New York ISO
Independent System Operator

NYISO Pilot Program

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Background

Date	Working Group	Discussion points and links to materials
02-02-17	Posted	Distributed Energy Resources Roadmap for New York's Wholesale Electricity Market
02-28-17	Market Issues Working Group (MIWG)	Comparison of pilot projects and programs in organized wholesale electric markets
05-05-17	Market Issues Working Group (MIWG)	Pilot program Framework Proposal
06-21-17	Market Issues Working Group (MIWG)	Pilot Program Framework Proposal
05-15-18	Market Issues Working Group (MIWG)	NYISO Pilot Program Update
07-26-18	Market Issues Working Group (MIWG)	NYISO Pilot Program Update
10-03-19	Market Issues Working Group (MIWG)	NYISO Pilot Program Status Update

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Background

- In 2017, the DER Roadmap initiated an effort to develop a framework to enable pilot projects to be tested to help the NYISO gain an understanding of how the integration of new technologies will affect NYISO systems
- In 2018, the NYISO selected three proposals from a Final Review Process and included aggregations comprised of the following:
  - High-rise buildings capable of curtailing load
  - In-front-of -the-meter battery energy storage facilities
  - In-front-of -the-meter battery energy storage facilities co-located with solar
- The Pilot Program was administered through a test environment, not in the NYISO's production *(i.e.* "live") market and operations systems
- Participation in the Pilot Program was voluntary and provided no compensation for any energy supplied to the grid in response to a pilot dispatch
- The Pilot Program concluded 10/31/2020

Objectives

- **Telemetry & Communication**
  - Demonstrate simultaneous communication from a Pilot Aggregation to NYISO and the TO
  - Demonstrate alternative telemetry medium using SD-WAN and public internet
- **Dispatch & Evaluation**
  - Real-time dispatch of multiple resources in an aggregation
  - Evaluate an aggregation's ability to meet real time dispatch basepoints with aggregated resources
  - Evaluate an aggregator's ability to determine aggregation level operating parameters
- **Coordination**
  - Demonstrate how a Market Participant can notify the NYISO of any non-pilot/non-wholesale activity
  - Demonstrate a Market Participant's capability to modify their offer/derate based on coordination with the TO in Real-Time and in Day-Ahead time horizons

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Pilot Project #1

Demand Response Aggregation

Pilot Sponsor: iES/Axon

- In May 2019, iES/Axon successfully completed its Pilot Project
- An aggregation of 4 demand response resources in Zone J were dispatched
  - The Aggregation's capability was 0.6 MW
  - A 6-second basepoint signal was sent to the Pilot Aggregation; the 6-second basepoint signal was created based historical data of a generator dispatched on a peak day
  - Telemetry was exchanged using ICCP over a secure public internet connection using SD-WAN
- An alternative telemetry scheme was employed using utility meter pulses and a smoothing spline algorithm
- The performance of each DER/Facility in the Aggregation was measured individually using a baseline and iES summed the data into a single net-performance signal for the Aggregation and sent to NYISO over ICCP

Outcomes

- **Demand Response Baselines**
  - The Pilot Aggregation greatly exceeded the desired output from NYISO as measured from it's calculated baseline during the test
  - This experience has informed the NYISO on building out the necessary tools to validate and process baselines in the DER Participation Model
- **Software Defined –Wide Area Network (SD-WAN)**
  - Installation and configuration completed as expected
  - No appreciable latency was measured over the testing period
- **Challenges**
  - The voluntary participation in the pilot without financial compensation limited the availability and ability to dispatch this pilot project for an extended period of time

Pilot Project #2

Energy Storage Aggregation

Pilot Sponsor: Consolidated Edison of New York

- **NYISO successfully dispatched Con Edison's Pilot Project over a period of 3 months (April –June)**
- **Pilot Project consisted of 1 - 250 kW, 1 MWh battery**
  - Energy, Reserves and Regulation were all tested
  - Approximately 12 MWh injected to the grid over this period as requested by NYISO
  - A Regulation Performance Index of 1 (i.e., 100% performance) was calculated throughout testing
- **A third-party telemetry metering and telemetry provider managed the dispatch from NYISO to the battery over SD-WAN network**
- **Several coordination exercises were tested and discussed to inform the "NYISO-DSP-Aggregator operational coordination framework"**

Outcomes

- **SD-WAN**
  - Installation and configuration completed as expected
  - No appreciable latency was measured over the testing period
- **Performance**
  - Energy and Regulation signals were modified from historical data of generators dispatched by the NYISO on normal and peak operating days
  - The battery perfectly followed all basepoints sent from the NYISO throughout the testing period
- **Challenges**
  - Delays in commissioning additional energy storage facilities attributed to COVID-19 prevented the planned addition of facilities to this pilot project
    - This restricted opportunities to conduct coordination exercises that involved varied availability of facilities in the aggregation

Pilot Project #3

Solar-Plus-Storage

Pilot Sponsor: Borrego Solar/AES

- This project was proposed as a 5 MW Aggregation comprised of 1 MW of Solar, and two 2 MW energy storage facilities that could operated independent of each other
- NYISO was unfortunately unable to conduct any Pilot dispatch activity with Borrego/AES
- SD-WAN
  - Installation and configuration was completed as expected
- Challenges and Issues:
  - Physical Installation and configuration of communication and controls equipment at the project site were delayed by business disruptions caused by COVID – 19
  - The NYISO's contract to evaluate SD-WAN technology expired at the end of October
    - Bad weather in the last week available for testing, disrupted the facilities connection to the grid

Pilot Program Closure and Conclusion

Conclusion and Key Findings

- The NYISO has concluded its Pilot Program
- Overall, the Program has informed the NYISO and built operational DER experience among the NYISO, utilities and pilot participants
- The alternative solutions and enabling technologies that the NYISO has included for the DER Participation Model demonstrated that they help eliminate barriers to wholesale market participation for DER and are expected to be utilized by future in the DER Participation Model
- SD-WAN technology was successfully introduced and tested by the NYISO and Utility network engineers
- Alternative telemetry solutions implemented at scale can facilitate the participation of aggregations of smaller (less than 100 kW) facilities
- While not tested in the Pilot Program, future potential support for DNP3 as a protocol for telemetry was voiced as a welcome addition by participants, citing a lack of familiarity with ICCP in the larger DER community that did lead to delays in setting up communications with the NYISO during Pilot testing

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

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Questions?