Non-BM Balancing Services Volumes and Expenditure

Contents

1 Introduction

1.1 What are “Balancing Services or Ancillary 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 second by second.

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 stops generating because of a technical problem.

To help us with balancing, we buy (procure) services from providers. These are “Balancing or Ancillary Services”. We use them to keep the transmission system (or “grid”) running in an efficient, economical and coordinated way which means everyone can get a steady flow of electricity.

For more detail about balancing, have a look at https://www.nationalgrid.com/uk/about-grid/our-networks-and-assets/how-we-balance-electricity-transmission-system.

1.2 What are “Balancing Mechanism” (BM) and “Non-Balancing Mechanism” (non-BM) Units?

To make this balancing act work and help us provide electricity at just the right time, we use what we call “Balancing Mechanism Units” (BMUs). These are a type of trading arrangement, introduced in 2001 and agreed by Government and the Regulator.

When an electricity generator, such as a power station or large wind farm, connects to the grid, we register it as a BMU. A BMU is the smallest grouping of equipment that we can meter separately, so a single generator might register as more than one BMU.

Registering these units means we can use them to make changes within the timescales set out in the Balancing Mechanism process. If we predict there’s going to be higher or lower demand than expected at a certain time, we can quickly accept a bid from a BMU to increase or reduce the amount of electricity it makes or uses at that time. The bid reflects what the generator is willing to be paid, or to pay, to be taken off or moved onto the grid.

If a company supplies a balancing service to us but isn’t registered as a BMU, these are “Non-Balancing Mechanism” (non-BM) units. We can’t change a non-BM supplier’s output or usage within the Balancing Mechanism timescales in the same way that we can for BMUs. Non-BMs tend to be smaller generators that connect to the grid, such as a small wind farm.

1.3 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 https://www.nationalgrid.com/uk/electricity/market-operations-and-data/system-balancing-reports.

There’s more detail about the balancing services we’ll need in future on our website here.

1.4 What’s in the report?

This report shows the volumes of services supplied to us, focussing on non-BM and how much they cost, from 1 April 2017 to 30 September 2017.

We break the report into classifications of the type of non-BM Provider although they are not displayed in the report if they do not have any cost or volume during this period:

- BM Generation Balancing Support
- Non-BM Generation Balancing Support
- Non-BM CHP
- Non-BM Generation Standby / Backup
- Non-BM Load Response (load shifting and temporary demand reduction)
- Non-BM Other (includes the Aggregator loads where no detailed asset data has been returned)
- *Non-BM Energy Storage Balancing Support*
- *Non-BM Energy Storage Standby / Backup*

You'll find an explanation of the non-BM classifications in Appendix A.

2 Total Volumes and Expenditure on non-BM Services

2.1 Demand Side Response Services

"Demand Side Response" (DSR) describes a collection of services that help us balance supply and demand for electricity from providers who can change their demand for or generation of electricity in real time. For example, they can use less electricity than normal during peak times or move their heavy usage to off-peak times.

DSR services include:

- Frequency Response
- Short Term Operating Reserve (STOR)
- Fast Reserve.

Table 1 shows the volumes of these DSR services we held between 1 April and 30 September 2017, in megawatts (MW). Please note that this capacity may not be available at the same time.

Table 1: DSR Services Volumes

Product	DSR Volume
Frequency Response	617MW
STOR	1369MW
DSBR	0MW
Fast Reserve	300MW
Total	**2286MW**

2.2 Total Balancing or Ancillary Services Expenditure

Table 2 shows how much we spent on services between 1 April and 30 September 2017, in pounds sterling (£ million) split by provider type.

Table 2: Ancillary services expenditure

Cost £m	Generation: Balancing Support (BM)	Load Response (NBM)	CHP (NBM)	Generation: Balancing Support (NBM)	Generation: Standby/Backup](NBM)	Energy Storage: Balancing Support (NBM)	Energy Storage: Standby/backup (NBM)	Other (NBM)	Total
Response and Reserve	£ 92.17	£ 6.11	£ 0.43	£ 22.62	£ 0.94	£ 1.36	£ -	£ 13.53	**£ 137.17**
Black Start	£ 14.89	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 14.89**
Reactive	£ 40.46	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 40.46**
Constraints and Intertrip	£ 41.88	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 41.88**
BM Start Up	£ 0.33	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 0.33**
SO-SO trading	£ 0.25	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 0.25**
Interconnector Capability	£ 1.38	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 1.38**
Forecast of future liabilities	£ 0.08	£ -	£ -	£ -	£ -	£ -	£ -	£ -	**£ 0.08**
Total	**£ 191.44**	**£ 6.11**	**£ 0.43**	**£ 22.62**	**£ 0.94**	**£ 1.36**	**£ -**	**£ 13.53**	**£ 236.44**

The left-hand column shows the type of service. You'll find explanations of these on our website at Balancing Services.

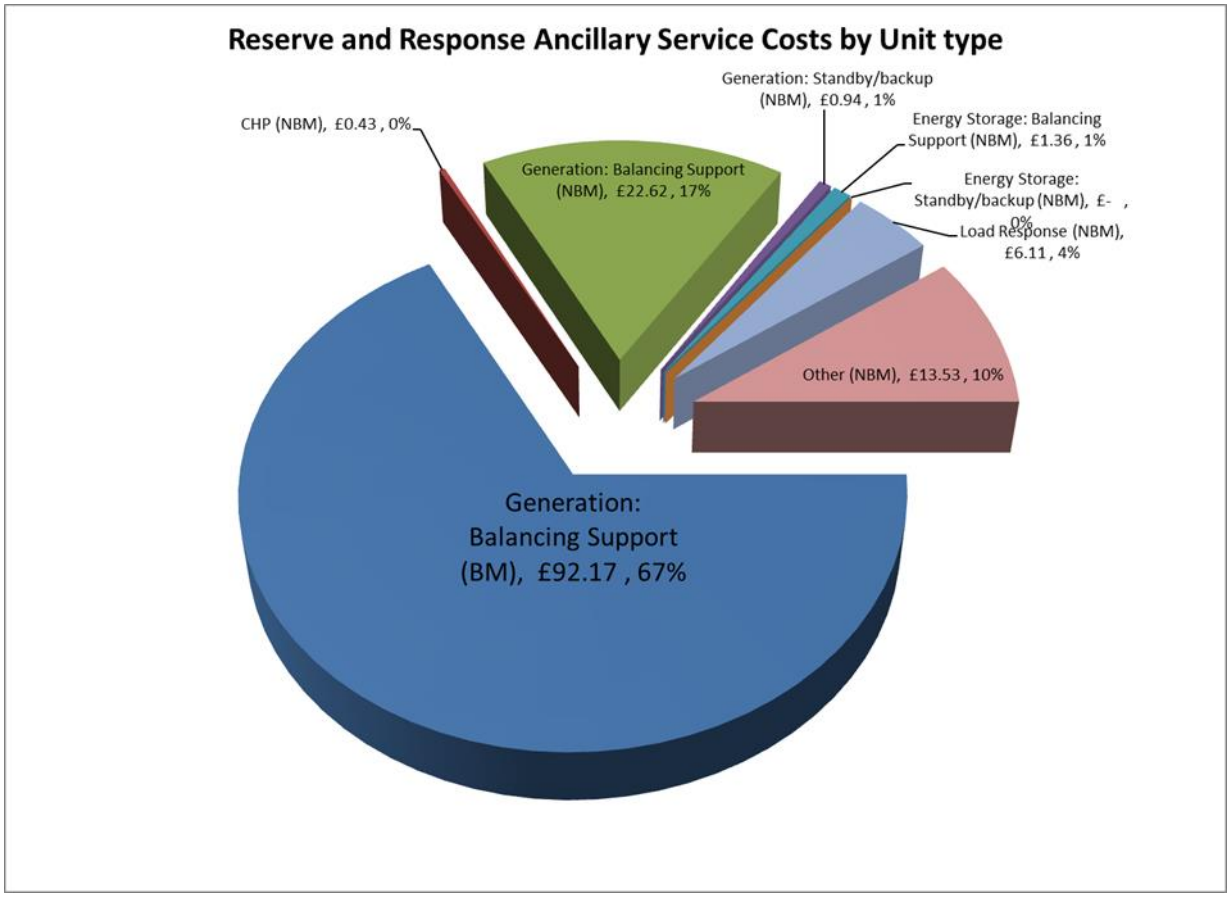
Please note that, when we wrote this report, there were fewer services available for non-BM providers than for BM providers, and their monetary value was lower.

The total amount we spent between 1 April and 30 September 2017 was £236.44 million. The table doesn't show the amounts that Elexon[1] paid to BM providers for balancing services. If we add these to the figure above, the total expenditure on balancing services for 1 April to 30 September 2017 was £424.3 million.

The main markets available to DSR are Reserve and Response services. There's more detail about these on our website at Demand Side Response.

Chart 1 shows that **33%** of expenditure in the period 1 April to 30 September 2017 was on non-BM ancillary DSR services, for the previous 12 month period this was **19%**.

Chart 1: Reserve and response ancillary service costs by type



3 Frequency Response Services

The electricity grid is designed to operate at 50 Hertz (Hz). In practice, system frequency varies second by second, depending on the balance between the demand for electricity and how much electricity is being produced. If demand is greater than generation, the frequency falls; if generation is greater than demand, the frequency rises.

We run the system to make sure that:

- After a normal loss, the frequency changes by no more than 0.5 Hz
- After an unusual loss, the frequency changes by no more than 0.8 Hz – and this should last for no more than 60 seconds.

The Frequency Response services we buy are to ensure we're always ready to manage the likely situations that might cause frequency variations on the network. We set the requirement for these services to the lowest amount we need.

[1] Elexon is the Balancing and Settlement Code Company (BSCCo), which administers wholesale electricity balancing and settlement arrangements. To find out more about Elexon, go to www.elexon.co.uk

Primary response and secondary response – these automatically increase electricity generation, or reduce demand, when the frequency falls below 50 Hz. Primary response is triggered within 10 seconds; secondary response within 30 seconds.

High response – this automatically reduces electricity generation, or increases demand, within 10 seconds of the frequency going above 50 Hz.

Enhanced response – is a dynamic service that we procured to automatically increase or reduce power within one second of the frequency changing from 50 Hz.

Dynamic and static response – we use these to provide primary, secondary and high response services. Dynamic response is a proportional change in power as the frequency changes. Static response is a fixed change in power when the frequency moves past a set limit.

When we talk about "frequency response capability", we mean providers must deliver power between 49.5 Hz and 50.5 Hz.

The following sections outline the types of frequency response services we procure. You can find more detail about these on our web site at Frequency Response Services.

3.1 Firm Frequency Response

This is where providers agree to supply us with a minimum amount of power or demand reduction when there's a large variation in system frequency (for example, if a power station suddenly shuts down).

We tender Firm Frequency Response (FFR) services every month. Tenders can be for any combination of primary, secondary and high responses, and a static or dynamic service. There's more detail about tenders and assessments on our web site at FFR - How to Participate. You'll find our latest market information report (with our current requirements) there, too.

3.2 Firm Frequency Response Bridging

To contract for FFR, providers had to be able to provide a minimum volume of 10 MW. FFR bridging was set up to enable demand side response providers who hadn't been able to enter this market. Bridging helped these smaller providers to develop a portfolio of FFR services, starting with a minimum of 1 MW. Once their portfolio had built up to 10 MW, they could apply for contracts through the FFR tendering process.

Now that the minimum volume for FFR tendering has been reduced to 1 MW, we are no longer offering new FFR bridging opportunities. Note FFR bridging was available only to providers of static response services.

Existing FFR bridging contracts are for a term of one or two years for which they are paid a fixed price for each megawatt hour, depending on the combination or services they provided.

3.3 Frequency Control Demand Management

This is where customers agree to use less electricity than normal during peak times or move their heavy usage to off-peak times. They're prepared to be interrupted automatically within two seconds of the system frequency at their site dropping to 49.7 Hz. The interruption lasts for 30 minutes.

We procure frequency control demand management (FCDM) services by offering contracts (bilateral agreements), each for a minimum volume of 3 MW. We pay providers a set amount for the contract, for example if they reduce their electricity use for, say, up to five hours a year.

Following our Rationalisation work (for more information see here) we are not entering into any further FCDM contracts as there is an existing route to market for these services through the FFR tendered market for static FFR.

3.4 Mandatory Frequency Response

This is a service that all large generators must provide Mandatory Frequency Response to comply with the Grid Code (Connection Conditions 6.3.7 and 8.1) in order to connect to the grid.

Mandatory Frequency Response is a dynamic service; providers offer primary, secondary and high responses, and the level of each service can vary. You can find out more on our web site here.

3.5 Bilateral Frequency Control contracts and optional services

In the past, where a supplier's frequency control service might have been helpful to us but didn't fit into our existing service terms, we considered offering an individual contract (bilateral agreement). Now that we've changed the terms of the services that we put out to tender, we no longer need to procure these contracts or optional services.

Some of these contracts are, of course, still in place. They are with BM and non-BM providers of dynamic or static response services. They may be for a firm or an optional contract with fees paid only if we use the service. Providers can make optional response services available (for example, low frequency triggered generation, typically 49.7 Hz or 49.6 Hz) as part of a fast reserve service. (See the 'Fast reserve' section of this report.)

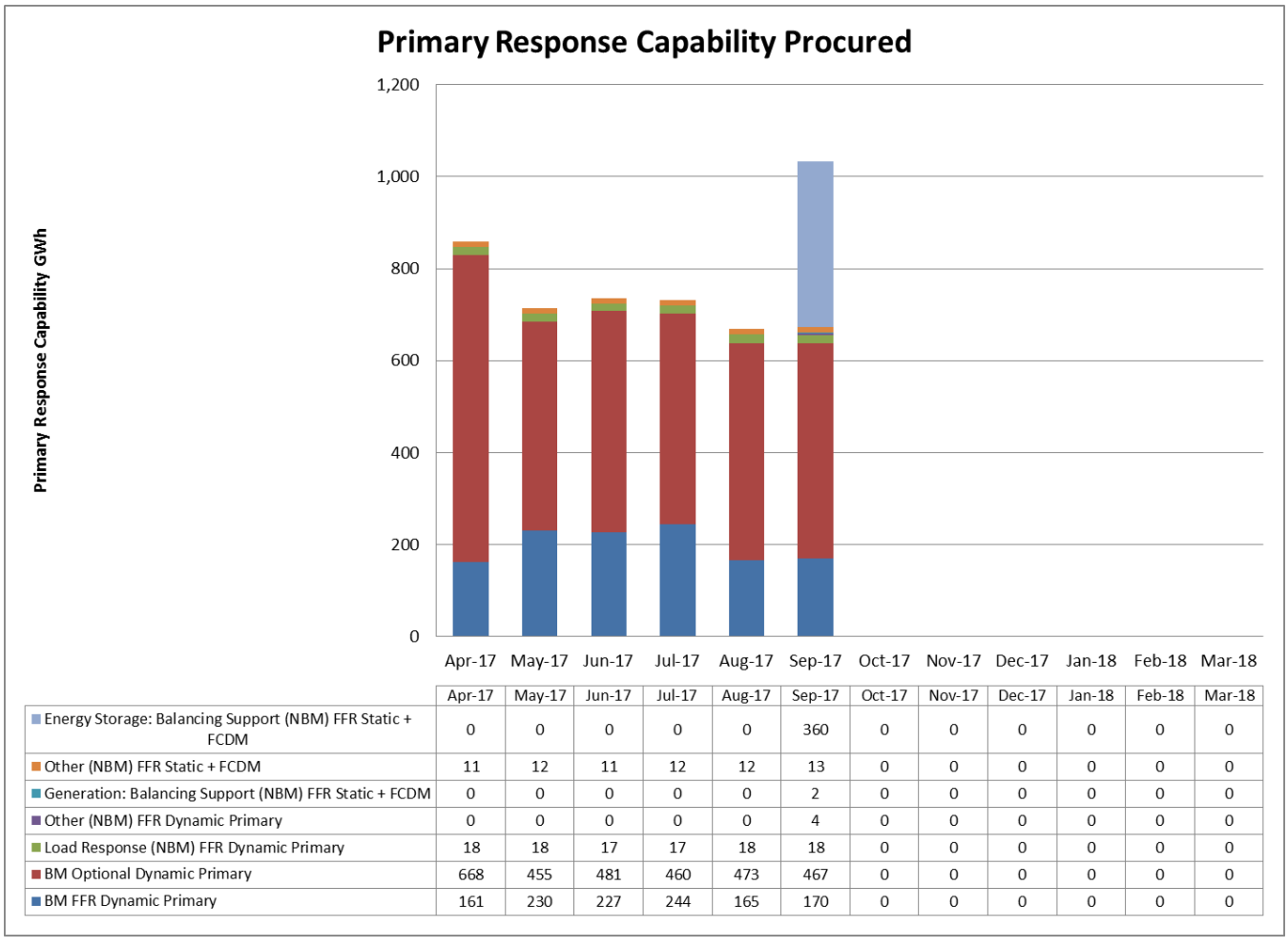
3.6 Volumes

Charts 2, 3 and 4 show the monthly volumes of frequency response services (primary, secondary and high) we procured from 1 April to 30 September 2017. We only show categories of services that we've used.

"BM optional dynamic" includes Mandatory Frequency Response services and any bilateral contracts for dynamic or enhanced mandatory services.

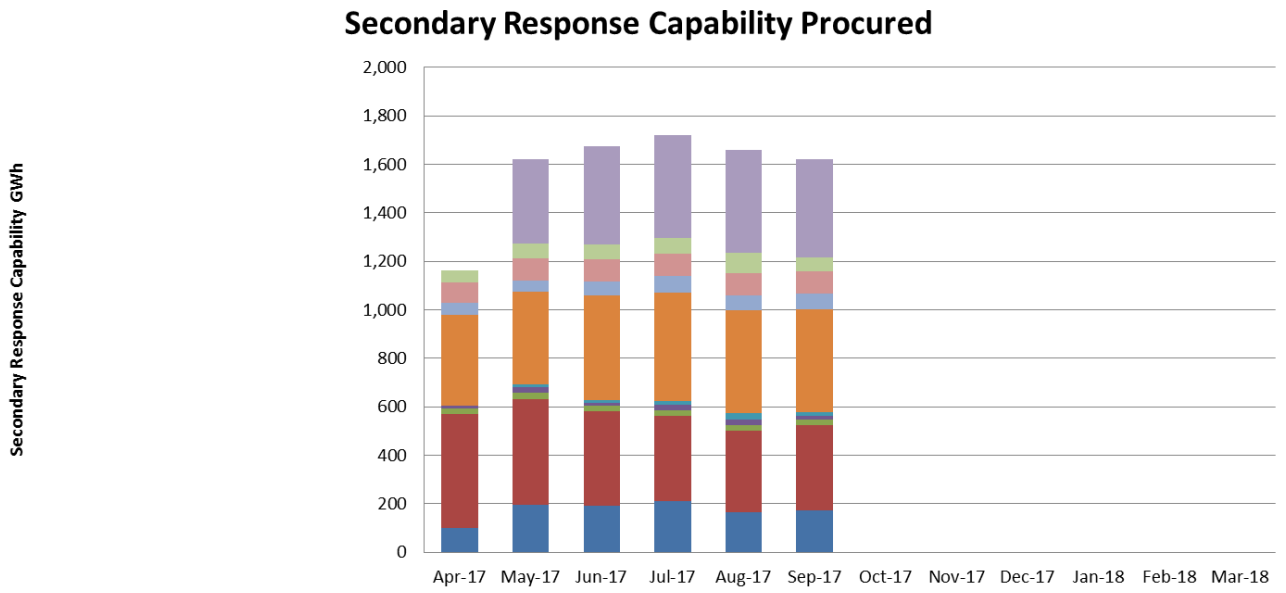
"BM optional static" includes services supplied to us as a Fast Reserve service or through other contracts (bilateral agreements).

Chart 2: Volumes of primary frequency response services procured, in gigawatt hours (GWh)



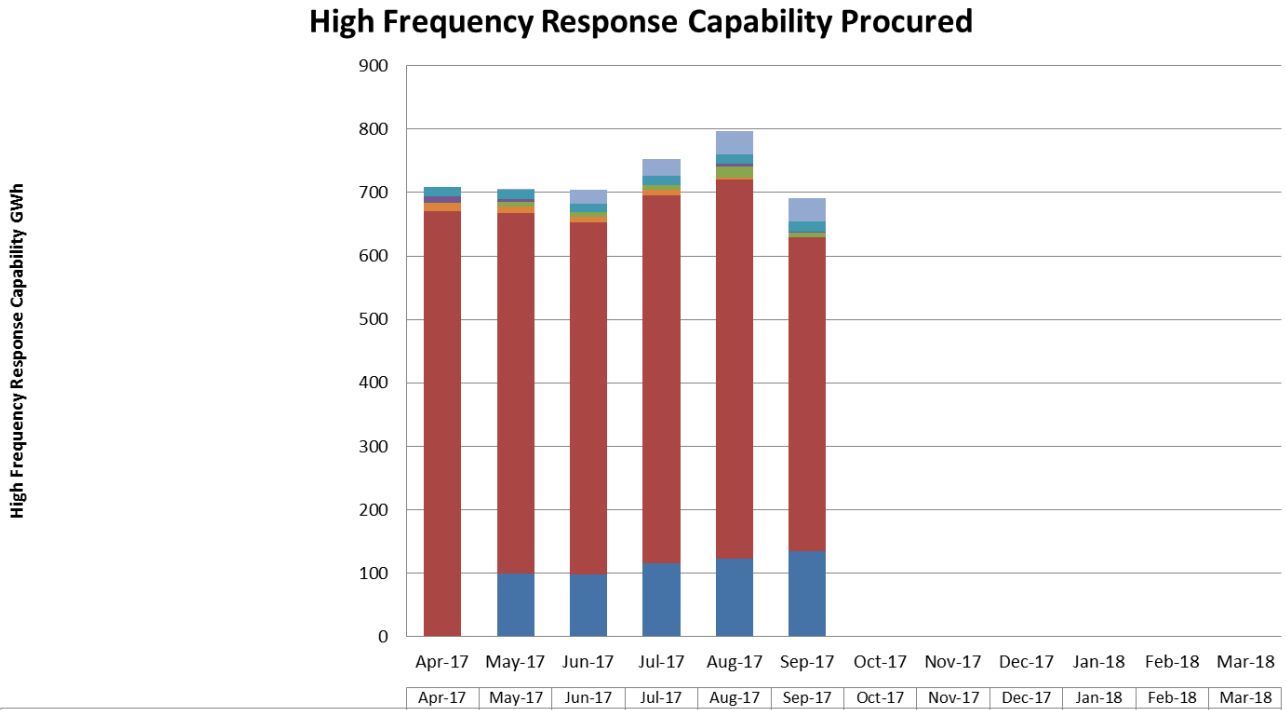
	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Energy Storage: Balancing Support (NBM) FFR Static + FCDM	0	0	0	0	0	360	0	0	0	0	0	0
Other (NBM) FFR Static + FCDM	11	12	11	12	12	13	0	0	0	0	0	0
Generation: Balancing Support (NBM) FFR Static + FCDM	0	0	0	0	0	2	0	0	0	0	0	0
Other (NBM) FFR Dynamic Primary	0	0	0	0	0	4	0	0	0	0	0	0
Load Response (NBM) FFR Dynamic Primary	18	18	17	17	18	18	0	0	0	0	0	0
BM Optional Dynamic Primary	668	455	481	460	473	467	0	0	0	0	0	0
BM FFR Dynamic Primary	161	230	227	244	165	170	0	0	0	0	0	0

Chart 3: Volumes of secondary frequency response services procured, in gigawatt hours (GWh)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Energy Storage: Balancing Support (NBM) FFR Static + FCDM	0	350	407	428	425	404	0	0	0	0	0	0
Other (NBM) FFR Static + FCDM	48	62	59	62	84	59	0	0	0	0	0	0
Load Response (NBM) FFR Static + FCDM	84	89	91	93	92	90	0	0	0	0	0	0
Generation: Balancing Support (NBM) FFR Static + FCDM	52	48	58	70	62	68	0	0	0	0	0	0
BM Optional Static Secondary	373	380	431	444	424	422	0	0	0	0	0	0
Other (NBM) FFR Dynamic Secondary	0	11	14	15	25	14	0	0	0	0	0	0
Load Response (NBM) Optional Dynamic Secondary	13	26	11	23	23	17	0	0	0	0	0	0
Load Response (NBM) FFR Dynamic Secondary	24	25	23	23	25	24	0	0	0	0	0	0
BM Optional Dynamic Secondary	467	438	390	353	335	350	0	0	0	0	0	0
BM FFR Dynamic Secondary	102	193	190	210	165	173	0	0	0	0	0	0

Chart 4: Volumes of high frequency response services procured, in gigawatt hours (GWh)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Energy Storage: Balancing Support (NBM) FFR Static + FCDM	0	2	22	26	37	37	0	0	0	0	0	0
Other (NBM) FFR Static + FCDM	14	15	14	14	15	15	0	0	0	0	0	0
BM Optional Static High	11	5	0	0	5	1	0	0	0	0	0	0
Other (NBM) FFR Dynamic High	0	7	7	7	17	7	0	0	0	0	0	0
Load Response (NBM) Optional Dynamic High	14	10	9	9	3	1	0	0	0	0	0	0
BM Optional Dynamic High	670	568	555	580	597	495	0	0	0	0	0	0
BM FFR Dynamic High	0	100	97	116	123	134	0	0	0	0	0	0

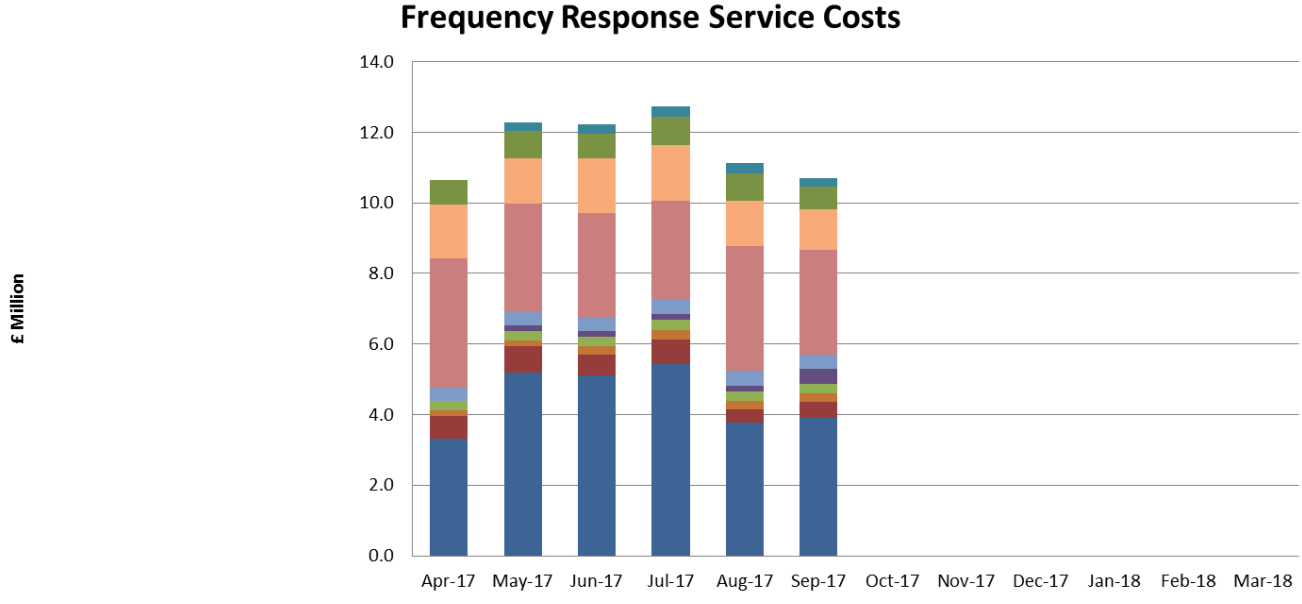
3.7 Expenditure

Chart 5 shows the monthly costs of the frequency response services we procured from 1 April to 30 September 2017.

We can't present a separate chart for each type of service because some costs are bundled together. For example, we may make a single payment to a Firm Frequency Response provider for any combination of primary, secondary or high response services.

We show expenditure on "FFR response energy" although it's not included in the previous volume charts. For BM FFR contracts, we show response energy as a separate category. For mandatory response services, the response energy cost was small; we've included it the BM optional dynamic services category.

Chart 5: Costs of Frequency Response services, in pounds sterling (£ million)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Energy Storage: Balancing Support (NBM) FFR Static + FCDM	0.0	0.2	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Load Response (NBM) FCDM + Bilateral Optional	0.7	0.8	0.7	0.8	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
BM Optional Static response services	1.5	1.3	1.5	1.6	1.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0
BM Optional Dynamic response services	3.7	3.1	3.0	2.8	3.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (NBM) Static FFR	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Other (NBM) Dynamic FFR	0.0	0.1	0.2	0.2	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Load Response (NBM) Dynamic FFR	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Generation: Balancing Support (NBM) Static FFR	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
BM Dynamic FFR respons energy	0.6	0.7	0.6	0.7	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
BM Dynamic FFR	3.3	5.2	5.1	5.4	3.8	3.9	0.0	0.0	0.0	0.0	0.0	0.0

4 Short Term Operating Reserve

Short Term Operating Reserve (STOR) allows us to have extra power or demand side response services in reserve for when we need it.

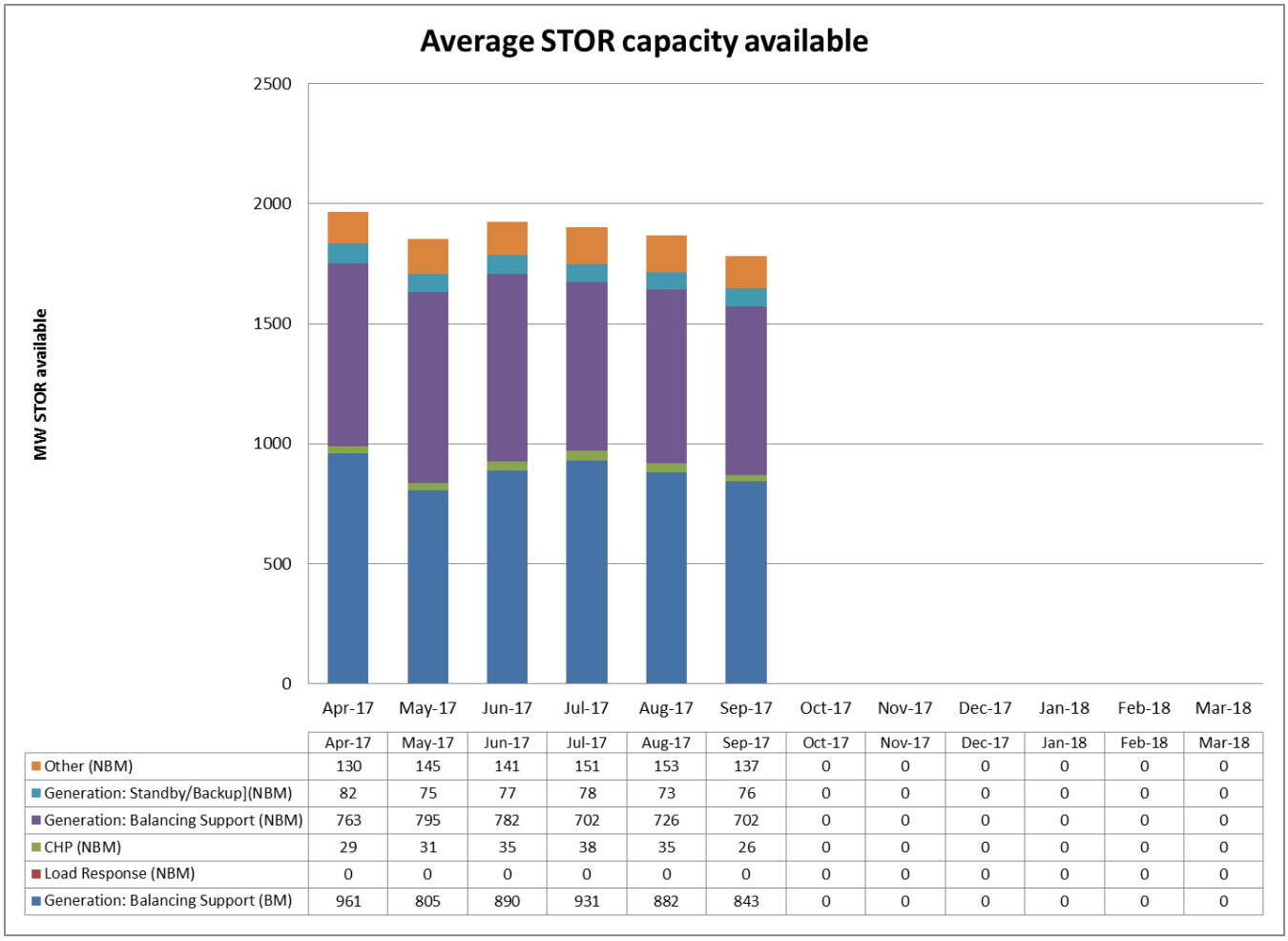
We procure STOR through competitive tendering three times a year. Providers can tender for the service for up to two years ahead.

You can find more detail about STOR, and the timetable for future tenders, on our web site, please see STOR.

4.1 Volumes

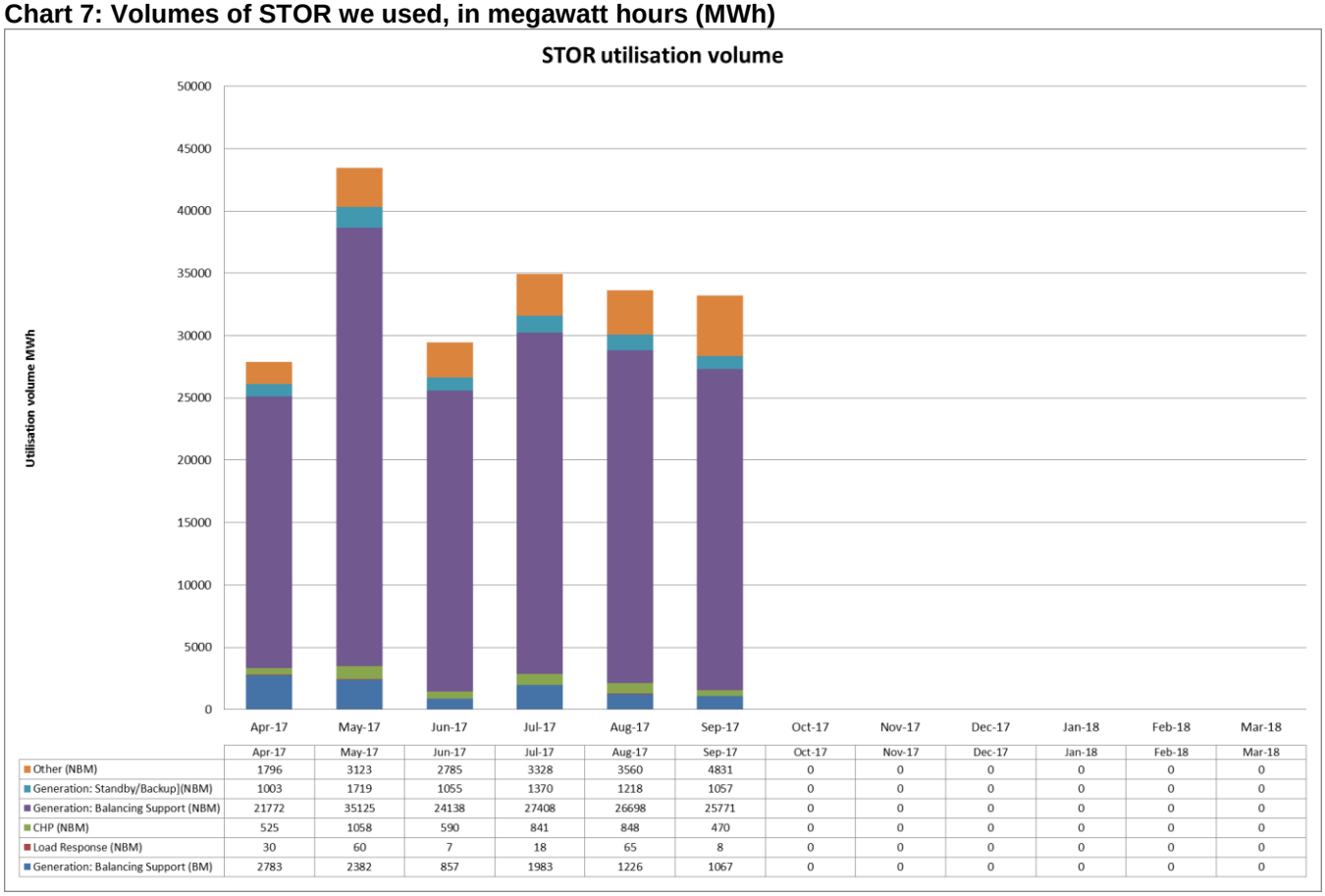
Charts 6 and 7 show the volumes of STOR we've procured from 1 April to 30 September 2017. We've split the figures to show the amounts by BM supplier, non-BM generation and non-BM other.

Chart 6: Average amount of STOR available, in megawatts (MW)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	130	145	141	151	153	137	0	0	0	0	0	0
Generation: Standby/Backup](NBM)	82	75	77	78	73	76	0	0	0	0	0	0
Generation: Balancing Support (NBM)	763	795	782	702	726	702	0	0	0	0	0	0
CHP (NBM)	29	31	35	38	35	26	0	0	0	0	0	0
Load Response (NBM)	0	0	0	0	0	0	0	0	0	0	0	0
Generation: Balancing Support (BM)	961	805	890	931	882	843	0	0	0	0	0	0

Chart 7: Volumes of STOR we used, in megawatt hours (MWh)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	1796	3123	2785	3328	3560	4831	0	0	0	0	0	0
Generation: Standby/Backup](NBM)	1003	1719	1055	1370	1218	1057	0	0	0	0	0	0
Generation: Balancing Support (NBM)	21772	35125	24138	27408	26698	25771	0	0	0	0	0	0
CHP (NBM)	525	1058	590	841	848	470	0	0	0	0	0	0
Load Response (NBM)	30	60	7	18	65	8	0	0	0	0	0	0
Generation: Balancing Support (BM)	2783	2382	857	1983	1226	1067	0	0	0	0	0	0

4.2 Expenditure

We make two kinds of payments:

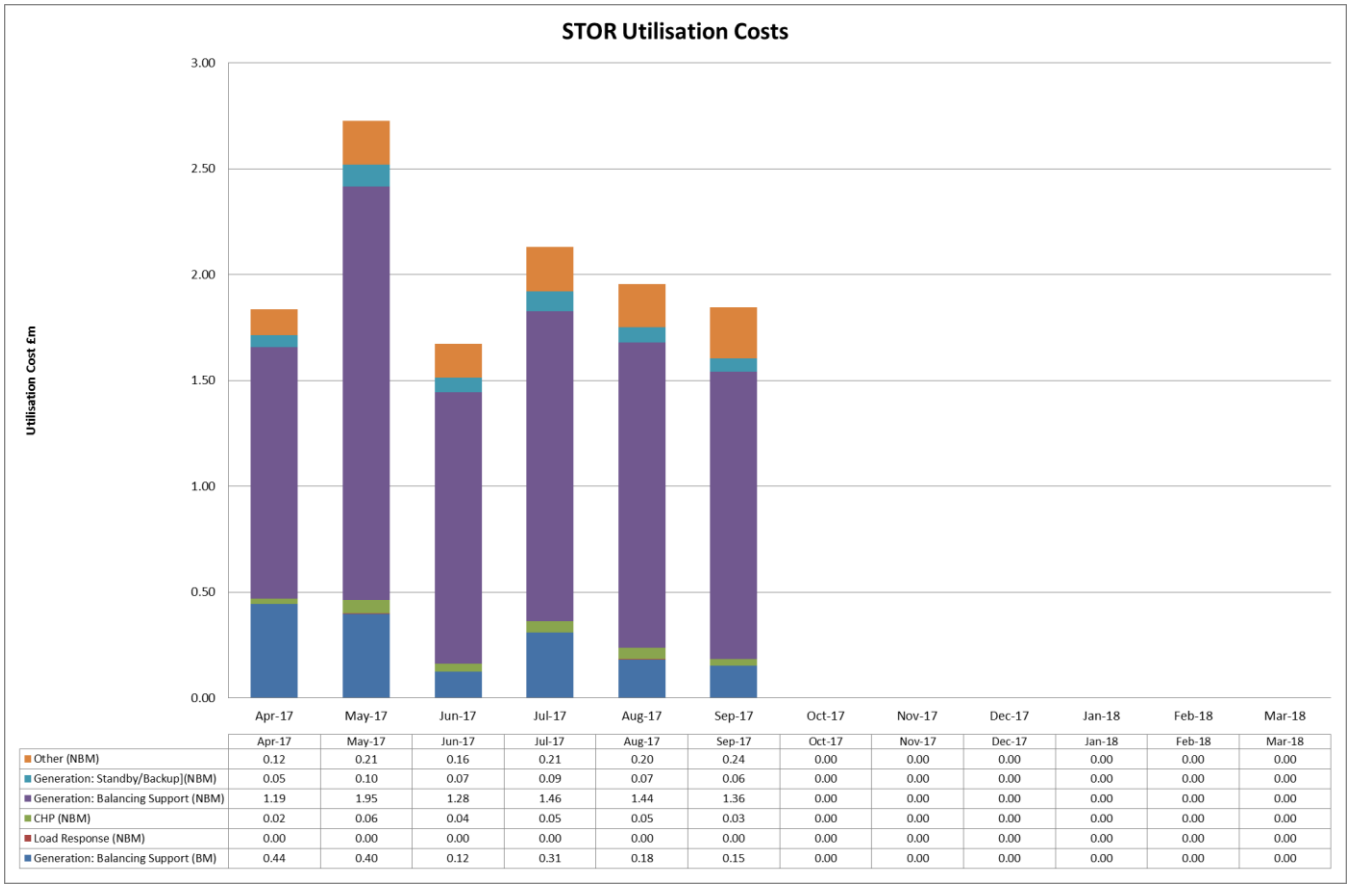
- Availability fees – these are what we pay to providers to be available to provide STOR
- Utilisation payments – we pay these when we use the STOR service.

Charts 8, 9 and 10 show the volumes of STOR we've procured from 1 April to 30 September 2017, and what we've spent on those successful tenders. We've split the figures to show the amounts by BM supplier, non-BM generation and non-BM other.

Chart 8: Availability fees, in pounds sterling (£ million)

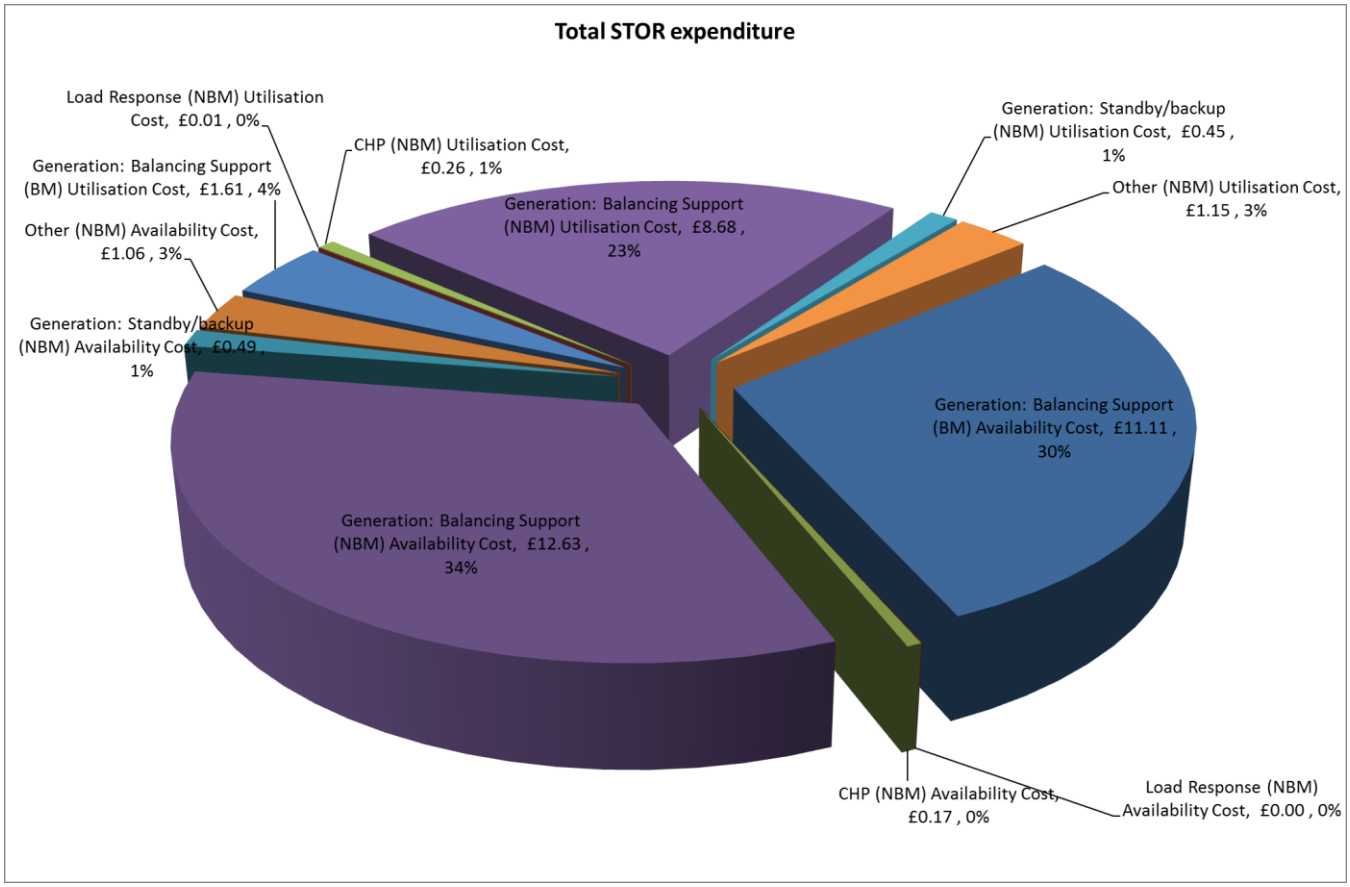
	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	0.14	0.18	0.18	0.19	0.20	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Standby/Backup](NBM)	0.08	0.08	0.08	0.09	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (NBM)	1.86	2.16	2.18	2.19	2.18	2.05	0.00	0.00	0.00	0.00	0.00	0.00
CHP (NBM)	0.02	0.03	0.03	0.04	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Load Response (NBM)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (BM)	1.74	1.72	1.87	2.03	1.94	1.81	0.00	0.00	0.00	0.00	0.00	0.00

Chart 9: Utilisation payments, in pounds sterling (£ million)



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	0.12	0.21	0.16	0.21	0.20	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Standby/Backup](NBM)	0.05	0.10	0.07	0.09	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (NBM)	1.19	1.95	1.28	1.46	1.44	1.36	0.00	0.00	0.00	0.00	0.00	0.00
CHP (NBM)	0.02	0.06	0.04	0.05	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Load Response (NBM)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (BM)	0.44	0.40	0.12	0.31	0.18	0.15	0.00	0.00	0.00	0.00	0.00	0.00

Chart 10: Total expenditure on STOR, in pounds sterling (£ million)



5 Fast Reserve

Fast Reserve (FR) is one of the balancing services we use to respond rapidly to sudden or unpredictable changes in the generation of, or demand for, electricity. It means we can bring extra power into the network or reduce consumption through DSR providers by instruction.

Within two minutes of the instruction, providers must start delivering the extra energy at a rate of 25 MW or more per minute and maintain this for at least 15 minutes. They have to be able to provide a minimum volume of 50 MW.

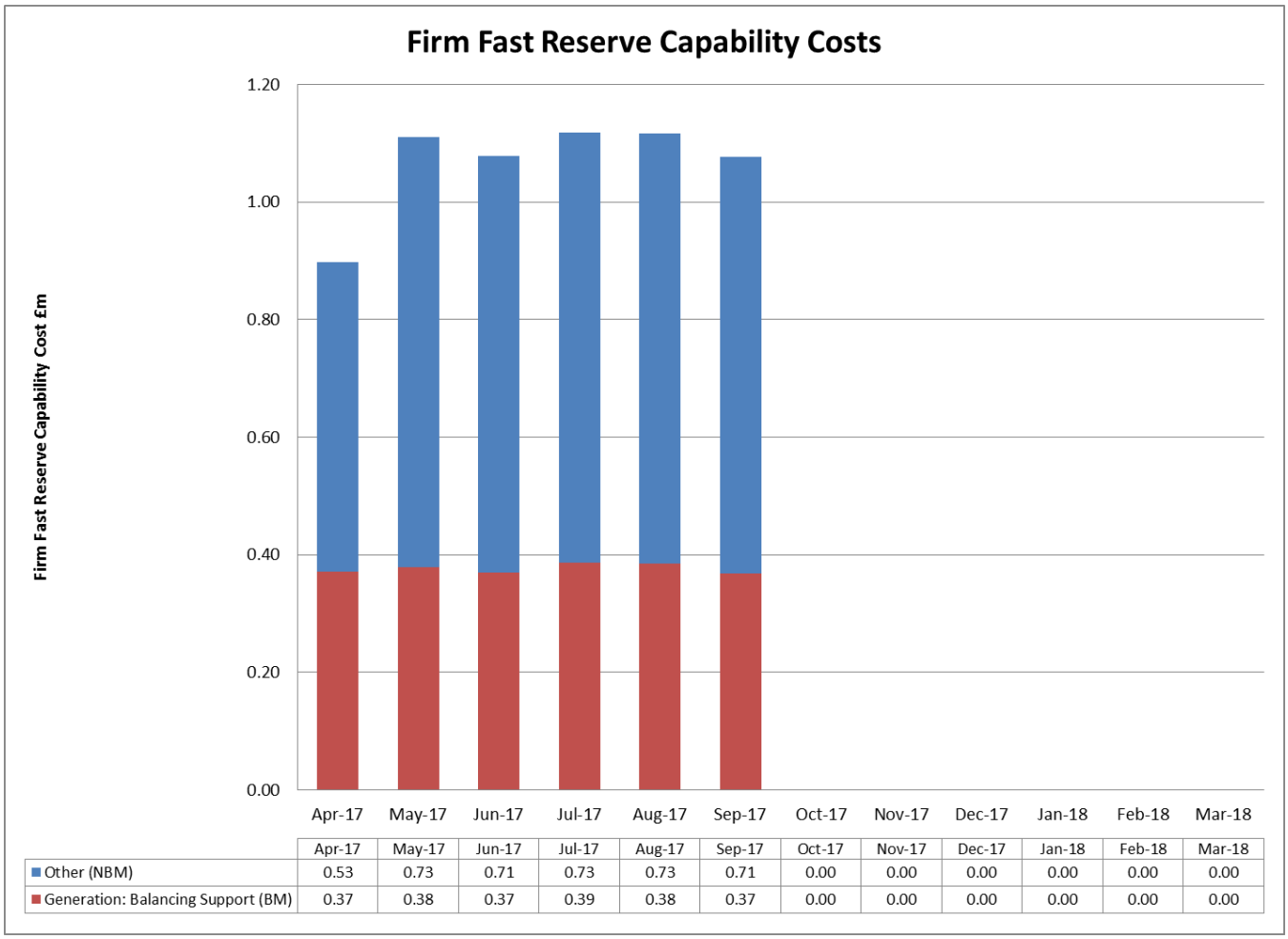
You can find more detail about fast reserve, and how we assess tenders for it here.

5.1 Volumes

Chart 11 and Chart 12 show the volumes of Balancing Mechanism (BM) and Non-BM Fast Reserve services – contracted (or "firm") and optional (or "non-firm") – we procured, month by month from 1 April to 30 September 2017.

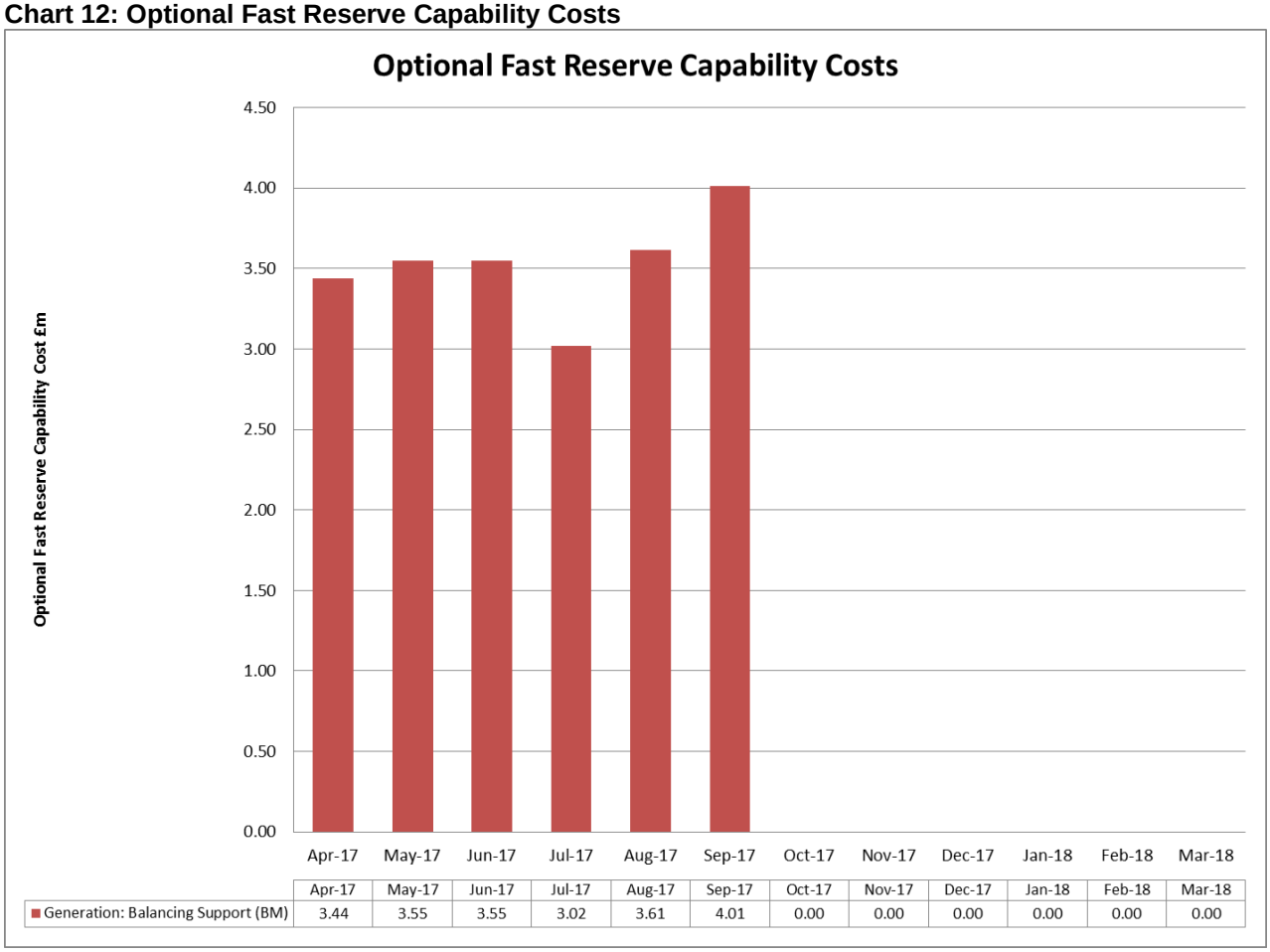
Chart 13 shows the procured capability for optional and firm Fast Reserve.

Chart 11: Firm Fast Reserve Capability Costs



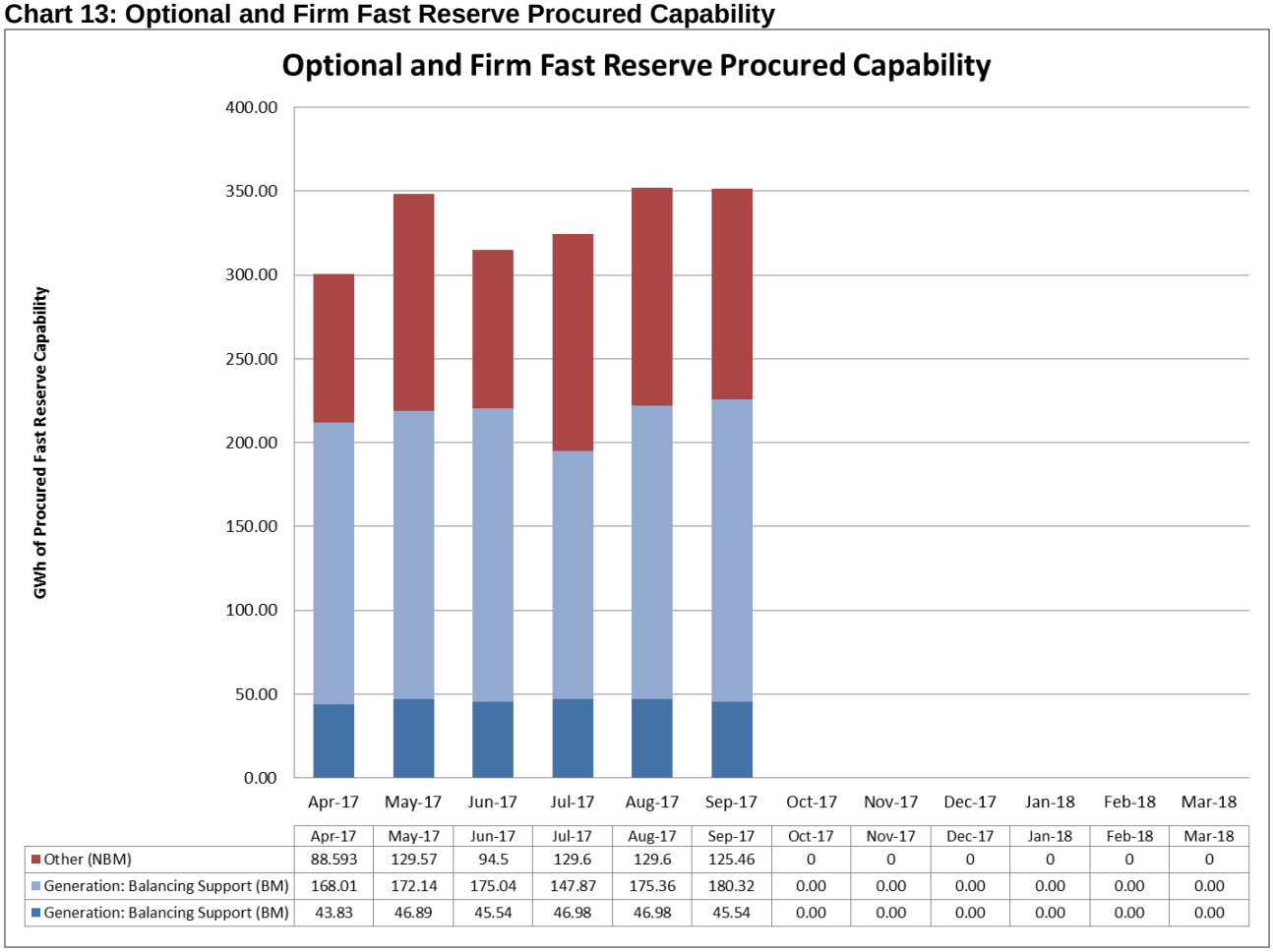
	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	0.53	0.73	0.71	0.73	0.73	0.71	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (BM)	0.37	0.38	0.37	0.39	0.38	0.37	0.00	0.00	0.00	0.00	0.00	0.00

Chart 12: Optional Fast Reserve Capability Costs



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Generation: Balancing Support (BM)	3.44	3.55	3.55	3.02	3.61	4.01	0.00	0.00	0.00	0.00	0.00	0.00

Chart 13: Optional and Firm Fast Reserve Procured Capability



	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Other (NBM)	88.593	129.57	94.5	129.6	129.6	125.46	0	0	0	0	0	0
Generation: Balancing Support (BM)	168.01	172.14	175.04	147.87	175.36	180.32	0.00	0.00	0.00	0.00	0.00	0.00
Generation: Balancing Support (BM)	43.83	46.89	45.54	46.98	46.98	45.54	0.00	0.00	0.00	0.00	0.00	0.00

7 Appendix 1: Service Classification

This section gives more information about the service classification we referred to in the introduction to this report. It describes the following types of service:

- BM generation, balancing support
- Non-BM load response, including load shifting and temporary demand reduction
- Non-BM combined heat and power (CHP)
- Non-BM generation, balancing support
- Non-BM generation, standby/back-up
- Non-BM energy storage, balancing support
- Non-BM energy storage, standby/back-up
- Non-BM other.

We've worked with DSR providers through Power Responsive, to agree on these definitions. Have a look at www.powerresponsive.com if you'd like to know more.

7.1 Why do we need a classification?

Providers usually have to be able to deliver a minimum volume of a balancing service. If they're just small businesses with small sites or assets, they can deliver services directly to National Grid or come together (often through a third party) to provide that minimum as a group. We call this "aggregating". It's a good way to help smaller providers get involved with Balancing Services.

We need to classify, or define, these services so we can:

- Better understand what assets are providing the services
- Measure the Non-BM progress in contributing to balancing services
- Report consistently Balancing services
- Allow third parties to carry out their own analysis of the data
- Identify the carbon impact of the different types of non-BM services.

7.2 Types of service

Load Response

This is an action that a provider – an end consumer – takes "behind-the-meter" to turn down or turn off any of their equipment that uses electricity.

Behind-the-meter means at the provider's own site, before it reaches the grid. It refers to anything the provider has control over and which uses or produces electricity.

There are two types of load response, which we call "load shifting" and "temporary demand reduction".

Load shifting

This is where a provider can make frequent changes in the amount of electricity it uses, through a "ramp-up" or "ramp-down". We can think of these changes as long-term energy efficiency measures.

If a factory moves its heavy electricity usage, such as a high-energy part of a production process, to another time, that's an example of a ramp-up. If a large office building switches off its heating system during certain periods, that's a ramp-down. Or it might have a smart appliance that responds to an instruction to turn the system down at set times.

A smart fridge, for instance, can be programmed to switch off for 30 minutes in a peak period; it switches back on after that and starts using energy again to stay cold.

Load shifting is based on the idea that the system or appliance, like the fridge, will use the "given-up" energy at another time. It also assumes that turning high-energy processes off and on or moving them to a different time won't affect the overall process – it won't break the fridge, damage the heating system or bring the factory to a complete standstill.

Temporary demand reduction
This is where a supplier offers to use less electricity once within a given period. For example, a factory might offer to reduce its production at a required time. When the reduction stops, production goes back to normal.

Non-BM CHP
"CHP" here stands for cogeneration of, or Combined Heat and Power.

In the generation of electricity on its own, some of the energy in the form of heat is wasted. Cogeneration is a way of generating electricity while also turning this extra energy into useful heating and cooling.

Non-BM generation, balancing support
This is where electricity is generated and fed exclusively into the grid. It helps us meet the general need for electricity, continually or just from time to time, and isn't designed to meet a specific local demand.

Non-BM generation, standby/back-up
This service uses electricity that's generated behind-the-meter, and it meets a specific local demand. If a supplier has access to a standby source of gas or diesel generation, it can reduce the amount of electricity it draws from the grid.

For example, a factory might use a diesel generator during peak periods, when the electricity is also at the peak price. This enables the factory to reduce its bill for using electricity from the grid.

Non-BM energy storage, balancing support
Energy storage here refers to reducing or shifting electricity usage or production when it's cheap, and saving it to use when it's more valuable (or there's higher demand).

The stored energy may be fed into the grid to balance supply and demand, and it's intended mainly to meet a specific local demand.

Non-BM energy storage, standby/back-up
Stored energy may also be held as a standby or back-up resource. It's fed exclusively into the grid to meet the general need for electricity and isn't linked to a specific source of demand.

Non-BM other
This covers the remaining aggregated assets for which we haven't been given detailed information.