

Bidirectional Unit JSON Submit Bid Format



Summary

All Participant Submit Energy and FCAS bids submission methods (FTP, API, Markets Portal Web UI and File Upload) leverage the single submit bids JSON format.

The format has been enhanced to support the additional attribute data for Bidirectional Unit (BDU) Energy and FCAS bids. The modified format supports backward compatibility.

Document Intent

Document is standalone for purpose of early socialisation of the changes to JSON Submit Bid format to support BDU for interested participants.

This document will not replace the existing [Energy, FCAS, and MNSP Bid Format and Validation \(aemo.com.au\)](#), or [NEM Dispatch Bidding Open API Specification Reference \(getpostman.com\)](#) to be updated and released in due course.

JSON Submit Bid High-level Changes

Energy bids

Supports a new conditional 'direction' indicator allowing submission of separate energyBids object and energyPeriods arrays (10 price, availability, and associated parameters) for the Load side and Generation side of the BDU (20 in total). This field is mandatory for BDU Energy and Regulation FCAS bid submissions.

For non-BDU the attribute is optional and may be provided i.e., optional to support backward compatibility. If provided validation will be performed as per allowable combination described in 'Direction Field Enumeration and Use' table below.

Contingency FCAS

Offers unchanged (single FCAS enablement - 10 bands) with variation the four trapezium period parameters support provision of positive and negative numeric values (currently +ve only).

Regulation FCAS

Supports a new optional 'direction' indicator allowing submission of separate fcasBids array and fcasPeriods arrays (10 price, availability, and associated parameters) for the Load side and Generation side of the BDU (20 in total).

Submit Bids Response

Formats remain unchanged i.e., existing attributes will support new error BDU responses.

Bidirectional Unit JSON Submit Bid Format

1. Energy Bids

Name	Rule	Data Type	Description
energyBids	Mandatory	Object	Object
tradingDate	Mandatory	String	String in date format Must be a valid date. The effective date for this bid. Format: yyyy-mm-dd or yyyy-mm-dd 00:00:00 For example, 2021-04-23 2021-04-23 00:00:00
duid	Mandatory	String (10)	Dispatchable Unit identifier recorded in AEMO's systems. Must be upper case maxLength: 10

Name	Rule	Data Type	Description
direction	Optional	String (15)	<p>Mandatory for BDU submissions (excludes Contingency FCAS); optional for all other unit types. To indicate no value, remove the entire attribute. Validation performed if provided.</p> <p>See 'Direction Field Enumeration and Use' table for allowable enumerated values and use. type: string maximum 15, format: upper case.</p> <p>For BDU 'direction' expresses if associated 'energyBids' and 'energyPeriods' reflect the 'LOAD' or 'GEN' side of the BDU.</p>
prices	Mandatory	Array	<p>The band price. Required.</p> <p>Type: number.</p> <p>Format: multiple of: 0.01 e.g. 0.01, etc.</p>
fastStartProfile	Optional	Object	For BDU and semi-scheduled generating units remove the entire attribute (must not be provided).
dailyEnergyConstraint	Optional	Integer (number)	For BDU remove the entire attribute (must not be provided).
rebidExplanation	Conditional	Object	Required for rebids, fixed LOAD, and low ramp rates Properties: reason, eventTime, awareTime, decisionTime, category

2. Energy Periods

Name	Rule	Data Type	Description
energyPeriods	Mandatory	Array	Mandatory for energy bids only. An array of 288 trading periods from 4:05 am to 4:00 am. Required for an energy submission, type: array, format: minimum items: 288, maximum items: 288
periodId	Mandatory	Integer	The 5-minute trading interval from 4:05 am to 4:00 am. Required for energyPeriods, mnsPeriods, and fcasPeriods, type: integer minimum item: 1, maximum item: 288, format: 1, 2, 3...288
maxAvail	Mandatory	Integer	Maximum availability for a period, integer minimum 0, format: whole numbers, value: megawatts. For BDU for each direction (LOAD and GEN) integer minimum 0, format: whole numbers, value: megawatts.
rampUpRate	Mandatory	Integer	Rate of change up - The maximum rate of increase for the unit. Required for energyPeriods and mnsPeriods, type: integer minimum 0, format: whole numbers, value: megawatts. For BDU for each direction (LOAD and GEN) integer minimum 0, format: whole numbers, value: MW/min

Name	Rule	Data Type	Description
rampDownRate	Mandatory	Integer	<p>Rate of change down - The maximum rate of decrease for the unit. Required for energyPeriods and mnspPeriods, type: integer maximum 0, format: whole numbers, value: megawatts.</p> <p>For BDU for each direction (LOAD and GEN) integer minimum 0, format: whole numbers, value: MW/min</p>
pasaAvail	Mandatory	Integer	<p>The unit's capability including any capability potentially available in 24 hours, including the offered availability. Required for energyPeriods, mnspPeriods, type: integer minimum: 0, format: whole numbers, value: megawatts.</p> <p>For BDU for each direction (LOAD and GEN) integer minimum 0, format: whole numbers, value: megawatts.</p>
fixedLoad	Optional	Integer	<p>Fixed unit output, in MW. Must be 1MW or greater.</p> <p>For BDU provide a single (1) fixedLoad for LOAD and GEN (direction) - remove the entire attribute for direction not provided.</p> <ul style="list-style-type: none"> - Direction of GEN, integer minimum 1, format: whole numbers, value: megawatts - Direction of LOAD, integer minimum 1, format: whole numbers, value: megawatts

Name	Rule	Data Type	Description
bandAvail	Mandatory	Array	<p>The availability for each 10 price bands. Required for energyPeriods, mnsPeriods, and fcasPeriods. Required properties: avail, type: array, minimum: 10 maximum: 10, format.</p> <p>For BDU for each direction (LOAD and GEN) required properties: avail, type: array, minimum: 10 maximum: 10, format: whole number increasing from lowest to highest.</p>
energyLimit	Optional	Integer	<p>Optional for BDU Bid submissions. For non-BDU remove the entire attribute.</p> <p>For each direction (LOAD and GEN) integer minimum 0, format: whole numbers, value: megawatthours.</p> <p>Direction of 'GEN' indicates the min charge level, and Direction of 'LOAD' indicates the max charge level.</p> <p>Rules:</p> <ul style="list-style-type: none"> - If provided defines the min and/or max charge levels for this period, energy limit modelling will be applied. - If not provided: <ul style="list-style-type: none"> • participants opt in - registered energyLimit (min and/or max) modelling applies. • participants opt out - no energy limit modelling applies.

3. FCAS Bids

Name	Rule	Data Type	Description
fcasBids	Mandatory	Array	<p>Mandatory for FCAS Offers only.</p> <p>The collection of one or more FCAS offers. Required for FCAS submissions: Properties: tradingDate, duid, direction, prices, service, rebidExplanation, fcasPeriods</p> <p>The rebidExplanation is only required for a rebid.</p>
tradingDate	Mandatory	String	<p>String in date format Must be a valid date.</p> <p>The effective date for this bid. Expected in the format: yyyy-mm-dd or yyyy-mm-dd 00:00:00 e.g. 2021-04-23 2021-04-23 00:00:00</p>
duid	Mandatory	String (10)	<p>Dispatchable Unit identifier recorded in AEMO's systems Must be upper case maxLength: 10</p>

Name	Rule	Data Type	Description
direction	Optional	String(15)	<p>Mandatory for BDU Regulation FCAS Bid submissions (service = RAISEREG or LOWERREG); optional for all other unit types and BDU Contingency FCAS. To indicate no value, remove the entire attribute. Validation performed if provided.</p> <p>See 'Direction Field Enumeration and Use' table for allowable enumerated values and use. type: string maximum 15, format: upper case.</p>
prices	Mandatory	Array	<p>An array of 10 prices - Items:price minItems: 10 maxItems: 10 e.g. [0.00, 0.00, 20.00, ...]</p> <p>For all unit types prices are 0.00 or positive.</p>
service	Mandatory	String (10)	<p>One of the FCAS service types. Required for fcasBid. Required properties: one of, RAISE1SEC, RAISE6SEC, RAISE60SEC, RAISE5MIN, RAISEREG, LOWER1SEC, LOWER6SEC, LOWER60SEC, LOWER5MIN, LOWERREG, type: string maximum 10, format: upper case</p>
rebidExplanation	Conditional	Object	<p>Required for rebids. Properties: reason, eventTime, awareTime, decisionTime, category</p>

4. FCAS Periods

Name	Rule	Data Type	Description
fcasPeriods	Mandatory	Array	Mandatory for FCAS Offers only.
periodId	Mandatory	Integer	The 5-minute trading interval from 4:05 am to 4:00 am. Required for energyPeriods, mnsPeriods, and fcasPeriods, type: integer minimum item: 1, maximum item: 288, format: 1, 2, 3...288
maxAvail	Mandatory	Integer	Maximum availability loading for a period, in whole megawatts minimum: 0 Includes BDU.
bandAvail	Mandatory	Integer	The availability for each 10 price bands. Required for energyPeriods, mnsPeriods, and fcasPeriods. Required properties: avail, type: array, minimum: 10 maximum: 10, format. For BDU for each direction (LOAD and GEN) required properties: avail, type: array, minimum: 10 maximum: 10, format: whole number increasing from lowest to highest.
enablementMin	Mandatory	Integer	For all unit types and Reg FCAS for BDU where direction = GEN, value is minimum FCAS enablement limit this service can supply. integer minimum 0, format: whole numbers, value: megawatts. For BDU Regulation FCAS where direction = LOAD value is defined on the negative side. integer maximum 0, whole negative numbers, value: megawatts. For BDU Contingency FCAS whole negative or positive numbers, value: megawatts.

Name	Rule	Data Type	Description
enablementMax	Mandatory	Integer	<p>For all unit types and Reg FCAS for BDU where direction = GEN, value is the maximum FCAS enablement limit this service can supply. Required for fcasPeriods, type: integer minimum 0, format: whole numbers, value: megawatts.</p> <p>For BDU Regulation FCAS where direction = LOAD value is defined on the negative side. integer maximum 0, whole negative numbers, value: megawatts.</p> <p>For BDU Contingency FCAS whole negative or positive numbers, value: megawatts.</p>
lowBreakPoint	Mandatory	Integer	<p>For all unit types and Reg FCAS for BDU where direction = GEN, value is the FCAS low break point. Required for fcasPeriods, type: integer minimum 0, format: whole numbers, value: megawatts.</p> <p>For BDU Regulation FCAS where direction = LOAD value is defined on the negative side. integer maximum 0, whole negative numbers, value: megawatts.</p> <p>For BDU Contingency FCAS whole negative or positive numbers, value: megawatts.</p>

Name	Rule	Data Type	Description
highBreakPoint	Mandatory	Integer	<p>For all unit types and Reg FCAS for BDU where direction = GEN, value is the maximum FCAS MW output this unit can provide (as per MaxAvail). Required for fcasPeriods, type: integer minimum 0, format: whole numbers, value: megawatts.</p> <p>For BDU Regulation FCAS where direction = LOAD value is defined on the negative side. integer maximum 0, whole negative numbers, value: megawatts.</p> <p>For BDU Contingency FCAS whole negative or positive numbers, value: megawatts.</p>

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Direction Field Enumeration and Use Table

Submit Bids 'energybid' and 'fcasBids' supports a new conditional 'direction' indicator. Provision of allowable uppercase enumerated value is mandatory for BDU Energy and Regulation FCAS service type, optional for remainder.

If provided validation will be performed as per allowable combination as below.

Unit Type	Service Type	Allowable Enumerated Value	Provision in Submit Bid (JSON)
Generator	Energy	GEN	Optional
Generator	Contingency FCAS	GEN	Optional
Generator	Regulation FCAS	GEN	Optional
Load	Energy	LOAD	Optional
Load	Contingency FCAS	LOAD	Optional
Load	Regulation FCAS	LOAD	Optional
BDU	Energy	GEN	Mandatory
	Energy	LOAD	Mandatory
BDU	Contingency FCAS	BIDIRECTIONAL	Optional
BDU	Regulation FCAS	GEN	Mandatory
	Regulation FCAS	LOAD	Mandatory
WDR	Energy	GEN	Optional