Material constrained portfolio determination

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Executive summary

The Economic Regulation Authority has made its first determination of material constrained portfolios for the Wholesale Electricity Market (WEM). This is a new function for the ERA for the new WEM, which commenced operation on 1 October 2023.

The new WEM includes a range of new requirements, including a market power mitigation framework. The framework includes two processes to focus regulatory effort on entities with the greatest potential to exercise market power.

Material constrained portfolios are those registered facilities that have the potential to hold localised market power due to network constraints that resulted in energy uplift payments.[1]

The ERA published a WEM procedure covering portfolio determination in October 2023, which sets out the process and method to identify constrained portfolios and material constrained portfolios.[2] This determination applies the WEM Procedure for the first time to identify all constrained portfolios and to determine which of those are material constrained portfolios.

The ERA will monitor price offers made by registered facilities assigned to a material constrained portfolio in the real time market for compliance with general trading obligations.[3]

While the ERA must monitor offers from facilities within material constrained portfolios, it can and will monitor prices across the real time market. Market participants are expected to make price offers in accordance with the offer construction guidelines and maintain records as appropriate.

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[1]   Energy Policy Western Australia, *Market Power Mitigation Strategy: Information Paper*, 10 November 2022, p. 21, (online).

[2]   ERA, October 2023, *WEM Procedure: Portfolio Determination*, (online).

[3]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.4(b), (online).

1. Introduction

Constrained portfolios were introduced as part of the market power mitigation framework for the new WEM. The framework includes two processes to focus regulatory effort on entities with the greatest potential to exercise market power. The first process identifies portfolios, and material portfolios. The ERA published its initial determination on this in December 2023.[4]

The second process, and the focus of this determination, is the identification of portfolios with the potential to exercise market power due to binding network constraints – referred to as material constrained portfolios.[5] This determination uses the portfolios identified through the first test, paired with a test based on binding network constraints and payments arising from them to identify the material constrained portfolios.[6]

The ERA's portfolio determination WEM procedure specifies two steps relating to constrained portfolios. These steps are:

1. Identify each constraint equation for a network constraint that bound during the rolling test window (a consecutive three-month period of trading days) and for each registered facility behind those constraint equations, assign them to constrained portfolio. [7,8]

2. Calculate the constrained uplift payment ratio for each constrained portfolio identified above, for both the rolling test window and for any relevant fixed assessment period, and identify material constrained portfolios.[9]

The ERA's more detailed determination process is outlined in Figure 1.

The ERA must within 10 business days of the end of a rolling test window complete step 1. For this initial determination the rolling test window began on the commencement day of the new WEM, from 8:00AM 1 October 2023 to 7:59AM 1 January 2024 (end of the 31 December trading day). [10]

The ERA has a further 20 business days from the end of a rolling test window complete step 2.[11] Material constrained portfolios are those constrained portfolios that return a result of 10 per cent or more on the constrained uplift payment ratio calculation. The ERA must publish the results of the calculation and resultant material constrained portfolios (this determination) and notify market participants with registered facilities allocated to a material constrained portfolio.

Market participants with registered facilities allocated to a material constrained portfolio must retain adequate records, that are capable of independent verification to support price offers made in the real time market within three months of receiving a notice from the ERA. Records should include internal governance arrangements; methods, assumptions and cost inputs used to develop prices, quantities and ramp rates for each relevant facility. The ERA must

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[4]   ERA, December 2023, *Portfolio Identification and Material Portfolio Determination*, (online).

[5]   Energy Policy Western Australia, Market Power Mitigation Strategy: Information Paper, 10 November 2022, p. 10, (online).

[6]   Material constrained portfolios deemed to be those with higher potential to exercise market power arising from the frequency of network constraints associated with uplift payments.

[7]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, (online).

[8]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16B.2, (online).

[9]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, p. 720 and 749, (online).

[10]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 1.62.1(b), (online).

[11]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.2(a), (online).

also monitor price offers for these facilities for compliance with the offer construction guidelines.[12,13]

A detailed breakdown of the methodology used to complete steps 1 and 2 is included in Appendix 3.

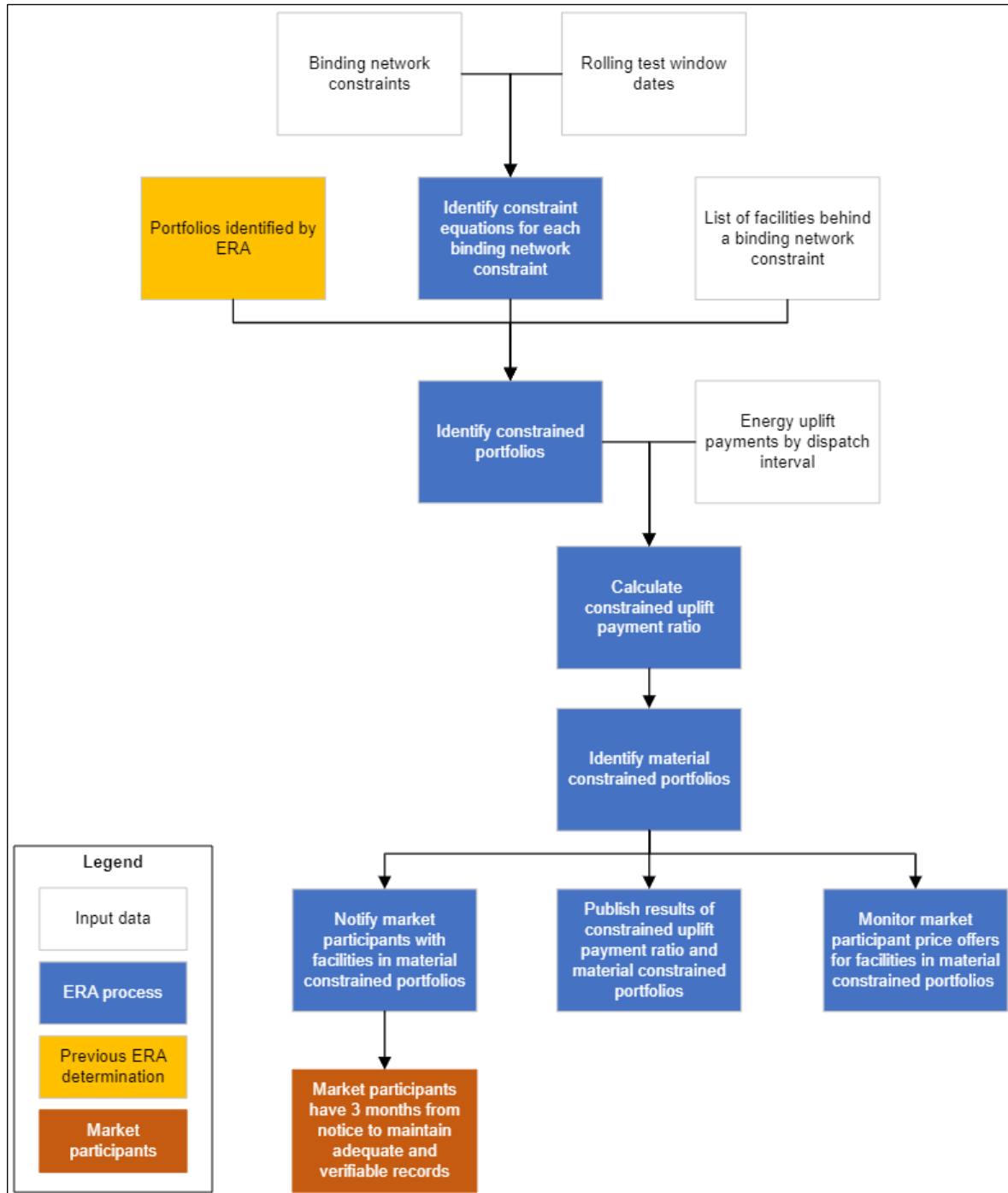**Figure 1: Process and inputs to identify constrained portfolios and determine material constrained portfolios**

12 Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.3, (online).
13 Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.4, (online).

2. Assessment of constrained portfolios

The ERA has completed its first assessment and identified each constraint equation for network constraints that bound within the first rolling test window. Constraint equations are a mathematical representation of a constraint on the network.[14] Registered facilities that are located behind each constraint equation have been assigned to constrained portfolios. The constrained portfolio will comprise all registered facilities also behind the constraint equation that are in the same portfolio.

The ERA identified 44 unique binding network constraint equations in the rolling test window. This resulted in identification of 236 unique constrained portfolios. A full list of constraint equations and constrained portfolios is included in Appendix 4.

The ERA used the portfolios it previously identified in December 2023 for this constrained portfolio identification process.[15] In the time between that determination and this process a new registered facility joined the market. For completeness, the ERA has included this facility in this assessment as a stand-alone portfolio as the market data does not readily identify it with an existing portfolio. The facility will be considered in the upcoming portfolio identification process that the ERA will complete by 1 April 2024.[16]

2.1 Constraint equation identification

The ERA identified 44 unique binding network constraint equations for this rolling test window and used AEMO's constraint equation data to identify all network constraints that bound during the rolling test window.

The data extract was filtered to only include data for binding network constraints from within the rolling test window.[17] AEMO publishes this data on its public data site, embedded in the dispatch solution files.[18]

2.2 Constrained portfolio identification

The ERA identified 236 unique constrained portfolios. The ERA assigned registered facilities to constrained portfolios where they were located behind a binding network constraint and according to their portfolio as determined by the ERA.[19] Registered facilities can be assigned to multiple constrained portfolios.[20]

The ERA used a combination of data provided by AEMO and information available in AEMO's public operational constraints library to identify the constrained portfolios.[21]

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[14]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, p. 707, (online).

[15]   ERA, December 2023, *Portfolio Identification and Material Portfolio Determination*, p. 3, (online).

[16]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16B.1, (online).

[17]   The rolling test window covered the period from 8:00AM Sunday, 1 October 2023 to 7:59AM Monday, 1 January 2024.

[18]   Australian Energy Market Operator, Market Data Western Australia, (online) [accessed 14 February 2024].

[19]   ERA, December 2023, *Portfolio Identification and Material Portfolio Determination*, p. 3, (online).

[20]   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16B.3, (online).

[21]   Australian Energy Market Operator, 'Operational Constraints Library', (online) [accessed 14 February 2024].

3. Material constrained portfolio determination

After identifying the constrained portfolios, the ERA must determine the material constrained portfolios by calculating and applying a materiality threshold specified in the Market Rules to the constrained uplift payment ratio. The ratio calculates, as a percentage, the number of dispatch intervals where a network constraint bound and any registered facilities within the relevant constrained portfolio that received energy uplift payments.

Where a constrained portfolio meets or exceeds the 10 per cent threshold in its constrained uplift payment ratio, it is determined as a material constrained portfolio. The ERA will notify market participants that have registered facilities allocated to a material constrained portfolio and will monitor any prices offered by the market participant in the real time market in line with the market power test. [22,23]

Market participants have three months from the date of receipt of a material constrained portfolio determination notice to maintain additional records to support their compliance with the WEM Rules general trading obligations.[24] Additional guidance regarding the increased record keeping obligations is available in the WEM procedure detailing portfolio determination and in the offer construction guideline.[25,26]

3.1 Constrained uplift payment ratio

The calculation identifies constrained portfolios that have received energy uplift payments in 10 per cent or more dispatch intervals in the rolling test window and/or a fixed assessment period. Where this occurs, the constrained portfolio is deemed to be a material constrained portfolio and considered to have potential to exercise market power when located behind a network constraint.

The calculation of the ratio is detailed in WEM Rule 2.16C.2(a):

(a) calculate for that rolling test window and for any relevant fixed assessment period, as a percentage, the constrained uplift payment ratio for each constrained portfolio identified under clause 2.16B.2(b) as follows:

$$Constrained\ Uplift\ Payment\ Ratio = \frac{CP\_UP}{NC} \times 100$$

where:

  i. CP_UP is the number of dispatch intervals in the rolling test window or fixed assessment period (as applicable) in which:

      1. the constraint equation relevant to the identification of the constrained portfolio identified under clause 2.16B.2(a) bound; and

      2. a registered facility in the constrained portfolio received an energy uplift Payment; and

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22   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.2(d), (online).

23   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16C.4, (online).

24   Wholesale Electricity Market Rules (WA) 13 December 2023, Rule 2.16A, (online).

25   ERA, *WEM Procedure: Portfolio Determination*, October 2023, p. 8, (online).

26   ERA, *Offer Construction Guideline*, September 2023, p. 56, (online).

    ii.   NC is the total number of dispatch intervals in the rolling test window or fixed assessment period (as applicable) in which the constraint equation relevant to the identification of the constrained portfolio bound.

3.1.1 Constrained uplift payment ratio calculation results

The constrained uplift payment ratio calculation is applied to the rolling test window and in any relevant fixed assessment periods.[27] The calculation returned 32 of 236 identified constrained portfolios with a non-zero result.

Full results of the calculation are provided in Appendix 4.

3.2 Material constrained portfolios

The constrained uplift payment ratio calculation resulted in 29 material constrained portfolios, capturing a total of 39 different facilities and 12 different market participants. These represent 57 per cent of all 68 facilities included in the portfolio assessment process.

Table 1 lists all material constrained portfolios. These are identified as all constrained portfolios that met or exceeded the 10 per cent threshold of the constrained uplift payment ratio calculation. No relevant fixed assessment periods were identified in this rolling test window.

Table 1: **Material constrained portfolios resulting from the constrained uplift payment ratio carried out under WEM Rule clause 2.16C.2(b)**

Constrained portfolio	Constraint equation	Registered facility	Constrained uplift payment ratio (%)[28]
10	DCCE-WEMDEUI-Security-72	BW1_BLUEWATERS_G2	100
13	DCCE-WEMDEUI-Security-80	PINJAR_GT9	89
16	DCCE-WEMDEUI-Security-165	NEWGEN_NEERABUP_GT1	75
17	DCCE-WEMDEUI-Security-166	ALINTA_WGP_GT	25
18	DCCE-WEMDEUI-Security-167	NEWGEN_NEERABUP_GT1	100
19	DCCE-WEMDEUI-Security-168	ALINTA_WGP_GT	90

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[27]   ERA, *WEM Procedure: Portfolio Determination*, October 2023, 4.2.1, ([online](#)).

[28]   Value is rounded to the nearest percentage point.

Constrained portfolio	Constraint equation	Registered facility	Constrained uplift payment ratio (%)[28]
34	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	COCKBURN_CCG1 KWINANA_GT2 KWINANA_GT3 PINJAR_GT1 PINJAR_GT10 PINJAR_GT11 PINJAR_GT2 PINJAR_GT3 PINJAR_GT4 PINJAR_GT5 PINJAR_GT7 PINJAR_GT9	29
44	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	ALINTA_PNJ_U1 ALINTA_PNJ_U2 ALINTA_WGP_GT ALINTA_WGP_U2	22
49	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	NAMKKN_MERR_SG1	12
52	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	TESLA_KEMERTON_G1 TESLA_PICTON_G1	26
74	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	TESLA_KEMERTON_G1 TESLA_NORTHAM_G1 TESLA_PICTON_G1	67
83	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	PRK_AG	33

Constrained portfolio	Constraint equation	Registered facility	Constrained uplift payment ratio (%)[28]
93	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	ALINTA_PNJ_U1 ALINTA_WGP_GT ALINTA_WGP_U2	14
98	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	NAMKKN_MERR_SG1	16
101	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	TESLA_KEMERTON_G1 TESLA_PICTON_G1	32
109	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	INVESTEC_COLLGAR_WF1	12
112	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	MERSOLAR_PV1	71
162	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	ALINTA_PNJ_U1 ALINTA_PNJ_U2 ALINTA_WGP_GT ALINTA_WGP_U2 ALINTA_WWF BADGINGARRA_WF1 YANDIN_WF1	67
171	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	NEWGEN_NEERABUP_GT1	33
176	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	TIWEST_COG1	67
180	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	ALINTA_PNJ_U1 ALINTA_PNJ_U2 ALINTA_WGP_GT ALINTA_WGP_U2	100

Constrained portfolio	Constraint equation	Registered facility	Constrained uplift payment ratio (%)[28]
		ALINTA_WWF	
		BADGINGARRA_WF1	
		YANDIN_WF1	
189	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	NEWGEN_NEERABUP_GT1	33
194	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	TIWEST_COG1	67
198	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	ALINTA_PNJ_U1	36
		ALINTA_WGP_GT	
		ALINTA_WGP_U2	
203	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	NAMKKN_MERR_SG1	45
205	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	COCKBURN_CCG1	41
		COLLIE_G1	
		KEMERTON_GT11	
		KEMERTON_GT12	
		KWINANA_GT2	
		KWINANA_GT3	
		MUJA_G6	
		MUJA_G7	
		MUJA_G8	
		WEST_KALGOORLIE_GT2	
		WEST_KALGOORLIE_GT3	
206	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	TESLA_KEMERTON_G1	50
		TESLA_PICTON_G1	

Constrained portfolio	Constraint equation	Registered facility	Constrained uplift payment ratio (%)[28]
214	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	MUNGARRA_GT1	19
		MUNGARRA_GT3	
		PINJAR_GT1	
		PINJAR_GT10	
		PINJAR_GT11	
		PINJAR_GT2	
		PINJAR_GT3	
		PINJAR_GT4	
		PINJAR_GT5	
		PINJAR_GT7	
		PINJAR_GT9	
231	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	TESLA_KEMERTON_G1	33
		TESLA_PICTON_G1	

The ERA must monitor market offers made by registered facilities assigned to a material constrained portfolio in the real time market for compliance with general trading obligations.[29] While the ERA must monitor offers from facilities within material constrained portfolios, it can and will monitor prices across the real time market. The ERA can investigate any potential breach of the market rules including from a facility outside material constrained portfolios.

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[29]   Wholesale Electricity Market Rules (WA) 13 December 2023, 2.16A.1, (online).

Appendix 1 List of Tables

Appendix 2 List of Figures

Appendix 3 Constrained portfolio method

The ERA developed and applied the process and method, outlined below, to identify constrained portfolios and calculate the constrained uplift payment ratio to determine material constrained portfolios. The method is outlined at a high level in Figure 2 below, with additional detail provided in the following sections.

Figure 2:   High level steps in the constrained portfolio method
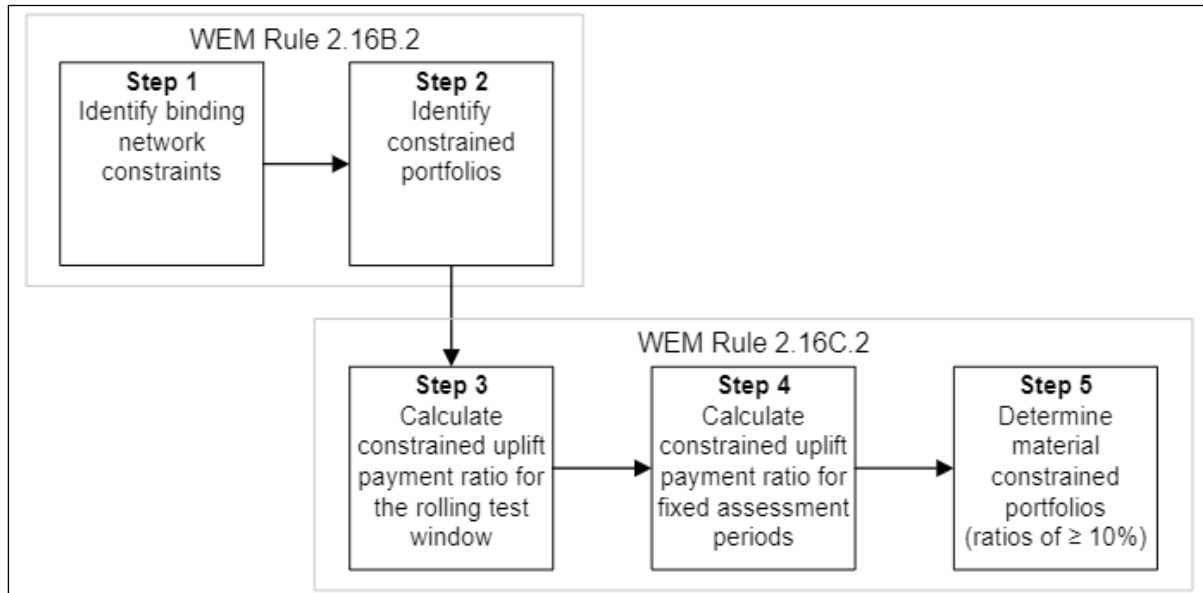
The assignment of constrained portfolios and calculation of the constrained uplift payment ratio is completed using R within RStudio.[30]

Data sets

The following data sets were used as inputs to this process:

1. WEMDE dispatch solution constraints.

2. 'Left Hand Side' terms of network constraints, which lists all the facilities located behind each network constraint.

3. Energy uplift payment data.

4. Portfolios identified under WEM Rule 2.16B.1.[31]

Data set 1 is available publicly via AEMO's public data site.[32] Data set 2 is partially available publicly via the Operational Constraints Library, however discretionary constraints are not included.[33] Data set 3 is not publicly available. Data set 4 is published by the ERA.[34]

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[30]   Libraries used were "tidyverse", "readxl" and "here".
[31]   Wholesale Electricity Market Rules (WA) 13 December 2023, 2.16B.1, (online).
[32]   Australian Energy Market Operator, Market Data Wester Australia: Dispatch Solution Files, (online).
[33]   Australian Energy Market Operator, Operational Constraints Library, (online).
[34]   ERA, October 2023, *WEM Procedure: Portfolio Determination*, (online).

Data cleansing

All data underwent cleansing processes. This included filtering the data to include only dispatch intervals falling within the rolling test window, ensuring consistent variable naming and formatting across data frames, and extracting facility names from string variable values.

Step 1 - Binding network constraint identification

The first step in the process of identifying constrained portfolios is to identify all binding network constraints within a rolling test window is. [35]

A network constraint is a limitation or requirement in a part of a network that may impact one or more registered facilities in the central dispatch process, such that it would be unacceptable to transfer electricity across that part of the network at a level or in a manner outside the limit or requirement.[36]

This step in the process requires the list of WEMDE dispatch solution constraints. This data was checked against the publicly available data. The three filters applied are date range, constraintType = "Network" and isBindingConstraint = "TRUE".

The list of unique constraint IDs are the network constraints that bound within the rolling test window.

Step 2 - Constrained portfolio identification

Following identification of all network constraints that bound during the rolling test window, the ERA then identified all constrained portfolios for each constraint equation.[37] A constrained portfolio is, for each constraint equation, a set comprising all the registered facilities within a single portfolio that are located behind the relevant network constraint.[38]

This step requires three data sets:

1. The list of unique binding network constraint resulting from part A of this process.

2. 'Left Hand Side' terms of those network constraints, which lists all the facilities located behind each network constraint.

3. Portfolios identified under WEM Rule 2.16B.1.[39]

Some network constraints have versions which applied through the rolling test window. Whilst most version changes only affect facility coefficients in the constraint equation, if a facility is commissioned or decommissioned, the terms of the equation would change. A strict interpretation of the WEM Rules definition of constrained portfolio is used, and the set comprising all the registered facilities that are located behind any version of the network constraint are considered.

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[35]   Wholesale Electricity Market Rules (WA) 13 December 2023, 2.16B.2(a), (online).

[36]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, p. 734, (online).

[37]   Wholesale Electricity Market Rules (WA) 13 December 2023, 2.16B.2(b), (online).

[38]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, p. 706, (online).

[39]   ERA, October 2023, *WEM Procedure: Portfolio Determination*, (online).

The three data sets are merged, the first two by network constraint ID and the last two by facility. Only those facilities which sit behind a network constraint which bound during the period are included in this process.

The data frame is arranged alphabetically by constraint ID, then numerically by portfolio and then alphabetically by facility. An exception to this ordering is where a constraint ID uses a numerical suffix, in which case those constraints are arranged numerically by their suffix.

A constrained portfolio number is assigned to each facility, row by row, according to the constraint ID and portfolio number. If either the constraint ID or the portfolio changes, then a new constrained portfolio number is assigned, see Table 2 below.

Table 2:   Example of constrained portfolio identification

Constraint ID	Facilities	Portfolio	Constrained portfolio number
Constraint-equation-1	Facility A	1	1
Constraint-equation-1	Facility B	1	1
Constraint-equation-1	Facility C	2	2
Constraint-equation-2	Facility A	1	3
Constraint-equation-3	Facility A	1	4

Step 3 - Constrained uplift payment ratio calculation (rolling test window)

Steps 1 and 2 of the process meet the requirements under WEM Rules 2.16B.2. From this point on, the steps are designed to apply the calculation required under the market power test set in market rule 2.16C.2 and determine which of the constrained portfolios meet or exceed the materiality threshold. This step calculates the constrained uplift payment ratio for each of the constrained portfolios within the rolling test window.

This calculation is applied to each constrained portfolio.

$$Constrained\ Uplift\ Payment\ Ratio = \frac{CP\_UP}{NC} \times 100$$

Where:

> CP_UP is the count of dispatch intervals within the rolling test window for a bound network constraint where uplift payments were made.

> NC is the count of dispatch intervals within the rolling test window where a network constraint equation bound.

This process requires the following data sets:

1. WEMDE dispatch solution constraints.

2. 'Left Hand Side' terms of those network constraints, which lists all the facilities located behind each network constraint.

3. Energy uplift payment data.

4. Constrained portfolios assigned in part B of this process.

The denominator (NC) is extracted for each constrained portfolio by filtering the WEMDE dispatch solution constraints by the network constraint for which the constrained portfolio was assigned. The row count is the number of dispatch intervals in the rolling test window for which the network constraint bound.

The numerator (CP_UP) is found by merging the solution constraints with the facilities from the LHS terms, and then with the facilities receiving energy uplift. The same filter for the relevant constraint is then applied as before. At this time, the data is filtered to only include intervals for which there is an energy uplift payment received by a facility within that constrained portfolio. The number of unique dispatch intervals is then counted and forms the numerator.

For example, Table 3 below shows a hypothetical example where all the dispatch intervals in which constraint equation 1 bound. This constraint equation resulted in identification of example constrained portfolios 1 and 2. Constrained portfolio 1 includes facilities A and B, while constrained portfolio 2 includes facility C. From this example NC is determined to be 4 for both constrained portfolios, and CP_UP is the count of gold and blue shaded intervals for constrained portfolios 1 and 2 respectively.

Table 3:   Example of determining constrained facilities that received energy uplift payments by dispatch interval

Dispatch interval	Constrained facilities	Energy uplift recipients
2023-10-01 11:00	A, B, C	A, B
2023-10-01 11:05	A, B, C	A
2023-10-02 17:30	A, B, C	-
2023-10-02 17:35	A, B, C	C

These numbers are then input to a second table, in which the ratio is calculated according to the formula set out in the WEM Rules. Table 4 below shows the calculation of constrained uplift payment ratios for example constrained portfolios 1 and 2.

Table 4: **Example of how the constrained uplift payment ratio is calculated**

Constrained portfolio	CP_UP	NC	Constrained uplift payment ratio (%)
1	2	4	50
2	1	4	25

Step 4 - Constrained uplift payment ratio calculation (fixed assessment periods)

The process for calculating fixed assessment period is the same used for the whole of the rolling test window period. However, instead of using the rolling test window, the calculation is applied where the constraint equation relevant to the constrained portfolio has continuously bound for a period of a least seven consecutive trading days within the rolling test window. A rolling test window may contain multiple fixed assessment periods.[40]

This process is the same as outlined in step 3 and uses the same data set, however the key difference is first filtering the network constraint data to only consider fixed assessment periods. This is done by creating a duration variable, by ordering the data by constraint ID, then by chronological order. Rows are then checked if they are 5 minutes apart, if they are this is added to a cumulative duration, if they are not, a new count is started.

The duration variable is then filtered to only include those which exceed 7 days. The numerator and denominator are then extracted as before, and the constrained uplift payment ratio is calculated. If there are multiple fixed assessment periods for the same network constraint, the highest constrained uplift payment ratio is provided.

Step 5 – Material constrained portfolios. A filter is applied to the calculation tables generated in steps 3 and 4 to only include those with a constrained uplift payment ratio greater than 10% from either part.

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[40]   Wholesale Electricity Market Rules (WA) 13 December 2023, Chapter 11, p. 720, (online).

Appendix 4 Constrained uplift payment ratio calculation results

The ERA must publish the results of the of the calculations carried out for WEM Rule clause 2.16C.2(a). This includes the results of the constrained uplift payment ratio for all constrained portfolios for both the rolling test window and any fixed assessment periods.

Table 5: **Complete results of the calculation carried out under WEM Rule clause 2.16C.2(a)**

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
1	DCCE-WEMDEUI-Security-17	0	NA
2	DCCE-WEMDEUI-Security-17	0	NA
3	DCCE-WEMDEUI-Security-58	0	NA
4	DCCE-WEMDEUI-Security-59	0	NA
5	DCCE-WEMDEUI-Security-60	0	NA
6	DCCE-WEMDEUI-Security-61	0	NA
7	DCCE-WEMDEUI-Security-62	0	NA
8	DCCE-WEMDEUI-Security-63	0	NA
9	DCCE-WEMDEUI-Security-64	0	NA
10	DCCE-WEMDEUI-Security-72	100	NA
11	DCCE-WEMDEUI-Security-79	0	NA
12	DCCE-WEMDEUI-Security-79	0	NA
13	DCCE-WEMDEUI-Security-80	89	NA
14	DCCE-WEMDEUI-Security-91	0	NA
15	DCCE-WEMDEUI-Security-92	0	NA
16	DCCE-WEMDEUI-Security-165	75	NA
17	DCCE-WEMDEUI-Security-166	25	NA
18	DCCE-WEMDEUI-Security-167	100	NA
19	DCCE-WEMDEUI-Security-168	90	NA
20	DCCE-WEMDEUI-Security-185	0	NA
21	DCCE-WEMDEUI-Security-209	0	NA

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[41] Value is rounded to the nearest percentage point.

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
22	DCCE-WEMDEUI-Security-220	0	NA
23	ENT-YDT 91, Off(SPS_MARNET) ^ {NIL} [TST-TS 81]	0	NA
24	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
25	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
26	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
27	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
28	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
29	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
30	HBK-MUC 81 > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
31	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	0	NA
32	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	0	NA
33	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	0	NA
34	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	29	NA
35	KW_8BA1 > {KW-CC-MED 81} [KW-BIB 81 (KW~)]	0	NA
36	NIL > Commitment {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
37	NIL > Commitment {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
38	NIL > Commitment {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
39	NIL > Commitment {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
40	NIL > Commitment {NIL} [YLN-WKT X1 (YLN~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
41	NIL > Commitment {NIL} [YLN-WKT X1 (YLN~)]	0	NA
42	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
43	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
44	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	22	NA
45	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
46	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
47	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
48	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
49	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	12	NA
50	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
51	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
52	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	26	NA
53	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
54	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	2	NA
55	NIL > {CT-MSS-PNJ 81} [MH-PNJ 81 (PNJ~)]	0	NA
56	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
57	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
58	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
59	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
60	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
61	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
62	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
63	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
64	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
65	NIL > {D-SVY 81 (D)} [MU-NGS X1 (MU~)]	0	NA
66	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
67	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
68	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
69	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
70	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
71	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
72	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
73	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
74	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	67	NA
75	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
76	NIL > {KEM-MRR 81 (KEM)} [KEM-MRR 82 (KEM~)]	0	NA
77	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
78	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
79	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	7	NA
80	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
81	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
82	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
83	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	33	NA
84	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
85	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
86	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
87	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
88	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
89	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
90	NIL > {KW-CC-MED 81} [MSR-WM-OFE 81 (MSR~)]	0	NA
91	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
92	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
93	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	14	NA
94	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
95	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
96	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
97	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
98	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	16	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
99	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
100	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
101	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	32	NA
102	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
103	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
104	NIL > {KW-CC-MED 81} [WM-MSR-OFE 81 (WM-)]	0	NA
105	NIL > {MGA-TS 81 (MGA)} [TS-MBA 81 (MBA~)]	0	NA
106	NIL > {MGA-TS 81 (MGA)} [TS-MBA 81 (MBA~)]	0	NA
107	NIL > {MGA-TS 81 (MGA)} [TS-MBA 81 (MBA~)]	0	NA
108	NIL > {MGA-TS 81 (MGA)} [TS-MBA 81 (MBA~)]	0	NA
109	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	12	NA
110	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
111	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
112	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	71	NA
113	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
114	NIL > {MRT-NOR 81 (MRT)} [MU-NGS X1 (MU~)]	0	NA
115	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
116	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
117	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
118	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
119	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
120	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
121	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
122	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
123	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
124	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
125	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
126	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
127	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
128	NIL > {MSR-WM-OFE 81} [MED-KW-CC 81 (MED-)]	0	NA
129	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
130	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
131	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
132	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
133	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
134	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	3	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
135	NIL > {NBT-NT 91, SPS_MARNET} [JDP-WNO 81 (WNO~)]	0	NA
136	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
137	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
138	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
139	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
140	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
141	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
142	NIL > {NBT-NT 91, SPS_MARNET} [NBT-WNO 81 (NBT~)]	0	NA
143	NIL > {NIL} [YLN-WKT X1 (WKT-)]	0	NA
144	NIL > {NIL} [YLN-WKT X1 (WKT-)]	0	NA
145	NIL > {NIL} [YLN-WKT X1 (WKT-)]	0	NA
146	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
147	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
148	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
149	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
150	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
151	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
152	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
153	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
154	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
155	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
156	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
157	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
158	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
159	NIL > {NT-PJR 81 (PJR)} [JDP-WNO 81 (WNO~)]	0	NA
160	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
161	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
162	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	67	NA
163	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
164	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
165	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
166	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
167	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
168	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
169	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
170	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
171	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	33	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
172	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
173	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
174	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
175	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
176	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	67	NA
177	NIL > {NT-SPK 81 (NT)} [EP-BEL-NT 81 (EP-)]	0	NA
178	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
179	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
180	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	100	NA
181	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
182	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
183	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
184	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
185	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
186	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
187	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
188	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
189	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	33	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
190	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
191	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
192	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
193	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
194	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	67	NA
195	NIL > {NT-SPK 81 (NT)} [NT-EP-BEL 81 (NT~)]	0	NA
196	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
197	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
198	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	36	NA
199	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
200	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
201	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
202	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
203	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	45	NA
204	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
205	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	41	NA
206	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	50	NA
207	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	**Fixed assessment period**
208	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
209	NIL > {PIC-PNJ-BSN-KEM 81} [PNJ-APJ 81 (APJ~)]	0	NA
210	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	0	NA
211	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	0	NA
212	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	0	NA
213	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	0	NA
214	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	19	NA
215	NIL > {PJR-CTB 81 (PJR)} [PJR-RGN 81 (RGN~)]	0	NA
216	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
217	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
218	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
219	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
220	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
221	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
222	NIL > {PJR-MUC 81 (PJR)} [PJR-MUC 82 (PJR~)]	0	NA
223	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
224	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
225	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA

Constrained portfolio	Constraint equation	Constrained uplift payment ratio[41]	
		Rolling test window	Fixed assessment period
226	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
227	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
228	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
229	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
230	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
231	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	33	NA
232	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
233	NIL > {RO-WAI 81 (RO)} [PNJ-APJ 81 (APJ~)]	0	NA
234	NIL > {TS-MBA 81 (MBA)} [MGA-TS 81 (MGA~)]	0	NA
235	NIL > {TS-MBA 81 (MBA)} [MGA-TS 81 (MGA~)]	0	NA
236	NIL > {TS-MBA 81 (MBA)} [MGA-TS 81 (MGA~)]	0	NA