Use Case Data Usage Description

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 (to avoid double counting)
	+ Double counting
	+ Distribution utility/load serving entity attestation
	+ Relevant electric retail regulatory authority permission
* 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)
	+ Dispatchable energy resource (yes/no)
	+ Ability to reverse direction (supply vs. demand switching)
	+ Voltage control (yes/no; volt-r) – see NERC guidance
	+ Frequency control – see NERC guidance
	+ Inertial control – need SME input
	+ Feeder voltage – need SME input
	+ Reactive support – need SME input
	+ Total energy capacity/maximum state of charge (megawatt hours or kilowatt hours)
	+ Market product eligibility (capacity, energy, regulation, etc.)

Are these needed in a registry?

* + Telemetry infrastructure to communicate operational characteristics
	+ Metering infrastructure (RMQ metering standards applicability – R. Berdahl)
	+ 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
	+ Joint ownership/JOU operations
	+ Nominal amperage/voltage
	+ (Review NERC materials to be provided by R. Berdahl for additional potential characteristics)
	+ Heat rate – need more input, possibly market monitoring
	+ Transient ability limits – need SME input
	+ Number of resources in the aggregation
	+ Types 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.)
* Operational characteristics of resources comprising aggregation
	+ Nameplate capacity of a DER (in megawatts or kilowatts)
	+ Ramp rate
	+ Response time
	+ Maximum run time
	+ Minimum run time
	+ DER type
	+ 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)
	+ Dispatchable energy resource (yes/no)
	+ Ability to reverse direction (supply vs. demand switching)
	+ Voltage control (yes/no; volt-r) – see NERC guidance
	+ Ride through capability (yes/no)
	+ Frequency control – see NERC guidance
	+ Inertial control – need SME input
	+ Feeder voltage – need SME input
	+ Reactive support – need SME input
	+ 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 (RMQ metering standards applicability – R. Berdahl)
	+ Efficiency rating
	+ Battery technology
	+ Battery performance over time
	+ Solar panel performance over time
	+ 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
	+ Joint ownership/JOU operations
	+ Nominal amperage/voltage
	+ (Review NERC materials to be provided by R. Berdahl for additional potential characteristics)

Are these needed in a registry?

* + Forecast weather data
	+ Actual weather data
	+ Distribution level data
	+ Interconnection data
	+ Known/planned outages or maintenance
	+ Duration of outage or maintenance
	+ Start/end time of outage or maintenance
	+ Designated dispatch entity