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 |
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|  |  |  |  |
| Modification | Market Participant | ISO/RTO | Defined in ISO/RTO governing documents |
| Termination | Market Participant | ISO/RTO | Defined in ISO/RTO governing documents |
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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
4. Add data elements to support minimum down time (minimum amount of time resource must be down before can start)
5. DER aggregation profile may need a seasonal aspect