

Industry Host: NYISO

Title: Cost effective, accurate and simple energy meter data transmission for DER

Challenge:

Develop a cheap, accurate, and robust method of transmitting DER/DR (Distributed Energy Resource/Demand Response) energy meter data to the grid operators so that they can ensure the reliability of the grid.

Background:

As the penetration of DER increases and these DER (in this particular case DER are smart homes or smart devices in homes) seek to provide services back to the electric grid, advanced real-time telemetry (energy meter data transmission) is required to maintain the reliability of the grid. To properly secure the grid and ensure the lights stay on, grid operators receive telemetry on a six second basis which is used to dispatch generation on the system to reliably meet the constantly changing load conditions. This advanced telemetry exists today and is used successfully by the large central generation facilities. However, it suffers from some major issues that are roadblocks for DER. These are the following issues:

- 1) It is very expensive equipment to measure the energy kW and to communicate the data in real-time
- 2) The energy kW measurement devices require licensed electricians to install
- 3) The current technology is inaccurate when trying to measure energy at the scale of DER (1kW or more) at a frequency (6 seconds or less) required for reliable operation of the grid. NYISO requires this frequency of data to properly maintain Area Control Area (ACE) as specified by the Northeast Power Coordinating Council's (NPCC) Regional Reliability Reference Directory #5.
- 4) The communications devices and setup required to send the telemetered data from the DER to the appropriate control center requires IT professionals to configure it

Without the ability to transmit accurate, real-time data from distributed resources to the grid operators, the full potential of the resources cannot be reached.

Boundaries and Considerations:

A viable solution would be one that is:

- 1) NYISO needs the energy meter data at a frequency of 6 seconds or less with no more than 5% error to maintain the reliability of grid.
- 2) Market penetration is important to getting enough coverage to accurately understand how DER/DR resources affect the grid. Therefore a solution likely needs to be installed in most homes across the country.
- 3) If homeowners are the installers of your solution, ensure the process is simple and requires no in depth electrical knowledge or IT professionals to configure it.