

# **Monthly Balancing Services Summary**

**2009/2010**

**May 2009**

**nationalgrid**

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# Monthly Balancing Services Summary

## 1. Introduction

National Grid procures Balancing Services to operate the transmission system in an efficient, economic and co-ordinated manner. A number of statements and market reports pertaining to the procurement and use of Balancing Services are already published on the industry information web site. National Grid has undertaken to publish on a monthly basis to increase the timeliness and visibility of the Balancing Service actions taken during the given month. This Monthly Summary provides information on the procurement of Balancing Services in twelve separate monthly publications.

### 1.1 Purpose of Monthly Balancing Services Summary Report

The purpose of the Monthly Balancing Services Summary Report is to provide information in respect of Balancing Services that National Grid has procured during the relevant month for the purpose of operating the electricity transmission system. This publication contains volume and cost information associated with these balancing services and is based on the latest data and information available at the time of publication. The data in this report is subject to revision post publication as reconciled information becomes available. This report, however, is intended only to give an indication of the balancing actions National Grid has undertaken and so the relevant months report will not be republished in light of any revisions.

### 1.2 Nature of information provided in this report

The information provided for the relevant month is based upon preliminary data. As future monthly summaries are produced, information in the graphs and tables will be updated to reflect the latest information available at that time. Changes to preliminary data that occur after the publication of the relevant month's report will thus be visible in the graphs and tables of future reports. Each monthly report will report volume data on a monthly rolling basis. The cost values contained in this document are predominantly reported to 2 decimal place (£m). Due to confidentiality agreements in place within Balancing Services contracts and the resolution of utilisation on a monthly basis, some information cannot be published in relation to the provision of some of these services. Where there are only a limited number of providers in a given month, cost information will not be separately identified on a monthly basis against the relevant service.

### 1.3 Balancing Services

The Balancing Services National Grid has procured, either via market arrangements or bilateral contracts, throughout the period covered by the Report, are:

- Frequency Response
- Reactive Power

- Fast Start
- Black Start
- Reserve Services - Fast Reserve, Short Term Operating Reserve, BM Start-up
- System to Generator Operational Intertripping Schemes
- Commercial Intertrip Service
- Ancillary Contracts to manage System Issues
- Maximum Generation Service
- All Other Services
- System to System Services
- Energy Related Products (including PGBT)

It is important to note that Balancing Services are procured from both Balancing Mechanism and Non Balancing Mechanism Parties.

For further information regarding the type of providers of Balancing Services please consult the Procurement guidelines on the National Grid website.

#### **1.4 Structure of Report**

This report presents the Balancing Services under three main titles –

Services Procured via Market Arrangements

- Services Procured via Non-Tendered Bilateral Contracts
- A summary section providing the high level information for all services for the relevant month.

#### **1.5 Services not included in the report**

This monthly total costs in this document intentionally do not include the acceptance of Bids or Offers in the Balancing Mechanism. However where the structure of ancillary services include a utilisation component exercised through the Balancing Mechanism those Bid and Offer volumes and costs have been included in the relevant graphs to better inform participants of the costs in those areas. Further information on Bid and Offer acceptances is contained within the Balancing Principles Statement which can be located on the National Grid Website in the Electricity section under Balancing Services & Transmission Licence Statements.

All Bid and Offer information is available by clicking the following link to the NETA web site in the BRMS, <http://www.bmreports.com/>

## 2. Services Procured Via Market Arrangements

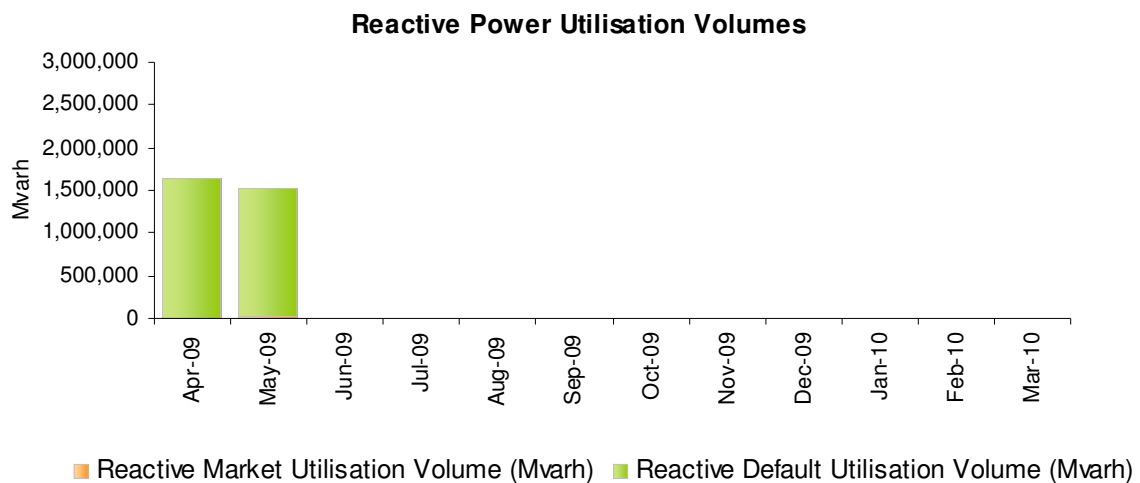
### 2.1 Reactive Power

National Grid manages voltage on the transmission system within statutory limits to ensure quality of supply. In doing this we ensure that reactive power resources are provided on a localised basis to meet the constantly varying needs of the system, and that there is sufficient reactive power reserve available to meet contingencies.

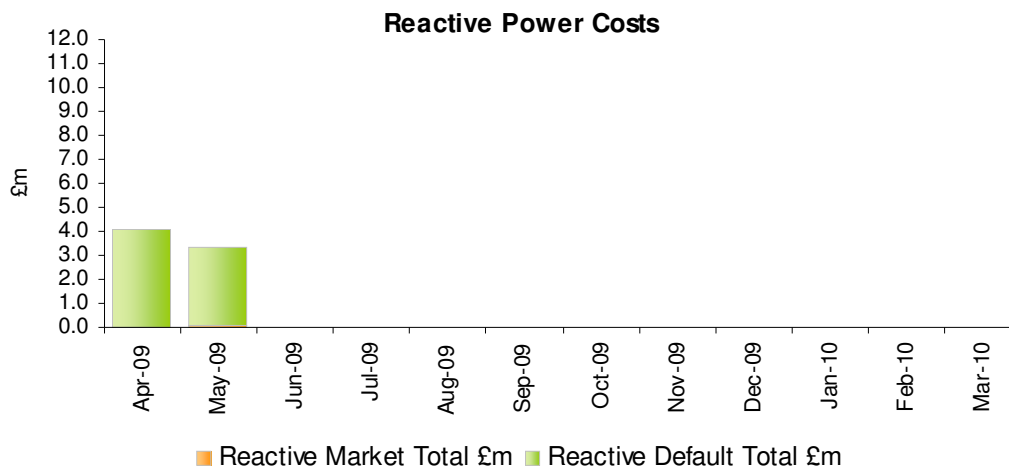
#### Market Arrangements for Reactive Power

All contracts awarded via tender round 21 (TR21) commenced on the 1<sup>st</sup> April 2009. Further information regarding the nature of these contracts can be found on the National Grid website.

Utilisation of Reactive Power under market and Default arrangements for the relevant month is detailed in the chart below.



Utilisation costs of Reactive Power under market and Default arrangements over the relevant period are detailed in the chart below.



Over this period, the total spend relating to the capability and utilisation costs of reactive power procured via market arrangements was **£0.05m**

Further information is contained on the National Grid Industry information web site.

**Default Arrangements for Reactive Power**

The total amount spent on Reactive Power under the default arrangements during this reporting month was **£3.26m**

For this month, the combined total spend on reactive power was **£3.31m**

For further information regarding the default payment arrangements please view the Introduction to Reactive document which can be found on the National Grid Website.

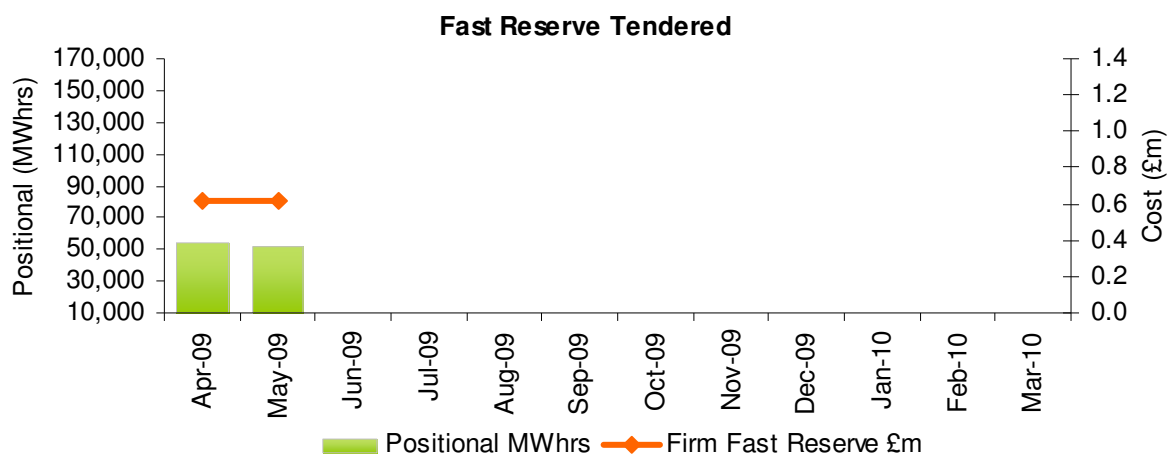
## 2.2 Fast Reserve (Tendered)

Further information explaining the service and assessment criteria of tenders for this Balancing Service can be found on the National Grid Website under Electricity/Balancing/tender reports/fast reserve.

The table detailed below lists the tender details for the relevant month.

	Eligible companies	Eligible units	Units tendered in previous months	Units tendered this month	Units accepted from previous months	Units accepted from this month	Total MW tendered	Total MW contracted	Max GWh tendered	Max GWh contracted	Positional MWhrs
Apr-09	6	18	2	0	2	0	180	180	84.24	84.24	54,585
May-09	6	18	2	0	2	0	180	180	86.76	86.76	51,795
Jun-09											
Jul-09											
Aug-09											
Sep-09											
Oct-09											
Nov-09											
Dec-09											
Jan-10											
Feb-10											
Mar-10											

The following graph shows the variation in Fast Reserve capacity contracting by month.



A total of **180MW** of capacity was contracted during the month. The total spend on availability and utilisation excluding bids and offers was **£0.61m**.

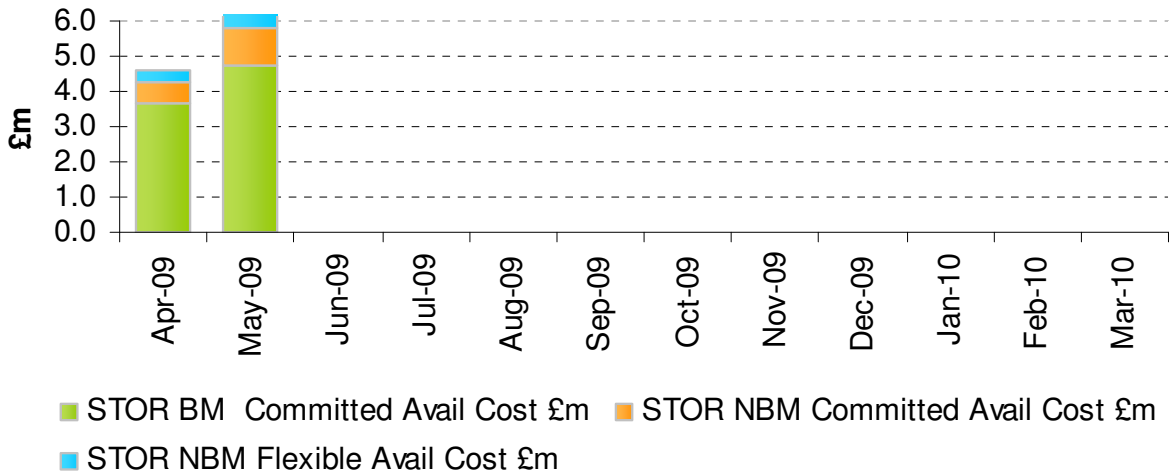
For more information on Fast Reserve please refer to the National Grid Website

Fast Reserve Contracts placed through non-tendered bilateral agreements are detailed in section 3.6 of this report.

### 2.3 Short Term Operating Reserve (STOR) including Balancing Mechanism (BM) and Non Balancing Mechanism (NBM)

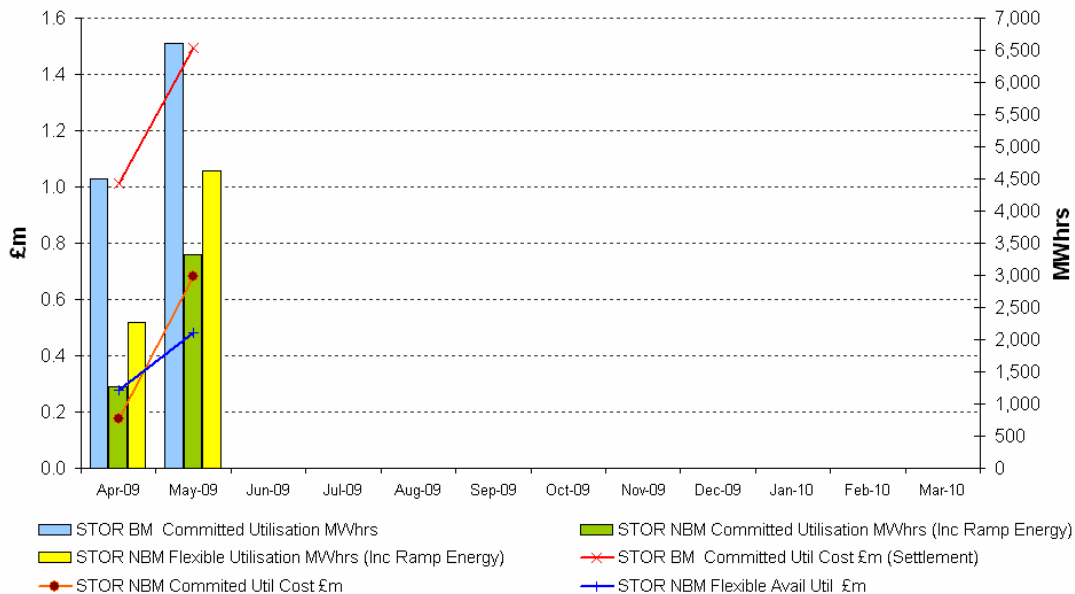
#### STOR

**STOR BM & NBM Utilisaton MWh and Cost**



The average availability payment for STOR during this period was **£7.42/MW/h** for both non-working days and working days.

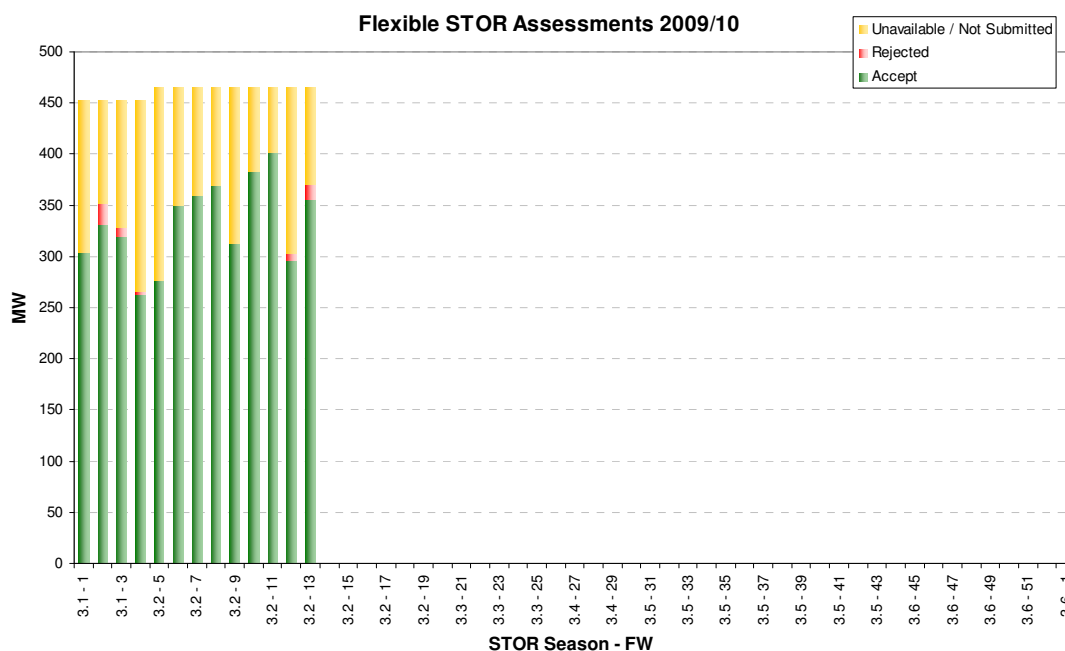
**STOR BM & NBM Utilisation MWhr and Cost**



Previous MBSS reports show STOR BM Utilisation Costs have been reported by the use of a reference price per settlement period<sup>1</sup>. This final report has

<sup>1</sup> Please see NGET System operator Incentives Initial Proposals – Appendix from <http://www.nationalgrid.com/uk/Electricity/soincentives/docs/> for further clarification

therefore been updated to reflect the actual Spend on STOR in the BM i.e. MWh utilised \* Utilisation Price for that BM STOR unit. All other costs are correct at time of publication.



The total expenditure on availability payments, plus utilisation payments to Balancing Mechanism providers and non Balancing Mechanism providers, in the month was **£7.33m**.

For further information on the nature of this service please refer to the STOR information on the National Grid Website.

### **Short Term Operating Reserve (STOR)**

National Grid procures Short Term Operating Reserve (STOR) through a competitive tender process which is conducted three times per year. For further information regarding this service, and the timetable for future tenders, please consult the 'tender and reports' section of National Grid's Balancing Services information website.

Tender round Season 3.2

The volume which was assessed as economic and which proceeded to contract was:

- **2712MW**

## 2.4 Tendered Frequency Response.

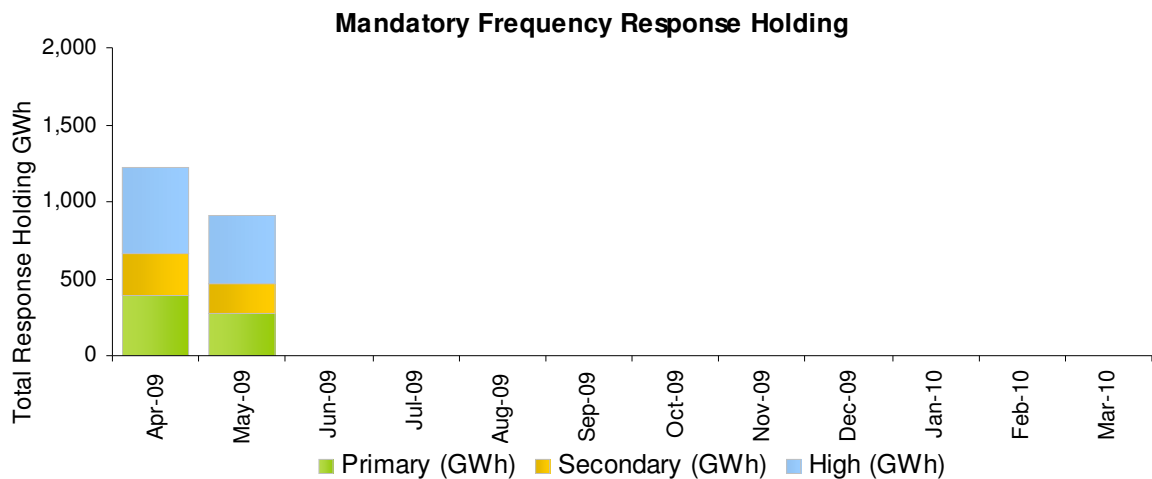
Please see Section 3.2

## 3 Services Procured Via Non-Tendered Bilateral Contracts

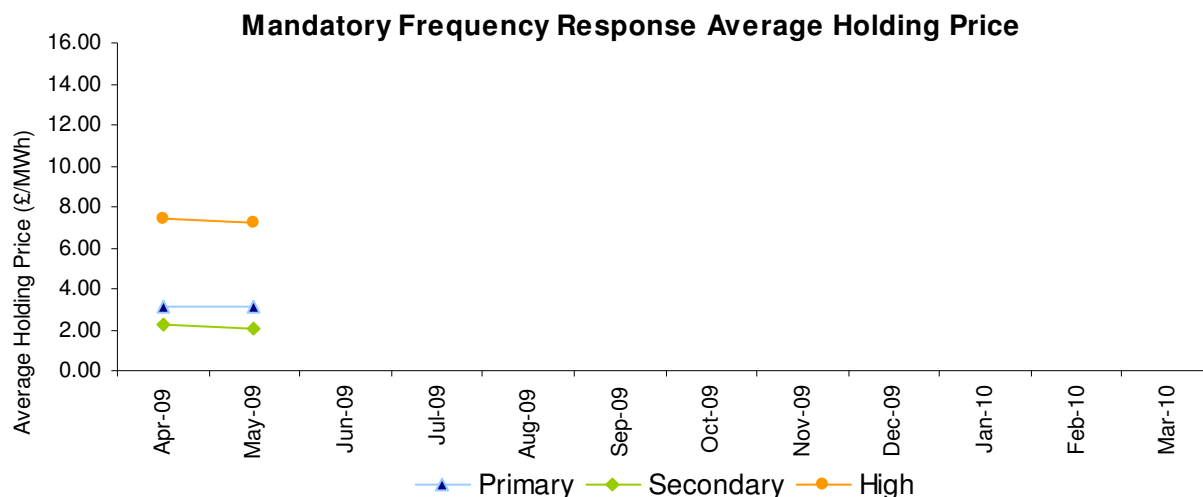
### 3.1 Mandatory Frequency Response

Mandatory Frequency Response is a mandatory service provided by large generators (>100MW) to automatically change their active power output in response to a change in system frequency. The Grid Code Connection Condition 6.3.7 and 8.1 describe the technical requirements for this service.

Payments for Mandatory Frequency Response comprise a Holding Payment (£/MW/h) and a Response Energy Payment (£/MW/h). Details on frequency response holding are given below. More information on this can be found on the National Grid Website.



The chart below shows the Average Holding cost of Mandatory Frequency Response.



The spend on Mandatory Frequency Response holding for the reporting month was **£4.46m**.

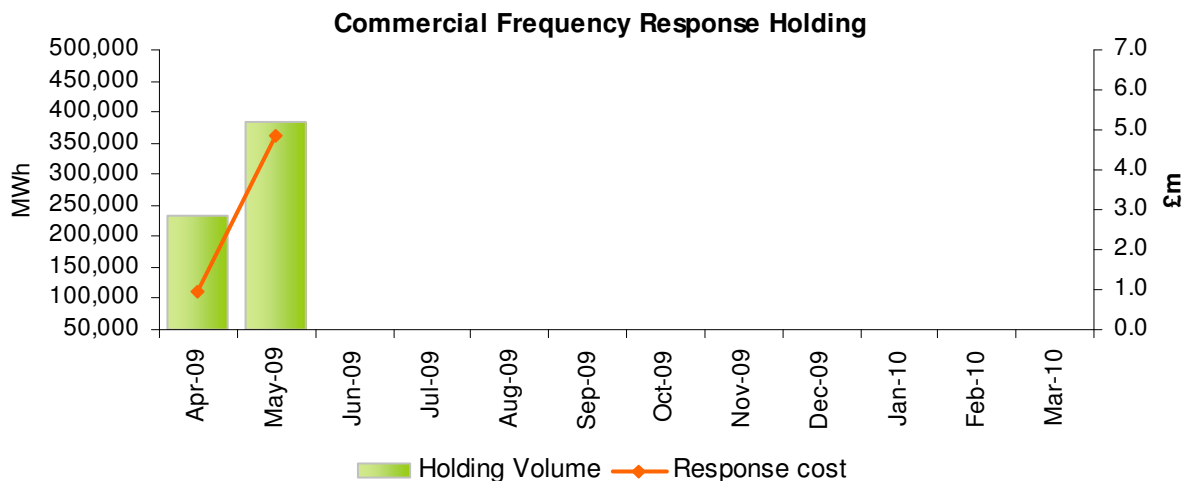
The spend on Response Energy Payments was **£0.16m<sup>2</sup>**. The methodology for calculating these payments is given in the Connection & Use of System Code (CUSC) section [4.1.3.9 & 4.1.3.9A](#). The CUSC can be found on the National Grid website.

The total spend on Mandatory Frequency Response during the reporting month was **£4.61m**.

### 3.2 Commercial Frequency Response

Commercial Frequency Response is a collection of services that can be provided by demand side participants and generation plant. The technical characteristics of these services are different to those required under mandatory service arrangements, and range from enhanced mandatory dynamic services through to non-dynamic services effected via LF relays. Part of the contract portfolio includes services provided by demand side participants through Frequency Control Demand Management (FCDM) and through the firm frequency response (FFR) tender rounds.

<sup>2</sup> The Response Energy Payment can be both a positive or negative payment, dependant upon the relative volumes of high and low frequency response dispatched during the course of the relevant month.

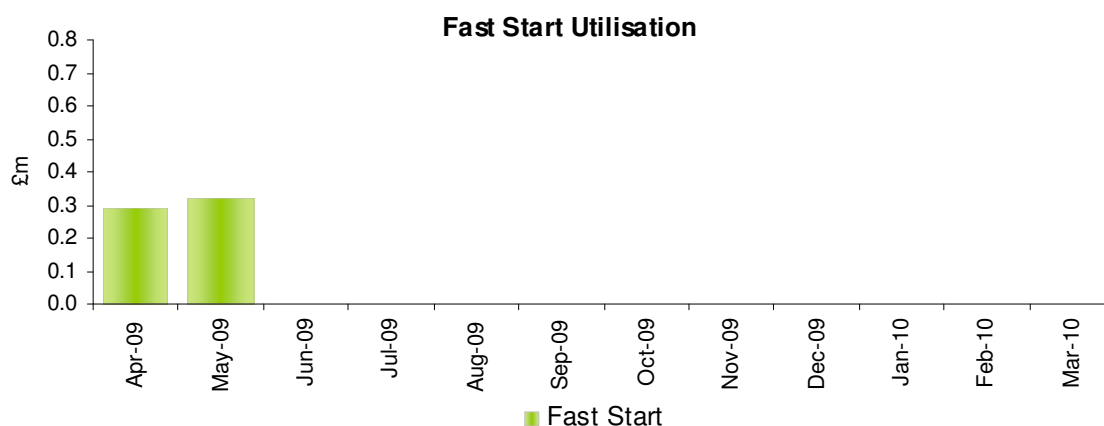


The total amount spent on Commercial Frequency Response holding during the reporting month was **£4.83m**.

Further information on Commercial Frequency is found in the appropriate place on the National Grid Website, or specifically on firm frequency response through the tenders and reports section of National Grid’s Balancing Services website.

### 3.3 Fast Start

Fast Start is the ability of Open Cycle Gas Turbine (OCGT) plant to start rapidly from a standstill condition and to deliver its rated power output automatically within a defined time period. Fast Start details below:

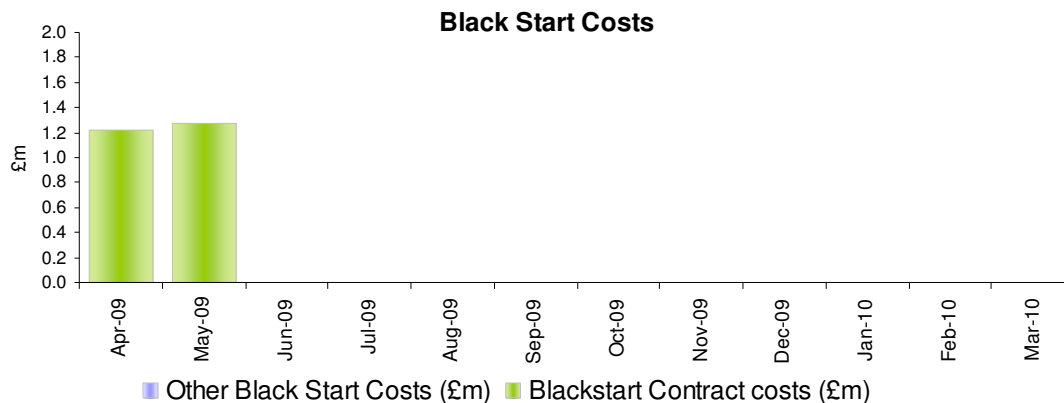


The total amount paid during the relevant reporting month for the availability and utilisation of the Fast Start service was **£0.32m**

Further information on Fast Start can be found on the National Grid Website.

### 3.4 Black Start

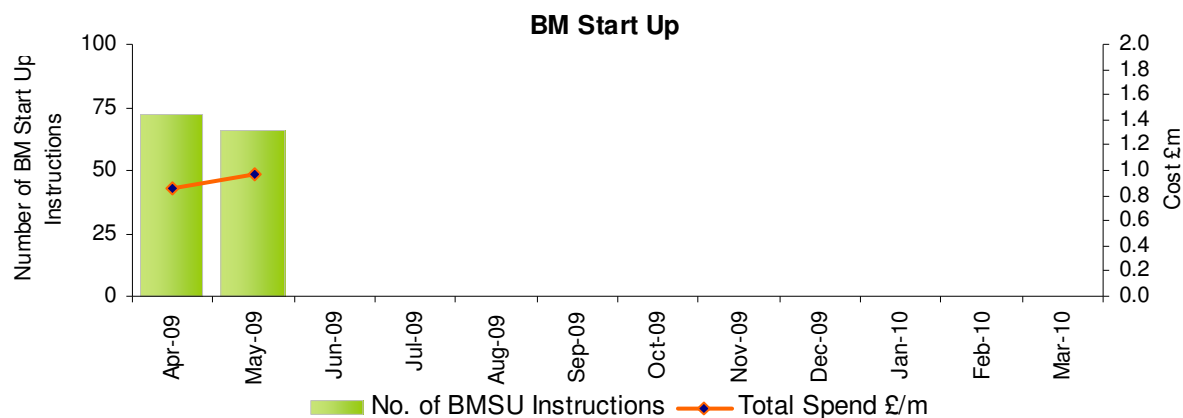
During the reporting month there were up to **22** stations with Black Start agreements in place. No new agreements were entered into during the period. The total amount paid during the relevant reporting month for the availability of the Black Start service was **£1.28m**.



Further information on Black Start can be found on the National Grid Website.

### 3.5 BM Start up

The chart below contains information relating to the procurement of BM Start Up Balancing Services.

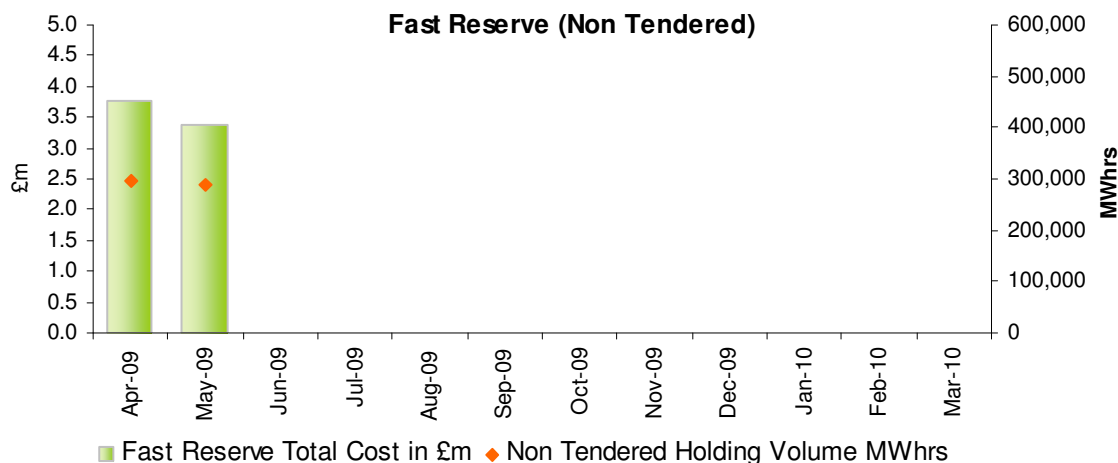


The total amount spent on BM Start Up during the reporting month was **£0.96m**. The total number of BM Start Up instructions was **66**.

Further details are available via the National Grid Website.

### 3.6 Fast Reserve (Procured on a Non-Tendered basis)

Non-Tendered Fast Reserve is a service that is contracted on a bilateral basis with service providers. The nature of the service is similar to the Firm Fast Reserve service although the payment and utilisation mechanisms differ for each service.

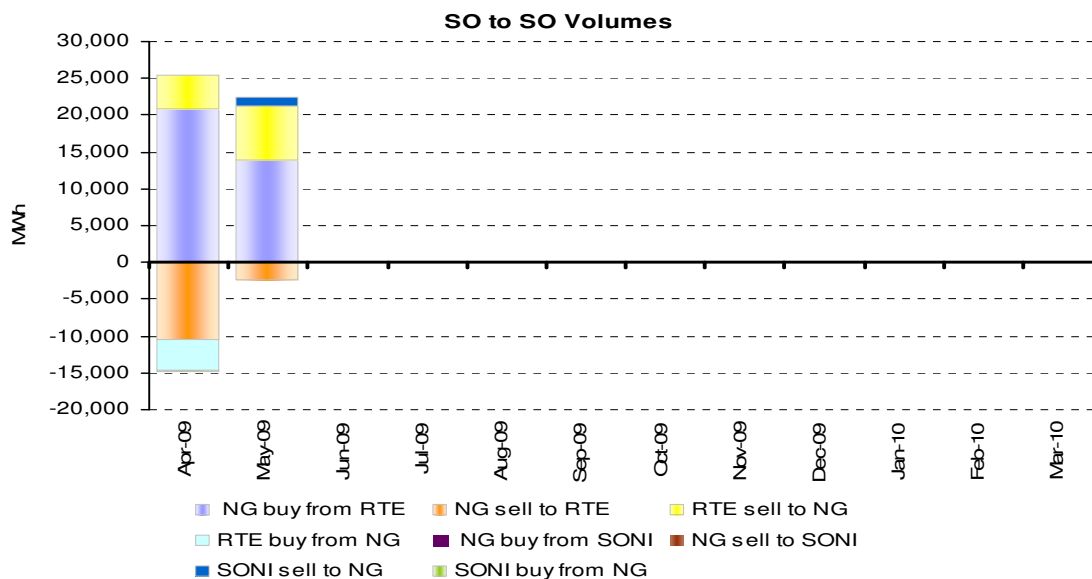


The availability payments during the relevant month totalled **£3.39m**. (Excluding Utilisation Via Offers and Bids Accepted in the Balancing Mechanism).

### 3.7 System to System Services

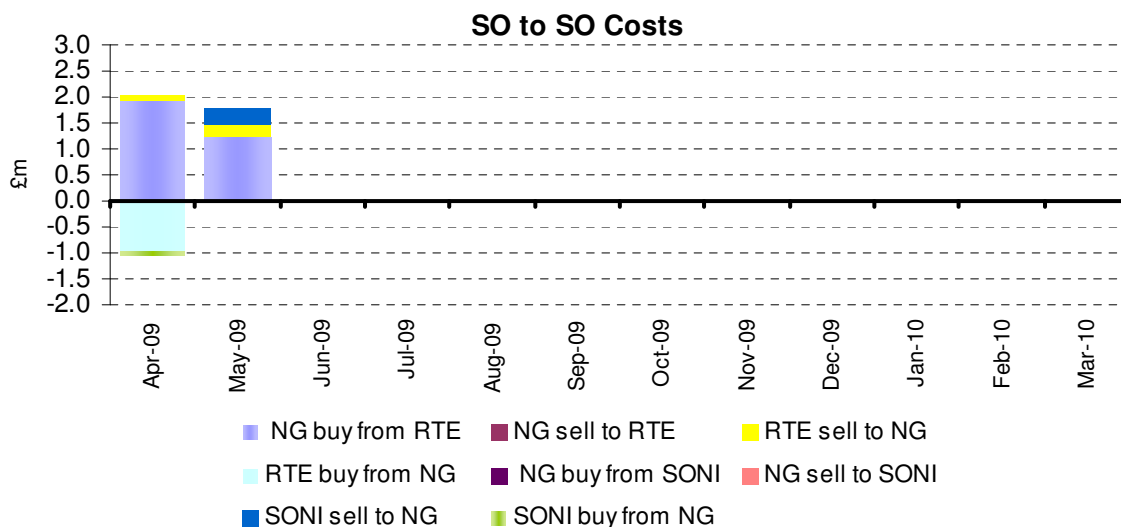
System to System services are provided mutually with other Transmission System Operators connected to the GB system via interconnectors. Such services are typically used to manage interconnector transfer profiles and to increase or reduce power flows across an interconnector to resolve transmission constraints on either side, or provide Emergency Assistance if required.

The graph below shows the total net volume imported and exported between GB, France and Northern Ireland.



The total energy volumes associated with system to system services during the reporting month was **-2GWh** export (from GB) and **22GWh** import (to GB).

A total spend associated with system to system services during the reporting month was **£1.77m**.

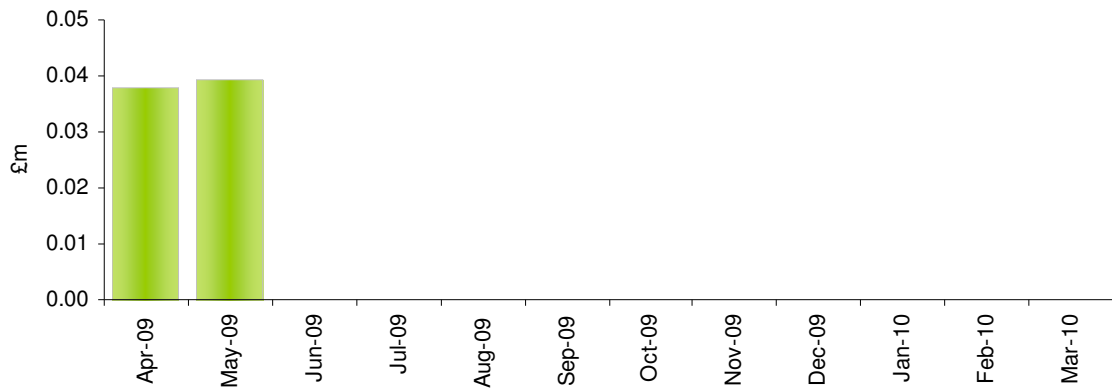


### 3.8 System to Generator Operational Inter-tripping Schemes

As a consequence of their connection conditions, certain generators are obligated to have in place operational intertrip schemes.

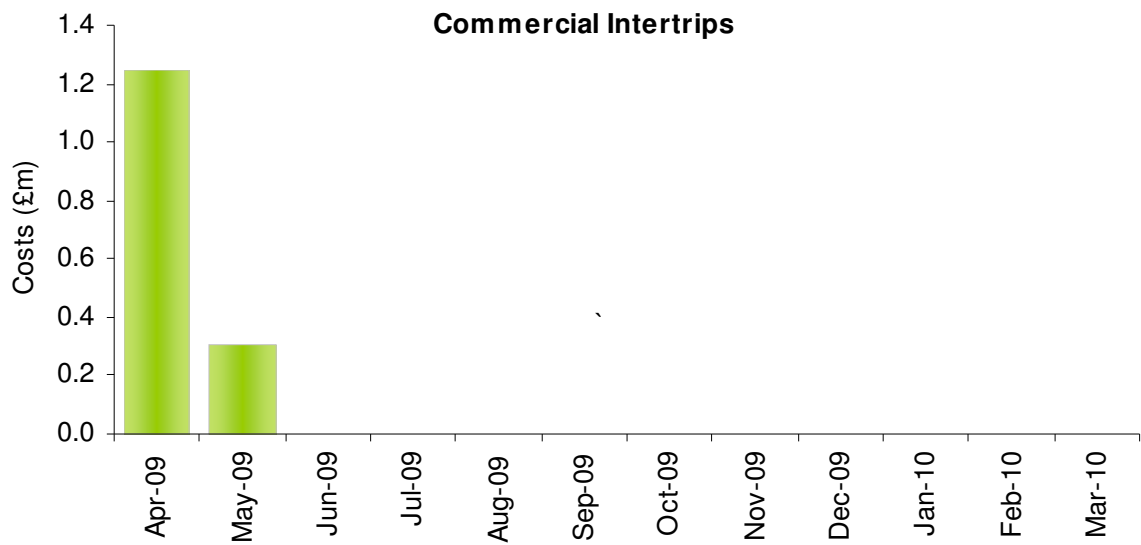
These schemes fall under a number of different category types as defined under section 4.2.A of the CUSC which describes the compensation arrangements relating for these schemes. A proportion of these categories entitle the counter party to payments for the arming (capability fee) and utilisation of this service.

**System to Generator Operational Intertripping - Capability Payments**



**3.9 Commercial Intertrip Service**

In addition to System to Generator Operational Inter-tripping Schemes, National Grid will seek to, where it proves economic and efficient to do so, enter into commercial Intertrip schemes to manage system issues.

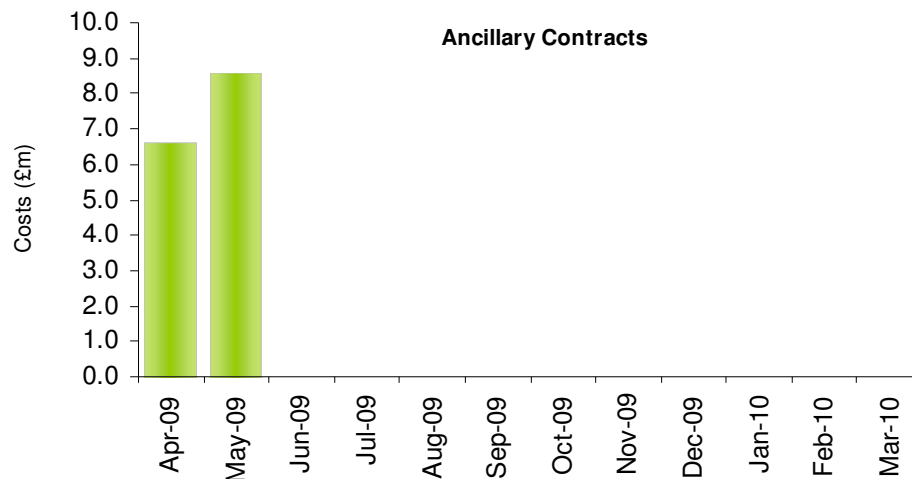


Month	Capability Payment £'s	Contracted Pre-paid Arming £'s	Arming Payment £'s	Tripping Payment £'s	Contracted arming Hrs	Number of Hours Armed outside of contract arming pre-payment	Number of Trips
Apr-09	87,653	0	1,158,548	0	0.00	216.10	0
May-09	90,575	0	216,278	0.00	0.00	44.00	0
Jun-09							
Jul-09							
Aug-09							
Sep-09							
Oct-09							
Nov-09							
Dec-09							
Jan-10							
Feb-10							
Mar-10							

- \* Under commercial intertrip agreements arming is payable either as;
1. A fixed pre-agreed sum, this may be for a fixed number of hours or unlimited hours (shown above as Contracted arming) or;
  2. Payable on utilisation with the generator typically having the right to alter their payments with a short notice period (shown above as Arming Payments).
  3. An agreement has been put in place with a generator for March 2009 to manage system issues which include the use of a number of hours of arming on an intertrip. The figure quoted in the "Contracted arming" column is the maximum firm payment that could be made assuming the intertrip is available for use for all the Contracted Arming Hrs as quoted in the above table during the contracted period.

### 3.10 Ancillary Contracts to manage System Issues

On occasion, National Grid enters into bespoke Ancillary contracts to manage certain transmission system issues. The number and nature of these contracts is necessarily confidential. The costs reported here include any costs of 'Transmission Related Agreements', which are entered as a consequence of certain customer choices of connection conditions.



### 3.11 Maximum Generation Service

The Maximum Generation Service (MGS) is required to provide additional short term generation output during periods of system stress for system balancing. This service allows access to unused capacity outside of the Generator’s normal operating range. MGS will be initiated by the issuing of an Emergency Instruction in accordance with the Grid Code BC2.9.2. Details of the service are contained in the CUSC section 4.2

Further details on the utilisation and availability of the service are available on the National Grid Website.

### 3.12 All Other Services

These include bespoke services to manage specific system conditions and costs relating to fees and liabilities.

Total spend on All Other Services during the reporting month was **£0.41m**.

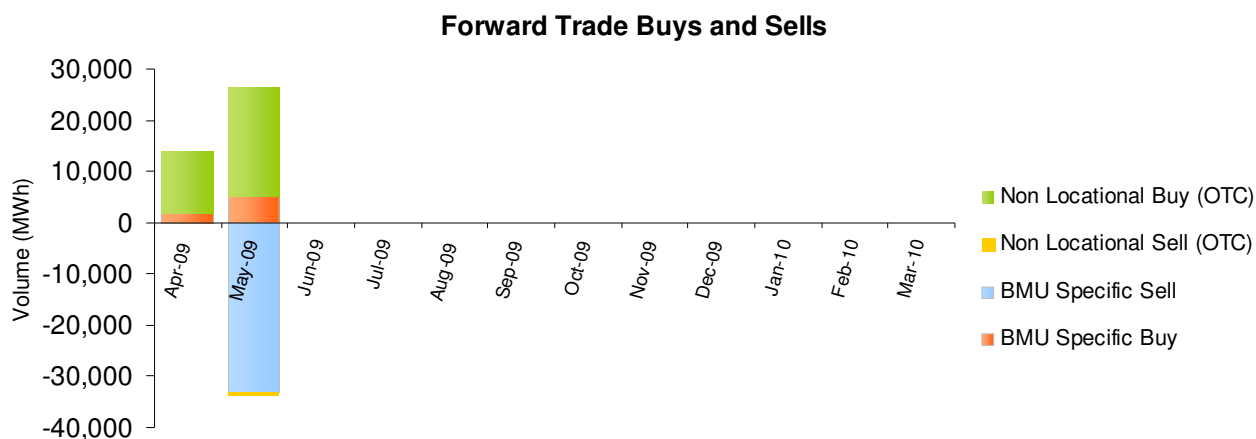
## 4 Energy Related Products

### 4.1 Forward Trading

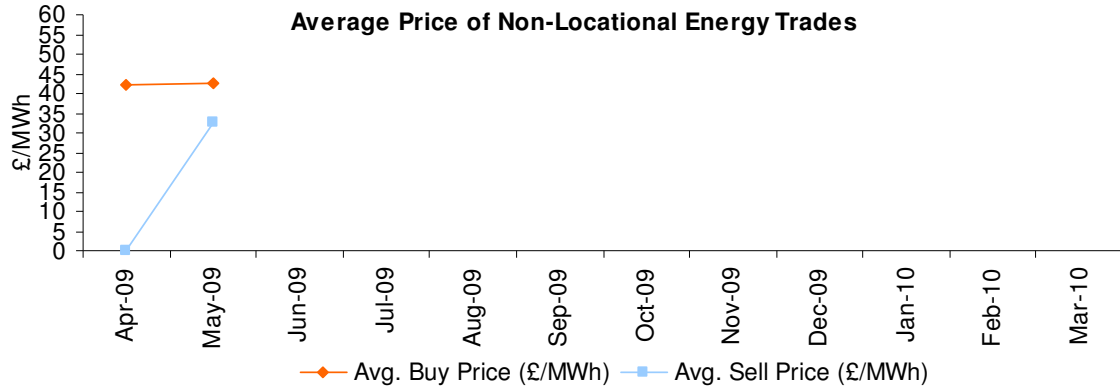
National Grid’s forward trading is undertaken to reduce the overall costs of balancing the system, and to resolve system issues as appropriate. There are a number of products and procurement mechanisms available. During the reporting month, National Grid traded a gross volume of **60148MWh**.

<b>Non Locational</b>		} Total Net Spend <b>£0.96m</b>
Buy Volume	21400 MWh	
Sell Volume	680 MWh	
<b>BMU Specific</b>		
Buy Volume	5076 MWh	
Sell Volume	32992 MWh	

The following chart shows the monthly profile of our trading activities, both for non-locational energy trades and BMU-Specific trades.



The following graph shows the monthly profile of our non-locational energy trading activities. It comprises all the trades undertaken by National Grid through Power Exchanges and through the use of brokerage houses for that purpose.

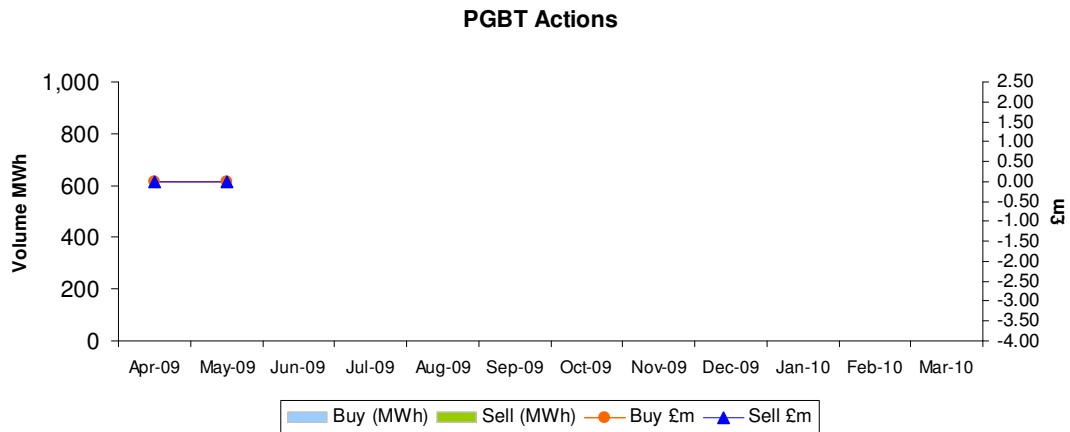


There were no non-locational sell energy trades in April 2009.

Further details are available via the National Grid Website.

#### 4.2 Pre-Gate BMU Transactions (PGBT)

Information on PGBT activity Transactions Sourced and Agreed is given in the chart below.



The total net spend on PGBT during the reporting month was **£0.00m**.

There were no PGBT transaction in April or May 2009.

Details on real time PGBT transactions can be found on the BMRS (system warning page) and post event, on the National Grid Website.

## 5 Constraints

National Grid resolves constraints in the GB Transmission System through different mechanisms, including bids and offers in the Balancing Mechanism, PGBTs, Trades and SO-SO actions. This section presents the costs for National Grid to resolve constraints in the reporting period, breaking them down into the three aforementioned categories. The costs of resolving constraints via intertrip contracts (see section 3.9) and bilateral contracts (see section 3.10) have already been explored.

The total cost of resolving constraints via those mechanisms was **£2.83m**. This cost includes part of the costs of SO-SO actions (section 3.7), Trades (section 4.1) and PGBTs (section 4.2) already reported above.

Explanatory notes on the meaning of each row in the tables below follow at the end of this section.

### 5.1 Summary of costs of constraint actions, including Balancing Mechanism, Trades and SO-SO actions

	Type of Constraint	Location	Date						
	Export			Export summary	Import			Import summary	Grand Summary
	Scotland	Cheviot	England & Wales		Scotland	Cheviot	England & Wales		
Constrained Volume (GWh) [A]	-34.822	0.000	-24.754	-59.576	3.657	0.000	17.647	21.304	-38.272
Average Price of Action (£/MWh) [B]	17.93	0.00	23.06	20.06	70.22	0.00	59.28	61.16	-2.81
Average Energy Replacement Price (£/MWh)	37.25	0.00	34.95	36.30	34.39	0.00	38.22	37.56	35.59
Total Direct Cost (£m)	0.67	0.00	0.29	0.97	0.13	0.00	0.37	0.50	1.47
[G]=[A]*(B-C)] Margin Replaced (GWh) [D]	29.651	0.000	23.123	52.774	0.000	0.000	0.616	0.616	53.390
Average Margin Replacement Price (£/MWh)	-6.06	0.00	-5.55	-5.84	0.00	0.00	1.96	1.96	-5.75
Average Energy Reference Price for Margin Replacement (£/MWh)	-77.48	0.00	-72.37	-75.24	0.00	0.00	152.38	152.38	-72.62
Total Margin Cost (£m)	2.12	0.00	1.55	3.66	0.00	0.00	-0.09	-0.09	3.57
[H]=[D]*(E-F)] Total Cost (£m)	2.79	0.00	1.84	4.63	0.13	0.00	0.28	0.41	5.04
[I]=[G+H] Additional (Transferred) Costs (£m)	-1.22	0.00	-0.80	-2.02	-0.09	0.00	-0.10	-0.19	-2.21
Total constraint net cost (£m) [I+J]	1.57	0.00	1.04	2.61	0.04	0.00	0.18	0.22	2.83

### 5.2 Break down of constraint costs per category

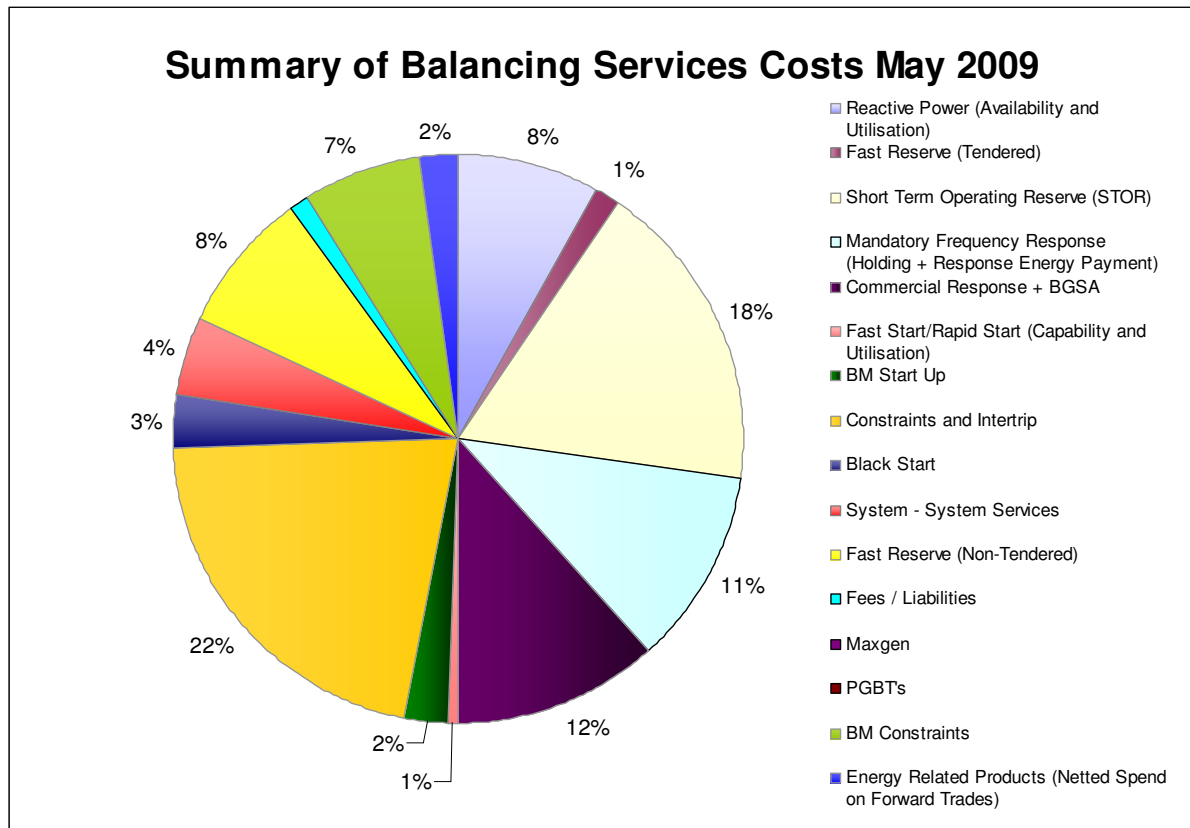
	Export	Import	Total
ACTION_TYPE			
BM Actions	2.61	0.15	2.76
SO-SO Trades	-	0.04	0.04
Trades (including PGBT)	-	0.04	0.04
<b>Total</b>	<b>2.61</b>	<b>0.22</b>	<b>2.83</b>

### 5.3 Explanatory Notes

Row	Description
Constrained Volume (GWh)	Total volume of bids/offers accepted for BM Units within a constrained zone
Average Price of Action (£/MWh)	Volume weighted average of the bids/offers prices
Average Energy Replacement Price (£/MWh)	Volume weighted average of the energy reference price(*)
Total Direct Cost (£m)	Constrained Volume x (Average Price of Action - Average Energy Replacement Price)
Margin Replaced (GWh)	Replacement for the sterilised footroom/headroom due to the constraint
Average Margin Replacement Price (£/MWh)	Volume weighted average of the prices of the margin actions
Average Energy Reference Price for Margin Replacement (£/MWh)	Volume weighted average of the energy reference price(*) for periods when margin is replaced
Total Margin Cost (£m)	Margin Replaced x (Average Margin Replacement Price - Average Energy Reference Price for Margin Replacement)
Total Cost (£m)	Total Direct Cost + Total Margin Cost
Additional (Transferred) Costs (£m)	For some import constraints, actions taken in BM units within the constrained zone may end up being the cheapest option for creating system margin -- in this case all or part of the cost is transferred to the relevant account. In all other circumstances, some actions taken to resolve the constraint may end up flipping the market direction, so additional action is required to re-establish market balance and this cost is allocated here
Total constraint net cost (£m)	Total Cost + Additional (Transferred) Costs
(*) Energy reference price (£/MWh)	For each settlement period, it is the volume weighted average of the submitted bids/offers available for National Grid to resolve NIV, i.e. the lowest (highest) available price of offers (bids) stacked up to NIV when the market is short (long)

## 6 Summary

This report has provided information on the Balancing Services procured (or acquired) during the relevant month.



As a summary of financial activity, the following breakdown of balancing service costs is provided by category, for this reporting month.

## 7 Further information

For further information on the types of Balancing Services that National Grid intends to procure, please refer to the prevailing **Procurement Guidelines**. Information on bid and offer acceptances in the Balancing Mechanism is contained within the **Balancing Principles Statement Report**. These documents, along with the **Procurement Guidelines Report**, are published in accordance with Standard Condition C16 of the Transmission Licence and are available on the National Grid Industry Information website.

**Electricity Balancing Development**

Email: [BSIS@uk.ngrid.com](mailto:BSIS@uk.ngrid.com)

## 8 Information Summary Page

Balancing Service	Info Provision	Total costs £m	Total Value
Reactive Power Market	Utilisation Volume (MA)		12GVArh
	Utilisation Volume (DefaultPM)		1520GVArh
	Total Spend (MA)	0.05	
	Total Spend (Default PM)	3.26	
Short Term Operating Reserve(STOR) Including BM and NBM	<u>Annual Average availability payments:</u>		
	Non-Working Days		7.42
	Working Days		7.42
	Total Spend	7.33	
	Total Volume		3,320
Mandatory Frequency Response	Holding Volumes & Prices:		Primary / Sec / High
	Average Volume held MW		375 255 600
	Average price £/MW/h		3.08 2.08 7.23
	Total Holding Spend	4.45	
	Total Response Energy Payment Spend	0.16	
Commercial Frequency Response	No. Of Contracts		5 (Apr-Jun, Oct-Mar), 6(Jul Sep)
	Total Spend	4.83	
Fast Start	Total Spend	0.32	
Black Start	Total Spend	1.28	
BM Start Up	Total Cost of BM Start Up	0.96	
	Number of instructions		66
Fast Reserve-Tendered	Total Spend on Availability & Utilisation	0.61	
Fast Reserve Non-Tendered	Total Spend on Availability	3.39	
SO to SO	Volume Imported		22GWh
	Volume Exported		-2GWh
	Total Spend	1.77	
System to Generator operational inter-trips	Capability Payments	0.04	
	Utilisation Payments	0.00	
Commercial Intertrip Service	Total Spend	0.31	
Balancing Services Constraint Contracts	Total Spend	8.57	
	Total Spend	2.76	
BM Constraints only	Total Spend	0.00	
Maximum Generation Service	Total Spend	0.41	
All Other Services	Total Spend	0.41	
Forward Trading	Traded gross volume		60148MWh
	Net cost of forward trading	0.96	
	OTC - Power Exchange & Energy		
	Buy Volume		21400MWh
	Sell Volume		-680MWh
	OTC - BMU Specific		
Buy Volume		5076MWh	
Sell Volume		-32992MWh	
PGBT	No. of PGBT entered into:		
	Sourced		0
	Agreed		0
	Average PGBT Prices £/MWh:		
	Buy		0.00
	Sell		0.00
	Volume MWh:		
	Buy		0MWh
	Sell		0MWh
	Total Cost of PGBT	0.00	
Summary	Total	£41.46m	