nationalgridESO

Procurement Guideline Report
FY 20-21

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Overview

Introduction

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 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.

What are "Balancing Services"?

Electricity can't be stored in large quantities, so we need to find ways to match supply with demand. That's part of National Grid's role. We call it "balancing", and we do it minute by minute.

We sometimes use balancing for other reasons, too, such as a sudden surge in demand during a televised sporting event, or if a power station suddenly stops generating because of a technical problem.

To help us with balancing, we buy in (procure) services from suppliers. These are "balancing services". We use them to keep the transmission system (or "grid") running in an efficient, economical and coordinated way. And that means everyone can get a steady flow of electricity.

For more detail about balancing, have a look at www.nationalgrideso.com, and then Balancing Services.

Why do we need this report?

We publish many statements and market reports about how we procure and use balancing services. You'll find these on our web site at www.nationalgrideso.com, under Balancing Services, then C16 statements and consultations.

We also want to give more details about the Balancing Services that National Grid has procured in the defined reporting period.

What's in the report?

This report shows the costs associated with balancing the system in order to keep electricity flowing steadily in FY20-21.

The report presents balancing costs in these main sections:

- services we've procured through the Balancing Mechanism.
- services we've procured through trading.
- services we've procured through ancillary services.
- services we've procured through SO-to-SO transactions.

Please note that the data in the different sections of this report have been processed independently to provide different insight and therefore small discrepancies are anticipated if data is compared between sections.

The report also presents information on all the balancing services supplied to National Grid. It uses charts and tables to show:

- which balancing services we've used in each month
- the volume for each service, month by month in megawatt hours (MWh) unless otherwise stated.
- the cost for each service, month by month in pounds sterling (£ million) usually to two decimal places.

We base the information on data we had when we published the report, to give an idea of what we've done in the year.

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

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

Balancing Costs categories included in this report

We use market arrangements or bilateral contracts to manage:

- Energy Imbalance
- Operating Reserve
- STOR
- Constraints
- Negative Reserve
- Fast Reserve
- Response
- Other Reserve
- Reactive
- Black Start
- Other

You can read more about our procurement guidelines on our web site at www.nationalgrideso.com, under Balancing Services, then C16 statements and consultations.

What are “Balancing Mechanism” (BM) and “non-Balancing Mechanism” (NBM) providers?

Because electricity cannot be stored, it needs to be generated at the time of demand. One of the tools National Grid uses to achieve the balancing act between electricity supply and demand at just the right time is called “balancing mechanism” (BM). It is the buying and selling of energy by National Grid Electricity Control Centre.

When an electricity generator, such as a power station or large wind farm, connects to the grid, we register it as a “balancing mechanism unit” (BMU). A BMU is used as a unit of trade in the BM and is the smallest grouping of plant or equipment that we can meter separately; therefore, a single generator might register as more than one BMU. Suppliers with BMUs are referred to as BM Suppliers.

When National Grid predicts that there will be a discrepancy between the amount of electricity produced and that which will be in demand during a certain time period, we may accept a ‘bid’ or ‘offer’ from a BMU to either increase or decrease generation (or demand).

In some instances, National Grid also uses balancing services supplied by companies not registered as BMUs. Those suppliers tend to be smaller generators, for example small wind farm with two or three turbines or a small conventional-fired unit. We call those suppliers “non-balancing mechanism” (non-BM) suppliers, and traditionally it has not been possible to change their output or usage within the BM timescales.

What we don’t include in the report

There are some details that we can’t publish here because:

- Contracts with suppliers of balancing services include confidentiality agreements.
- Data about some types of balancing services aren’t always available every month.

Information on bid and offer acceptances is in our Balancing Principles Statement at www.nationalgrideso.com, under Balancing Services, then C16 statements and consultations. More information is available from the Balancing Mechanism Reporting Service (BMRS) at www.bmreports.com.

2

Balancing Costs Summary

Overview of Balancing Costs

This section provides an overview of balancing costs we have incurred in.

The total spent to balance the system for the FY20-21 is £1850.49 m. This is the total cost charged to generators and suppliers through BSUoS. You can find a copy of our monthly BSUoS report on our ESO Data Portal. The figures in this report may differ to those in the BSUoS report due to updated data since the publication of the BSUoS report.

The cost is broken down to £1116.49 m spent in the Balancing Mechanism, £227.55 m spent on Trades, £523.86 m spent on Ancillary Services, -£2.74 m spent on SO-to-SO transactions, and -£14.66 m for system losses, non-delivery, and reconciliation costs.

Total balancing costs (£m)

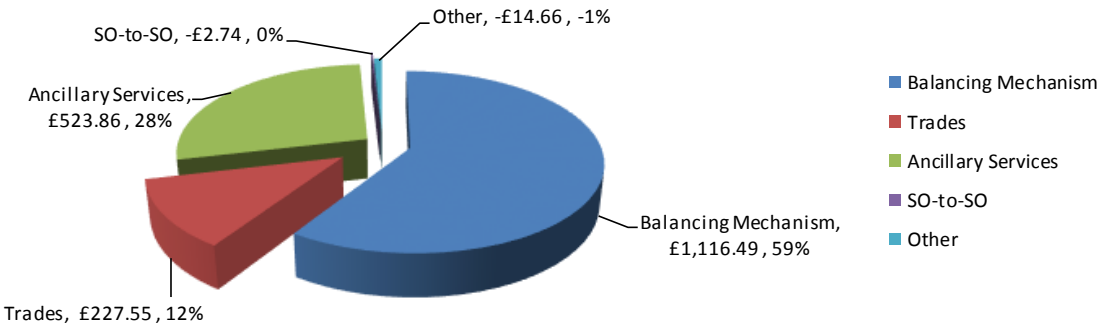
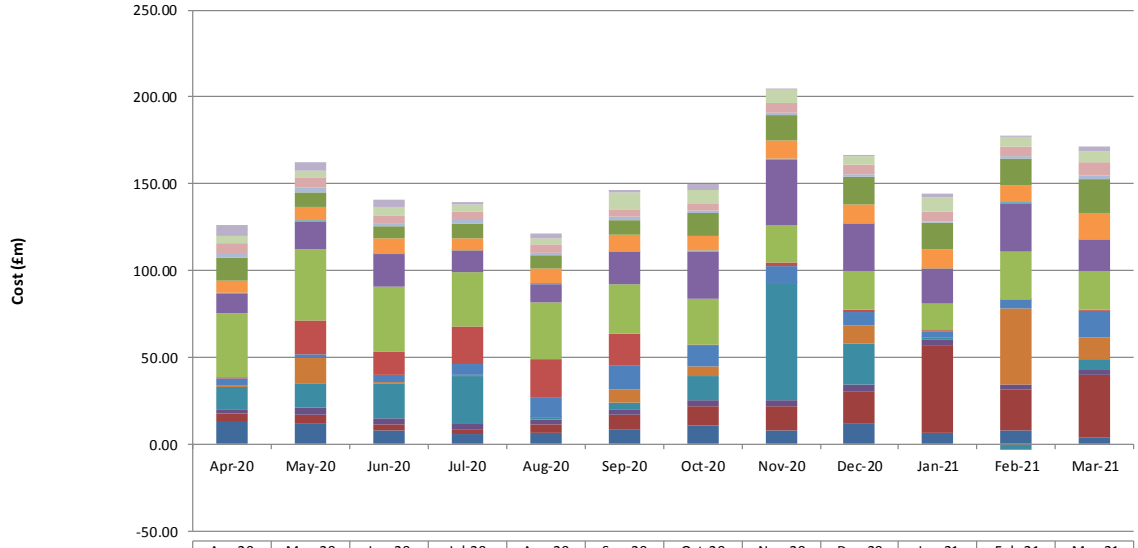


Figure 1

Total Balancing Services

The following graph shows the total balancing expenditure of £1325.16 m for the FY broken down by monthly balancing cost category in pounds sterling (£ million).

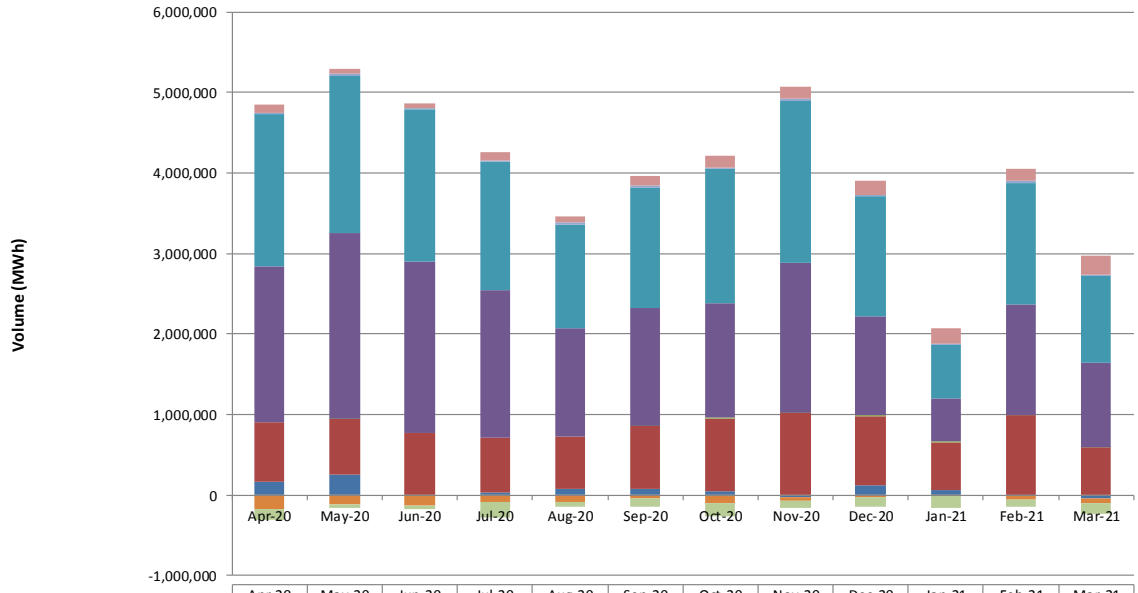
Total balancing cost by category



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Minor Components	6.57	5.16	4.04	1.82	2.59	1.73	2.98	0.95	0.93	2.40	0.29	3.01
Black Start	3.83	3.87	4.92	3.71	3.76	9.68	7.66	7.93	4.47	8.04	5.35	6.05
Reactive	6.34	5.84	4.83	4.65	4.51	4.13	4.47	5.33	5.86	5.39	5.56	7.61
Other Reserve	1.90	2.63	1.83	2.46	1.90	1.94	1.57	1.62	1.47	1.19	1.44	2.00
Response	13.26	8.69	7.00	8.13	7.21	8.21	12.64	14.42	15.56	15.05	15.29	20.07
Fast Reserve	7.39	7.79	8.75	7.06	8.45	9.67	8.91	10.52	10.98	11.36	10.27	14.70
Negative Reserve	0.58	0.62	0.22	0.17	0.50	0.55	0.52	0.35	0.28	0.05	0.29	0.18
Constrained Sterilised HR	10.71	15.68	18.90	12.55	10.41	18.60	27.16	37.59	27.10	19.74	27.85	18.03
ROCOF	37.21	41.50	37.16	31.11	32.91	28.63	26.43	21.93	22.28	15.52	27.83	22.18
Constraints - Ancillary	0.58	18.98	13.72	21.77	22.37	17.92	0.94	2.09	1.41	0.49	0.47	1.10
Constraints - Scotland	4.06	2.12	4.16	6.45	10.83	13.93	11.79	9.55	7.48	3.41	4.79	14.96
Constraints - Cheviot	1.09	15.04	0.38	0.38	0.52	7.84	5.40	0.39	10.87	0.31	43.91	12.42
Constraints - E&W	12.85	13.73	20.25	27.30	0.91	3.82	13.98	67.19	23.42	1.60	-3.47	6.25
STOR	2.36	3.92	3.41	3.14	2.73	2.66	3.13	3.80	4.10	3.02	2.72	2.86
Operating Reserve	4.95	4.80	3.75	3.13	4.83	8.73	11.07	13.76	17.96	50.30	23.44	36.16
Energy Imbalance	12.47	12.32	7.63	5.74	6.81	8.46	10.88	7.68	12.32	6.53	7.82	3.96

Figure 2

The following graph shows the monthly total balancing volume for the FY, broken down by balancing categories. For a more cohesive view of all the volumes utilised, please refer to individual balancing categories in Section 3.



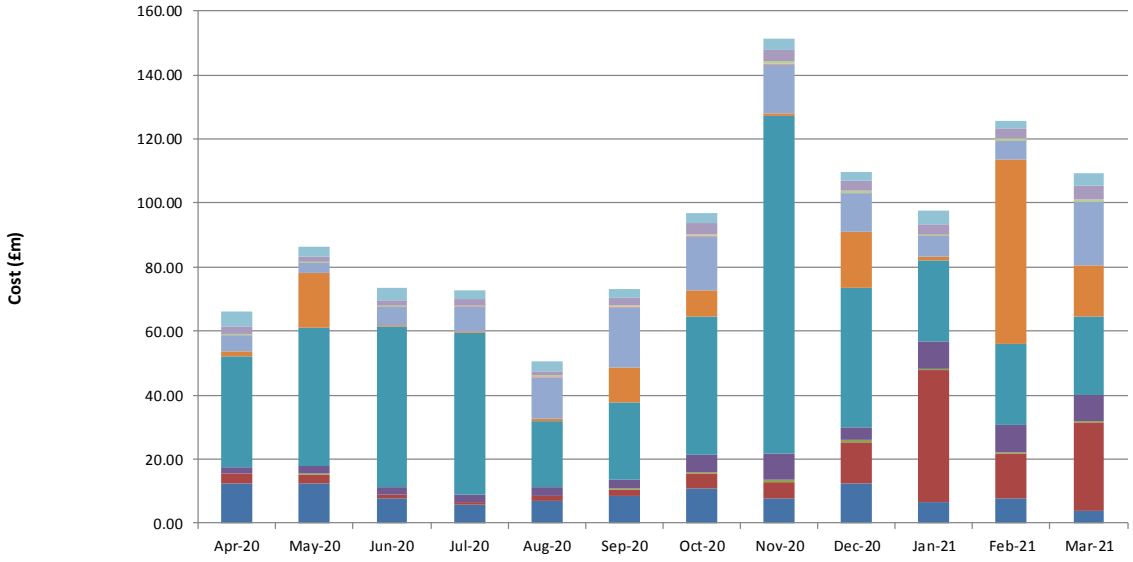
	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Minor Components	-123,350	-37,485	-46,435	-180,022	-58,190	-102,975	-174,065	-93,097	-114,512	-153,703	-94,572	-126,883
Response (Absolute- BM only)	101,006	67,474	55,105	103,743	70,271	127,789	141,899	150,257	172,751	191,948	150,539	230,109
Fast Reserve (BM only)	20,892	20,505	27,105	20,630	26,245	21,548	19,881	25,601	20,993	16,286	24,856	21,420
Negative Reserve	-179,009	-117,323	-124,688	-93,295	-87,938	-44,624	-93,963	-48,778	-26,560	-10,001	-38,338	-53,573
Constraint Margin Replacement	1,883,240	1,952,270	1,883,556	1,590,705	1,293,555	1,495,389	1,673,770	2,018,319	1,487,311	669,939	1,505,640	1,076,030
Constraints	1,936,884	2,309,930	2,124,845	1,842,352	1,350,137	1,465,987	1,419,485	1,855,379	1,228,681	531,684	1,372,439	1,044,987
STOR (BM only)	0	529	0	0	0	3,618	4,238	8,012	10,553	4,329	1,509	3,187
Operating Reserve	747,253	692,829	775,747	665,843	646,830	781,930	912,871	1,017,929	867,767	600,249	995,071	592,517
Energy Imbalance	161,945	254,260	-1,941	39,239	74,090	72,914	39,913	-25,268	113,579	57,771	-19,366	-48,094

Figure 3

Balancing Mechanism

This section provides a summary of costs incurred in the Balancing Mechanism for the reporting financial year. Total cost for the FY was £1116.49 m. The chart and table show the costs incurred in, and the volume used for each balancing category. For detail of the actions taken in the BM see Elexon's BMRS website www.bmreports.com.

Total balancing cost by category, in pounds sterling (£m)

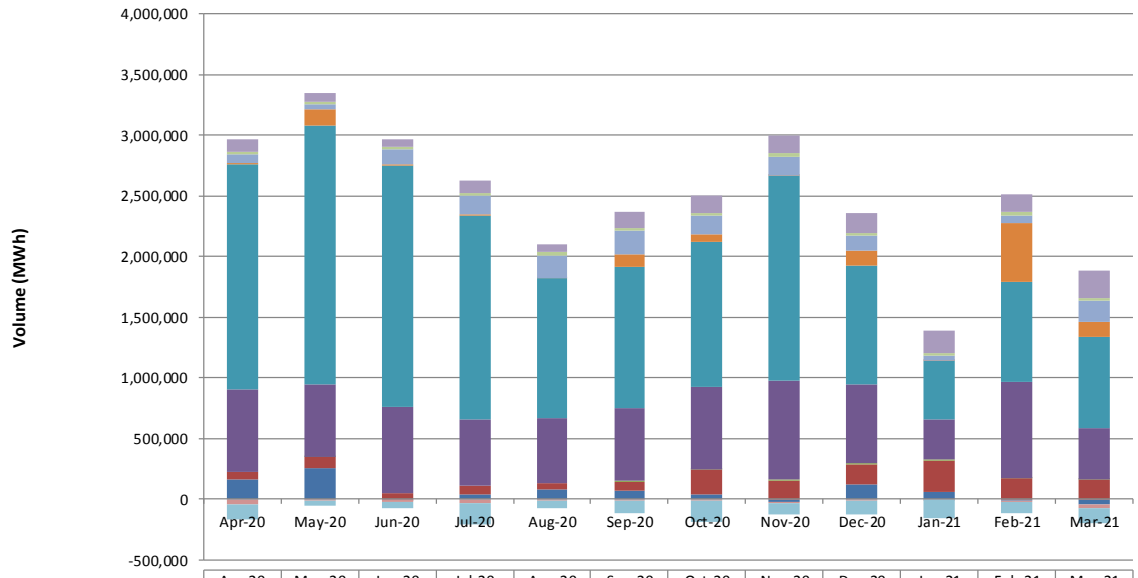


	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
BM - Minor Components	4.59	3.04	4.13	2.83	3.03	2.89	3.41	3.32	2.75	4.33	2.36	3.92
BM - Response	2.20	1.51	1.25	1.76	1.14	2.15	3.23	3.58	3.43	2.98	3.03	4.51
BM - Fast Reserve	0.41	0.38	0.54	0.32	0.38	0.39	0.62	0.79	0.60	0.58	0.83	0.78
BM - Negative Reserve	0.16	0.09	0.08	0.21	0.39	0.46	0.19	0.22	0.12	0.03	0.11	0.11
BM - Constraints Scotland	5.07	3.11	5.68	7.74	13.02	18.99	16.98	15.38	12.05	6.45	5.77	19.66
BM - Constraints Cheviot	1.49	17.12	0.53	0.51	0.60	10.74	7.91	0.86	17.24	1.35	57.57	15.93
BM - Constraints E&W	34.60	43.37	50.15	50.59	20.63	23.96	43.34	105.52	43.70	25.19	25.15	24.43
BM - Constrained Margin	2.11	2.38	2.49	2.09	2.62	2.96	5.52	7.82	3.82	8.63	8.84	8.47
BM - STOR	0.00	0.04	0.00	0.00	0.00	0.20	0.39	0.99	1.11	0.44	0.16	0.36
BM - Operating Reserve	2.82	2.99	1.13	0.97	1.70	2.06	4.64	5.15	12.67	40.98	13.97	27.34
BM - Energy balancing	12.49	12.31	7.65	5.77	6.90	8.47	10.77	7.58	12.39	6.69	7.88	3.98

Figure 4

The graph below provides the summary of the volumes utilised in the Balancing Mechanism for the reporting FY.

Balancing Mechanism volume, in megawatt hours MWh



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
BM - Minor Components	-122,849	-38,135	-46,147	-179,494	-56,041	-101,844	-176,508	-94,140	-112,170	-150,444	-93,497	-126,458
BM - Response	101,006	67,474	55,105	103,743	70,271	127,789	141,899	150,257	172,751	191,948	150,539	230,109
BM - Fast Reserve	20,892	20,505	27,105	20,630	26,245	21,548	19,881	25,601	20,993	16,286	24,856	21,420
BM - Negative Reserve	-45,873	-16,883	-24,648	-32,792	-15,986	-13,481	-9,440	-7,975	-10,591	-8,501	-6,038	-25,498
BM - Constraints Scotland	67,721	38,660	124,972	146,353	184,299	201,283	157,118	158,790	117,164	38,171	67,191	175,579
BM - Constraints Cheviot	12,933	139,958	5,771	12,801	5,171	104,576	62,484	4,000	122,503	6,014	480,020	122,310
BM - Constraints E&W	1,856,230	2,131,312	1,994,102	1,683,198	1,156,039	1,160,127	1,199,883	1,692,589	989,014	487,499	825,227	747,099
BM - Constrained Margin	676,470	600,654	708,116	547,734	527,051	602,586	676,862	815,178	644,855	327,964	796,355	424,719
BM - STOR	0	529	0	0	0	3,618	4,238	8,012	10,553	4,329	1,509	3,187
BM - Operating Reserve	64,418	91,489	48,066	68,237	58,248	71,218	201,712	148,233	169,701	258,035	168,504	158,751
BM - Energy balancing	162,446	254,837	-1,653	39,767	76,812	72,989	37,065	-27,023	115,207	61,029	-18,291	-47,669

Figure 5

For Figure 5 and Figure 3, the volumes represented are defined below:

Category	Volume Definition	Comment
Energy Balancing	Net Volume	Positive and Negative volumes
Operating Reserve	Gross Volume	Positive volumes only
STOR	Absolute Volume	Positive and Negative volumes
Constrained Margin	Gross Volume	Positive volumes only
Constraints (all regions)	Absolute Volume	Positive and Negative volumes
Negative Reserve	Gross Volume	Negative volumes only
Fast Reserve	Net Volume	Positive and Negative volumes
Response	Absolute Volume	Positive and Negative volumes
Other	Net Volume	Positive and Negative volumes

Trading

This section includes information about forward trading, including non-locational and BMU-specific trading.

We use two categories of trading:

- forward trading – negotiated bilateral contracts. Our trading requirements are often not met by standard products, usually because we are trading for a specific location or aiming to achieve a specific level of generation/demand or flow on the network. Therefore, we will often contact counterparties directly to negotiate a trade with defined parameters. These bilateral trades can either take place with interconnector or BMU specific counterparties
- energy balancing contracts – agreements for services that help us balance the system; we use these mainly when a power plant stops working or produces less energy than expected.

You'll find more detail on our ESO Data Portal under Trade Data .

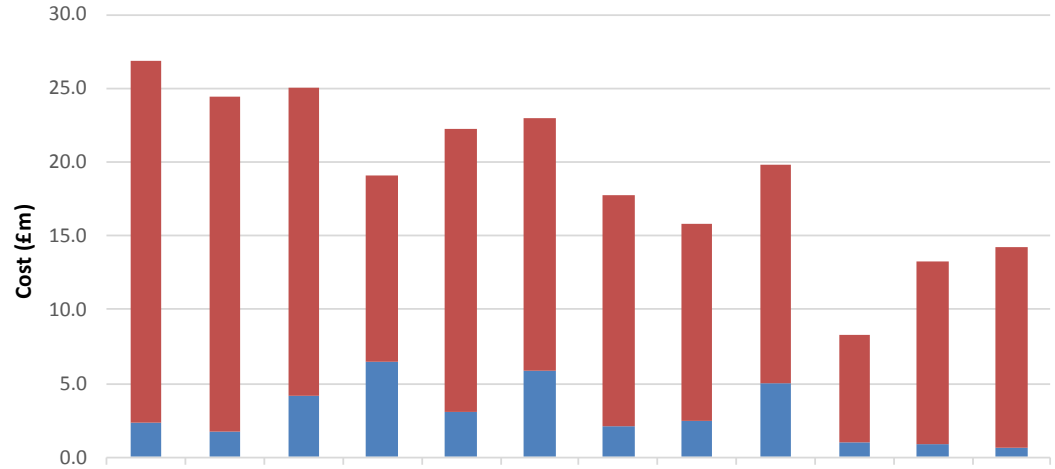
Forward Trading

We sometimes buy or sell electricity (in advance of the balancing mechanism process), called "forward trading". It helps us balance the system and manage system issues ahead of real time.

The total cost of forward trading was: £229.7m

The absolute volume of forward trades: 8,154,916 MWh

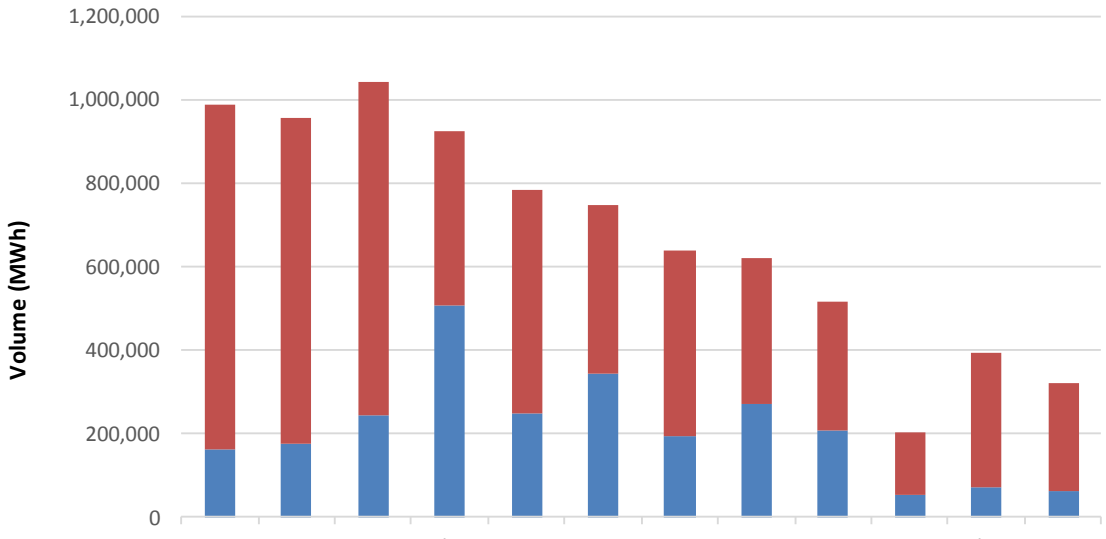
Forward trading cost, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Sell Cost	24.4	22.8	20.9	12.6	19.1	17.1	15.6	13.3	14.7	7.3	12.4	13.5
Buy Cost	2.4	1.7	4.2	6.5	3.1	5.9	2.1	2.5	5.0	1.0	0.8	0.7

Figure 6

Forward trading volumes, in megawatt hours (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Sell Volume	826502.5	778371.1	802002.0	416644.2	537183.1	405483.7	445318.9	352056.7	311074.0	150038.0	322116.5	259036.0
Buy Volume	164805.0	177907.0	244259.5	509378.0	248423.0	343137.0	194705.0	270219.0	207977.5	53455.00	71633.50	63189.50

Figure 7

Ancillary Services

We sometimes enter into extra contracts with suppliers to help us manage electricity grid issues. We call these “Ancillary Services” sometime abbreviated to AS. The total amount we spent on Ancillary Services in the reporting FY was £523.86m.

A guide to the Ancillary Services we procure can be found on our website at **www.nationalgrideso.com**. Look under Balancing services, Balancing Services overview.

Summary of Ancillary Services cost, in pounds sterling (£m)

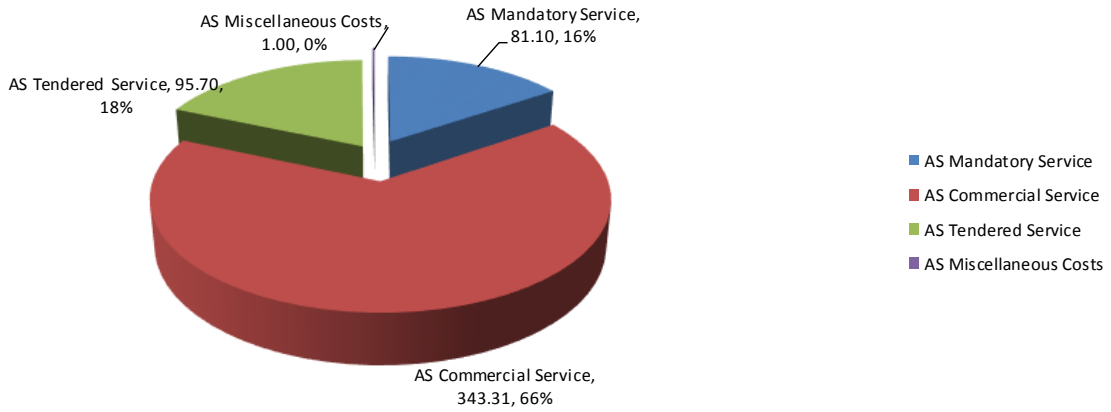
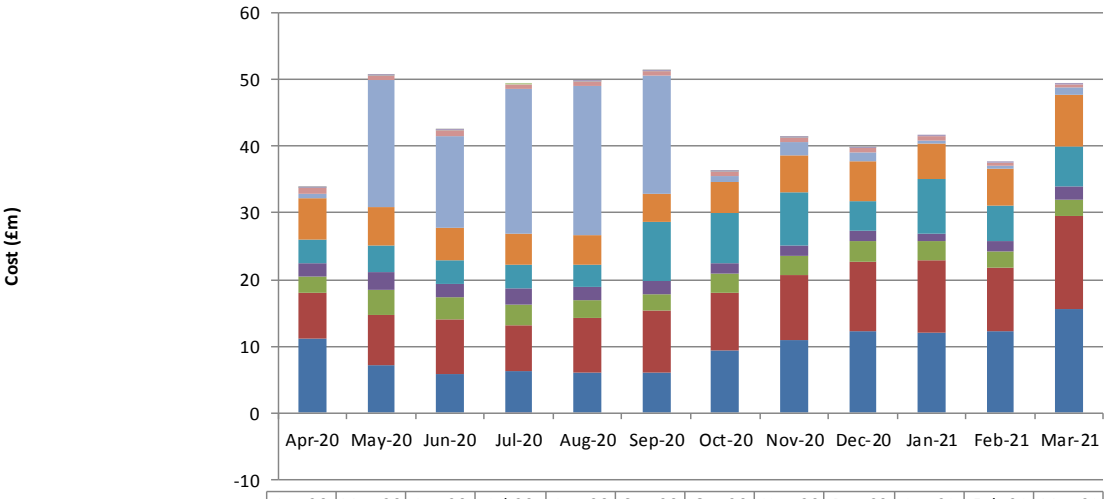


Figure 8

The chart divides the costs into “mandatory”, “commercial”, and “tendered” service types. Tendered costs are attributed to our tendered services frameworks, for example Firm Frequency Response, Fast Reserve and STOR. Mandatory costs are for Ancillary Services that participants are required to provide under the Grid Code, or as part of their connection agreement, for example reactive power, and some types of generator intertrip. Commercial services cover Ancillary Service contracts that are not part of our tendered services frameworks, for example black start costs.

Summary of Ancillary Services costs, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - Outstanding Liabilities	0.13	0.21	0.10	-0.05	0.09	0.09	0.03	0.03	0.03	0.03	0.04	0.25
AS - Other Ancillary Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS - SO-SO Costs	0.91	0.75	0.92	0.60	0.61	0.62	0.64	0.62	0.61	0.63	0.54	0.59
AS - Constraints	0.58	18.98	13.72	21.77	22.37	17.84	0.94	2.09	1.41	0.49	0.47	1.10
AS - Reactive	6.39	5.89	4.88	4.69	4.56	4.20	4.55	5.42	5.94	5.39	5.56	7.61
AS - Black Start	3.54	3.85	3.62	3.43	3.33	8.86	7.58	7.93	4.47	8.04	5.35	6.05
AS - Other Reserves	1.90	2.63	1.83	2.46	1.90	1.94	1.57	1.62	1.47	1.19	1.44	2.00
AS - STOR	2.41	3.97	3.48	3.23	2.78	2.49	2.89	2.99	3.20	2.93	2.56	2.50
AS - Fast Reserves	6.98	7.41	8.21	6.74	8.09	9.27	8.59	9.73	10.38	10.80	9.44	13.92
AS - Response	11.06	7.19	5.76	6.37	6.08	6.07	9.41	10.85	12.21	12.07	12.26	15.56

Figure 9

The left-hand column shows the type of service we are providing the costs for. You'll find explanations of these on our website at nationalgrideso.com. Look under Balancing services.

Ancillary Services from non-BM providers

As referenced previously, there are a number of participants that are not registered to participate in the BM but can provide Ancillary Services. Costs associated with these providers include availability (or contract) costs and utilisation costs and are reported within the Ancillary Services cost categories.

Non-BM participants currently provide the following services:

- Frequency Response
- Short-term Operating Reserve (STOR)
- Fast Reserve

'AS – Miscellaneous' costs relate to other Ancillary costs, such as liabilities, currency adjustments and costs associated with trading.

Ancillary Services from Non-BM and BM providers, £ million

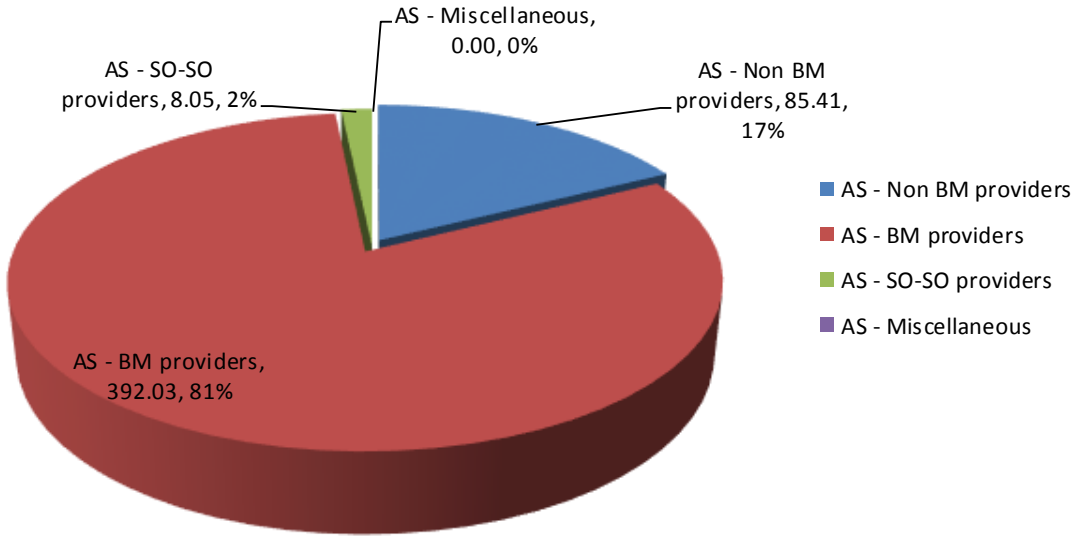
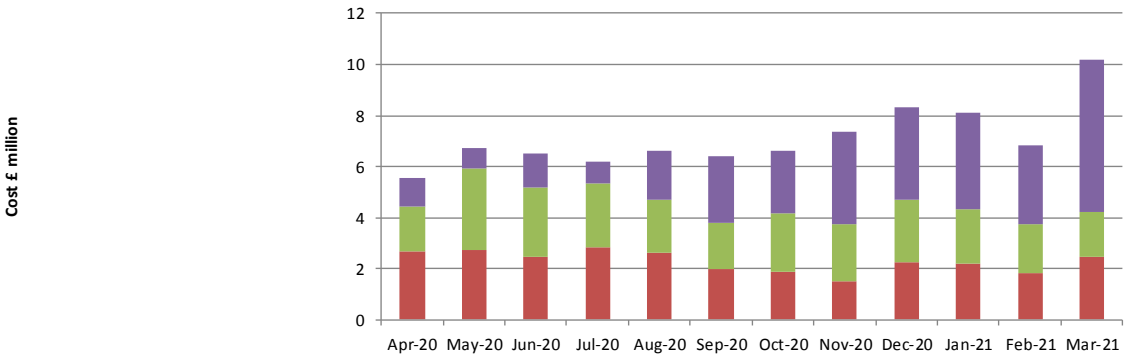


Figure 10

There's more detail about the services from by non-BM providers on our website at www.nationalgrideso.com. Look under Balancing services, then Demand Side Response.

Ancillary Services costs from non-BM providers, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
NBM - Fast Reserve	1.09	0.80	1.33	0.84	1.92	2.61	2.46	3.60	3.63	3.81	3.09	6.01
NBM - Short-term operating reserve (STOR)	1.77	3.21	2.71	2.51	2.04	1.81	2.31	2.25	2.44	2.15	1.89	1.74
NBM - Frequency Response	2.67	2.72	2.47	2.84	2.64	2.00	1.87	1.51	2.25	2.17	1.83	2.46

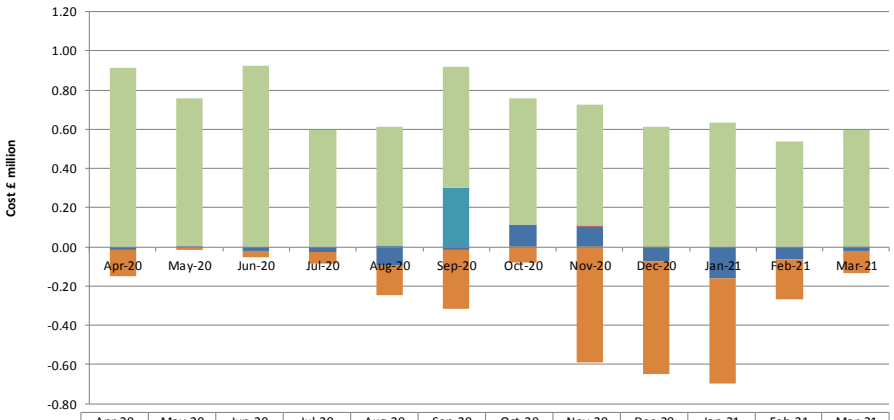
Figure 11

SO-SO Services

SO-SO services are provided by other System Operators, the costs will be negative if we receive any revenue for providing balancing services to other System Operators.

The total amount we spent on SO-SO services in the reporting FY was £5.31 m.

BM and Ancillary Services costs from SO-SO providers, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - SO-SO Interconnector Capability (Commercial)	0.91	0.75	0.92	0.60	0.61	0.62	0.64	0.62	0.61	0.63	0.54	0.59
SO-SO Constraints	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO Invoked by External Parties	-0.13	-0.02	-0.03	-0.06	-0.15	-0.30	-0.08	-0.59	-0.58	-0.54	-0.21	-0.11
SO-SO Ramping	0.00	0.00	0.00	0.00	0.01	0.30	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO Footroom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO Constrained Margin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO Margin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO Energy Trades	-0.02	0.00	-0.02	-0.02	-0.10	-0.02	0.12	0.10	-0.07	-0.16	-0.06	-0.02

Figure 12

3

Balancing Costs Detail

Balancing Categories

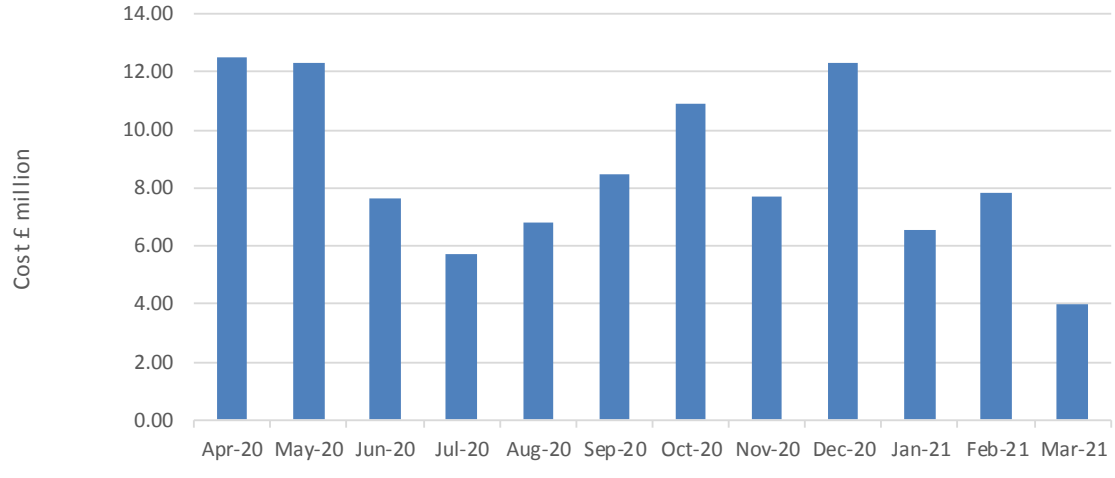
Energy Imbalance

Definition

Energy imbalance is the difference between the amount of energy generated in real time, the amount of energy consumed during that same time, and the amount of energy sold ahead of the generation time for that specific time period. The monthly energy imbalance cost can be negative or positive depending whether the market was predominantly long or short. For further information on energy imbalance see the Elexon website at www.elexon.co.uk/operations-settlement/.

Energy Imbalance Volume and Expenditure

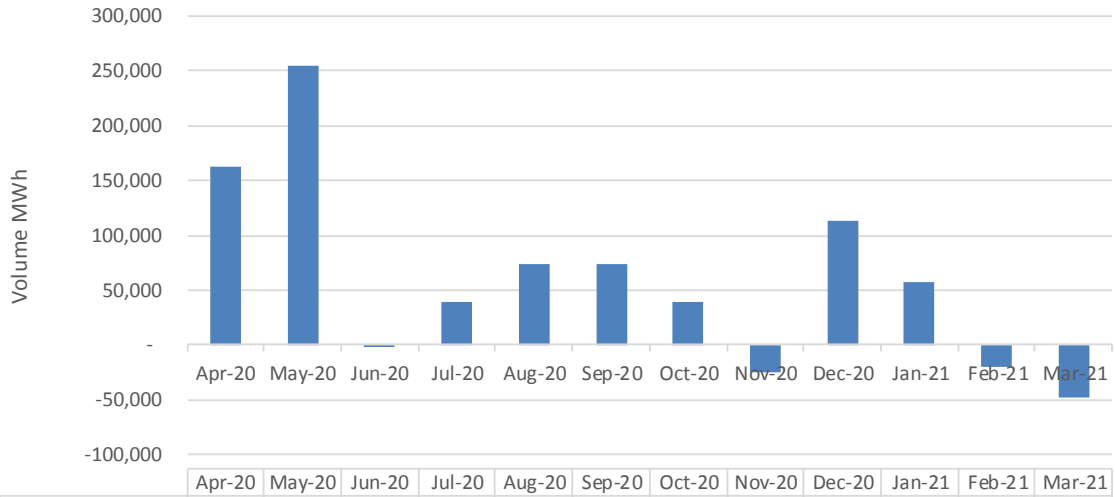
Energy Imbalance, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Energy Imbalance	12.47	12.32	7.63	5.74	6.81	8.45	10.88	7.68	12.32	6.53	7.82	3.96

Figure 13

Energy Imbalance volume, in megawatt hours (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Energy Imbalance	161,945	254,260	-1,941	39,239	74,090	72,914	39,913	-25,268	113,579	57,771	-19,366	-48,094

Figure 14

Operating Reserve

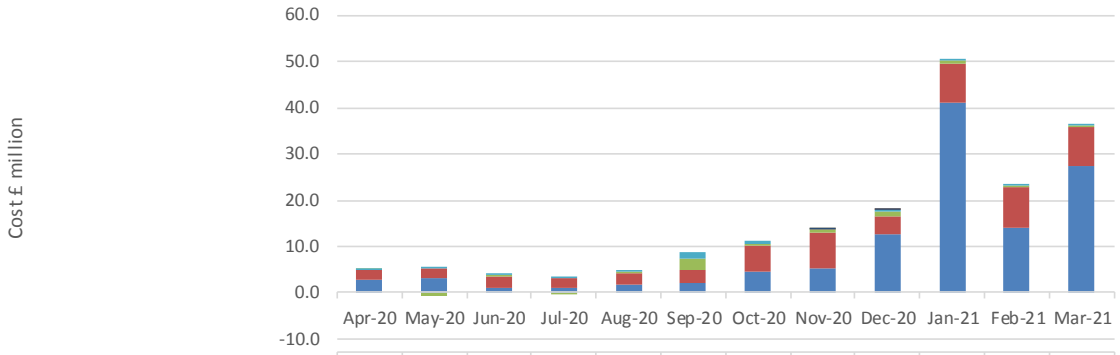
Definition

This section covers Positive Reserve that is managed in the BM, through trades, or SO-SO services. Positive Reserve is required to operate the transmission system securely and provides the reserve energy required to meet the demand when there are shortfalls, due to demand changes or generation breakdowns.

Operating Reserve Volume and Expenditure

The charts show the cost of managing Operating Reserve across the BM, trading and SO-SO services. Constrained Operating Reserve is the additional cost of maintaining sufficient reserve levels caused by system constraints. For example, the option to maintain Operating Reserve on generation in one part of the network might be removed because of a system constraint that limits the energy that can be exported from that area. This reduces the reserve options available and potentially increases the cost.

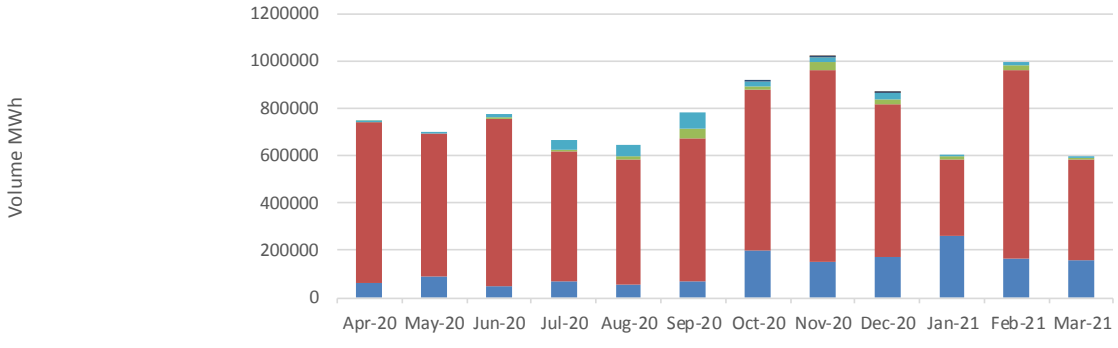
Operating Reserve, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
SO-SO - Constrained Operating Reserve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO - Operating Reserve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trade - Constrained Operating Reserve	0.01	0.05	0.05	0.29	0.38	1.25	0.39	0.20	0.44	0.13	0.15	0.12
Trade - UTEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trade - Operating Reserve	0.01	-0.62	0.09	-0.22	0.14	2.43	0.51	0.58	1.02	0.57	0.48	0.23
BM - Constrained Operating Reserve	2.11	2.38	2.49	2.09	2.62	2.96	5.52	7.82	3.82	8.63	8.84	8.47
BM - Operating Reserve	2.82	2.99	1.13	0.97	1.70	2.06	4.64	5.15	12.67	40.98	13.97	27.34

Figure 15

Positive Reserve volume, in megawatt hours MWh



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
SO-SO - Constrained Operating Reserve	-	-	-	-	-	-	405	289	480	-	-	-
SO-SO - Operating Reserve	-	-	-	-	-	-	-	423	234	-	-	-
Trade - Constrained Operating Reserve	5,463	687	14,425	39,042	47,354	65,457	20,813	24,015	27,015	4,864	11,971	4,580
Trade - UTEV	-	-	-	-	-	-	-	-	-	-	-	-
Trade - Operating Reserve	903	-	5,141	10,830	14,178	42,670	13,079	29,792	25,483	9,386	18,241	4,468
BM - Constrained Operating Reserve	676,470	600,654	708,116	547,734	527,051	602,586	676,862	815,178	644,855	327,964	796,355	424,719
BM - Operating Reserve	64,418	91,489	48,066	68,237	58,248	71,218	201,712	148,233	169,701	258,035	168,504	158,751

Figure 16

STOR

Definition

Short-term Operating Reserve (STOR) allows us to have extra power in reserve for when we need it. It helps us meet extra demand at certain times of the day or if there's an unexpected drop in generation.

The requirement for STOR is dependent upon the demand profile at any time. The STOR year starts in May, and is split into six seasons, which specify the Availability Windows where STOR is required each day.

National Grid aims to procure a minimum of 1800MW of STOR per year (subject to economics). Forecasting demand is getting more difficult due to the growth of intermittent wind and solar generation. STOR is therefore being increasingly used to ensure that imbalances on the system can be managed

You can find more detail about STOR, and the timetable for future tenders, on the ESO Data Portal, under Ancillary Services and then Short Term Operating Reserve.

Paying for STOR

We procure short-term operating reserve (STOR) through competitive procurement. To make sure we have enough STOR available through the year, we procure suppliers that are both BM and no-BM participants.

We make two kinds of payments to suppliers:

- availability payments – these are what we pay to suppliers to be available to supply STOR to us at certain times. Both BM and non-BM participants are paid for availability.
- utilisation payments – we pay non-BM participants these for using the STOR service.

We don't make utilisation payments for BM STOR as an ancillary service; we pay for that through the BM bids and offers process. But we've included it in this report so we can show the total amount we've spent on STOR.

STOR Volume and Expenditure

Table 1 shows the mean STOR available and contracted for the year to April 2021. Utilisation prices are no longer fixed in advance but determined on the day.

The year to April 2021 corresponds to STOR year 14. Each STOR year has six seasons. The STOR available during this year was contracted in tender rounds 11 and 12 (during 2010) and rounds 34 to 39 (2018 to 2019). The mean STOR contracted for year 14 was 2090 MW.

STOR Volumes and Prices: mean for 2020-2021

	Outturn	Contracted
Volume weighted average availability price	£4.35/MWh	£3.71/MWh
Volume weighted average utilisation price	N/A	N/A
Megawatts available	2,031 MW	2,090 MW

Table 1

The total amount we spent on the utilisation and availability for BM and non-BM STOR providers in the reporting financial year was:

- £39.12 m

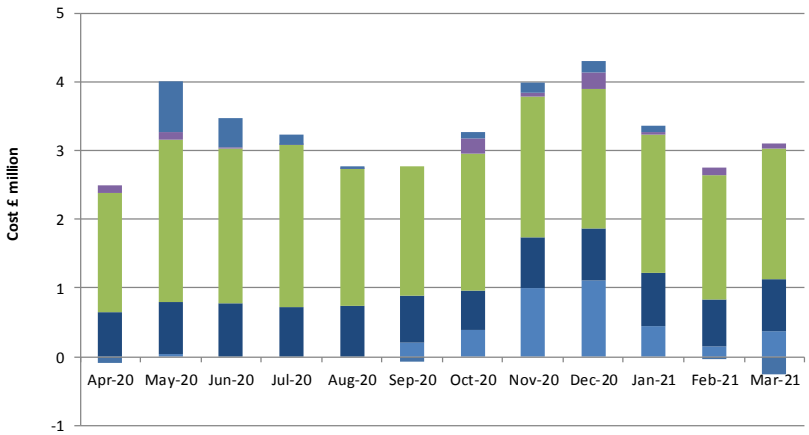
That total cost breaks down into:

- £12.30 m to BM STOR providers
- £26.82 m to Non-BM STOR providers

For further information, please see our website:

https://www.nationalgrideso.com/balancing-services/reserve-services/short-term-operating-reserve-stor?market-information

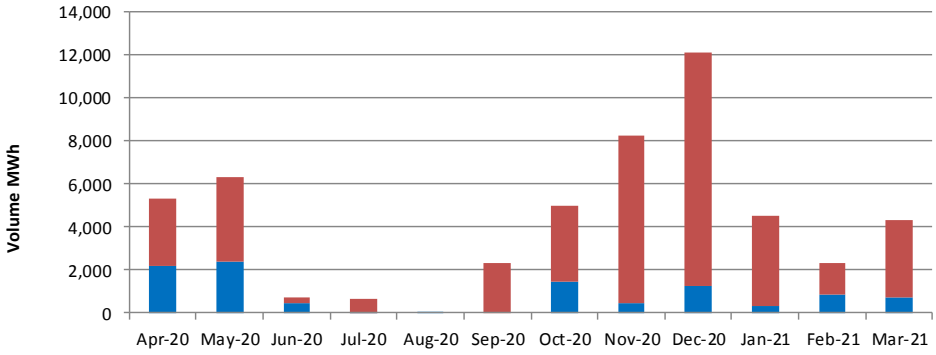
Total Non-BM and BM STOR cost, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - NBM Season/Term Reconciliation (Tendered)	-0.08	0.73	0.44	0.15	0.04	-0.08	0.11	0.15	0.18	0.10	-0.04	-0.25
AS - BM Season/Term Reconciliation (Tendered)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS - NBM STOR utilisation (Tendered)	0.11	0.12	0.02	0.00	0.00	0.00	0.22	0.06	0.23	0.04	0.11	0.08
AS - NBM STOR availability (Tendered)	1.74	2.36	2.25	2.36	2.00	1.89	1.99	2.05	2.03	2.01	1.81	1.91
AS - BM STOR (Tendered)	0.64	0.76	0.77	0.72	0.74	0.69	0.58	0.74	0.77	0.78	0.67	0.76
BM - STOR	0.00	0.04	0.00	0.00	0.00	0.20	0.39	0.99	1.11	0.44	0.16	0.36

Figure 17

Tendered STOR utilisation volume, in megawatt hours (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - BM STOR utilisation (Tendered)	3,148	3,945	238	650	-	2,303	3,511	7,793	10,900	4,158	1,509	3,603
AS - NBM STOR utilisation (Tendered)	2,166	2,387	469	16	1	-	1,465	437	1,230	348	839	745

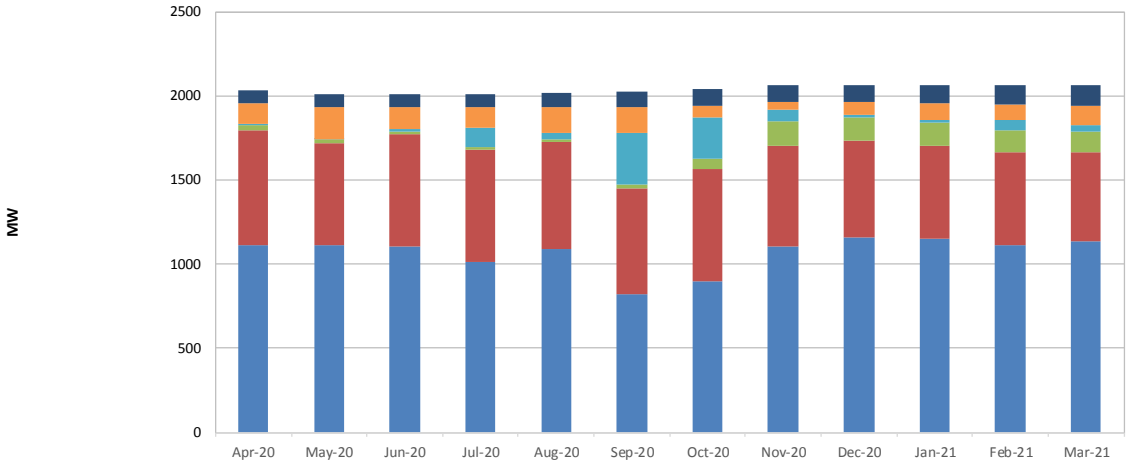
Figure 18

The total volume of STOR we used in the financial year was:

- 51,862 MWh

The graphs below show the volume of BM and non-BM STOR, which was made available to use in window 1, window 2 and window 3.

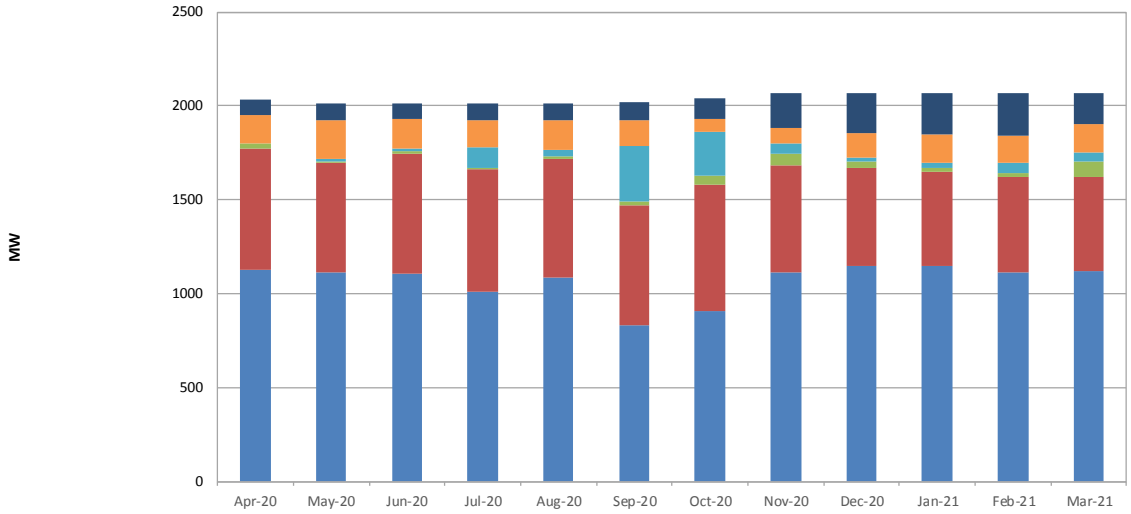
Average STOR availability volume, in megawatts (MW) – Window 1



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Flexible Unavailability	75	80	80	81	83	88	96	99	102	107	114	123
NBM Committed Unavailability	122	189	131	126	156	154	74	52	75	100	97	119
BM Unavailability	9	5	12	109	33	306	242	63	16	22	60	36
Flexible Rejected	0	0	0	0	0	0	0	0	0	0	0	0
Flexible Accepted	32	18	18	17	15	23	62	145	142	137	130	121
NBM Committed	678	608	666	671	641	632	667	599	576	551	554	532
BM Availiability	1116	1114	1107	1010	1086	820	900	1108	1155	1149	1110	1134

Figure 19

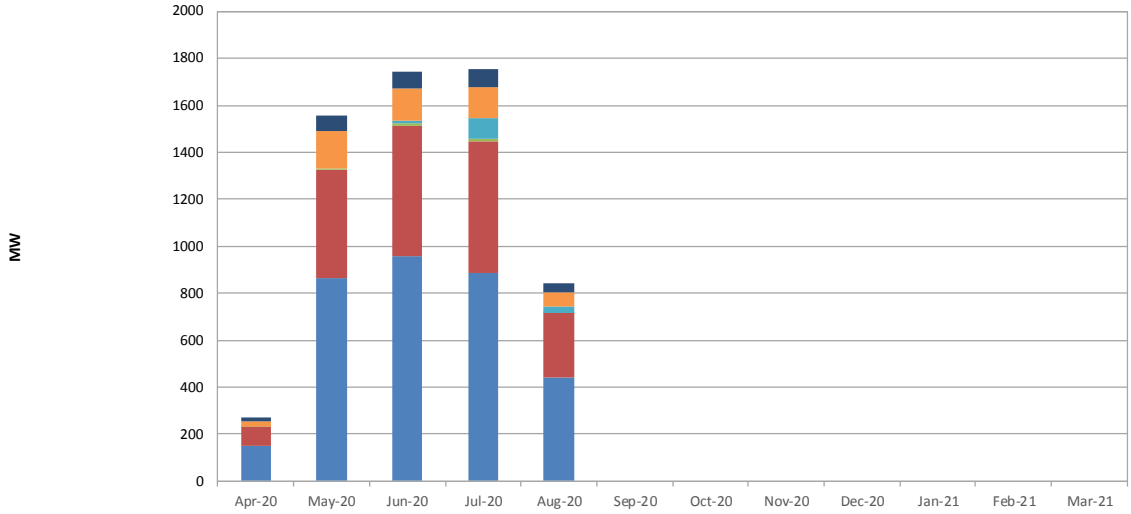
STOR availability volume, in megawatts (MW) – Window 2



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Flexible Unavailability	82	88	86	88	88	95	112	183	210	220	223	163
NBM Committed Unavailability	153	211	157	148	163	142	68	80	127	151	142	148
BM Unavailability	0	8	11	106	34	296	233	59	23	24	59	48
Flexible Rejected	0	0	0	0	0	0	0	0	0	0	0	0
Flexible Accepted	25	10	12	10	10	16	46	61	34	24	21	81
NBM Committed	647	586	640	649	634	644	672	571	524	500	509	503
BM Availiability	1125	1111	1108	1013	1086	830	909	1112	1148	1147	1111	1122

Figure 20

STOR availability volume, in megawatts (MW) – Window 3 (Season 2 only April-August)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Flexible Unavailability	12	67	74	76	40	0	0	0	0	0	0	0
NBM Committed Unavailability	25	159	136	133	62	0	0	0	0	0	0	0
BM Unavailability	0	0	11	89	28	0	0	0	0	0	0	0
Flexible Rejected	0	0	0	0	0	0	0	0	0	0	0	0
Flexible Accepted	1	9	11	9	2	0	0	0	0	0	0	0
NBM Committed	81	458	555	561	272	0	0	0	0	0	0	0
BM Availiability	149	866	959	886	442	0	0	0	0	0	0	0

Figure 21

Negative Reserve

Definition

A Negative Reserve service can provide the flexibility to reduce generation or increase demand to ensure supply and demand are balanced. The service is held in reserve to cover unforeseen fluctuations in demand, or generation from demand side PV and wind.

Paying for Negative Reserve

The Negative Reserve in this section is paid for through the BM, trades and SO-SO. There are Ancillary Services that are used to offset the cost of Negative Reserve (for example, demand turn-up); these are covered in the Other Reserves section of the report.

Negative Reserve Volume and Expenditure

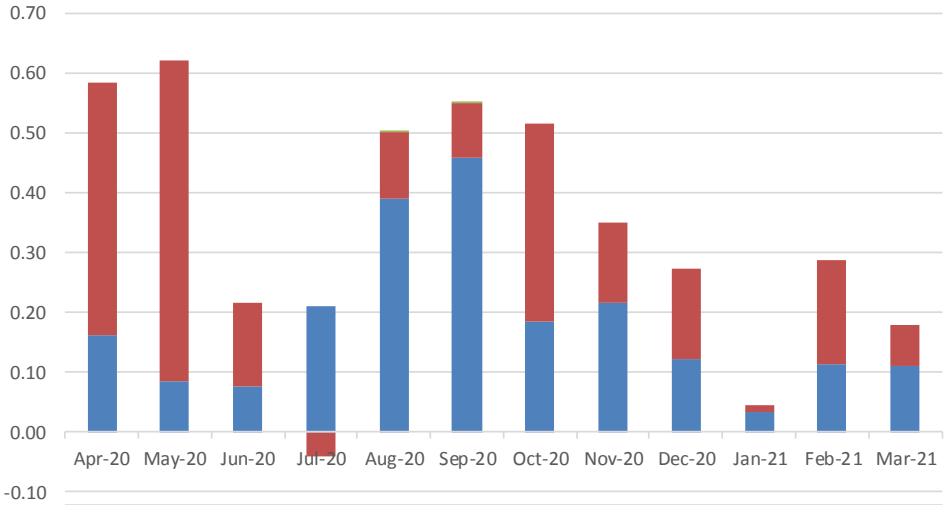
The total amount we paid for Negative Reserve in the FY20-21 was:

- £4.31 million

The total volume of Negative Reserve we procured in the FY20-21 was:

- -9,181 MWh

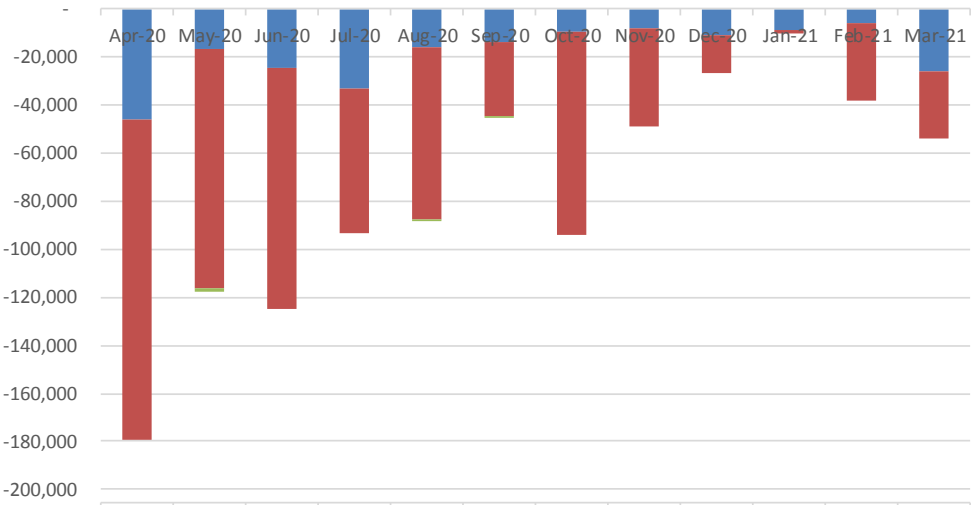
Negative Reserve cost, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
SO-SO - Negative reserve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trade - Negative reserve	0.42	0.54	0.14	-0.04	0.11	0.09	0.33	0.13	0.15	0.01	0.17	0.07
BM - Negative reserve	0.16	0.09	0.08	0.21	0.39	0.46	0.19	0.22	0.12	0.03	0.11	0.11

Figure 22

Negative Reserve volume, in megawatt hours (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
SO-SO - Negative Reserve	-	-1,226	-	-	-597	-1	-	-	-	-	-	-
Trade - Negative Reserve	-133,136	-99,214	-100,040	-60,503	-71,355	-31,142	-84,523	-40,803	-15,969	-1,500	-32,300	-28,075
BM - Negative Reserve	-45,873	-16,883	-24,648	-32,792	-15,986	-13,481	-9,440	-7,975	-10,591	-8,501	-6,038	-25,498

Figure 23

Fast Reserve

Definition

Fast Reserve provides the rapid and reliable delivery of active power through an increased output from generation or a reduction in consumption from demand sources, following receipt of an electronic dispatch instruction from National Grid. Fast Reserve service must commence within two minutes following instruction, at rates of 25MW or greater per minute and providing a minimum of 50MW.

National Grid currently breaks down the Fast Reserve into two categories: Firm Fast Reserve, Optional Fast Reserve for BM and Non-BM suppliers.

You can find more detail about Fast Reserve on our web site at nationalgrideso.com. Look under Balancing services, and then Reserve services. More data are also available on our ESO Data Portal.

Paying for Fast Reserve

We procure Firm Fast reserve through a competitive monthly tendering process.

Only Suppliers who have entered into a Fast Reserve Framework Agreement can provide the Optional Fast Reserve service. This service is called upon through requests from the National Grid Electricity Control centre.

We procure Optional Spin Gen (for Hydro Pump Storage only) via bilateral agreements, and the services are called upon through requests from the National Grid Electricity Control centre, but not through the BM.

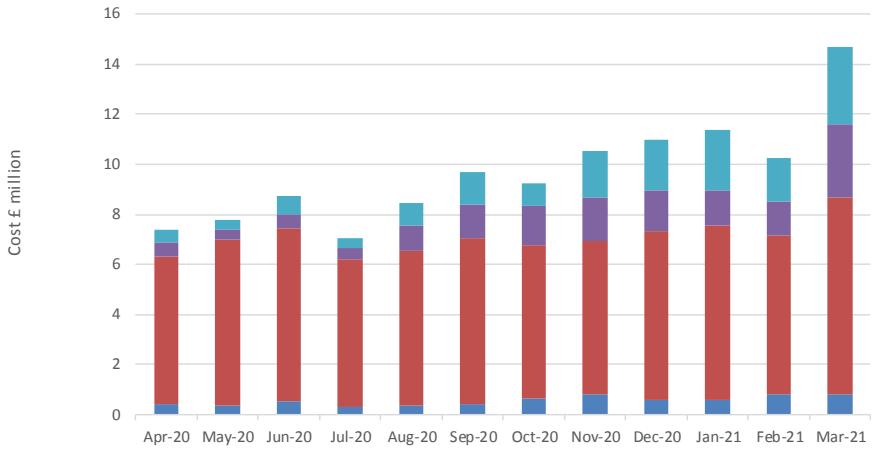
We make four types of payments to suppliers:

- availability payments in £/hours – these are what we pay to suppliers to be available to supply Fast Reserve to us at certain times.
- utilisation payments in £/MWh – we pay these when we actually use the Fast Reserve. We pay providers the Capped Bid-Offer price for use of the service through the BM, or the Firm Fast Reserve Energy Fee for non-BM providers.

Please note that NGESO stopped procuring Firm Fast Reserve from 1 February 2020 and the last firm fast reserve contracts expired on 31 March 2020. The Capped Bid-Offer price and Firm Fast Reserve Energy Fee were cancelled from 1 February 2020.

Fast Reserve Volume and Expenditure

Fast Reserve services costs, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
NBM Firm Fast Reserve Utilisation (Tendered)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NBM Firm Fast Reserve Avail + Nom (Tendered)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Firm Fast Reserve (Tendered)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NBM Optional Fast Reserve Utilisation (Commercial)	0.54	0.41	0.75	0.39	0.93	1.29	0.88	1.82	2.01	2.43	1.74	3.09
NBM Optional Fast Reserve Availability (Commercial)	0.55	0.39	0.58	0.45	0.99	1.32	1.58	1.77	1.62	1.37	1.35	2.92
BM Optional Fast Reserve (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Spin Gen No LF (Commercial)	5.90	6.61	6.88	5.91	6.17	6.66	6.13	6.14	6.75	6.99	6.35	7.91
BM - Fast Reserves	0.41	0.38	0.54	0.32	0.38	0.39	0.62	0.79	0.60	0.58	0.83	0.78

Figure 24

The total amount we paid for Fast Reserve in the FY20-21 was:

- £116.2 million.

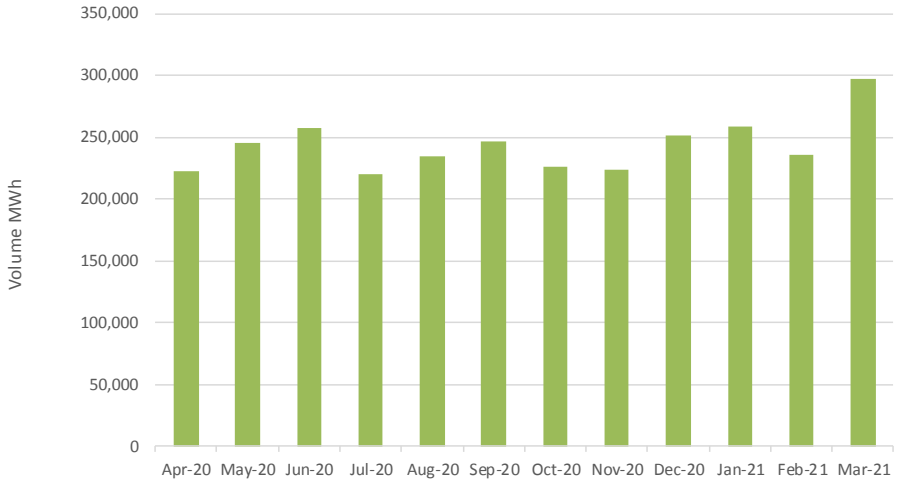
That cost breaks down into

- £85.0 million to BM providers
- £31.2 million to non BM providers

For further information, please see:

https://www.nationalgrideso.com/balancing-services/reserve-services/fast-reserve?market-information

Fast Reserve services volume, in megawatt hours (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - BM Hydro Spin Gen No LF (Commercial)	223,099	245,049	257,775	220,188	234,746	246,478	226,666	223,393	251,215	258,384	235,537	297,154
AS - BM Firm Fast Reserve availability (Tendered)	0	0	0	0	-	-	-	-	-	-	-	-
AS - NBM Firm Fast Reserve availability + nomination (Tendered)	0	0	0	0	-	-	-	-	-	-	-	-

Figure 25

Other Reserves

Definition

This section includes the other contracted reserve services that help to offset the cost of managing reserve in the BM.

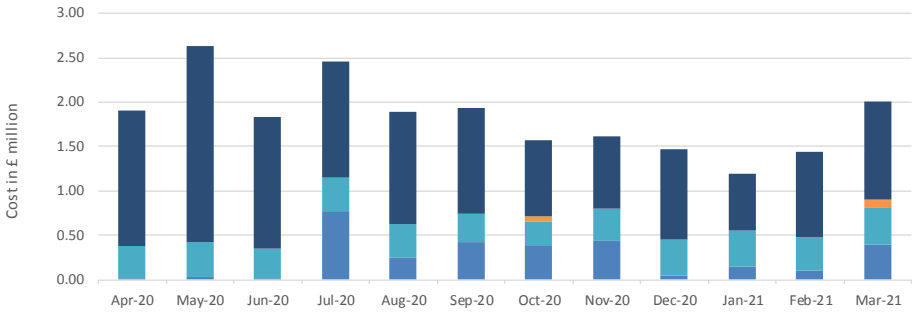
Details of the reserve types presented here can be found on our website. Look for Balancing services, list of all balancing services.

Paying for Other Reserves

Reserves in this section are paid for through commercial contracts, the demand turn-up service for example has an annual tender round.

Other Reserves Volume and Expenditure

Other reserves cost, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Hydro Optional Spin Pump (Commercial)	1.51	2.22	1.48	1.31	1.27	1.19	0.86	0.81	1.02	0.64	0.97	1.11
Hydro Rapid Start And GT Fast Start Utilisation (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.09
BM GT Fast Start Availability (Commerial)	0.37	0.39	0.34	0.38	0.37	0.32	0.29	0.37	0.41	0.41	0.37	0.42
NBM Demand Turn Up (Commerical)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Power Potential (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Demand Turn Up (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Warming (Commercial)	0.01	0.03	0.02	0.77	0.25	0.42	0.38	0.44	0.04	0.14	0.10	0.39

Figure 26

Table 2 below shows utilisation and availability stats for the different reserve types. Some are in MWh and some show how many sites available or instructions issued.

Other Reserves utilisation and availability data

	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Hydro Optional Spin Pump availability (MWh)	100,467	147,298	98,017	83,422	73,620	67,671	48,836	47,079	54,983	36,144	54,502	61,312
Hydro Rapid Start And GT Fast Start utilisation (MWh)	0	0	0	0	0	0	0	0	0	0	0	0
BM GT Fast Start Availability number of sites	14	13	13	13	13	14	14	14	14	14	14	14
NBM Demand Turn Up utilisation (MWh)	0	0	0	0	0	0	0	0	0	0	0	0
BM Power Potential utilisation (MWh)	0	0	0	0	0	0	0	0	0	0	0	0
BM Demand Turn Up utilisation (MWh)	0	0	0	0	0	0	0	0	0	0	0	0
BM Warming instructions	3	6	3	10	6	18	13	17	9	8	7	13

Table 2

Response

Definition

Response is a service we use to keep the system frequency close to 50Hz. Fast acting generation and demand services are held in readiness to manage any fluctuation in the system frequency, which could be caused by a sudden loss of generation or demand. There are three types of frequency response known as “primary”, “secondary” and “high”. The difference between primary and secondary is the speed at which they act recover the system frequency. Both primary and secondary react to low frequency conditions, and high response reacts to high system frequency conditions, restoring the frequency to normal operational limits.

More information about frequency response and the service we procure can be found on our ESO Data Portal under Ancillary Services.

Paying for Response

We procure Firm Frequency Response through a competitive monthly tendering process. Additional response, where required, is also procured through the Mandatory Frequency Response Market in the balance mechanism. Only Balancing Mechanism Units are able to offer mandatory response.

Payments made to Firm Frequency Response suppliers are:

- Availability payments in £/hr – for the hours for which a provider has tendered to make the service available for.
- Nomination payments in £/hr – a holding fee for each hour used within Firm Frequency Response nominated windows.
- Window initiation payments in £/window – for each Firm Frequency Response nominated window that we instruct within the tendered frames.
- Tendered window revision fee in £/hr – we notify providers of window nominations in advance and, if the provider allows, this payment is payable if we subsequently revise this nomination.
- Response energy fee in £/MWh – based upon the actual response energy provided in the nominated window.
    - As per CUSC section 4.1.3.9A for BMU Providers.

N.B. Utilisation volumes will be determined in accordance with system frequency and the characteristic of the response service.

Response Volume and Expenditure

The total amount we paid for Response in the financial year was:

- £145.67 million.

The Response holding volume in the financial year was:

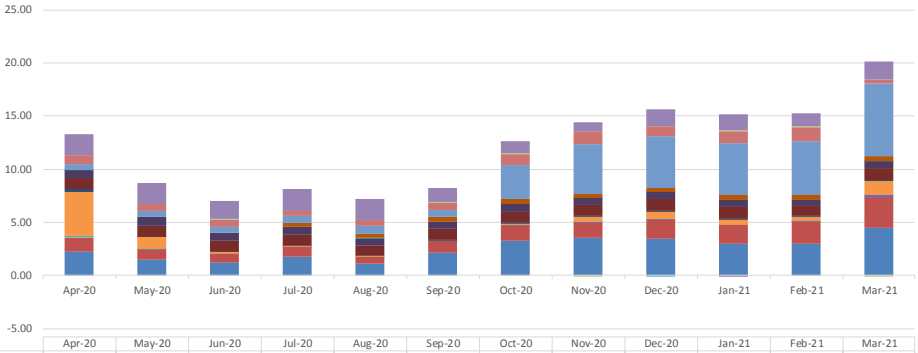
- Primary: 5,438 MWh
- Secondary: 5,691 MWh
- High: 6,185 MWh

Firm Frequency Response tenders are run monthly, and number of participants varies across months.

For further information, please visit our ESO Data Portal:

https://data.nationalgrideso.com/ancillary-services/firm-frequency-response-post-tender-reports

Response Service costs, in pounds sterling (£m)

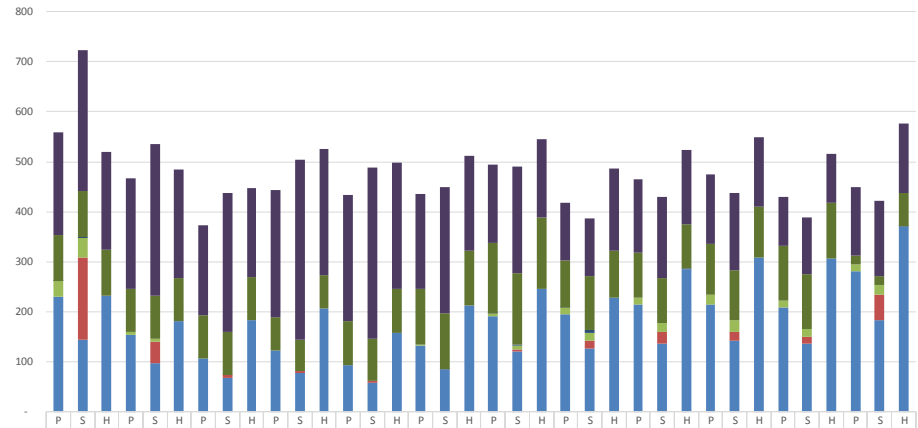


	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
NBM FFR (Tendered)	1.88	1.92	1.69	2.05	1.97	1.31	1.15	0.84	1.58	1.50	1.22	1.74
BM FFR Response Energy (Tendered)	0.04	0.02	0.04	0.04	0.03	0.06	0.08	-0.01	0.00	0.05	0.07	-0.08
BM FFR (Tendered)	0.82	0.65	0.69	0.45	0.57	0.68	1.02	1.24	0.97	1.16	1.37	0.32
FFR Bridging/ FFR Auction/Dynamic Containment	0.57	0.58	0.58	0.65	0.70	0.66	3.21	4.68	4.87	4.91	5.09	6.83
Stability	0.00	0.00	0.00	0.34	0.44	0.43	0.45	0.36	0.39	0.43	0.38	0.46
NBM Demand Side Response (Commerical)	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00
NBM Enhanced Frequency Response (Commercial)	0.78	0.81	0.78	0.79	0.67	0.69	0.71	0.64	0.66	0.67	0.61	0.72
Interconnector Response (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Enhanced Frequency Response (Commercial)	1.01	1.04	1.02	1.04	0.99	1.07	1.07	1.03	1.08	1.08	0.94	1.06
Hydro Pump deload	0.25	0.04	0.00	0.00	0.00	0.01	0.05	0.10	0.12	0.15	0.10	0.12
Hydro Spin Gen with LF	4.18	1.11	0.12	0.05	0.07	0.00	0.09	0.46	0.64	0.46	0.33	1.34
BM Generator Response Energy (Commercial)	0.03	0.01	0.02	0.00	0.00	0.00	0.01	0.02	-0.01	0.01	0.02	0.02
BM Generator Response Energy (Mandatory)	0.09	0.07	0.00	0.01	0.00	0.01	0.15	0.11	0.08	-0.10	0.06	0.20
BM Generator Response (Commercial)	0.03	0.01	0.02	0.01	0.01	0.00	0.01	0.02	0.04	0.02	0.03	0.04
BM Generator Response (Mandatory)	1.38	0.93	0.80	0.95	0.61	1.15	1.40	1.34	1.79	1.74	2.03	2.78
BM - Response	2.20	1.51	1.25	1.76	1.14	2.15	3.23	3.58	3.43	2.98	3.03	4.51

Figure 27

Figure 34 shows the dynamic and static response holding volumes in GWh, for primary, secondary and high response types (P, S, and H on the chart).

Response Service volume; primary, secondary and high, in Gigawatt hours (GWh)



	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
	Apr-20			May-20			Jun-20			Jul-20			Aug-20			Sep-20			Oct-20			Nov-20			Dec-20			Jan-21			Feb-21			Mar-21		
NBM FFR (Tendered)	204	281	196	221	304	219	180	279	178	253	360	253	253	342	253	189	253	189	156	214	156	115	115	165	148	163	148	139	154	139	99	112	99	136.	151.	138.
BM FFR (Tendered)	92	92	92	86	85	86	86	86	86	66	63	66	88	85	88	112	110	111	142	142	142	94	109	94	89	89	89	102	101	102	110	110	110	17.3	17.3	67.6
Stability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NBM Demand Side Response (Commerical)	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	-	0	5	-	-	-	1	-	-	-	-	-	-	-	-	0.74
NBM Enhanced Frequency Response (Commercial)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interconnector Response (Commercial)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BM Enhanced Frequency Response (Commercial)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydro Pump deload	32	39	-	5	6	-	0	0	-	-	-	-	-	-	1	1	-	6	8	-	12	15	-	15	18	-	19	23	-	12	15	-	14.5	19.1	-
Hydro Spin Gen with LF	-	164	-	-	43	-	-	5	-	-	3	-	-	3	-	-	0	-	-	3	-	-	17	-	-	24	-	-	18	-	-	15	-	-	51.3	-
BM Generator Response (Mandatory)	229	144	232	154	97	180	106	68	184	123	77	207	93	58	157	133	84	212	190	121	247	196	125	228	214	136	284	215	141	308	209	135	307	280.	183.	369.

Figure 28

Dynamic Containment

Dynamic Containment (DC) is an end-state response service designed to operate post fault, i.e. after a significant frequency deviation. This service was launched in October 2020.

More information about Dynamic Containment and the procurement process can be found on our website nationalgrideso.com under frequency response services, and on the ESO Data Portal under Ancillary Services.

Constraints

Definition

Running the transmission network also requires actions to protect equipment, enable access to the system, keep within the SQSS[1] and prevent the loss of large parts of the network.

In order to do this, we sometimes ask a generator to reduce, or constrain, the amount of electricity it's producing. When we do that, we still need the electricity it would have produced – so we can balance the system – but we can't move it in or out of a certain area. We make up the difference by buying energy from another generator in a different part of the transmission network.

It can also happen the other way around: we might need to produce more energy in some areas, which means we need to reduce production elsewhere.

Managing Constraints

It's important that we manage these constraint activities. If we don't, equipment might be damaged or areas of the grid might be at risk of shutting down.

To deal with constraints, we use a range of mechanisms, including BM bids and offers, pre-gate BMU transactions, trading, system-to-system (SO to SO) services, and contracted services.

We break down constraints into three groups:

- Transmission Constraints
- Voltage Constraints
- ROCOF Constraints

Constraints Volume and Expenditure

The total spent on constraints in the reporting financial year was £1070.7m. Figure 23 shows the constraint costs broken down by BM, trades, SO-SO and Ancillary Services.

Constraints costs, in pounds sterling (£m)

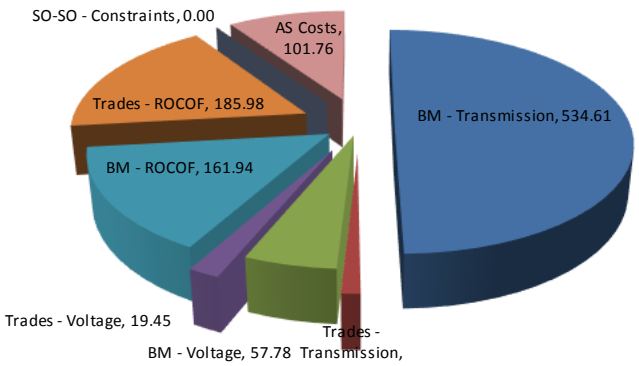
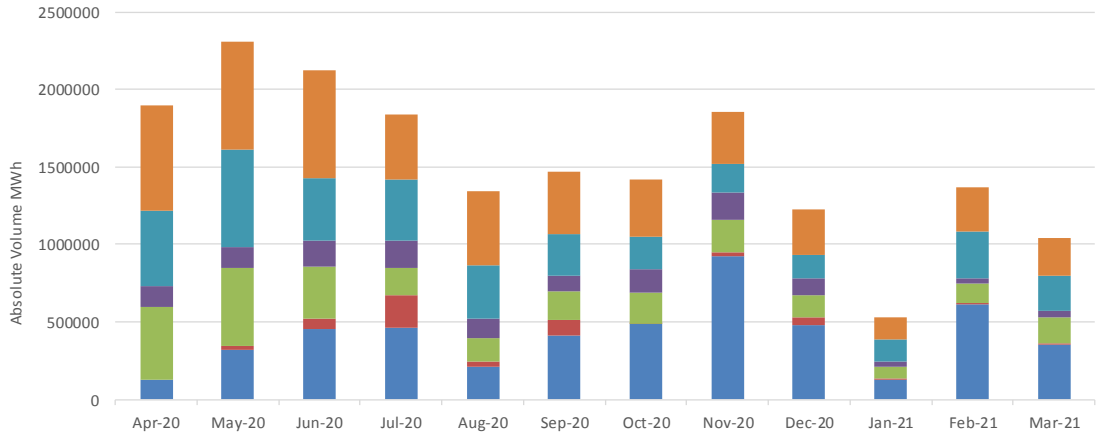


Figure 29

The BM constraint costs are broken down by England and Wales, Scotland and Cheviot regions in the BM costs section of this report. ROCOF and Voltage costs are recorded in the England & Wales category.

[1] Security and Quality of Supply Standard

Constraint volume, in megawatt hours (MWh)

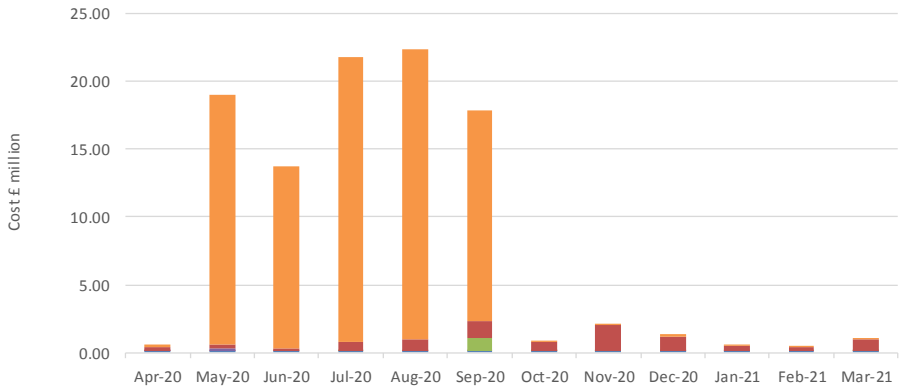


	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Trades - ROCOF	676243	695659	695580	423190	483993	399355	365765	333351	293434	148423	288913	245851
BM - ROCOF	488799	627213	404744	391966	337912	266408	210458	189169	156447	138265	304290	228825
Trades - Voltage	136090	138675	161865	178172	131297	102552	153393	172487	108251	36055	35287	36798
BM - Voltage	472674	506713	340561	174084	151600	181753	202031	213260	144469	76301	124419	175560
Trades - Transmission	0	22452	68163	214213	32803	107746	2451	21829	48901	3265	6094	2455
BM - Transmission	123614	319218	451696	460728	207904	408474	485388	925282	477179	129375	613437	355498

Figure 30

The total spent on ancillary services to manage constraints in the FY 20-21 was £101.76m and are broken down further in Figure 25.

Ancillary Service constraint costs, in pounds sterling (£m)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
AS - BM Constraints	0.19	18.39	13.36	20.98	21.35	15.46	0.13	0.06	0.19	0.00	0.06	0.13
AS - BM Constraints Voltage	0.22	0.25	0.24	0.64	0.90	1.33	0.64	1.90	1.10	0.36	0.30	0.82
AS - BM Intertrip - trip (Mandatory and Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS - Interconnector Intertrip Arming (Commercial)	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS - BM Intertrip Arming (Commercial)	0.00	0.00	0.00	0.03	0.00	0.92	0.04	0.01	0.00	0.00	0.00	0.02
AS - BM Intertrip capability (Commercial)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
AS - BM Intertrip capability (Mandatory - CAP76)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.11

Figure 31

Optional Downward Flexibility Management (ODFM)

The ODFM service has been developed to mitigate low electricity demand risks resulting from unprecedented changes caused by COVID-19 pandemic and so for a time limited need.

ODFM provides additional flexibility to the control room in scenarios where demand levels are low enough for there to be a risk that our need for downward flexibility cannot be guaranteed by other commercial solutions. Costs for this service are captured under the AS-BM Constraints category.

More information about ODFM service can be found on our ESO Data Portal under Ancillary Services.

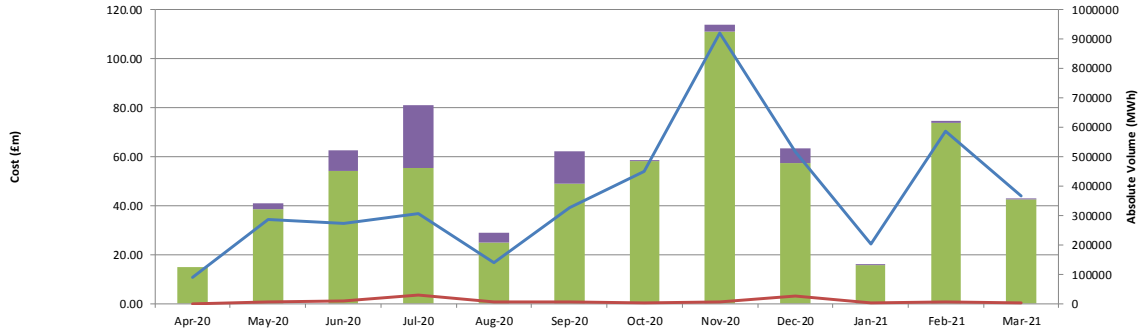
Transmission

These costs are incurred when we need to increase or decrease power flows from one part of the network to another.

Costs are largely incurred in the BM and via trades. Occasionally contracts are entered into if it is economic to do so.

Figure 26 to Figure 28 show costs (represented by lines) and volumes (represented by columns)

Transmission BM and Trade costs (£m) and volumes (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Trades - Transmission	0	22452	68163	214213	32803	107746	2451	21829	48901	3265	6094	2455
BM - Transmission	123614	319218	451696	460728	207904	408474	485388	925282	477179	129375	613437	355498
BM - Transmission	10.70	34.15	32.51	36.87	16.84	39.29	53.88	110.32	61.73	24.11	70.27	43.93
Trades - Transmission	0.00	0.67	0.87	3.47	0.55	0.80	0.34	0.76	3.04	0.07	0.65	0.39

Figure 32

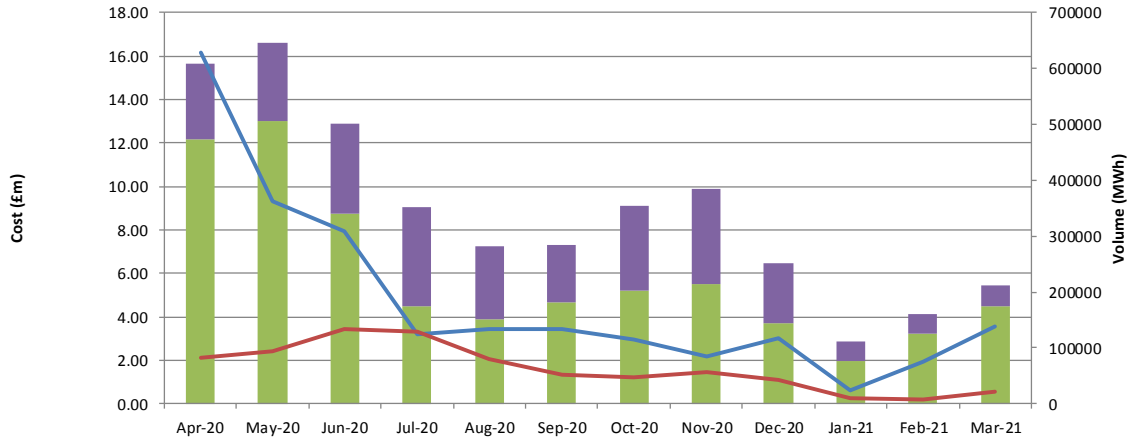
Voltage

Voltage levels are controlled by reactive power, and we pay providers to help manage voltage levels on the system by controlling the volume of reactive power that they absorb or generate. These costs are reported in the Reactive Power section.

In order to access Reactive Power, sometimes a generator is required to be synchronised to the network. In this case, we must buy the energy from the generator in order for the reactive power to be delivered.

We currently procure this service through the BM and Trades.

Voltage BM and Trade costs (£m) and volumes (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Trades - Voltage	136090	138675	161865	178172	131297	102552	153393	172487	108251	36055	35287	36798
BM - Voltage	472674	506713	340561	174084	151600	181753	202031	213260	144469	76301	124419	175560
BM - Voltage	16.19	9.35	7.92	3.18	3.46	3.46	2.94	2.17	3.00	0.62	1.95	3.54
Trades - Voltage	2.11	2.41	3.45	3.30	2.03	1.34	1.22	1.46	1.09	0.26	0.21	0.58

Figure 33

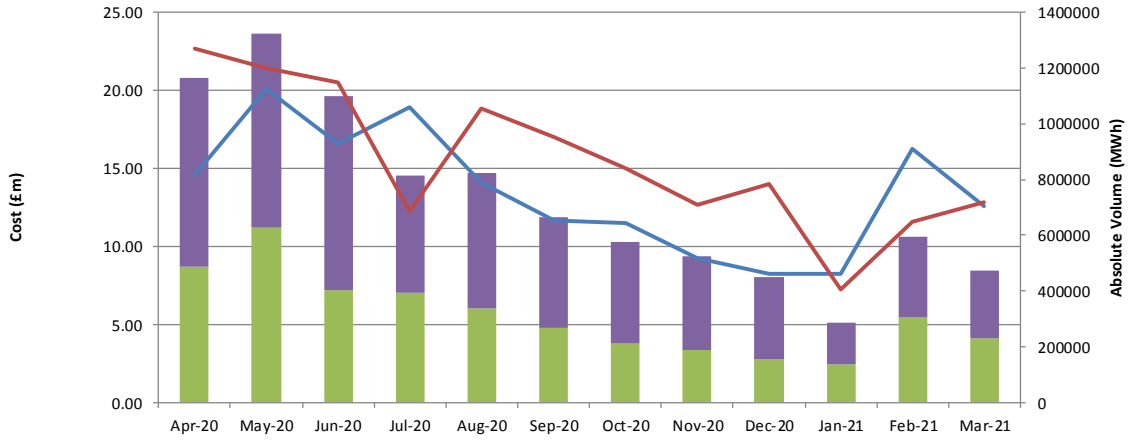
Rate of Change of Frequency (ROCOF)

Some embedded generators use protection relays that monitor the rate of change of system frequency to detect a fault on the network. When the protection detects that the rate of change of frequency is higher than a set threshold, the generator is tripped, or taken off the system. The protection relay is a safety measure, to make sure that the embedded generator is never connected to an islanded part of the network following a system fault. The increase in wind and PV generation means that the rate of change of frequency on the system can be higher than was historically allowed for following the loss of a large generator or interconnector.

We have two options available to us; we can reduce the size of the largest possible infeed loss to make sure that the ROCOF protection relays are not triggered, resulting in further loss of generation after a fault; or we can bring on more generation to increase the amount of inertia on the system – inertia helps the system to cope in the event of a large infeed loss and reduces the rate at which frequency changes.

We currently procure ROCOF actions in the BM or through Trades.

ROCOF BM and Trade costs (£m) and volumes (MWh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Trades - ROCOF	676243	695659	695580	423190	483993	399355	365765	333351	293434	148423	288913	245851
BM - ROCOF	488799	627213	404744	391966	337912	266408	210458	189169	156447	138265	304290	228825
BM - ROCOF	14.55	20.10	16.62	18.89	14.08	11.63	11.47	9.26	8.26	8.26	16.28	12.55
Trades - ROCOF	22.66	21.40	20.54	12.22	18.83	17.01	14.97	12.67	14.02	7.26	11.56	12.85

Figure 34

Constraint actions by fuel type

This section shows how the constraint costs for the reporting financial year break down by generator fuel type (excluding ROCOF).

Table 3 show the costs of the two types of payments we make, in pounds sterling (£ million):

- payments to manage the constraint – our costs in constraining electricity generation
- payments to rebalance the system – our payments to participants to bring the system back into balance

Positive values show the costs to National Grid, negative values show receipts. “Other” includes all fuel types not reported separately and includes hydro, open-cycle gas turbine (OCGT), demand side suppliers, and nuclear.

Most of the constraint costs are payments for suppliers to reduce or increase their output of electricity. But when managing constraints, we incur costs in other ways too. For example, we might use an intertrip service or bilateral contract to reduce the overall costs to consumers. As these costs arise because of the constraint, we’ve included them in the tables.

Breakdown of constraint costs by fuel type, for the FY20-21

Fuel Type	Payments to Manage Constraint	Payments to Rebalance System	Net Cost
COAL	6.72	22.05	28.77
GAS	88.01	582.49	670.50
INTERCONNECTOR	-24.87	26.52	1.65
WIND	224.15	5.11	229.27
OTHER	115.18	25.30	140.48
Total	409.20	661.48	1070.68

Table 3

Reactive Power (Voltage Control)

Definition

We manage voltage levels across the grid to make sure we stay within our operational standards and avoid damage to transmission equipment. Voltage levels are controlled by reactive power, and we pay providers to help manage voltage levels on the system by controlling the volume of reactive power that they absorb or generate.

You can find more detail about reactive power on our web site at nationalgrideso.com. Look under Balancing services, then Reactive power services. More data can also be found on the ESO Data Portal under Ancillary Services.

Paying for Reactive Power

Generators covered by the requirements of the Grid Code are required to have the capability to provide reactive power. There is a payment mechanism that is updated monthly in line with market indicators. The latest utilisation and payment figures can be found on our website. Look under Balancing services, reactive power services, obligatory reactive power, market information.

Reactive Power Volume and Expenditure

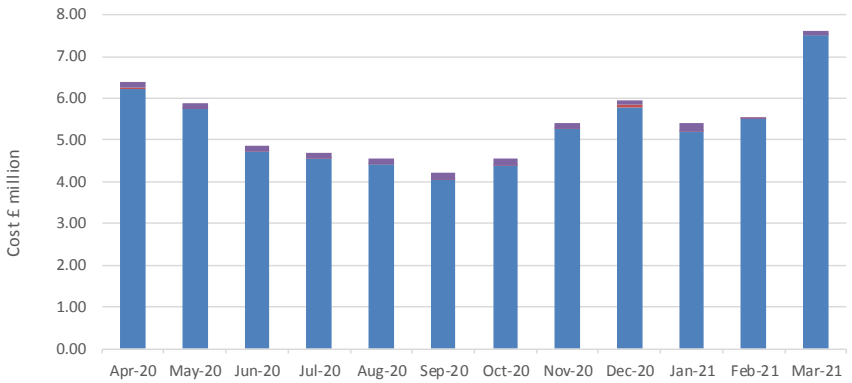
The total amount we paid for Reactive Service in the year was:

- £65.1 million

The total volume of reactive power used in the year was:

- 26,162,816 MVArh

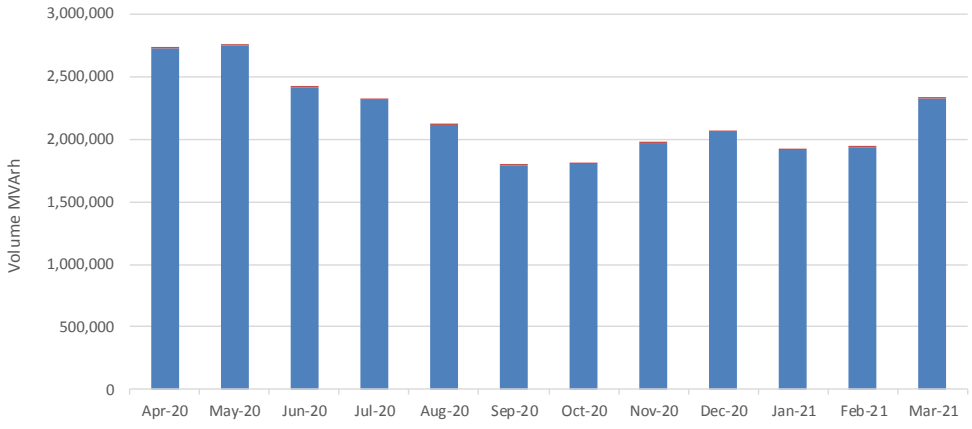
Costs of Reactive Power, in pounds sterling (£ million)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Power Potential (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS-BM Syncronous Compensation (Commercial)	0.13	0.14	0.14	0.11	0.12	0.15	0.17	0.14	0.11	0.19	0.05	0.10
AS-BM Reactive Utilisation (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AS-BM Utilisation (Mandatory - SVA)	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.04	0.01	0.01	0.01
AS-BM Default Utilisation (Mandatory - CVA)	6.24	5.74	4.72	4.56	4.42	4.04	4.37	5.27	5.79	5.19	5.49	7.50

Figure 35

Volume of Reactive Power volume, in mega volt amp reactive hours (MVArh)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Power Potential (Commercial)	0	0	0	0	0	0	0	0	0	0	0	0
BM Utilisation (Mandatory - SVA)	0	0	0	0	0	0	0	0	0	0	0	0
BM Reactive Utilisation (Commercial)	1,546	1,713	1,817	1,500	6,837	3,917	2,426	3,875	3,390	2,820	3,494	3,293
BM Default Utilisation (Mandatory - CVA)	2,731,698	2,748,293	2,418,468	2,312,694	2,118,607	1,791,149	1,806,249	1,971,377	2,054,988	1,909,888	1,933,415	2,329,363

Figure 36

Black Start

Definition

Black start is the procedure we use to restore power in the event of a total or partial shutdown of the national electricity transmission system. It means we can start up each power station in turn and reconnect them to the grid one by one.

In this sort of emergency, a power station can get its electricity supply from a small back-up generating plant on the same site. But not all power stations have one of these, so we have agreements with other suppliers. They help us make sure we have enough black start arrangements in place in case we need them.

You can find more detail about black start on our web site at www.nationalgrideso.com. Look under Balancing services, then System security.

Paying for Black Start

We make various types of payments (depending on several factors):

- availability payments – what we pay suppliers to be available to supply black start to us
- warming payments – what we pay suppliers to maintain readiness when they are not running in the energy market
- capital contributions – the cost of setting up black start capability
- other payments – for example, for testing

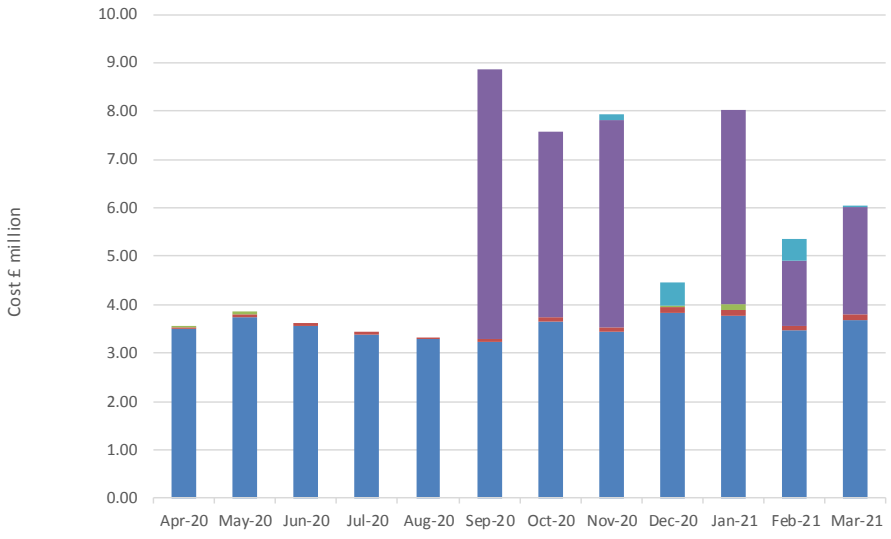
Black Start Volume and Expenditure

Figure 37 shows the amount we spent on Black Start, in pounds sterling (£ million).

The amount we spent on Black Start contracts in the financial year was:

- £69.26 million

Black Start service costs, in pounds sterling (£ million)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
BM Black Start Other (Commerical)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Black Start Warming (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM Black Start Feasibility (Commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.48	0.00	0.45	0.01
BM Black Start Capital Contributions (Commerical)	0.00	0.00	0.00	0.00	0.00	5.57	3.83	4.26	0.00	4.03	1.34	2.24
BM Black Start Test (Commerical)	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.00	0.00
Interconnector Black Start Availability (Commercial)	0.05	0.05	0.05	0.05	0.05	0.06	0.10	0.11	0.11	0.11	0.10	0.11
BM Black Start Availability (Commercial)	3.49	3.75	3.57	3.38	3.28	3.23	3.65	3.44	3.83	3.78	3.47	3.68

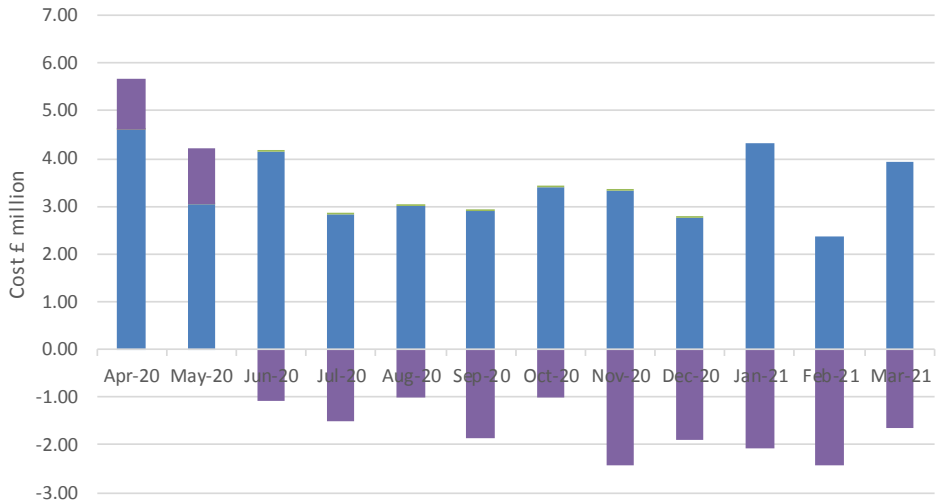
Figure 37

Other Costs

The costs reported in this sections account for:

- BM actions, which are not easily accounted for in the previously reported categories
- Other general costs; trading option fees, bank charges, sterling adjustments
- Non-Delivery and Reconciliation

Other costs, in pounds sterling (£ million)



	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Non-Delivery & Reconciliation	1.07	1.18	-1.08	-1.50	-1.00	-1.86	-1.02	-2.43	-1.88	-2.06	-2.44	-1.65
AS - Minor Components	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO-SO - Minor Components	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM - Minor Components	4.59	3.04	4.13	2.83	3.03	2.89	3.41	3.32	2.75	4.33	2.36	3.92

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Other Information

Performance Monitoring

Within National Grid ESO, we have robust processes in place to monitor balancing services performance and hold providers to account against their contractual delivery commitments.

Since October, we have begun publishing a report on a quarterly basis to highlight service-specific performance monitoring data for a number of balancing services. While the report is focused on bringing transparency to the performance monitoring of a small number of services, the principles of cost recovery based on performance are applied across the suite of Balancing Services we procure. Where providers are consistently underperforming, action will be taken.

The quarterly performance monitoring reports can be found at the following link along with a roadmap for Enhancements to Performance Monitoring of Balancing Services:

nationalgrideso.com/industry-information/industry-data-and-reports/balancing-services-performance-monitoring

Technology Breakdown

As part of the ESO Reporting Incentive (ESORI), we will be providing quarterly updates to Ofgem and industry on the breakdown of differing technologies that are providing Ancillary Services. We are looking to provide this using the categories of Response, Reserve, Voltage, etc. and the first update is due in July.

Further Information

You'll find more detail about balancing services on our web site at **www.nationalgrideso.com**.

We publish a number of documents in line with the Electricity Transmission Standard Licence Conditions (Condition C16: Procurement and use of balancing services). These documents include:

- Daily Balancing Costs – Information about the daily costs resulting from balancing the system. Find the report on our ESO Data Portal under Balancing Costs.
- Monthly BSUoS Report – Outturn and Forecast information about the monthly BSUoS charge resulting from balancing the system. Find the report on our ESO Data Portal under Balancing Costs, then BSUoS Forecast Reports.
- Procurement Guidelines Report – information about the balancing services that we're going to procure. Find the report on our web site under Balancing services, C16 Statements, and then Latest Statements.
- Balancing Principles Statement – information about balancing mechanism bid and offer acceptances. Find it under Balancing services, C16 Statements, then Latest Statements.

Questions and Feedback

If you have any questions or comments about our electricity balancing services, or anything in this report, please email us at balancing.costs@nationalgrideso.com .

We'll look forward to hearing from you.

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Glossary

MBSS Data Item	Costs Included	Volume/other Information
Bank Charges	Interest costs associated with Ancillary Services payment adjustments.	n/a
BM Black Start Availability (commercial)	Black Start Availability Costs in respect of contracted BM Stations.	No. of stations contracted is provided
BM STOR (Tendered)	STOR Availability costs in respect of Balancing Mechanism Units.	n/a
BM Black Start Capital Contributions (Commercial)	Black Start Capital Contributions paid to BM units towards the development/maintenance of Black Start Capability.	n/a
BM Black Start Feasibility (Commercial)	Black Start Feasibility payment paid to BM units towards the assessment of feasibility of providing the Black Start service.	n/a
BM Black Start Other (Commercial)	Not currently used.	Not currently used.
BM Black Start Test (Commercial)	Black Start Test costs paid to BM units to cover the costs of undertaking a test of the service.	n/a
BM Black Start Warming (Commercial)	Warming costs payable under a Black Start contract to BM stations to keep the plant warm so that it is able to start up in the time-sales prescribed in the contract. There is no warming instruction required for this service to be provided.	n/a
BM Constraints - Voltage	If the system is unable to flow electricity in the way required, NGESO will take actions in the market to increase and decrease the amount of electricity at different locations on the network - agreements of this type are called Constraints contracts. This category is for Constraints Payments entered into for the purpose of voltage support.	n/a
BM Constraints - Constraint Management	If the system is unable to flow electricity in the way required, NGESO will take actions in the market to increase and decrease the amount of electricity at different locations on the network - agreements of this type are called Constraints contracts. This category is for Constraints Payments entered into for purposes other than voltage support	n/a

MBSS Data Item	Costs Included	Volume/other Information
BM Default Utilisation (Mandatory - CVA)	Reactive power services are how we make sure voltage levels on the system remain within a given range. BM Default Utilisation is also known as Mandatory Reactive Power Utilisation, and utilisation payment for Lead (Absorbing) and Lag (Generating) MVARS paid in accordance with the Connection and Use of System Code. In this case the meter data on which payment is made is based on CVA meter data collected by Elexon and supplied in the CDCA-I012 file.	Lead + Lag MVARH total
BM Demand Turn Up (commercial)	The Demand Turn Up (DTU) service encourages large energy users and generators to either increase demand or reduce generation at times of high renewable output and low national demand. ●availability payment – to Fixed DTU providers for being available to provide the service; and ●utilisation payment – to Fixed and Optional DTU providers for delivering the service when instructed This service is no longer contracted.	Not currently reported
BM Enhanced Frequency Response (commercial)	Enhanced frequency response (EFR) is a dynamic service where the active power changes proportionally in response to changes in system frequency. To provide EFR response is within one second to frequency deviations and operate in frequency sensitive mode within the operational envelope and associated restrictions set out in the invitation to tender. The total payment reported is an availability payment.	Not currently reported
BM FFR Response Energy (Tendered)	This is effectively a utilisation payment to BM Firm Frequency Response providers based on the amount of energy they are expected to deliver in response to a change for system frequency above or below the target frequency of 50 HZ.	n/a
BM FFR (Tendered)	This is the total paid for Availability and Nomination in respect of BM service Providers. Availability Fee is Paid per hour (£/hr) - for the hours for which a provider has tendered to make the service available for. Nomination fee (£/hr) - a holding fee for each hour used within FFR nominated windows.	During the Nominated Windows (subject to the provider being available) the Holding Volume "Available Volume" is computed for Primary, Secondary and HF response in MWh based on Tendered Response MW at 0.5Hz. Note: Includes both Dynamic and Static response totals, but currently weekly auction data is not included.

MBSS Data Item	Costs Included	Volume/other Information
BM Firm Fast Reserve (Tendered)	Firm Fast reserve provides rapid and reliable delivery of active power through increasing output from generation or reducing consumption from demand sources. Power is deliverable within 2 minutes at a minimum ramp rate of 25 MW/Min. This covers the payment for: Availability: Paid for the hours a provider has tendered to make the service available to us. Nomination: Paid for being called upon to provide the service within a fast reserve nomination window.	Volume is the available Volume Computed as Nominated Hours * Contracted MW.
BM Generator Response (Commercial)	These are the Holding Payments "Availability Payments" for a commercial Dynamic Response Service. They are computed: 1. In accordance with the CUSC methodology. and based on the instruction given by the NGESO control room, and the Primary, Secondary and HF response volumes that the unit can provide at 0.5Hz. Prices are submitted on an adhoc basis.	Not currently reported
BM Generator Response (Mandatory)	These are the Holding Payments "Availability Payments" for the Mandatory Dynamic Response Service. This is computed: 1. In accordance with the CUSC 2. Based on the instruction given by NGESO control room. 3. Based on Primary, Secondary and HF response volumes that the unit can provide at 0.5Hz. note: Prices are submitted on a monthly basis.	Volume in MWh of Primary, Secondary and HF Dynamic Response. This is computed by reference to the contracted response MW at 0.5 Hz, the instruction issued by the NGESO control room, and the deload of the unit during the period it is instructed by NGESO to provide response.
BM Generator Response Energy (Commercial)	These are "Utilisation Payments" for the provision of the Commercial Dynamic response Service. These payments are computed in accordance with the CUSC response energy methodology based on the units deload, system frequency deviation from the target frequency, and the service instructed.	Volume in MWh of Primary, Secondary and HF Dynamic Response. This is computed by reference to the contracted response MW at 0.5 Hz, the instruction given by the NGESO control room, and the deload of the unit during the period it is instructed by NGESO to provide response.
BM Generator Response Energy (Mandatory)	These are "Utilisation Payments" for the provision of the Mandatory Dynamic response Service, . These payments are computed in accordance with the CUSC response energy methodology based on the units deload, system frequency deviation	n/a

MBSS Data Item	Costs Included	Volume/other Information
	from the target frequency, and the service instructed.	
BM GT Fast Start Avail (Commercial)	An availability payment paid to a unit for being capable of synchronising and achieving full load within 5 minutes of a frequency excursion beyond a pre-set limit.	Number of units paid
BM Intertrip - trip (Mandatory and Commercial)	A payment to cover the costs of wear and tear, and fuel costs when an intertrip is activated triggering the disconnection of generation or demand.	n/a
BM Intertrip Arming (Commercial)	A fee payable whenever the Intertrip is armed by National Grid.	Number of hours armed
BM Intertrip capability (Commercial)	A capability payment for each settlement period that the unit is contracted to provide the Intertrip service.	Number of units contracted
BM Intertrip capability (Mandatory - CAP76)	Annual fee to cover the installation of the scheme and staff training costs (£/settlement period) payable under the terms in the CUSC.	Number of units contracted
BM Optional Fast Reserve Availability (commercial)	This Enhanced availability payment is made to providers of the Optional Service for periods of time where they provide National Grid (following dispatch) with enhanced MW run-up and run-down rates.	n/a
BM Optional Fast Reserve Utilisation (Commercial)	A payment when the optional Fast Reserve Utilisation service is instructed	n/a
BM Other Response (Commercial)	Not currently used	Not currently used
BM Power Potential	This service is not currently live	This service is not currently live
BM Reactive Utilisation (Commercial)	Not currently used	Not currently used
BM Season/Term Reconciliations (Tendered)	A reclaim of STOR payments where (a) Delivery is less than 95% of Expected in a given season and/or (b) Availability is less than 85% of contracted availability in a given financial year.	n/a
BM Sync Comp Reactive (Commercial)	Where a unit is able to provide reactive power by means of operating in synchronous compensation mode (synchronous spin) then it can be paid for being available to provide the Sync Comp service, as well as being paid when instructed to provide the sync comp service.	n/a

MBSS Data Item	Costs Included	Volume/other Information
BM Utilisation (Mandatory - SVA)	Reactive power services are how we make sure voltage levels on the system remain within a given range. BM Default Utilisation is also known as Mandatory Reactive Power Utilisation, and utilisation payment for Lead (Absorbing) and Lag (Generating) MVARS paid in accordance with the Connection and Use of System Code. In this case the meter data on which payment is made is based on SVA meter data supplied by the service provider.	Lead + Lag MVARH total
BM Warming (Commercial)	This payment covers both BM Start up and Hot Standby. BM start up is the process of bringing the generating unit to a state where it is capable of synchronising with the system within BM timescales. Hot standby holds the generating unit in this state of readiness. The unit will then either remain in hot standby until the end of its capability or be instructed to run via an offer in the BM.	Number of Instructions
Customer Raised Disputes	This is an estimated cost impact of a customer raised dispute in respect of the current financial year.	n/a
Hydro Optional Spin Pump (Commercial)	This is a payment for the period of time that a unit is instructed to provide the Spin Pump service - which allows BM units to provide Reserve and Synchronous compensation.	Number of Hours instructed *Reserve MW Available
Hydro Pump deload	This is a payment for the period of time the unit is instructed to provide Pump Deload with LF. This service allows BM units to provide Primary and Secondary Response.	Number of Hours Instructed * Contracted Response MW
Hydro Rapid Start and GT Fast Start Utilisation (Commercial)	A Rapid Start payment is made following a rapid synchronisation of a BM Unit to the GB Transmission System when instructed by the NGESO control room. GT Fast Start utilisation payment is made following a rapid synchronisation of the BM unit to the GB Transmission following a frequency excursion below a pre-set limit.	MWhs expected
Hydro Spin Gen No LF (Commercial)	This is a payment for the period of time the unit is instructed to provide Spin Gen without LF. This service allows BM units to provide Reserve and Synchronous compensation.	Number of Hours instructed *Reserve MW Available.
Hydro Spin Gen with LF	This is a payment for the period of time the unit is instructed to provide Spin Gen with LF. This service allows BM units to provide Secondary Response and Synchronous compensation.	Number of Hours Instructed *Contracted Response MW

MBSS Data Item	Costs Included	Volume/other Information
Interconnector Black Start Availability (commercial)	Black Start Availability Costs in respect of an Interconnector.	No. of stations contracted is provided.
Interconnector Capability (Commercial)	A capability payment for each settlement period that the unit is contracted to provide the Intertrip service.	Number of Interconnectors contracted.
Interconnector Intertrip Arming (Commercial)	A fee payable whenever an Interconnector Intertrip is armed by National Grid.	Number of hours armed
Interconnector Response (Commercial)	Not currently used	Not currently used
National Grid Identified liability	This is an estimated cost impact of an issue known to NGESO in respect of the current financial year e.g. a backdated contract/data issue.	n/a
NBM Demand Side Response (Commercial)	FFR Bridging contracts.	n/a
NBM Demand Turn Up (commercial)	The Demand Turn Up (DTU) service encourages large energy users and generators to either increase demand or reduce generation at times of high renewable output and low national demand. ● Availability payment – to Fixed DTU providers for being available to provide the service; and ● Utilisation payment – to Fixed and Optional DTU providers for delivering the service when instructed This service is no longer contracted.	Not currently reported.
NBM Enhanced Frequency Response (commercial)	Enhanced frequency response (EFR) is a dynamic service where the active power changes proportionally in response to changes in system frequency. To provide EFR response is within one second to frequency deviations and operate in frequency sensitive mode within the operational envelope and associated restrictions set out in the invitation to tender. The total payment reported is an availability payment.	Not currently reported
NBM FFR (tendered)	This is the total paid for Availability and Nomination in respect of NBM service Providers. Availability Fee is Paid per hour (£/hr) - for the hours for which a provider has tendered to make the service available for. Nomination fee (£/hr) - a holding fee for each hour used within FFR nominated windows.	During the Nominated Windows (subject to the provider being available) the Holding Volume "Available Volume" is computed for Primary, Secondary and HF response in MWh based on Tendered Response volumes at 0.5Hz. Note: Includes both Dynamic and Static response totals. However, week auction volumes are not included.

MBSS Data Item	Costs Included	Volume/other Information
NBM Firm Fast Reserve Avail + Nom (Tendered)	Firm Fast reserve provides rapid and reliable delivery of active power through increasing output from generation or reducing consumption from demand sources. Power is deliverable within 2 minutes at a minimum ramp rate of 25 MW/Min. This covers the payment for: Availability : Paid for the hours a provider has tendered to make the service available to us. Nomination :Paid for being called upon to provide the service within a fast reserve nomination window.	Volume is the available Volume Computed as Nominated Hours * Contracted MW
NBM Firm Fast Reserve Utilisation (Tendered)	(£/MW/h) payable for the energy delivered during a Firm Service window	n/a
NBM Optional Fast Reserve Availability (Commercial)	Providers of the Optional Service will receive an Enhanced Rate Availability Fee (£/h) payment for periods of time where they provide National Grid (following dispatch) with enhanced MW run-up and run-down rates.	n/a
NBM Optional Fast Reserve Utilisation (Commercial)	(£/MW/h) payable for the energy delivered outside of a Firm Service Window	n/a
NBM Other Response (Commercial)	Not currently used	Not currently used
NBM Season/Term Reconciliations (Tendered)	A reclaim of STOR payments where (a) Delivery is less than 95% of Expected in a given season and/or (b) Availability is less than 85% of contracted availability in a given financial year.	n/a
NBM STOR AVAIL (Tendered)	STOR Availability costs in respect of NON-Balancing Mechanism Units	n/a
NBM STOR UTIL (Tendered)	STOR Utilisation costs based on capped energy delivered	MWhs Expected
Power Potential (Commercial)	Not currently used	Not currently used
SO-SO Trades (Commercial)	Interconnector Trades for services that alter the Energy flow across the Interconnector	Buy and Sell volumes in MWh's reported
Sterling adjustments	Euro to Sterling currency conversion adjustment required to account for the fact that the sterling equivalent cost of Interconnector trades settled in euros is initially estimated.	n/a
Trading Option Fees	Not currently used	Not currently used

Faraday House, Warwick Technology Park,
Gallows Hill, Warwick, CV346DA

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