

March 2017

**Procurement Guidelines Report
1 April 2016/17**

nationalgrid

**As required by Standard Condition
C16 of the National Grid's Electricity
Transmission Licence.**



Procurement Guidelines Report

1 April 2016 to 31 March 2017

1.	Introduction	2
1.1	Purpose of Procurement Guidelines Report	2
1.2	Reporting Period	2
1.3	Balancing Services	2
1.4	Structure of Report	3
1.5	Services not included in the report	3
1.6	Comparison with previous year	4
2.	Services Procured Via Market Arrangements	5
2.1	Reactive Power	5
2.2	Market Arrangements for Reactive Power	5
2.3	Default Arrangements for Reactive Power	7
2.4	Reactive Power Comparison with previous year	6
2.5	Fast Reserve (Contracted)	8
2.6	Fast Reserve (Tendered) Comparison with previous year	8
2.7	Short Term Operating Reserve (STOR) including Balancing Mechanism (BM) and Non Balancing Mechanism (NBM)	9
2.8	STOR Comparison with previous year	12
2.9	Tendered Frequency Response.	12
3.	Services Procured Via Non-Tendered Bilateral Contracts	13
3.1	Mandatory Frequency Response	13
3.2	Commercial Frequency Response	15
3.3	Frequency Response Comparison with previous year	16
3.4	Fast Start	17
3.5	Black Start	18
3.6	BM Start up	19
3.7	BM Start up Comparison with previous year	19
3.8	Fast Reserve (Procured on a Non-Tendered basis)	20
3.9	Non-tendered Fast Reserve Comparison with previous year	20
3.10	System to System Services	21
3.11	SO-SO Comparison with previous year	22
3.12	System to Generator Operational Inter-tripping Schemes	23
3.13	Commercial Intertrip Service	24
3.14	Balancing Services Contracts to manage System Issues	26
3.15	System Issues Comparison with previous year	27
3.16	Maximum Generation Service	28
3.17	All Other Services	28
4.	Energy Related Products	29
4.1	Forward Trading	29
4.2	Trades Comparison with previous year	31
4.3	Pre-Gate BMU Transactions (PGBT)	32
4.4	PGBTs Comparison with previous year	32
5.	Constraints	33
5.1	BM Constraints Comparison with previous year	33
6.	Summary	34
6.1	Summary Chart	34
6.2	Further information	34
6.3	Contact and Feedback	34
7.	Appendices	35
7.1	Appendix 1	35
7.2	Appendix 2	36

1. INTRODUCTION

National Grid procures Balancing Services subject to the framework laid down in Condition C16 of the Transmission Licence. This framework obliges National Grid to “operate the transmission system in an efficient, economic and co-ordinated manner” and also requires a number of statements and reports on the procurement and use of Balancing Services to be established. The **Procurement Guidelines** is one of these statements, and sets out the principles used in our procurement of Balancing Services, the kinds of Balancing Services that we may be interested in purchasing and the mechanisms by which we do so. The Procurement Guidelines is published on National Grid’s website and is subject to annual review and industry consultation. When a new Procurement Guidelines statement is published annually (covering the forthcoming relevant period), National Grid is required to produce a **Procurement Guidelines Report** (“Report”) covering the preceding relevant period, having previously agreed the ‘form’ of the Report with The Authority.

1.1 Purpose of Procurement Guidelines Report

The purpose of the Report is to provide information in respect of the relevant¹ Balancing Services that National Grid has procured in the defined reporting period.

1.2 Reporting Period

In accordance with Condition C16 of the Transmission Licence, the Report will be produced within one month after the date on which each revised Procurement Guidelines Statement is to be published.

The information utilised in this report is the best available at the time of publication and may be subject to minor changes as a result of final reconciliation.

¹ Scope of the balancing services covered in this document can be found in section 1.3 and 1.5

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, STOR and BM Start-Up
- System to System Services
- Inter-trips

- Ancillary Contracts to manage System issues
- Maximum Generation Service
- All Other Services
- Energy Related Products (including PGBTs)
- BM Constraints

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

1.4 Structure of Report

This report presents the Balancing Services under four main titles:-

- Services Procured via Market Arrangements
- Services Procured via Non-Tendered Bilateral Contracts
- Other Energy Related Products
- Constraints

It is then followed by a summary section providing the high level information for all services for the financial year 2016-17.

1.5 Services not included in the report

The scope of the Procurement Guidelines does not include the acceptance of Bids and Offers in the Balancing Mechanism. However, Bids and Offers for Constraint management (see section 5) and BM STOR Utilisation (see section 2.7) have been included to provide an appreciation of the overall costs. Further information on Bid and Offer acceptances can be found in the Balancing Principles Statement Report.

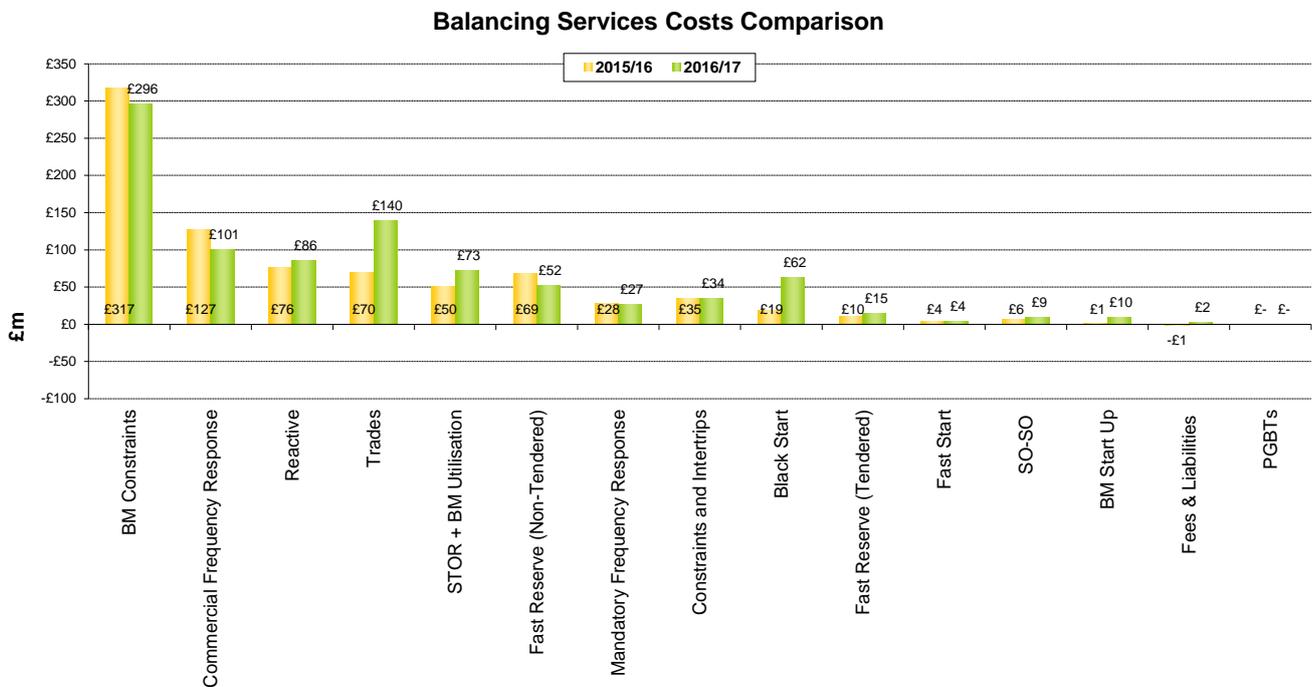
Procurement Guidelines Report

1 April 2016 to 31 March 2017

1.6 Comparison with previous year

The total cost of Balancing Services has increased by £89m, from £812m in 2015/16 to £902m in 2016/17. Commercial Frequency Response costs saw the biggest reduction of £26m in 2016/17. Balancing Mechanism Constraints costs also reduced by £22m from £317m in 2015/16. Non-Tendered Fast Reserve had a substantial reduction as well from the past year, around £17m. Forward Trades costs however nearly doubled from £70m in 2015/16, recording a substantial increase for the second year in a row.

The reasons behind the changes discussed above are analysed in more detail in the relevant sections of this report.



Procurement Guidelines Report

1 April 2016 to 31 March 2017

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 line with the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS). 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.

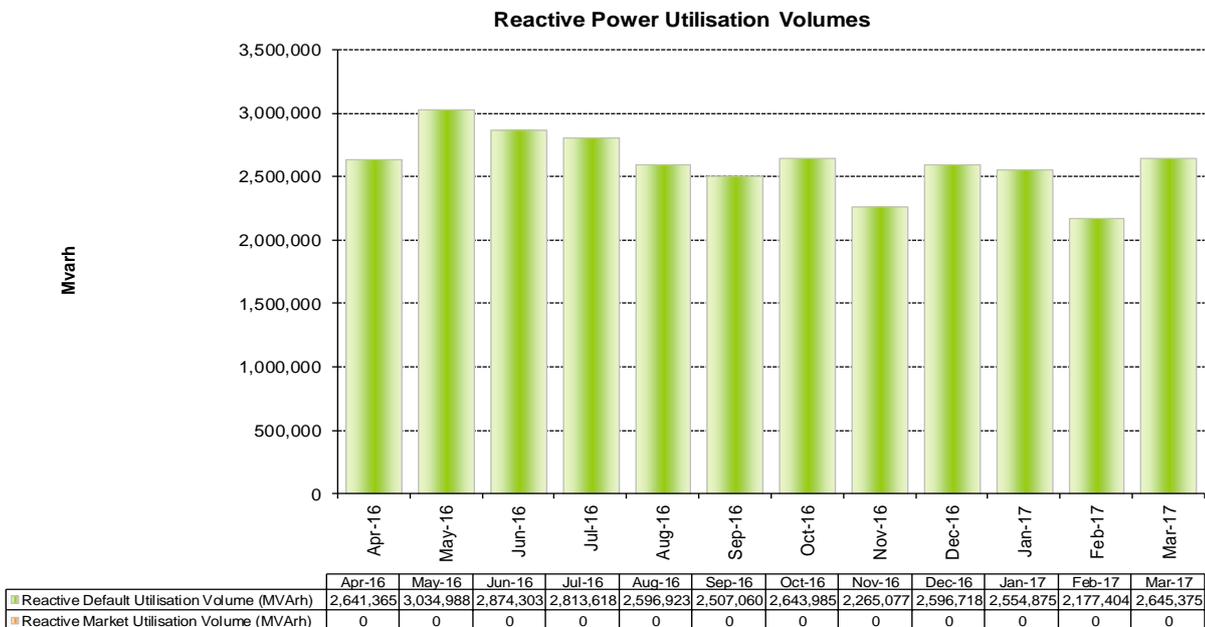
2.2 Market Arrangements for Reactive Power

There were two tender rounds (TR37, TR38) covering April 2016 to March 2017 period. No tenders were received for this period. Further information regarding each of these tender rounds can be found at the following website address:

<http://www2.nationalgrid.com/UK/Services/Balancing-services/Reactive-power-services/Enhanced-Reactive-Power-Services/ERPS-Information/>

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

There were no reactive power utilisation volumes under market arrangements as a result of no tenders being received for the period.



2.3 Default Arrangements for Reactive Power

Further information regarding the default payment arrangements can be found at the following National Grid Website.

<http://www2.nationalgrid.com/uk/services/balancing-services/reactive-power-services/>

2.4 Reactive Power Comparison with previous year

Total Reactive costs have increased by 13.6% from ~£75.7m in 2015/16 to ~£86.1m in 2016/17, while the utilisation increased by just 6% from ~29TVARh in 2015/16 to ~31TVARh in 2016/17. The average monthly Reactive Default Price in 2016/17 increased by 7.4% from £2.56/MVARh in 2015/16 to £2.75/MVARh.

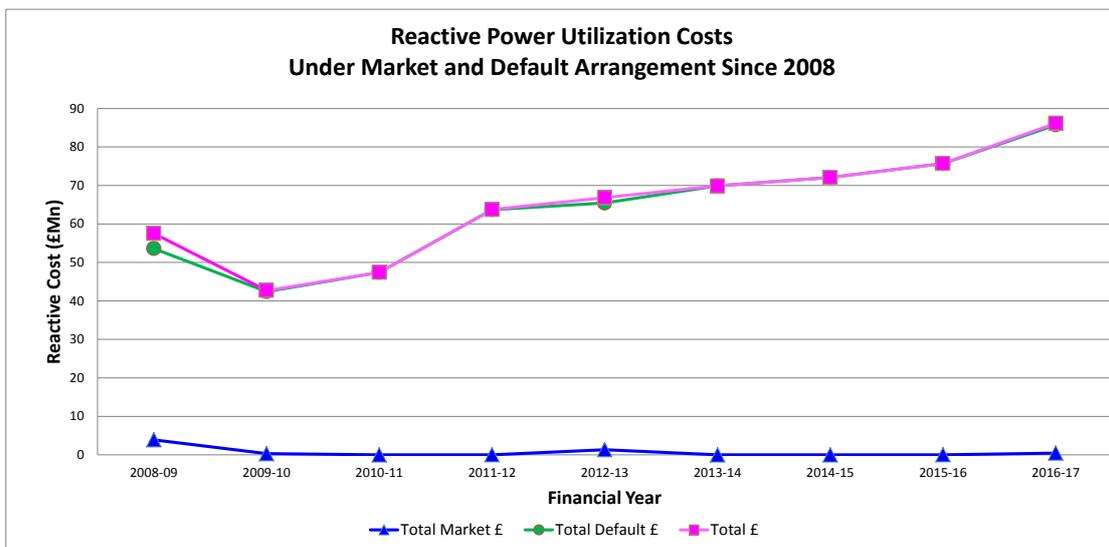
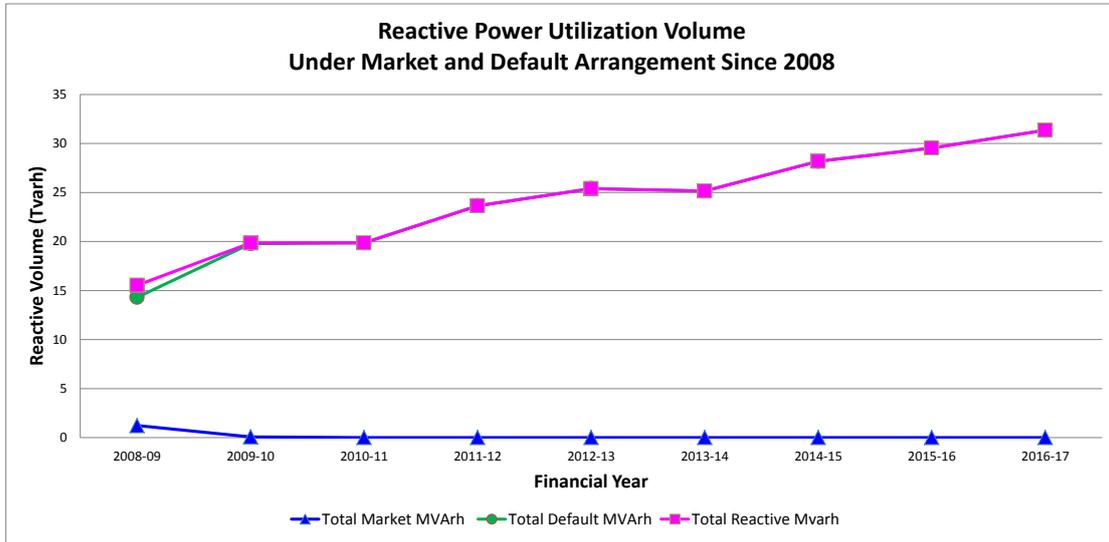
Utilisation volume and costs of Reactive Power under Market and Default arrangements for the last 8 years are detailed in the charts below.

The proportion of utilisation under “market arrangement” has been shrinking, and in the previous six years, reactive power was purchased solely via the default arrangement.

In some instances additional Balancing Service contracts were taken to ensure generators were running and thus able to provide reactive power via the default mechanism. The costs of these addition contracts are reported in section 3.14.

Procurement Guidelines Report

1 April 2016 to 31 March 2017



Procurement Guidelines Report

1 April 2016 to 31 March 2017

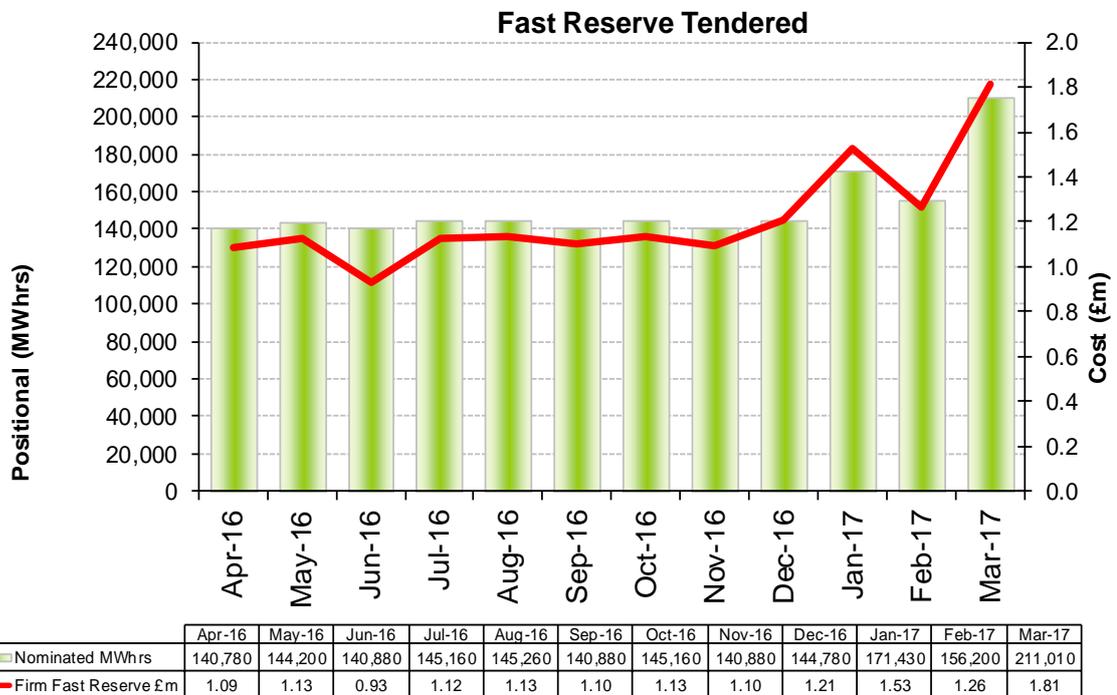
2.5 Fast Reserve

Further information explaining Fast Reserve and the assessment criteria of tenders can be found on the National Grid Website.

<http://www2.nationalgrid.com/UK/services/Balancing-services/Reserve-services/Fast-reserve/>

2.6 Fast Reserve (Tendered) Comparison with previous year

The following graph shows the monthly variation in nominated hours from the contracted Fast Reserve Capacity.



The nominated volume of Fast Reserve in 2016/17 has increased to 1,827GWh, from 1,429GWh in 2015/16.

Procurement Guidelines Report

1 April 2016 to 31 March 2017

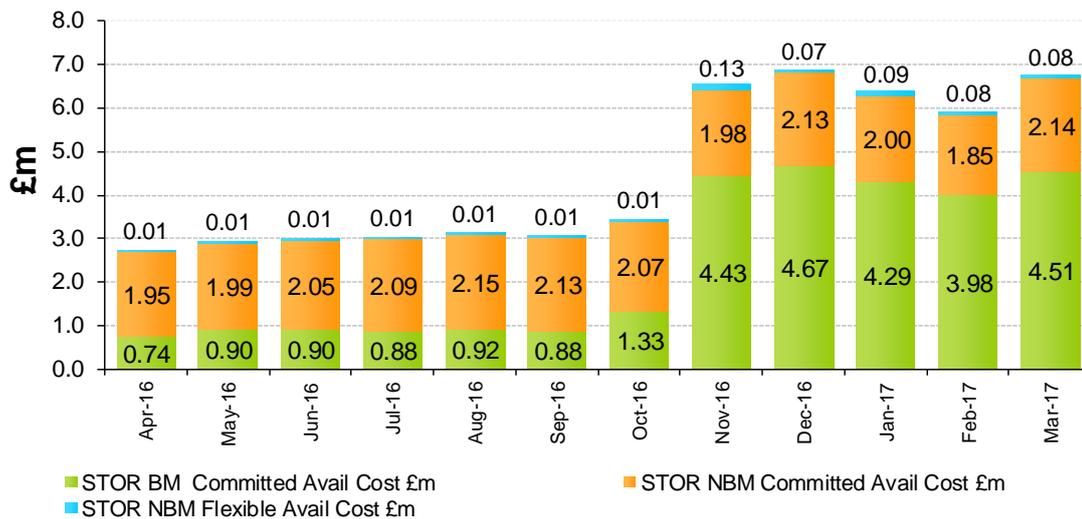
2.7 Short Term Operating Reserve (STOR) including Balancing Mechanism (BM) and Non Balancing Mechanism (NBM)

National Grid procures Short Term Operating Reserve (STOR) through a competitive tender process which is conducted three times per year.

Further information on STOR can be found on the National Grid website.

<http://www2.nationalgrid.com/uk/services/balancing-services/reserve-services/short-term-operating-reserve/>

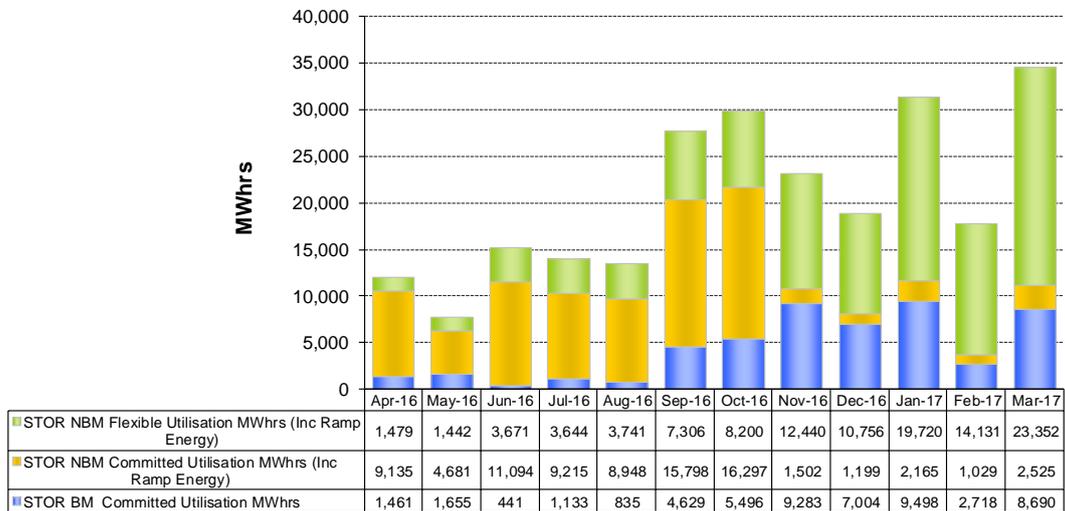
STOR BM & NBM Availability Costs



Procurement Guidelines Report

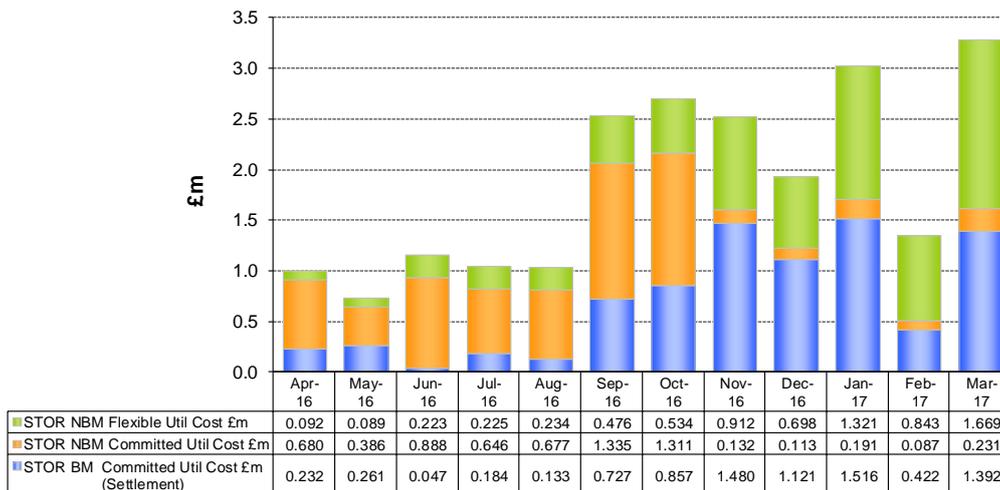
1 April 2016 to 31 March 2017

STOR BM and NBM Utilisation MWhrs - Flexible and Committed



The increase and fall in the proportion of STOR NBM Committed and Flexible utilisation during 2016/17 is seasonally driven by the NBM market's provision of Committed and Flexible STOR services. During the winter seasons (November to March) a large proportion of the NBM market switches from a committed service to the flexible service. More details can be found in the STOR market reports.

STOR BM and NBM Utilisation Cost - Flexible and Committed



Procurement Guidelines Report

1 April 2016 to 31 March 2017

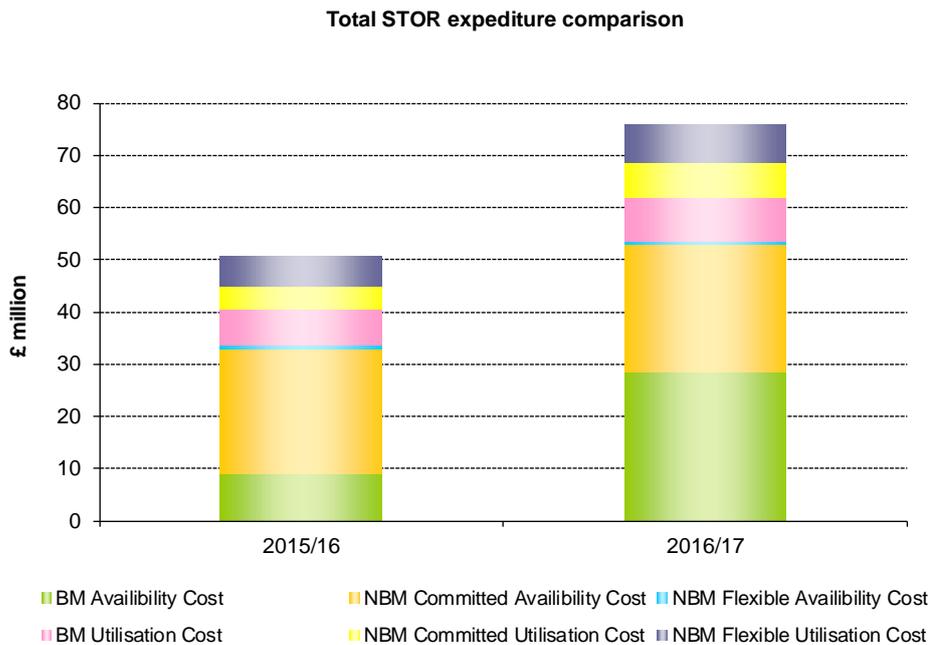
STOR BM and NBM Utilisation Volume and Costs (Data)

Month	STOR BM Committed Util Cost £m (Settlement)	STOR NBM Committed Util Cost £m	STOR NBM Flexible Util Cost £m	STOR BM Committed Utilisation MWhrs	STOR NBM Committed Utilisation MWhrs (Inc Ramp Energy)	STOR NBM Flexible Utilisation MWhrs (Inc Ramp Energy)
Apr-16	0.232	0.680	0.092	1,461.258	9,135.496	1,478.853
May-16	0.261	0.386	0.089	1,655.426	4,680.547	1,441.631
Jun-16	0.047	0.888	0.223	440.886	11,094.470	3,670.870
Jul-16	0.184	0.646	0.225	1,132.792	9,215.202	3,643.849
Aug-16	0.133	0.677	0.234	835.176	8,948.180	3,741.070
Sep-16	0.727	1.335	0.476	4,629.068	15,797.600	7,306.032
Oct-16	0.857	1.311	0.534	5,496.166	16,297.410	8,199.730
Nov-16	1.480	0.132	0.912	9,282.915	1,501.759	12,439.930
Dec-16	1.121	0.113	0.698	7,003.620	1,198.741	10,756.010
Jan-17	1.516	0.191	1.321	9,497.914	2,165.145	19,719.500
Feb-17	0.422	0.087	0.843	2,718.383	1,029.215	14,131.150
Mar-17	1.392	0.231	1.669	8,689.980	2,524.905	23,351.670

[Please note graphs and the table above do not reflect any seasonal reconciliation due to non-availability]

Non Balancing Mechanism (Non-BM) STOR Availability payments, Non-BM STOR Utilisation payments and BM STOR Availability payments are paid as Ancillary Services. BM STOR Utilisation payments are paid via the BM Bids and Offers, not as an Ancillary Service; they are included in this report to clarify the total STOR expenditure. STOR BM Utilisation costs in this report are based on actual spend (i.e. MWh Utilised x Utilisation Price for that BM STOR unit).

2.8 STOR Comparison with previous year



Total STOR costs for 2016/17 were £75.8m – a £25m higher than in 2015/16. The main drive behind this increase was the BM availability cost, which accounted for 37.5% of the overall spend. All other areas of cost recorded marginal increases.

2.9 Tendered Frequency Response.

Please see Section 3.2 Services Procured via Non-Tendered Bilateral Contracts.

3. Services Procured Via Non-Tendered Bilateral Contracts

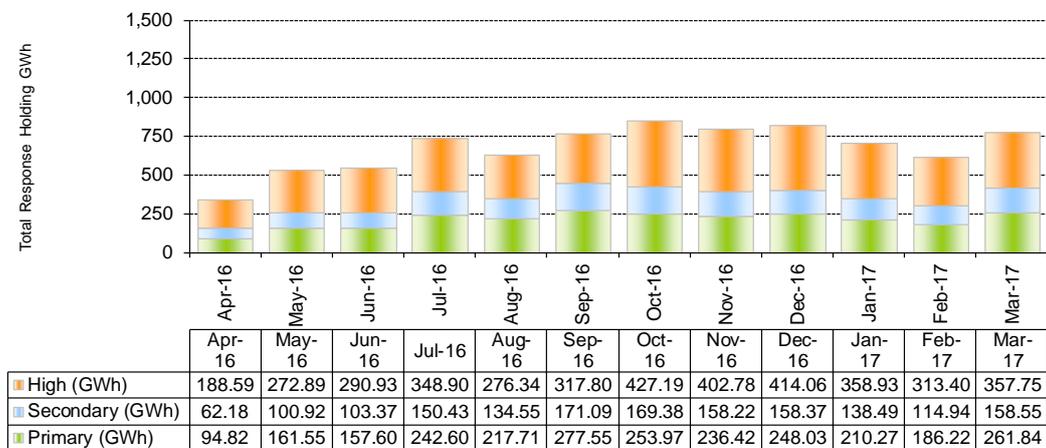
3.1 Mandatory Frequency Response

Mandatory Frequency Response is a compulsory 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 (£/MWh). Details on frequency response holding volumes are given below. More information on this can be found on the National Grid Website.

<http://www2.nationalgrid.com/uk/services/balancing-services/frequency-response/mandatory-frequency-response/>

Mandatory Frequency Response Holding

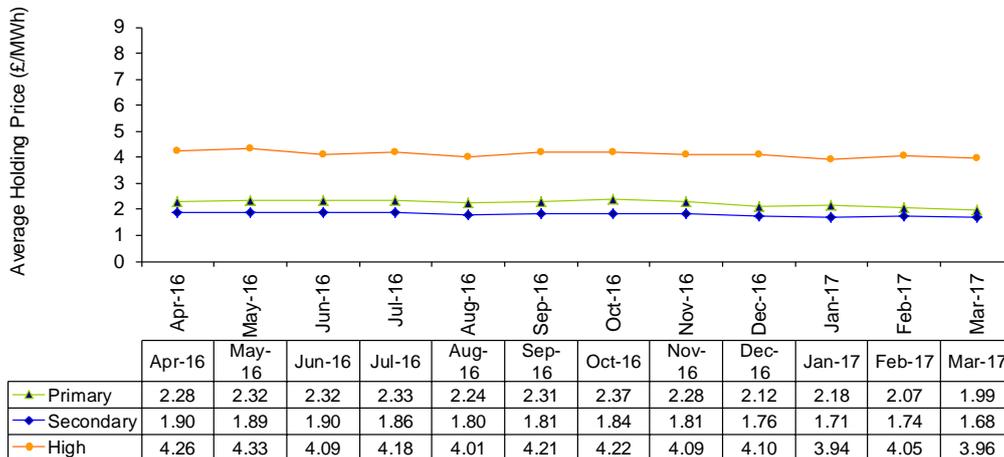


Procurement Guidelines Report

1 April 2016 to 31 March 2017

The next chart shows the Average Holding price paid for Mandatory Frequency Response.

Mandatory Frequency Response Average Holding Price



The methodology for calculating Mandatory Frequency Response energy payments is given in CUSC section 4.1.3.9 & 4.1.3.9A.

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/>

Procurement Guidelines Report

1 April 2016 to 31 March 2017

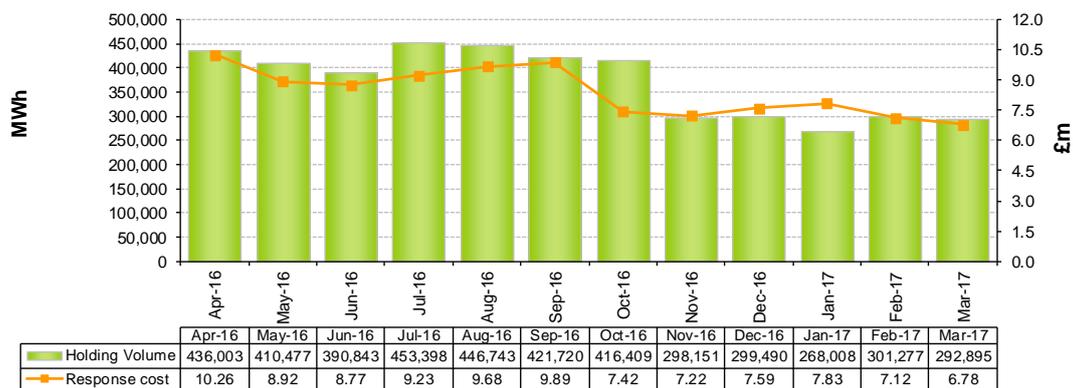
3.2 Commercial Frequency Response

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 Low Frequency relays. Part of the contract portfolio includes services provided by demand side participants via the Frequency Control by Demand Management (FCDM) service and through Firm Frequency Response (FFR) tender rounds.

Further information on Commercial Frequency Response is available on the National Grid Website, or specifically on firm frequency response through the tenders and reports section of National Grid's Balancing Services website.

<http://www2.nationalgrid.com/uk/services/balancing-services/frequency-response/>

Commercial Frequency Response Holding

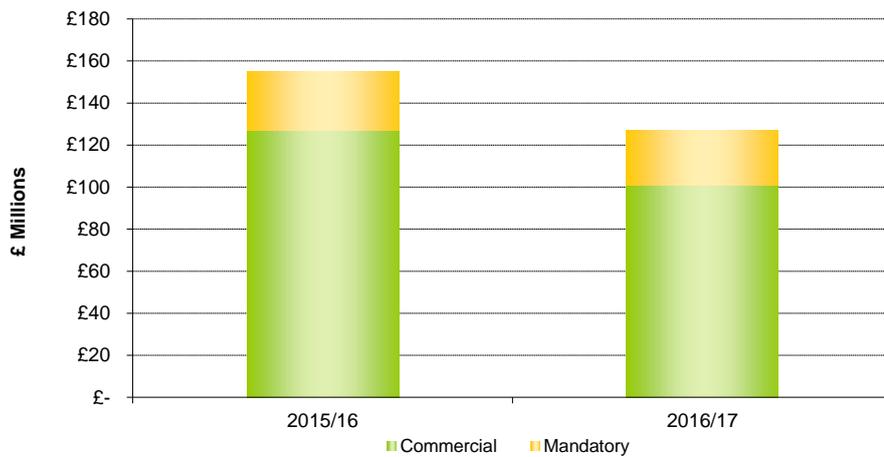


The response holding volume shown in the chart above is the Primary response capability or Secondary response capability if no Primary is offered. The costs are the total cost for all capabilities (Primary, Secondary and High).

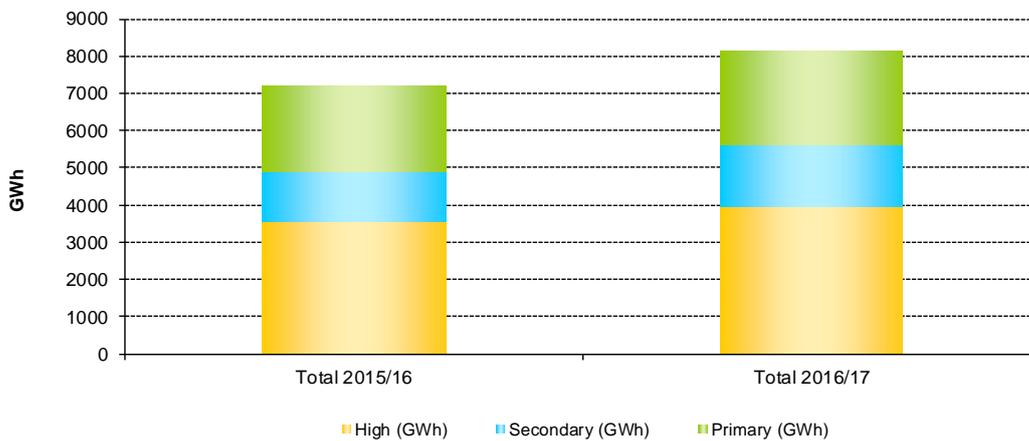
3.3 Frequency Response Comparison with previous year

There was a £26m decrease in commercial frequency response costs in 16/17, to £100m. It has been contracted less commercial Frequency Response than the previous financial year. This is consistent with the increase in the High Mandatory Response Holding Volume.

Total Response Holding Costs (Commercial/Mandatory)



Total Mandatory Response Holding Volumes



Procurement Guidelines Report

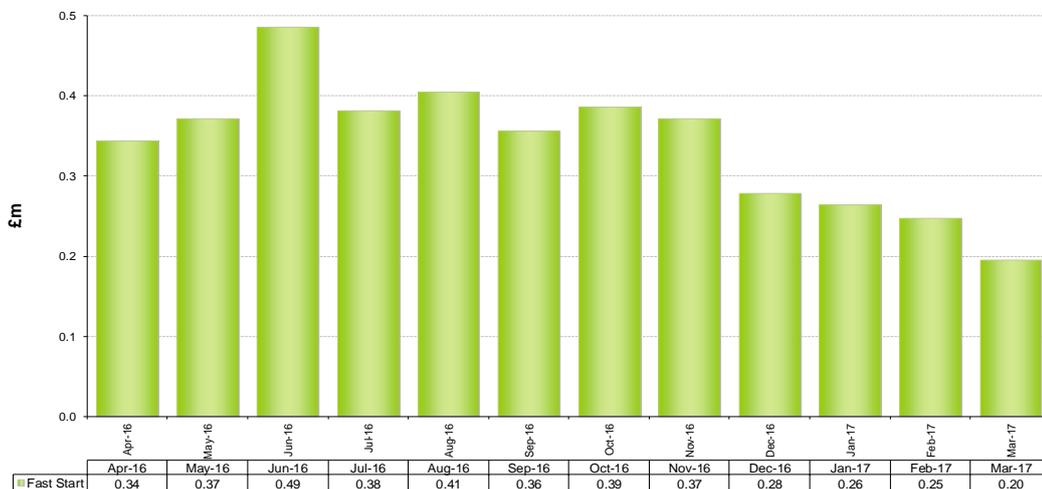
1 April 2016 to 31 March 2017

3.4 Fast Start

Fast Start is the ability of generation to start rapidly from a standstill condition, either via a Low Frequency triggered relay or through manual instruction; and to deliver its rated power output automatically within a defined time period. The Fast Start service is a legacy service and as such volumes and costs are not expected to change significantly.

Utilisation of the Fast start service in 2016/17 was a little lower than 2015/16. Fast Start Capability and Utilisation Costs have come in at £4.1m in 2016/17. Fast Start costs per month from April 2016 to March 2017 can be found below:

Fast Start Utilisation

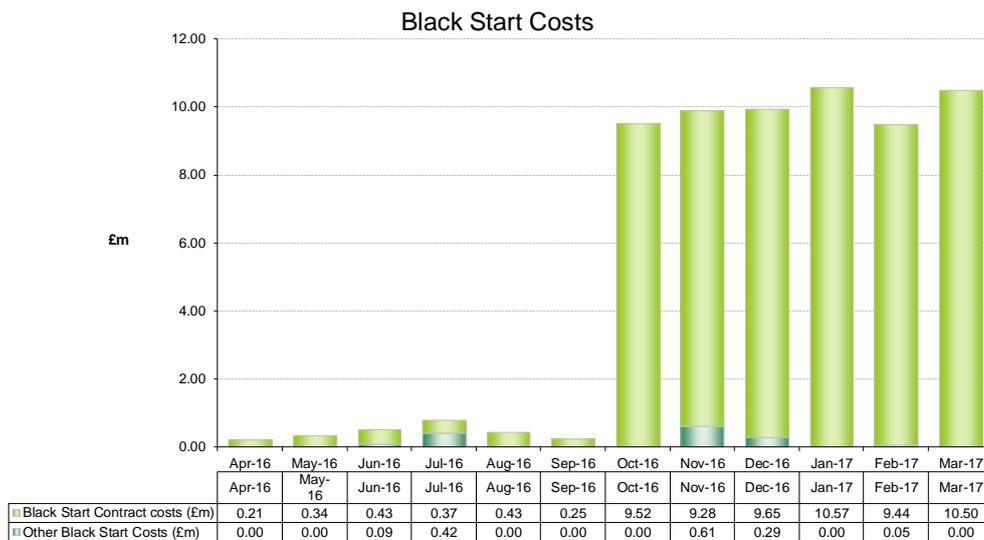


Procurement Guidelines Report

1 April 2016 to 31 March 2017

3.5 Black Start

In 2016/17 there were a total of 17 Black Start providers with agreement in place. Two more black start providers from the past year. However, one provider stopped the service in July 2016, and another one started the provision from September 2016. Total Black Start costs in 2016/17 have been more than doubled from the past financial year reaching over £62m.



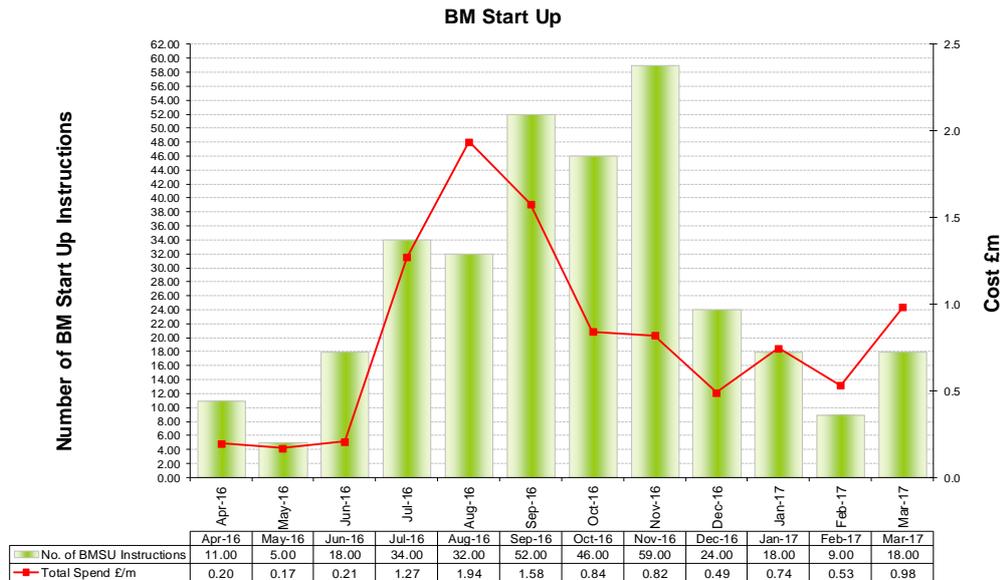
[Please note that the above chart and table do not include the costs incurred in warming and running Blackstart units to maintain service availability]

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

<http://www2.nationalgrid.com/uk/services/balancing-services/system-security/black-start/>

3.6 BM Start up

The chart below contains information relating to the procurement of BM Start up Balancing Services:



3.7 BM Start up Comparison with previous year

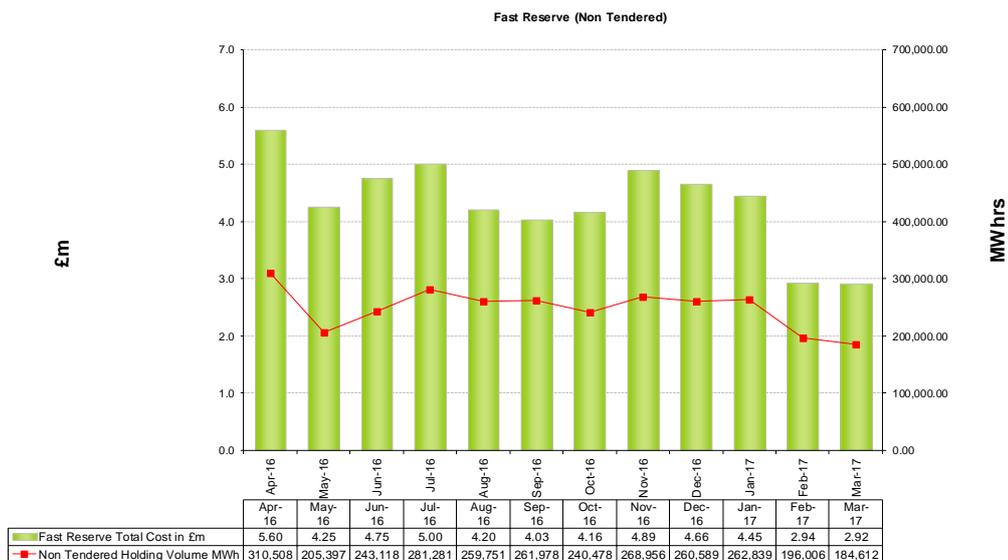
The number of BM Start up instructions issued during 2016/17 were 326 compared to 191 instructions during the previous year. A nearly doubled figure of BM start up instructions is reflected in the costs as well, which recorded a substantial increase from the previous financial year. Around £9.8m was spent on this service in 2016/17 compared to £0.866m in 2015/16.

Further details are available via the National Grid Website.

<http://www2.nationalgrid.com/uk/services/balancing-services/reserve-services/bm-start-up/>

3.8 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.



3.9 Non-Tendered Fast Reserve Comparison with previous year

Non-tendered Fast Reserve costs have decreased by 25% from £69m in 2015/16 to £51.86m in 2016/17.

The Unit capability fees have also decreased from £1.79m in 2015/16 to £1.06m in 2016/17.

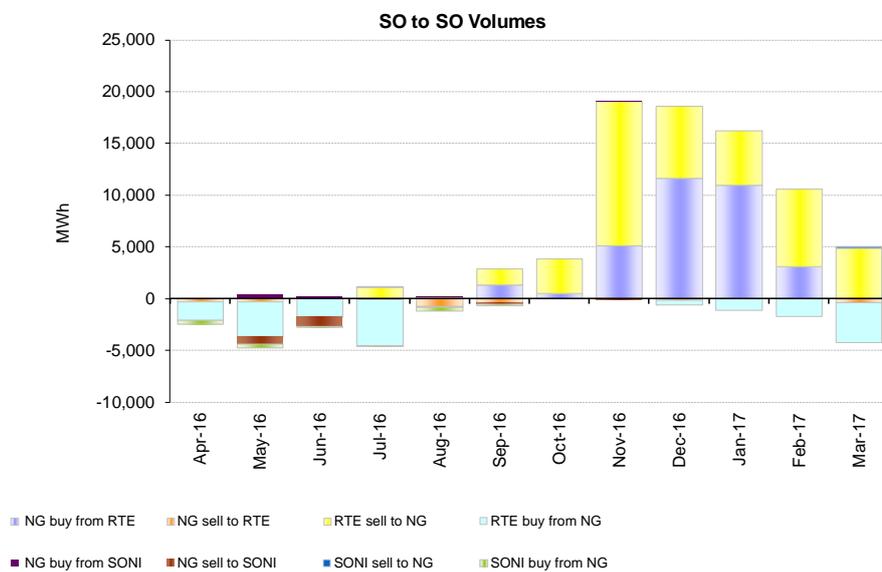
Procurement Guidelines Report

1 April 2016 to 31 March 2017

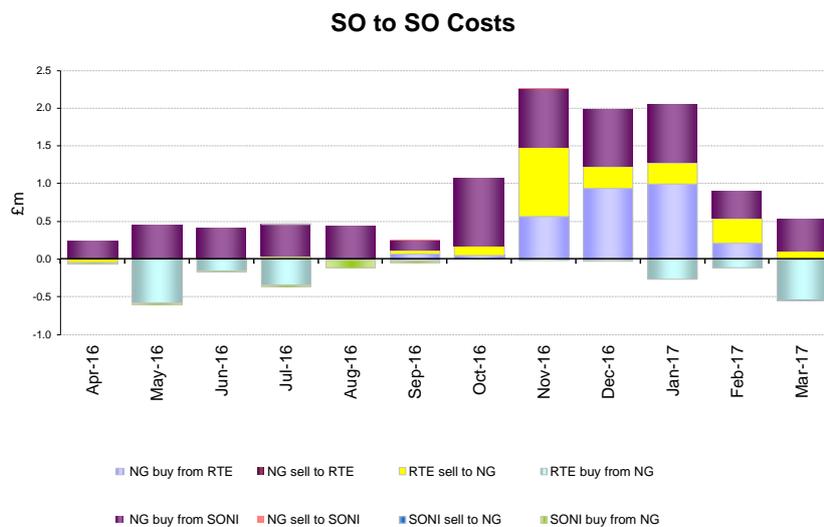
3.10 System to System Services

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 Great Britain, France and Ireland. Please see **Appendix 1** for further clarification on System Operator to System Operator (SO-SO) services.

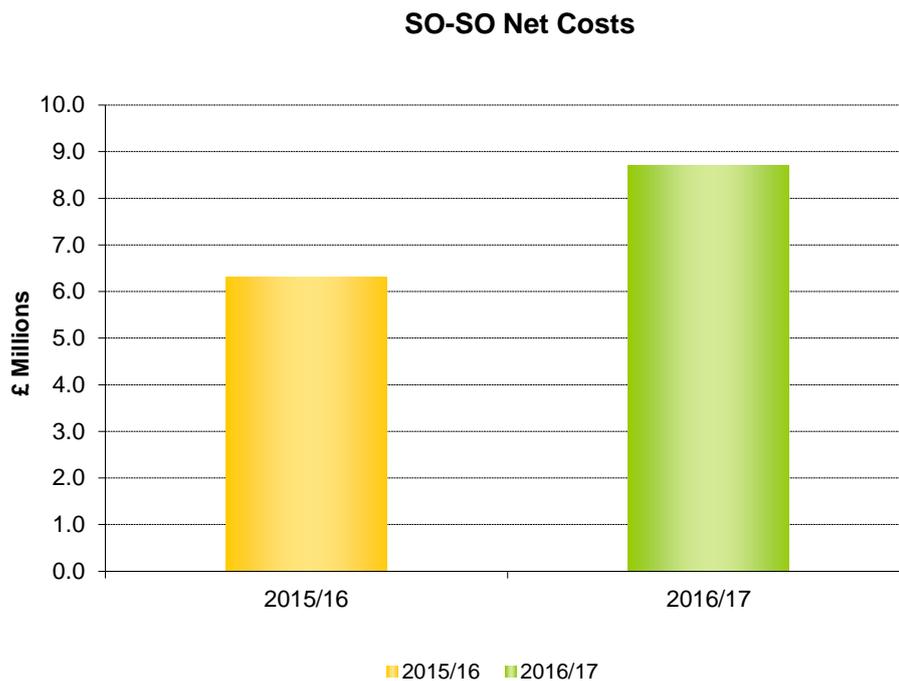


For definition see Appendix 1



3.11 SO-SO Comparison with previous year

Total System Operator to System Operator Costs increased from £6.3m in 2015/16 to £8.7m in 2016/17 as shown in the graph below.



The volume of SO-SO trades undertaken increased this year from 30GWh net in 2015/16 to 102GWh net in 2016/17.

There has been a significant increase in the import volumes to the UK, and this is consistent with the increase in costs. Import volume increased from 10GWh in 2015/16 to 78GWh in 2016/17. The export volume in 2016/17 was 24GWh, which is a 4GWh increase from 2015/16.

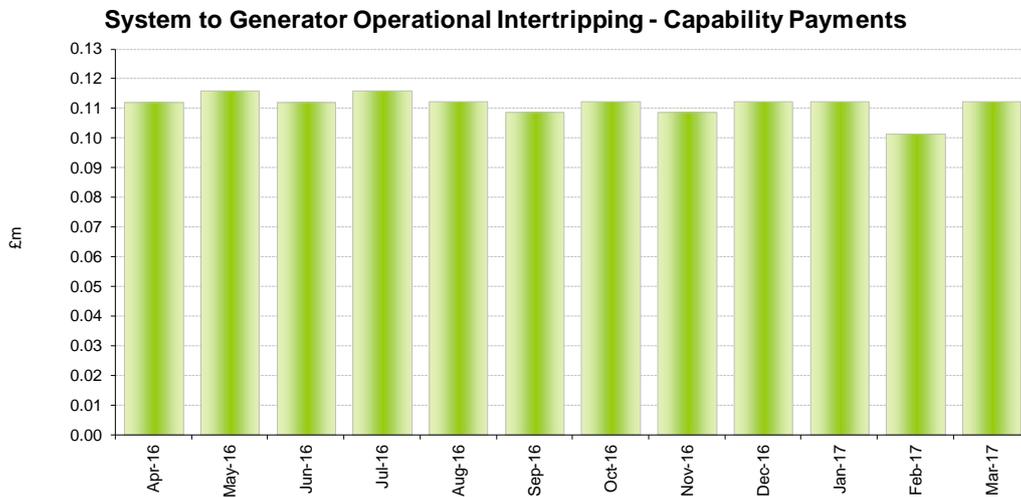
SO-SO trade services are still not available over the BritNed Interconnector due to contractual and market differences between the UK and Dutch markets.

3.12 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 respective compensation arrangements. A proportion of these categories entitle the counterparty to payments for maintaining the capability to provide the intertrip and also following utilisation of the service.

Total costs for System to Generator Operational Inter-tripping Schemes has remained substantially the same from the previous financial year recording a spend of around £1.34m.



Procurement Guidelines Report

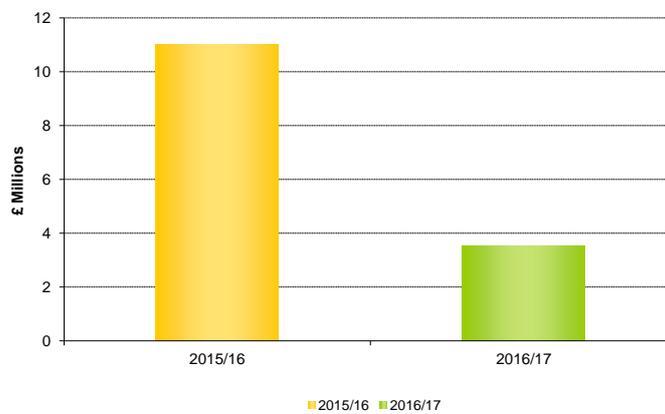
1 April 2016 to 31 March 2017

3.13 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 assist with managing system issues.

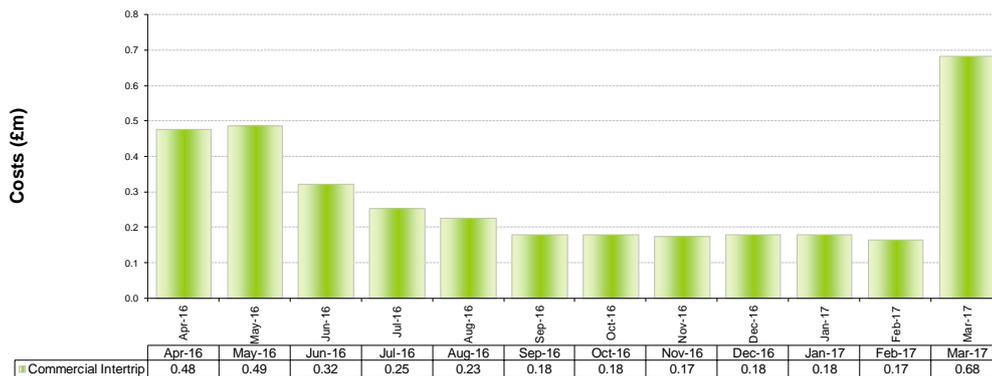
The total expenditure on Commercial Intertrips has decreased from £11.02m in 2015/16 to £3.5m in 2016/17.

Commercial Intertrip Cost Comparison



Commercial Intertrip Monthly Summary

Commercial Intertrips



Procurement Guidelines Report

1 April 2016 to 31 March 2017

Month	Capability Payment £'s	Arming Payment £'s	Number of Hours of Intertrip Arming, Outside of Pre-Paid Arming Contract(s)	Contracted Pre-paid Arming £'s	Number of Hours Armed under Pre-Paid Arming Contract(s)	Number of Trips	Tripping Payment £'s
Apr-16	279,051	199,690	137	0	0	0	0
May-16	284,846	202,490	278	0	0	0	0
Jun-16	279,051	43,082	59	0	0	0	0
Jul-16	246,186	8,011	24	0	0	0	0
Aug-16	180,322	47,750	32	0	0	0	0
Sep-16	174,614	4,544	8	0	0	0	0
Oct-16	179,658	0	0	0	0	0	0
Nov-16	174,614	0	0	0	0	0	0
Dec-16	180,322	0	0	0	0	0	0
Jan-17	180,322	0	0	0	0	0	0
Feb-17	163,199	2,368	8	0	0	0	0
Mar-17	180,322	502,665	73	0	0	0	0

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. The "Contracted Pre-Paid Arming" column indicates the maximum firm payment that could be made assuming the intertrip is available for use for all the Contracted Arming hours during the contracted period.

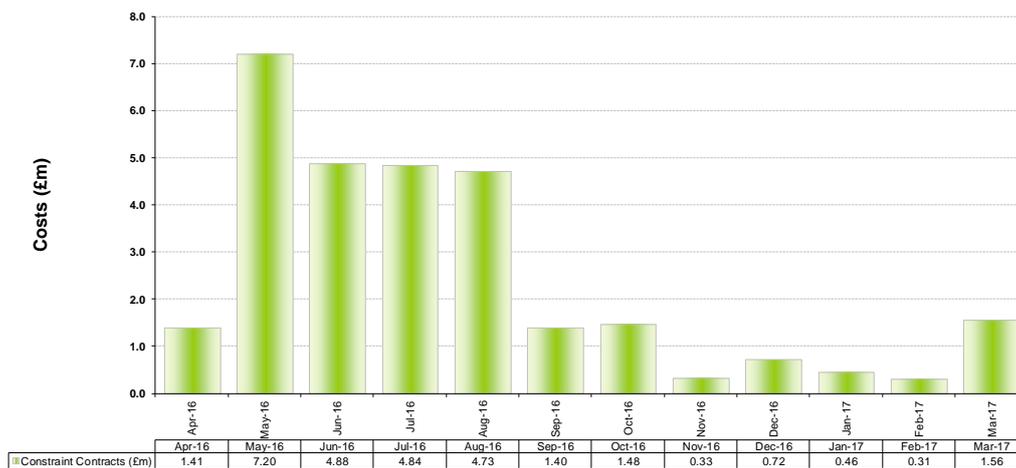
3.14 Balancing Services Contracts to manage System Issues

On occasion, National Grid enters into bespoke Balancing Services contracts to manage certain transmission system issues such as voltage issues or system inertia. The contracts agreed via tender runs are available on the National Grid website, some of them however, by the nature of these contracts, remain 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.

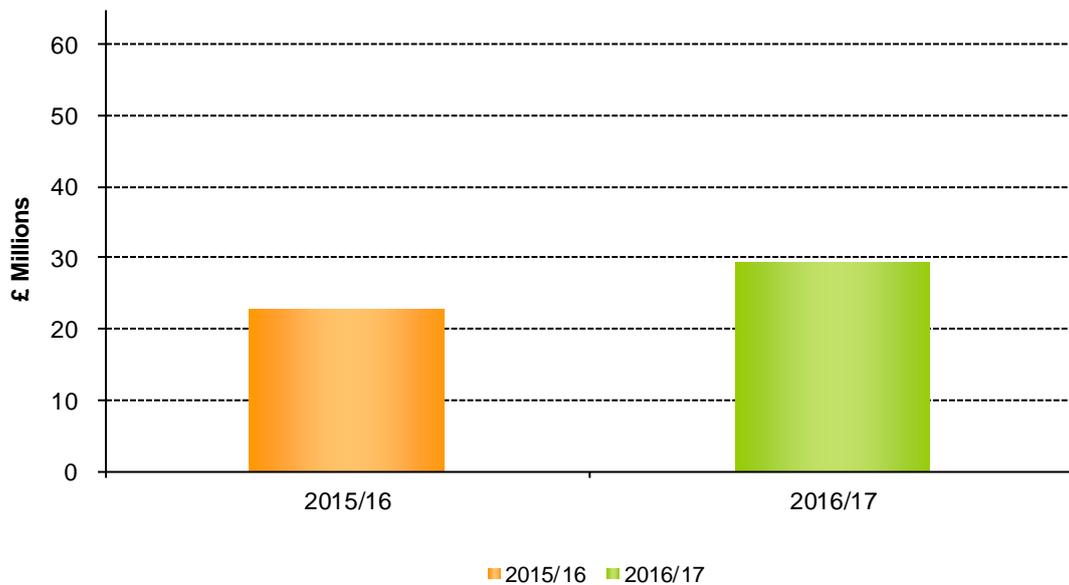
More information related to contracts designed to economically and effectively manage forecast constraint cost and volumes, arising from declining MVAR demand and low levels of expected generation overnight, can be found on the National Grid Website:

<http://www2.nationalgrid.com/UK/Services/Balancing-services/System-security/Transmission-Constraint-Management/Transmission-Constraint-Management-Information/>

Balancing Services Contracts



Balancing Service Contracts for System Issues Costs



3.15 System Issues Comparison with previous year

The costs of managing Transmission System constraints via contracts increased from £22.68m in 2015/16 to £29.31m in 2016/17.

The constraint contract costs is the amount spent on contracts with generators to manage constraint groups as economically as possible and avoid cost that would have otherwise been accrued in the Balancing Mechanism.

Commercial Intertrip costs have decreased from £11.02m in 2015/16 to £3.51m in 2016/17. The commercial intertrip costs are the costs of arming generator intertrips to manage constraints.

Procurement Guidelines Report

1 April 2016 to 31 March 2017

3.16 Maximum Generation Service

The Maximum Generation Service (MGS) is required to provide additional short term generation output during periods of system stress for energy 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.

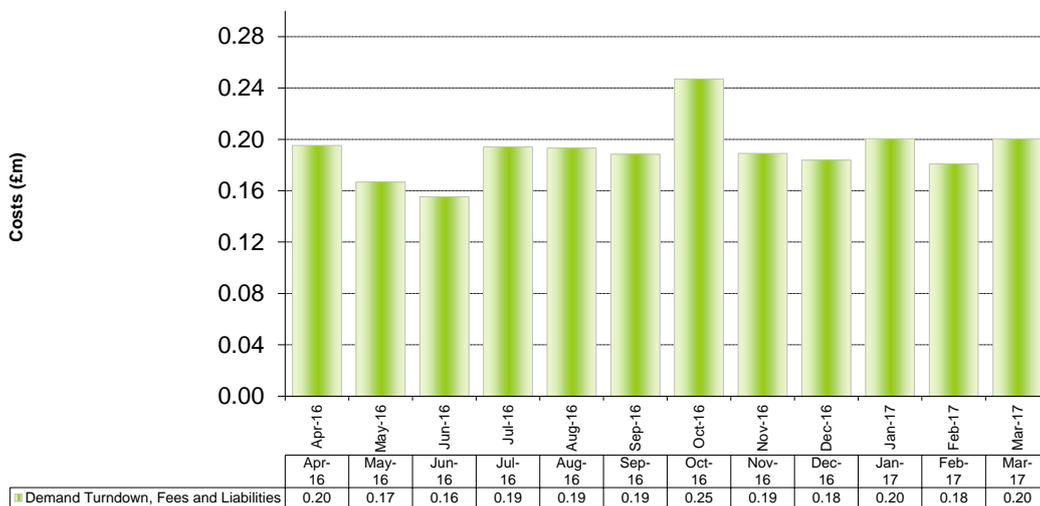
<http://www2.nationalgrid.com/uk/services/balancing-services/system-security/maximum-generation/>

This service was not utilised during 2013, 2014 or 2015.

3.17 All Other Services

These include costs relating to trading fees and liabilities which are expected to be paid as a result of contracts awaiting signature or unresolved disputes. In 2016/17 costs have outturned to £2.29.

Other Services



Procurement Guidelines Report

1 April 2016 to 31 March 2017

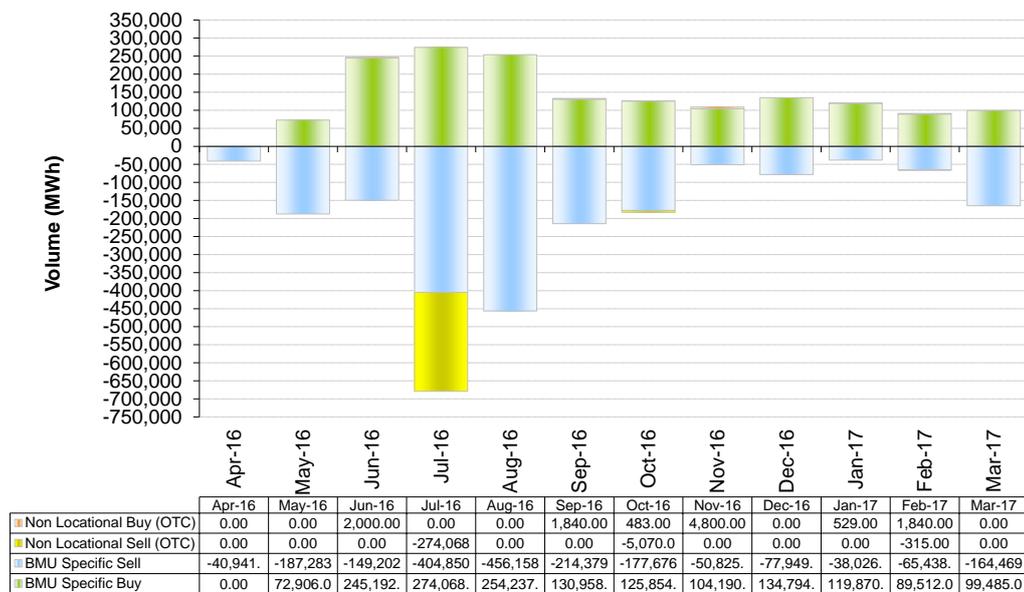
4. Energy Related Products

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.

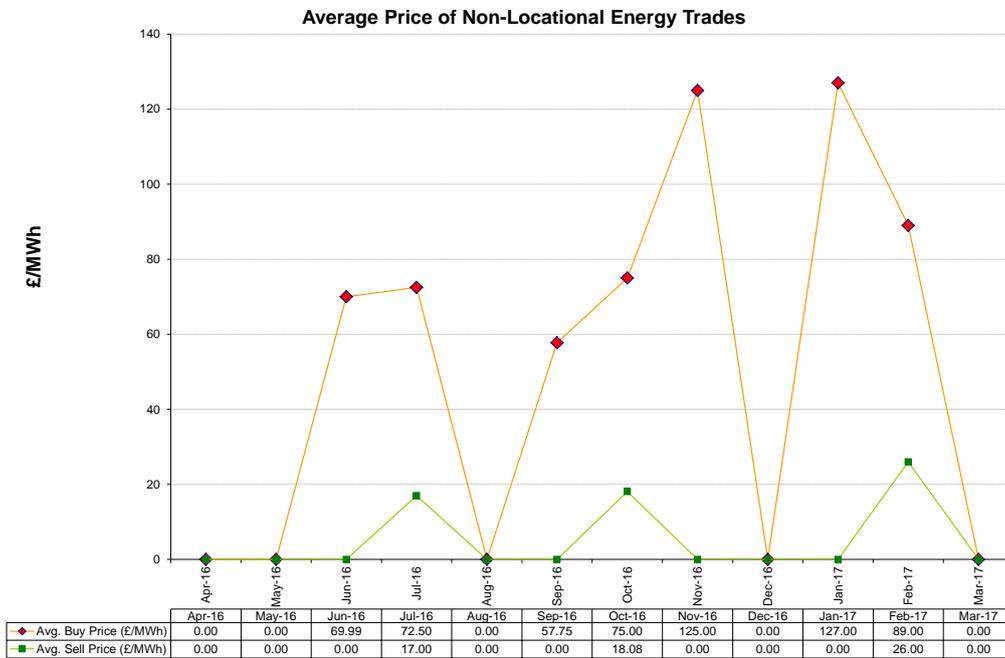
Non Locational	Volume (MWh)	Cost (£)
Buy Volume	13,252	£1,241,746.0
Sell Volume	-5,535	-£144,310.00
BMU Specific		
Buy Volume (MWh)	1,651,068	£153,831,194.2
Sell Volume (MWh)	-2,027,198	-£15,307,887.28
Net Total		£139,620,742.93

Forward Trade Buys and Sells



Procurement Guidelines Report

1 April 2016 to 31 March 2017

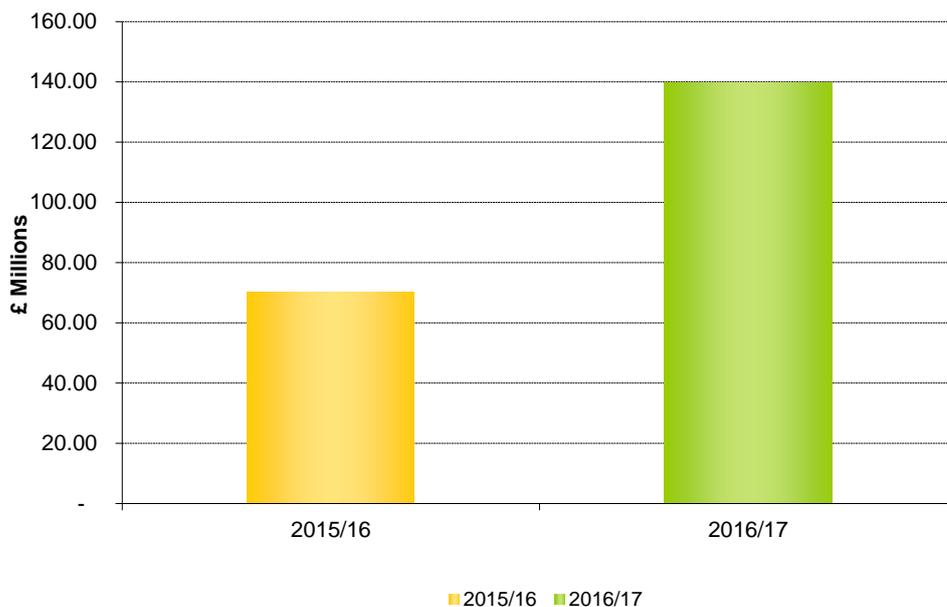


4.2 Trades Comparison with previous year

The changing system needs have led to a shift in the trading strategy over the past financial year. Overall, the absolute volume traded has continued to increase, seeing a 1,000GWH rise, reflecting National Grid's continued efforts to employ the most economic mechanism for energy balancing and system management. The split between BMU Specific trades and non-locational trades has seen a significant change with BMU Specific trades increasing by 70% and non-locational trades dropping by 61% year-on-year.

The drop in non-locational trading is largely due to an increase in BMU Specific trades undertaken on IFA and Britned displacing the need for some non-locational energy requirements. Both BMU specific purchases and sells have increased, by 100% and 50% respectively. This is in part due to the increase in the interconnectors meeting margin requirements, but also due to a higher number of instances of system constraints, especially Voltage and Inertia actions met locally by plant and by IFA and Britned.

Net Trading Costs £m



Further details are available on the National Grid Website

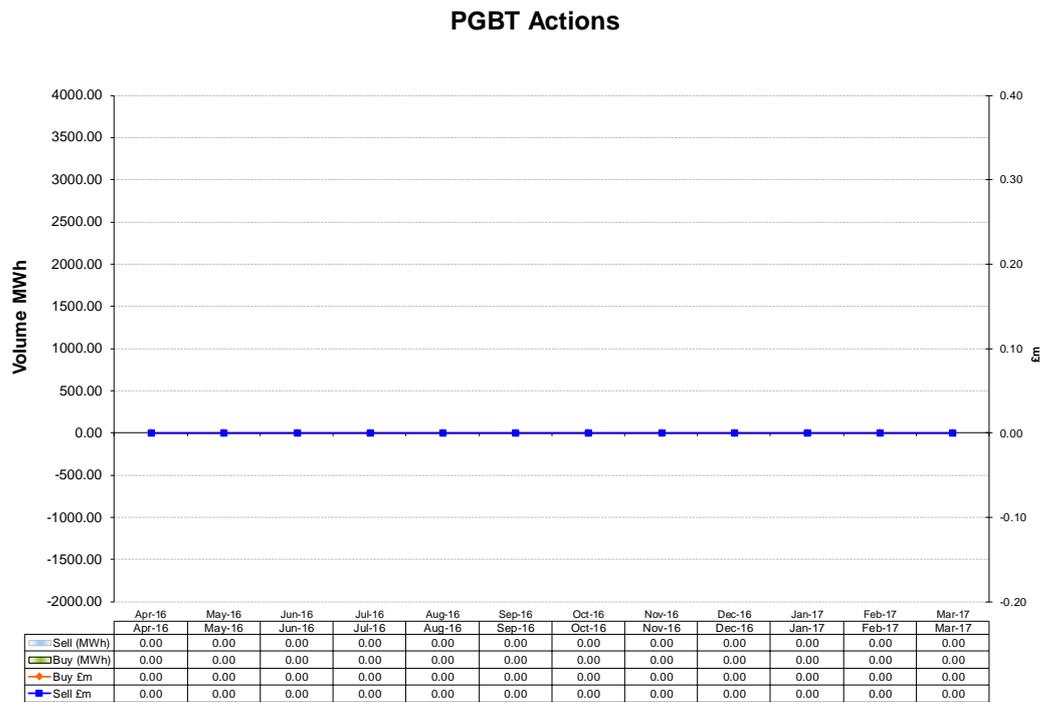
<http://www2.nationalgrid.com/UK/Services/Balancing-services/Trading/>

Procurement Guidelines Report

1 April 2016 to 31 March 2017

4.3 Pre-Gate BMU Transactions (PGBT)

Information on PGBT activity transactions is given in the chart below:



4.4 PGBTs Comparison with previous year

There were no Pre-Gate BMU Transactions undertaken in 2016/17.

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

<http://www.nationalgrid.com/uk/Electricity/Balancing/services/energyrelated/pgbt/>

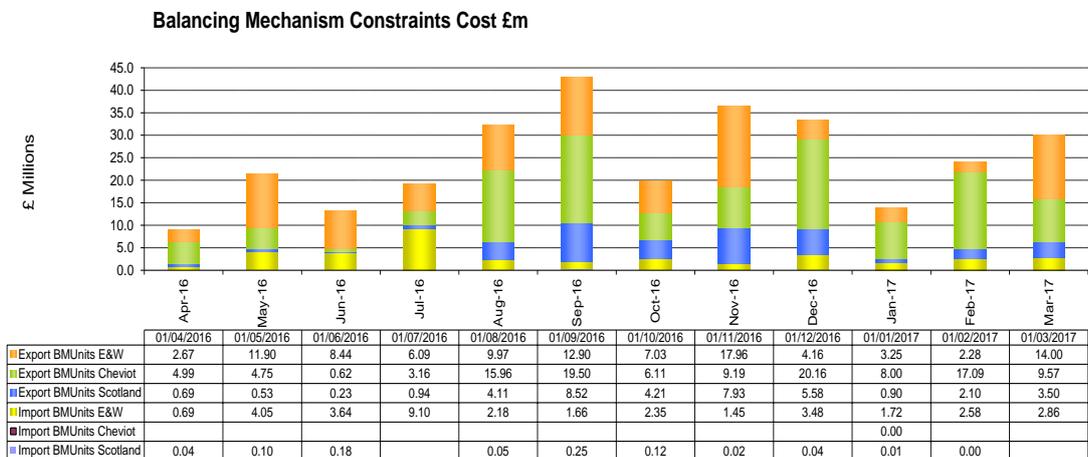
Procurement Guidelines Report

1 April 2016 to 31 March 2017

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 System to System Services (SO-SO). The costs of resolving constraints via intertrip contracts (see section 3.13) and bilateral contracts (see section 3.14) have already been explored.

Information on BM constraints activity for the year is given in the chart below



5.1 BM Constraints Comparison with previous year

BM Constraints Costs for reporting year 2016/17 out turned at £295.55m compared to £317.2m in 2015/16. This is a decrease from the previous financial year. However the constraint management spend is still sustained, mainly because of substantial capital investment schemes that reduce the capacity of the network. Other significant drivers behind the continued spend on network constraints, are unplanned outages, adverse weather conditions and high wind days.

Procurement Guidelines Report

1 April 2016 to 31 March 2017

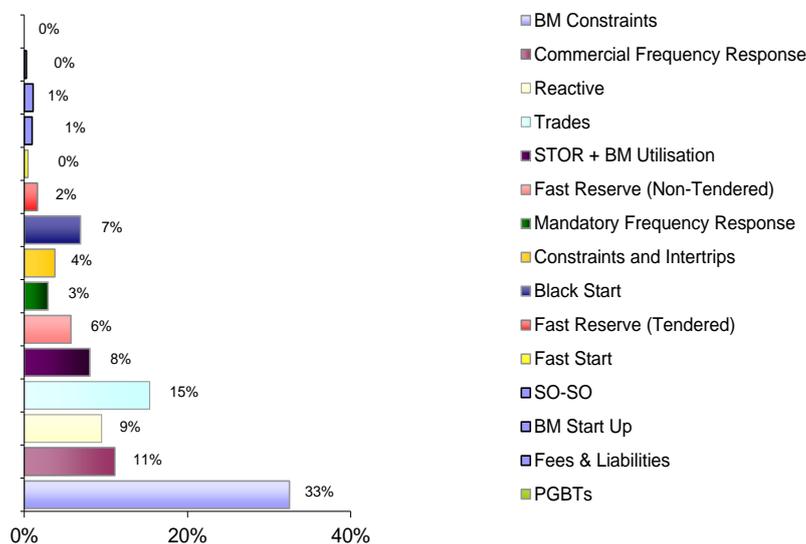
6. Summary

As a summary of financial activity, the following breakdown of balancing services costs is provided by category, for the financial year 2016/17.

6.1 Summary Chart

The information presented in the chart below is analysed in more detail in the relevant sections of this report.

Summary of Balancing Services Costs



6.2 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** and published via the <http://bmreports.com> website. These documents, along with the **Procurement Guidelines Report**, are published in accordance with Standard Condition C16 of the Transmission Licence and are available on National Grid's website.

6.3 Contact and Feedback

National Grid welcomes feedback on any aspect of this report including suggestions for future reports. For any comments please email Electricity Codes at soincentives@nationalgrid.com

7.1 Appendix 1: System to System Services Definitions

Initiator	Definition
NG buy from RTE	National Grid request to RTE for additional energy to GB
NG sell to RTE	National Grid request to RTE for reduced energy to GB
RTE sell to NG	RTE request to National Grid for additional energy to GB
RTE buy from NG	RTE request to National Grid for reduced energy to GB
NG buy from SONI	National Grid request to SONI for additional energy to GB
NG sell to SONI	National Grid request to SONI for reduced energy to GB
SONI sell to NG	SONI request to National Grid for Additional energy to GB
SONI buy from NG	SONI request to National Grid for reduced energy to GB.

RTE = Reseau de Transport de l'Electricite (*French electricity grid operator*)

NG = National Grid

SONI = System Operator Northern Ireland

Procurement Guidelines Report

1 April 2016 to 31 March 2017

7.2 Appendix 2: Table of Raw Data

Balancing Service	Info Provision	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Total costs £m	Total Value	
Reactive Power Market	Utilisation Volume (Market)	0	0	0	0	0	0	0	0	0	0	0	0		0GVAm	
	Utilisation Volume (Default)	2641	3035	2874	2814	2597	2507	2644	2265	2597	2555	2177	2645		31352 GVAm	
	Total Spend (Market)	0.00	0.00	0.00	0.02	0.02	0.03	0.03	0.00	0.09	0.09	0.09	0.09	0.45		
	Total Spend (Default)	5.97	6.81	6.39	6.39	6.24	6.19	7.03	6.84	9.60	9.18	6.93	8.16	85.73		
Short Term Operating Reserve(STOR)	Annual Average Availability Payments:	4.37	4.75	4.49	4.53	4.35	4.62	4.90	8.62	8.43	8.34	8.76	8.40		6.21	
Including BM and NBM Availability & Utilisation	Average Contracted Utilisation Payments	95.52	106.76	87.41	86.31	88.59	103.24	99.72	116.68	111.97	110.55	88.59	105.81	74.47	100.10	
	Total Spend in £m	3.70	3.64	4.12	4.04	4.12	5.55	5.70	9.07	8.80	9.40	7.26	9.07		148.94	
	Total Volume	12076	7778	15206	13992	13524	27733	29993	23225	18958	31383	17879	34567		246312.549MWh	
Mandatory Frequency Response	Holding Volumes & Prices:	P S H	P S H	P S H	P S H	P S H	P S H	P S H	P S H	P S H	P S H	P S H	P S H	Primary / Sec / High	Primary / Sec / High	
	Average Volume held MW	132 87 262	218 136 367	219 144 405	327 203 469	293 181 372	386 238 442	342 228 575	329 220 560	334 213 557	283 187 483	278 172 467	352 214 481	291 185 453	291 185 453	
	Average price €/MWh	2.28 1.9 4.26	2.32 1.89 4.33	2.32 1.9 4.09	2.33 1.86 4.18	2.24 1.8 4.01	2.31 1.81 4.21	2.37 1.84 4.22	2.28 1.81 4.09	2.12 1.76 4.1	2.18 1.71 3.94	2.07 1.74 4.05	1.99 1.68 3.96	2.24 1.81 4.12	2.24 1.81 4.12	
	Total Holding Spend	1.14	1.80	1.75	2.30	1.86	2.52	2.88	2.60	2.29	1.95	2.30	2.30	25.95		
	Total Response Energy Payment Spend	0.01	0.00	-0.01	0.09	0.11	0.26	-0.14	-0.03	0.08	0.04	0.05	0.11	0.57		
Commercial Frequency Response	Total Spend	10.26	8.92	8.77	9.23	9.68	9.89	7.42	7.22	7.59	7.83	7.12	6.78	100.70		
Fast Start	Total Spend	0.34	0.37	0.49	0.38	0.41	0.36	0.39	0.37	0.28	0.26	0.25	0.20	4.09		
Black Start	Total Spend	0.21	0.34	0.52	0.79	0.43	0.25	9.52	9.89	9.94	10.57	9.49	10.50	62.46		
BM Start Up	Total Cost of BM Start Up	0.20	0.17	0.21	1.27	1.94	1.58	0.84	0.82	0.49	0.74	0.53	0.98	9.77		
	Number of instructions	11	5	18	34	32	59	46	24	18	9	18	18	326		
Fast Reserve-Tendered	Total Spend on Availability & Utilisation	1.09	1.13	0.93	1.12	1.13	1.10	1.13	1.10	1.21	1.53	1.26	1.81	14.54		
Fast Reserve Non-Tendered	Total Spend on Availability & Utilisation	5.60	4.25	4.75	5.00	4.20	4.03	6.10	4.89	4.66	4.45	2.94	2.92	51.86		
SO to SO	Volume Imported	0	0	0	1	0	3	4	19	19	16	11	5		78GWh	
	Volume Exported	-2	-5	-3	-5	-1	-1	0	0	-1	-1	-2	-4		-24GWh	
	Total Spend	0.17	-0.15	0.26	0.11	0.32	0.20	1.06	2.24	1.96	1.78	0.79	-0.03	8.71		
System to Generator operational inter-trips	Capability Payments	0.11	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.11	1.33		
	Utilisation Payments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Total Spend	0.48	0.49	0.32	0.25	0.23	0.18	0.18	0.17	0.18	0.18	0.17	0.68	3.51		
Commercial Intertrip Service	Total Spend	1.41	7.20	4.88	4.84	4.73	1.40	1.48	0.33	0.72	0.46	0.31	1.56	29.31		
Ancillary Constraint Contracts	Total Spend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Maximum Generation Service	Total Spend	0.20	0.17	0.16	0.19	0.19	0.19	0.25	0.19	0.18	0.20	0.18	0.20	2.29		
All Other Services	Total Spend	9.07	21.33	13.11	19.29	32.27	42.83	19.82	36.55	33.42	13.89	24.04	29.94	295.55		
BM Constraints	Traded gross volume	40942	260189	396394	680829	710396	347177	309083	159816	212744	158425	157105	263955	3,697,053	3697053MWh	
Forward Trading	Net cost of forward trading	-0.01	3	16.54	17.81	19.73		8.61	21.37	15.32	11.55		7.73	139.62		
	OTC - Power Exchange & Energy															
	Buy Volume	0	0	2000	0	0	1840	483	4800	0	529	1840	0	11,492	11492MWh	
	Sell Volume	0	0	0	-274068.5	0	0	-5070	0	0	-315	0	-279,454	-279453.5MWh		
	OTC - BMU Specific															
	Buy Volume	0	72906	245192	274068.5	254237.5	130958	125854	104190	134794.5	119870	89512	99485	1,651,068	1651067.5MWh	
	Sell Volume	-40941.5	-187283	-149202	-404850	-456158.5	-214379	-177676	-50825.5	-77949	-38026	-65438	-164469.5	-2,027,198	-2027198MWh	
PGBT	No. of PGBT entered into:															
	Sourced	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	
	Agreed	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	
	Average PGBT Prices €/MWh:															
	Buy	0	0	0	0	0	0.00	0	0	0.00	0.00	0	0	0	0	
	Sell	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0.00	0(Monthly Avg)	
	Volume MWh:															
	Buy	0	0	0	0	0	0.00	0	0	0.00	0.00	0	0	0	0MWh	
	Sell	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0.00	0MWh	
	Total Cost of PGBT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total		39.94	59.63	63.28	73.25	87.73	86.30	70.47	103.73	97.19	74.56	71.72	83.13	£910.93m		

Procurement Guidelines Report

1 April 2016 to 31 March 2017