

# Firm Frequency Response (FFR)

## Market Information for Tenders for OCTOBER 2009

National Grid wishes to highlight to participants its requirement for Firm Frequency Response. Participants are invited to note the inclusion of Figures 7 and 8 for this purpose, as well as the enhancement to the Price breakdown table on page 7.

### Total Frequency Response Requirements

Our indicative daily Total Requirement for Frequency Response for the above month is shown by Settlement Period for weekdays, in Figure 1 and for Saturdays, Sundays and Bank Holidays, in Figure 2. The graphs show the requirement to a maximum frequency deviation of 0.5Hz for Primary for a 1000MW loss and 0.5Hz for Secondary for a 1320MW loss and 0.5Hz for High Response for an 840MW demand loss.

*Indicative Total Response Requirement - Weekday*

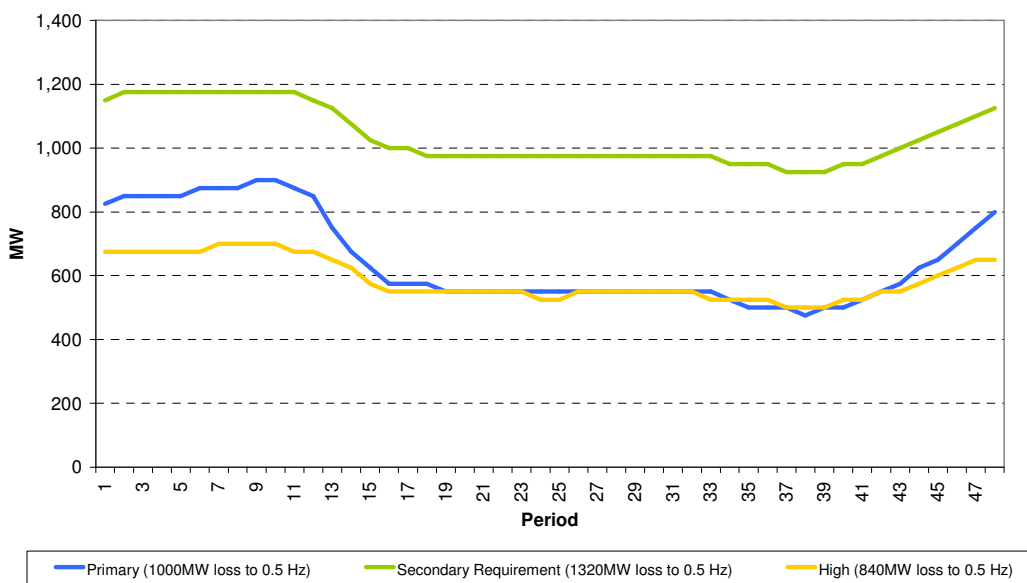


Figure 1

*Indicative Total Response Requirement - Weekend*

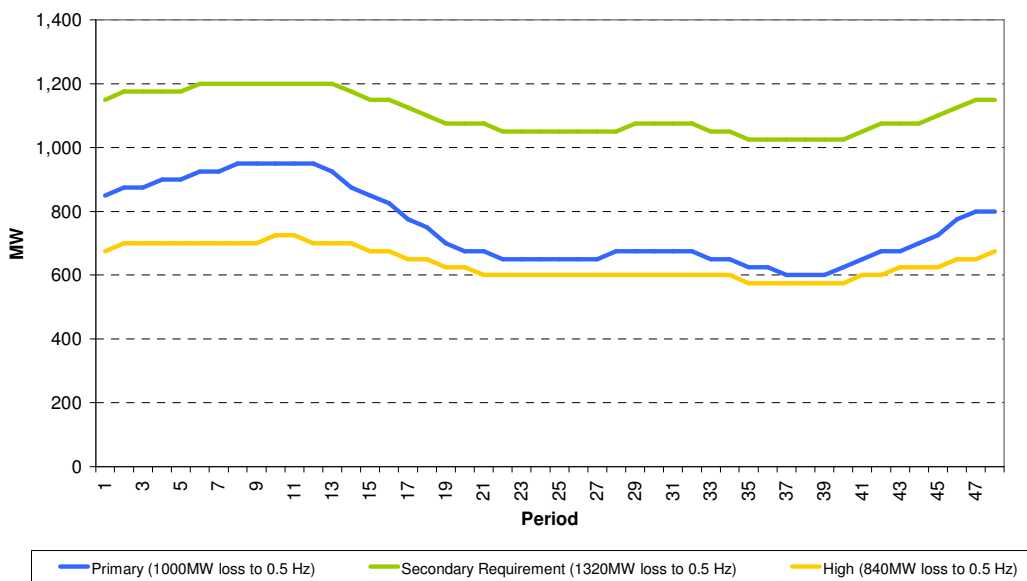


Figure 2

**Minimum Dynamic Response Requirement**

The indicative minimum required levels for Dynamic response are shown for Weekdays, Figure 3, and Saturdays, Sundays and Bank Holidays, Figure 4. The levels are shown for delivery at 0.5 Hz deviation, although 0.2 Hz is the largest frequency deviation within normal operational range. The total amount of response delivered by Dynamic providers contributes to meeting the Total Response Requirement, Figures 1 and 2, above.

*Indicative Minimum Dynamic Response Requirement - Weekday*

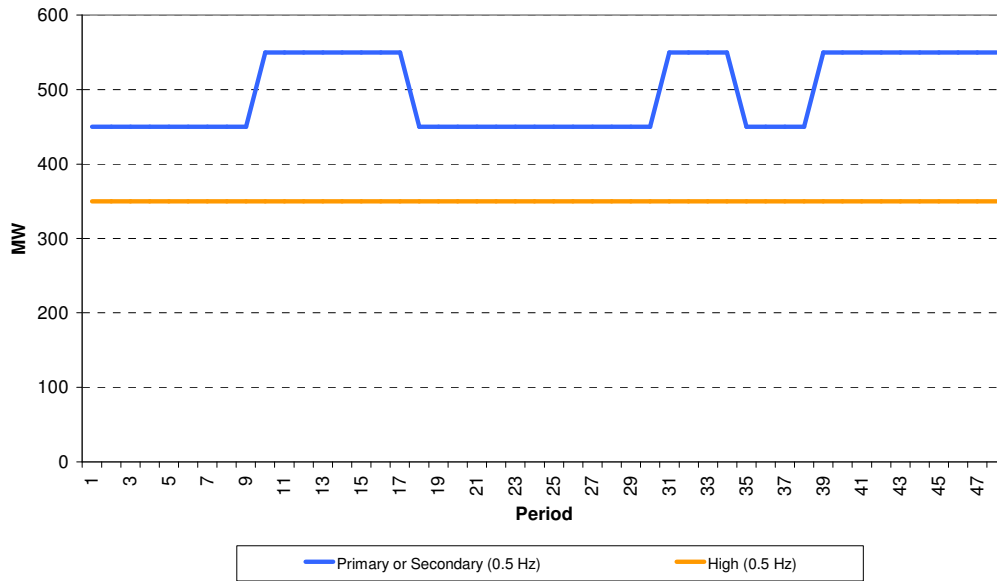


Figure 3

*Indicative Minimum Dynamic Response Requirement - Weekend*

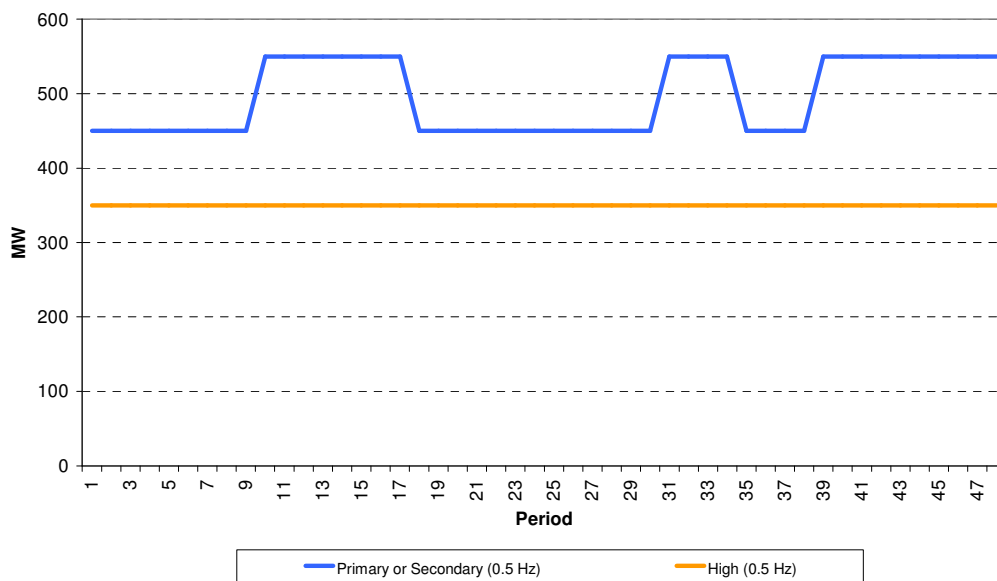


Figure 4

**Maximum Non-Dynamic Response Level**

The expected maximum level of Non-Dynamic Response is shown below for Weekdays, Figure 5, and for Saturdays, Sundays and Bank Holidays, Figure 6. The maximum level of Non-Dynamic Response achievable is the Total Response Requirement (at 0.5Hz) less the Minimum Dynamic Response Requirement delivery (at 0.5Hz as appropriate).

*Indicative Maximum Non-Dynamic Response Level - Weekday*

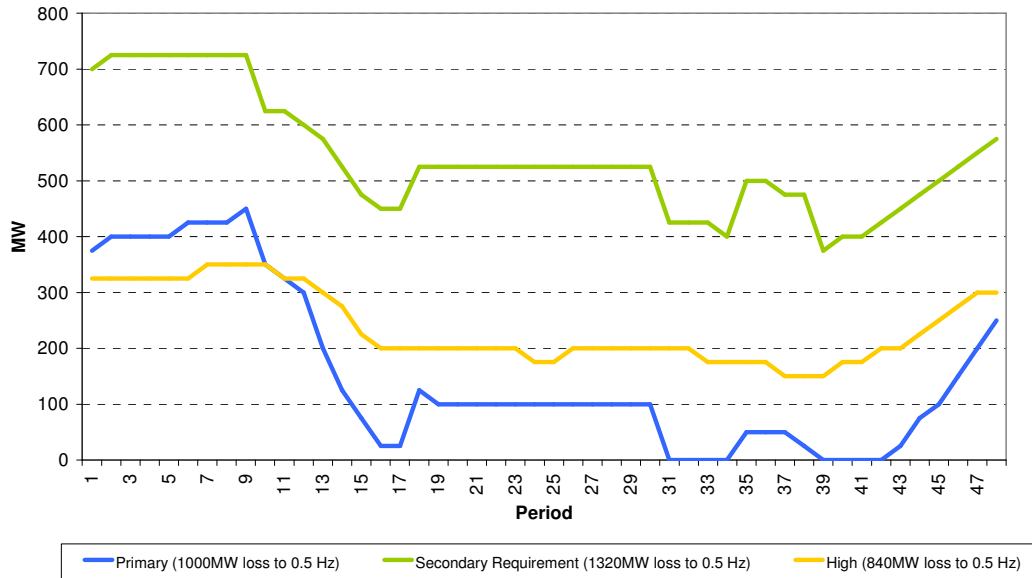


Figure 5

*Indicative Maximum Non-Dynamic Response Level - Weekend*

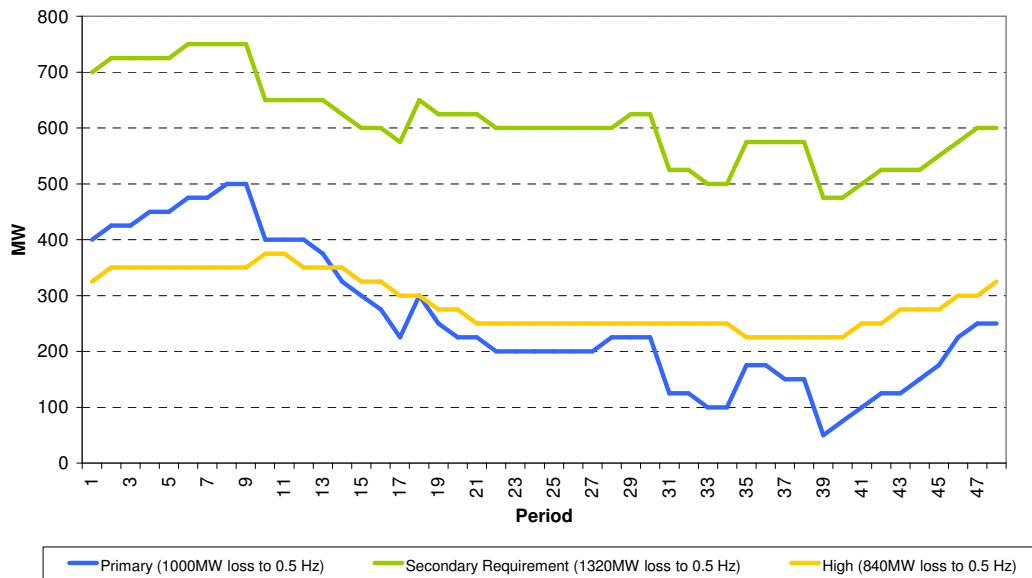


Figure 6

**Balancing Mechanism instructions on Frequency Responsive plant**

Figure 7, below, shows a post-event analysis of the volume of Bid Offer Acceptances instructed on Balancing Mechanism Units that were, in conjunction with the delivery of the BOA energy, also providing Frequency Response. This analysis covers **July 2009 and August 2009** on a daily basis. This data gives an indication of periods during which National Grid takes balancing actions which also contribute to the optimisation of the response holding across the system. However, readers should be aware that this is only indicative and actions may have been required for other reasons apart from (or as well as) Frequency Response optimisation (such as resolving energy imbalance or transmission system constraints).

**Response BOA Summary for August 2009**

Total Response Bid Cost	= £1,515,249
Total Response Bid Volume	= -137,390 MWh
Total Response Offer Cost	= £ 5,310,463
Total Response Offer Volume	= 199,246 MWh

*Where*

Response Offer Cost = Volume\_Offers x (Offer\_Price – Energy Reference Price)

Response Bid Cost = Volume\_Bid x (Bid\_Price – Energy Reference Price)

Note: To produce the above numbers for publication by business day 18 the last few days of the month have been calculated using estimates.

**Energy Reference Price**

The Energy Reference Price is the volume weighted average of the submitted bids or offers available to resolve NIV ignoring plant dynamics. This also does not include non-BM standing reserve prices, trades, PGBTS or SO-SO trades. The Energy reference Price is calculated for each settlement period individually as follows:

Short Market: All submitted Offers up to the value of NIV, Capped by MEL, unconstrained by dynamic parameters

Long Market: All submitted Bids on synchronised plant down to zero, includes Demand Side Bidders and unsynchronised units (e.g. DINO/FFES pumps), unconstrained by dynamic parameters

*Average volume of BOAs on Frequency Responsive BM Units*

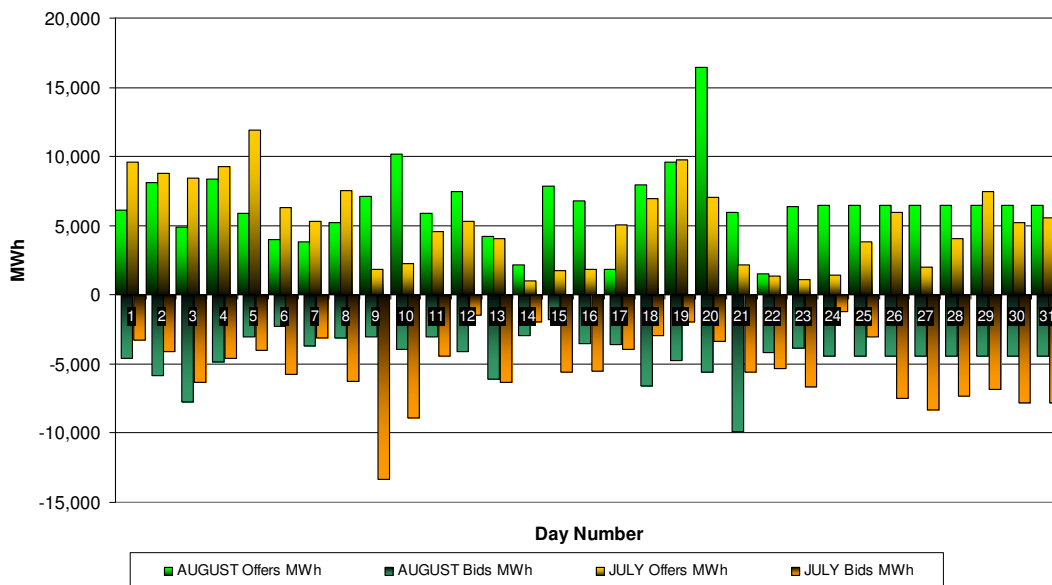


Figure 7

Figure 8 represents this data on a settlement period basis.

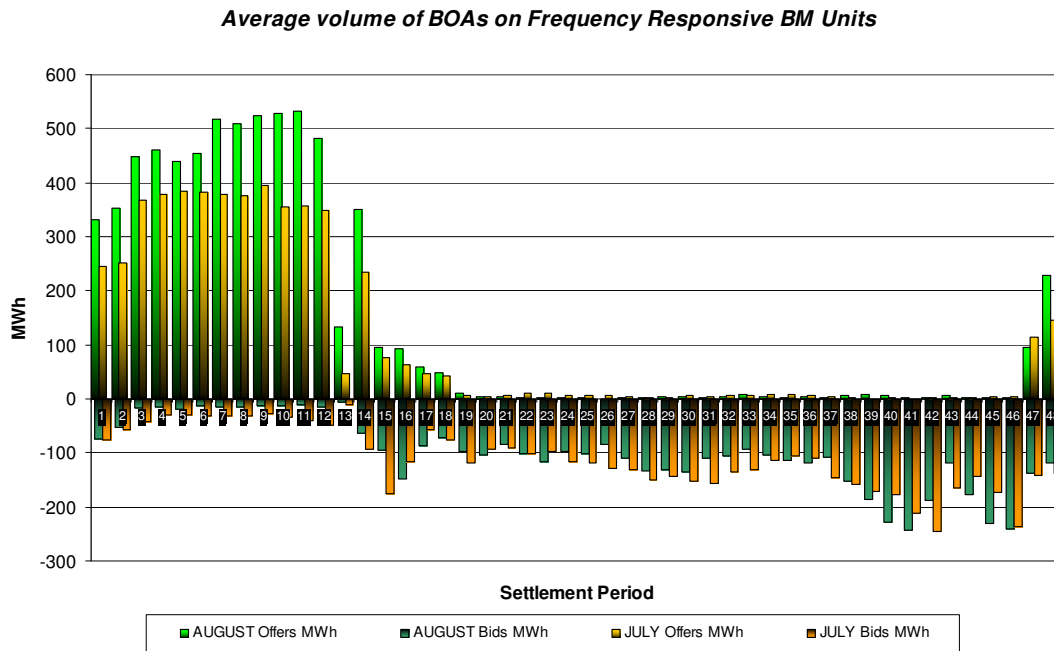


Figure 8

Note: To produce the above charts for publication by business day 18 the last few days of the month have been calculated using estimates.

**Indication of Firm Contract Position**

Figure 9a below shows the aggregated firm position that National Grid has already procured, and expects to be available, for weekdays for the month ahead through a combination of static and dynamic providers. Figure 9b shows the same for the year ahead.

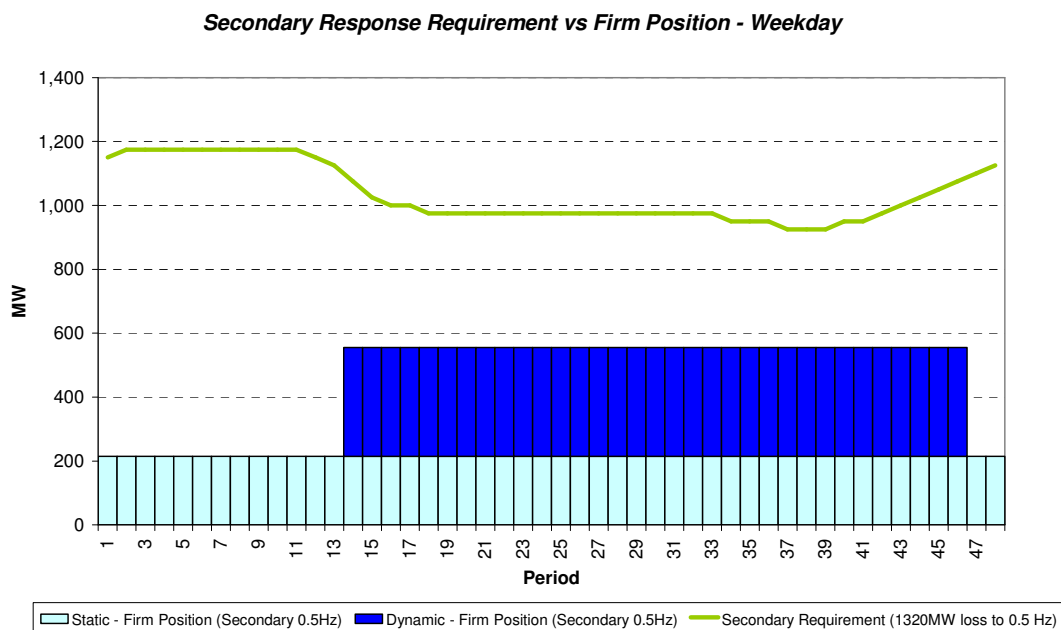


Figure 9a

\* Two FFR contracts shown in graphs 9a, 9b, 10a & 10b were agreed on bilateral terms. In line with the Procurement Guidelines if we consider that there is insufficient competition in the provision of a Balancing Service we shall contract for such provision on a negotiated bilateral basis. Full details are available on the National Grid website.

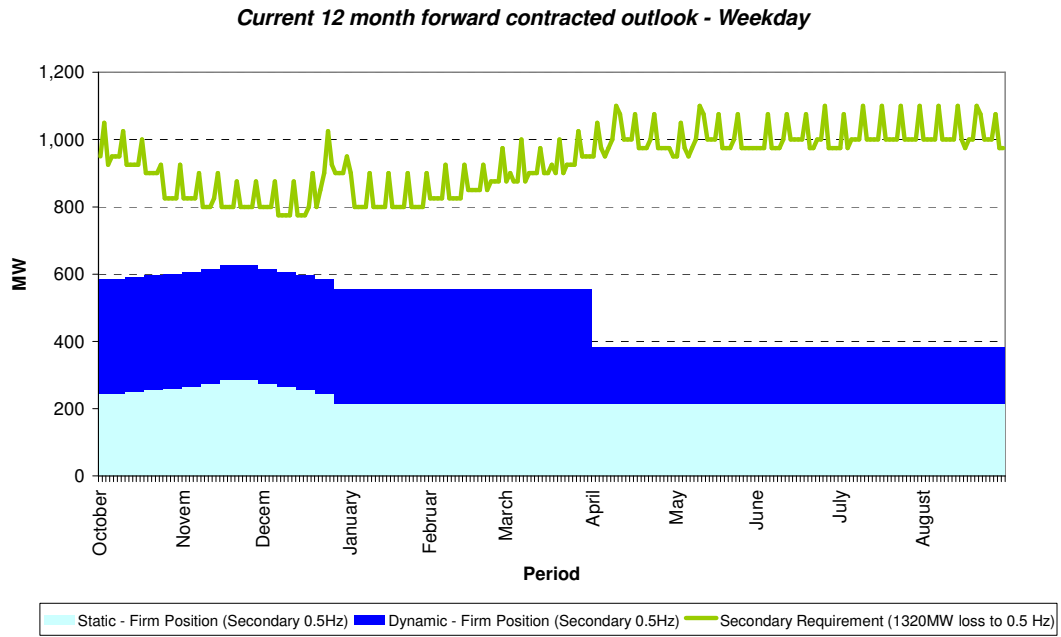


Figure 9b

Figure 10a below shows the aggregated firm position that National Grid has already procured, and expects to be available, for weekends for the month ahead through a combination of static and dynamic providers. Figure 10b shows the same for the year ahead.

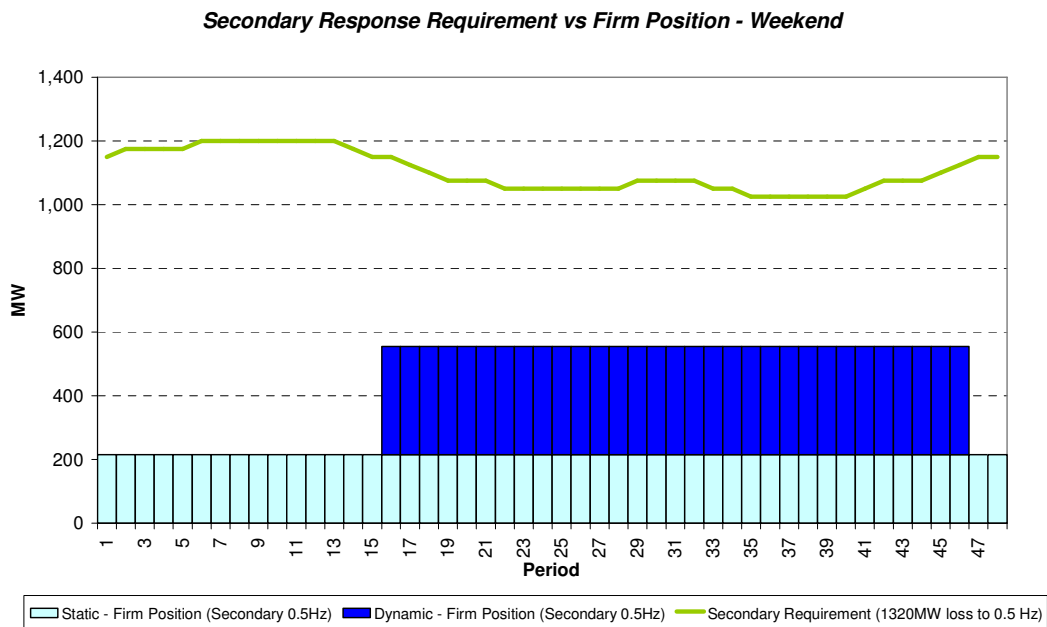


Figure 10a

Current 12 month forward contracted outlook - Weekend

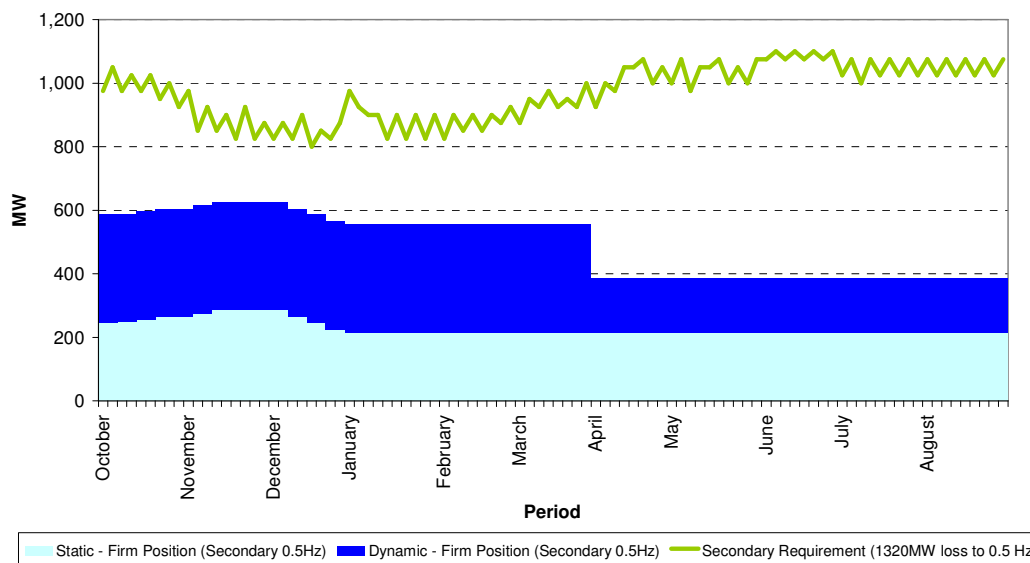


Figure 10b

The total volumes for Frequency Response holding on Mandatory service providers are **863 GWh** for **July 2009** and **813 GWh** for **August 2009**, and break down into price bands as follows:

jul 2009	Primary	Secondary	High
Price band (£/MW/h range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	709	234	80,614
6 to 8	5,333	0	289,647
4 to 6	30,391	10,221	84,316
2 to 4	173,178	90,869	5,564
0 to 2	26,450	64,664	1,010
<b>Totals</b>	<b>236.1 GWh</b>	<b>166.0 GWh</b>	<b>461.2 GWh</b>
<b>Costs</b>	<b>£0.74 m</b>	<b>£0.38 m</b>	<b>£3.27 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>0,863 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.40 £m</b>

aug 2009	Primary	Secondary	High
Price band (£/MW/h range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	1,371	449	57,624
6 to 8	6,751	0	239,370
4 to 6	38,761	10,238	77,319
2 to 4	223,055	90,891	77
0 to 2	15,295	50,752	608
<b>Totals</b>	<b>285.2 GWh</b>	<b>152.3 GWh</b>	<b>375.0 GWh</b>
<b>Costs</b>	<b>£1.45 m</b>	<b>£0.37 m</b>	<b>£2.40 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>0,813 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.22 £m</b>

Note: To produce the above numbers for publication by business day 18 the last few days of the month have been calculated using estimates.

Please note that the MW/h units of payment are defined in the CUSC and do not relate to the units of 0.5Hz Primary, Secondary and High Response as quoted for the requirements, above.

For **October 2009**, Frequency Response Requirements are anticipated to be in line with the forecast Figures 1 – 6, above. National Grid will procure in line with the principles laid out in the Assessment Principles. Tenders from eligible Service Providers for Firm Frequency Response should be submitted by **1<sup>st</sup> September 2009** (1<sup>st</sup> business day – for Multi-month tenders) or **3<sup>rd</sup> September 2009** (3<sup>rd</sup> business day – for Single-month tenders). National Grid will notify Service Providers of the outcome of the tender assessment by **14<sup>th</sup> September 2009** (10<sup>th</sup> business day). For successful tenders, National Grid will notify nominated windows, following assessment, by the **21<sup>st</sup> September 2009** (15<sup>th</sup> business day).

Tenders should be sent for the attention of:

Bea Ennim  
Network Operations  
National Grid plc  
National Grid House  
Warwick Technology Park  
Gallows Hill  
Warwick  
CV34 6DA

Tenders can be sent by email to [Bea.Ennim@uk.ngrid.com](mailto:Bea.Ennim@uk.ngrid.com)