Use Case – Data Usage Descriptions

The WEQ Business Practices Subcommittee has developed a use case to identify data elements that may be needed in the registration of Distributed Energy Resource (DER) aggregations and/or individual resources comprising a DER aggregation. This use case is envisioned to support the various entities with which the DER registration may interact as a common set of information requirements. The WEQ BPS is seeking input on if there are additional data elements that may be required.

An ISO or RTO may elect to increase or reduce the amount of information obtained from the data usage description subject to their Governing Documents. Other entities, such as distribution utilities, may have other data requirements. This information does not define which party or entity is providing the data.

1. Registration for the resource aggregation from the ISO/RTO perspective

* DER Aggregation ID
* Locational information
* Geographic location
  + Longitude and latitude (conditionally required i.e. offshore wind)
  + Street name and number (conditionally required i.e. land-based facilities)
  + City (conditionally required i.e. land-based facilities)
  + State (required)
  + County
  + Country (required)
  + Province (required)
  + Apartment number
* Zonal information (network)
  + Load zone
  + Load aggregation point
  + Reserve zone
  + Capacity zone
* Market nodal information (p-node) (may or may not be a single p-node)
  + Default distribution factors (for multi-nodal DER aggregations)
* Electrical nodal information (e-node aka service points (RTO/ISO point of interconnection)
* Distribution Utility
* Energy Authority (relevant electric retail regulatory authority)
* Load Serving Entity
* Market Participant/Aggregator Name
* Metering agent
* Balancing Area
* Pseudo-ties/dynamic schedules
* Service location (maybe point of interconnection?)
* Customer account
* Service delivery point
* Attestation/certificates
* DER aggregation would not result in double counting (yes/no)
* Distribution utility/load serving entity reliability attestation (yes/no)
* Relevant electric retail regulatory authority allows (yes/no)
* Operational contact
* Planning contact
* Ownership of the resource (jointly owned or not)
* Operational characteristics of the aggregation
  + Nameplate capacity in megawatts
  + Ramp rate
  + Response time
  + Maximum run time
  + Minimum run time
  + DER aggregation type (homogeneous or heterogeneous)
    - Heterogeneous type, including DER type comprising the aggregation
    - Number of DERs in the aggregation
  + DER aggregation profile (historical or expected DER aggregation output with active and reactive power profiles)
  + Dispatchable energy resource (yes/no)
  + Ability to reverse direction (supply vs. demand switching)
  + Voltage control (yes/no; volt-r)
  + Frequency control
  + Inertial control
  + Feeder voltage
  + Feeder impedance – distribution system equivalent feeder impedance
  + Reactive support
  + Total energy capacity/maximum state of charge (megawatt hours or kilowatt hours)
  + Market product eligibility (capacity, energy, regulation, etc.)

These data elements were identified by the WEQ BPS, and the subcommittee seeks input from the industry on the applicability of these data elements.

* + Telemetry infrastructure to communicate operational characteristics
  + Metering infrastructure
  + Efficiency rating
  + Battery technology
  + Battery performance over time
  + Solar panel performance over time
  + Manufacturer of DER
  + Types of communication protocols supported
  + Operating status
  + Known/planned outages or maintenance
  + Duration of outage or maintenance
  + Start/end time of outage or maintenance
  + Mobility flag
  + Single phase/three-phase fault indicators
  + Loss of line faults (transformer configuration)
  + Weatherization applications
  + Designated dispatch entity
  + Nominal amperage/voltage
  + Heat rate
  + Transient ability limits
  + Number of resources in the aggregation

2. Registration for the individual resource from the ISO/RTO perspective

* DER ID
* Locational information
  + Geographic location
    - Longitude and latitude (conditionally required i.e. offshore wind)
    - Street name and number (conditionally required i.e. land-based facilities)
    - City (conditionally required i.e. land-based facilities)
    - State (required)
    - County
    - Country (required)
    - Province (required)
    - Apartment number
  + Zonal information
    - Load zone
    - Reserve zone
    - Capacity zone
  + Market nodal information (p-node)
  + Electrical nodal information (e-node aka service points)
    - Meter information
    - Substation
    - Feeder/circuit
    - Phase information
    - further details needed from SME
* Distribution Utility
* Energy Authority (relevant retail electric regulatory authority)
* Load Serving Entity
* Balancing Area
* Service location
  + Customer account
  + Service delivery point
  + Retail rate (net metering, dynamic pricing, etc.)
* Ownership of the resource (jointly owned or not)
* Operational contact
* Planning contact
* Asset owner contact
* Operational characteristics of resources comprising aggregation
  + DER type
  + Dispatchable energy resource (yes/no)
  + Nameplate capacity of a DER (in megawatts or kilowatts)
  + Battery resource
    - Battery technology
    - Battery performance over time
* Available Energy and Available Storage (in MWh)
* State of Charge
* Maximum State of Charge
* Minimum State of Charge
* Maximum Charge Limit
* Maximum Discharge Limit
* Maximum Charge Rate
* Maximum Discharge Rate
* Minimum Charge Time
* Maximum Charge Time
* Minimum Run Time
* Maximum Run Time
* Discharge Ramp Rate
* Charge Ramp Rate
* Minimum Discharge Limit
* Minimum Charge Limit
  + Solar resource
    - Performance over time
    - Number/capacity of PV cells
    - Autotracking capability
    - Obstructions
  + Wind resource
    - Number/capacity of turbines
  + Demand reduction resource
    - Demand reduction capability
  + Known operational constraints (i.e. analogue to permitting restrictions, environmental restrictions, contractual limit on when individual DER in aggregation can be dispatched)
  + Time delay to initiate response (start time)
  + Ability to reverse direction (supply vs. demand switching)
  + Voltage control (yes/no; volt-r)
  + Ride through capability (yes/no)
  + Frequency control
  + Inertial control
  + Feeder voltage
  + Reactive support
  + Sensitivity to ambient weather conditions
  + Relevant weather station id
  + Total energy capacity/maximum state of charge (megawatt hours or kilowatt hours)
  + Telemetry infrastructure to communicate operational characteristics
  + Metering infrastructure
  + Efficiency rating
  + Manufacturer of DER
  + Types of communication protocols supported
  + Applicable operating status conditions
  + Mobility flag
  + Single phase/three-phase fault indicators
  + Loss of line faults (transformer configuration)
  + Weatherization applications
  + Nominal amperage/voltage

These data elements were identified by the WEQ BPS, and the subcommittee seeks input from the industry on the applicability of these data elements:

* Distribution level data
* Interconnection data
* Designated dispatch entity