Economic Regulation Authority

Decision on the Australian Energy Market Operator's 2023/24 ancillary services requirements

30 June 2023

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Executive summary

Ancillary services maintain power system security and reliability and ensure that electricity supplies are of acceptable quality. These services maintain the technical characteristics of the power system, including frequency and recovery from system outages.

The Australian Energy Market Operator (AEMO) is responsible for procuring sufficient ancillary services to operate the South West Interconnected System (SWIS) in a safe and reliable manner.[1]

The Wholesale Electricity Market (WEM) Rules require AEMO to submit its ancillary services requirements and plan for the forthcoming year to the Economic Regulation Authority for audit and approval.[2] The ancillary services requirements are the levels of ancillary services needed to meet the SWIS operating standards and the ancillary services standards.

AEMO submitted its 2023/24 ancillary services requirements and plan on 23 May 2023 and an amended version on 31 May 2023. AEMO must publish a report containing its 2023/24 ancillary services requirements and plan by 1 July 2023. The ancillary requirements and plan in the report will apply from the start of the 2023/24 financial year until the commencement of the new market in October 2023.

AEMO did not propose changes to the ancillary services requirements from last year. The ERA has approved AEMO's proposed requirements as listed in Table 1.

Table 1 ERA determination of AEMO's 2023/24 ancillary service requirements

Service	2023/24 requirement proposed by AEMO	Determinations
LFAS upwards	Up to 110 MW (between 5:30 am and 8:30 pm).	Approved
	Up to 65 MW (between 8:30 pm and 5:30 am).	Approved
LFAS downwards	Up to 110 MW (between 8:30 pm and 5:30 am).	Approved
	Up to 65 MW (between 8:30 pm and 5:30 am).	Approved
Spinning reserve service	At least the maximum of: 1. 70% of the largest generating unit 2. 70% of the largest contingency event that would result in generation loss 3. the maximum load ramp expected over a period of 15 minutes.	Approved

1 Ancillary Services will be re-named to essential system services in the new market design commencing in October 2023.

2 AEMO must determine its ancillary services requirements in accordance with the SWIS Operating Standards and the Ancillary Service Standards and on the facilities and configurations expected for the SWIS in the coming year considering location specific differences and different SWIS load levels or other scenarios, that very by the type of day and time of day, and vary across the year (WEM Rules 3.11.1, 3.11.2, 3.11.4 & 3.11.5).

Service	2023/24 requirement proposed by AEMO	Determinations
Load rejection reserve service	A maximum of 97 MW.	Approved
System restart service	Three facilities with system restart capability.	Approved

Source: AEMO's 2023 Ancillary Service Report

1. Introduction

Ancillary services are system security services procured by AEMO to operate the SWIS in a safe and reliable manner. These services allow AEMO to manage frequency and voltage within the operational limits set by the Technical Rules and the WEM Rules.

The WEM Rules require AEMO to prepare an ancillary services report. The report must include the ancillary services costs and quantities provided in the previous year and AEMO's ancillary services requirements and plan for the coming year.

The ancillary services requirements must be determined in accordance with the SWIS operating standards and the ancillary services standards in WEM Rules.[3] The requirements are the levels of services needed to meet the standards.

The WEM Rules require AEMO to review and update its ancillary services requirements annually, and when determining the requirements AEMO must consider the facilities and configuration expected for the SWIS in the coming year.[4] AEMO may also consider location, varying load levels, and varying daily conditions including the type of day, the time of day and variance across the year.[5]

The ERA:

- Audits and approves AEMO's determination of the ancillary services requirements. The ERA may require AEMO to redetermine the requirements.[6]
- Audits AEMO's determination of the ancillary services plan to procure the required ancillary services. The ERA may require AEMO to amend the plan.[7]

AEMO must submit its ancillary services requirements and plan to the ERA for audit and approval by 1 June each year.[8] AEMO submitted its report containing the proposed ancillary services requirements and plan to the ERA on 23 May 2023 and an amended version on 31 May 2023.

Once the new market commences in October 2023, the existing suite of ancillary services will be replaced by essential system services. The ancillary services requirements and plans in AEMO's report will apply for a period of three months from the start of the 2023/24 financial year until October 2023.

The ERA has assessed AEMO's 2023/24 ancillary services requirements and plan against AEMO's obligations under the WEM Rules. This report contains the ERA's audit of AEMO's determination of the ancillary services requirements and plan for 2023/24.

3 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.11.1, (online)

4 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.11.2, (online)

5 Wholesale Electricity Market Rules (WA), 29 April 2023, Rules 3.11.4 and 3.11.5, (online)

6 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.11.6, (online)

7 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.11.12, (online)

8 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.11.11, (online)

2. Load following ancillary services

Load following ancillary services (LFAS) ensure electricity supply and demand are balanced in real time to maintain the frequency of the power system within the operating standards. The services require one or more generators adjusting their output to match total system generation to total system load in real time. [9]

The SWIS power system operates at a frequency of 50 Hz and, in normal operating conditions, the frequency must remain within a band of 49.8 Hz to 50.2 Hz.[10] To ensure the frequency is maintained within the normal operating range for 99 per cent of the time, AEMO uses LFAS provided by accredited generators to continuously balance supply and demand.

AEMO procures its LFAS requirements from the LFAS market. The LFAS requirements comprise a component to cater for frequency variations in an upwards direction, referred to as LFAS upwards, and variations in a downwards direction, referred to as LFAS downwards.

AEMO reported that there are currently seven LFAS generators accredited to participate in the LFAS market, in addition to Synergy's Balancing Portfolio. The LFAS market is settled on the quantity of LFAS that AEMO requires up to the maximum amount approved by the ERA.

On occasion, AEMO may identify a shortfall of LFAS. That is, more LFAS is needed than the amount cleared in the LFAS market.[11] This may arise due to large fluctuations in distributed rooftop PV and wind generation, or in other circumstances such as where a scheduled generator is unable to provide its cleared LFAS quantity. When this occurs, AEMO may procure backup LFAS from the balancing portfolio or a stand alone facility.[12]

2.1 AEMO's load following ancillary services proposal

AEMO has not proposed to vary the existing LFAS raise and lower requirement of up to 110 MW between 5:30 am and 8:30 pm (peak), and up to 65 MW between 8:30 pm and 5:30 am (off-peak) for 2023/24.

To determine its LFAS requirements, AEMO estimates the quantity of LFAS that will be required by calculating the amount of 'frequency keeping mechanisms' (FKM) that have historically been used.[13]

AEMO uses FKM as a measure for determining its LFAS requirement rather than actual historic LFAS usage. This is because AEMO is unable to measure the quantities of LFAS provided by the balancing portfolio as it is not possible to differentiate between the constant re-dispatch of these facilities during normal balancing market operation and adjustments to these facilities' output targets for ancillary services purposes.[14] AEMO then considers the year-

9 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.9.1, (online)

10 Wholesale Electricity Market Rules (WA), 29 April 2023, Appendix 13, (online)

11 AEMO has informed the ERA that it typically only requires the use of backup LFAS in circumstances where there are material or considerable shortfall of load following is occurring or is likely to occur.

12 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 7B.4.1, (online)

13 Page 27 of AEMO's 2022 Ancillary Service Report, (online), states "The methodology calculates the generator response, referred to as Frequency Keeping Mechanism (FKM), to maintain frequency. This is a combination of response from the Balancing Portfolio and generators providing LFAS. Through calculation of the underlying FKM, AEMO determines the real system response to frequency deviations, not just LFAS enabled services."

14 Balancing Portfolio Facilities enabled via AGC provide a combination of services, including LFAS and energy balancing services for the Synergy Portfolio. Therefore, each Facility in the Balancing Portfolio is enabled for its entire operating range, providing LFAS Upwards and LFAS Downwards depending on the output at the time.

on-year change in its FKM analysis alongside its operational experience and uses this analysis to determine the LFAS requirements.[15]

AEMO must also determine its requirements based on the facilities and configuration expected for the SWIS in the upcoming year.[16] AEMO did not report any network configuration or changes to registered facilities relevant to its LFAS requirement. However, as in recent years, AEMO considered the volatility in rooftop PV and grid connected renewable generation for the SWIS when determining its requirements.

A summary of AEMO's proposed and implemented LFAS requirements from 2021/22 to 2023/24 are presented in Table 2, including the corresponding FKM quantities year-on-year change and the increase in distributed rooftop PV.

Table 2 AEMO's proposed and implemented LFAS requirements compared to FKM quantities and distributed rooftop PV

Year	Proposed LFAS requirement (Peak)	Implemented LFAS requirement (Peak)	Change in implemented LFAS requirement (Peak)	FKM change from prior year (Peak)	Proposed LFAS requirement (Off-peak)	FKM change from prior year (Off-peak)	Increase in distributed rooftop PV[17]
2021/22	+/-110 MW (ERA approved)	+/-100 MW	5 MW	26 MW	+/-65 MW	17MW	336 MW
2022/23	+/-110 MW[18] (ERA approved)	+/-110 MW	10 MW	6 MW	+/-65 MW	-3MW	342 MW
2023/24*	+/-110 MW (proposed)	+/-110 MW (proposed)	0 MW	10 MW	+/-65 MW (proposed)	-5MW	70 MW[19]

**July to October 2023*

Source: AEMO Data and Ancillary Service Reports

15 Through experience operating the power system, AEMO normally requires a lower level of LFAS than the FKM analysis indicates. This reduction is related to the contribution of non-market responses including primary frequency control such as droop response, used to develop the LFAS requirement.

16 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.11.2, (online)

17 Distributed PV values are from annual capacity year forecasts of installed behind the meter rooftop PV capacity information in AEMO's 2022 ESOO report (online).

18 AEMO's 2022 ancillary service report proposed up to +/-120 MW LFAS requirement for peak period and the ERA approved up to +/-110 MW.

19 Distributed PV values from annual capacity year forecasts of installed behind the meter rooftop PV capacity information in AEMO's 2022 ESOO report (online) is divided by 4 to reflect period from July to October 2023.

2.2 ERA's assessment of AEMO's LFAS load proposal

AEMO has not proposed to vary the existing LFAS requirement of up to +/-110 MW between 5:30 am and 8:30 pm (peak), and up to +/-65 MW between 8:30 pm and 5:30 am (off-peak) for 2023/24.

Last year, AEMO proposed an increase to its LFAS peak requirement. The ERA did not approve the proposed peak LFAS requirement of up to +/-120 MW, instead approved the retention of up to +/-110 MW for 2022/23. AEMO reported that the frequency performance in 2022/23 has exceeded the standard and improved from year 2021/22 due to additional over-frequency response from generators.

As mentioned above, AEMO uses FKM as a measure to determine the requirement for 2023/24. Table 2 (columns five and seven) provides the FKM year-on-year change. As can be seen, there has been a marginal decrease in FKM during off-peak period, but an increasing trend in FKM during peak period. The following assessment focuses on the peak period.

In 2023/24, AEMO has found an average increase of 10 MW in FKM that will be required to manage system frequency. Table 2 shows the LFAS peak requirement (column four) increased by 10 MW starting from July 2022, while the increase in FKM (column five) for peak times was 16 MW correspondingly.[20] In 2021/22, AEMO managed the 26 MW increase in FKM with 5 MW increase implemented in LFAS peak requirement. The ERA considers that the already 10 MW increase in peak requirement from July 2022 will be adequate to manage system frequency from July 2023 until the commencement of the new market.

AEMO reported that the increasing trend in the peak requirement is due to volatility of continued connection of new distributed rooftop PV. In 2021/22, AEMO implemented 5 MW increase in LFAS peak requirement to manage 336 MW installed distributed rooftop PV. Based on this performance, the ERA considers that the 10 MW increase in LFAS peak requirement from July 2022 be adequate to manage the 412 MW installed distributed rooftop PV from July 2022 until the commencement of new market.[21]

The ERA has also considered AEMO's frequency performance in the past years. AEMO must maintain power system security by ensuring that the frequency of the SWIS is kept within the normal operating band of 49.8 Hz and 50.2 Hz for 99 per cent of the time.[22] AEMO reported that the frequency performance exceeds the standard with frequency remaining within the normal operating band for 99.98 per cent of the time.[23] This high-level frequency performance indicates that the frequency standard can still be maintained even with a slight decrease in the frequency performance due to increased LFAS utilisation.

Further, AEMO may also use backup LFAS to maintain power system security where there is a shortfall in the enabled quantity of LFAS or a scheduled generator fails to provide its cleared quantities through the LFAS market.[24]

Based on the above analysis of FKM quantities, rooftop PV connection to network, and the SWIS's frequency performance, the ERA approves AEMO's proposed LFAS requirement for 2023/24.

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20 The 16 MW in FKM is the sum of 6 MW in 2022/23 and 10 MW in 2023/24 from column 5 in Table 2.

21 The 412 MW distributed rooftop PV is the sum of 342 MW in 2022/23 and 70 MW from July to October 2023 in last column of Table 2.

22 Wholesale Electricity Market Rules, 29 April 2023, Appendix 13, (online)

23 Page 7 of AEMO's 2023 Ancillary Service Report, states that "The frequency remained in the normal operating band for 99.98% of the time."

24 Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 7B.4.1, (online)

3. Spinning reserve services

Spinning reserve is defined as the service of holding capacity associated with a synchronised scheduled generator or interruptible load in reserve so that the relevant facility is able to respond appropriately to limit frequency drops. In the case of spinning reserve services provided by scheduled generators, the generators need to supply electricity if the alternative is to trigger involuntary load curtailment.[25]

Spinning reserve services provide a rapid increase in generation following a sudden or unexpected shortfall in supply. This may result from the loss of a large generator or transmission asset. Spinning reserve is currently provided by a mix of gas, diesel, coal, and interruptible load facilities.

The SWIS operating standards require the frequency to remain within the 48.75 Hz to 51 Hz band for credible contingency events.[26]

The WEM Rules require the standard for spinning reserve services to be a level that is sufficient to be able to cover whichever is the greater of:

- 70 per cent of the total output, including Parasitic Load, of the generation unit synchronised to the SWIS with the highest total output at that time.
- The maximum load ramp expected over a period of 15 minutes.[27]

AEMO may relax the spinning reserve level by up to 12 per cent where it expects that the shortfall will be for a period of less than 30 minutes. Following activation of spinning reserve (for example to manage a contingency event), the level may be further relaxed by up to 100 per cent if all reserves are exhausted where maintaining reserves would require involuntary load shedding. In such situations the levels must be fully restored as soon as practicable.[28]

3.1 AEMO's spinning reserve proposal

AEMO's spinning reserve requirement must meet SWIS operating standards and the ancillary service standards. AEMO has continued to use the same criteria used in 2022/23 as outlined in Table 3 to set the spinning reserve requirement for 2023/24.

Table 3 Spinning reserve service requirement 2023/24

Ancillary service	Criteria
Spinning reserve service	At least the maximum of: 1. 70% of the largest generating unit 2. 70% of the largest contingency event that would result in generation loss 3. the maximum load ramp expected over a period of 15 minutes.

25 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.9.2 (online)

26 Wholesale Electricity Market Rules, 29 April 2023, Appendix 13 (online)

27 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.10.2(a) (online)

28 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.10.2 (c) and (d) (online)

3.2 ERA's assessment of AEMO's spinning reserve proposal

The criteria for spinning reserve mean that the spinning reserve requirement is not a static MW level. Rather, it is a dynamic requirement that AEMO sets in the planning horizon and adjusts closer to real time according to system conditions.

For criteria 2: 70 per cent of the largest contingency event that would result in generation loss, AEMO continued to use the updated methodology to calculate the largest contingency by combining the largest generation output with net distributed PV tripped. Given the increasing pace of connected distributed rooftop PV, AEMO continues to investigate the impact of distributed rooftop PV disconnection.

AEMO reported that the maximum load ramp over a 15 minute period in 2022/23 occurred during a distributed rooftop PV cloud cover event. This resulted in a load ramp of 412 MW, which was 113 MW higher than the past year. Therefore, when planning spinning reserve requirements, AEMO will consider the forecast maximum load ramp. If this value is greater than the expected spinning reserve quantity, AEMO will adjust the spinning reserve quantity accordingly.

The ERA also considers AEMO's performance with meeting the SWIS operating standards to maintain frequency above 48.75 Hz to assess whether AEMO's requirement has been adequate. AEMO's report shows that its frequency performance in 2022/23 exceeds the SWIS operating standards and there was no frequency excursion below 48.75 Hz. There were also no emergency operating states identified due to a generation contingency, and no under-frequency load shedding events. Based on this performance, the ERA approves AEMO's 2023/24 proposed continuation of its application of spinning reserve requirements.

4. Load rejection reserve services

The WEM Rules define the load rejection reserve as the service of holding capacity associated with a scheduled generator in reserve so that the scheduled generator can reduce output rapidly in response to a sudden decrease in SWIS load.[29]

Load rejection reserve provides a quick reduction in generators' output in instances where a large load is suddenly and unexpectedly lost, for example due to a transmission line outage. When a large load is lost, system frequency increases. The generator providing load rejection automatically reduces output to maintain system frequency within limits necessary for system security. These large load rejection events typically happen a few times each year.

AEMO sets the quantity of load rejection reserve necessary to meet the standard described in the WEM Rules. The standard for load rejection reserve must be sufficient to keep frequency below 51 Hz for all credible load rejection events.[30]

The quantity of load rejection reserve needed to maintain the operating standard may be relaxed up to 25 percent where AEMO considers the probability of transmission faults to be low.[31]

4.1 AEMO's load rejection proposal

AEMO has not proposed changes to the load rejection reserve requirement for 2023/24. The proposed load rejection reserve requirement is up to a maximum of 97 MW.

In 2022/23, AEMO proposed an increase of 7 MW in the load rejection reserve from 90 MW to 97 MW due to the increase in the transfer limit for the eastern goldfields region, which the ERA approved.

AEMO stated it continues to operate with a dynamic load rejection requirement that is based on the largest credible contingency in real time, less load relief,[32] specific facility protection systems and other known facility responses.[33] AEMO also considers the over-frequency response from distributed rooftop PV in calculating the dynamic load rejection reserve requirement.

4.2 The ERA's assessment of AEMO's load rejection proposal

In 2022, AEMO reported that the constraints limiting power flow for the eastern goldfields network increased by 30 MW from 120 MW to 150 MW, and their assessment indicated an increase of 7 MW in load rejection reserve requirement. In 2023, AEMO reported the transfer limit estimated for the eastern goldfields region had increased from 150 MW to 160 MW. This

29 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.9.6 (online)

30 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.10.4 (a) (online)

31 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.10.4 (b) (online)

32 Load relief relates to how some loads (such as traditional motors, pumps and fans) draw less power when frequency is low, and more power when frequency is high. (online)

33 In practice this means that the 97MW is the standard AEMO schedules generators around and if the available quantity erodes closer to the dispatch interval, the dynamic requirement after accounting for other factors may allow the 97MW threshold to be relaxed.

10 MW increase, compared to the 30 MW increase in 2022, hasn't significantly increased the load rejection reserve requirement in the past year, reported by AEMO.

AEMO reported that energy market outcomes together with increased transfer capability have resulted in the increase in eastern goldfields power transmission to the region due to local generators not being dispatched over low load periods.

The standards applicable to load rejection reserve require AEMO to set the service at a level sufficient to keep the frequency below 51Hz. AEMO reported that there was no frequency excursion greater than 51Hz during the reporting period. The ERA considers the frequency performance information provided by AEMO is adequate to meet the frequency standard.

Based on the above analysis and the frequency performance, the ERA approves AEMO's 2023/24 proposed load rejection reserve requirement.

5. Contracted services

The WEM Rules state AEMO may enter into ancillary service contracts with a rule participant other than Synergy for spinning reserve where it does not consider that it can meet the requirements with Synergy's registered facilities, or the contract provides a less expensive alternative.[34]

AEMO may also enter into an ancillary service contract with a rule participant for the provision of a load rejection reserve service or system restart service.[35]

Spinning reserve services and load rejection reserve services are discussed in section 3 and 4 of this report. System restart services are discussed below.

System restart services providers are capable of restarting and providing power to the grid in total blackout conditions. This will enable other generators without this capability to also start.

5.1 System restart services

System restart is the ancillary service provided by participants capable of re-energising the electricity system, or part of the electricity system, following a full system blackout. AEMO procures these services through contracts.

The WEM Rules require AEMO to determine the standard for the system restart service. The standard must:

- identify the minimum length of time for which a system restart service may be required to operate continuously following a system shutdown
- specify technical requirements for a registered facility to provide a service
- include the guidelines of diversity of system restart services and
- include requirements for mitigating against the risk of unavailability of any system restart service following a system shutdown.

AEMO may include other matters that it determines are necessary to ensure the SWIS is restarted in the event of a system shutdown or major disruption.[36]

AEMO has published its system restart standard.[37] The standard outlines the geographic diversity of spinning reserve services required to effectively restart the SWIS following an interruption, and the electrical subnetworks in geographically defined areas of the network where spinning reserve is required.

A diversity of system restart services is needed across the network to ensure that the system can be re-energised if a particular system restart provider fails, or where parts of the network become physically isolated – such as through a bushfire or storm.

In its ancillary service report, AEMO has specified that it requires three system restart providers. System restart service providers are located in the north metropolitan, south metropolitan and south country regions of the network. The north metropolitan and south

34 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.11.8 (online)

35 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.11.8A (online)

36 Wholesale Electricity Market Rules, 29 April 2023, Rule 3.7.2 (online)

37 Australian Energy Market Operator, 2022, *WEM System Restart Standard*, (online)

metropolitan contracts expire in June 2026. The south country contract expires in October 2028.

AEMO has contracted three service providers in three different geographical locations, consistent with the standard. These three service providers will continue to apply until the contract expire. The ERA approves the system restart requirement for 2023/24.

6. Ancillary service costs

AEMO reported ancillary service costs for the period April 2022 to March 2023. Total ancillary service costs during this period were $29.9 million lower than the corresponding 2021/22 period, despite a marginal increase in the LFAS and load rejection requirement quantities.

The reduction in ancillary service costs was mainly due to a $28.4 million decrease in load following service costs. Between load following service upwards and downwards, the cost reduced $10.4 million for upwards service and $17.2 million for the downwards service. The combined $27.6 million reduction from upwards and downwards services was mainly driven by a significant decrease in average upwards and downwards service prices from 2021/22 to 2022/23. The load following capacity costs fell by $0.8 million due to the lower capacity prices.[38]

Margin values are used in the calculation that determines the compensation paid to Synergy for spinning reserve service. The ERA determines the margin values parameters. AEMO must apply the margin values and balancing price to the average spinning reserve service requirement for peak periods and off-peak trading intervals.

Spinning reserve ancillary service costs reduced $1.4 million from 2021/2022 to 2022/23. Between peak and off-peak periods, the peak period service cost increased marginally by $0.3 million, and the off-peak period service cost decreased by $1.7 million. The cost increase in peak period was mainly due to the increased quantity from 243 MW to 273 MW, even though the time-weighted average margin value during peak period reduced marginally. The cost reduction in off-peak period was primarily driven by the decrease in time-weighted average off-peak margin value.[39]

Load rejection cost and system restart service cost are Cost_LR parameters determined by ERA.[40] The combined cost reduced by $0.2 million from 2021/22 to 2022/23. The reduction was mainly driven by the $0.3 million decrease in load rejection cost, while the system restart service cost increased marginally because of the increased availability against the contract when compared to 2021/22.

[38] The administered Reserve Capacity Price ($/MW per year) for Capacity Year was: $85,294.19 (2022-2023); $78,573.33 (2021-22) and $114,134.15 (2020-21).

[39] Further information on margin values is outlined in the ERA's Ancillary Service costs: Spinning Reserve, load rejection reserve and system restart costs (Margin values and Cost_LR) for 2022/23 determination.

[40] Further information on load rejection cost and system restart service cost is outlined in the ERA's Ancillary Service costs: Spinning Reserve, load rejection reserve and system restart costs (Margin values and Cost_LR) for 2022/23 determination.

Appendix 1 List of Tables