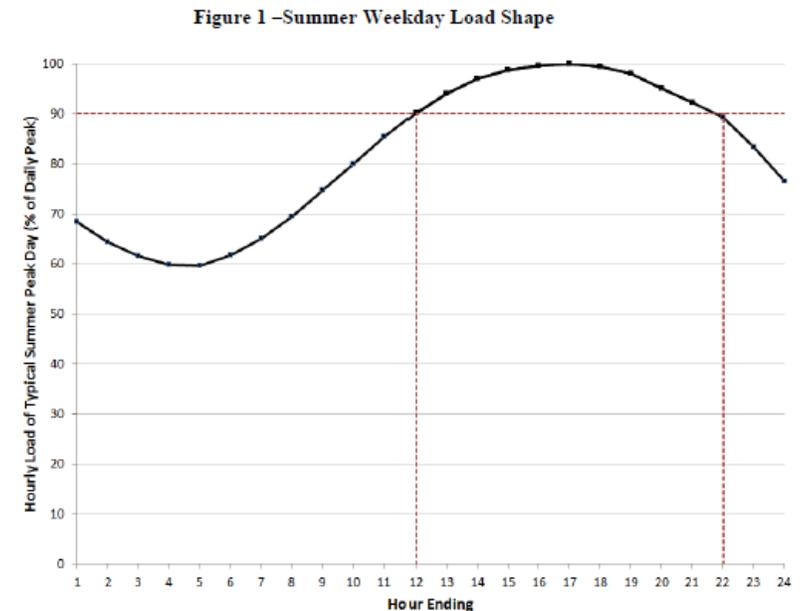
PJM maintaining the requirement, per manual 21, that capacity resources have a minimum 10 hour duration.

ESR capacity interconnection rights will be derated based on the total energy capability of the resource

- Total MWh/10h

- 10 hours, current rule for Capacity Storage Resources
- Comparable to Other Resources
- Consistent with elevated demand
- Penetration and Duration are Linked

<https://pjm.com/directory/etariff/FercDockets/3872/20181203-er19-469-000%20.pdf>





- Within the PJM New Services Queue resources are evaluated for Energy (maximum facility output) and Capacity (Capacity Interconnection Rights)
- If granted CIRs the storage unit can elect to offer into RPM having met the requirements for offers
 - IA: ISA or WMPA
 - BRA: Facilities Study Agreement > 20 MW or Impact Study Agreement <= 20 MW
- Capacity Interconnection Rights cap the total considered Installed Capacity
- Once converted to a Unforced Capacity those MW can be offered into RPM

**UCAP is ICAP*EFORd (the forced outage rate of a unit)..*

- Summer test periods June 1 – August 31 each year
- Test duration one contiguous hour
- MWh taken into account in CIR, but not in annual testing

PJM Manual 21:

Rules and Procedures for Determination of
Generating Capability

- Energy Storage Resources are exempt from the must offer requirement in RPM
- *Note: ESR are NOT exempt from the Day-ahead Energy Market must offer requirement*

- Like all Capacity Performance resources during Performance Assessment Intervals (i.e., shortage and related emergencies), Energy Storage Resources must be available to PJM and produce power according to PJM expectations based on system conditions for the duration of the PAI, even if it exceeds 10 hours.
- An ESR that fails to meet expected performance during a PAI, due any reason, can face a Non-Performance Charge.

- *a Capacity Storage or Intermittent Resource shall satisfy the must offer requirement by either self-scheduling or offering the unit as a dispatchable resource, in accordance with the PJM Manuals, where the hourly day ahead self-scheduled values for such resources may vary hour to hour from the capacity commitment.*

- Lack of charge is not considered a Forced outage in some instances
 - Unless called by PJM and unable to perform (forced outage)
 - A forced outage should ensue if a storage resource runs out of charge before it delivers its committed energy scheduled for the operating day.
- Energy Storage must enter outages much like other generation resources (excluding solar and wind) into eGADs
- Calculation of UCAP is done using EFORd equations in PJM Manual 22: Generator Resource Performance Indices