



Project EDGE

Wholesale Service Qualification Guide December 2021

Version: Initial Draft

Important notice

PURPOSE & AUDIENCE

This document provides overview of the Wholesale Service Qualification test and data requirements to facilitate participation in the EDGE DER Marketplace operation and to deliver Wholesale Services. The Australian Energy Market Operator (AEMO) provides this information as a service targeting business and IT staff in participant organisations.

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DOCUMENT IDENTIFICATION

Business Custodian: New Markets Services

Prepared by: Project EDGE Team

Last update: Thursday, 16 December 2021 3:11 PM

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VERSION RELEASE HISTORY

Version	Effective date	Summary of changes
Initial Draft	1 Dec 2021	Initial Draft for consultation

1. Introduction

This Project EDGE Wholesale Service Qualification document and accompanying test sheet are published to provide prospective Aggregators and interested parties with an overview of the raw DER Services, Wholesale Service Qualification and test data requirements for participating in Project EDGE. Its contents are for the purpose of facilitating the research activities of Project EDGE and are not intended to set a precedent to be adopted within current or future market arrangements. The project intends to gather evidence to inform future market arrangements that would occur through appropriate consultation processes

1.1 Purpose

This document aims to assist intending EDGE aggregators in demonstrating the capability of their DER portfolio to deliver, measure and verify DER services. This is a prerequisite for selection to participate in Project EDGE.

This document provides descriptions of:

- DER Capability
- Definition of Raw DER Services
- Wholesale Service Qualification test and test data requirements.

The wholesale service qualification test is intended to demonstrate an aggregator's ability to verifiably deliver wholesale market Energy services. For local network support services, aggregators may be required to provide additional data and/or conduct additional tests particularly where Voltage management services are concerned. These services are currently being defined. To meet local service requirements for active power, it is anticipated that the wholesale service qualification tests can be repeated with subset of customer sites concentrated in a particular geography within the distribution network (e.g at zone substation or feeder level).

This information is provided as an overview of the requirements needed to participate in Project EDGE. Testing for capability will be required only by aggregators who are invited to register after the expression of interest phase has been completed. Aggregators invited to register are encouraged to consult and liaise with Project EDGE team as they finalise their Raw DER Service test plan, conduct these tests and gather results.

1.2 Audience

This document is intended for staff of Aggregators who are involved in product and application development.

1.3 Assumed reading and context

This document assumes a knowledge and awareness of the following documents that have been published by AEMO in relation to Project EDGE

- [Project EDGE Factsheet](#)
- [Project EDGE Aggregator overview](#)
- [Applicant Expression of Interest form](#)
- [Project EDGE Data Specification: Part A](#)
- [Project EDGE Data Specification: Part B](#)
- [Project EDGE DUID Telemetry Overview](#)
- [Project EDGE EWF Solution introduction and information](#)
- [Project EDGE LSE Draft Overview](#)
- [Project EDGE Wholesale Service Qualification Guide](#)

2. Raw DER Services

Raw DER Services in the context of Project EDGE can be grouped in to two broad categories

- **Localised Services** are the Raw DER services that are applicable and relevant within the distribution network in a geographic area as defined by DNSP
- **System Services** are the Raw DER services for whole of system services/at Transmission level such as those traded in the wholesale energy market.

2.1 Localised Services

Raw DER Service Name	Raw DER Service Definition	Lead Time
Boost	Generation increase or reduction of load to enable real power benefits; for example, to reduce undervoltage issues	Instant
Buck	Generation decrease or increase of load to enable real power benefits; for example, to reduce overvoltage issues	Instant
Build	Using reactive power to make dynamic adjustments to alleviate forecasted excursion of voltage limits.	Fast – within 10 mins

Raw DER Service Name	Raw DER Service Definition	Lead Time
Bridge	Using reactive power to make dynamic adjustments to alleviate forecasted excursion of voltage or capacity limits as a substitution of real power.	Fast – within 10 mins
Balance	Shifting of real power from one part of the network to another; for example, load balancing across phases.	Fast – within 10 mins

2.2 DER Capability

DER assets within the aggregator portfolio must have one or more the below capabilities to deliver Raw DER Services.

DER Capability	Definition	Outcome
Turn Off	Ability to 'Turn Off' the DER device remotely i.e. remove the generation or consumption from the DER Asset	Generation/Load Reduction
Turn On	Ability to 'Turn On' the DER device remotely i.e. create/ start the generation or consumption from the DER Asset	Generation/Load Increase
Ramp Up	Ability to increase the generation or consumption from the DER Asset remotely thereby increasing the 'net' generation from portfolio or 'net' load consumed by portfolio.	Adjust or increase Generation/ Load
Ramp Down	Ability to decrease the generation or consumption from the DER Asset remotely thereby reducing the 'net' generation from portfolio or 'net' load consumed by portfolio.	Adjust or decrease Generation/ Load
Power Quality Mode	Ability to source or absorb 'Vars' from DER assets remotely	Change in 'Vars'

2.2.1 DER Capability & Raw DER Services

Based on the DER capability or the minimum asset dispatch capability (load and/or generation) the asset can provide one or more Raw DER Service(s). The table below represents the mapping between DER Capabilities and Raw DER Service.

Raw DER Service	Required DER Capability	Service Lead Time
Boost	<ul style="list-style-type: none"> • Turn Off, • Ramp Down 	Instant
Buck	<ul style="list-style-type: none"> • Turn On, • Ramp Up 	Instant
Build	<ul style="list-style-type: none"> • Power Quality 	Fast – within 10 mins
Bridge	<ul style="list-style-type: none"> • Power Quality 	Fast – within 10 mins
Balance	<ul style="list-style-type: none"> • Power Quality • Turn Off/ Ramp Down • Turn On/ Ramp Up 	Fast – within 10 mins

2.2.2 Example of Appliances providing the Raw DER Services

Device Name	Device Capability
 Air Conditioners	Ramp Up/Ramp Down On/Off (bringing on load, taking off load)
 Pool Pump	Ramp Up/Ramp Down
 Pool Pump Controllers	On/Off (bringing on load, taking off load)
 Electric Storage	Ramp Up/Ramp Down
 Hot Water Systems	On/Off (bringing on load, taking off load)
 Electric Vehicles	• Ramp Up/Ramp Down
 Chargers (EVSE)	• Import (Consumption) • Export (Generation) • Var control
 PV Inverters	• On/Off • Ramp Down • Export (Generation) • Var control
 Electrical Energy Storage	• Ramp Up/Ramp Down • Import (Consumption) • Export (Generation) • Var Control
 Energy Management Systems	Algorithm to control a variety of installed devices at household.

2.3 Why test for Raw DER Services?

Raw DER Service response is critically important to qualifying the DER assets and aggregator portfolio to:

- Provide clean assessment of Aggregator-controlled response separate or distinct from risk of native generation or load interference
 - To demonstrate actual capability to control aggregation of assets
 - To demonstrate capability to sustain a response

- To demonstrate the step change and identify how that step change is achieved.
- Assess what monitoring is required to perform measurement and verification and refine the data requirements (i.e. what data needs to be captured)
- Assess a response has actually been delivered.
- Assess what quantum of load/generation (number of assets, volume of customer sites, total quantity, concentration of assets) is required to be under control to deliver a service
- Assess what quantum is required at different system levels to achieve the desired service outcome at each level.

2.4 Raw DER Service test Overview

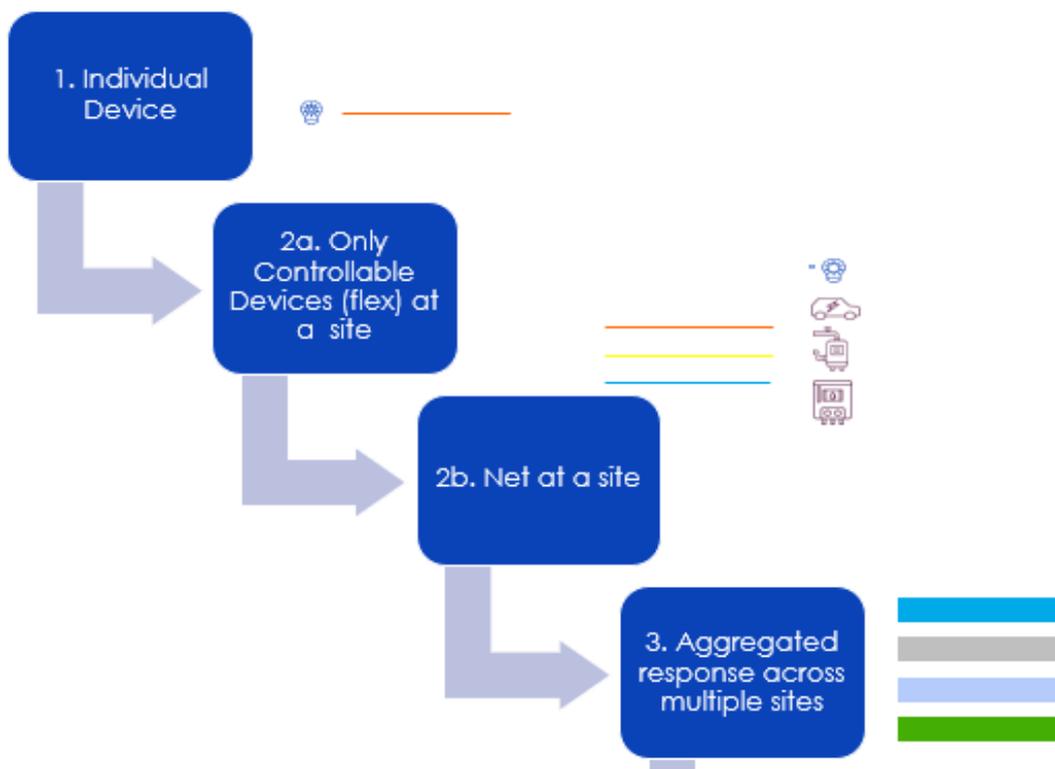
Raw DER service test or Wholesale Service Qualification test is a confirmatory test and not a test to pass or fail; this test is performed to understand, assess and confirm the speed of response and determine allowable tolerance for DER assets.

As these tests highlight the speed of the response and provide details on tolerances; we can determine how close the individual appliances or aggregation of appliances can meet the dispatch target.

2.4.1 Test Measurement flow

Testing of the Raw DER Service will be done on:

- Individual Appliance(s) and measuring the response of each appliance type (i.e. measure the actual physical response at device level)
- Aggregation of all controllable devices at a site (i.e. measure the response at the common measurement point at the site)
- Net at site (i.e. measure the response at the connection point at the site)
- Multiple sites within the portfolio (i.e. measure aggregated response of group of sites/group of devices across sites to demonstrate response and shift in network state)



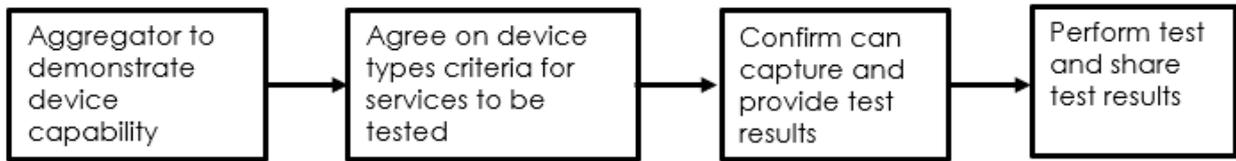
2.4.2 Roles and Responsibility

- Aggregator is responsible for:
 - Sharing the test plan with AEMO
 - Test each of the appliance type and their ability to provide Raw DER services
 - To conduct/ perform the test and capture test results
 - Share test results with the AEMO and DNSP
 - Provide test parameters including the target kW or kVar for each test

3. EDGE Raw DER Service Test Plan (Wholesale Service Qualification)

This section provides step by step guidance on how to conduct Raw DER Service test and how to capture the test results. Raw DER Service test plan is also referred as Wholesale Service Qualification.

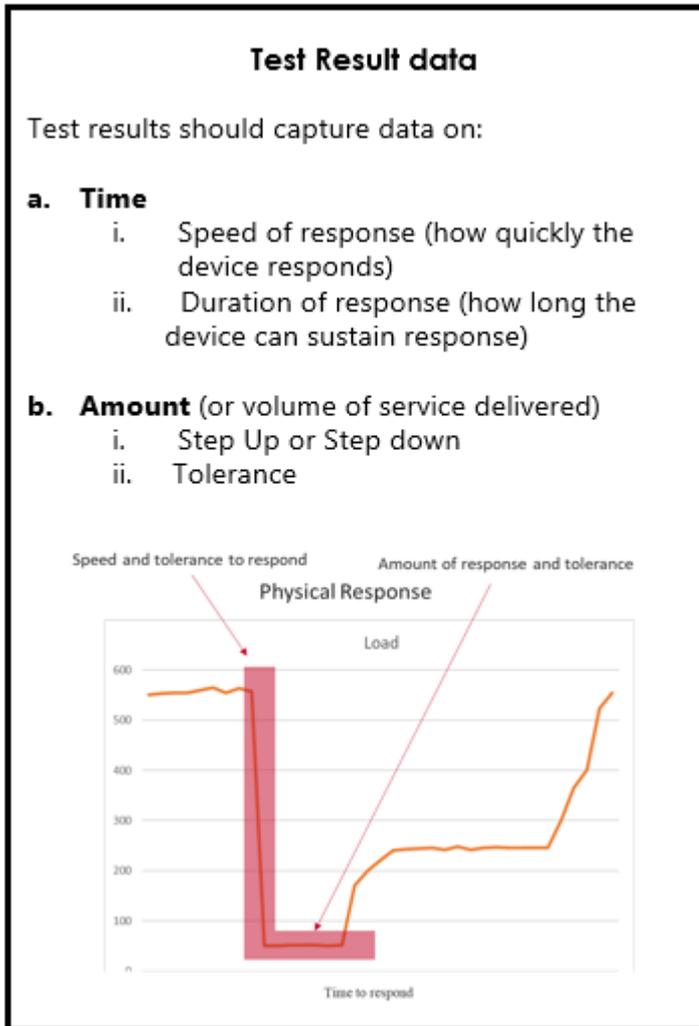
3.1 Raw DER Service Test Plan Overview



Step	Task	Actor
Step 1	Aggregator to demonstrate DER Asset capability (i.e. confirm the devices are capable of receiving and responding to the instructions from Aggregator)	Aggregator
Step 2	Determine the DER Asset types (devices) to be included in the Raw DER Service test	Aggregator, AEMO
Step 3	<p>Aggregator to determine in consultation with AEMO for each service type:</p> <ul style="list-style-type: none"> • Dispatch target • Lead time (for activation of service) • Service duration <p>Aggregator will measure the device response in terms of time and volume against above targets</p> <ul style="list-style-type: none"> • Time <ul style="list-style-type: none"> – Speed of response – Duration of response • Volume <ul style="list-style-type: none"> – Change (Step up or step down) – Tolerance <p>Test results shall be captured in the format described in the 'Wholesale Service Qualification Test Sheet'. Aggregator shall provide the test results in defined format with AEMO. See Section 3.2 Raw DER Service Test Results below for</p>	Aggregator, AEMO

Step	Task	Actor
	additional details on test results/ data.	
Step 4	Individual device or appliance type test: Aggregator to perform test at an individual device level or an appliance type and capture test results in the test sheet.	Aggregator
Step 5a	All controllable devices at a site: Aggregator to perform the test and measure the response of all the devices/ appliances (as an aggregate value) at a site (household) for controllable assets only. The results shall be captured in the test sheet and provided to AEMO.	Aggregator
Step 5b	Net at a site: Aggregator to perform the test and measure the response of all the devices/ appliances including controllable and non-controllable (as an aggregate value) at a site. The results are captured in the test sheet and provided to AEMO	Aggregator
Step 5c	Across multiple sites: Aggregator to perform the test and measure the response across (as aggregate value) across multiple sites. The results are captured in the test sheet and provided to AEMO.	Aggregator
Step 6	Perform the test across multiple sites; and capture and gather test results/data or evidence at an aggregated level for all controllable devices. This will also assist in determining the number of DER assets required to deliver a service	Aggregator
Step 7	Provide test results/data or evidence to AEMO via email to EDGE@aemo.com.au in the format provided in 'Wholesale Service Qualification Test Sheet'	Aggregator

3.2 Raw DER Service Test Results



3.3 Wholesale Service Qualification Test Sheet

Aggregators are required to populate and provide test data in the format provided in Wholesale Service Qualification Test sheet. This test sheet is available on the Project EDGE webpage¹. The Raw DER test shall be performed on

- Individual devices/an appliance type
- Aggregation of all appliances at a site (controllable assets only and net at site)
- Aggregation of appliances in the portfolio i.e. fleet level (across multiple sites)
- For balance service, similarly, test needs to be performed across phases.

¹ Available at: <https://aemo.com.au/-/media/files/initiatives/der/2021/edge-wholesale-service-qualification-test-sheet.xls>