

# Firm Frequency Response Market Information

Monthly Report | National Grid

November 2011

## Key points:

This report is intended for tenders to be submitted in the next month for services starting on or after the month named in the report

The prices in submitted tenders are usually compared with the cost of alternative actions in the BM. Therefore, participants should note the historic volumes and prices provided for bid and offers, and mandatory frequency response holding.

Daytime period is from 07:00- 23:00 and Overnight is from 23:00 -07:00

## Introduction

Firm Frequency Response (FFR) is a service through which balancing mechanism (BM) and non-BM participants commit to providing a given measure of response for a fee. The service is procured through a tender process ahead of BM timescales and competes with the mandatory response service offered by BM participants.

This report is intended to provide useful information to current and potential providers about the volume of response required, the likely periods over which it is required and the recent costs of obtaining frequency response through the mandatory market.

In October 2011, National Grid will procure frequency response in line with the principles laid out in the Assessment Principles. In principle, tendered prices are compared to the alternative costs buying mandatory response through the BM. Mandatory costs include the response holding costs, the bid and offer acceptance costs and the margin costs. More details on how these costs are considered during tender assessments are contained in our assessment principles.

The next three pages of the report show the volumes of frequency response holding required. While the subsequent pages show the recent volumes and costs of response holding and bid and offer acceptances in the mandatory market.

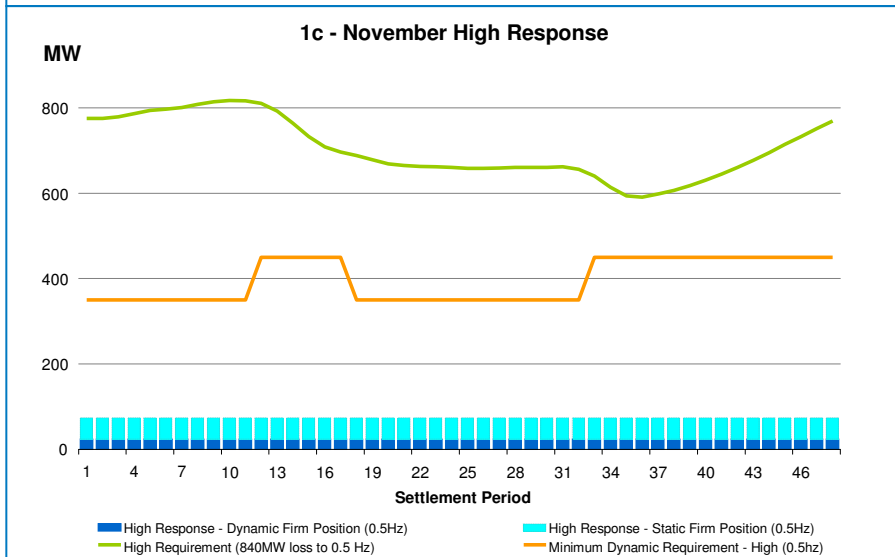
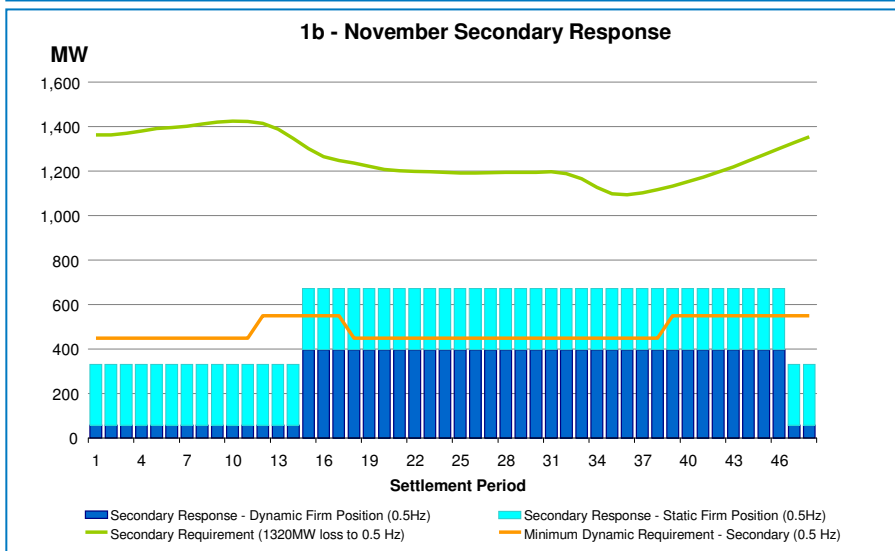
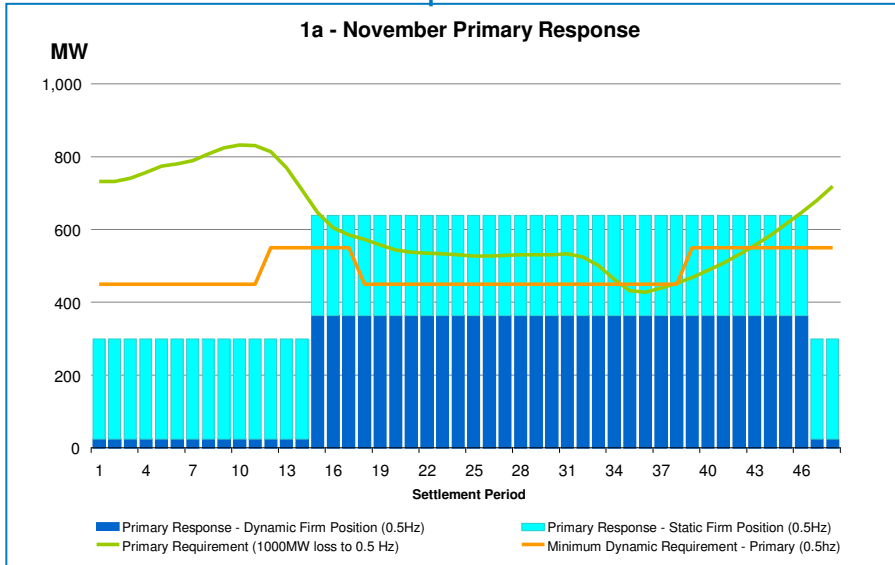
## Highlights

In September 2011, 13 tenders were received offering frequency response from five BM units and one demand-side unit. Four tenders were accepted; three single month tenders for October 2011 service period and a three-month tender beginning 1<sup>st</sup> October 2011. More details on the tenders accepted/rejected are available from the post-assessment tender report.

The FFR assessment principles and post-assessment tender report are available at:

<http://www.nationalgrid.com/uk/Electricity/Balancing/services/frequencyresponse/ffr/>

### Settlement Period Requirement



Figures 1a to 1c show the indicative frequency response requirement for each settlement period in November 2011.

The expected response requirements shown in the following graphs are averaged for each day of the month. The requirements are estimated based on forecast demand for individual settlement periods.

It should be noted that the volume of frequency response required over the weekend is slightly higher than during the week because of the lower demands experienced over the weekend.

The green lines show the total response required to recover from a maximum frequency deviation of 0.5Hz. The primary response requirements are set for a 1000MW loss, secondary response for a 1320MW loss and high response for an 840MW demand loss.

The orange lines show the indicative minimum dynamic response required at 0.5Hz deviation.

The bars in the graphs show the total contracted response which is expected to be available during the periods shown on the graph. The deep blue bars indicate the firm dynamic response and light blue bars represent firm static response.

Providers should note that dynamic response over the minimum dynamic level also contributes to meeting the total response requirement.

### Daytime 12-Month Requirement

Figures 2a to 2c show the indicative daytime (07:00hrs - 23:00hrs) frequency response requirement for twelve months beginning November 2011.

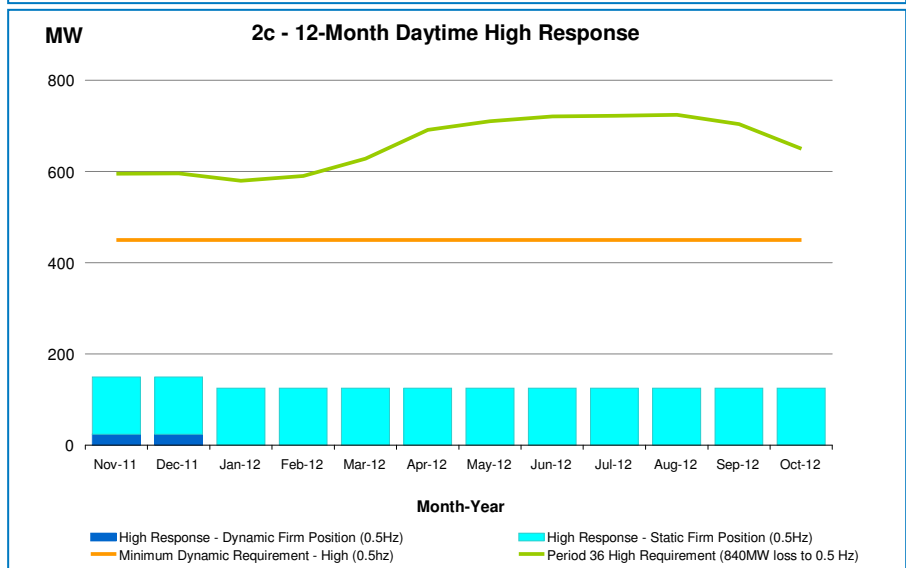
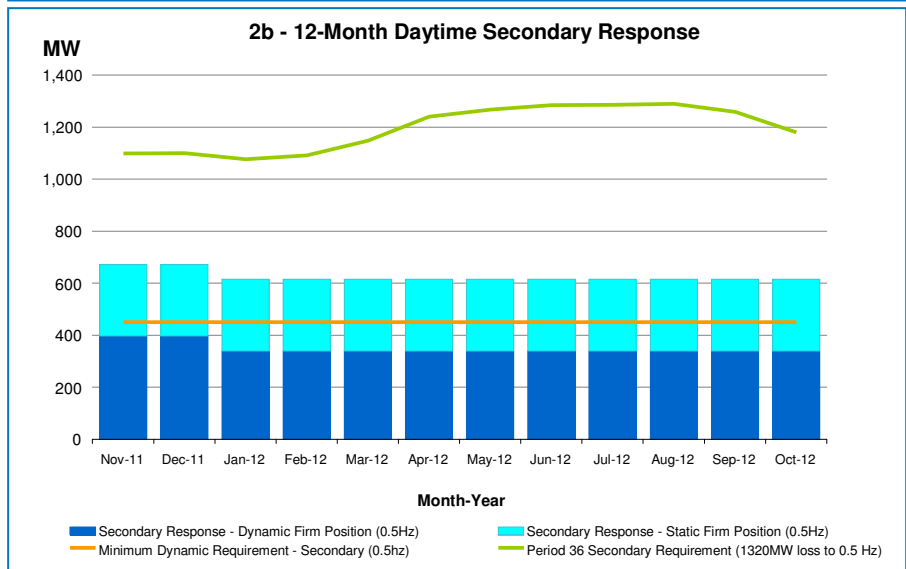
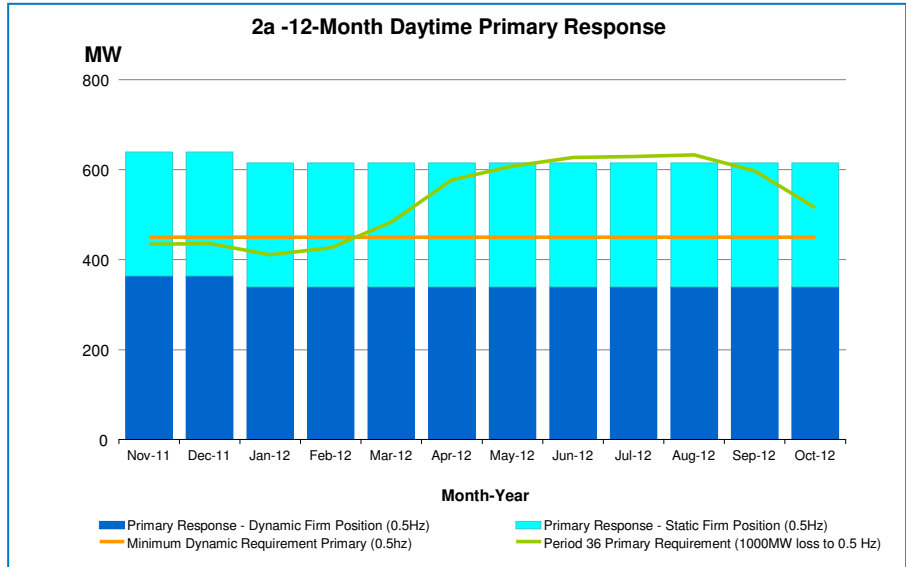
The expected response requirements shown in the following graphs are averaged for each day of the month and are calculated based on the forecast demand during settlement period 36. The volume of response required will vary over individual daytime settlement periods. The requirement shown in the figures are the expected base/minimum requirements expected during the day.

The green lines show the total response required to recover from a maximum frequency deviation of 0.5Hz. The primary response requirements are set for a 1000MW loss, secondary response for a 1320MW loss and high response for an 840MW demand loss.

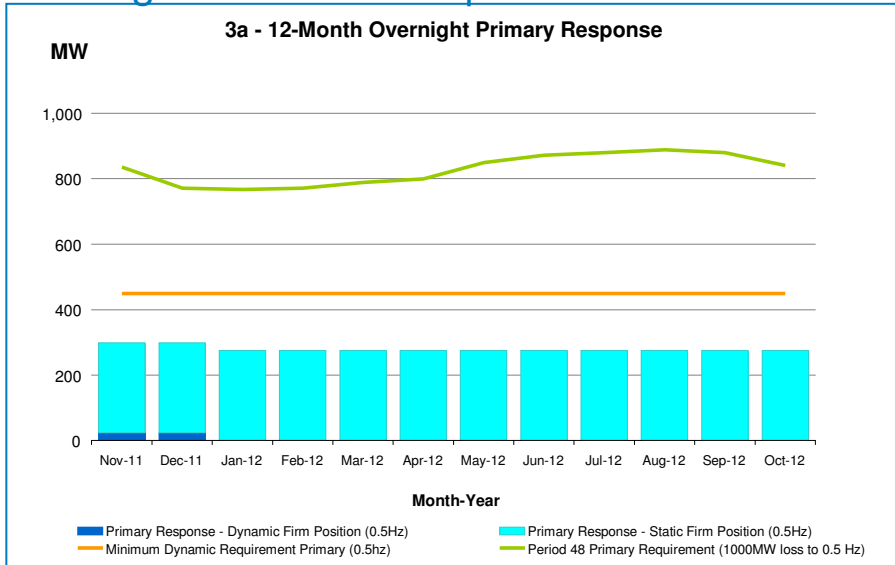
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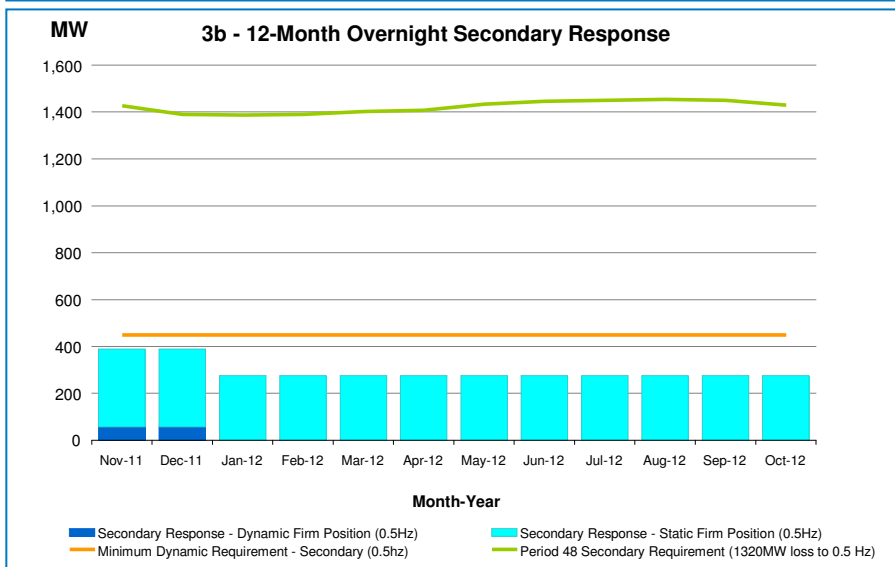


### Overnight 12-Month Requirement



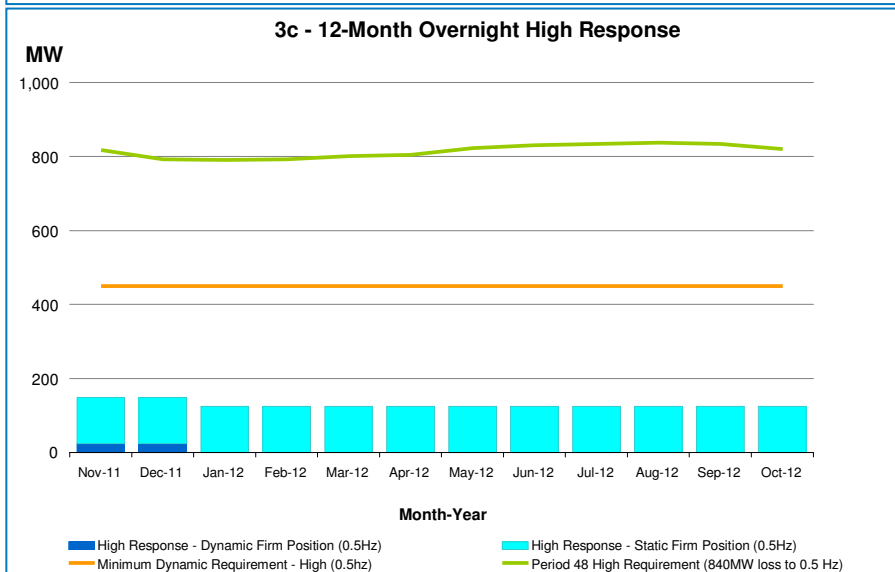
Figures 3a to 3c show the indicative daytime (23:00hrs - 07:00hrs) frequency response requirement for twelve months beginning November 2011.

The expected response requirements shown in the following graphs are averaged for each day of the month and are calculated based on the forecast demand for settlement period 48. The volume of response required will vary over individual overnight settlement periods. The requirement shown in the figures are the expected base/minimum requirements expected during the night.



The green lines show the total response required to recover from a maximum frequency deviation of 0.5Hz. The primary response requirements are set for a 1000MW loss, secondary response for a 1320MW loss and high response for an 840MW demand loss.

The orange lines show the indicative minimum dynamic response required at 0.5Hz deviation.



The bars in the graphs show the total contracted response which is expected to be available during the periods shown on the graph. The deep blue bars indicate the firm dynamic response and light blue bars represent firm static response.

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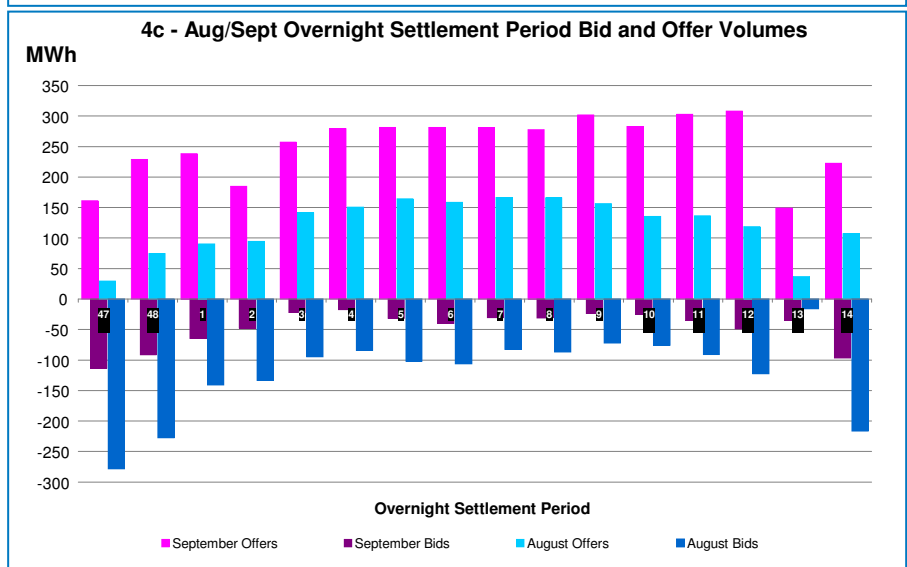
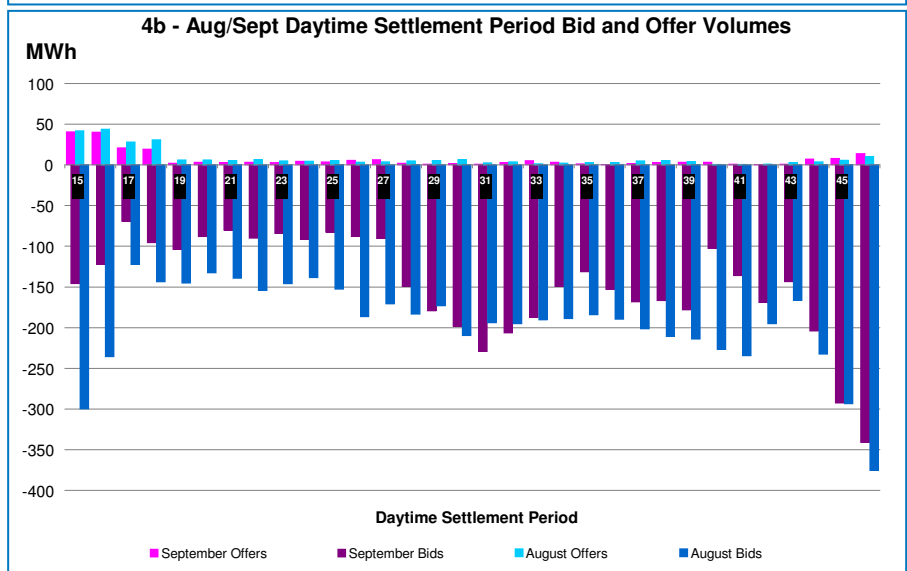
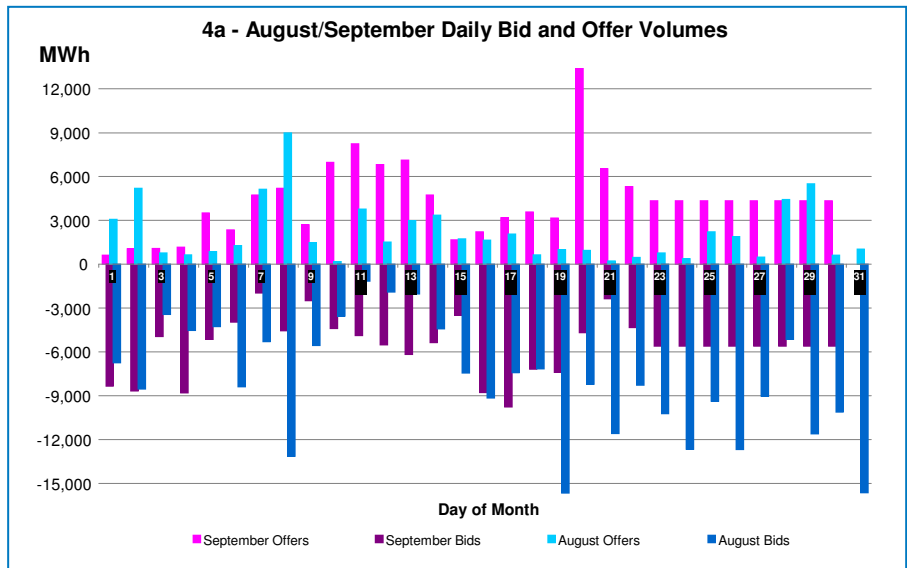
### Historic Bids and Offers

Figures 4a to 4c provide an indication of the volume of Bid and Offer acceptances instructed on BM units that were, in conjunction with the delivery of the BOA energy, also providing Frequency Response. These figures are presented for August and September 2011.

Figure 4a shows the volumes on a daily basis while figures 4a and 4c provide the average volume by settlement period.

The settlement period figures show a profile of bid and offer acceptances over the day. It can be gleaned that more bids were taken in the daytime periods compared to the overnight periods.

The Bid and Offer acceptance data presented in Figures 4a to 4c is indicative and actions have been required for other reasons apart from (or as well as) frequency response optimisation (such as resolving energy imbalance or transmission system constraints).



Key dates in October

In October 2011, National Grid will procure frequency response in line with the principles laid out in the Assessment Principles.

Tenders from eligible service providers for firm frequency response should be submitted by **Monday 3<sup>rd</sup> October 2011** (1st business day) for single month and long term tenders or by **Wednesday 5<sup>th</sup> October 2011** (3<sup>rd</sup> business day) for short term tenders.

National Grid will notify service providers of the outcome of the tender assessment by **Friday 14<sup>th</sup> October 2011** (10<sup>th</sup> business day).

For successful tenders, National Grid will notify nominated windows, following assessment, by **Friday 21<sup>st</sup> October 2011** (15<sup>th</sup> business day).

## Mandatory Response Costs

Response Bid and Offer cost			
	August 2011 (actual)	September 2011 (estimate)	
Total Response Bid Cost	£1,783,498	£1,426,054	
Total Response Bid Volume	244,079 MWh	169,798 MWh	
Total Response Offer Cost	£1,650,737	£3,655,145	
Total Response Offer Volume	65,552 MWh	113,501 MWh	
Response Holding Cost			
August 2011	Primary	Secondary	High
Price band (£/MWh range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	25,455	6,152	39,810
6 to 8	15,414	7,095	65,906
4 to 6	55,844	3,089	307,787
2 to 4	187,095	56,212	851
0 to 2	68,940	202,098	163,965
<b>Totals</b>	<b>352.7 GWh</b>	<b>274.6 GWh</b>	<b>578.3 GWh</b>
<b>Costs</b>	<b>£1.29 m</b>	<b>£0.50 m</b>	<b>£2.66 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>1,206 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.45 £m</b>
September 2011	Primary	Secondary	High
Price band (£/MWh range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	11,973	2,072	30,756
6 to 8	15,757	6,964	53,413
4 to 6	64,022	3,824	308,934
2 to 4	206,873	46,035	2,044
0 to 2	79,661	205,239	141,752
<b>Totals</b>	<b>378.3 GWh</b>	<b>264.1 GWh</b>	<b>536.9 GWh</b>
<b>Costs</b>	<b>£1.36 m</b>	<b>£0.45 m</b>	<b>£2.37 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>1,179 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.17 £m</b>

\*This table is also provided in excel format on the website.

### Calculation of Bid and Offer acceptance costs

Response offer cost = Volume Offers x (Offer Price – ERP)

Response Bid Cost = Volume Bid x (Bid Price – ERP)

ERP (Energy Reference Price) is the volume weighted average of the submitted bids or offers used to resolve net imbalance volume (NIV) ignoring plant dynamics. It does not include non-BM standing reserve prices, trades, PGBTS or SO-SO trades. The Energy reference Price is calculated for each settlement period .

For a short market, the price is calculated using all submitted offers up to the value of NIV, capped by MEL, unconstrained by dynamic parameters. For a short market, the price is calculated using all submitted bids on synchronised plant down to zero, including demand side bidders and unsynchronised units (e.g. DINO/FFES pumps), unconstrained by dynamic parameters