

STOR Market Information Report: Tender Round 25

(Short-Term Operating Reserve)

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 25 (TR25). 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/>

Furthermore, information on the use of the STOR service can be seen at monthly resolution in the Monthly Balancing Services Statement or annually in the Procurement Guidelines Report, found on the National Grid Balancing Services information website:

<http://www2.nationalgrid.com/uk/Industry-information/electricity-transmission-operational-data/>

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/>

In assessing the benefit of a STOR tender, the value and costs of that tender are considered. The forecast cost of an accepted tender will reflect expected availability costs and utilisation costs which incorporate the Minimum Non Zero Time (MNZT) of the unit and Minimum Utilisation Period (MUP) for non-BM providers. The tender assessment further considers the response time, the location and the reliability of the tendered unit. The latest assessment principles can be found on the STOR section of the Balancing Services website:

<http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=29290>

This report is divided into two sections:

- Section 1 provides a summary of tendered and accepted volumes and price information across STOR seasons in 2015/16 (Year 9) and 2016/17 (Year 10). The data is broken down by response time and Flexible or Committed service providers.
- Section 2 provides an overview of the total contracted position for each season in Years 9 and 10 from TR25 and previous tender rounds.

This report is under continuous review and improvement, 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 STOR service leads: Nicholas.Blair@nationalgrid.com and Owen.Zambuko@nationalgrid.com

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Section 1.1 Submitted and Accepted Volumes

As National Electricity Transmission System Operator (NETSO), National Grid maintains 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.

The tenders are assessed in accordance with the STOR Assessment Principles^{*}, which, amongst other things, consider availability prices (£/MW/h), utilisation prices (£/MWh), response times and geographical location. The accepted tenders are selected such that the total costs of maintaining the ORR and operating the system are lower than without the selection of those tenders.

STOR Volumes Procured by National Grid

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. This optimal STOR level can include STOR units with a response time greater than 20 minutes if the economics of those units are sufficient. A unit's tendered response time and price are, and will remain, key factors in the assessment of STOR tenders.

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.

In TR22 for seasons 8.1 and 8.2, National Grid reduced its ORR and hence the optimal level of STOR for these seasons was reduced to 2200MW. National Grid also increased its forecast of availability levels from Committed and Flexible units for those seasons. At the subsequent tender round the optimal level for the immediate seasons (8.3 and 8.4) was reassessed and increased back to 2300MW. For this tender round the level has been re-assessed and for the immediate seasons of 9.1 and 9.2 remains at 2300MW.

Premium Flexible STOR

As a consequence of the competitive STOR market, Flexible providers who tender and are accepted early in the tender round calendar, have been suffering from being undercut at later tender opportunities and thus being rejected at the week ahead stage, failing to receive any contract revenue. National Grid has worked with the market to produce a development which will provide some security to this sector of the market.

As with the Flexible option, this is open to non-BM participants only and for accepted tenders provides the option to tender in their availability for the week ahead on the preceding Friday. Within the Invitation to Tender Pack for STOR Tender Round 25 National Grid has defined "premium windows" for each season and if, at the week ahead stage, a successful Premium Flexible STOR provider offers availability during these premium windows National Grid guarantees to accept the offered availability for the whole day at the week ahead assessment[†]. This essentially offers the Premium Flexible units protection from being undercut in subsequent tender rounds where they offer availability to National Grid in the windows of greatest value to National Grid. As a result of offering this additional security and accepting the additional risk, National Grid applies a devaluation to these tenders when compared to traditional Flexible tenders during the main tender assessment. Under this contract option providers also have the ability to request secondary assessment (at the main tender

^{*} http://www.nationalgrid.com/NR/ronlyres/7B8CA1AB-4964-4965-B5A2-126C8C202A11/40677/STOR_Assessment_Principles.pdf

[†] A minimum of 85% of daily tendered premium window availability will be accepted where the premium window is offered at the week ahead stage. See the STOR Frequency Asked Questions document available from the STOR service link on page 1 for further details

assessment stage) as a standard Flexible tender should their tender be rejected as a premium tender due to the devaluation.

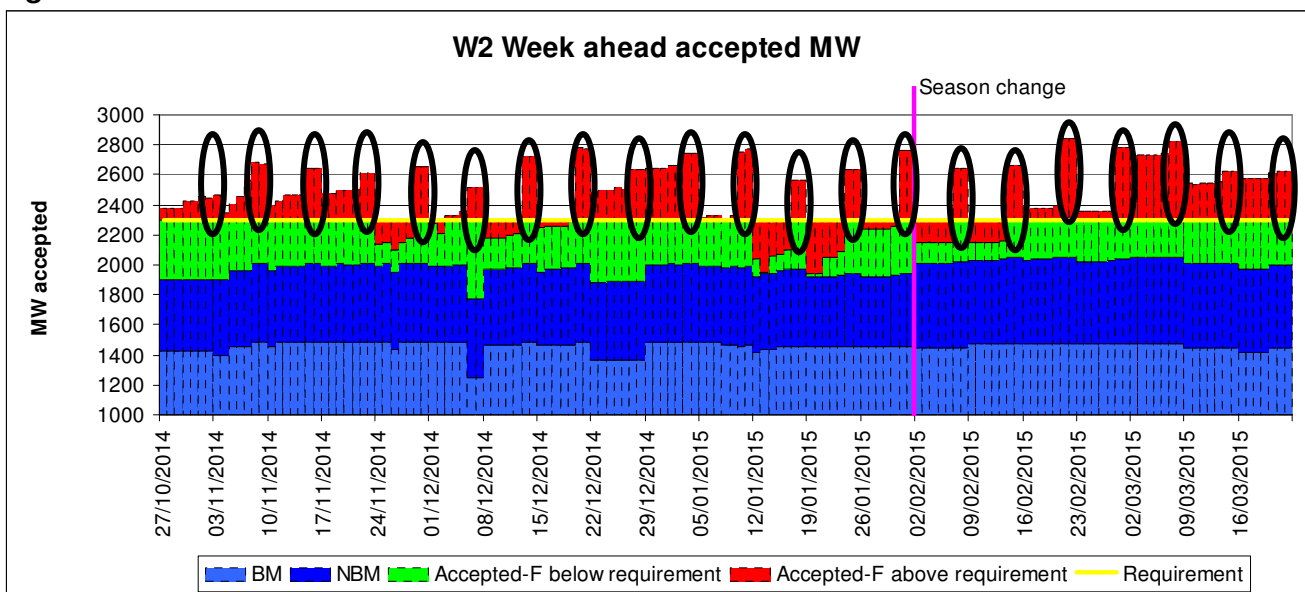
The STOR assessment principles, which are available via the link on page 1, describe the differences in the assessment of Premium Flexible tenders compared to standard tenders. However in brief, a forecast of the level of availability is used to reduce the alternative availability cost used in the calculation of cost benefits. The definition of the alternative availability cost is slightly modified to be the minimum of the forecast cost of creating reserve via the BM or the cost of alternative firm contract options available for the same time period within this tender round.

Proposal to change Premium window definition

Following experience of winter 2014/15 and the performance of the premium flexible product, National Grid has decided to take this opportunity to change the PF premium window definitions. This is the first tender opportunity for year 10 and as such no PF tenders have yet been accepted for this year making this an opportune time to introduce any change without affecting existing contracts. Figure 1 below highlights the problem faced during the weekly flexible assessment whereby availability levels at weekends are much higher than during the week, but the designation of all winter seasons window 2 as premium windows means that there is no scope to optimise this level and leads to over procurement. This over procurement has been highlighted by the black rings on the charts. National Grid intends to change the definition of premium windows for year 10 and onwards to be Monday to Friday only. To enable this National Grid has taken the strategic decision to not accept any PF tenders for year 10 at this tender opportunity to enable the market to consider the revised terms before tendering at the next opportunity. This will be confirmed in the next Invitation to Tender pack.

Figure 1 shows the week-ahead position following the flexible assessment for window 2 in season 8.5 and 8.6. The chart displays the availability of BM and NBM committed units along with the accepted Flexible and Premium Flexible units. The accepted Flexible and PF units have been coloured based on whether the volume exceeds the target requirement. During the week ahead assessment National Grid looks to accept only the cheapest units to meet the requirement where we have exceeded the requirement below it is either because the units are £0/MW/h or because they can not be rejected due to the restrictions of the PF contract. There are several key messages on this chart, it can be seen that for 6 weeks during the winter there are several days when there was not enough units available to meet the requirement (red below the yellow line). It can also be seen that every weekend there was an excess of availability (ringed in black). Christmas and New Year weeks are easily identified by the increased availability and hence over procurement. The weeks that fall in season 6 also highlight the difficulty NG faces in accurately predicting levels to contract for, the first two weeks are short of target but the whole of March has high availability and hence over procurement.

Figure 1



STOR Runway

TR25 also marked the introduction of a new growth service for STOR called STOR Runway. The purpose of the STOR runway service is to provide a route to market for units who cannot offer the 3MW minimum requirement from the beginning of their contract, but have a growth structure in place to meet this requirement by the start of the following STOR year. Additional details can be found on the STOR Runway website[‡]. An initial requirement of 200MW was open to tender from all service types (Committed, Flexible and Premium Flexible) 111MW of tenders were received 30MW of Committed units and the remainder for PF. The results of the assessment will be presented separately at the end of this report but in the future will become part of the main report. There will be another opportunity in TR26 to tender for the STOR runway product.

Tenders Received in TR25

On Market Day for TR25 (16th January 2015), National Grid received tenders from 48 separate companies including 5 new companies for 224 different units across the two years. This included 44 new units with a total of 240MW not tendered before.

Year 9 (2014/15)

This tender round was the final tender opportunity for seasons 9.1 and 9.2, with a total volume of ~1550MW from 90 different units tendered for these seasons in addition to the 2147MW and 2128MW already contracted for these seasons. Of this volume over 80% was for committed units with ~14% for standard flexible and only 6% for the premium flexible service.

For seasons 3 to 6 approximately 1300MW was tendered from 60 units and 18 companies. In season 3 and 4 the volume was 99% for the committed service with only 1 premium flexible unit tendered. For seasons 5 and 6 there were no standard flexible units tendered and the volume was split by 75% committed to 25% premium flexible.

Two units with response times greater than 20 minutes were tendered for seasons 5 and 6 (85MW).

Year 10 (2015/16)

For year 10 this is the first tender opportunity aside from the long term tenders let in 2010. Approximately 2850MW from 180 units and 35 companies were received for seasons 1 to 4. This is an increase over the volume offered at the first opportunity for year 9 of approximately 800MW. The majority of the tenders for seasons 1-4 were for the committed service with 250MW of Premium Flexible and only 3MW of standard flexible.

For seasons 5 and 6, 2550MW was tendered from 140 units. Again this represents a significant increase in volume (~550MW) when compared to the first opportunity for year 9.5.

The STOR Marketplace Continues to be Competitive and Heavily Subscribed

The maximum volume of STOR tendered for year 9 has decreased slightly in comparison to year 8. Excluding long term tenders and one off speculative tenders there remains >1000MW of tendered STOR capacity without a contract. See Figure 2 for further details.

Successful Tenders in TR25

Year 9 (2015/16)

For Year 9 seasons 1 and 2, the combined capacity of tenders received in TR25 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 TR25 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 remaining seasons the most beneficial units were accepted whilst leaving enough volume for the remaining tender opportunities.

Premium Flexible in Year 9

For seasons 9.1 and 9.2 there was 90MW of PF tendered, 0MW were accepted as PF but 68MW were accepted following secondary assessment as standard flexible units. For season 9.3 and 9.4 only 4MW of PF units were tendered and 0MW were accepted. For seasons 5 and 6, 332MW of PF was tendered 84MW was

[‡] <http://www2.nationalgrid.com/UK/Services/Balancing-services/Reserve-services/Short-Term-Operating-Reserve/STOR-Runway/>

accepted as PF and 7MW accepted after secondary assessment as standard flexible, the remaining units were rejected.

Year 10 (2016/17)

For year 10 there is only 338MW of long term contracts existing. Similar price forecasts were used to those used for year 9 and a relatively low volume was accepted at this first opportunity. There remains significant volume to contract at the subsequent opportunities for year 10.

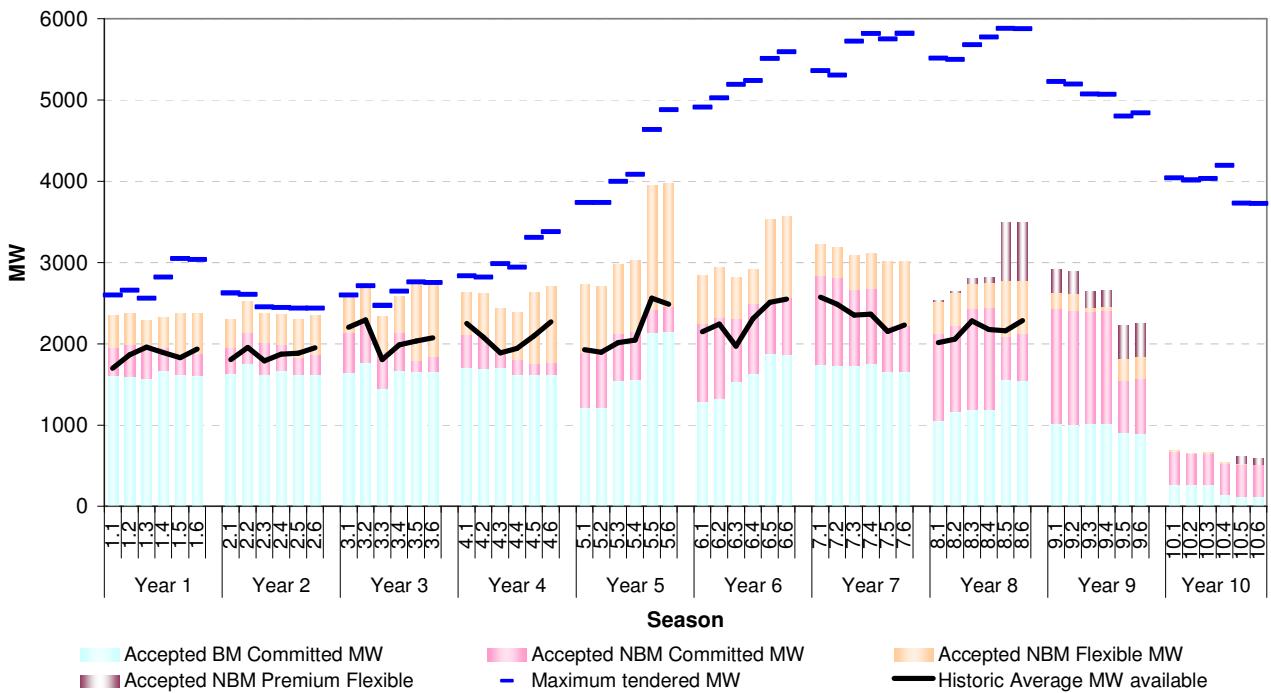
Premium Flexible in Year 10

As discussed in the section above, a strategic decision was taken to not accept any PF units for year 10 with a view to changing the window definition to remove weekends from the premium definition. A significant volume of PF tenders were received for seasons 1-4 and much greater for the winter seasons. The majority of these tenders would have been rejected based on the price cut-off used, regardless of the strategic decision as can be seen on the scatter plots in section 1.2.

Figure 2 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. 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

Breakdown of Accepted Flexible and Committed MW per season



Tables 1 and 2 show the total number of MW rejected or accepted together with their respective volume weighted availability and utilisation prices for Year 8 and Year 9. The table is split into Flexible (including Premium Flexible) or Committed units with response time less than or equal to 20 minutes, and units (Flexible or Committed) with response time greater than 20 minutes.

Table 1 Year 9 Summary

Season	9.1			9.2			9.3			9.4			9.5			9.6			
	Service Type	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C
Total Minimum Requirements MW																			
TR 10 Rejected MW (LONG TERM)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 10 Accepted MW (LONG TERM)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 11 Rejected MW (LONG TERM)		424	0	0	420	0	0	422	0	0	424	0	0	426	0	0	426	0	0
TR 11 Accepted MW (LONG TERM)		116	0	0	116	0	0	116	0	0	116	0	0	116	0	0	116	0	0
TR 12 Rejected MW (LONG TERM)		587	0	0	583	0	0	585	0	0	587	0	0	589	0	0	589	0	0
TR 12 Accepted MW (LONG TERM)		273	0	0	271	0	0	272	0	0	273	0	0	274	0	0	274	0	0
TR 22 Rejected MW		1063	75	0	1051	75	0	1056	75	0	1061	75	0	1079	92	0	1074	92	0
TR 22 Accepted MW		764	186	0	769	181	0	769	172	0	767	172	0	506	286	0	508	286	0
TR 23 Rejected MW		1680	97	0	1651	104	0	1443	97	0	1451	97	0	1535	279	0	1594	224	0
TR 23 Accepted MW		463	6	0	461	7	0	461	6	0	466	6	0	40	85	0	70	85	0
TR 24 Rejected MW		1432	163	0	1415	163	0	1439	155	0	1453	155	0	1242	317	0	1296	262	0
TR 24 Accepted MW		248	66	88	238	66	82	225	72	84	225	72	86	240	220	0	235	220	0
TR 25 Rejected MW		815	38	0	811	38	0	830	12	0	814	12	0	651	241	0	651	241	0
TR 25 Accepted MW		486	222	0	478	225	0	473	0	0	483	0	0	373	7	84	372	7	86
sub Total Rejected MW		6001	373	0	5931	380	0	5775	339	0	5790	339	0	5522	929	0	5630	819	0
sub Total Accepted MW		2350	480	88	2333	479	82	2316	250	84	2330	250	86	1549	598	84	1575	598	86
Total Accepted MW		2918			2894			2650			2666			2231			2259		
Average Rejected Availability Price (£/MW/h)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 19.32	£ -	£ -	£ 19.28	£ -	£ -	£ 19.30	£ -	£ -	£ 19.32	£ -	£ -	£ 19.33	£ -	£ -	£ 19.33	£ -	£ -
	TR 12 (LT)	£ 12.26	£ -	£ -	£ 12.25	£ -	£ -	£ 12.26	£ -	£ -	£ 12.26	£ -	£ -	£ 12.27	£ -	£ -	£ 12.27	£ -	£ -
	TR22	£ 8.26	£ 3.75	£ -	£ 8.26	£ 3.75	£ -	£ 8.26	£ 3.75	£ -	£ 8.26	£ 3.75	£ -	£ 10.16	£ 3.97	£ -	£ 8.57	£ 3.97	£ -
	TR23	£ 3.25	£ 4.10	£ -	£ 3.25	£ 4.03	£ -	£ 3.13	£ 4.20	£ -	£ 3.24	£ 4.21	£ -	£ 5.91	£ 3.92	£ -	£ 3.15	£ 3.95	£ -
	TR24	£ 2.10	£ 1.44	£ -	£ 2.10	£ 1.46	£ -	£ 2.09	£ 1.43	£ -	£ 2.25	£ 1.45	£ -	£ 5.61	£ 2.00	£ -	£ 2.31	£ 2.09	£ -
TR25	£ 2.80	£ 1.79	£ -	£ 2.80	£ 1.80	£ -	£ 2.88	£ 2.49	£ -	£ 2.90	£ 2.49	£ -	£ 3.05	£ 0.81	£ -	£ 3.05	£ 0.81	£ -	
Average Accepted Availability Price (£/MW/h)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -
	TR 12 (LT)	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.52	£ -	£ -	£ 11.52	£ -	£ -
	TR22	£ 3.77	£ 2.29	£ -	£ 3.76	£ 2.27	£ -	£ 3.77	£ 2.24	£ -	£ 4.16	£ 2.24	£ -	£ 4.58	£ 2.85	£ -	£ 4.57	£ 2.84	£ -
	TR23	£ 1.35	£ 1.50	£ -	£ 1.34	£ 2.00	£ -	£ 1.34	£ 1.50	£ -	£ 1.35	£ 1.50	£ -	£ 1.50	£ 0.71	£ -	£ 1.39	£ 0.71	£ -
	TR24	£ 1.00	£ 0.89	£ 0.49	£ 1.00	£ 0.89	£ 0.49	£ 1.00	£ 0.97	£ 0.49	£ 1.00	£ 0.97	£ 0.49	£ 1.00	£ 0.71	£ -	£ 1.00	£ 0.71	£ -
TR25	£ 0.59	£ 0.28	£ -	£ 0.59	£ 0.28	£ -	£ 0.64	£ -	£ -	£ 0.69	£ -	£ -	£ 1.15	£ 1.00	£ 0.49	£ 1.15	£ 1.00	£ 0.49	
Average Rejected Utilisation Price (£/MWh)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 187	£ -	£ -	£ 185	£ -	£ -	£ 186	£ -	£ -	£ 187	£ -	£ -	£ 190	£ -	£ -	£ 191	£ -	£ -
	TR 12 (LT)	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -
	TR22	£ 206	£ 160	£ -	£ 206	£ 160	£ -	£ 206	£ 160	£ -	£ 206	£ 160	£ -	£ 205	£ 164	£ -	£ 205	£ 164	£ -
	TR23	£ 172	£ 133	£ -	£ 172	£ 132	£ -	£ 176	£ 132	£ -	£ 176	£ 132	£ -	£ 197	£ 162	£ -	£ 195	£ 158	£ -
	TR24	£ 178	£ 118	£ -	£ 179	£ 118	£ -	£ 179	£ 117	£ -	£ 179	£ 117	£ -	£ 214	£ 124	£ -	£ 215	£ 125	£ -
TR25	£ 191	£ 149	£ -	£ 191	£ 149	£ -	£ 189	£ 138	£ -	£ 190	£ 138	£ -	£ 207	£ 102	£ -	£ 207	£ 102	£ -	
Average Accepted Utilisation Price (£/MWh)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -
	TR 12 (LT)	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -
	TR22	£ 161	£ 147	£ -	£ 160	£ 148	£ -	£ 160	£ 151	£ -	£ 160	£ 151	£ -	£ 159	£ 155	£ -	£ 159	£ 155	£ -
	TR23	£ 221	£ 90	£ -	£ 221	£ 90	£ -	£ 221	£ 100	£ -	£ 221	£ 100	£ -	£ 230	£ 140	£ -	£ 204	£ 140	£ -
	TR24	£ 182	£ 123	£ 99	£ 182	£ 123	£ 99	£ 185	£ 120	£ 99	£ 185	£ 120	£ 99	£ 185	£ 143	£ -	£ 185	£ 143	£ -
TR25	£ 118	£ 99	£ -	£ 118	£ 99	£ -	£ 126	£ -	£ -	£ 131	£ -	£ -	£ 193	£ 100	£ 99	£ 193	£ 100	£ 99	

Average Prices are Weighted by MW Volume and Hours Tendered

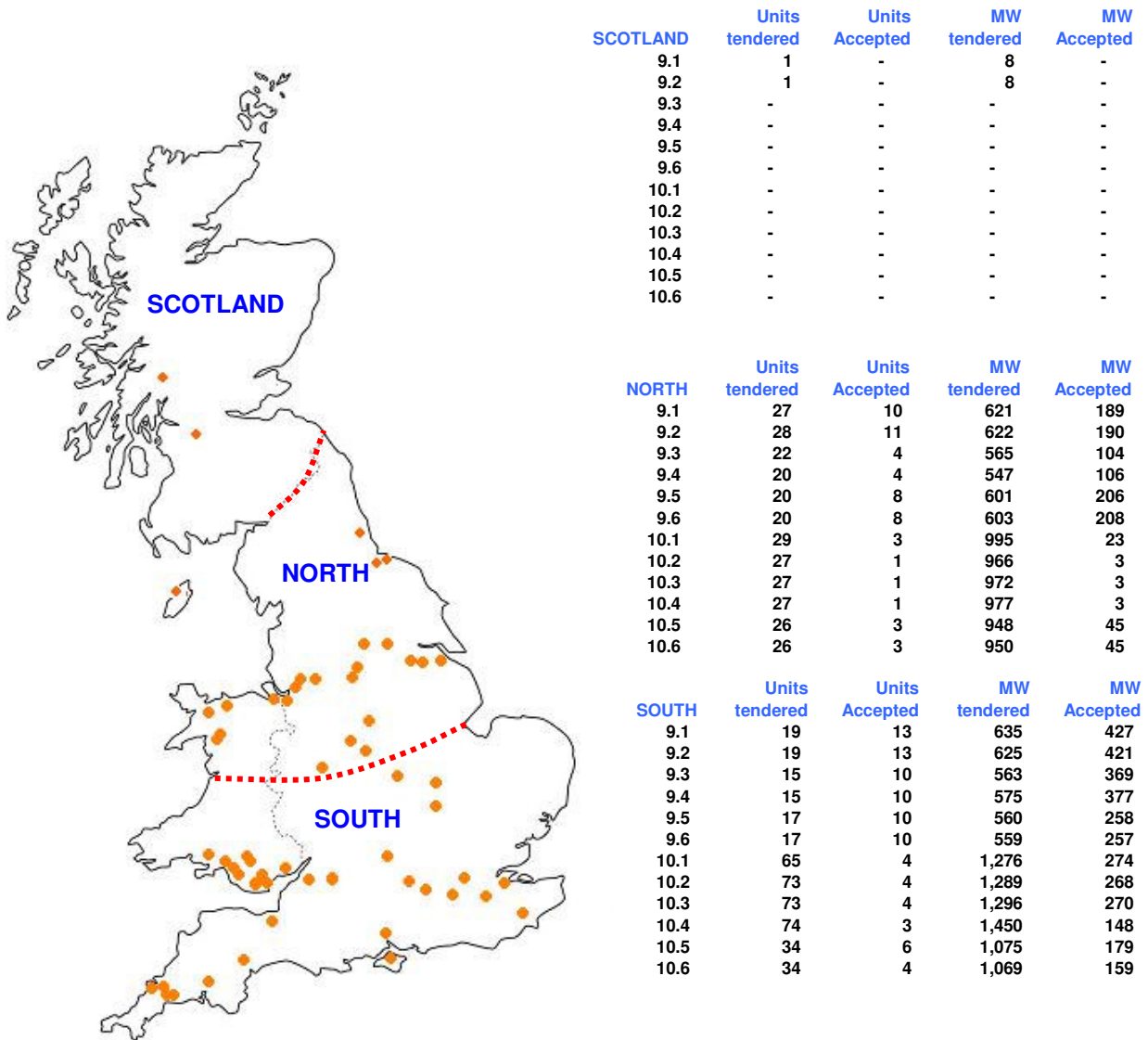
Table 2 Year 10 Summary

Season	10.1			10.2			10.3			10.4			10.5			10.6			
	Service Type	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C	C <20mins	F <20mins	>20mins F or C
Total Minimum Requirements MW		1800			1800			1800			1800			1800			1800		
TR 10 Rejected MW (LONG TERM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 10 Accepted MW (LONG TERM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 11 Rejected MW (LONG TERM)	424	0	0	420	0	0	422	0	0	424	0	0	426	0	0	426	0	0	0
TR 11 Accepted MW (LONG TERM)	116	0	0	116	0	0	116	0	0	116	0	0	116	0	0	116	0	0	0
TR 12 Rejected MW (LONG TERM)	587	0	0	583	0	0	585	0	0	587	0	0	589	0	0	589	0	0	0
TR 12 Accepted MW (LONG TERM)	273	0	0	271	0	0	272	0	0	273	0	0	274	0	0	274	0	0	0
TR 22 Rejected MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 22 Accepted MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 23 Rejected MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 23 Accepted MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 24 Rejected MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 24 Accepted MW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TR 25 Rejected MW	2221	260	88	2243	254	82	2252	254	84	2525	260	86	1667	578	84	1661	598	86	
TR 25 Accepted MW	294	3	0	268	3	0	270	3	0	148	3	0	120	104	0	120	84	0	
sub Total Rejected MW	3232	260	88	3246	254	82	3259	254	84	3536	260	86	2682	578	84	2676	598	86	
sub Total Accepted MW	683	3	0	655	3	0	658	3	0	537	3	0	510	104	0	510	84	0	
Total Accepted MW		686			658			661			540			614			594		
Average Rejected Availability Price (£/MW/h)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 19.32	£ -	£ -	£ 19.28	£ -	£ -	£ 19.30	£ -	£ -	£ 19.32	£ -	£ -	£ 19.33	£ -	£ -	£ 19.33	£ -	£ -
	TR 12 (LT)	£ 12.26	£ -	£ -	£ 12.25	£ -	£ -	£ 12.26	£ -	£ -	£ 12.26	£ -	£ -	£ 12.27	£ -	£ -	£ 12.27	£ -	£ -
	TR22	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR25	£ 4.11	£ 3.58	£ 1.49	£ 4.09	£ 3.59	£ 1.49	£ 4.10	£ 3.59	£ 1.49	£ 5.10	£ 3.58	£ 1.49	£ 6.11	£ 2.91	£ 1.49	£ 6.11	£ 3.00	£ 1.49
Average Accepted Availability Price (£/MW/h)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -	£ 11.00	£ -	£ -
	TR 12 (LT)	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.51	£ -	£ -	£ 11.52	£ -	£ -	£ 11.52	£ -	£ -
	TR22	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR25	£ 1.86	£ 0.50	£ -	£ 1.87	£ 0.50	£ -	£ 1.89	£ 0.50	£ -	£ 1.83	£ 0.50	£ -	£ 1.79	£ 0.78	£ -	£ 1.79	£ 0.73	£ -
Average Rejected Utilisation Price (£/MWh)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 187	£ -	£ -	£ 185	£ -	£ -	£ 186	£ -	£ -	£ 187	£ -	£ -	£ 190	£ -	£ -	£ 191	£ -	£ -
	TR 12 (LT)	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -	£ 222	£ -	£ -
	TR22	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR25	£ 164	£ 113	£ 99	£ 163	£ 113	£ 99	£ 163	£ 114	£ 99	£ 166	£ 113	£ 99	£ 177	£ 127	£ 99	£ 177	£ 128	£ 99
Average Accepted Utilisation Price (£/MWh)	TR 10 (LT)	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR 11 (LT)	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -	£ 224	£ -	£ -
	TR 12 (LT)	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -	£ 206	£ -	£ -
	TR22	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	TR25	£ 199	£ 91	£ -	£ 205	£ 91	£ -	£ 205	£ 91	£ -	£ 193	£ 91	£ -	£ 203	£ 123	£ -	£ 203	£ 119	£ -

Average Prices are Weighted by MW Volume and Hours Tendered

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



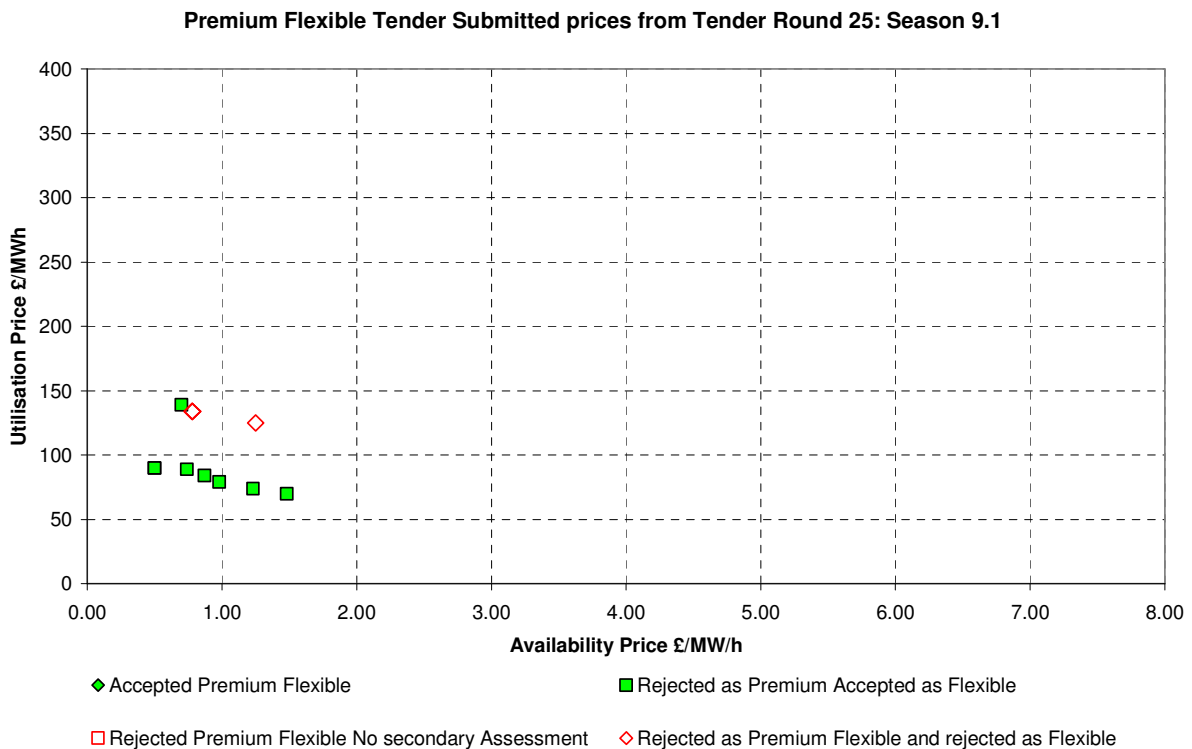
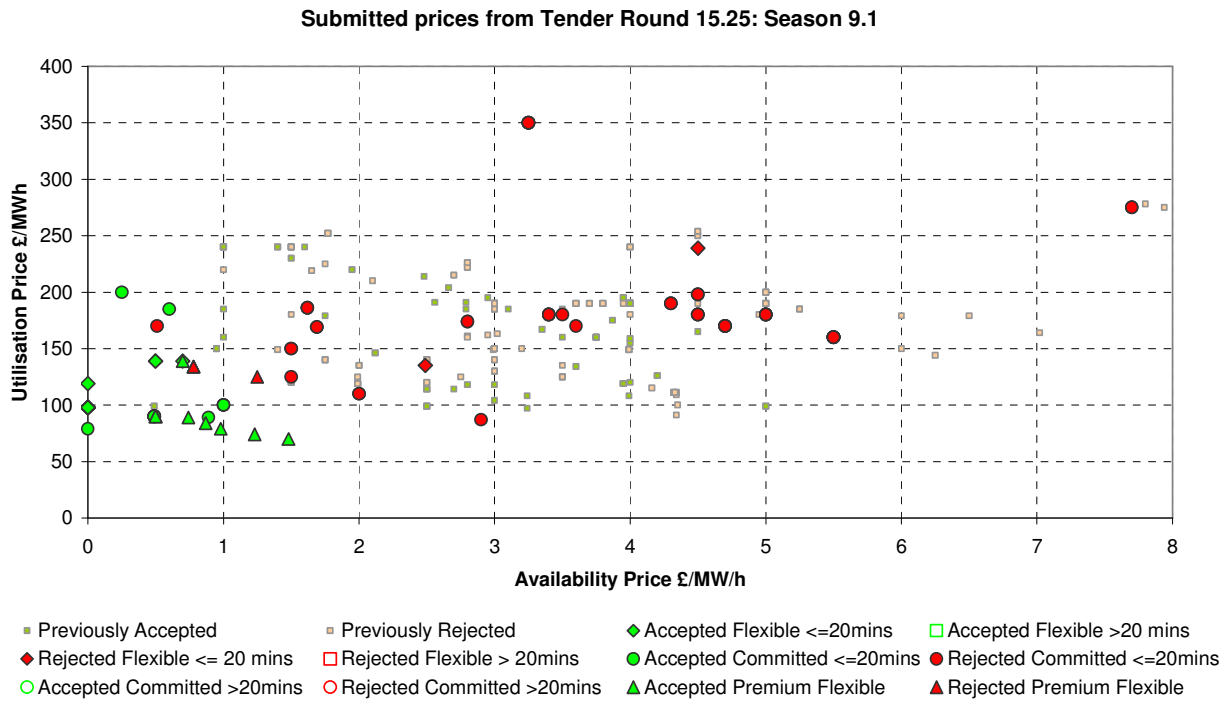
MULTIPLE LOCATIONS (Aggregated sites)

MULTIPLE	Units tendered	Units Accepted	MW tendered	MW Accepted
9.1	43	12	297	92
9.2	43	12	297	92
9.3	28	-	187	-
9.4	28	-	187	-
9.5	29	-	195	-
9.6	29	-	195	-
10.1	85	-	595	-
10.2	85	-	595	-
10.3	85	-	595	-
10.4	85	-	595	-
10.5	78	-	530	-
10.6	78	-	530	-

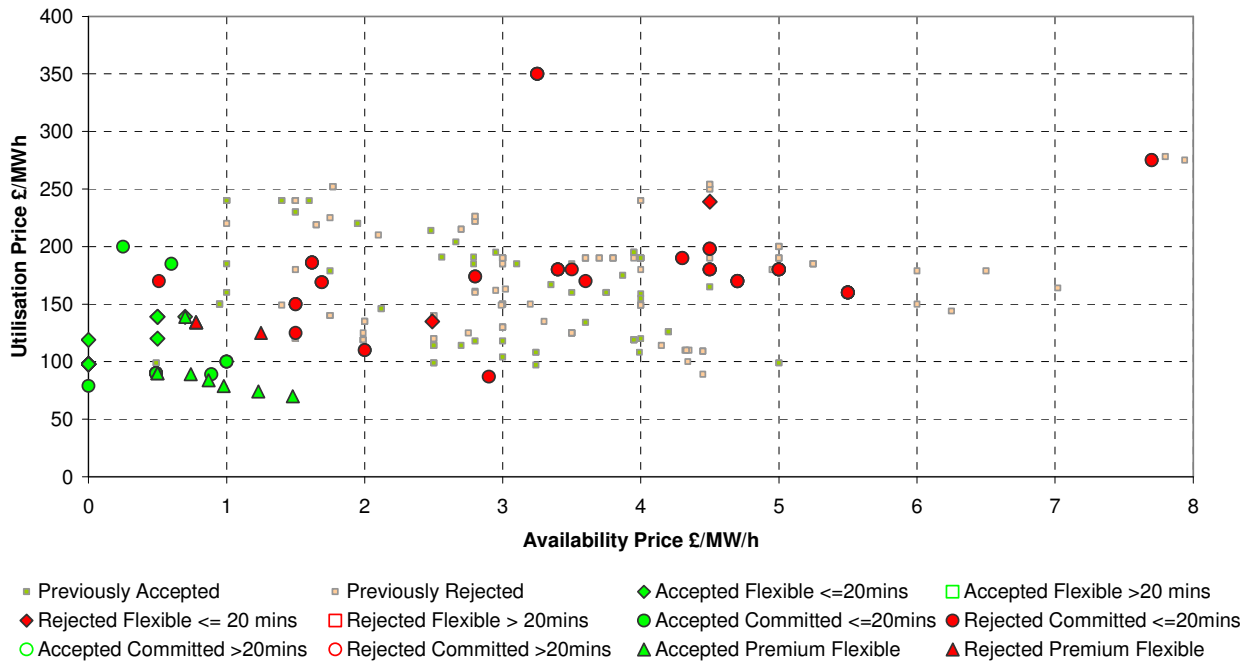
Section 1.2 Prices

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. Additional plots displaying only the Premium Flexible tenders are included for clarity.

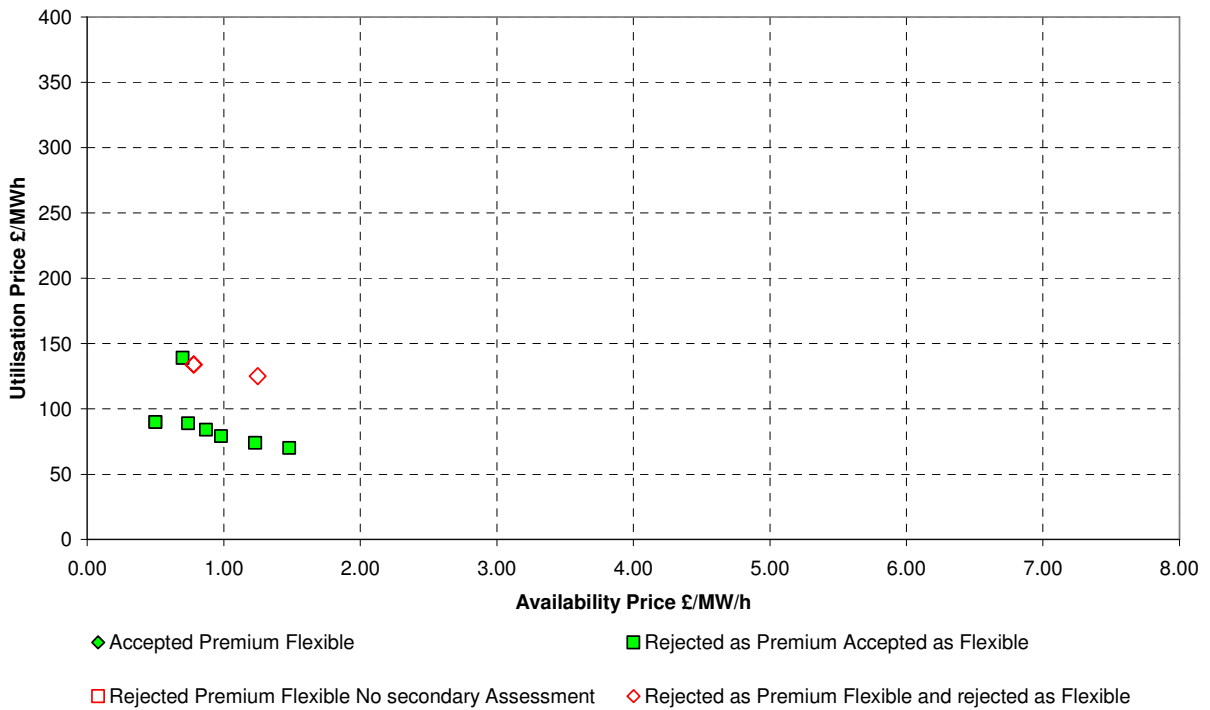
Figure 4 Year 9 Availability and Utilisation price charts



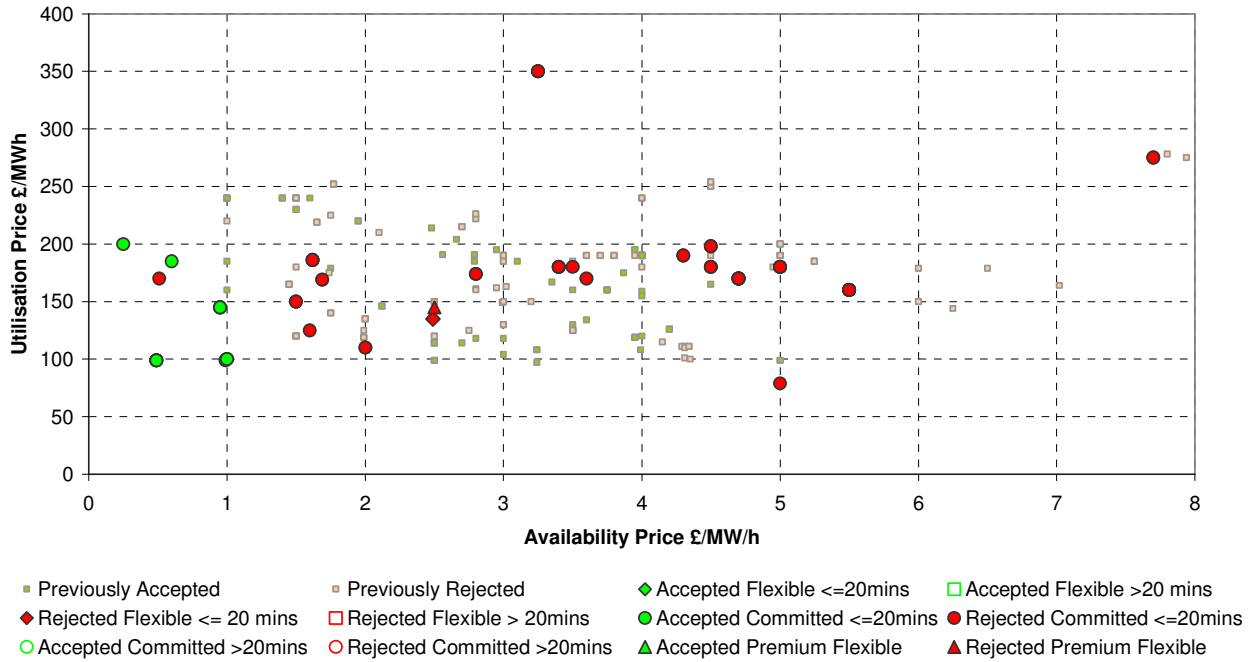
Submitted prices from Tender Round 15.25: Season 9.2



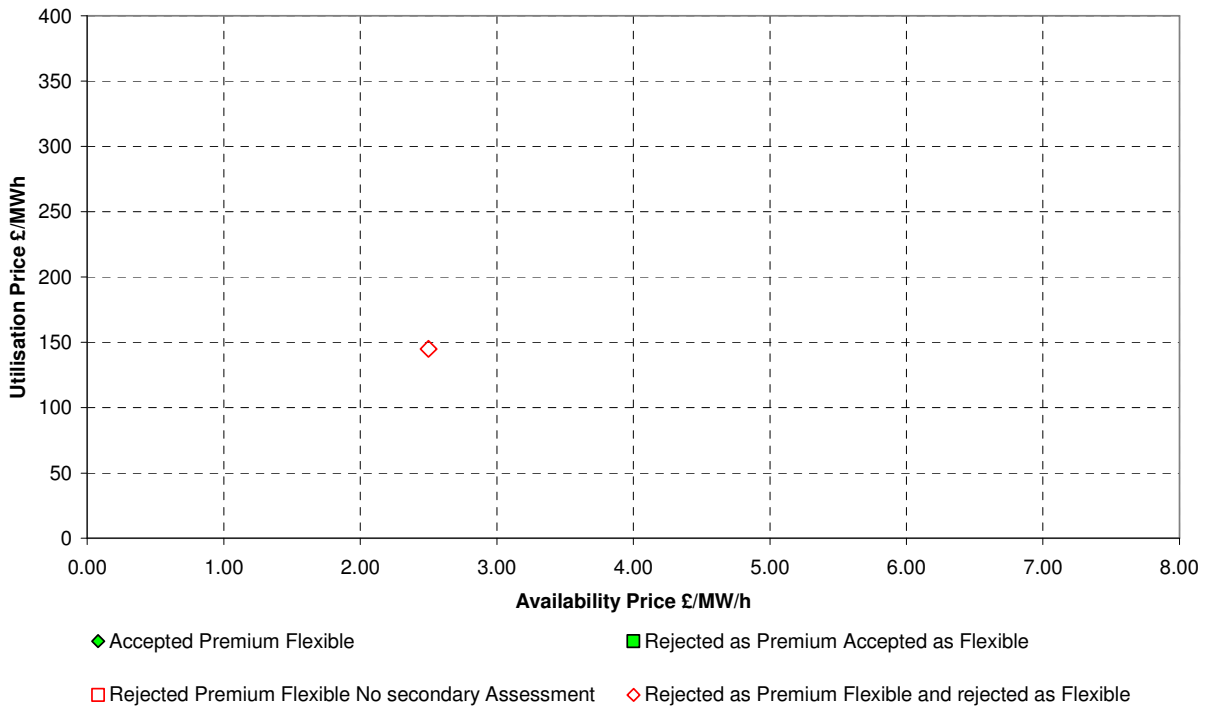
Premium Flexible Tender Submitted prices from Tender Round 25: Season 9.2



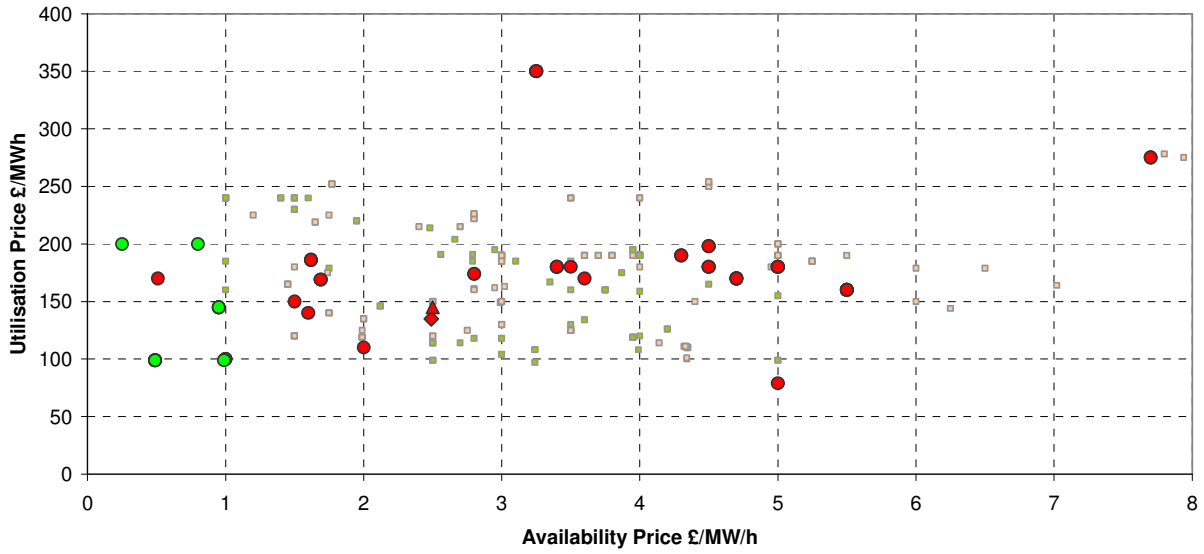
Submitted prices from Tender Round 15.25: Season 9.3



Premium Flexible Tender Submitted prices from Tender Round 25: Season 9.3

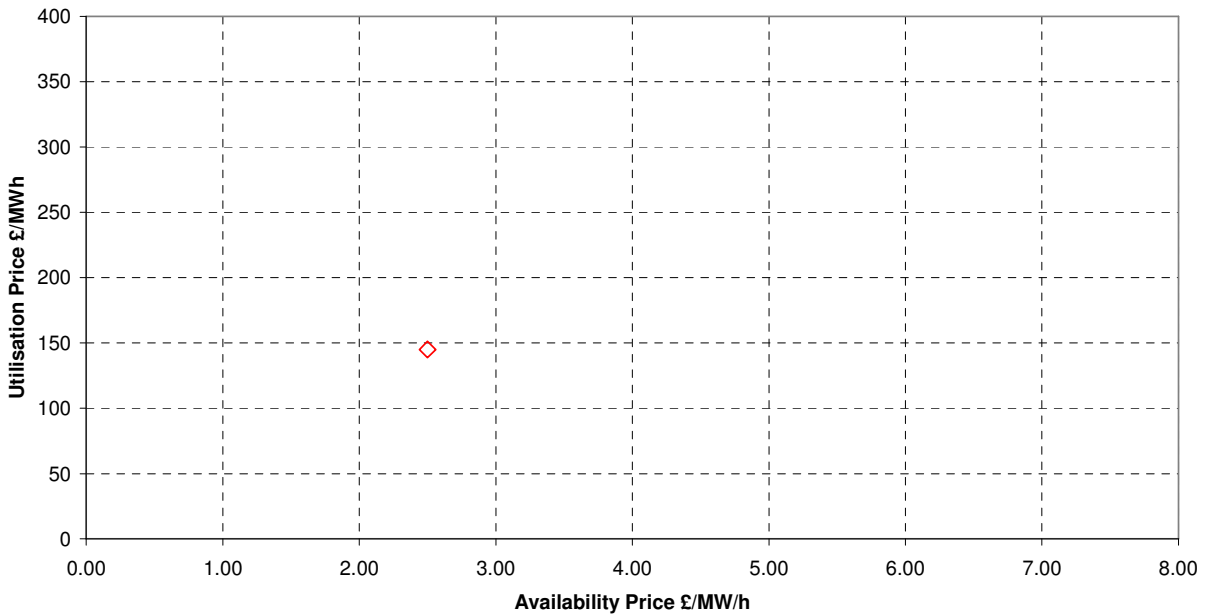


Submitted prices from Tender Round 15.25: Season 9.4



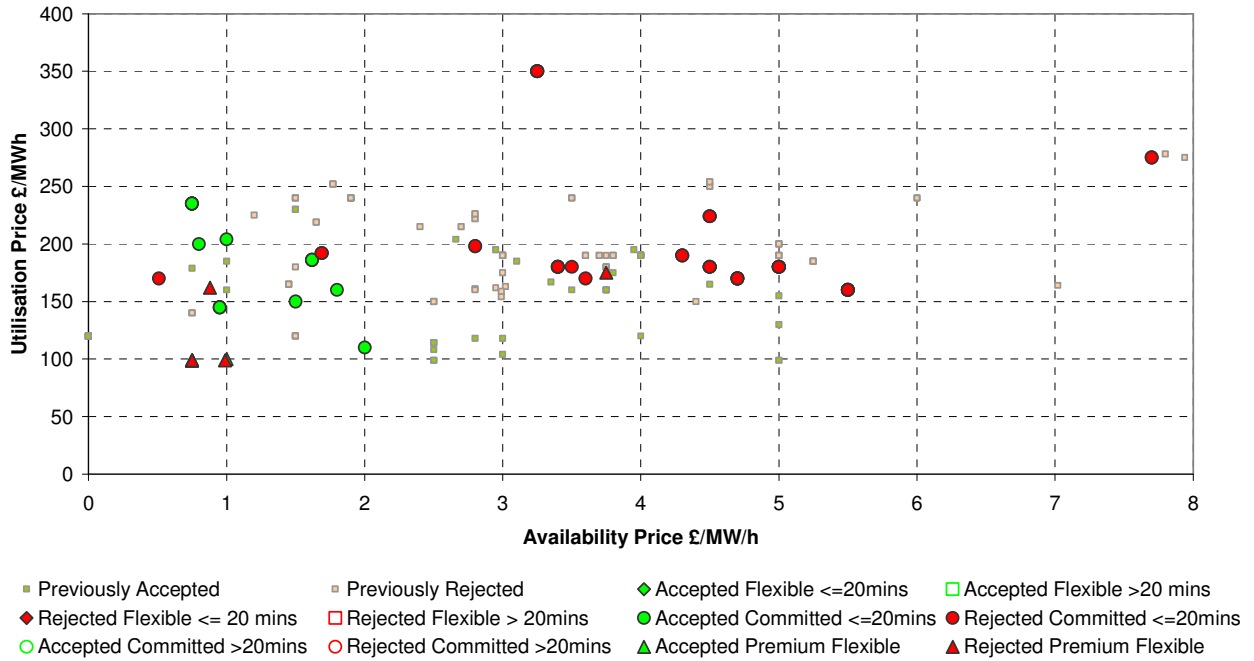
- Previously Accepted ■ Previously Rejected ◆ Accepted Flexible <=20mins □ Accepted Flexible >20 mins
- ◆ Rejected Flexible <= 20 mins □ Rejected Flexible >20mins ● Accepted Committed <=20mins ● Rejected Committed <=20mins
- Accepted Committed >20mins ○ Rejected Committed >20mins ▲ Accepted Premium Flexible ▲ Rejected Premium Flexible

Premium Flexible Tender Submitted prices from Tender Round 25: Season 9.4

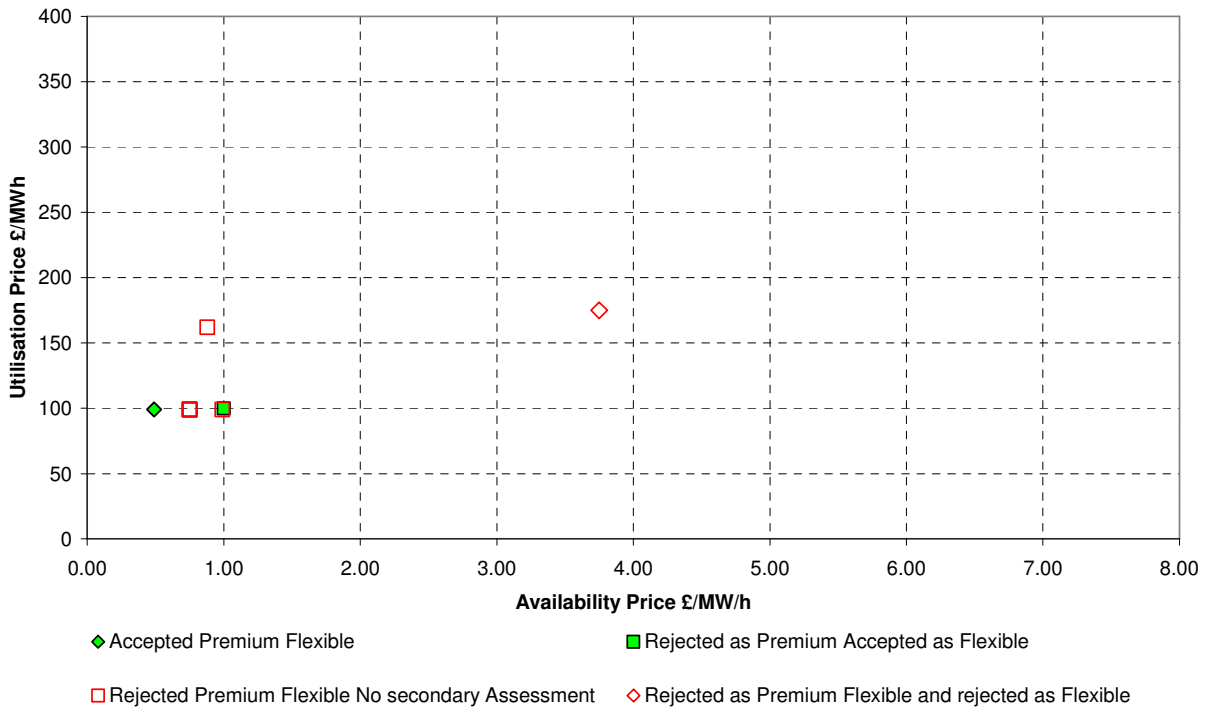


- ◆ Accepted Premium Flexible ■ Rejected as Premium Accepted as Flexible
- Rejected Premium Flexible No secondary Assessment ◇ Rejected as Premium Flexible and rejected as Flexible

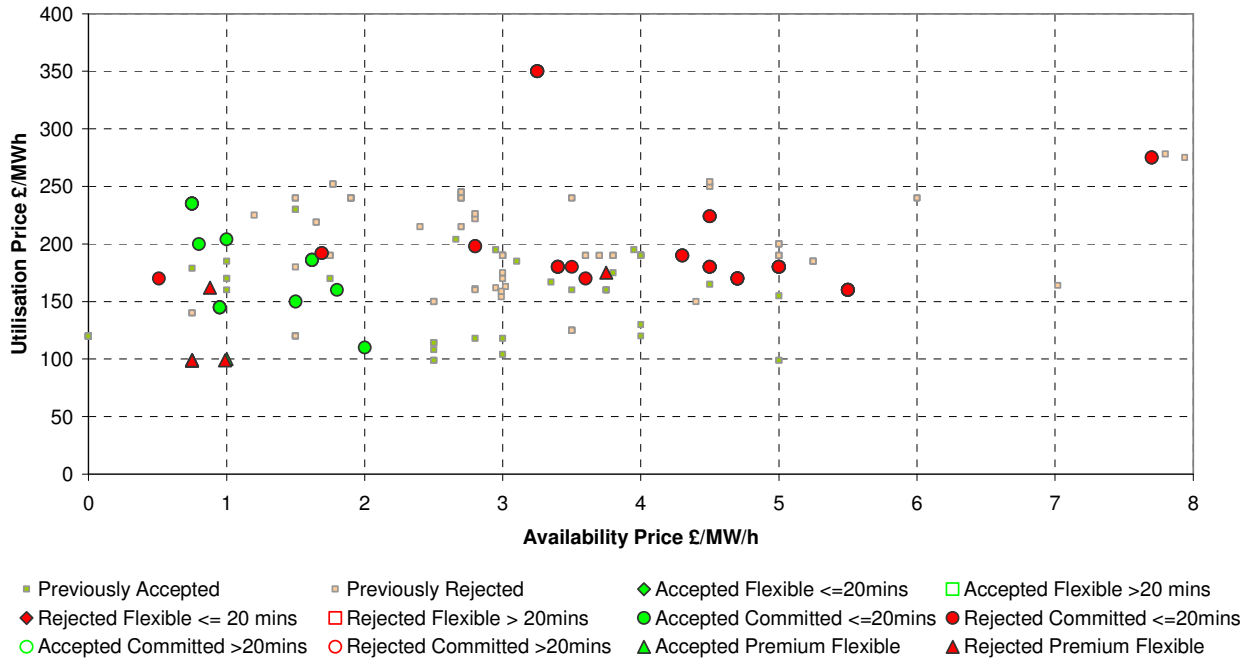
Submitted prices from Tender Round 15.25: Season 9.5



Premium Flexible Tender Submitted prices from Tender Round 25: Season 9.5



Submitted prices from Tender Round 15.25: Season 9.6



Premium Flexible Tender Submitted prices from Tender Round 25: Season 9.6

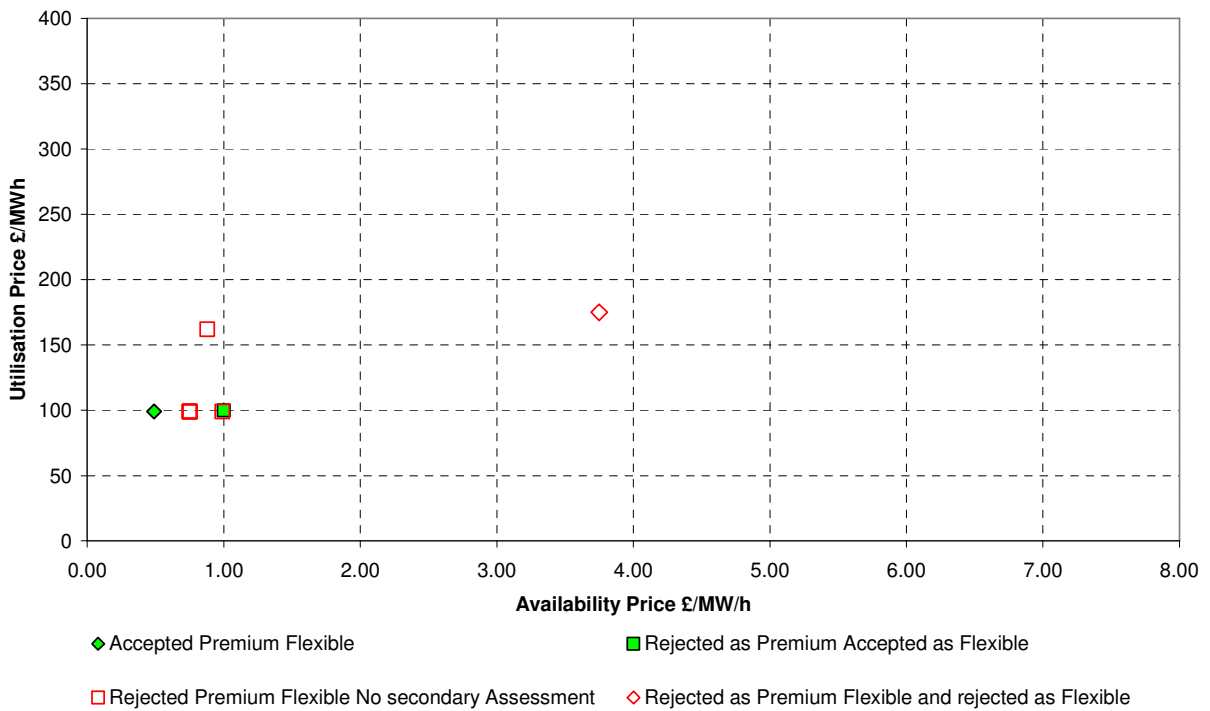
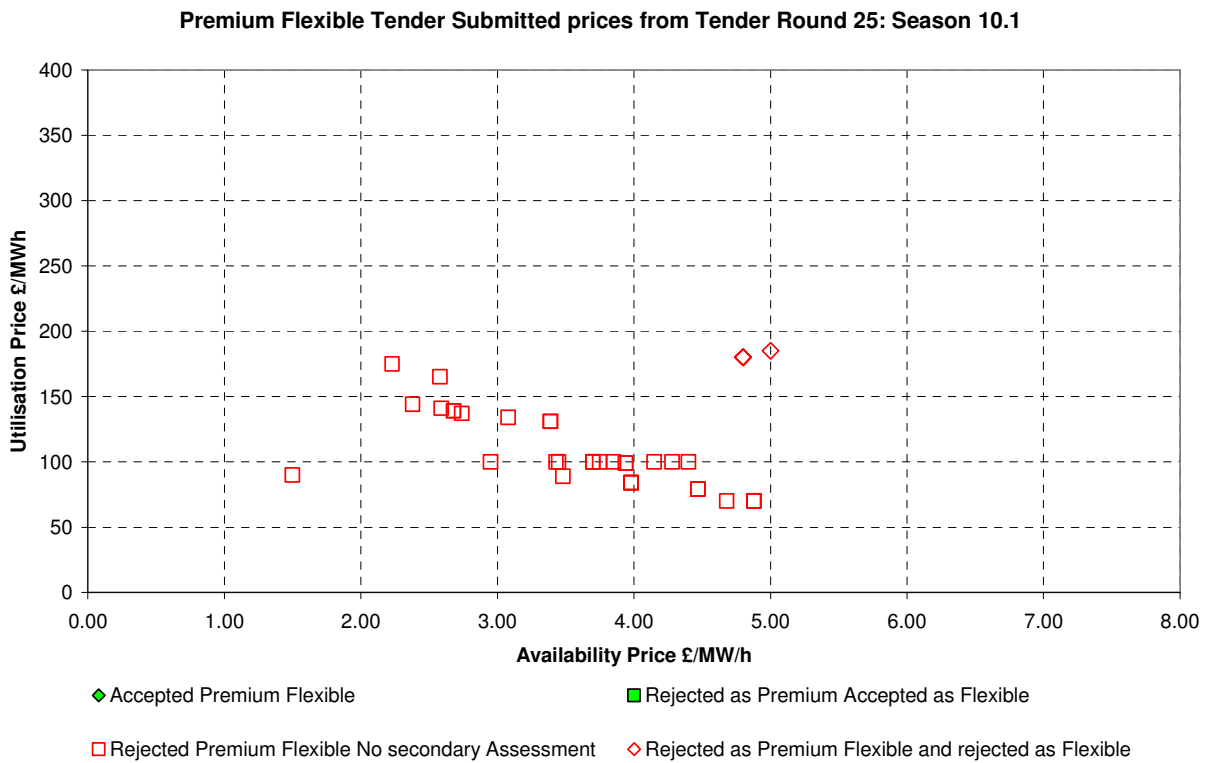
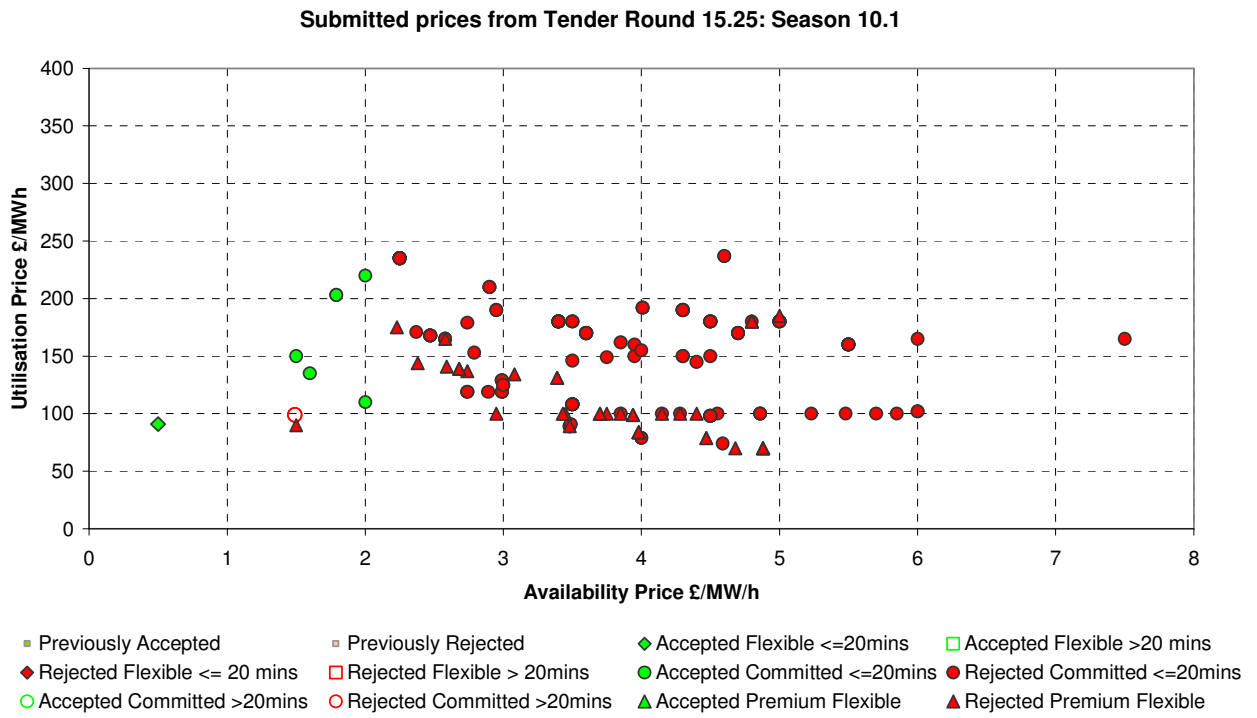
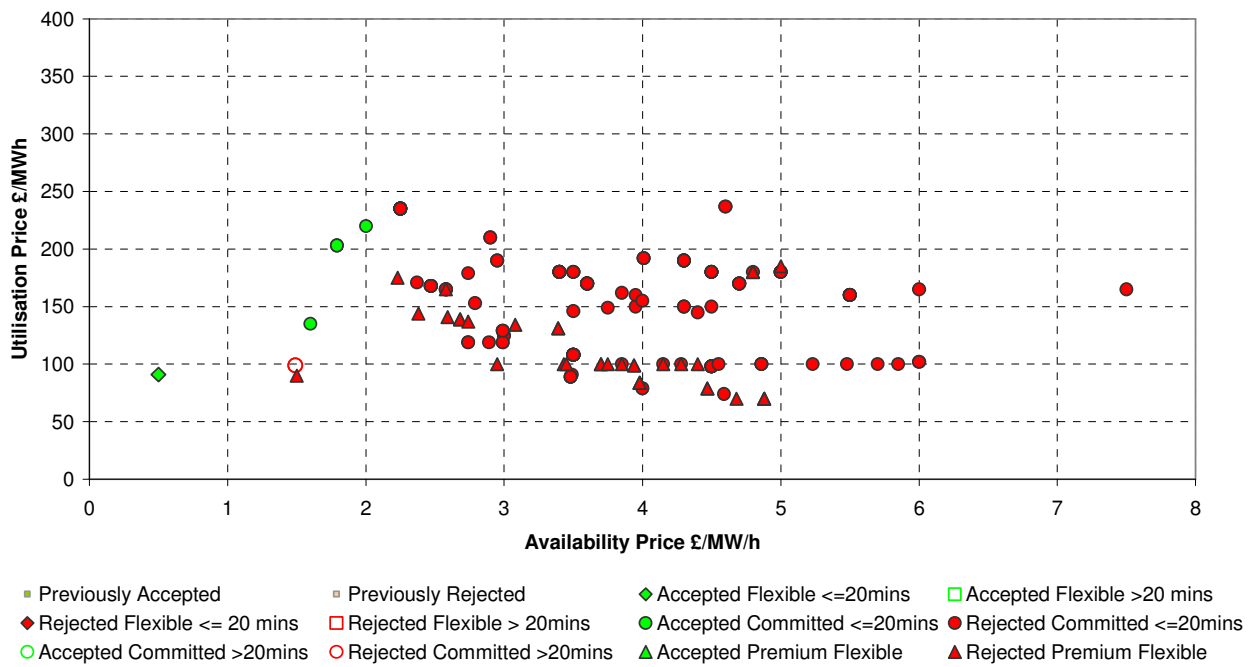


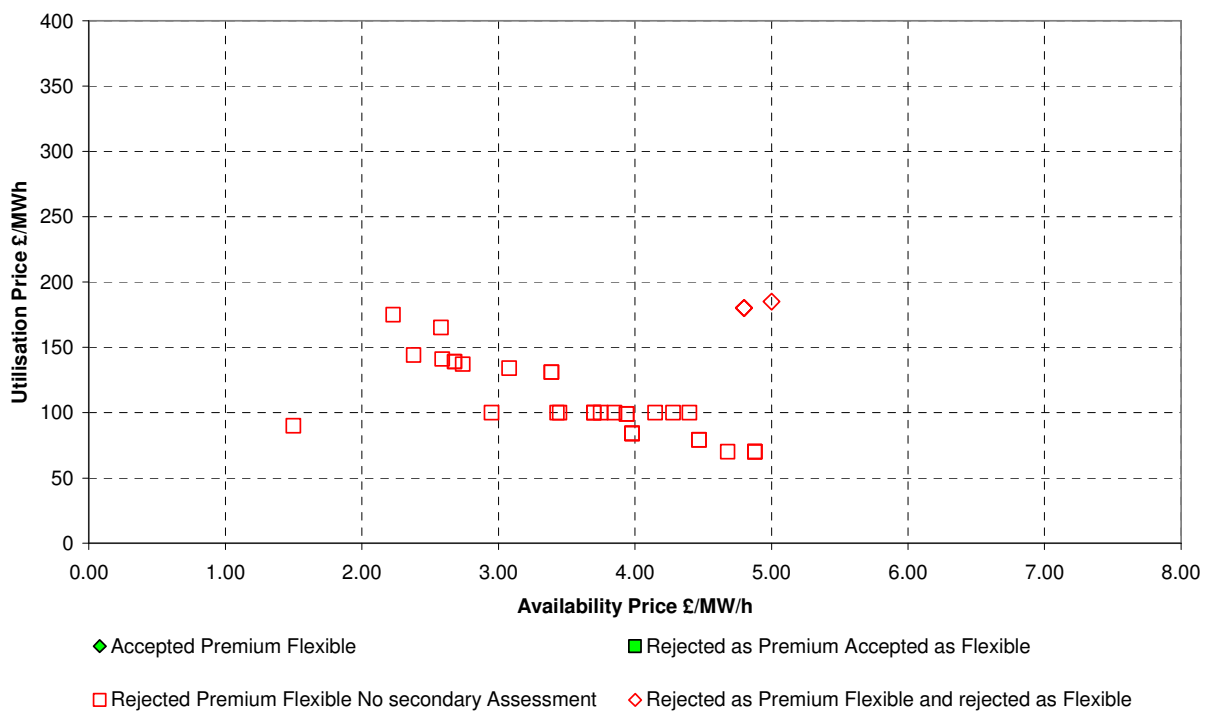
Figure 5 Year 10 Availability and Utilisation price charts



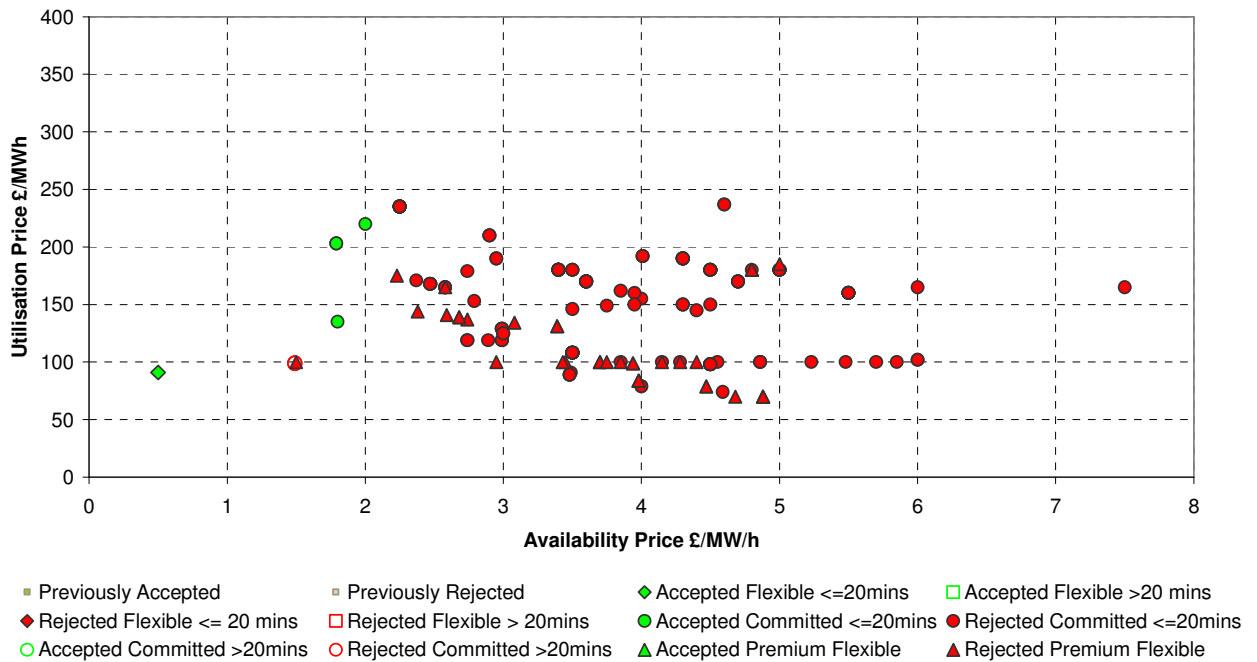
Submitted prices from Tender Round 15.25: Season 10.2



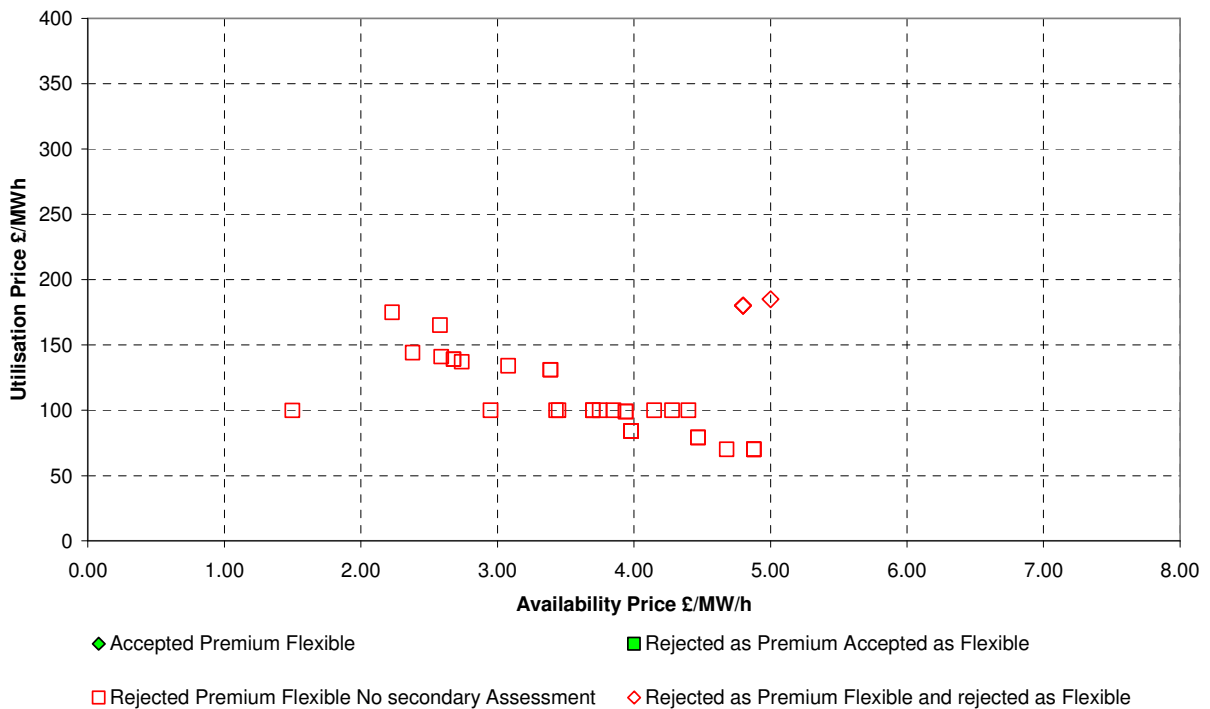
Premium Flexible Tender Submitted prices from Tender Round 25: Season 10.2



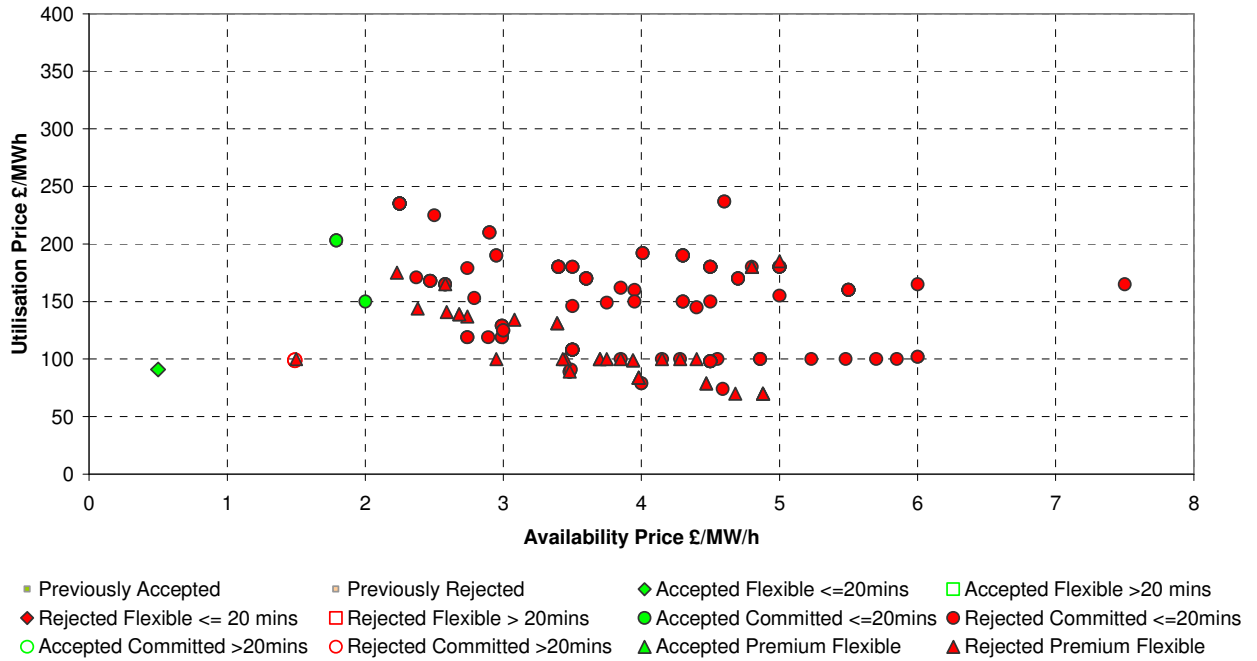
Submitted prices from Tender Round 15.25: Season 10.3



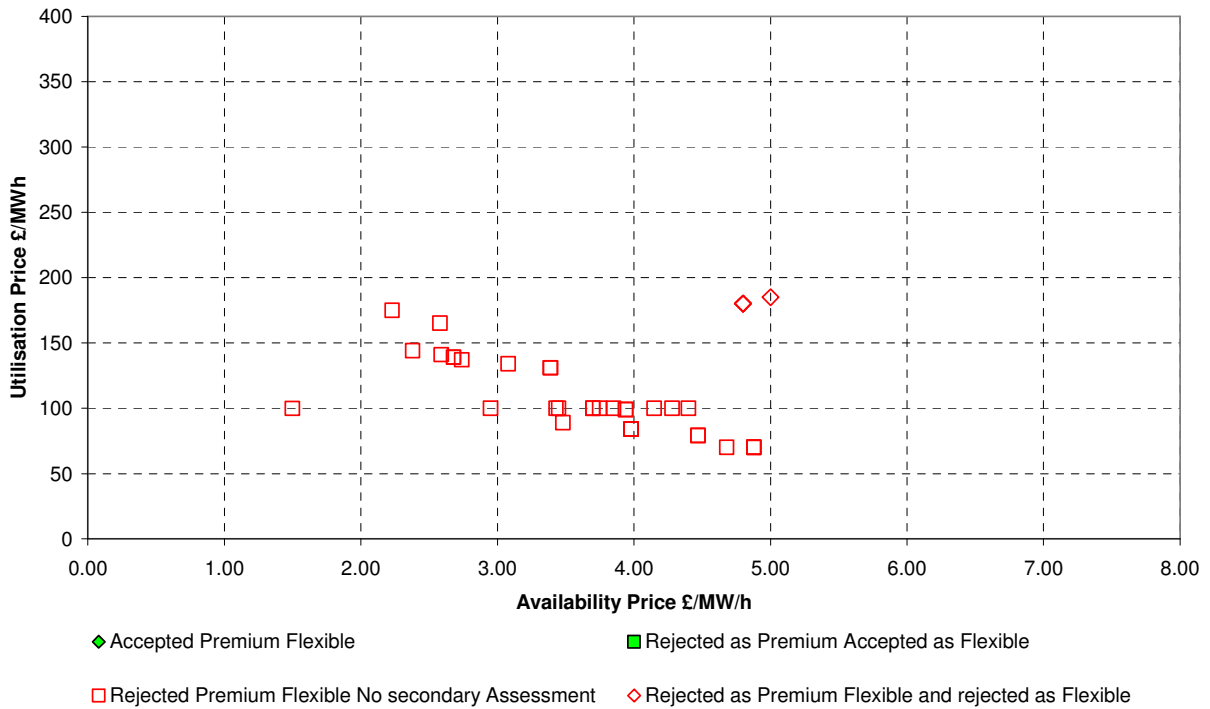
Premium Flexible Tender Submitted prices from Tender Round 25: Season 10.3



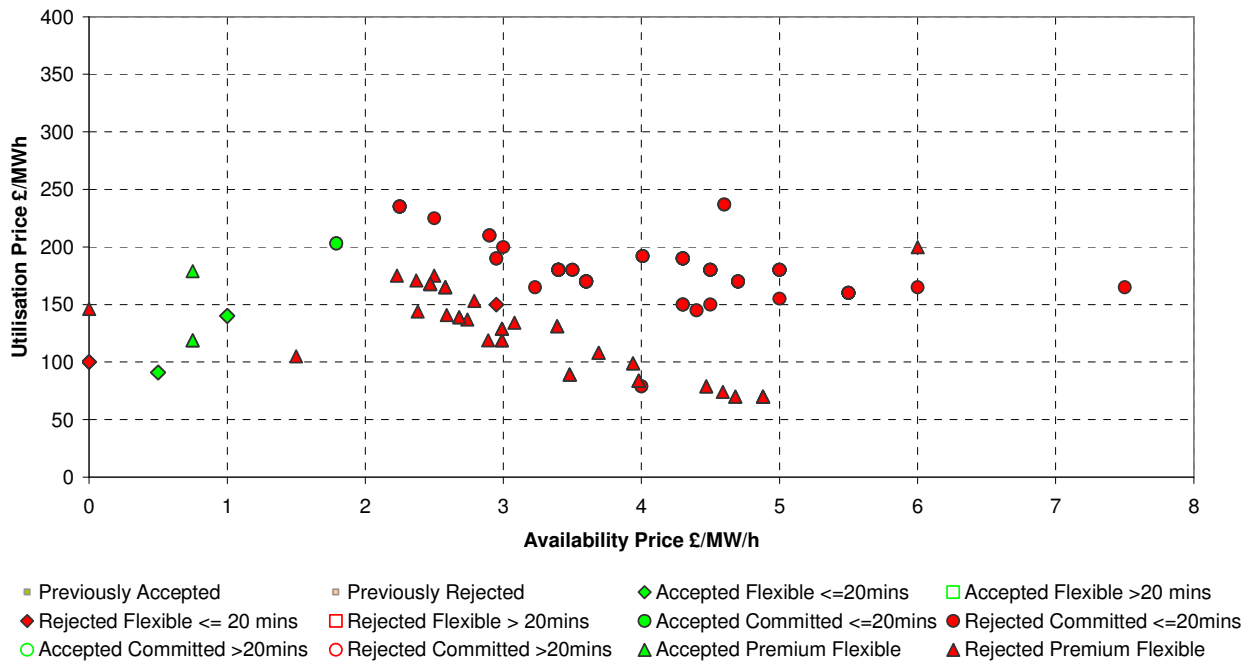
Submitted prices from Tender Round 15.25: Season 10.4



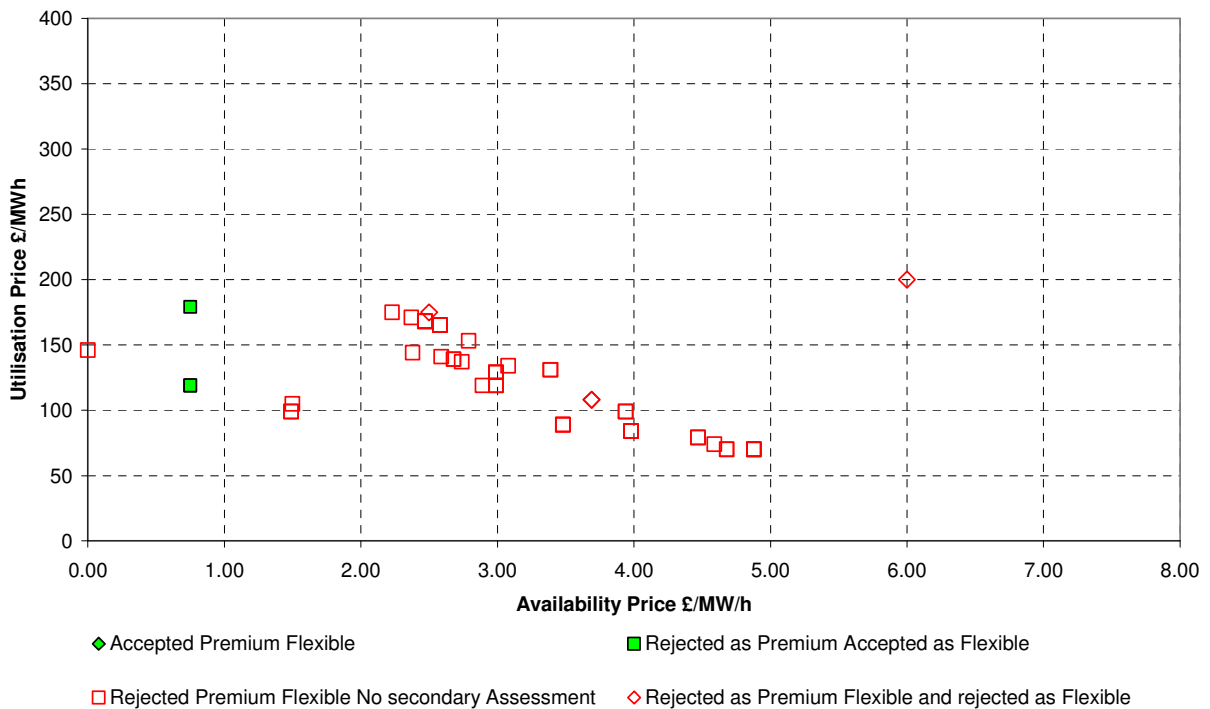
Premium Flexible Tender Submitted prices from Tender Round 25: Season 10.4



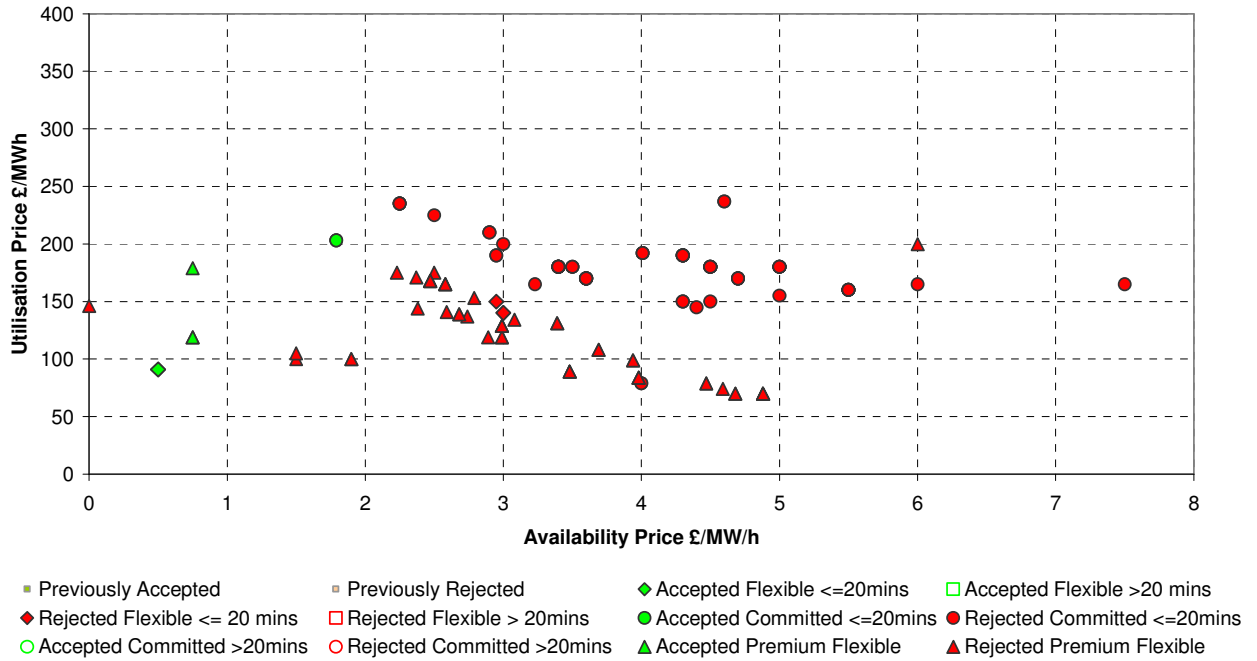
Submitted prices from Tender Round 15.25: Season 10.5



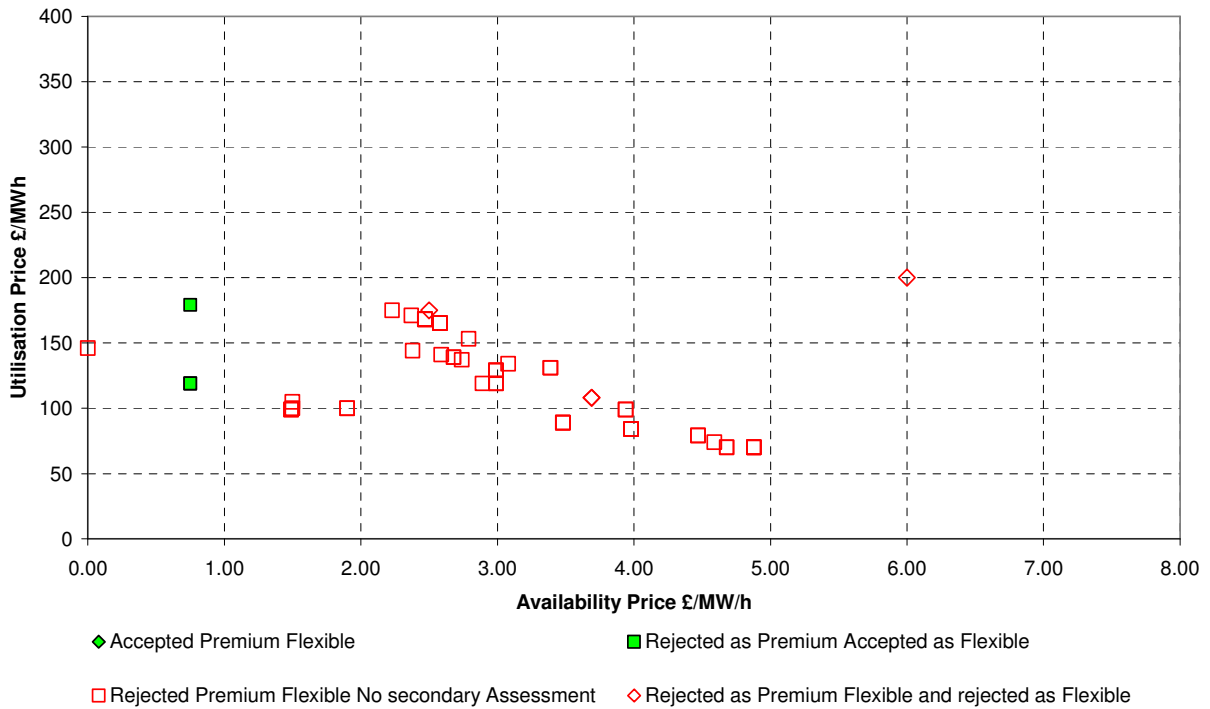
Premium Flexible Tender Submitted prices from Tender Round 25: Season 10.5



Submitted prices from Tender Round 15.25: Season 10.6



Premium Flexible Tender Submitted prices from Tender Round 25: Season 10.6

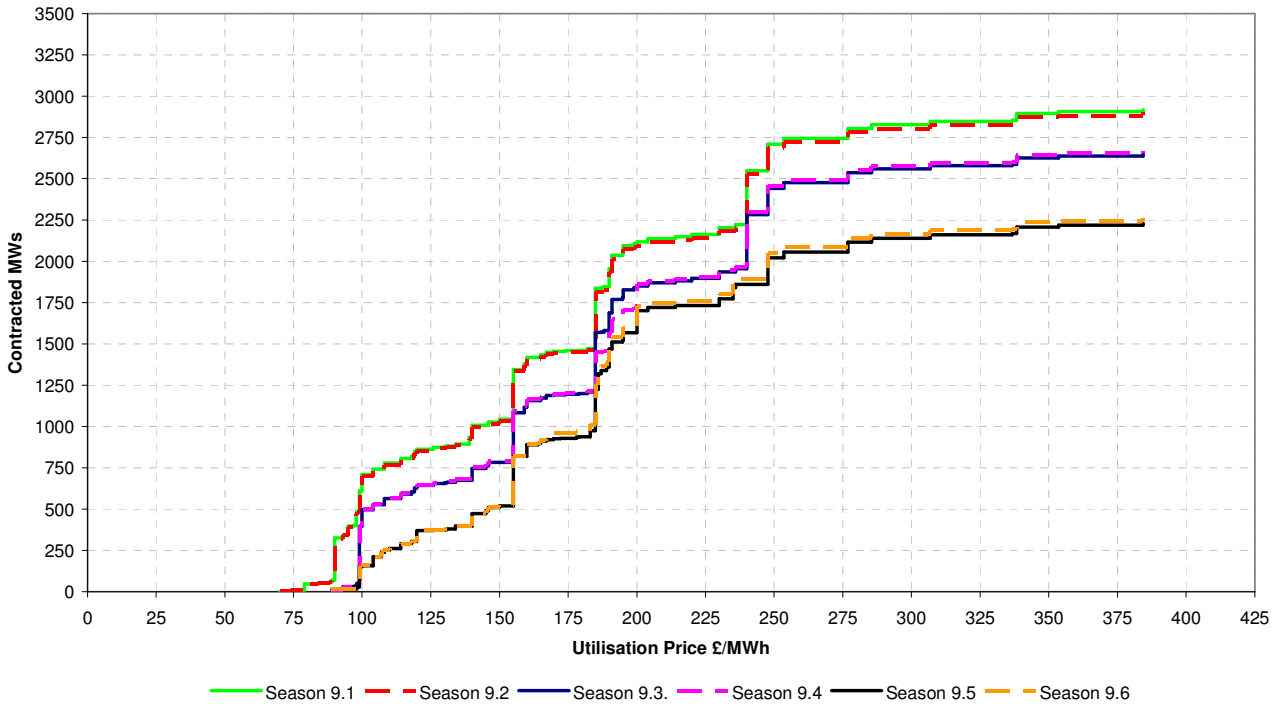


Section 1.3 MW Capacity

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 TR25, 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 9.1 and 9.2 approximately 1000MW of STOR is contracted with a utilisation prices of £150/MWh or less.

Cumulative MW by Utilisation Price for Year 9



Cumulative MW by Utilisation Price for Year 10

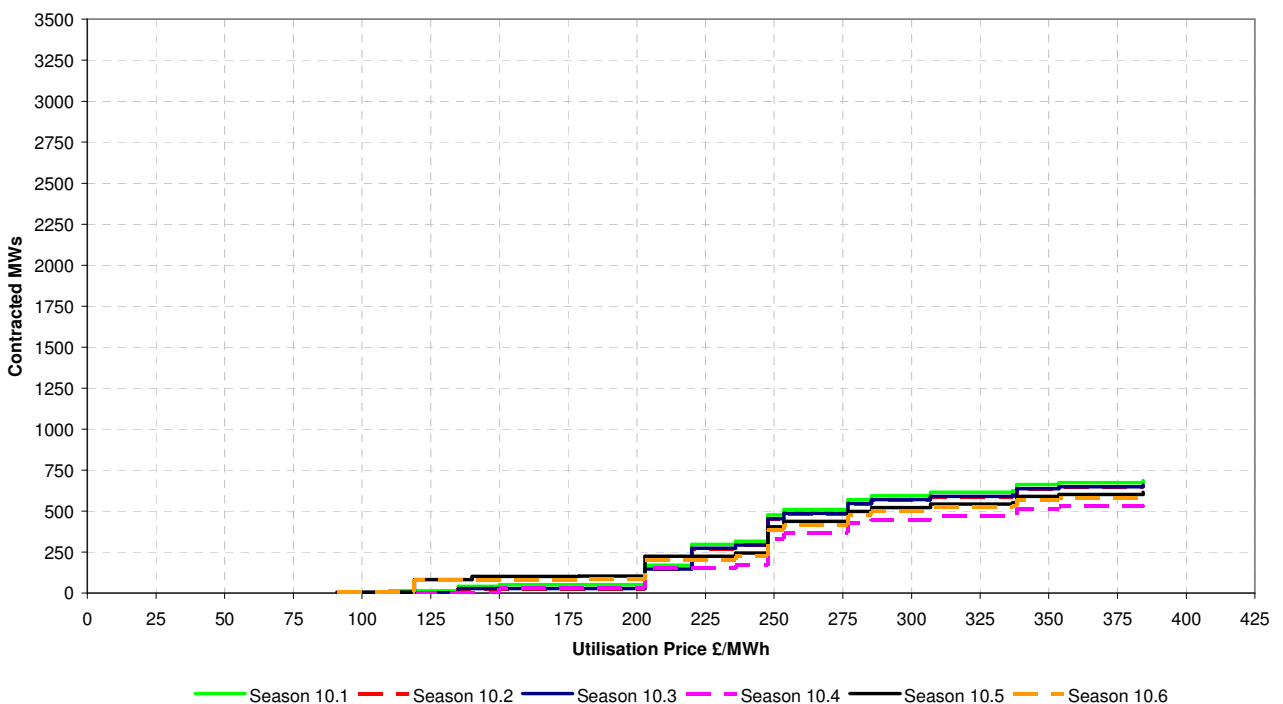
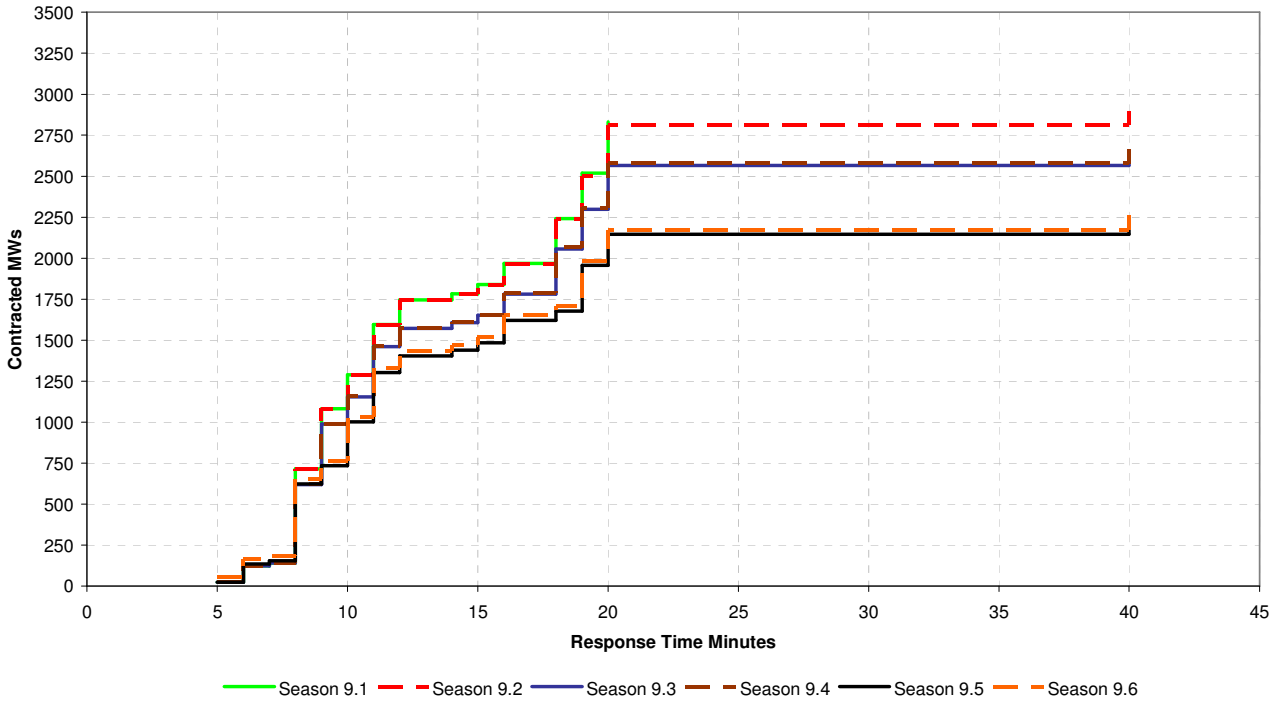
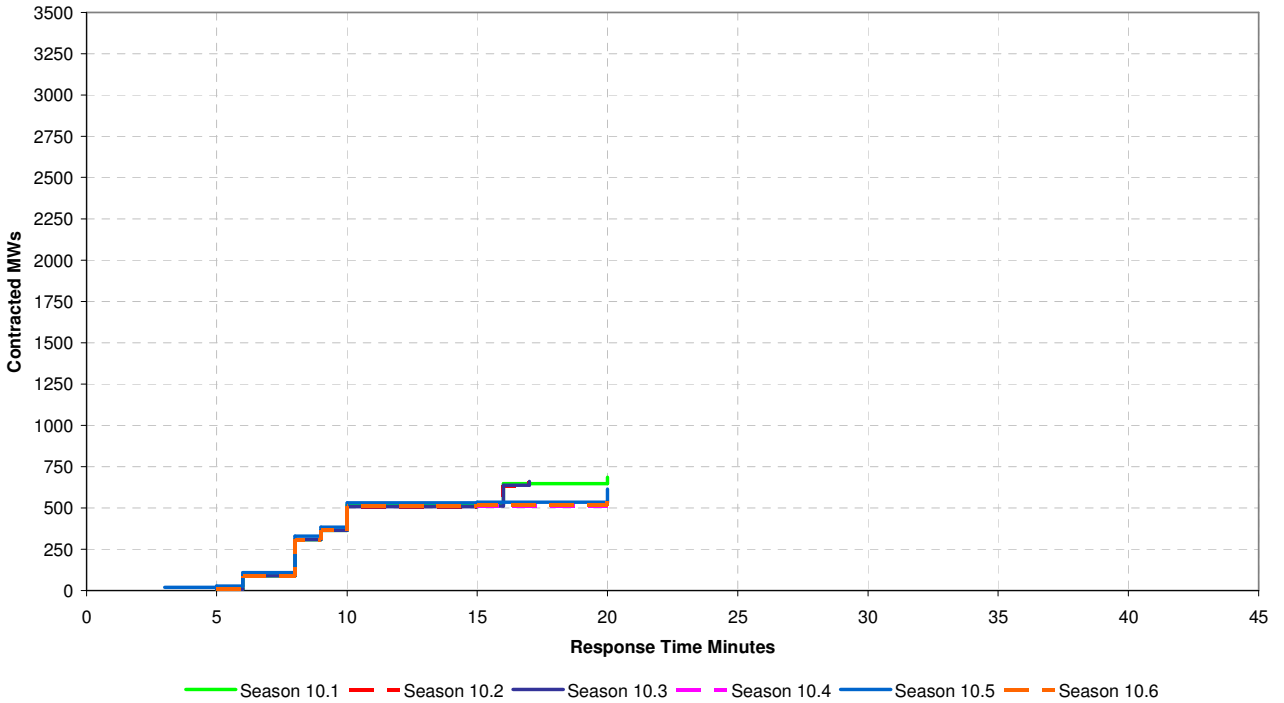


Figure 7a illustrates that for seasons 9.1 and 9.2 approximately 1100MW of STOR is contracted with a response time of 10 minutes or less.

Cumulative MW by Response Time for Year 9



Cumulative MW by Response Time for Year 10

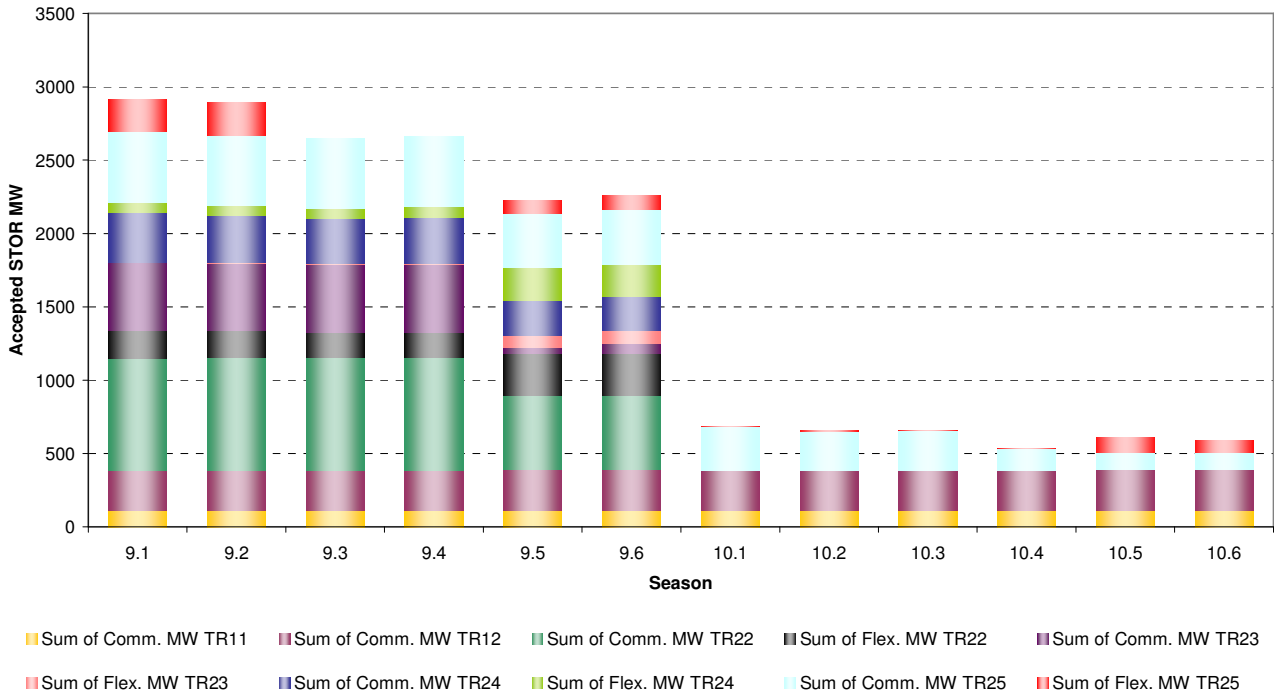


Section 2 Total Contracted Position

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 8 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

Overview of Accepted STOR Tenders for Seasons 9.1 - 10.6

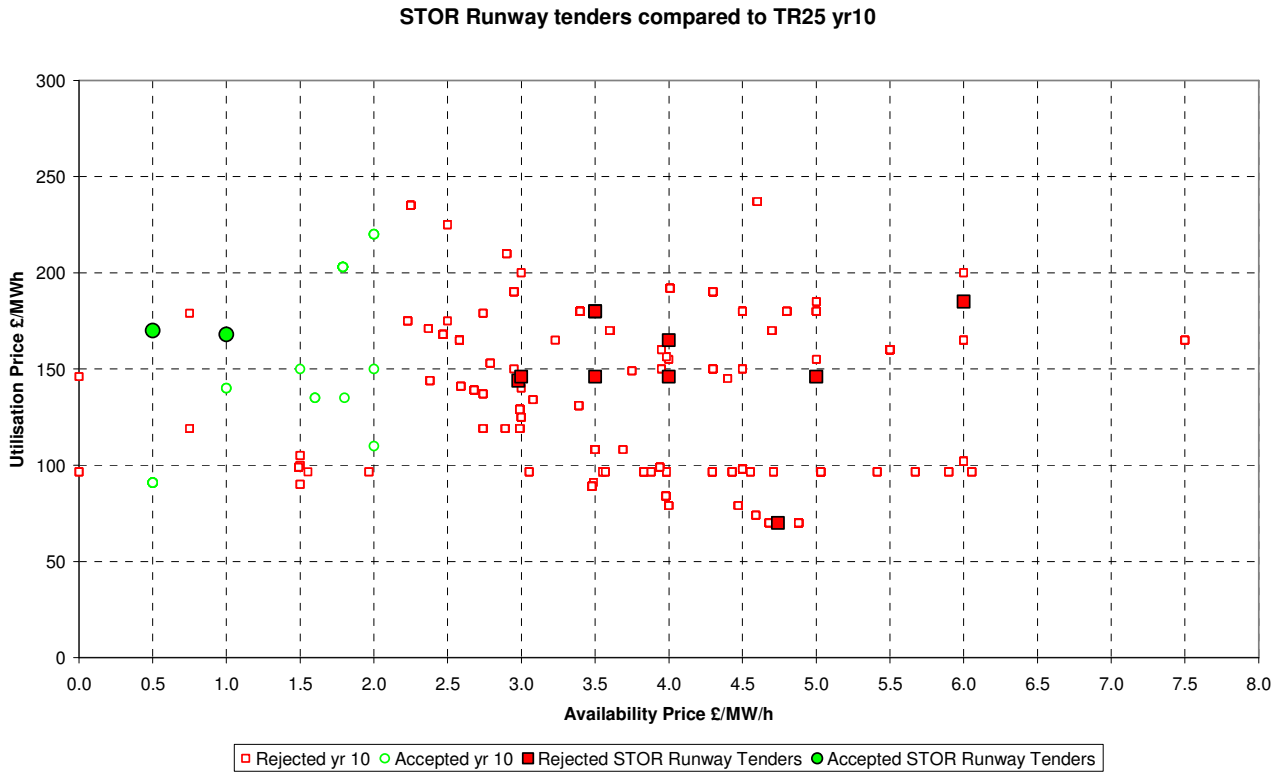


Season		9.1		9.2		9.3		9.4		9.5		9.6	
Service Type		C	F	C	F	C	F	C	F	C	F	C	F
Accepted MW	TR11 (LT)	116		116		116		116		116		116	
	TR12 (LT)	273		271		272		273		274		274	
	TR22	764	186	769	181	769	172	767	172	506	286	508	286
	TR23	463	6	461	7	461	6	466	6	40	85	70	85
	TR24	336	66	320	66	309	72	311	72	240	220	235	220
	TR25	486	222	478	225	473		483		373	91	372	93
Total		2438	480	2415	479	2400	250	2416	250	1549	682	1575	684

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
	Total	683	3	655	3	658	3	537	3	510	104	510	84

Section 3 STOR Runway Tender details

The scatterplot below plots the STOR runway tenders against all other tenders for year 10.



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 TR25: 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		NWD		Hours/Day Type		Total
		Start Time	End Time	Start Time	End Time	WD	NWD	
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
						Total Hours		3867
Season	WD	NWD						
1	21	5						
2	100	19						
3	23	5						
4	30	5						
5	80	18						
6	51	9						

Seasons 2016/17								
Season	Dates	WD		NWD		Hours/Day Type		Total
		Start Time	End Time	Start Time	End Time	WD	NWD	
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 31st 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 31st 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
						Total Hours		3865.5
Season	WD	NWD						
1	20	4						
2	100	19						
3	23	5						
4	36	6						
5	75	16						
6	53	8						