DRAFT STANDARDS – Distributed Energy Resources

Introduction

Applicability

PSE, GPE, LSE, TPSE, MO

Business Practice Standards

XXX-1 Registration of Distributed Energy Resources

XXX-1.1 An Entity registering a distributed energy resource or aggregation thereof shall register as the applicable entity within the NAESB EIR.

 An Entity seeking to register distributed energy resources shall acquire a Distributed Energy Resource Aggregation ID by registering in the NAESB EIR.

XXX-1.2 All distributed energy resources shall be registered with a unique DER ID by the responsible Market Participant

XXX-1.3 All distributed energy resource aggregations shall be registered with a unique DER Aggregation ID by the responsible Market Participant.

XXX-1.4 Governing Documents shall specify all requirements for registration for participation in an organized market administered by an ISO/RTO, which may vary from details outlined in the standard.

Appendix A – Data Elements

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| **DER Aggregation Data Elements** |  |  |
| **Category** | **Data Element** | **Data Element Definition** | **Party Providing Information** |
| Identity | DER Aggregation ID | Unique code value associated with DER aggregation | System Operator/generated  |
| Identity | Group version | Version number incremented to indicate membership changes in an aggregation | Market Participant |
| Geographic Locational | Longitude and latitude (conditionally required i.e. offshore wind) | Longitude and latitude of the aggregation | Market Participant |
| Geographic Locational | Street name and number (conditionally required i.e. land-based facilities) | Street name and number of the aggregation | Market Participant |
| Geographic Locational | City (conditionally required i.e. land-based facilities) | City of the aggregation | Market Participant |
| Geographic Locational | State | Two-letter state abbreviation of the aggregation | Market Participant |
| Geographic Locational | County | County of the aggregation | Market Participant |
| Geographic Locational | Country | Country of the aggregation | Market Participant |
| Geographic Locational | Province | Province of the aggregation | Market Participant |
| Geographic Locational | Zip Code | Zip code of the aggregation | Market Participant |
| Zonal Information | Load zone | Load zone associated with the aggregation | System Operator |
| Zonal Information | Load aggregation point | Load aggregation point associated with the aggregation | System Operator |
| Zonal Information | Reserve zone | Reserve zone associated with the aggregation | System Operator |
| Zonal Information | Capacity zone | Capacity zone associated with the aggregation  | System Operator |
| Zonal Information | Market nodal information (p-node) (may or may not be a single p-node) | Price node (p-node) associated with the aggregation  | System Operator |
| Operational | Default distribution factors (for multi-nodal DER aggregations) | Default distribution factors associated with the aggregation | Market Participant |
| Network Locational | Electrical nodal information (e-node aka service points (RTO/ISO point of interconnection) | Electrical node (e-node) information associated with the aggregation | System Operator |
| Entity | Aggregator ID | Unique identifier for the DER aggregator making the registration request | Market Participant |
| Entity | Distribution Utility  | The distribution utility behind which an aggregation is located or the distribution utility responsible for the load associated with the aggregation  | Market Participant |
| Entity | Relevant Electric Retail Regulatory Authority (RERRA) | A retail regulatory authority with responsibility for rates or rules regarding retail participation within an aggregation  | Market Participant |
| Entity | Public Utility Commission (PUC) | The state utility commission with jurisdiction over the aggregation | Market Participant |
| Entity | Load-Serving Entity | The NAESB EIR entity code for the load serving entity associated with the aggregation  | Market Participant |
| Entity | Market Participant/Aggregator Name | The market participant name associated with the aggregation | Market Participant |
| Entity | Metering agent | The metering agent responsible for providing settlement quality metering and performance data associated with the aggregation | Market Participant |
| Entity | Balancing Authority Area  | The balancing authority area associated with the aggregation | Market Participant |
| Entity | Asset Owner | The owner of the aggregation. (The owner may be the aggregator) | Market Participant |
| Operational | Pseudo-ties/dynamic schedules | The NAESB EIR registered pseudo-tie identifier or dynamic schedule details | Market Participant |
| Locational | Service delivery point [auxillary load drop point] | The service delivery point associated with the aggregation | Market Participant |
| Attestation | DER aggregation would not result in double counting (yes/no) | Yes/no attestation from the market participant regarding double counting (could include uploaded copy of attestation document) | Market Participant |
| Attestation | Distribution utility/load serving entity reliability concern (yes/no) | Yes/no attestation from the market participant that the distribution utility and load serving entity do not have reliability concerns (could include uploaded copy of attestation document) | Market Participant |
| Attestation | Relevant electric retail regulatory authority allows (yes/no) | Yes/no attestation from the market participant that the relevant electric retail regulatory authority allows participation (could include uploaded copy of attestation document) | Market Participant |
| Entity | Operational contact | Point of contact associated with operational parameters and performance of the aggregation  | Market Participant |
| Entity | Planning contact  | Point of contact associated with the planning parameters of the aggregation  | Market Participant |
| Information | Ownership of the resource (jointly owned or not) | Flag indicating if aggregation is jointly or solely owned  | Market Participant |
| Resource Descriptor | Nameplate capacity in megawatts  | Nameplate capacity associated with the aggregation in megawatts  | Market Participant |
| Resource Descriptor | Ramp rate | Ramping capability of the aggregation expressed in megawatts per minute | Market Participant |
| Resource Descriptor | Response time  | The amount of time needed for an aggregation to respond to a dispatch signal expressed in minutes  | Market Participant |
| Resource Descriptor | Maximum run time | Maximum run time at full capacity expressed in minutes | Market Participant |
| Resource Descriptor | Minimum run time | Minimum rum time at full capacity expressed in minutes | Market Participant |
| Resource Descriptor | DER aggregation type (homogeneous or heterogeneous) | Flag to indicate if aggregation is homogenous or heterogeneous  | Market Participant |
| Resource Descriptor | Heterogeneous type, including DER type comprising the aggregation | The type code associated with a heterogenous aggregation as defined in NAESB WEQ-XXX. | Market Participant |
| Resource Descriptor | Number of DERs in the aggregation | Integer value representing the number of individual DERs within an aggregation | Market Participant |
| Resource Descriptor | DER aggregation profile (historical or expected DER aggregation output with active and reactive power profiles) | The twenty-four hour load profile for the resources comprising the aggregation Hourly representation of historical or expected average output | Market Participant |
| Resource Descriptor | Dispatchable energy resource (yes/no) | Yes/no flag associated with the ability of the aggregation to respond to dispatch signals  | Market Participant |
| Resource Descriptor | Ability to operate as resource or load (supply vs. demand switching) | Flag to indicate if resource operates as load, supply, or both | Market Participant |
| Resource Descriptor | Voltage control (yes/no; volt-r)  | Yes/no flag to indicate if the aggregation can provide voltage control | Market Participant |
| Resource Descriptor | Frequency control  | Yes/no flag to indicate if the aggregation can provide frequency control | Market Participant |
| Resource Descriptor | Inertial control  | Yes/no flag to indicate if the aggregation can provide inertial control | Market Participant |
| Resource Descriptor | Feeder voltage  | Feeder voltage associated with the point of interconnection for the aggregation | Market Participant |
| Resource Descriptor | Feeder impedance – distribution system equivalent feeder impedance  | Feeder impedance associated with the aggregation  | Market Participant |
| Resource Descriptor | Reactive support  | Reactive support associated with the aggregation expressed in vars | Market Participant |
| Resource Descriptor | Total energy capacity (megawatt hours) | Total capacity capability of the aggregation represented in megawatt hours | Market Participant |
| Resource Descriptor | Market product eligibility (capacity, energy, regulation, etc.) | A description of the market services provided by the aggregation resource – one or more required | Market Participant |
| Resource Descriptor | Telemetry infrastructure to communicate operational characteristics  | The telemetry capabilities of the aggregation  | Market Participant |
| Resource Descriptor | Distribution metering infrastructure | Parameters laid out by the distribution utility with respect to metering requirements | Market Participant |
| Resource Descriptor | ISO/RTO metering infrastructure  | TBD | Market Participant |
| Resource Descriptor | Efficiency rating | TBD | Market Participant |
| Resource Descriptor | Battery technology | Indicator for type of battery technologies that may be part of the aggregation  | Market Participant |
| Resource Descriptor | Manufacturer of DER | Manufacturer associated with a generation distributed energy resource aggregation  | Market Participant |
| Resource Descriptor | Project status | Drop down option for current project status (development status of the DER) | Market Participant |
| ~~Resource Descriptor~~ | ~~Known/planned outages or maintenance~~  |  | ~~Market Participant~~ |
| ~~Resource Descriptor~~ | ~~Duration of outage or maintenance~~  |  | ~~Market Participant~~ |
| ~~Resource Descriptor~~ | ~~Start/end time of outage or maintenance~~  |  | ~~Market Participant~~ |
| Resource Descriptor | Mobility flag | Yes/no indicator of whether the aggregation is mobile or stationary  | Market Participant |
| ~~Resource Descriptor~~ | ~~Nominal amperage/voltage~~ |  | ~~Market Participant~~ |
| Resource Descriptor | Transient ability limits  | TBD | Market Participant |
|  | Service Type | List of type of services  |  |
|  | List of DERs | Unique identifiers of the DERs in the aggregation |  |

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| **DER Data Elements** |
| **Category** | **Data Element** | **Data Element Definition** | **Party Providing Information** |
| Identity | DER ID |  |  |
| Geographic Locational | Longitude and latitude (conditionally required i.e. offshore wind) |  | Market Participant |
| Geographic Locational | Street name and number (conditionally required i.e. land-based facilities) |  | Market Participant |
| Geographic Locational | City (conditionally required i.e. land-based facilities) |  | Market Participant |
| Geographic Locational | State (required) |  | Market Participant |
| Geographic Locational | County |  | Market Participant |
| Geographic Locational | Country (required) |  | Market Participant |
| Geographic Locational | Province (required) |  | Market Participant |
| Geographic Locational | Apartment number |  | Market Participant |
| Geographic Locational | Zip Code |  | Market Participant |
| Zonal Locational | Load zone |  | System Operator |
| Zonal Locational | Reserve zone |  | System Operator |
| Zonal Locational | Capacity zone |  | System Operator |
| Zonal Locational | Market nodal information (p-node) |  | System Operator |
| Resource Descriptor | Meter information |  | Market Participant |
| Locational | Substation |  | System Operator |
| Locational | Feeder/circuit |  | System Operator |
| Resource Descriptor | Phase information |  | System Operator |
| Entity | DER owner | Name of the owner of the individual DER | Market Participant  |
| Entity | DER operator | Name of the entity that operates the DER | Market Participant |
| Entity | Aggregator name | Name of the aggregator of the DER | Market Participant |
| Entity | Aggregator ID | Unique identifier for the DER aggregator making the registration request | Market Participant |
| Entity | Distribution Utility  |  | Market Participant |
| Entity | relevant retail electric regulatory authority (RERRA) |  | Market Participant |
| Entity | State Public Service Commission |  | Market Participant |
| Entity | Load Serving Entity |  | Market Participant |
| Locational | Balancing Area  |  | Market Participant |
| Locational | Service delivery point [auxillary load drop point] |  | Market Participant |
| Resource Descriptor | Ownership of the resource (jointly owned or not) |  | Market Participant |
| Resource Descriptor | Operational characteristics of resources comprising aggregation |  | Market Participant |
| Resource Descriptor | DER type |  | Market Participant |
| Resource Descriptor | Dispatchable energy resource (yes/no) |  | Market Participant |
| Resource Descriptor | Nameplate capacity of a DER (in megawatts or kilowatts) |  | Market Participant |
| Resource Descriptor | Battery technology |  | Market Participant |
| Resource Descriptor | Battery performance over time |  | Market Participant |
| Resource Descriptor | Available Energy and Available Storage (in MWh) |  | Market Participant |
| Resource Descriptor | State of Charge |  | Market Participant |
| Resource Descriptor | Maximum State of Charge |  | Market Participant |
| Resource Descriptor | Minimum State of Charge |  | Market Participant |
| Resource Descriptor | Maximum Charge Limit |  | Market Participant |
| Resource Descriptor | Maximum Discharge Limit |  | Market Participant |
| Resource Descriptor | Maximum Charge Rate |  | Market Participant |
| Resource Descriptor | Maximum Discharge Rate |  | Market Participant |
| Resource Descriptor | Minimum Charge Time |  | Market Participant |
| Resource Descriptor | Maximum Charge Time |  | Market Participant |
| Resource Descriptor | Minimum Run Time |  | Market Participant |
| Resource Descriptor | Maximum Run Time |  | Market Participant |
| Resource Descriptor | Discharge Ramp Rate |  | Market Participant |
| Resource Descriptor | Charge Ramp Rate |  | Market Participant |
| Resource Descriptor | Minimum Discharge Limit |  | Market Participant |
| Resource Descriptor | Minimum Charge Limit |  | Market Participant |
| Resource Descriptor | Performance over time |  | Market Participant |
| Resource Descriptor | Number/capacity of PV cells |  | Market Participant |
| Resource Descriptor | Autotracking capability |  | Market Participant |
| Resource Descriptor | Obstructions |  | Market Participant |
| Resource Descriptor | Number/capacity of turbines |  | Market Participant |
| Resource Descriptor | Demand reduction capability |  | Market Participant |

Appendix B – Timing Table

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| Action | Initiator | Actor | Response Time |
| Market Participant Registration with ISO/RTO | * Market participant
 | * ISO/RTO
 | * Defined in ISO/RTO governing documents
 |
| DER Registration |  |  |  |
| * Distribution Utility reliability assessment
* Distribution Utility program compatibility assessment
 | * ISO/RTO
 | * Distribution Utility performs the assessment
 | * Should respond within 60 days of request;
 |
| RERRA Attestation* Allowed participation
* Participation will not result in double-counting
 | Market Participant | RERRA provides | Should be completed prior to completion of aggregation registration  |
|  |  |  |  |
|  |  |  |  |
| Modification | Market Participant | ISO/RTO | Defined in ISO/RTO governing documents |
| Termination | Market Participant | ISO/RTO | Defined in ISO/RTO governing documents |
|  |  |  |  |

Parking Lot Items:

1. Indicator as to if transmission or distribution upgrades are required as part of participation
2. Related to aggregation versioning, should the standards also address/accommodate portfolio management – identifying characteristics about the resources that make up an aggregation
3. Identified data elements address capability of resource/aggregation to provide some grid services – are additional data elements and/or standards needed to support more granularity in this area