STOR Market Information Report TR37

Published 22nd March 2019

Foreword

Welcome to the TR37 Market Information Report and the first tender opportunity for STOR Year 14. As part of the recent update to the contract terms, we have published greater details about STOR tender which we hope provides a greater degree of understanding of the STOR market.

We are continuing to develop the new despatch system for NBM providers, ASDP, and existing providers should be in contact with the our technical team to share their plans for testing and deployment. Further material on ASDP can be found under the PAS Documents section on this page. If you have not been in contact with our technical team or are a new provider planning to participate in future tender rounds, you can contact the team at box.support.pas@nationalgrid.com

As set out in the MIR for TR36, we highlighted that we would be removing the Premium Flexible option due to low availability out-turn from accepted units. This also helped to reduce complexity and standardise available service types.

December 2019 will see the implementation of TERRE and Wider Access opening up opportunities for increasing number of market participants to offer flexibility to the System Operator. Prequalification for these product has now begin and can be complete from this page. Further guidance is also available on Elexon's website.

We are keen to hear your thoughts on how we can improve the STOR service or this report, so if you do have any comments, please do get in touch.

Thanks,

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Introduction

This market report is produced after each tender round and is designed to give existing and potential STOR participants an overall view of the tenders received in tender round 37 (TR37). The report provides details of tendered utilisation and availability prices and the National Grid Electricity System Operator (NGESO) consequent forward contracted position; together with further details on the type and dynamics of the tendered plant. For further information regarding this product, Frequently Asked Questions, or how and when to tender please consult the STOR section found on the Balancing Services information website:

https://www.nationalgrid.com/uk/electricity/balancing-services/reserve-services/short-term-operating-reserve-stor

This report is under continuous review and development, if you have any comments or suggestions of information you would like to see in future issues of this report, please contact your account manager.

Data and charts that were previously found in this report can still be found in the associated Excel file available on the website.

Operating Reserve Requirement and STOR requirement and de-rating factors

As National Grid Electricity System Operator (NETSO) we hold an Operating Reserve Requirement (ORR) from 4 hours ahead of time to real time, to take account of demand forecast errors, plant losses and market imbalance. The ORR is met by headroom on market synchronised machines, additional actions taken by NGESO via the Balancing Mechanism (BM) and contracted reserve products. STOR is a contracted reserve product and as such STOR tenders can make up a finite proportion of the ORR. The amount of contracted STOR required is determined by the size of the ORR which changes due to forecast market length, market provided headroom, volume of intermittent generation and demand forecast errors. The proportion of the ORR met by STOR is determined by considering the technical system requirements and the forecast cost of alternatives versus the cost of the tendered STOR units.

NGESO aims to procure STOR tenders such that a minimum of 1800MW of contracted STOR is made available throughout the STOR seasons. The daily and seasonal optimal STOR MW level varies due to real-time and seasonal pressures on the system, but NGESO typically aims to achieve approximately 2300MW of STOR available where economic to do so.

NGESO manages the optimal STOR MW level at a daily resolution through the week-ahead Flexible STOR assessment, refining the available portfolio in response to the forecast conditions for the week-ahead.

To achieve the optimal level at the week-ahead stage, National Grid examines historic availability profiles from Committed and Flexible providers to help determine the volume of STOR tenders to procure at the tri-annual tender round. During the assessment, National Grid uses specific unit forecasts based on history where available and based on any other information available, however as a rule the following de-rated percentages can be applied to the data to develop a clearer understanding of the actual volume available. BM-C 90%, NBM-C 85%, NBM-F non-winter 50% NBM-F winter 25%. These figures represent average outturn availability over the various seasons, the actual availability over the peak winter evenings has been significantly lower for NBM-F. When considering the capacity accepted and tendered it is important to think of it not in absolute volumes but instead the de-rated volume. Whilst there is currently no fixed limit to the amount of Committed or Flexible we are willing to accept, committed units are key in meeting the requirement during those periods of low non-committed availability and as such National Grid values committed units particularly in the winter seasons.

The two versions of the chart below demonstrate this concept.

Figure 1 gives a breakdown of the accepted Flexible and Committed MW per season since the start of the STOR service. The blue line represents the sum of the maximum tendered MW from unique units from any tender round for each season. Capacity is as tendered, in a change to previous charts unsuccessful tenders from 2010 long term tenders have been removed from the maximum MW tendered. For seasons with tender rounds still to come, this figure will increase if units that thus far have not tendered for that season, tender in. The black line on the chart represents the outturn average availability for each season (where available). Premium Flexible tenders are included in the Flexible category for this chart.

Figure 2 gives the same data as figure 1 but using the general de-rating figures shown above. This demonstrates a much closer match between total de-rated MW and the actual outturn available MW.

It should also be noted that the Maximum tendered capacity is greater than (or equal to) the actual current capacity as some units have left the market or reduced their capacity.

Figure 1

Breakdown of Accepted Flexible and Committed MW per season

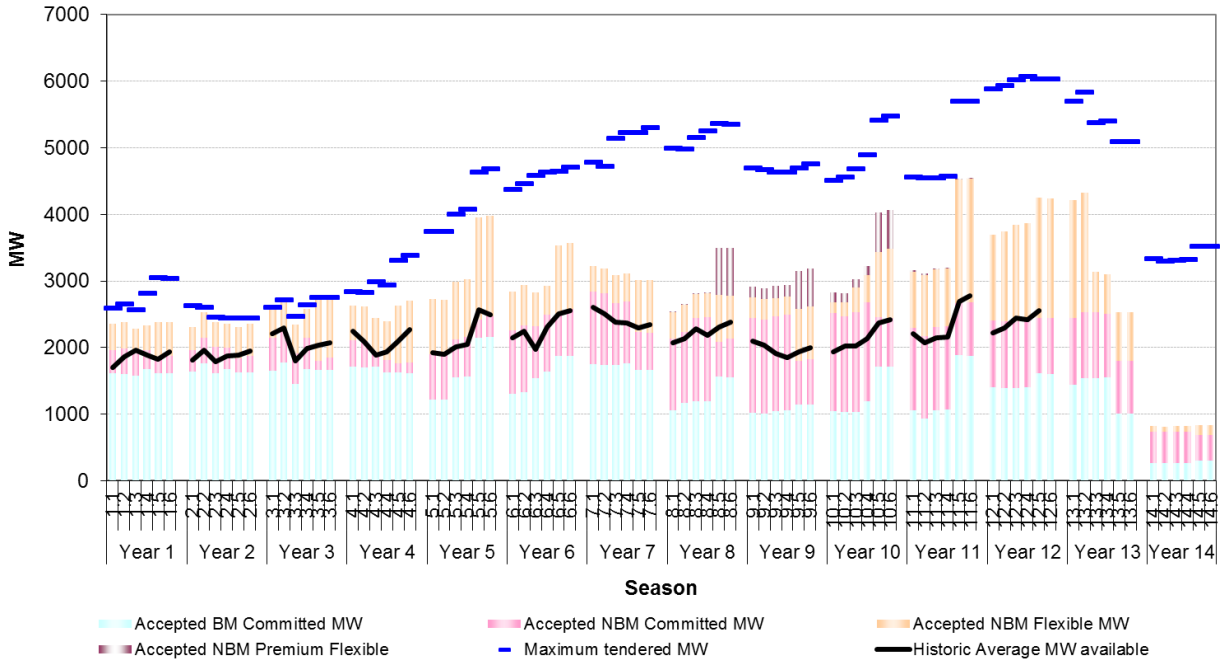
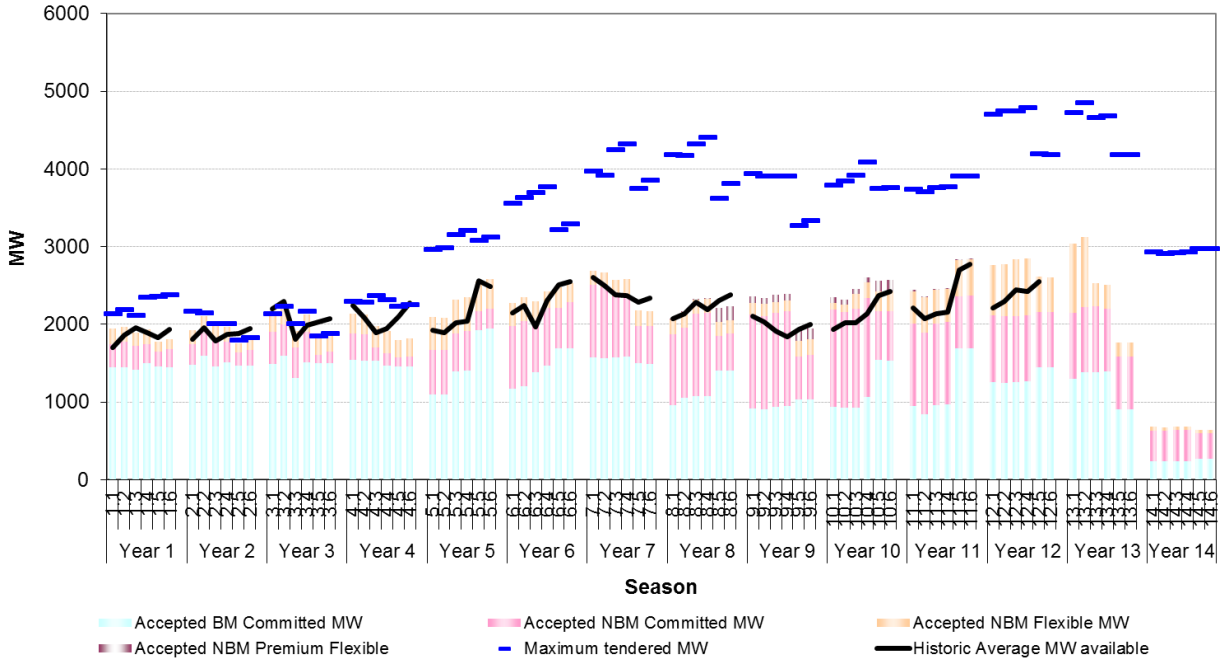


Figure 2

Breakdown of Accepted Flexible and Committed De-rated MW per season



Tenders received and assessment results

Table 1 below summarises the tenders received, it also summarises the total contracted and de-rated. A full breakdown of contracted and tendered data can be found in the Excel file.

	TR37 Tenders					Already contracted capacity	
Season Number	BM-C	NBM-C	NBM-F	Total	De-rated Total	Total	De-rated Total
13.1	858	430	1287	2575	**1781**	**2456**	**1976**
13.2	814	426	1319	2559	**1754**	**2540**	**2056**
13.3	1123	426	120	1669	**1433**	**2541**	**2057**
13.4	1132	473	120	1725	**1481**	**2499**	**2021**
13.5	1608	294	0	1902	**1697**	**2183**	**1458**
13.6	1602	294	0	1896	**1692**	**2183**	**1458**
14.1	1931	691	95	2717	**2373**	**389**	**331**
14.2	1919	689	84	2692	**2355**	**387**	**329**
14.3	1926	689	84	2699	**2361**	**388**	**330**
14.4	1935	691	84	2710	**2371**	**389**	**331**
14.5	2107	530	269	2906	**2414**	**390**	**332**
14.6	2101	530	269	2900	**2409**	**390**	**332**

Table 2 below summarises the accepted units and the approximate requirement remaining for the next tender rounds.

	TR37 Tenders Accepted					Remaining
Season Number	BM-C	NBM-C	NBM-F	Total	De-rated Total	Total
13.1	232	243	1287	**1762**	**1059**	**-**
13.2	230	239	1319	**1788**	**1070**	**-**
13.3	232	239	120	**591**	**472**	**-**
13.4	241	241	120	**602**	**482**	**-**
13.5	202	150	0	**352**	**309**	**700**
13.6	201	150	0	**351**	**308**	**700**
14.1	270	72	95	**437**	**352**	**1600**
14.2	270	75	84	**429**	**349**	**1600**
14.3	270	75	84	**429**	**349**	**1600**
14.4	270	75	84	**429**	**349**	**1600**
14.5	300	0	150	**450**	**308**	**1700**
14.6	300	0	150	**450**	**308**	**1700**

Successful Tenders in TR37

Year 13 (2019/20)

This tender round was the final opportunity to tender for seasons 13.1 and 13.2; as such the most economic tenders were accepted to provide sufficient volume to meet the optimal level. We accepted additional volume for 13.3 & 13.4. We also accepted a proportion of our remaining requirement for seasons 13.5 and 13.6. We have a remaining requirement for seasons 13.5 & 13.6 that we aim to fulfil within the future tender rounds if this is considered to be efficient.

Year 14 (2020/21)

This was the first opportunity for Year 14 (excluding long term tenders). A combination of the most economic all or nothing and tenders with no restrictions were accepted. Overall, we have a surplus of tenders for year 14 above our minimum requirement. We have a significant remaining requirement that we aim to fulfil within the future tender rounds if this is considered to be efficient.

Tables demonstrating the breakdown of accepted and rejected tenders and average prices have been moved to the MIR Excel file.

Expectations for TR38

This section is designed to clarify our views for the next tender round, including remaining requirement and likely intentions.

- **Year 13:** TR38 is the fifth opportunity (excluding long term tenders) for Year 13. A proportion of the requirement remains for the 13.5 & 13.6. NGESO will accept only the most economic tenders.
- **Year 14:** TR38 is the second opportunity for Year 14. We intend to procure only the most economic tenders.

Figure 3 presents the number of units and the total MW tendered and accepted for each season and each location.

Figure 3

SCOTLAND	Units tendered	Units Accepted	MW tendered	MW Accepted
13.1	-	-	-	-
13.2	-	-	-	-
13.3	-	-	-	-
13.4	-	-	-	-
13.5	-	-	-	-
13.6	-	-	-	-
14.1	-	-	-	-
14.2	-	-	-	-
14.3	-	-	-	-
14.4	-	-	-	-
14.5	-	-	-	-
14.6	-	-	-	-

SOUTH	Units tendered	Units Accepted	MW tendered	MW Accepted
13.1	79	77	1,090	840
13.2	81	79	1,104	864
13.3	13	11	572	327
13.4	14	11	626	336
13.5	13	6	586	212
13.6	13	6	580	211
14.1	26	5	994	75
14.2	25	4	976	70
14.3	25	4	983	70
14.4	25	4	993	70
14.5	26	4	1,026	71
14.6	26	4	1,020	71

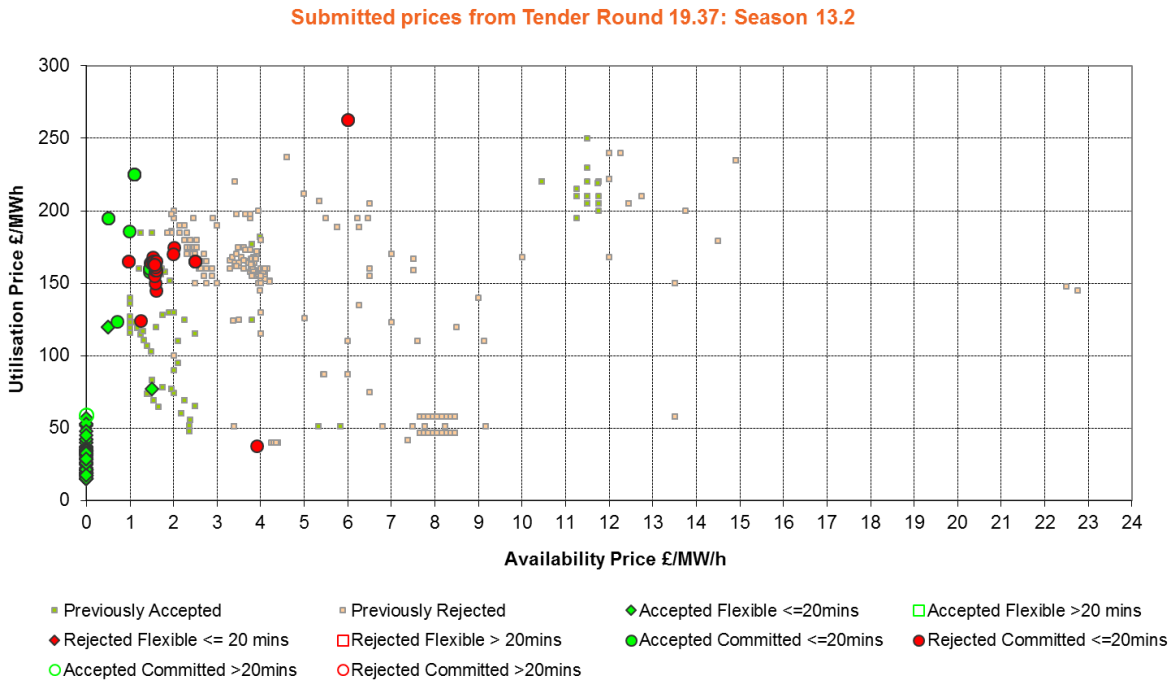
NORTH	Units tendered	Units Accepted	MW tendered	MW Accepted
13.1	96	89	1,125	709
13.2	95	89	1,089	705
13.3	13	5	817	131
13.4	13	5	819	133
13.5	12	1	1,076	7
13.6	12	1	1,076	7
14.1	18	3	1,233	283
14.2	18	3	1,232	283
14.3	18	3	1,232	283
14.4	18	3	1,233	283
14.5	21	2	1,390	305
14.6	21	2	1,390	305

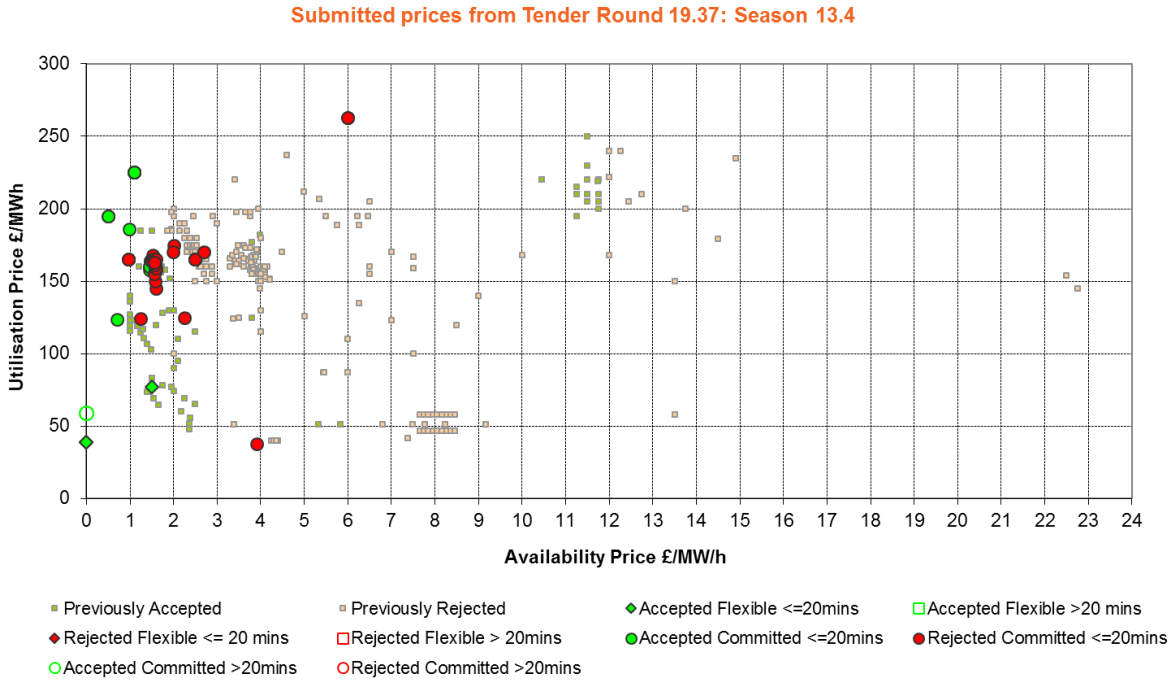
MULTIPLE	Units tendered	Units Accepted	MW tendered	MW Accepted
13.1	41	20	360	213
13.2	42	21	366	219
13.3	25	4	280	133
13.4	25	4	280	133
13.5	21	4	240	133
13.6	21	4	240	133
14.1	60	18	490	79
14.2	59	18	484	76
14.3	59	18	484	76
14.4	59	18	484	76
14.5	60	17	490	74
14.6	60	17	490	74

Prices

Figures 4 and 5 below show scatter plots of availability and utilisation price for each tender and for each season. The data is broken down into response time groups of >20 mins or <=20 mins, Flexible or Committed service and accepted or rejected tenders. These charts also depict the accepted and rejected tenders from previous tender rounds. To keep this report short only seasons 2, 4 and 5 are displayed (these are the longest of each of the season pairs). The full data for all seasons is available in the MIR Excel file.

Figure 4 Year 13 Availability and Utilisation price charts





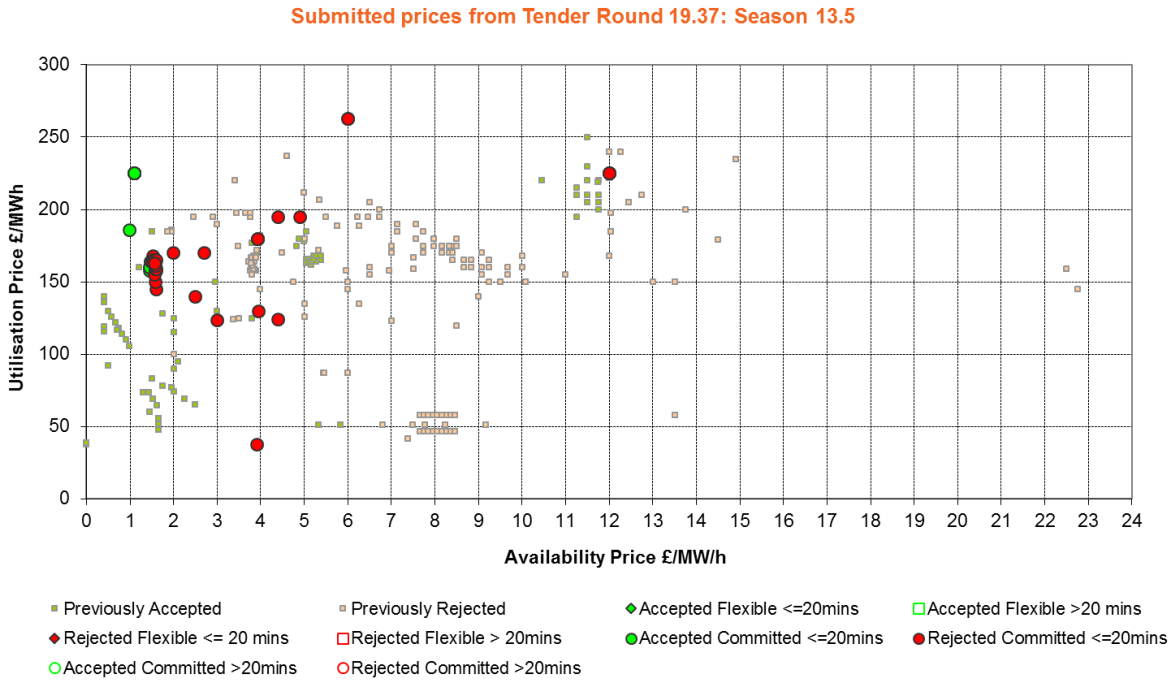
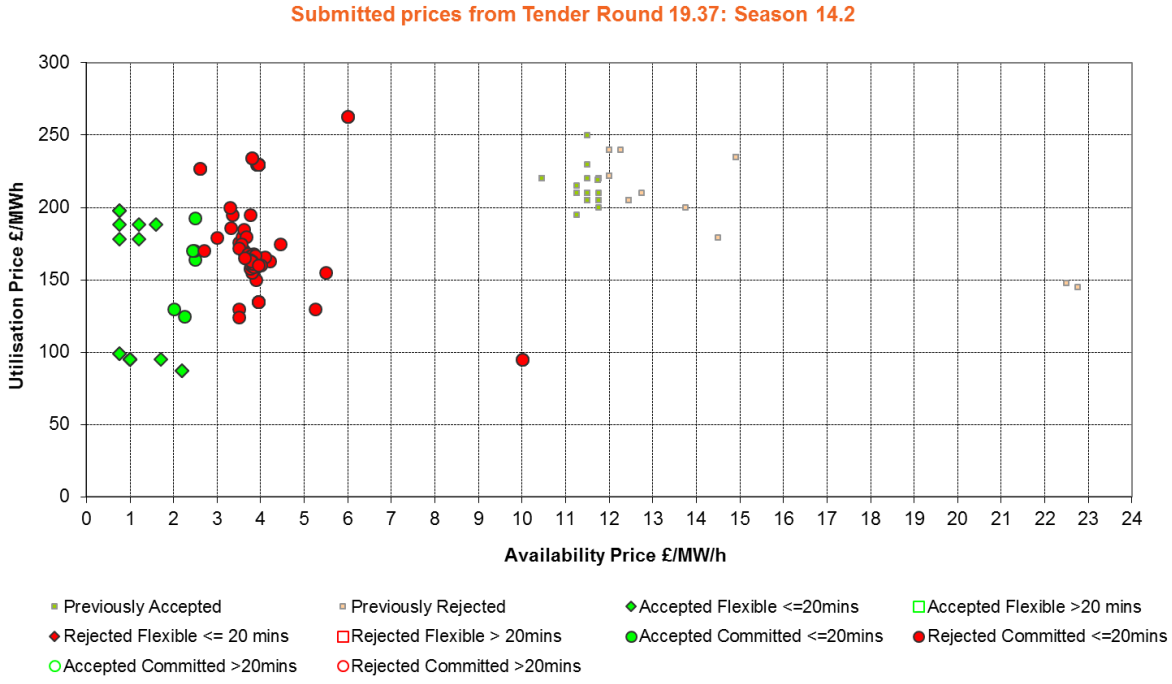
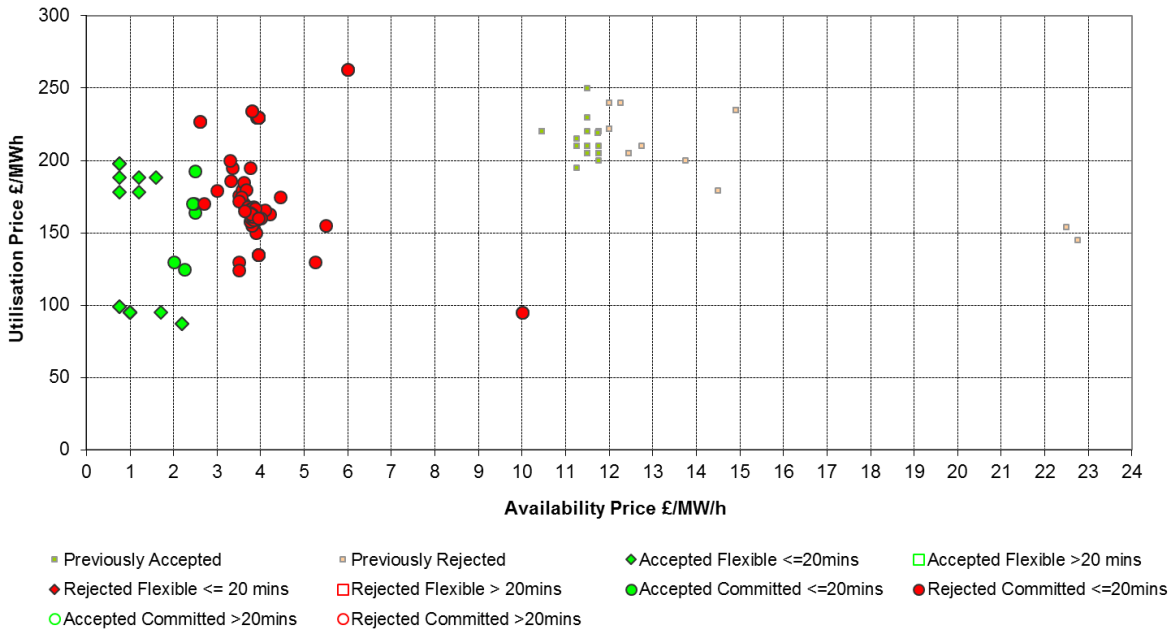


Figure 5 Year 14 Availability and Utilisation price charts



Submitted prices from Tender Round 19.37: Season 14.4



Submitted prices from Tender Round 19.37: Season 14.5

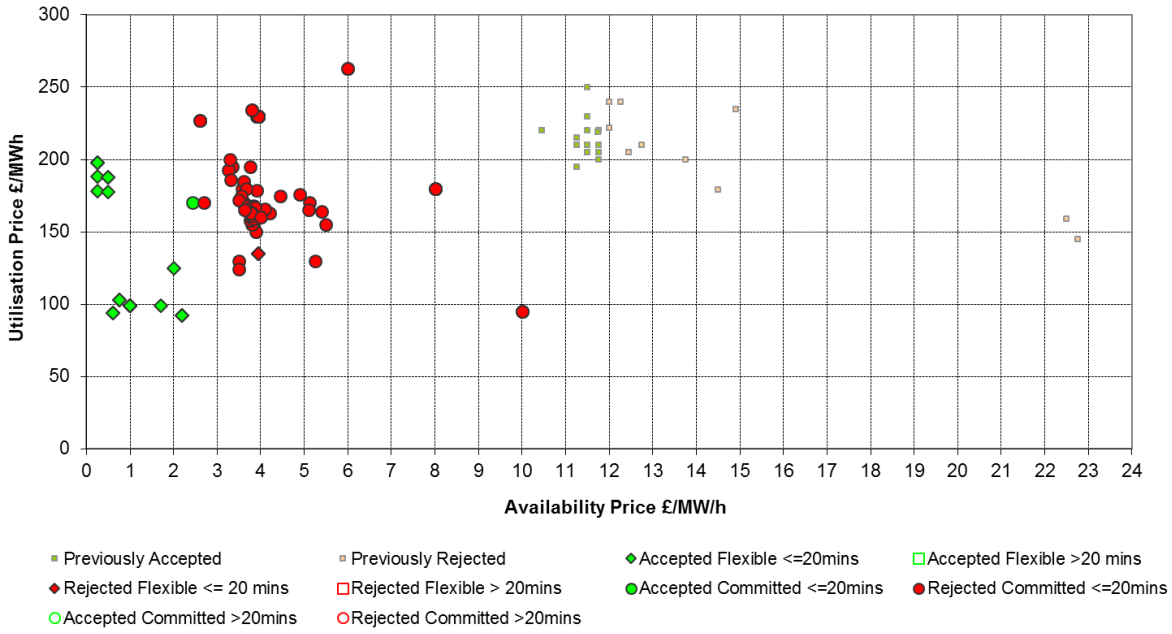


Table 3 below presents a summary of the highest accepted availability price for Committed and Flexible units. The table also presents the highest and lowest Utilisation price accepted for each season as a guide. This information can be seen on the scatter plots above. For this report we have added an extra column which is the highest availability price accepted that is not from an “all or nothing” tender. This change is to help distinguish between “all or nothing” prices that were accepted due to their benefits in other seasons to those accepted for their benefit in the current season.

Table 3 Summary of accepted Prices

Season Number	Marginal Availability price accepted £/MW/h	Marginal Availability price accepted non all or nothing	Highest Utilisation Price accepted £/MWh	Lowest Utilisation Price accepted £/MWh
13.1	1.47	0.70	225.00	15.40
13.2	1.50	1.50	225.00	15.40
13.3	1.50	1.50	225.00	39.00
13.4	1.50	1.50	225.00	39.00
13.5	1.47	-	225.00	158.00
13.6	1.47	-	225.00	158.00
14.1	2.50	2.20	207.99	86.96
14.2	2.50	2.50	197.93	86.96
14.3	2.50	2.50	197.93	86.96
14.4	2.50	2.50	197.93	86.96
14.5	2.44	2.20	197.83	91.93
14.6	2.44	2.20	197.83	91.93

Figure 6 below shows the detail of all or nothing tenders. For simplicity multiple tenders of the same price are removed from the following charts. Tenders that were accepted are coloured green and rejected tenders coloured red.

Figure 6 All or nothing tenders

Utilisation price and response time stacks

Figures 7 and 8 exhibit cumulative graphs. In these graphs the total accepted MW from previous tender rounds, up to and including the results from TR37, have been stacked according to two categories: **Figure 7a & 7b** is ranked according to utilisation price and **Figures 8a & 8b** according to the response time of the unit. **The utilisation prices have had indexation applied (seasonal and annual).**

Figure 7a illustrates that for seasons 13.1 and 13.2 approximately 1850MW of STOR is contracted with a utilisation prices of £90/MWh or less.

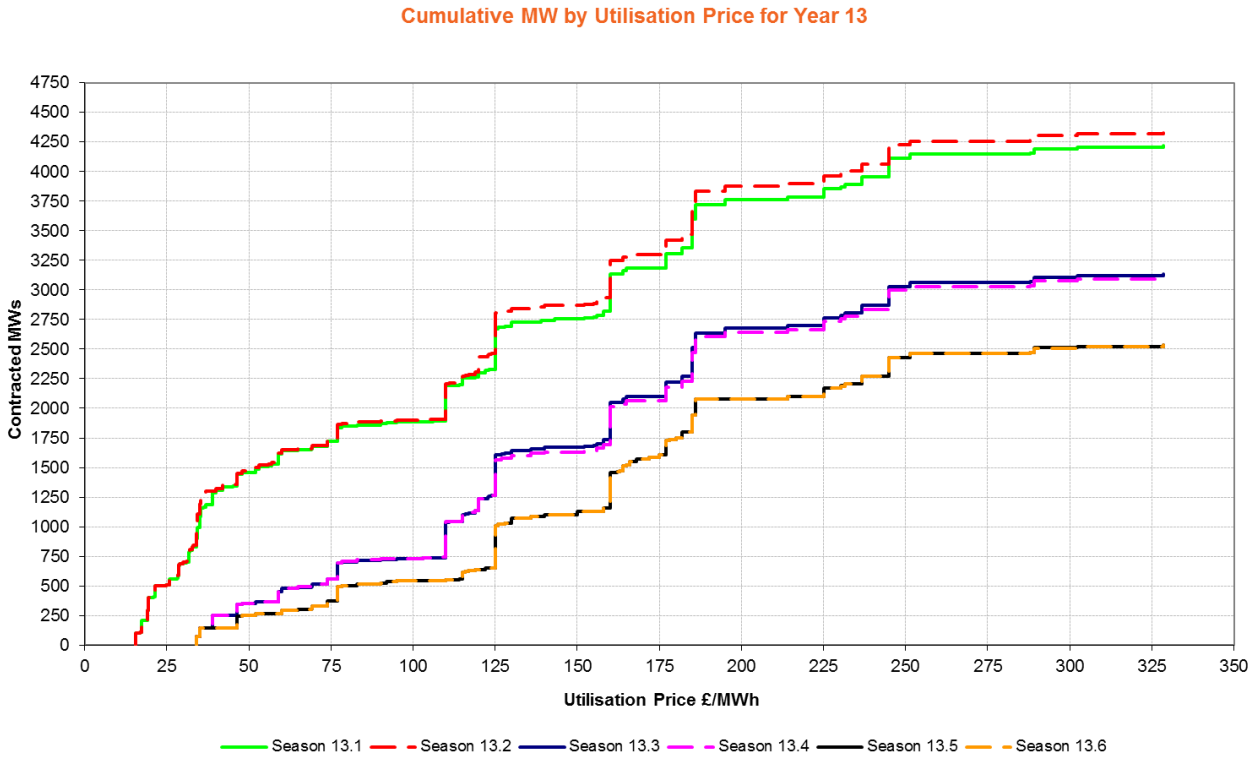


Figure 7b

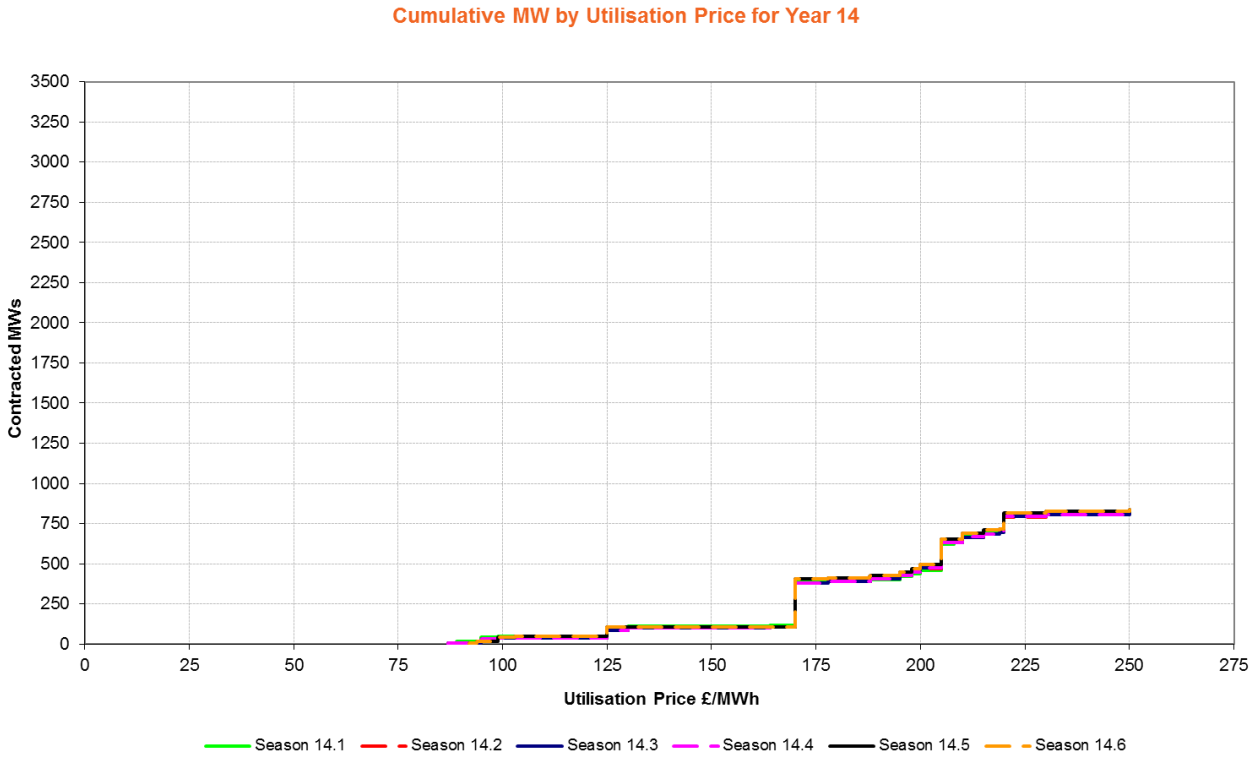


Figure 8a illustrates that for seasons 13.1 and 13.2 approximately 2250MW of STOR is contracted with a response time of 10 minutes or less.

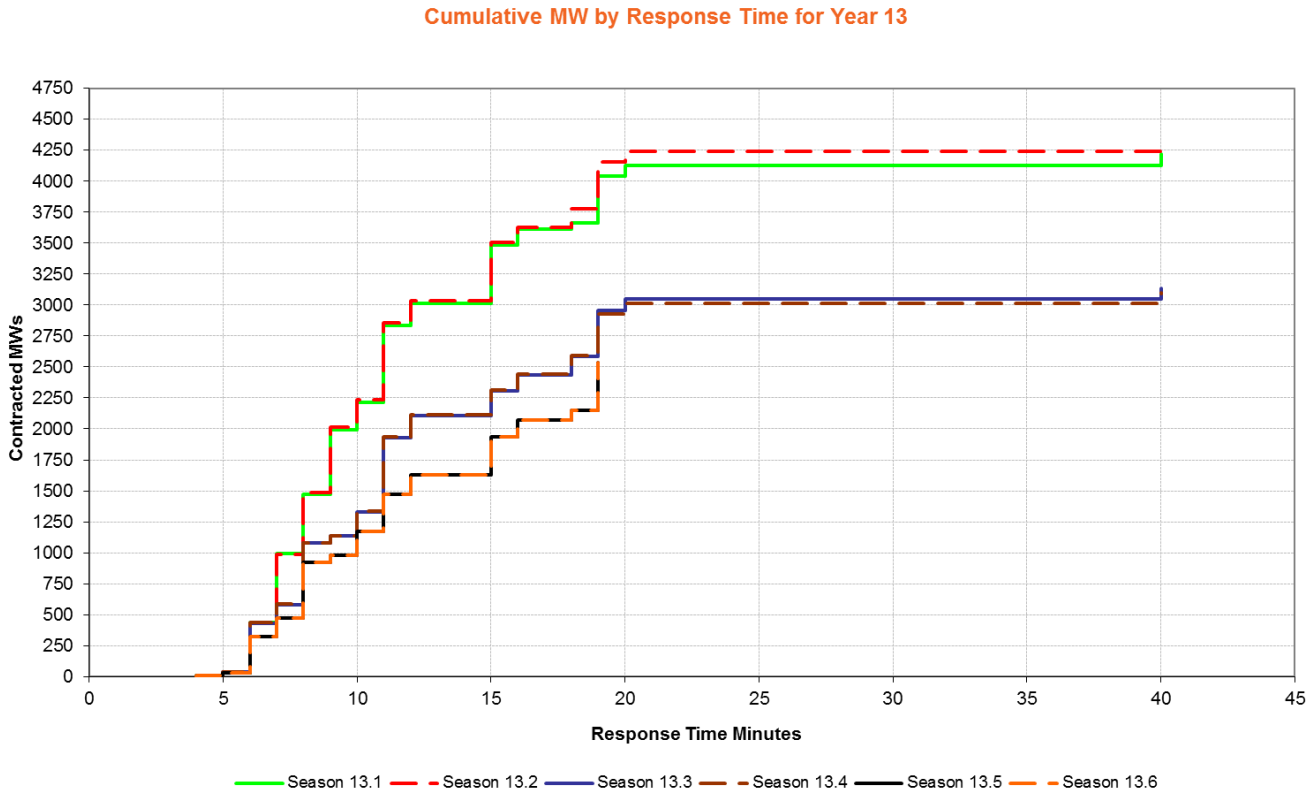
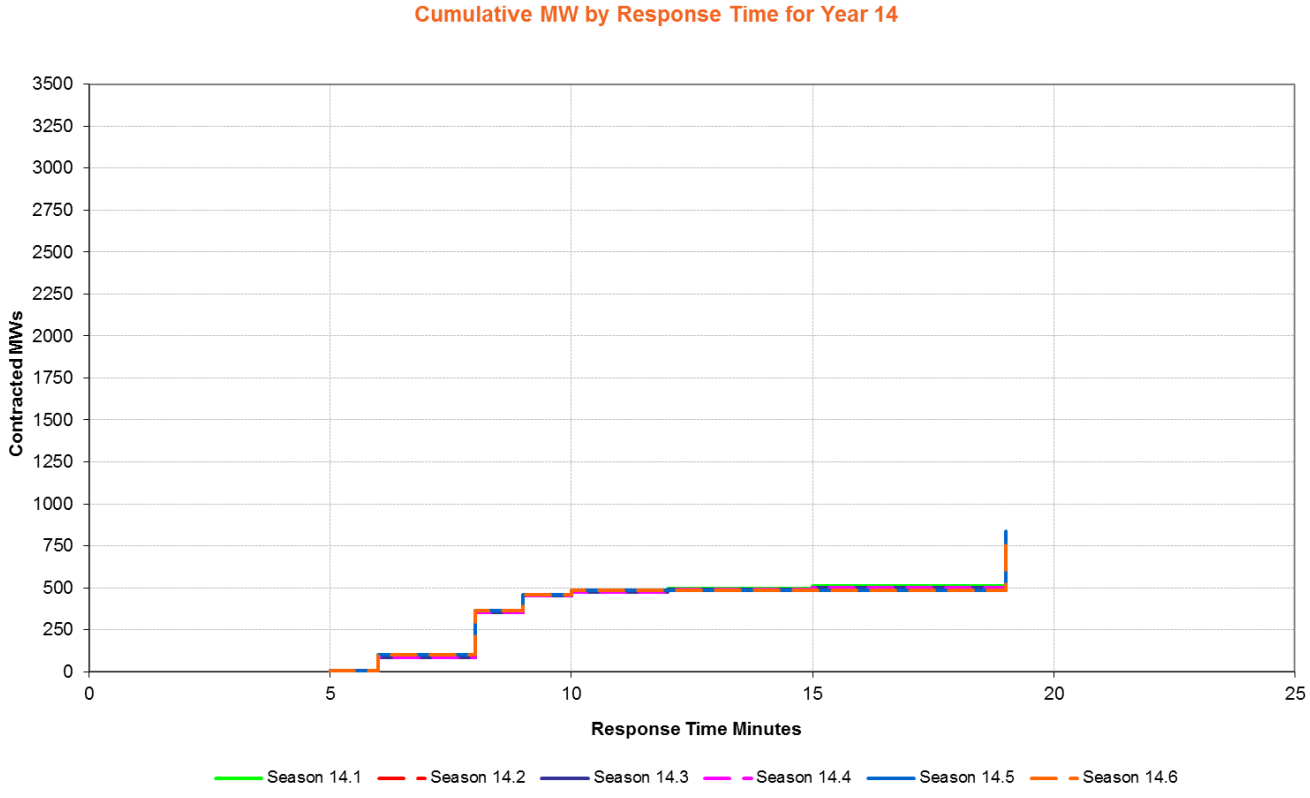


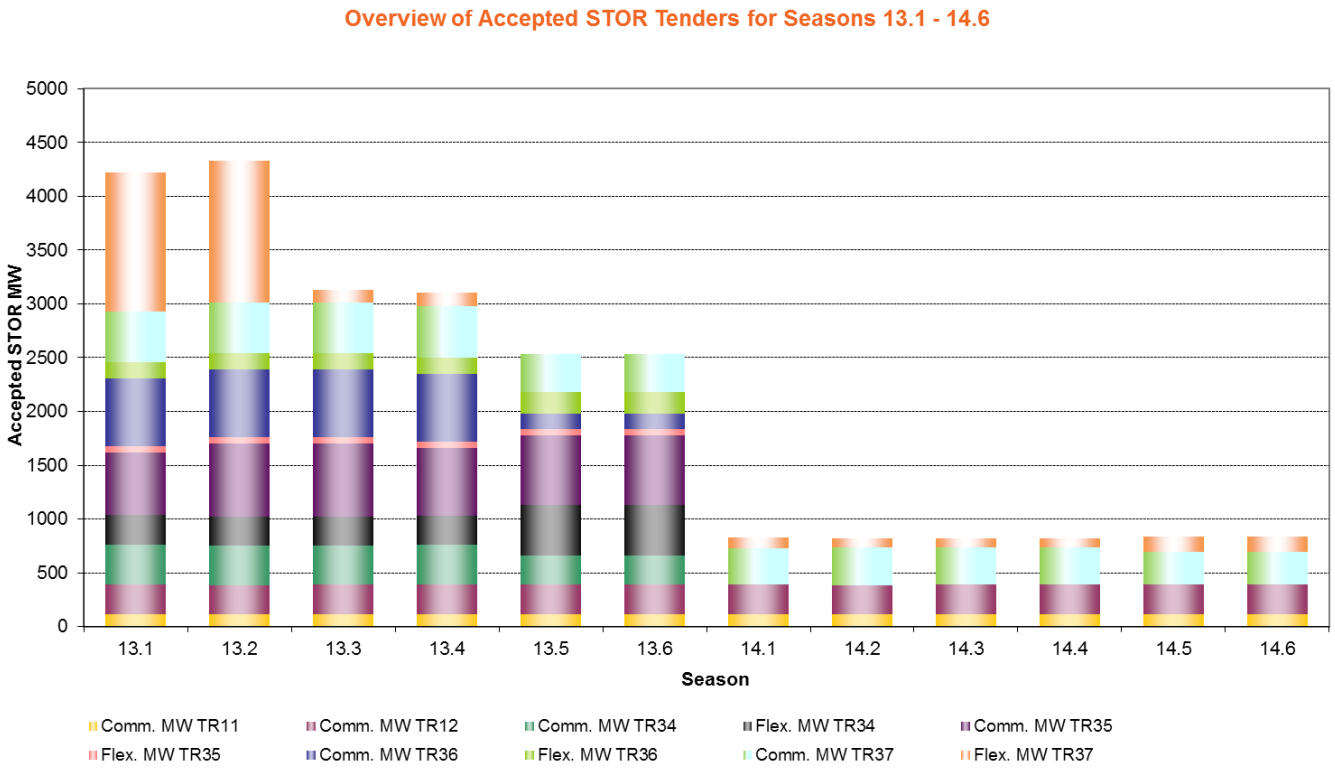
Figure 8b



Total Contracted Position

Figure 9 shows the breakdown of accepted volumes from all previous tender rounds across the seasons of Years 13 and 14. The table accompanying Figure 9 below displays the same data in table format split by Committed or Flexible.

Figure 9 Year 13 and 14 summaries by tender round



	Season	13.1		13.2		13.3		13.4		13.5		13.6	
	Service Type	C	F	C	F	C	F	C	F	C	F	C	F
Accepted MW	TR11	116		116		116		116		116		116	
	TR12	273		271		272		273		274		274	
	TR34	368	282	366	271	366	271	368	271	271	466	271	466
	TR35	578	62	677	62	677	62	632	62	652	61	652	61
	TR36	629	148	629	148	629	148	629	148	140	203	140	203
	TR37	475	1287	469	1319	471	120	482	120	352		351	
	Total	2439	1779	2528	1800	2531	601	2500	601	1805	730	1804	730

	Season	14.1		14.2		14.3		14.4		14.5		14.6	
	Service Type	C	F	C	F	C	F	C	F	C	F	C	F
Accepted MW	TR11	116		116		116		116		116		116	
	TR12	273		271		272		273		274		274	
	TR37	342	95	345	84	345	84	345	84	300	150	300	150
	Total	**731**	**95**	**732**	**84**	**733**	**84**	**734**	**84**	**690**	**150**	**690**	**150**

Appendix 1: Terminology and Definitions

High level description of STOR:

STOR is designed to give NGESO sufficient Operating Reserve to replace sudden generation losses, or unpredictable changes in demand between four hours ahead of real time and real time and requires a large proportion of units to be available within 20 minutes. STOR also recognises that other potential reserve providers who cannot meet the 20 minute response time criteria can still be of value in meeting our reserve requirement. Hence a key aspect of the definition of the STOR product is that it extends the maximum response time to 240 minutes to allow alternative providers to participate. How value is placed on these units by NGESO is different to the sub 20 minute notice units as the longer notice units compete mainly with alternative options available in the Balancing Mechanism with equivalent response times. Location, reliability and utilisation parameters are also important elements of the STOR assessment.

The Committed service applies to all providers who wish to make themselves available for all required windows nominated by NGESO. Both BM and NBM providers can tender for this service. The Flexible service applies only to NBM providers and allows the provider to make the unit available or unavailable for particular windows. This availability is assessed on a week-ahead basis and providers are notified if their service is required or not. It is at the discretion of NGESO whether a unit is accepted or rejected at the week-ahead stage and this decision will be based on the same assessment principles as the main tender assessment. The increased accuracy of the week-ahead forecast means that some factors may have more importance such as location if specific constraint issues are forecast. Both Services attract an availability payment paid on a £/MW/h basis when available within defined windows and a utilisation payment on delivery of STOR MW when instructed by NGESO paid on a £/MWh basis.

A summary of the STOR service can be found on our website at the following link:

https://www.nationalgrideso.com/document/85476/download

Appendix 2:

Accepted and Rejected Tenders TR38: A list of information containing prices, response time, location and unit type of all accepted and rejected tenders from this tender round, previously found in the appendix to the market information reports, can now be downloaded, in spreadsheet format, from the Market Information section of the STOR website:

https://www.nationalgrideso.com/balancing-services/reserve-services/short-term-operating-reserve-stor?market-information

Appendix 3: Season Reference

The following tables summarise the season information for the current year (Year 13) and the following year (Year 14).

Year 13 Seasons – 2019/20							
		WD		NWD		Indicative Hours	
Season	Dates	Start Time	End Time	Start Time	End Time	WD	NWD
1	05:00 on Monday 1st April 2019 - 05:00 on Monday 29th April 2019	06:00	13:00	10:00	14:00	161	20
		19:00	21:30	19:30	21:30	57.5	10
2	05:00 on Monday 29th April 2019 - 05:00 on Monday 19th August 2019	06:30	14:00	10:30	13:30	705	54
		16:00	18:00	19:30	22:00	188	45
		19:30	22:00	-	-	235	-
3	05:00 on Monday 19th August 2019 - 05:00 on Monday 23rd September 2019	06:30	13:00	10:30	12:30	188.5	12
		16:00	21:00	19:30	21:30	145	12
4	05:00 on Monday 23rd September 2019 - 05:00 on Monday 28th October 2019	06:00	13:00	10:30	13:00	210	12.5
		17:00	20:30	17:30	20:00	105	12.5
5	05:00 on Monday 28th October 2019 - 05:00 on Monday 27th January 2020	06:00	13:00	10:30	13:30	525	48
		16:00	20:30	16:00	19:30	337.5	56
6	05:00 on Monday 27th January 2020 - 05:00 on Wednesday 1st April 2020	06:00	13:00	10:30	13:00	392	22.5
		16:30	20:30	16:30	20:00	224	31.5
						3,473.50	336

Season	WD	NWD
1	23	5
2	94	18
3	29	6
4	30	5
5	75	16
6	56	9

Year 14 Seasons – 2020/21							
		WD		NWD		Indicative Hours	
Season	Dates	Start Time	End Time	Start Time	End Time	WD	NWD
1	05:00 on Wednesday 1st April 2020 - 05:00 on Monday 27th April 2020	06:00	13:00	10:00	14:00	140	24
		19:00	21:30	19:30	21:30	50	12
2	05:00 on Monday 27th April 2020 - 05:00 on Monday 17th August 2020	06:30	14:00	10:30	13:30	705	54
		16:00	18:00	19:30	22:00	188	45
		19:30	22:00	00:00	00:00	235	
3	05:00 on Monday 17th August 2020 - 05:00 on Monday 21st September 2020	06:30	13:00	10:30	12:30	188.5	12
		16:00	21:00	19:30	21:30	145	12
4	05:00 on Monday 21st September 2020 - 05:00 on Monday 26th October 2020	06:00	13:00	10:30	13:00	210	12.5
		17:00	20:30	17:30	20:00	105	12.5
5	05:00 on Monday 26th October 2020 - 05:00 on Monday 25th January 2021	06:00	13:00	10:30	13:30	525	48
		16:00	20:30	16:00	19:30	337.5	56
6	05:00 on Monday 25th January 2021 - 05:00 on Thursday 1st April 2021	06:00	13:00	10:30	13:00	399	22.5
		16:30	20:30	16:30	20:00	228	31.5
						3,456.00	342.00

Season	WD	NWD
1	20	6
2	94	18
3	29	6
4	30	5
5	75	16
6	57	9