

Energy Storage Use Cases



**NEW YORK BATTERY
AND ENERGY STORAGE**
TECHNOLOGY CONSORTIUM

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Key Drivers from PSC Order and Roadmap



- Tariff/Retail Actions
- Bridge Incentive
 - Incentive for BTM Storage
 - Solar + Storage incentive (\$350/kWh up to 4 hours)
 - Bulk storage incentive in coordination with Utility procurement program
- Longer duration Demand Response program
- Utility procurement program
- NWA+

Anticipated Installations

- A wide range of use cases are likely to emerge
- We expect use case to continue to evolve
- Interconnections studied with full physical capability or submitted operational constraints, but not locked to use case.

Standalone Energy Storage: Behind-The-Meter C&I



- Primary focus on Peak Load Reduction
- Non-Exporting
 - Demand charge reduction
 - Usually standby rate and/or Rider Q
 - Demand Response participation with no export
 - System size typically 10% to 25% of customer peak load
- Exporting
 - Demand charge reduction
 - Standby rate (including Rider Q) or Time of Use Rates
 - DR participation
 - These projects usually will export for DR (when allowed)
 - VDER (ancillary value stream, will depend on the customers load profile)
 - System size typically 50% of customer peak load

Solar + Storage: Behind-the-meter C&I



- Builds on values discussed for stand-alone storage
- Non-exporting
 - Maximize self consumption in locations where VDER compensation is low.
- Exporting
 - Demand charge reduction
 - Demand Response
 - VDER
 - DRV value enhancement
 - Capacity value enhancement (Alt 2: 2-7pm summer)

CHP + Storage: Behind-the-meter C&I

- NYSERDA CHP incentives focusing on CHP with advanced control and/or energy storage
- Compensation
 - Optimization of performance and sizing of CHP system
 - Demand Charge Reduction
 - Standby rate and/or Rider Q (eligibility depends on utility)
 - Demand Response participation (export for DR when allowed)
 - VDER (or other export)
 - Rider Q Option C (Con Ed)
 - Will have higher levels of export than most other combinations

Examples of more complex use cases

Behind-the-meter C&I



Behind-the-meter Solar+Storage for demand charge management, demand response, ancillary services, and resiliency

Asset type(s): Storage + Solar

Revenue streams:

- Utility bill savings by maximizing onsite consumption of solar generation

- Demand charge management

- Demand response

- Ancillary services (e.g. frequency regulation and/or spinning reserves at NYISO)

- Resiliency - support building critical loads during distribution grid outage

Export profile:

- Variable - depends on DR event occurrences and NYISO's 6-second frequency regulation signal

Examples of more complex use cases

Behind-the-meter C&I



Behind-the-meter CHP+Solar+Storage for load shifting, demand charge management, demand response, ancillary services

Asset type(s): Storage + Solar + CHP

Revenue streams:

- Utility bill savings by maximizing onsite consumption of solar generation

- Load shifting to match CHP's thermal output (useful in electrically-limited buildings)

- Demand charge management

- Demand response

- Ancillary services (e.g. frequency regulation and/or spinning reserves at NYISO)

- Resiliency - support building critical loads during distribution grid outage

Export profile:

- Variable - depends on DR event occurrences and NYISO's 6-second frequency regulation signal

Examples of more complex use cases

Behind-the-meter C&I



Behind-the-meter Fuel Cell+Solar+Storage for demand response, ancillary services and resiliency

Asset type(s): Storage + Solar + Fuel Cell

Revenue streams:

- Utility bill savings by maximizing onsite DG consumption

- Demand charge management

- Demand response

- Wholesale energy market participation (Day-ahead and/or Real-time energy markets at NYISO)

- Ancillary services (e.g. frequency regulation and/or spinning reserves at NYISO)

- Resiliency - support building critical loads during distribution grid outage

Export profile:

- Variable - depends on LBMP, DR event occurrences and NYISO's 6-second frequency regulation signal

Residential Use Cases

- Solar + Storage
 - Residential Time of Use Rates (Future)
 - Demand Response participation (may export for DR when allowed) either on their own or via an aggregator
 - PSEG-LI has a proposed incentive program for the deployment of combined solar+storage residential systems for participation in their dynamic load management (DLM) tariff
- Standalone Storage
 - Backup Power
 - Demand Response participation
 - Via an aggregator

Standalone Energy Storage: Front-of-the-Meter



- Utility Interconnected
 - Compensation
 - Utility programs (NWA)
 - Demand Response
 - Both Utility and ISO DR
 - Import energy through TOU/Standby Rate
 - Opportunity for future dual participation with ISO markets
- Wholesale Interconnected
 - Wholesale market participation - energy, capacity, regulation and reserves.

Solar + Storage: Front-of-the-Meter

- Both AC and DC coupled projects
- Community Distributed Generation
 - VDER
 - DRV value enhancement
 - Capacity value enhancement (Alt 2: 2-7pm summer)
- Wholesale Interconnected (Proposed)

Non-Wires Alternatives

- May feature any of the use cases above
 - Compensation from the Utility for NWA service
 - Compensated through another mechanism when not operational on behalf of the utility
- BTM NWA solutions generally have more straight forward non-NWA service revenue streams
- FTM NWA solutions include dedicated resources and resources participating in ISO market but callable by utility with more that 24 hour notice
- Usually the battery solution will export as part of its NWA role

ISO Aggregation and Dual Participation

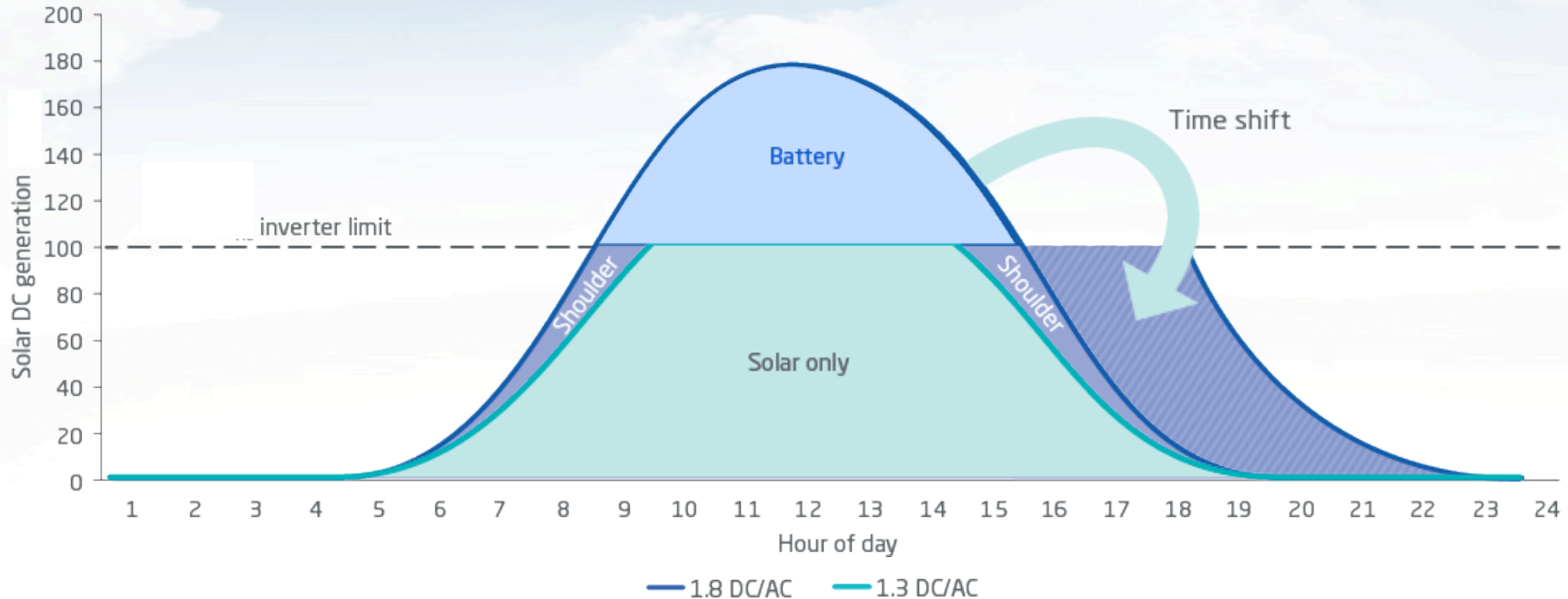


- ISO DER Roadmap process
 - Market rules planned to be finalized this winter
 - 2021 implementation
 - Dual participation may take longer – PSC order working group to accelerate
- Most likely aggregation use case will be focused on load reduction (ISO Demand response program particularly SCR) or capacity
- Still are significant decisions to be made on Dual Participation – area of interest particularly for large projects and NWA projects
- Need to harmonize interconnect process

Storage to maximize interconnection

- Storage can be used to modify the properties of exported energy from DG assets
 - Mitigate voltage fluctuation/flicker issues
 - Avoid project size reduction
- Increase Solar energy for a given interconnection size

Maximizing Solar with Interconnect constraint



Thank You

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