STOR Market Information Report TR26

Published 17th July 2015

Foreword

Welcome to the TR26 Market Information Report. In line with recent feedback, we have looked to make changes to the market report, in order to provide both the data that we know is important to you as service providers, but also to give more insight into the decisions we make, and views on the market – both our own and those of the stakeholders we interact with.

There has been a lot of change in the STOR market over the past couple of years; the introduction, and subsequent reshaping, of Premium Flexible; the development of STOR Runway to make it easier for aggregators to bring new volume into the market; and the increased competition that STOR faces from other commercial opportunities – particularly during the winter months. We are keen to ensure that the service continues to deliver value to National Grid (and ultimately end consumers), whilst not driving down the price to a point where it becomes uneconomical for new providers to enter the market.

STOR is a commercial tendered service, so we strive to understand the factors affecting price and volume. In making decisions through the course of a tender assessment we have to base this on knowledge of the STOR market, growth of providers and historic pricing trends. With this as our toolbox, in TR25 we accepted lower volumes of tenders than we have at the same round in recent years, and this surprised the market more than we expected it to. One thing that was particularly clear to us, alongside the understanding that we need to better explain our decisions, is that we needed to highlight the importance of having committed STOR over the winter months, when margins are at their tightest. In this tender round we have accepted significantly different pricing for the winter months than for the rest of the year. We continue to explore how we can send the right signals to contracts which are able to provide committed STOR contracts year-round

Lastly, as a STOR provider we really do value your thoughts on the market and the decisions we make through tender rounds. That doesn't mean we can alter the price, or increase the volume requirement (without the necessary technical requirement to back this up), but you can certainly hold us accountable for explaining our decisions, providing you with data in an easy-to-interpret format, and giving you our insight into the growth of the STOR market and balancing services in general.

Thanks for reading – we look forward to hearing from you,

Nick Blair – STOR Lead, Contract Services
Pete Underhill – Senior Analyst, Market Requirements

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 26 (TR26). The report provides details of tendered utilisation and availability prices and National Grid's 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 National Grid Balancing Services information website:

http://www2.nationalgrid.com/uk/services/balancing-services/reserve-services/short-term-operating-reserve/

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 or email the assessment team: box.AncillaryAssessment@nationalgrid.com

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-ratings

As National Electricity Transmission System Operator (NETSO), National Grid holds 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 National Grid 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 also the forecast cost of alternatives versus the cost of the tendered STOR units.

National Grid 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 National Grid typically aims to achieve approximately 2300MW of STOR available where economic to do so.

National Grid 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.

In order 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 also based on any other information available, however as a general 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 as low as zero. 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, Flexible, or Premium 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 and also highlight the recent change in the market “available capacity” over the winter months in particular.

Figure 1 gives a breakdown of the accepted Flexible and Committed MW per season since the start of the STOR service. Premium Flexible tenders are included in the Flexible category for the purpose of this chart. 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).

Figure 2 gives exactly 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 also demonstrates how the excess capacity has decreased from ~2000MW in year 7 and 8 to ~1300MW for winter year 10.

It should also be noted that the Max tendered capacity is greater than (or equal to) the actual current capacity as some units have left the market or reduced their capacity. We are working on a way of collating and publishing a “current” market capacity figure.

Figure 1

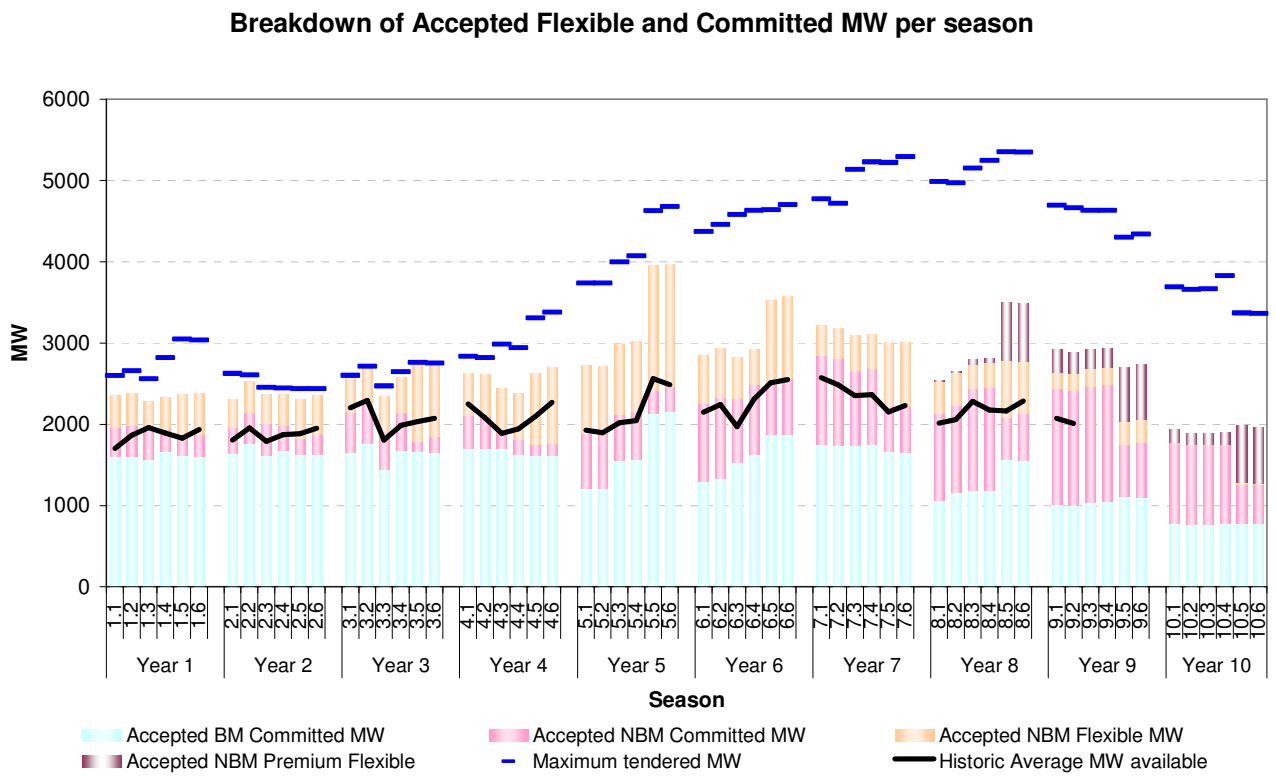
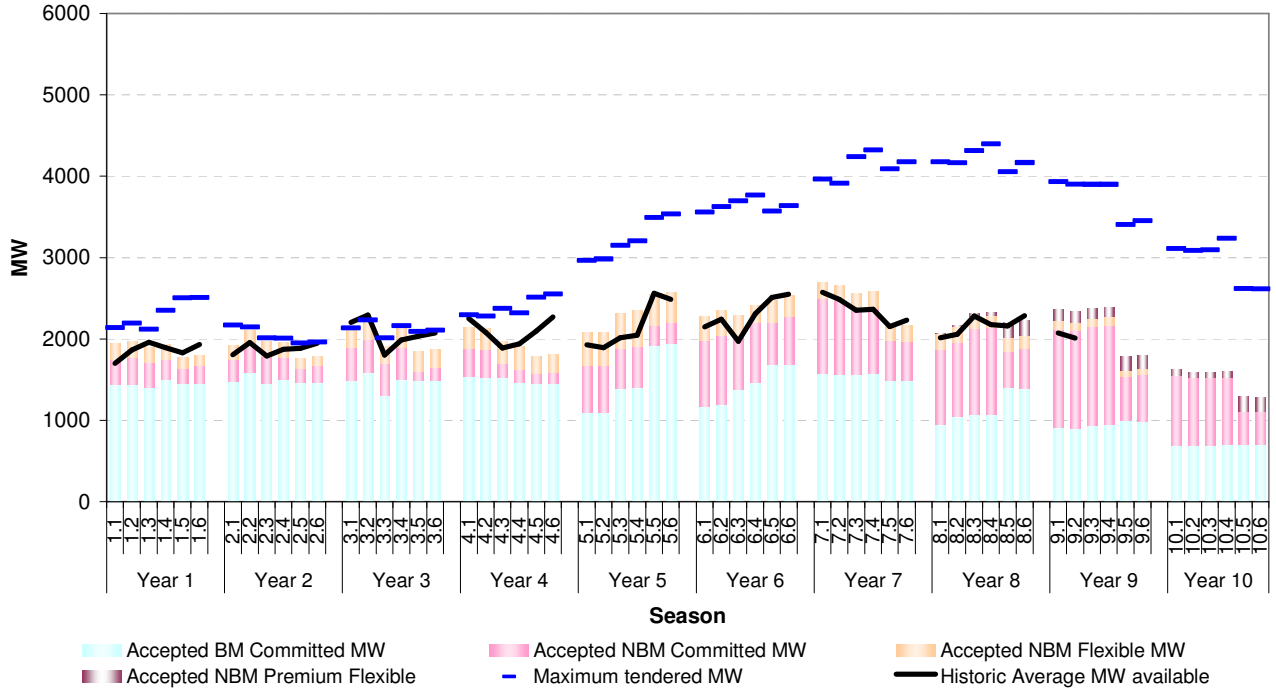


Figure 2



Tenders received and assessment results

Table 1 below summarises the tenders received including STOR Runway it also summarises the total contracted and de-rated.

	TR 26 Tenders						STOR Runway TR2 tenders					Already contracted capacity	
Season Number	BM-C	NBM-C	NBM-F	NBM-PF	Total	De-rated Total	RW-C	RW-F	RW-PF	Total	De-rated Total	Total	De-rated Total
9.3	320	64	176	36	596	448	4	3	6.3	13.3	8	2650	2294
9.4	324	64	176	36	600	452	22	5	12.2	39.2	27	2666	2307
9.5	200	6	11	257	474	252	32	7	21	60	34	2231	1773
9.6	200	6	11	257	474	252	60	10	33	103	62	2259	1795
10.1	881	837	0	323	2041	1666	60	10	33	103	73	686	642
10.2	881	826	0	306	2013	1648	60	10	33	103	73	658	617
10.3	881	824	0	306	2011	1646	60	10	33	103	73	661	619
10.4	1016	823	0	320	2159	1774	60	10	33	103	73	540	517
10.5	749	211	3	805	1768	1055	60	10	33	103	62	614	528
10.6	748	211	3	805	1767	1055	60	10	33	103	62	594	518

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

	TR 26 Tenders Accepted						STOR Runway TR2 tenders Accepted					Remaining Requirement
Season Number	BM-C	NBM-C	NBM-F	NBM-PF	Total	De-rated Total	RW-C	RW-F	RW-PF	Total	De-rated Total	Total
9.3	24	46	172	28	270	161	0	3	0.3	3.3	2	0
9.4	28	46	172	28	274	164	6	5	2.2	13.2	9	0
9.5	200	6	25	243	474	252	6	7	7	20	9	400
9.6	200	6	25	243	474	252	30	10	18	58	33	400
10.1	501	597	46	106	1250	1034	30	10	18	58	40	600
10.2	501	594	40	95	1230	1023	30	10	18	58	40	600
10.3	501	592	40	95	1228	1022	30	10	18	58	40	600
10.4	636	583	54	95	1368	1142	30	10	18	58	40	600
10.5	669	82	71	554	1376	828	30	10	18	58	33	900
10.6	668	82	71	554	1375	827	30	10	18	58	33	900

Successful Tenders in TR26

Year 9 (2015/16)

For Year 9 seasons 3 and 4, TR26 was the final opportunity; as such the combined capacity of tenders received along with the STOR already procured in previous tender rounds would result in a level of STOR availability that would exceed the optimal STOR level. Thus, the tenders that were accepted in TR26 were those that demonstrated the most cost-beneficial prices up to a level that would provide sufficient MW to deliver the optimal STOR level for these seasons.

For the winter seasons (9.5 and 9.6) the switching of units from Committed to Flexible or Premium Flexible has resulted in a lack of committed volume in the market, as such there was not enough capacity tendered to meet the requirement although one further tender round remains for these seasons. The shift to Flexible and Premium Flexible has been predominantly due to parties running triad avoidance, but there has also been some plant closures over the recent period. In order to maximise reserve availability, all committed units were accepted to help reduce the remaining requirement and secure committed capacity.

Year 10 (2016/17)

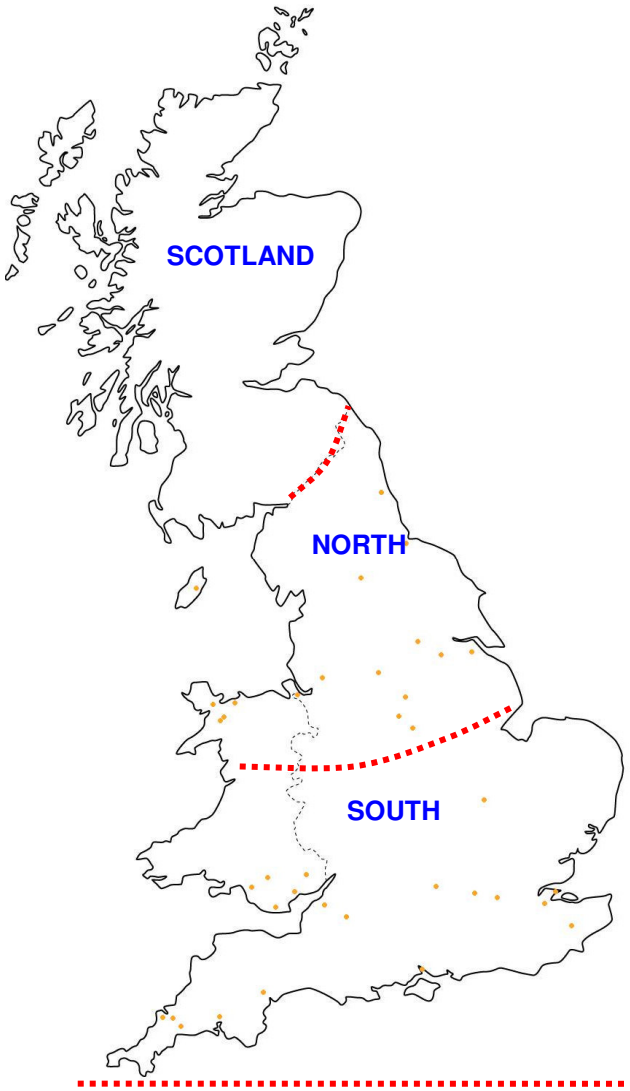
This was the second tender opportunity for year 10 aside from the long term tenders. For seasons 1-4 there was more than enough volume tendered to meet the requirement, with the majority of units reducing their prices from TR25.

For the winter seasons again there has been a significant shift from units tendering the Committed service to Flexible or Premium Flexible. As in year 9 National Grid values committed capacity over winter (when non committed availability is at its lowest) and as such higher prices were accepted in year 10 winter to secure committed capacity.
Across Year 9 and Year 10 there is the added uncertainty of the changes to the cash out arrangements in the balancing mechanism, which may be affecting some tendering.

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

Figure 3 presents the number of units and the total MW tendered and accepted for each season and each location. The orange dots on the map indicate the approximate location of the units tendered in any season (not including sites located in more than one region).

Figure 3 Map of Great Britain



SCOTLAND	Units tendered	Units Accepted	MW tendered	MW Accepted
9.1	-	-	-	-
9.2	-	-	-	-
9.3	-	-	-	-
9.4	-	-	-	-
9.5	-	-	-	-
9.6	-	-	-	-
10.1	-	-	-	-
10.2	-	-	-	-
10.3	-	-	-	-
10.4	-	-	-	-
10.5	-	-	-	-
10.6	-	-	-	-

NORTH	Units tendered	Units Accepted	MW tendered	MW Accepted
9.1	-	-	-	-
9.2	-	-	-	-
9.3	12	6	208	74
9.4	12	6	208	74
9.5	7	7	144	144
9.6	7	7	144	144
10.1	25	20	912	548
10.2	25	20	897	541
10.3	24	19	895	539
10.4	24	19	908	544
10.5	20	14	1,012	647
10.6	20	14	1,012	647

SOUTH	Units tendered	Units Accepted	MW tendered	MW Accepted
9.1	-	-	-	-
9.2	-	-	-	-
9.3	13	7	277	89
9.4	13	7	281	93
9.5	10	10	326	326
9.6	10	10	326	326
10.1	34	25	573	466
10.2	32	23	560	453
10.3	32	23	560	453
10.4	33	24	695	588
10.5	28	23	528	462
10.6	28	23	527	461

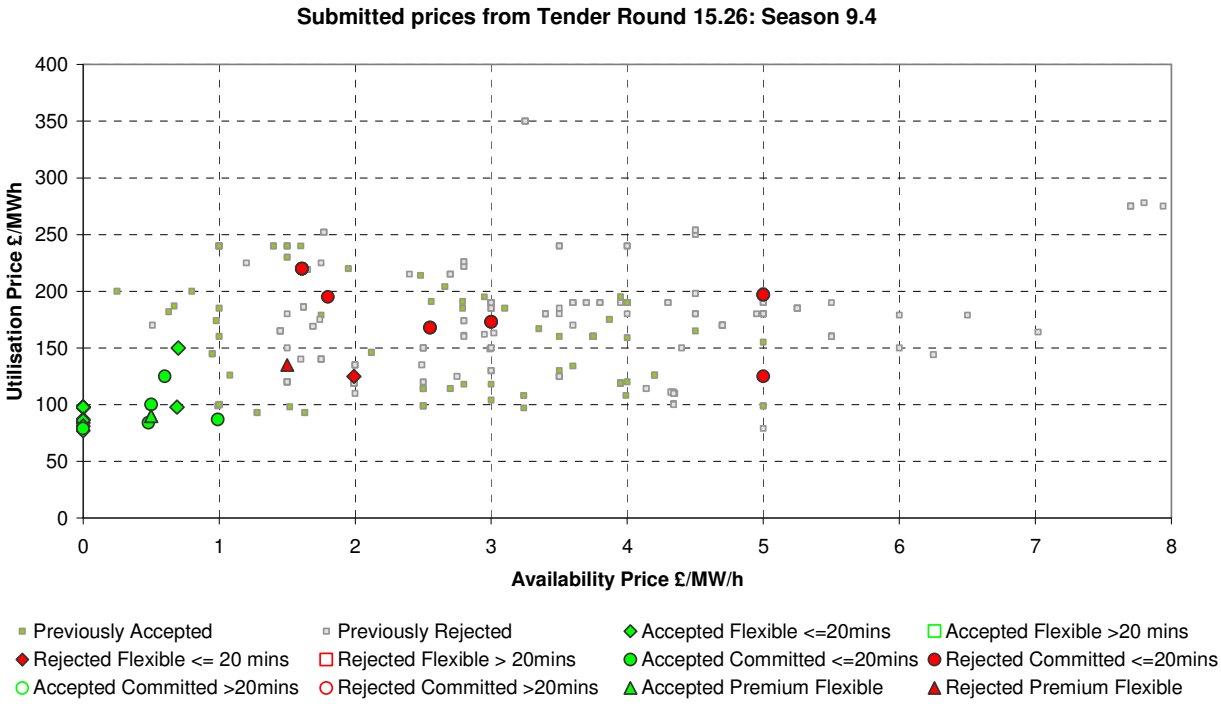
MULTIPLE LOCATIONS (Aggregated sites)

MULTIPLE	Units tendered	Units Accepted	MW tendered	MW Accepted
9.1	-	-	-	-
9.2	-	-	-	-
9.3	14	13	111	107
9.4	14	13	111	107
9.5	1	1	4	4
9.6	1	1	4	4
10.1	82	32	556	236
10.2	82	32	556	236
10.3	82	32	556	236
10.4	82	32	556	236
10.5	77	40	528	267
10.6	77	40	528	267

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 display any units accepted as Premium Flexible, or rejected as Premium Flexible if they were not then assessed as Flexible. If a unit was rejected as Premium Flexible and then assessed as Flexible, they are represented on the chart as normal Flexible 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 including the details of PF units and secondary assessment.

Figure 4 Year 9 Availability and Utilisation price charts



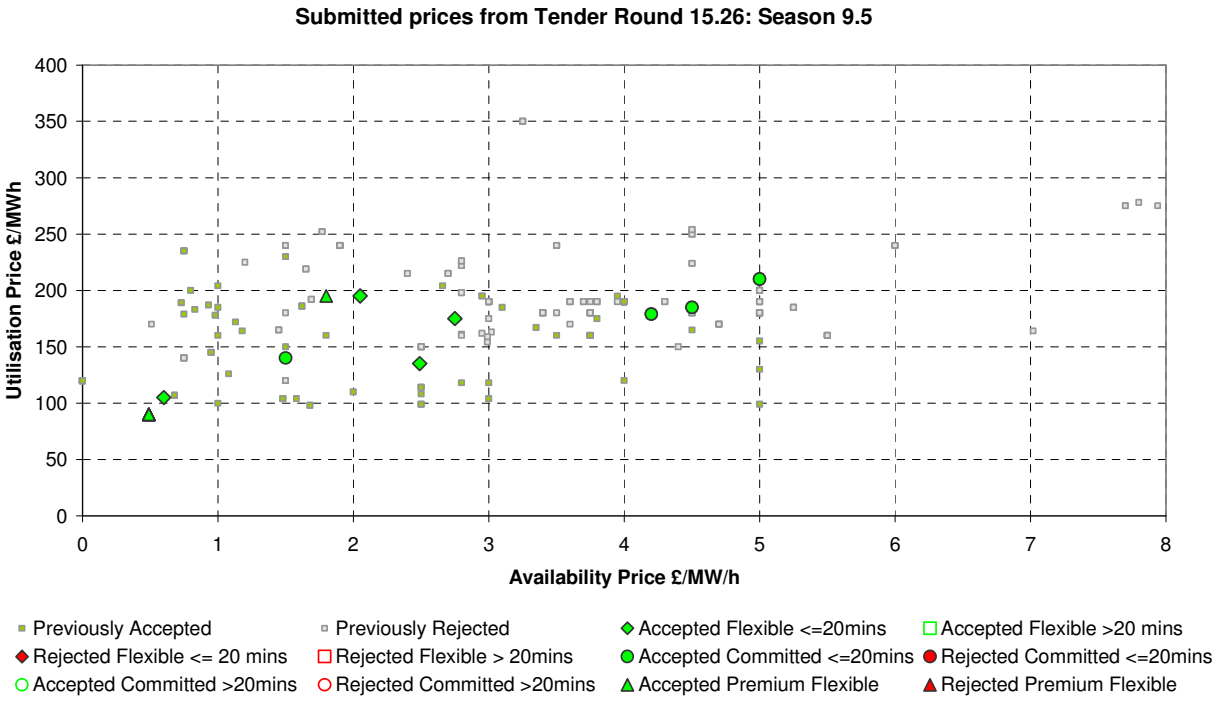
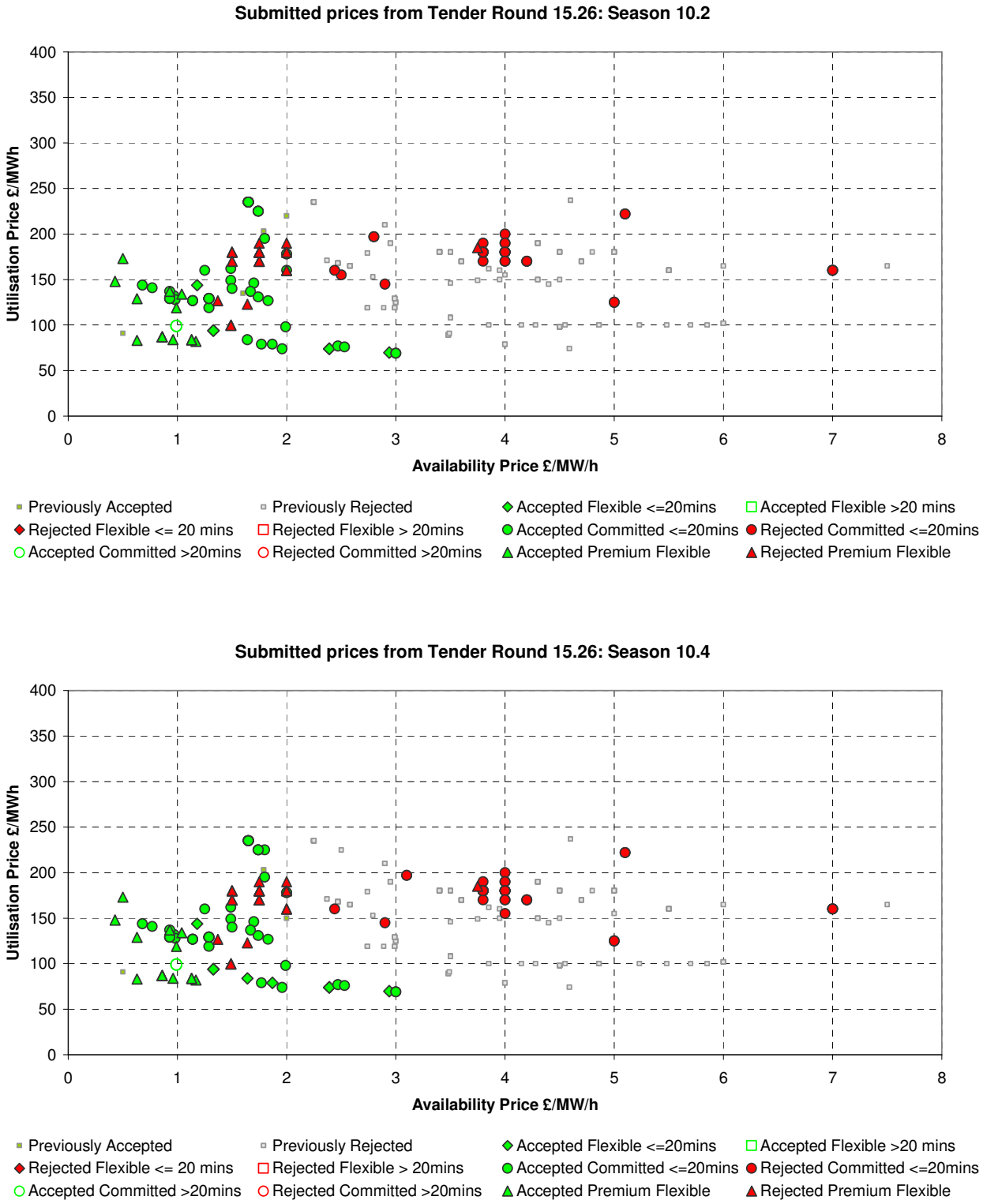


Figure 5 Year 10 Availability and Utilisation price charts



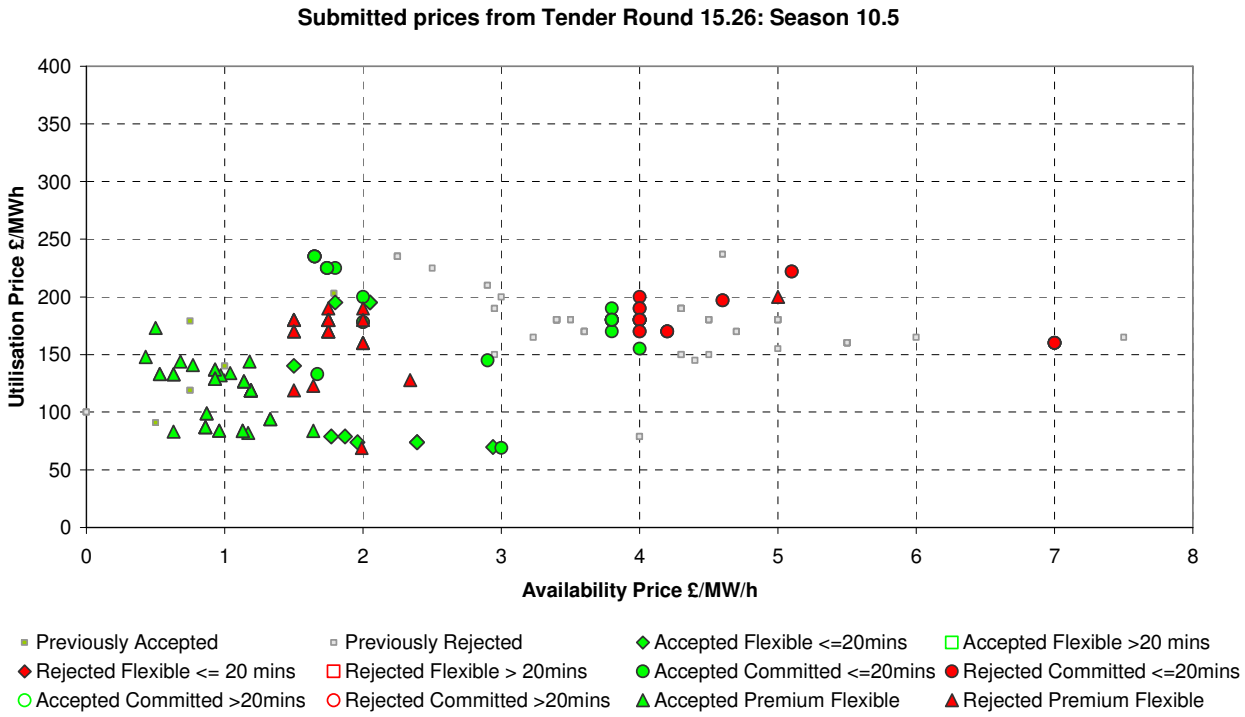


Table 3 below presents a summary of the marginal accepted availability prices for normal tenders and Premium Flexible tenders along with the highest and lowest Utilisation price accepted by season. This is intended to display the difference in value between Premium Flexible and normal tenders, although it should be noted that it is the combination of utilisation and availability price that is key. This information can be seen on the scatter plots above.

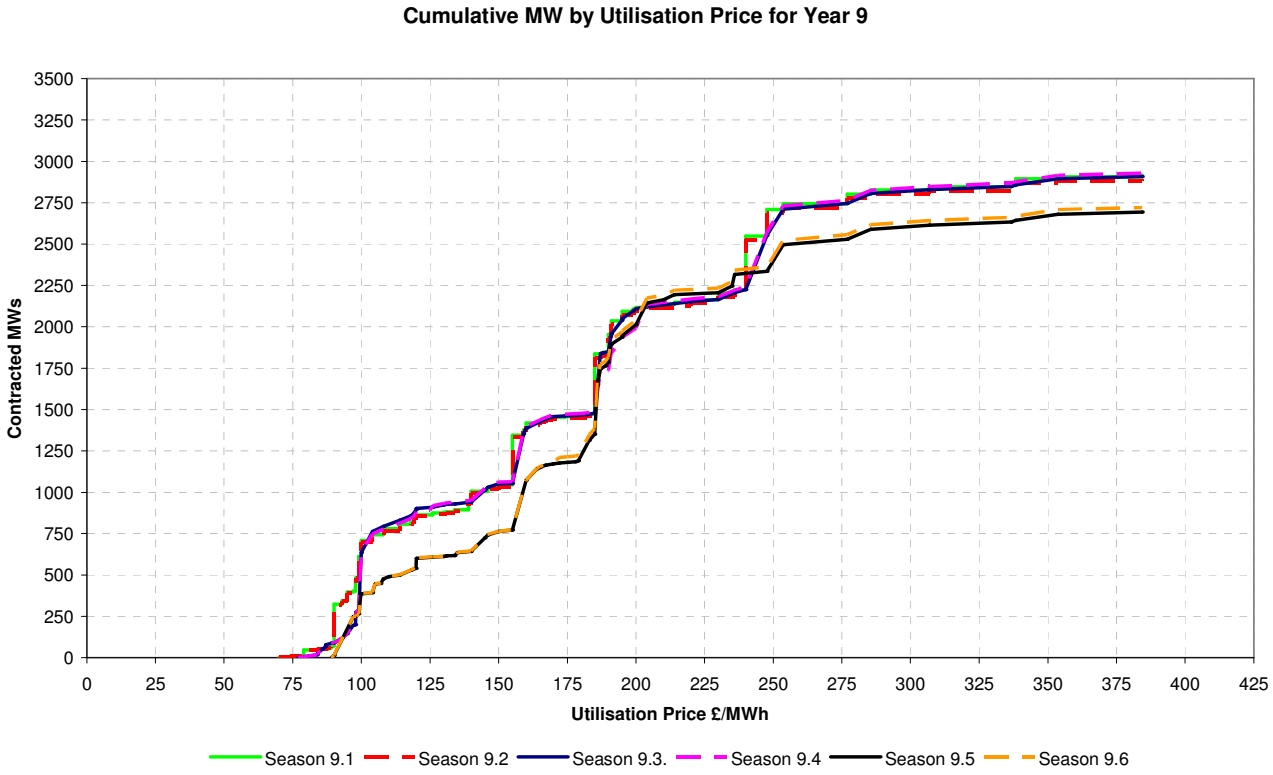
Table 3 Summary of accepted Prices

Season Number	Marginal Availability price accepted £/MW/h	Marginal PF availability price accepted £/MW/h	Highest Utilisation Price accepted £/MWh	Lowest Utilisation Price accepted £/MWh
9.3	0.99	0.50	150	77
9.4	0.99	0.50	150	77
9.5	5.00	1.80	210	90
9.6	5.00	1.80	210	90
10.1	3.00	1.17	235	69
10.2	3.00	1.17	235	69
10.3	3.00	1.17	235	69
10.4	3.00	1.17	235	69
10.5	4.00	1.64	235	69
10.6	4.00	1.64	235	69

Utilisation price and response time stacks

Figures 6 and 7 exhibit cumulative graphs. In these graphs the total accepted MW from previous tender rounds, up to and including the results from TR26, have been stacked according to two categories: **Figure 6a & 6b** is ranked according to utilisation price and **Figures 7a & 7b** according to the response time of the unit. **The utilisation prices have had indexation applied (seasonal and annual) these are final for season 9.1 but may change for the remaining seasons**.

Figure 6a illustrates that for seasons 9.3 and 9.4 approximately 1000MW of STOR is contracted with a utilisation prices of £150/MWh or less.



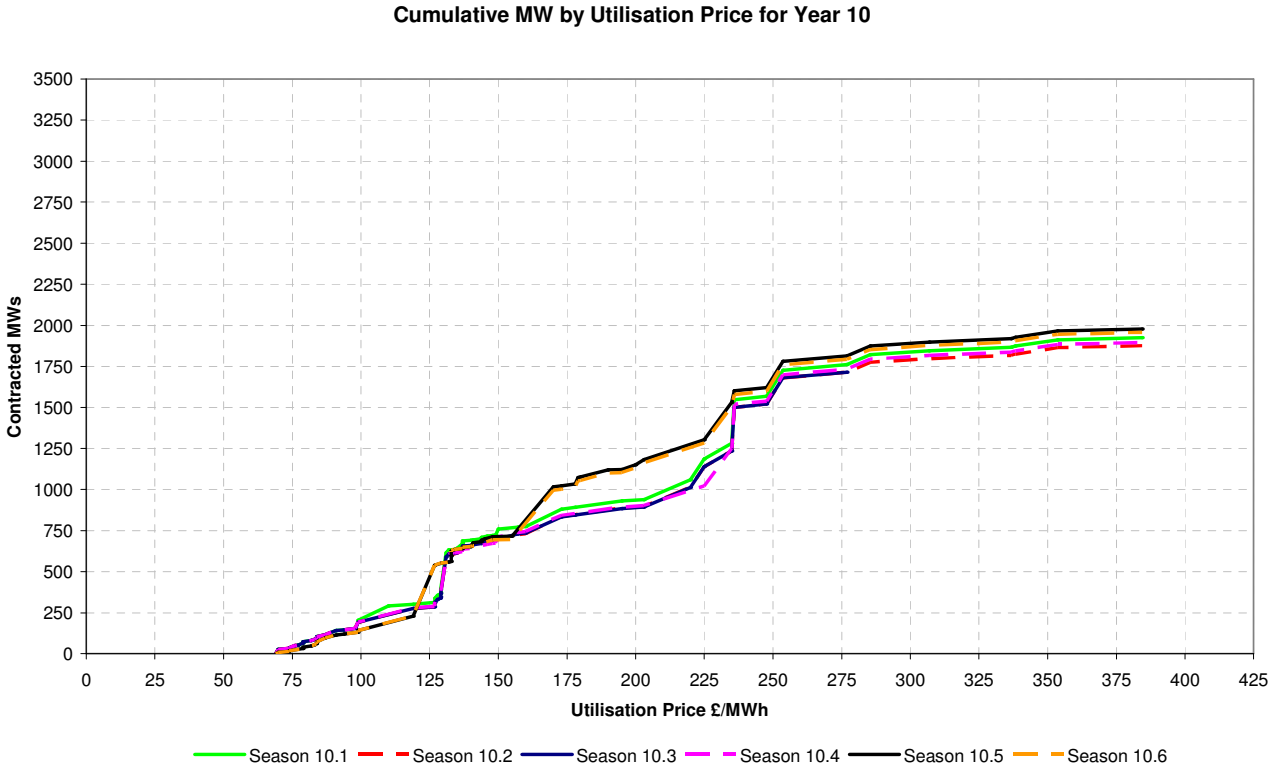
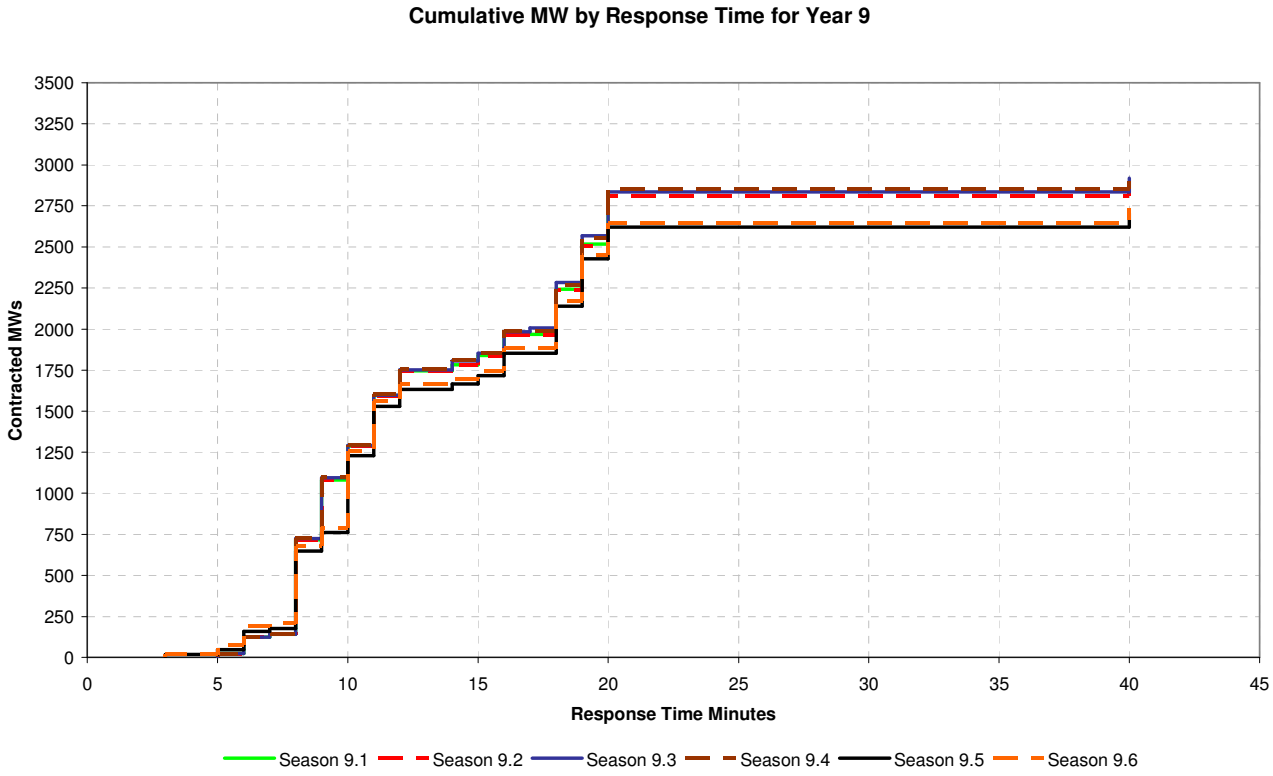
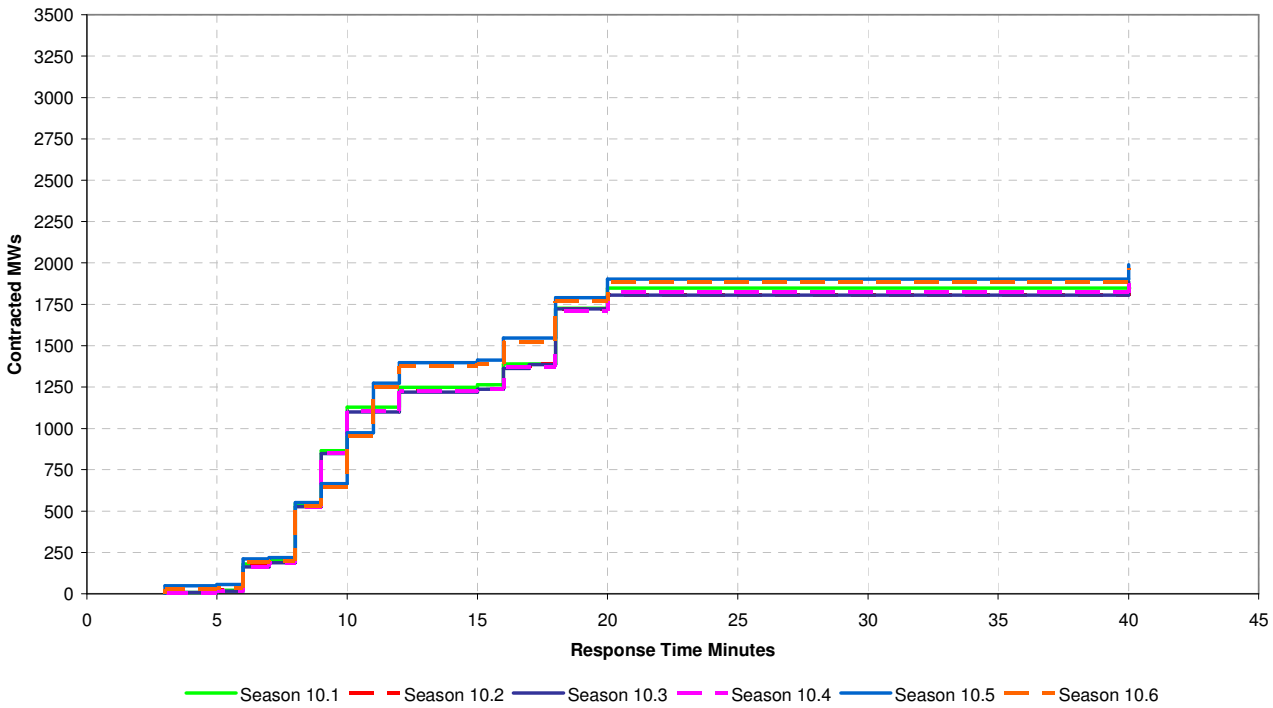


Figure 7a illustrates that for seasons 9.3 and 9.4 approximately 1250MW of STOR is contracted with a response time of 10 minutes or less.

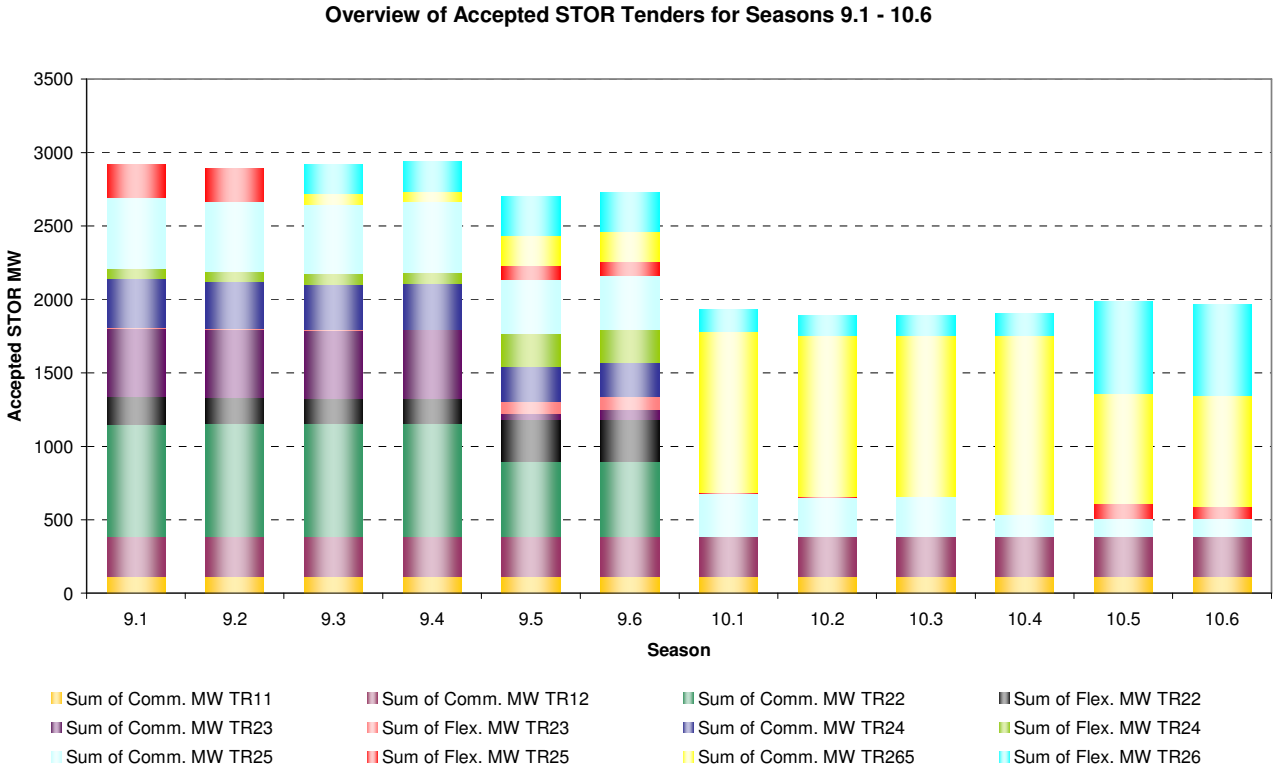




Total Contracted Position

Figure 8 shows the breakdown of accepted volumes from all previous tender rounds across the seasons of Years 9 and 10. The table accompanying Figure 7 below displays the same data in table format split by Committed or Flexible. For purpose of this chart and table Premium Flexible units are classed as Flexible units.

Figure 8 Year 9 and 10 summaries by tender round



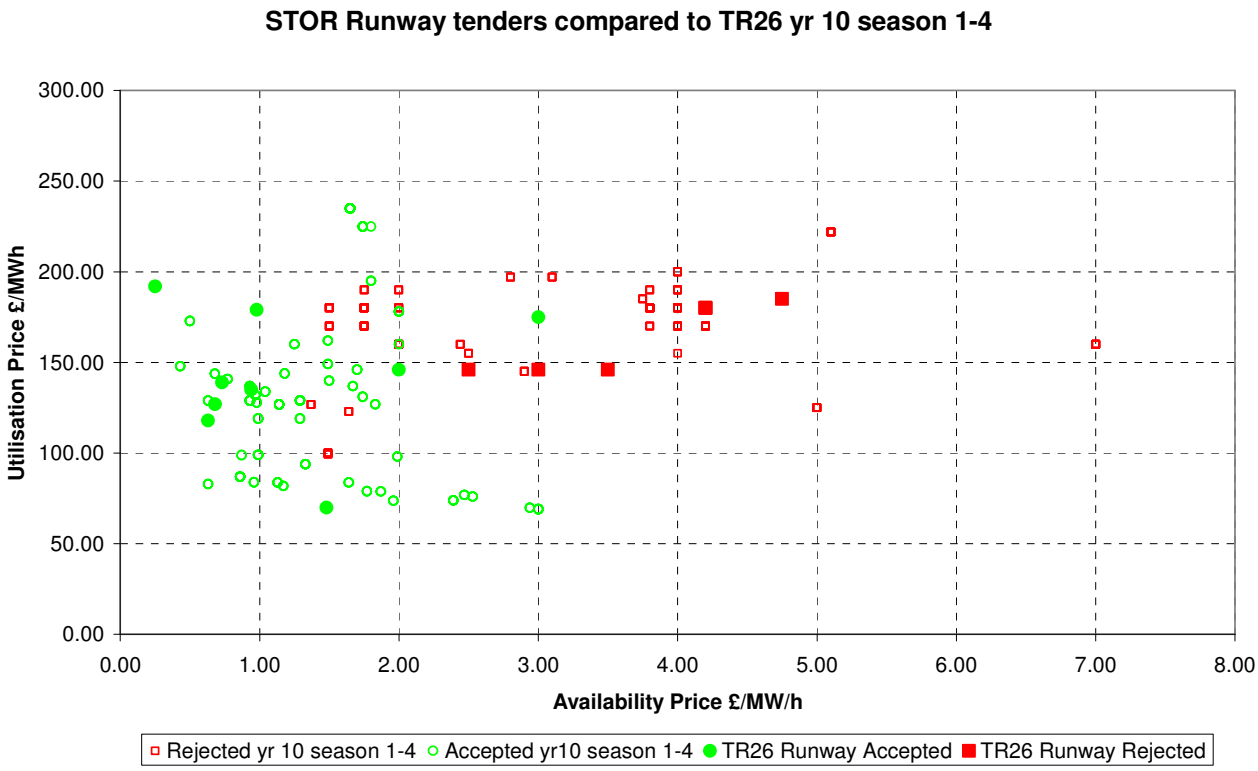
	Season	9.1		9.2		9.3		9.4		9.5		9.6	
	Service Type	C	F	C	F	C	F	C	F	C	F	C	F
Accepted MW	TR11 (LT)	116		116		116		116		116		116	
	TR12 (LT)	273		271		272		273		274		274	
	TR22	764	186	769	181	769	172	767	172	506	286	508	286
	TR23	463	6	461	7	461	6	466	6	40	85	70	85
	TR24	336	66	320	66	309	72	311	72	240	220	235	220
	TR25	486	222	478	225	473		483		373	91	372	93
	TR26					70	200	74	200	206	268	206	268
	Total	2438	480	2415	479	2470	450	2490	450	1755	950	1781	952

	Season	10.1		10.2		10.3		10.4		10.5		10.6	
	Service Type	C	F	C	F	C	F	C	F	C	F	C	F
Accepted MW	TR11 (LT)	116		116		116		116		116		116	
	TR12 (LT)	273		271		272		273		274		274	
	TR25	294	3	268	3	270	3	148	3	120	104	120	84
	TR25	1098	152	1095	135	1093	135	1219	149	751	625	750	625
	Total	1781	155	1750	138	1751	138	1756	152	1261	729	1260	709

STOR Runway Tender details

Figure 9 shows STOR runway tenders plotted against the results of all other tenders for year 10 season 1-4. The full details including service type and growth plan can be found in the accompanying Excel file and in the appendix file.

Figure 9 STOR runway tender details



Appendix 1: Terminology and Definitions

High level description of STOR:

STOR is designed to give National Grid 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 National Grid 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 National Grid. 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 National Grid 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 an utilisation payment on delivery of STOR MW when instructed by National Grid paid on a £/MWh basis.

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

http://www.nationalgrid.com/NR/rdonlyres/083D0D9C-1A33-4336-8FA3-1A69DCC1C903/60303/TR20_General_Description.pdf

Appendix 2:

Accepted and Rejected Tenders TR26: 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 tender and reports section of the National Grid Balancing Services webpage:

http://www.nationalgrid.com/uk/Electricity/Balancing/services/STOR/

Appendix 3: Season Reference

The following tables summarise the season information for the current year (Year 9) and the following year (Year 10).

Seasons 2015/16

Season	Dates	WD Start Time	WD End Time	NWD Start Time	NWD End Time	Hours/Day Type WD	Hours/Day Type NWD	Total
1	05:00 on Wednesday 1st Apr 2015 - 05:00 on Monday 27th Apr 2015	07:00	13:30	10:00	14:00	199.5	32.5	232
		19:00	22:00	19:30	22:00			
2	05:00 on Monday 27th Apr 2015 - 05:00 on Monday 24th Aug 2015	07:30	14:00	09:30	13:30	1150	133	1283
		16:00	18:00	19:30	22:30			
		19:30	22:30					
3	05:00 on Monday 24th Aug 2015 - 05:00 on Monday 21st Sep 2015	07:30	14:00	10:30	13:30	276	30	306
		16:00	21:30	19:00	22:00			
4	05:00 on Monday 21st Sep 2015 - 05:00 on Monday 26th Oct 2015	07:00	13:30	10:30	13:30	330	32.5	362.5
		16:30	21:00	17:30	21:00			
5	05:00 on Monday 26th Oct 2015 - 05:00 on Monday 1st Feb 2016	07:00	13:30	10:30	13:30	920	135	1055
		16:00	21:00	16:00	20:30			
6	05:00 on Monday 1st Feb 2016 - 05:00 on Friday 1st Apr 2016	07:00	13:30	10:30	13:30	561	67.5	628.5
		16:30	21:00	16:30	21:00			
						3436.5	430.5	3867

Season	WD	NWD
1	21	5
2	100	19
3	23	5
4	30	5
5	80	18
6	51	9

Total Hours	3867

Seasons 2016/17

Season	Dates	WD Start Time	WD End Time	NWD Start Time	NWD End Time	Hours/Day Type WD	Hours/Day Type NWD	Total
1	05:00 on Friday 1st Apr 2016 - 05:00 on Monday 25th Apr 2016	07:00	13:30	10:00	14:00	190	26	216
		19:00	22:00	19:30	22:00			
2	05:00 on Monday 25th Apr 2016 - 05:00 on Monday 22nd Aug 2016	07:30	14:00	09:30	13:30	1150	133	1283
		16:00	18:00	19:30	22:30			
		19:30	22:30					
3	05:00 on Monday 22nd Aug 2016 - 05:00 on Monday 19th Sep 2016	07:30	14:00	10:30	13:30	276	30	306
		16:00	21:30	19:00	22:00			
4	05:00 on Monday 19th Sep 2016 - 05:00 on Monday 31th Oct 2016	07:00	13:30	10:30	13:30	396	39	435
		16:30	21:00	17:30	21:00			
5	05:00 on Monday 31th Oct 2016 - 05:00 on Monday 30th Jan 2017	07:00	13:30	10:30	13:30	862.5	120	982.5
		16:00	21:00	16:00	20:30			
6	05:00 on Monday 30th Jan 2017 - 05:00 on Saturday 1st Apr 2017	07:00	13:30	10:30	13:30	583	60	643
		16:30	21:00	16:30	21:00			
						3457.5	408	3865.5

Season	WD	NWD
1	20	4
2	100	19
3	23	5
4	36	6
5	75	16
6	53	8

Total Hours	3865.5