

# Firm Frequency Response

## Market Information for Tenders for APRIL 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 6.

## Total Frequency Response Requirements

Our indicative daily Total Requirement for Frequency Response for the above month is shown on a Settlement Period basis for weekdays, in Figure 1 and for Saturdays, Sundays and Bank Holidays, in Figure 2. The graphs show the requirement at maximum frequency deviation: 0.8Hz for Primary and 0.5Hz for Secondary and High Response.

*Indicative Total Response Requirement - Weekday*

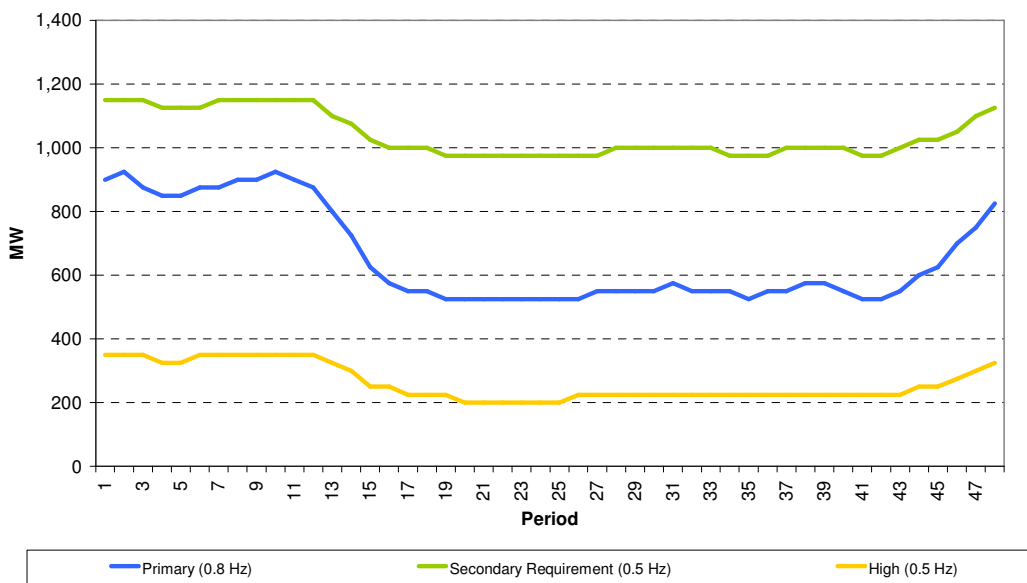


Figure 1

*Indicative Total Response Requirement - Weekend*

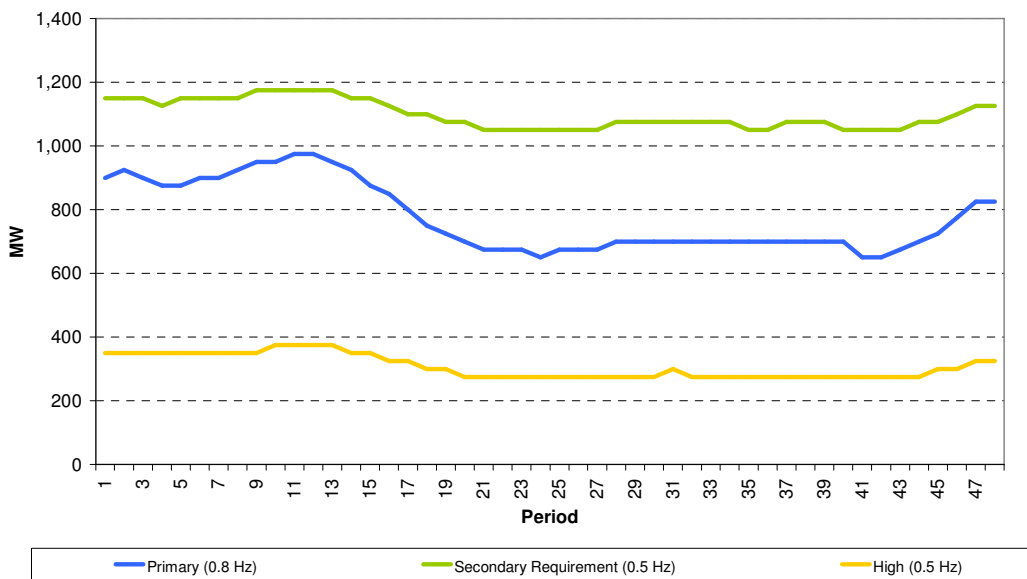


Figure 2

**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*

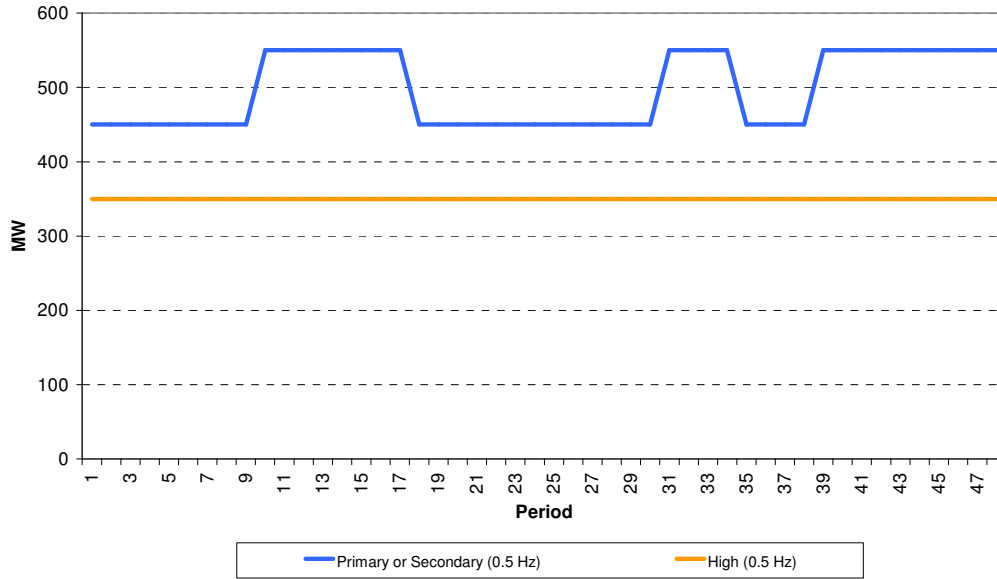


Figure 3

*Indicative Minimum Dynamic Response Requirement - Weekend*

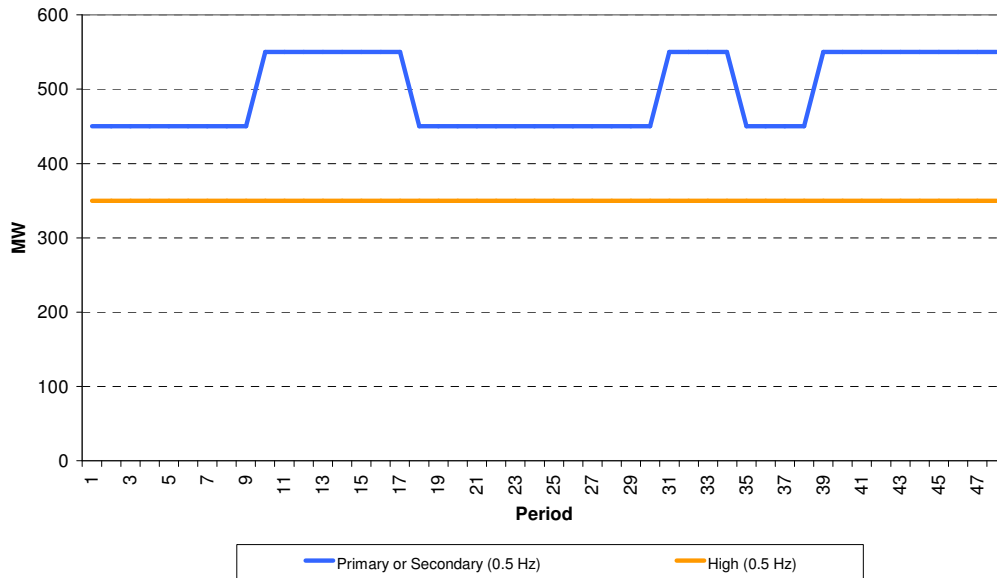


Figure 4

### 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.

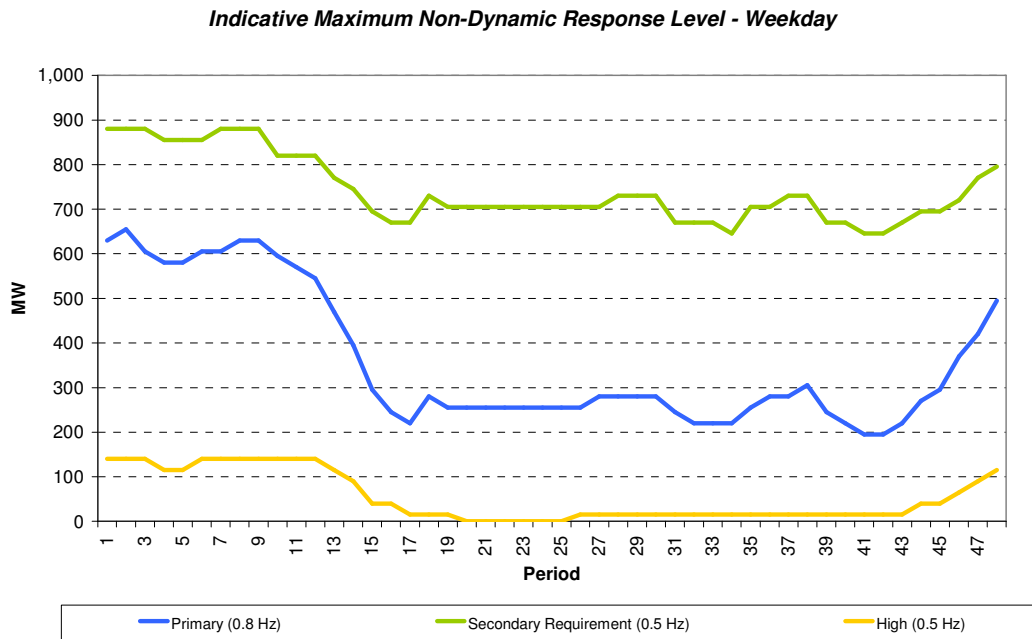


Figure 5

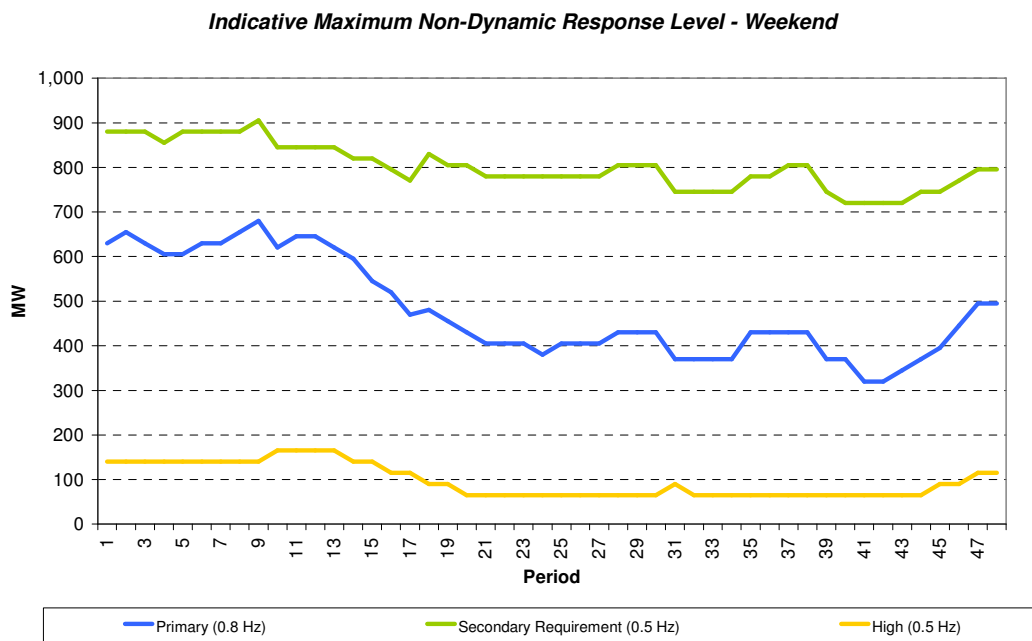


Figure 6

The maximum level of Non-Dynamic Response achievable is the Total Response Requirement (at 0.5 and 0.8Hz) less the Minimum Dynamic Response Requirement delivery (at 0.5 and 0.8Hz as appropriate).

**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 **January 2009 and February 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 February 2009**

Total Response Bid Cost	= £ 1,388,971
Total Response Bid Volume	= -179,356 MWh
Total Response Offer Cost	= £ 160,447
Total Response Offer Volume	= 10,934 MWh

Where

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

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

**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

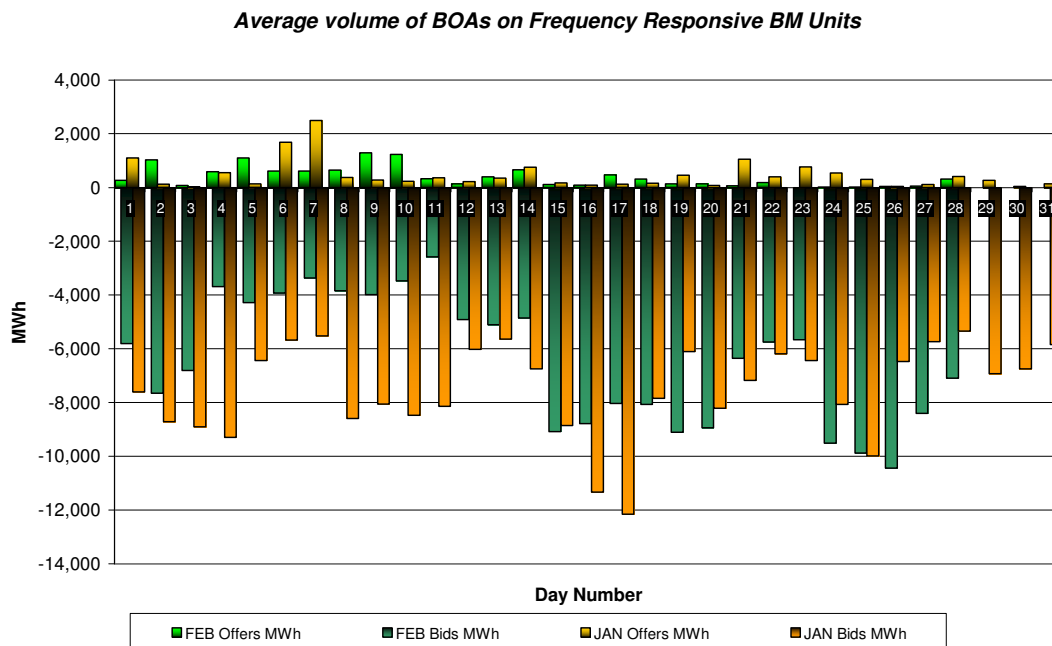


Figure 7

Figure 8 represents this data on a settlement period basis.

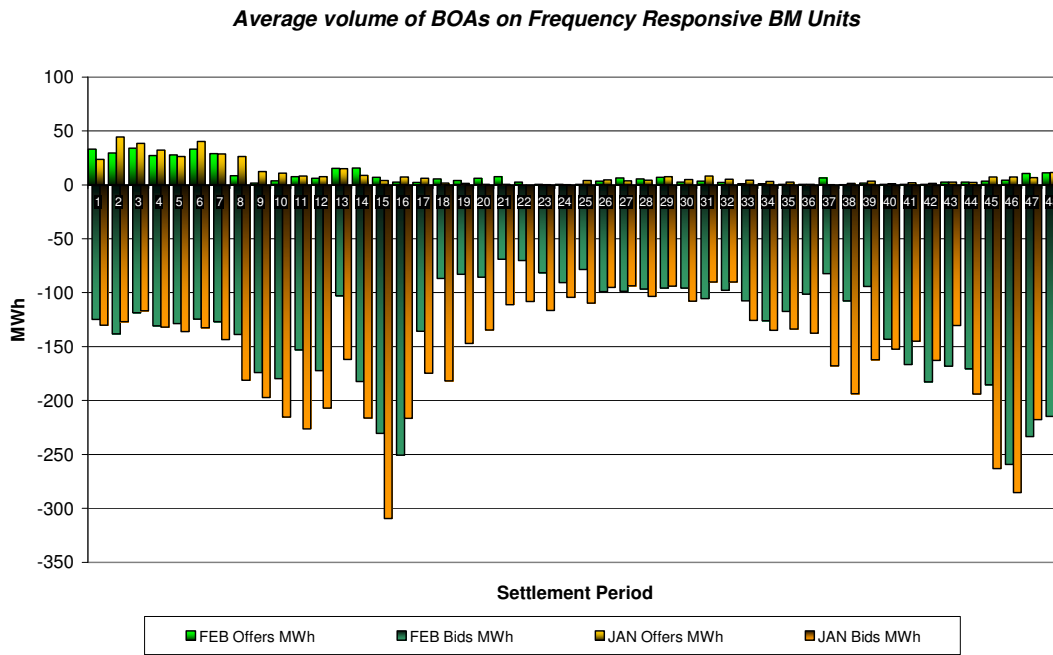


Figure 8

**Indication of Firm Contract Position**

Figure 9 below shows the aggregated firm position that National Grid has already procured for weekdays for the month ahead through a combination of static and dynamic providers.

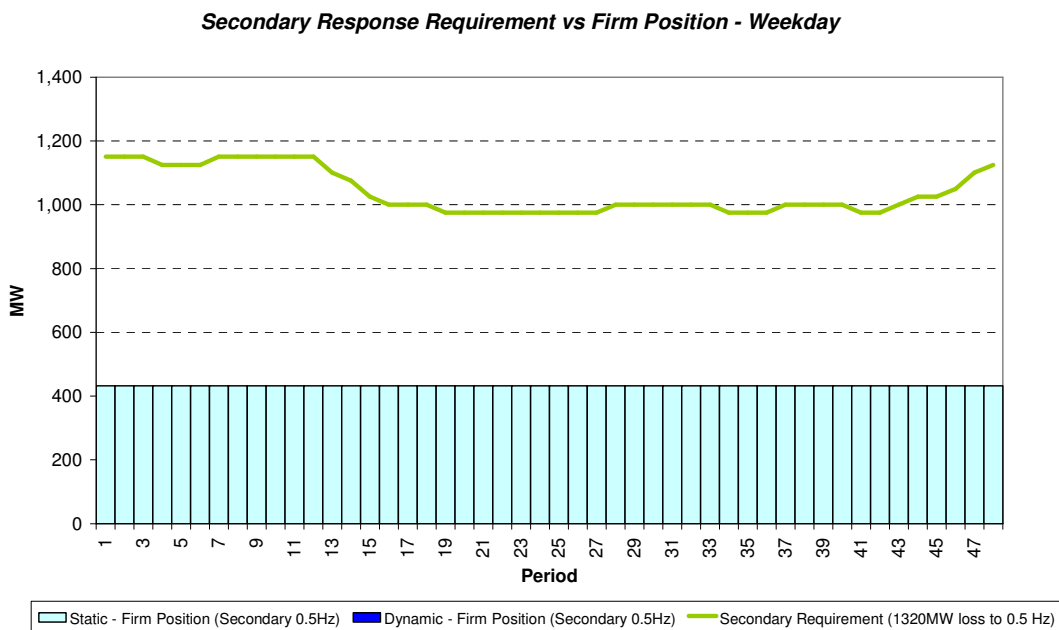


Figure 9

Figure 10 below shows the aggregated firm position that National Grid has already procured for weekend for the month ahead through a combination of static and dynamic providers.

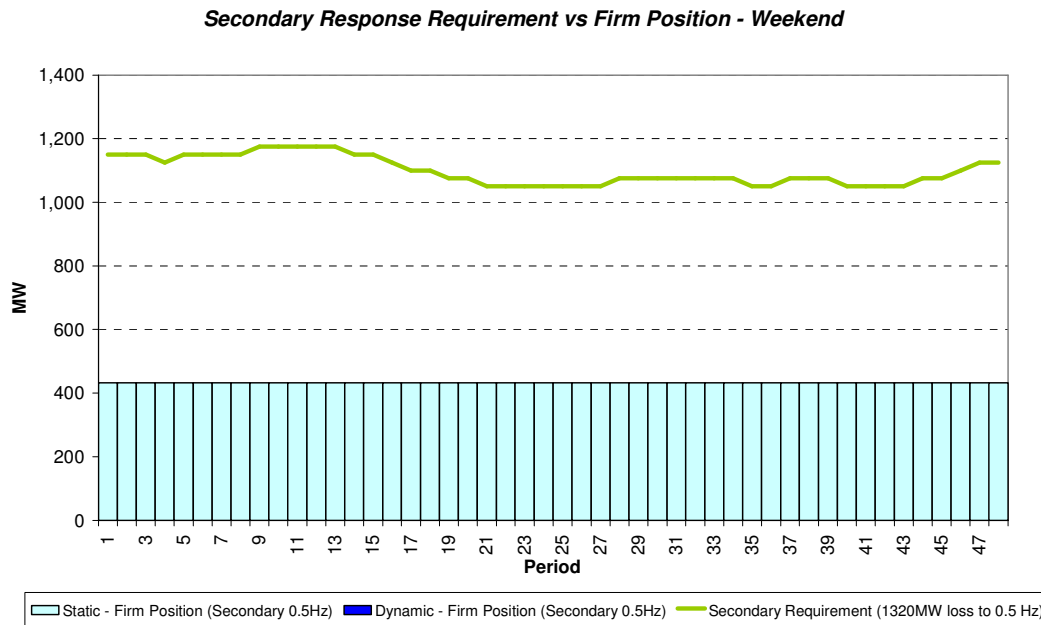


Figure 10

The total volumes for Frequency Response holding on Mandatory service providers are **923 GWh** for **January 2009** and **828 GWh** for **February 2009**, and break down into price bands as follows:

jan 2009	Primary	Secondary	High
Price band (£/MW/h range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	322	76	189,900
6 to 8	18,069	0	198,041
4 to 6	30,976	8,563	75,762
2 to 4	150,856	50,528	29,189
0 to 2	52,136	103,319	15,009
<b>Totals</b>	<b>252.4 GWh</b>	<b>162.5 GWh</b>	<b>507.9 GWh</b>
<b>Costs</b>	<b>£0.80 m</b>	<b>£0.31 m</b>	<b>£3.72 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>0,923 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.83 £m</b>

feb 2009	Primary	Secondary	High
Price band (£/MW/h range)	Volume (MWh)	Volume (MWh)	Volume (MWh)
Greater than 8	1,367	25	127,356
6 to 8	6,527	0	228,009
4 to 6	24,731	4,652	90,342
2 to 4	127,181	56,655	25,487
0 to 2	54,369	77,234	3,566
<b>Totals</b>	<b>214.2 GWh</b>	<b>138.6 GWh</b>	<b>474.7606 GWh</b>
<b>Costs</b>	<b>£0.65 m</b>	<b>£0.28 m</b>	<b>£3.48 m</b>
<b>Total Frequency Response Holding Volume</b>			<b>0,828 GWh</b>
<b>Total Frequency Response Holding Cost</b>			<b>4.40 £m</b>

Please note that the MW/h units of payment are defined in the CUSC and do not relate to the units of 0.8Hz Primary and 0.5 Hz Secondary and High Response as quoted for the requirements, above.

For **April 2009**, Frequency Response Requirements are anticipated to be in line with the forecast Figures 1 – 6, above. The availability of response services on optional contracts and on part loaded units means that it is unlikely that National Grid will seek to procure the entirety of its forecast requirement through this tender round. However, National Grid will procure in line with the principles laid out in the Assessment Principles.

For the month of **April 2009**, tenders from eligible Service Providers for Firm Frequency Response should be submitted by **6<sup>th</sup> March 2009** (5<sup>th</sup> business day). National Grid will notify Service Providers of the outcome of the tender assessment by **17<sup>th</sup> March 2009** (12<sup>th</sup> business day). For successful tenders, National Grid will notify nominated windows, following assessment, by the **19<sup>th</sup> March 2009** (14<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)