Public

Annual Balancing Services Spend Report 2023 / 2024

Published in accordance with Standard Condition C16 of National Grid Electricity System Operator Transmission Licence

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Contents

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1. Version Control

Version No.	Date	Version / Amendment
1.0	18/06/2024	Report for 2023 – 2024 Regulatory Year
2.0	18/10/2024	Re-branded as NESO

2. Purpose of Report

On 1st October 2024 the Electricity System Operator (ESO) became the National Energy System Operator (NESO). This report details the actions of ESO during the period April 2023 – March 2024.

The Electricity System Operator (ESO) has created this report in accordance with Clause 8, Part G of Ofgem's Electricity Transmission Licence Standard Conditions.

A statement from an independent auditor accompanies this report, confirming that the report is accurate and detailing the auditor's independent assessment of the extent to which ESO has complied with the relevant statements contained within the published Procurement Guidelines and Balancing Principles Statement.

The purpose of this report is to document the total spend made by ESO on Balancing Services throughout the regulatory year April 2023 – March 2024. The report discusses the total costs that have been calculated and how they have been incurred in accordance with the following publications:

- **Procurement Guidelines v24.0**- This document sets out the Procurement Guidelines which ESO is required to establish in accordance with Standard Condition C16 of the Transmission Licence for the period covered within this report. The purpose of the guidelines is to set out the kinds of Balancing Services which they may be interested in purchasing, together with the mechanisms by which such Balancing Services will be purchased within the next financial year. The Procurement Guidelines can be found online here: https://www.nationalgrideso.com/industry-information/codes/balancing-settlement-code-bsc/c16-statements-and-consultations
    - v23.1 was published in April 2023 following the standard annual consultation, this was later revised in November 2023 to v24.0 to incorporate changes required for the Demand Flexibility Service (DFS)
- **Balancing Principles Statement v22.0** – the purpose of this document is to define the broad principles and criteria by which ESO will determine at different times and in different circumstances, which Balancing Services will be used to operate the transmission system efficiently and effectively for the period covered by this report. This document is required under Standard Condition C16 of the Transmission Licence and can be found online here: Appendix 1 Draft of Balancing Principles (nationalgrideso.com)

Scope of Report

The following Balancing Services are within scope for this report:

- Ancillary Services, including services procured through Pathfinders (Network Services Procurement)
- Forward Trades

- System Operator (SO) to SO Transactions (made via the interconnectors)

Out of Scope

The following services are out of scope for this report:

- Bids or offers accepted through the Balancing Mechanism (BM). This is where parties can submit an "offer" to sell energy (through increase of generation or decrease of consumption) and a "bid" to buy energy (through increase of consumption or decrease of generation) at prices set by the parties.

3. Introduction

ESO are responsible for balancing demand and supply every minute of every day to ensure the security and quality of electricity supply across Britain's transmission system. To do this, ESO procure Balancing Services from providers which are then used to keep the transmission system (or "grid") running in an efficient, economical, and coordinated way. That means everyone is delivered a steady flow of electricity. More information about Balancing Services can be found on ESO's website: https://www.nationalgrideso.com/industry-information/balancing-services.

This report details the various Balancing Services that ESO procured and the associated cost for regulatory year April 2023 – March 2024.

As mentioned previously, the spend covered in this report is made up of the following types of purchase:

- **Ancillary Services** – ESO enter contracts with providers to secure services which are used to help manage operability challenges. These contracts are secured either bilaterally, via competitive tenders, mandatory agreements or via a Pathfinder (now known as 'Network Services Procurement' – see below). The services contracted here are called "Ancillary Services".
- **Forward Trading** – to balance the system or manage system issues, ESO will procure electricity in advance of the balancing mechanism (BM) process. These are forward trades.
- **Network Services Procurement (previously Pathfinders)** – these are projects which look to find the most cost-effective way to address issues in the electricity system created by changes to the mix of generation seen in the grid across recent years. These projects will include a competitive tender.
- **SO-SO Transactions –** these are SO-SO services, provided by other System Operators made via the interconnectors.

Some services reported within this document are split into BM and NBM (for non-BM) categories. This refers to whether the provider's asset is registered within the BM as a BM Unit (BMU) or not.

Any figures which are reported as negative numbers represent a payment to the ESO.

Please note – the figures reported in this document were correct at the time or shortly before submission and publication. Late invoices, adjustments and disputes can occur and mean minor adjustments to spend figures.

4. Annual Spend Overview

For the regulatory year April 2023 to March 2024, ESO spent a total of £1,008,471,846.58 on Balancing Services. Last year's reported spend was £2,605,754,746.04, meaning a decrease of £1,597,282,899.46 or 61%. This significant decrease has been driven predominantly by reduced wholesale electricity prices but there are also other factors as set out below.

Response costs have reduced significantly over the period due to increased competition in battery assets and ESO's new Enduring Auction Capability (EAC). Overall volumes have reduced due to the performance of the Dynamic Services (Dynamic Containment, Dynamic Moderation and Dynamic Regulation) and there has been less reliance on Mandatory Frequency Response (MFR) as a result. Fast Frequency Reserve (FFR) costs have also fallen by 88% due to the service ending in October 2023. Response Avoidance trades also saw a decrease of 101% and a swing from a cost to ESO to an overall credit.

Utilisation volumes were down on positive reserve services as a result of the improved performance of both reserve and response services. Short Term Operating Reserve (STOR) spend was down 85% for BM assets and 12% for non-BMU assets. Operating Reserve trades saw a decrease in spend of 83%. While Negative Reserve spend showed a decrease, this was of a lesser magnitude at only 25%. This could be due to the effect of higher volumes but lower prices – the higher volumes were due to increased high frequency management during periods of high renewable generation.

Voltage conditions have been challenging throughout the past Regulatory Year with significant increase in synchronisation volumes due to voltage volatility, outages and retirement of legacy infrastructure. Voltage trades saw an increased spend of 51%, BM Constraint spend for Voltage Support increased by 94% and spend made under commercial Reactive Power contracts also rose by 30%. Mandatory reactive spend decreased by 48%.

Volume of thermal constraint actions have reduced due to new control room tools and a combination of different weather patterns. Again, a decrease in gas prices has resulted in lower cost per action and a significant reduction in overall costs. Constraint Management Intertrip Service (CMIS) spend is down by 90% on last year and Thermal trades have also decreased by 91%. While BM Constraint spend for non-Voltage Support has increased by 414%, it should be noted that this takes the total spend to £3.8m.

Restoration spend for availability payments remained roughly the same this year and while capital contribution spend decreased by 68%, a change of this magnitude is not unusual as capital contributions are usually paid out within the first 2 years of a contract, rather than being consistently spent throughout the term. Payment for feasibility studies rose by 1287%: this represents a £0.95m increase. This overall rise in feasibility study costs is due to an increase in the number of studies required now that distribution connected assets can also bid for the service. There is also a general increase in uptake to all restoration service categories as ESO remove barriers to entry for providers.

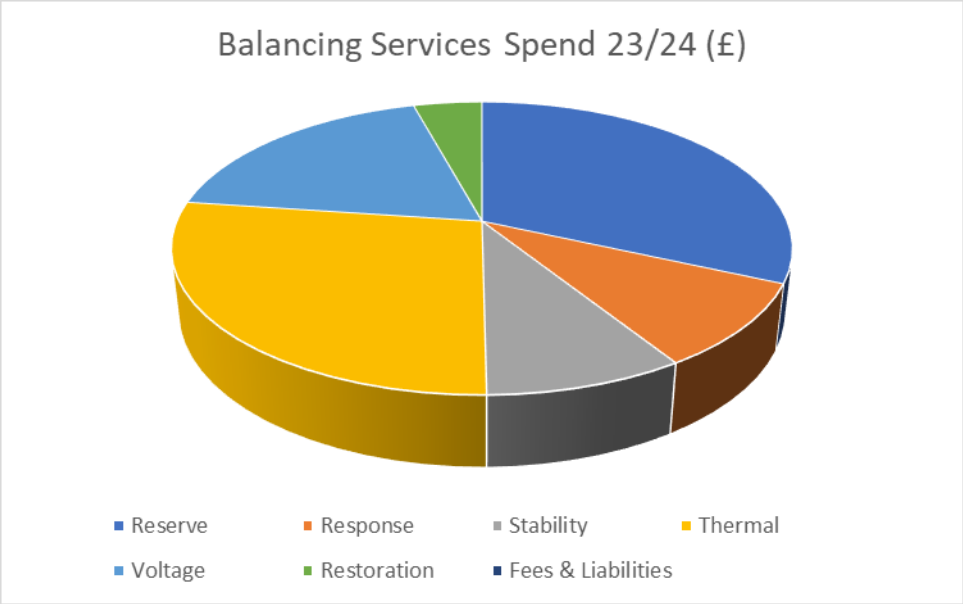

Figure 1 Total Balancing Services Spend Chart

Spend Category	Spend (£)
Reserve	£319,858,716.51
Response	£93,744,236.07
Stability	£88,611,513.44
Thermal	£276,208,267.30
Voltage	£187,116,069.35
Restoration	£42,832,744.31
Fees & Liabilities	£100,299.60
Total	£ 1,008,471,846.58

Figure 2 Total Balancing Services Spend Table

5. Reserve

At certain times of the day, ESO need access to sources of extra power in the form of either increased generation or reduced demand. This enables them to manage any electricity demand which may be greater than forecast. The additional power sources available are called Reserve Services.

In total, ESO spent £319,858,716.51 on reserve services throughout the previous regulatory year. The following sections break this down by specific services.

Short-term Operating Reserve (STOR)

Short-term Operating Reserve (STOR) allows ESO to have extra power in reserve for when it's needed. It helps to 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 previously started in April, and is split into six seasons, which specify the Availability Windows where STOR is required each day. ESO aims to procure a minimum of 1600 megawatts (MW) of STOR per day (subject to requirements). This consists of around 400MW of legacy long-term contracts and around 1200MW auction based. Since April 2021, STOR has been purchased through a daily, pay-as-clear auction process. The results are published here: ESO Data Portal: Short Term Operating Reserve (STOR) Day Ahead Auction Results - Dataset| National Grid Electricity System Operator (nationalgrideso.com).

ESO purchases two types of STOR: firm and optional. The firm service can be provided by both BM and NBM providers. They must make the service available for all availability windows and the only reason for the service not to be delivered is if the site is technically unable to do so. If a tender is accepted, ESO commit to buying all the services offered. The optional service is only open to NBM providers. Initial declarations of availability are made towards the start of the previous week and can later be refined. ESO does not commit to buying any of the services offered.

Meeting the requirement depends on liquidity in the market and if the volume can be secured at a lower cost than the alternative actions.

ESO make two types of payments for STOR:

- **Availability Payments** – Paid (£/MWh) for the hours in which the firm service has been made available. This paid as "pay as clear" through the daily auction. This is not applicable to the optional service.
- **Utilisation Payments** – Applicable to firm and optional service. Paid £/MWh for the energy delivered.

  You can find more detail about the STOR service here: Short term operating reserve (STOR) | ESO (nationalgrideso.com).

  In total, ESO spent £34,917,360.85 on STOR over the last regulatory year. Please see the figures below for further detail.

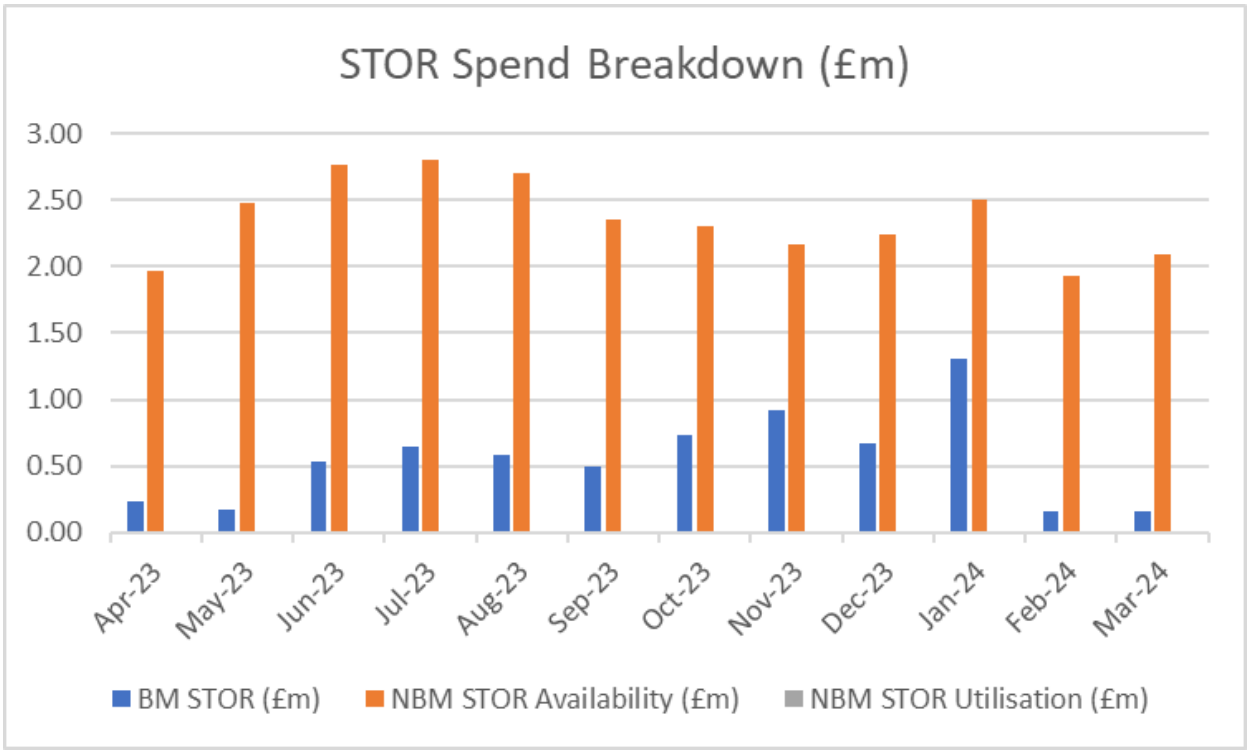

Figure 3 STOR Spend Breakdown Chart

Month	NBM STOR Availability (£m)	NBM STOR Utilisation (£m)	BM STOR (£m)
Apr-23	1.97	0.00	0.23
May-23	2.48	0.00	0.17
Jun-23	2.77	0.00	0.54
Jul-23	2.80	0.00	0.64
Aug-23	2.71	0.00	0.58
Sep-23	2.36	0.00	0.49
Oct-23	2.30	0.00	0.73
Nov-23	2.16	0.00	0.92
Dec-23	2.25	0.00	0.67
Jan-24	2.51	0.00	1.31
Feb-24	1.93	0.00	0.15
Mar-24	2.09	0.00	0.16
TOTAL	28.33	0.00	6.59

Figure 4 STOR Spend Breakdown Table

Balancing Reserve (BR)

Balancing Reserve (BR) is a new Reserve product, which was launched in March 2024, primarily for pre-fault correction of energy imbalances during system operation.

- The BR Market enables the ESO to procure access to upwards flexibility (headroom) and downwards flexibility (foot room), from existing Balancing Mechanism participating units, through two new balancing services, Positive Balancing Reserve and Negative Balancing Reserve. The contracted capacity can then be manually dispatched by ESO control

engineers in real time, dependant on system needs. BR can be dispatched in both pre and post fault system operation scenarios.

In total, ESO spent £620,528.63 on Balancing Reserve services over the last regulatory year.

You can find more details about the Balancing Reserve here:

Balancing Reserve | ESO (nationalgrideso.com)

BR is procured through a day ahead auction. Results from the auction are published here: https://www.nationalgrideso.com/data-portal/eac-br-auction-results

ESO make two types of payments to providers for BR:

- **Availability Payments** – Paid (£/MWh) clearing price to all successful providers for each service window (there are 48 service windows in a day), for both Positive and Negative Balancing Reserve, for the hours in which the service has been made available. This is determined as "pay as clear" through the daily auction.
- **Utilisation Payments** –Paid £/MWh for the energy delivered. Utilisation of BR is through bids and offers in the BM, with payments being made through the usual BOA payment process from Elexon.

Fast Reserve

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 the Electricity National Control Centre (ENCC). Fast Reserve service must commence within two minutes following instruction, at rates of 25MW or greater per minute.

ESO secures its full Fast Reserve volume via the Optional Fast Reserve (OFR) service, procured on the day by ENCC. Only providers who have entered into a Fast Reserve Framework Agreement can provide the Optional Fast Reserve service. The service can be provided by both BM and NBM providers but since November 2020 there has only been NBM participation.

You can find more details about the Fast Reserve service here: Fast reserve | ESO (nationalgrideso.com)

Two types of payments are made for the Optional Fast Reserve service:

- **Availability Payments in £/hours** – these are what ESO pay to providers to be "armed", available to supply Fast Reserve
- **Utilisation Payments in £/MWh –** paid for the energy delivered under the service.

In total, ESO spent £74,160,611.89 on Fast Reserve over the last regulatory year. This was all on non-BM Optional Fast Reserve. Further breakdown can be seen below.

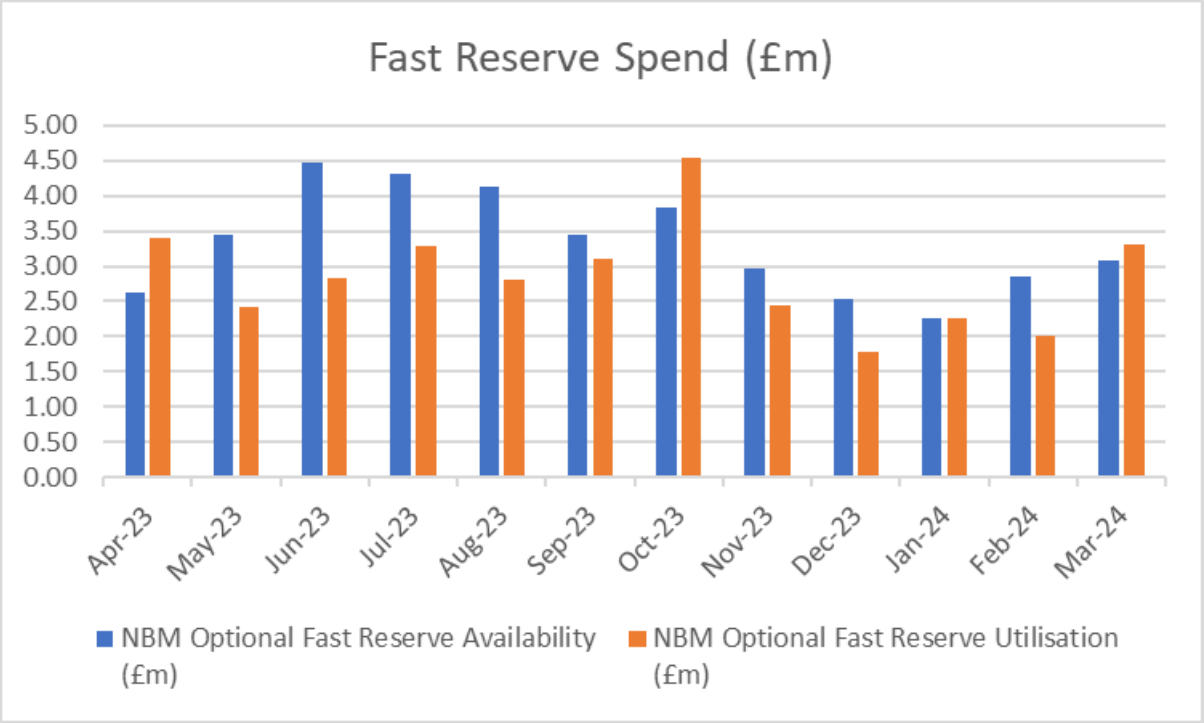

Figure 5 Fast Reserve Spend Breakdown Chart

Month	NBM Optional Fast Reserve Availability (£m)	NBM Optional Fast Reserve Utilisation (£m)
Apr-23	2.64	3.39
May-23	3.45	2.42
Jun-23	4.48	2.83
Jul-23	4.30	3.29
Aug-23	4.12	2.80
Sep-23	3.46	3.11
Oct-23	3.84	4.53
Nov-23	2.97	2.44
Dec-23	2.53	1.79
Jan-24	2.25	2.25
Feb-24	2.86	2.02
Mar-24	3.08	3.32
TOTAL	39.96	34.20

Figure 6 Fast Reserve Spend Breakdown Table

Operating Reserve

Operating or 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 forecast changes or generation breakdowns.

The spend on Operating Reserve in scope for this report is procured through:

- **SO-SO Trades -** purchases of energy from neighbouring SOs, to provide additional operating reserves.
- **Emergency Assistance (EA) and Emergency Instruction (EI) -** EA is a request for support from the connected SO. If this request is going to cause that System Operator a security issue, the request can be rejected, or the availability withdrawn. EI is a mandatory instruction to the Interconnector operator to alter the flow immediately. This is done without coordination with

the connected System Operator unless the connected SO is already in an emergency state. If the connected System Operator is already in an Emergency state, ESO will coordinate with that SO as much as possible to obtain a solution applicable form all parties. EA prices are dependent upon the arrangements agreed with the connected SO. Some are a fixed price; others are reflective of any necessary rebalancing actions taken by the assisting SO and others are reflective of the cash out price for the relevant settlement period. EI are priced at the Imbalance costs to the interconnector owners in both the GB and connected countries markets.

- **SO-SO Interconnector Capability Payments -** payments made to other System Operators (SOs) for high frequency (HF) / low frequency (LF) response capability.
- **Forward Trades -** purchases of energy in forward markets, usually over Interconnectors, to provide additional operating reserves.

In total, ESO spent £102,883,605.24 on Operating Reserve over the last regulatory year. Please see the below figures for further details overall spend and the Trade spend broken down by months.

Category	Spend (£m)
SO-SO Trades	0.10
EA and EI	0.10
SO-SO Interconnector Capability	1.48
Trades (Margin)	101.21
Total	102.88

Figure **7**: Operating Reserve Spend Breakdown Table

Month	Trades Margin (£m)
Apr-23	6.92
May-23	2.60
Jun-23	5.81
Jul-23	9.06
Aug-23	7.98
Sep-23	11.91
Oct-23	14.96
Nov-23	13.63
Dec-23	8.86
Jan-24	12.59
Feb-24	2.28
Mar-24	4.61
Total	101.21

Figure 8 Trades Margin Spend Breakdown Table

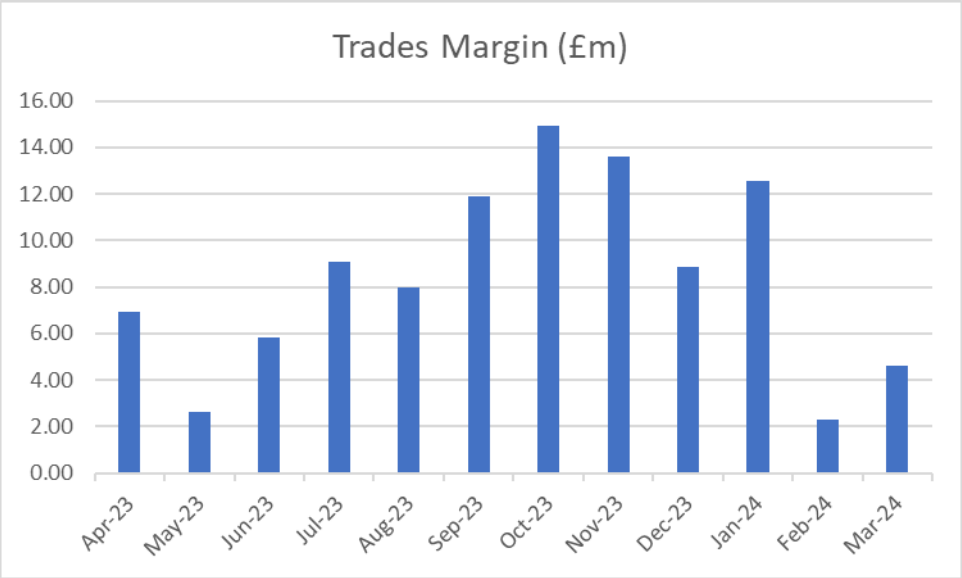

Figure 9 Trades Margin Spend Breakdown Chart

Spend made on trades for margin purposes has fallen by about 83% since 22/23. Last year, prices were much higher due to higher electricity prices and the French nuclear fleet outages which lead to power exports to France via the Interconnectors and having to replace this power.

Negative Reserve

Negative Reserve 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 (photovoltaic/solar) and wind.

The spend on Negative Reserve in scope for this report is procured through:

- **SO-SO Trades –** sales of energy to neighbouring TSOs to provide additional negative reserves.
- **EA and EI –** as described above.
- **Forward Trades –** sales of energy in forward markets, usually over Interconnectors, to provide additional negative reserves.

The total net payment to ESO for Negative Reserve regulatory year is -£14,498,158.23. This is the net of payments made by ESO for energy and money received for energy sold by ESO over the interconnector. Please see the below figures for the separated breakdown.

Category	Spend (£m)
SO-SO Trades	-0.15
EA and EI	-0.08
Trades	- 14.27
Total	-14.50

Figure 10 Negative Reserve Spend Breakdown Table

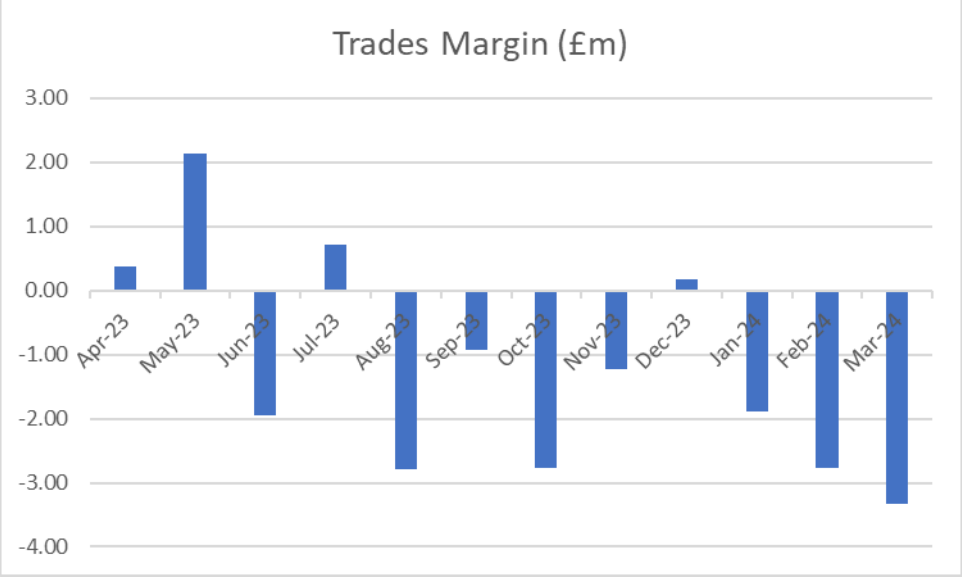

Figure 11 Negative Reserve Spend Breakdown Chart

Maximum Generation (MaxGen)

The Maximum Generation (MaxGen) service allows access to capacity which is outside of the generator's normal operating range in times of system stress. The service would be used to provide additional, short term generation output following the issuing of an Emergency Instruction.

Providers are paid a Utilisation Payment (£/MWh) once the service is utilised, and energy delivered. The agreed Utilisation Payment is included within each providers' Commercial Services Agreement (CSA).

ESO is no longer actively procuring this service. Existing contracts were put in place via bilateral negotiations and will remain in place until the sites close or the contracts are terminated.

No MaxGen services were procured or paid for during the previous regulatory year.

Super SEL (Stable Export Limit)

Super SEL is utilised to directly reduce the minimum generation level (Stable Export Limit - SEL) of generators synchronized to the system. Super SEL contract enactment will be through a trading instruction. Dispatch will be via the Balancing Mechanism to reduce output to the new lower SEL if required. The live data file is refreshed every ten minutes. The Super SEL service can be used to access additional negative reserve during periods of low demand and high inflexible generation output.

Super SEL is procured through bilateral agreements. Providers will be paid an agreed Enactment Payment (£/MWh) for the periods between start up and end time. The payment can be considered a compensation to the generator for running outside of their normal operating parameters.

In total, ESO spent £81,200.00 on Super SEL during the last regulatory year. This was used on the 24th and 25th September 2023.

Hydro Optional Pump De-load

Hydro Optional Pump De-load is the provision of Primary and Secondary frequency response where hydro units will automatically stop pumping (de-load to 0MW) when a certain real-time frequency trigger level is reached. This reduces the pumping unit's contribution to system demand, helping the frequency to increase. When required, it will be instructed in real-time by ENCC and the unit must be pumping to deliver this.

This service was procured through bilateral contracts and providers are paid a £/h amount in accordance with terms set out in their Commercial Services Agreements (CSAs).

In total, ESO spent £36,073.30 on Hydro Optional Pump De-load last regulatory year.

Hydro Optional Spin Gen

Hydro Optional Spin Gen is similar to the previous service, however, instead of the unit ceasing to pump, this service instead triggers the unit to start generating. This is instructed in real-time by ENCC. Whilst instructed to provide this the unit will spin in air using a small amount of demand to do so.

This service was procured through bilateral contracts and providers are paid a £/h amount in accordance with terms set out in their CSAs.

In total, ESO spent £88,484,709.51 on Hydro Optional Spin Gen this regulatory year. Please see below for a further breakdown on the spend.

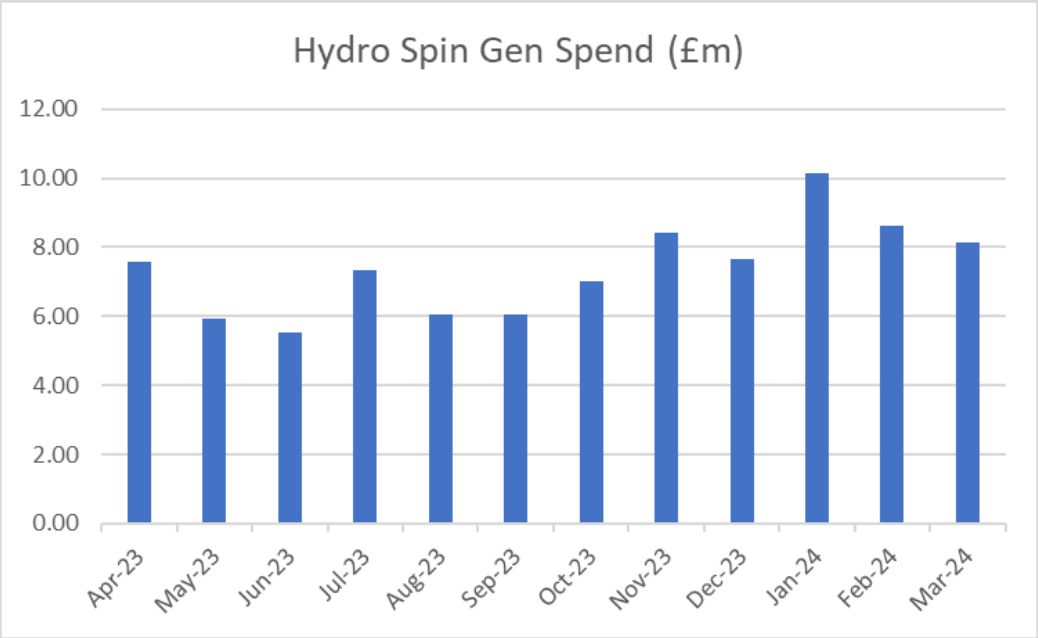

Figure 12 Hydro Optional Spin Gen Spend Breakdown Chart

Month	Hydro Spin Gen Spend (£m)
Apr-23	7.58
May-23	5.94
Jun-23	5.54
Jul-23	7.32
Aug-23	6.06
Sep-23	6.04
Oct-23	7.02
Nov-23	8.40
Dec-23	7.66
Jan-24	10.16
Feb-24	8.61
Mar-24	8.15
Total	88.48

Figure 13 Hydro Optional Spin Gen Spend Breakdown Table

Hydro Optional Spin Pump

This service is similar to the previously mentioned hydro services but occurs when a unit is instructed to begin pumping. This is a payment for the period that a unit is instructed to provide the Spin Pump service, which allows BM units to provide Reserve and Synchronous Compensation. This service is an optional, bilateral service which is contracted via providers' CSAs, the £/h payment for this service is included within this document.

In total, ESO spent £16,371,771.04 on this service last regulatory year. Please see the below figure for further breakdown.

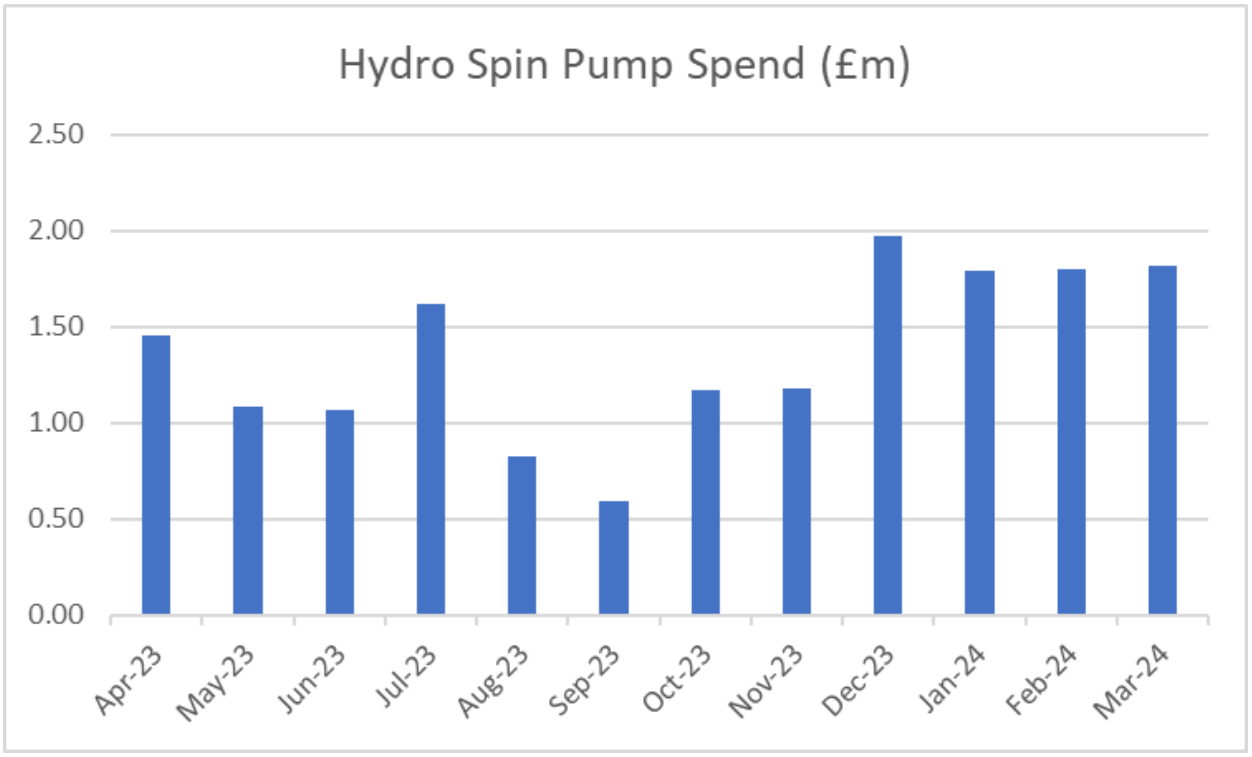

Figure 14 Hydro Spin Pump Spend Breakdown Chart

Month	Hydro Spin Pump (£m)
Apr-23	1.46
May-23	1.08
Jun-23	1.07
Jul-23	1.62
Aug-23	0.82
Sep-23	0.59
Oct-23	1.17
Nov-23	1.18
Dec-23	1.97
Jan-24	1.79
Feb-24	1.80
Mar-24	1.81
Total	16.37

Figure 15 Hydro Spin Pump Spend Breakdown Table

Hydro Rapid Start and GT Fast Start Utilisation & GT Fast Start Availability

Hydro Rapid Start is a payment made following a rapid synchronisation of a BMU when instructed by ENCC.

A Gas Turbine (GT) Fast Start utilisation payment is made following a rapid synchronisation of the BMU to the GB Transmission System following a frequency excursion below a pre-set limit. This service is an optional, bilateral service which is contracted via providers' CSAs.

Service providers of Hydro Rapid Start will be paid a £s figure when the service is provided.

Providers of GT Fast Start will be paid the following payments:

- Availability Rate (£/h)
- Start Up Payment (£/start)
- Automatic Delivery Payment for every 15 minutes of active power (£)
- Continuation Rate (£/min)

The specific prices for all of these will be included within the provider's CSA.

In total ESO spent £99,423.82 for utilisation of this service during the last regulatory year and £4,300,059.58 in availability payments.

BM Warming

This service 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.

This service is procured via bilateral contracts. There are two forms of payment for the BM start up service:

- **BM start up payment (£/hour) –** providers may submit up to three payment rates depending on the different lead times of a start-up instruction. These payments are designed to cover the costs associated with getting a unit ready for dispatch.
- **Hot standby payment (£/h) – these** payments are designed to cover the cost of sustaining a generating unit in a state of readiness.

Providers can submit their own prices for both BM start up and hot standby. These prices can be updated up to a maximum of once a week. Submitted prices inform the economic assessment to determine which providers are dispatched.

In total, ESO spent £424,416.70 on this service last regulatory year.

Demand Flexibility Service (DFS)

DFS was originally launched in November 2022 for the use over the 2022/2023 winter. The service was an "Enhanced Action" (meaning it's only utilised after the usual business as usual (BAU) actions to ensure sufficient margin has been taken over Winter). More information regarding the "Order of Actions" can be found here: https://www.nationalgrideso.com/industry-information/winter-operations. The service aimed to allow the ESO to access additional flexibility when national demand is at its highest – and margins at their tightest offering additional winter contingency.

Providers interested in the service (namely energy suppliers and aggregators) were invited to register their interest via the ESO's SMP (Single Market Platform) system and following several checks they were then added to a list of registered service providers. End consumers and businesses participated in this service via suppliers / aggregators.

For its second year of operation DFS made several improvements and changes such as adding the additional capability to procure within day. The service remained positioned as an enhanced action and a derogation was granted that expired on 30 April 2024. DFS continued to see volume grow in its second year of operation and over 2.5m consumers and businesses signed up to the

service being offered various incentives through the registered service providers to shift/reduce their demand during the DFS event periods.

Following the conclusion of the second year of operation, ESO will shortly be publishing an end of DFS season report that will be sharing all learnings to date over this winter. ESO have also conducted an industry wide questionnaire. This information alongside the early winter outlook modelling is supporting shaping what the future evolution of such a service may look like. ESO are intending to launch a consultation for an evolved version of the service in July this year.

In total, ESO spent £11,714,828.43 on the DFS service over the last regulatory year. Please see below for further breakdown.

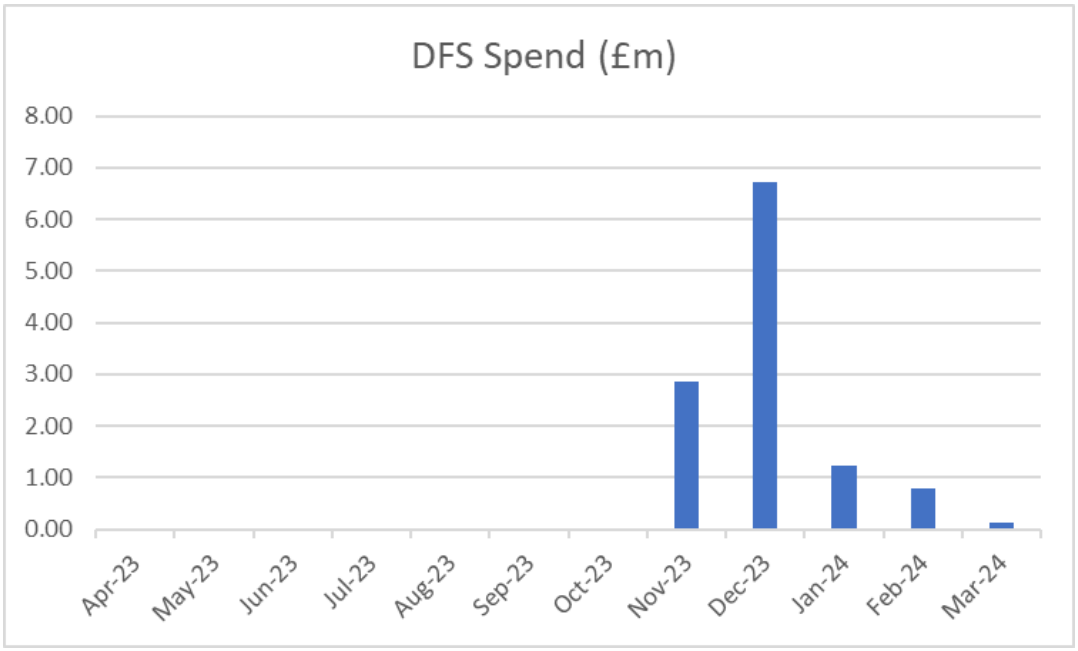

Figure 16 DFS Spend Breakdown Chart

Month	DFS (£)
Apr-23	0.00
May-23	0.00
Jun-23	0.00
Jul-23	0.00
Aug-23	0.00
Sep-23	0.00
Oct-23	0.00
Nov-23	2.86
Dec-23	6.72
Jan-24	1.22
Feb-24	0.80
Mar-24	0.12
Total	11.71

Figure 17 DFS Spend Breakdown Table

Interconnector Net Transfer Capacity Payments (NTCs)

Net Transfer Capacity is the method by which System Operators (SOs) on both sides of each interconnector can restrict the capacities released to the interconnector auctions. They are required to ensure that system security and security of supply can be maintained at all times. NTCs are obtained through trilaterally agreed procedures for each interconnector between the connected SOs and the interconnector. The NTC compensation payments are made under the "Methodology for GB Commercial Arrangements" relating to Interconnector Capacity Calculation. Only interconnectors covered under this arrangement are included within this report, as such, not all interconnectors are included within the data.

In total, ESO spent £262,285.75 on NTCs this regulatory year. Please see below for further breakdown. Spend has significantly reduced from 22/23 (99% reduction, spend during 22/23 was £35,997,165.80) as a result of a number of factors:

- Introduction of an Explicit Market on the French Interconnector, giving ESO increased commercial options to manage flows i.e. Trading.
- Increase of system response via the dynamic frequency services, reducing need for NTC's on the Interconnector with Norway.
- Spread of system prices as Energy prices have reduced dramatically since 2022.
- Introduction of FRCR2 (Frequency Risk and Control Report 2) widening statutory frequency limits giving ESO more flexibility in system reserves and response and therefore allowing greater Interconnector flows and reduced NTC usage.

Month	UK – Norway 23/24 (£m)*	Change from Previous Year (£m)	UK – France 23/24 (£m)**	Change from Previous Year (£m)	Total NTC Spend 23/24 (£m)
Apr-23	0.36	0.36	-0.01	-0.01	0.36
May-23	0.00	0.00	0.00	-0.11	0.00
Jun-23	0.01	-0.96	-0.03	-1.93	-0.01
Jul-23	0.00	-2.48	-0.01	-0.01	-0.01
Aug-23	0.00	-1.54	0.01	0.01	0.01
Sep-23	0.00	-6.12	-0.03	-0.03	-0.03
Oct-23	0.00	-3.53	0.00	0.00	0.00
Nov-23	0.00	-5.58	-0.02	-0.04	-0.02
Dec-23	0.00	-2.80	-0.06	-0.06	-0.06
Jan-24	0.00	-4.11	0.04	0.05	0.04
Feb-24	0.00	-4.91	-0.01	-0.01	-0.01
Mar-24	0.00	-1.95	0.00	0.03	0.00
Total	0.38	-33.62	-0.12	-2.11	0.26

Figure 18 NTC Spend Breakdown (£m)

*Reason – Largest securable loss, **Reason – Constraints

Winter Contingency Contracts

The Winter Contingency Contracts were entered into with a number of coal-fired power stations in order to provide further security of supply over Winter 2022/2023 which was forecast to be particularly tight in terms of margin. The request to enter into these bilateral agreements was made by BEIS (the Department for Business, Energy & Industrial Strategy), now known as DESNZ (Department for Energy, Security and Net Zero). These contracts were only to be utilised as "Enhanced Actions", similar to DFS. For more information on the order of actions please see ESO's website: https://www.nationalgrideso.com/industry-information/winter-operations.

No Winter Contingency Contracts were procured during the last regulatory year.

6. Response

Response is a service used to keep the system frequency within +/-1% of 50Hz as required by ESO's licence obligation. 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.

More information about Frequency Response and the services ESO procure can be found on the ESO website:

https://www.nationalgrideso.com/industry-information/balancing-services/frequency-response-services

In total, ESO spent £93,744,236.07 on Response services this regulatory year. The below figure and following sections break this down by specific services.

Firm Frequency Response (FFR)

ESO previously procured FFR through a competitive monthly tendering process. The results were published in the market information report: https://data.nationalgrideso.com/ancillary-services/firm-frequency-response-market-information. Meeting the requirement for FFR depended on liquidity in the market and whether or not the volume could be secured at a lower cost than the alternative actions (i.e., the BM).

Additional Response, when required, is procured through Mandatory Frequency Response (MFR) in the BM. Only BMUs can offer MFR.

FFR was previously made up of:

- **Static FFR –** a non-dynamic frequency response service which is triggered at a defined frequency deviation. It is provided within 30 seconds and sustained until 30 minutes following the point at which the frequency trigger was reached. Previously a month ahead service, this has now moved to day ahead procurement as of 1st April 2023.
- **Dynamic FFR -** was a continuously provided service used to manage the normal second-by-second frequency changes on the system. This service ceased in October 2023, with spend

incurred up to November 2023. The new dynamic response services (DC, DM, DR) offset this requirement.

Five types of payments are made to FFR providers:

- **Availability payments in £/hr –** for the hours for which a provider has tendered be able to deliver the service.
- **Nomination payments in £/hr –** a holding fee for each hour used within FFR nominated windows.
- **Window initiation payments in £/window –** for each FFR 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 and as per a defined calculation set out within the CUSC. This is represented as "Energy" within the below breakdown, all other costs above are included within the other categories.

In total, ESO spent £7,933,794.41 on Dynamic FFR over the last regulatory year and £8,406,295.74 on Static FFR. In total, £16,340,090.15 on FFR. Please see the below figures for further breakdown.

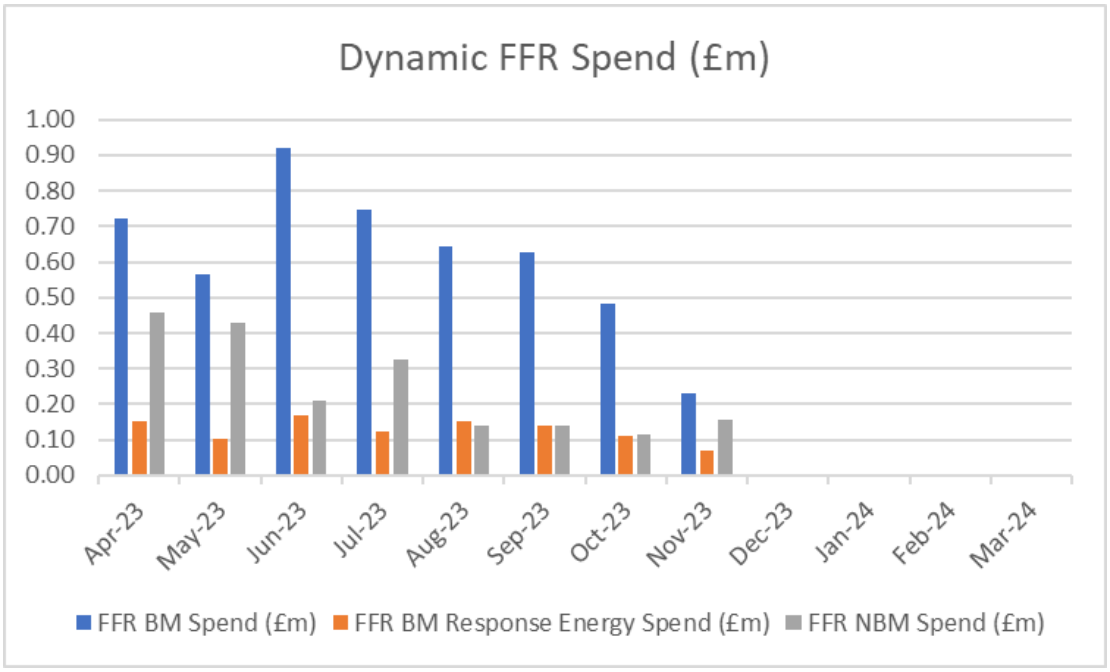

Figure 19 Dynamic FFR Spend Breakdown Chart

Month	DFFR BM Spend (£m)	DFFR BM Response Energy Spend (£m)	DFFR NBM Spend (£m)
Apr-23	0.72	0.15	0.46
May-23	0.57	0.10	0.43
Jun-23	0.92	0.17	0.21
Jul-23	0.75	0.12	0.33
Aug-23	0.64	0.15	0.14
Sep-23	0.63	0.14	0.14
Oct-23	0.48	0.11	0.12
Nov-23	0.23	0.07	0.16
Dec-23	0.00	0.00	0.00
Jan-24	0.00	0.00	0.00
Feb-24	0.00	0.00	0.00
Mar-24	0.00	0.00	0.00
Total	4.93	1.02	1.98

Figure 20 Dynamic FFR Spend Breakdown Table

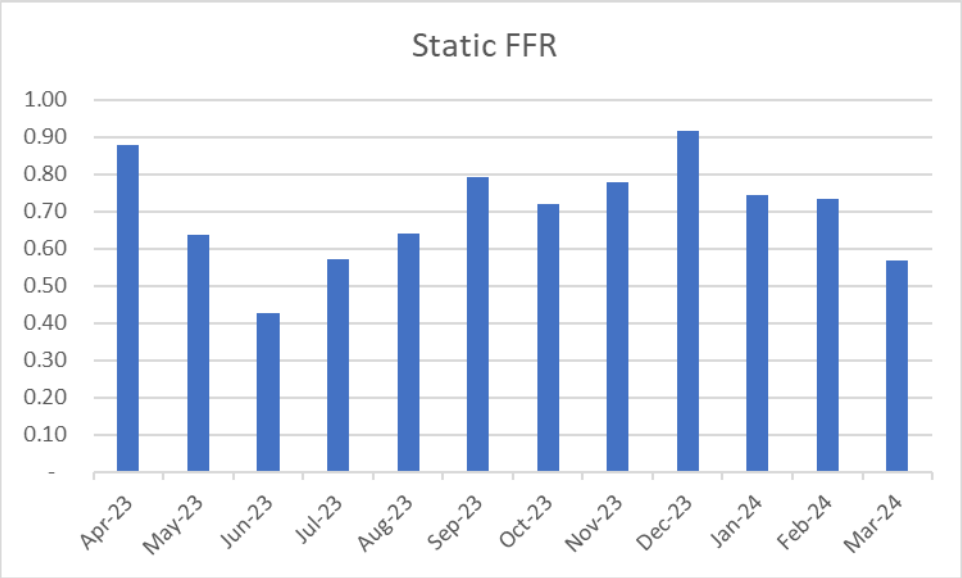

Figure 21: Static FFR Spend Breakdown Chart

Month	Static FFR (£m)
Apr-23	0.88
May-23	0.64
Jun-23	0.43
Jul-23	0.57
Aug-23	0.64
Sep-23	0.79
Oct-23	0.72
Nov-23	0.78
Dec-23	0.92
Jan-24	0.74
Feb-24	0.73
Mar-24	0.57
Total	8.41

Figure 22: Static FFR Breakdown Table

Enhanced Frequency Response (EFR)

EFR was procured as a one-off tender in 2016, awarding four-year contracts with effective dates throughout 2018 and 2019 as an incentive to invest in new capability to provide faster response. It is a dynamic service where the active power changes proportionally in response to changes in system frequency. To provide EFR, response must be within one second of 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 (£/MW/hr).

In total, ESO spent £3,500,425.35 on EFR over the last regulatory year.

DC, DM & DR

Dynamic Containment (DC), Dynamic Moderation (DM) and Dynamic Regulation (DR) make up ESO's new suite of Dynamic Response Services. Together they work to control system frequency and keep it within the licence obligations of 50Hz plus or minus 1%. DM provides fast acting pre-fault delivery for particularly volatile periods, DR is the staple slower pre-fault service and DC is a post-fault service.

Each service is procured via a day ahead auction within ESO's Enduring Auction Capability (EAC) and results are published here: Enduring Auction Capability (EAC) auction results | ESO (nationalgrideso.com).

A 4 day ahead forecast is published here for DC https://data.nationalgrideso.com/ancillary-services/dynamic-containment-4-day-forecast and longer-term indicative requirements can be found within the market information report here: https://data.nationalgrideso.com/ancillary-services/firm-frequency-response-market-information. DM and DC requirements are published on the data portal here: ESO Data Portal: Ancillary Services | National Grid Electricity System Operator (nationalgrideso.com).

Meeting the requirement depends on liquidity in the market and if the volume can be secured at a lower cost than the alternative actions.

Winning providers are paid an availability price only as determined by the pay-as-clear auction.

In total, ESO spent £45,557,220.95 on DC, £11,573,321.60 on DR and £3,615,278.04 on DM this regulatory year. A total of £60,745,820.59 on Dynamic Frequency Services. Please see the below figures for further breakdown.

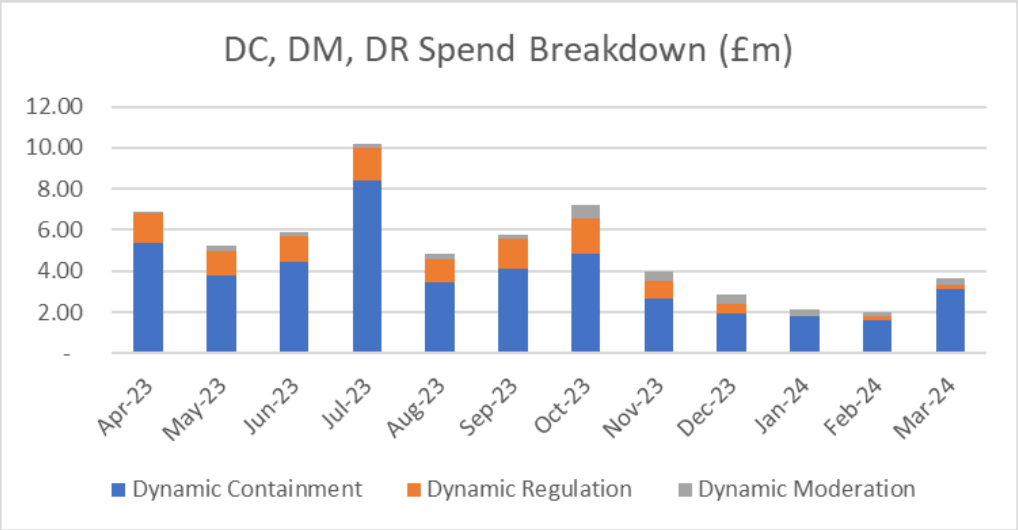

Figure 23 DC, DM, DR Spend Breakdown Chart

Month	Dynamic Containment	Dynamic Regulation	Dynamic Moderation
Apr-23	5.35	1.46	0.11
May-23	3.77	1.23	0.23
Jun-23	4.44	1.26	0.21
Jul-23	8.41	1.57	0.23
Aug-23	3.49	1.07	0.28
Sep-23	4.10	1.49	0.20
Oct-23	4.84	1.73	0.63
Nov-23	2.68	0.87	0.43
Dec-23	1.91	0.52	0.41
Jan-24	1.81	0.02	0.31
Feb-24	1.64	0.17	0.21
Mar-24	3.12	0.20	0.37
Total	45.56	11.57	3.62

Figure 24 DC, DM, DR Spend Breakdown Table

Hydro Spin Gen with LF

Similar to the Optional Hydro Spin Gen under Reserve, under this service a hydro unit will be instructed to start generating in real-time by ENCC. Whilst instructed to provide this the unit will spin in the air using a small amount of demand to do so. However, in this instance when the frequency trigger is reached, the water barriers will open, and the unit will start generating to help increase the frequency.

ESO spent £151,392.50 on this service over the last regulatory year.

Hydro Optional Frequency Response

This is the provision of Primary and Secondary frequency response where a hydro unit will automatically increase its output from its scheduled position according to the real-time frequency. This is a static service that triggers at a set frequency level. When the frequency trigger level is reached, the unit will automatically increase its output to maximum generation helping to increase the system frequency. It is armed in real-time by ENCC. The unit must be generating at its Part Load Point to be able to provide/deliver this.

Over this regulatory year, ESO spend a total of £93,311.47 on this service, made up of £53,732.38 for service availability and £39,579.09 for energy.

Generator Frequency Response

This spend line is inclusive of both mandatory and commercial frequency response. Mandatory Frequency Response (MFR) is a service that generators connected to the transmission network must have the capability to deliver in accordance with the Grid Code. Once connected, the detail of capability is contained within each provider's Mandatory Service Agreement (MSA). After which, generators may submit holding prices to deliver MFR into a system called FRPS monthly. The ENCC will instruct MFR based on volume requirements and the lowest cost in the stack based on the holding prices. A calculator called FRPF runs every 30 mins to determine the stack.

The commercial element in this context relates to a small number of contracts that are settled in the same way as MFR but with different pricing. Specifically, the MFR price submission is monthly however, the bilateral contact price submission is on an ad-hoc basis by the service provider.

Over this regulatory year, ESO spent a total of £13,057,041.57 on generator response, this is made up of £12,750,517.95 on service availability and £306,523.62 on response energy.

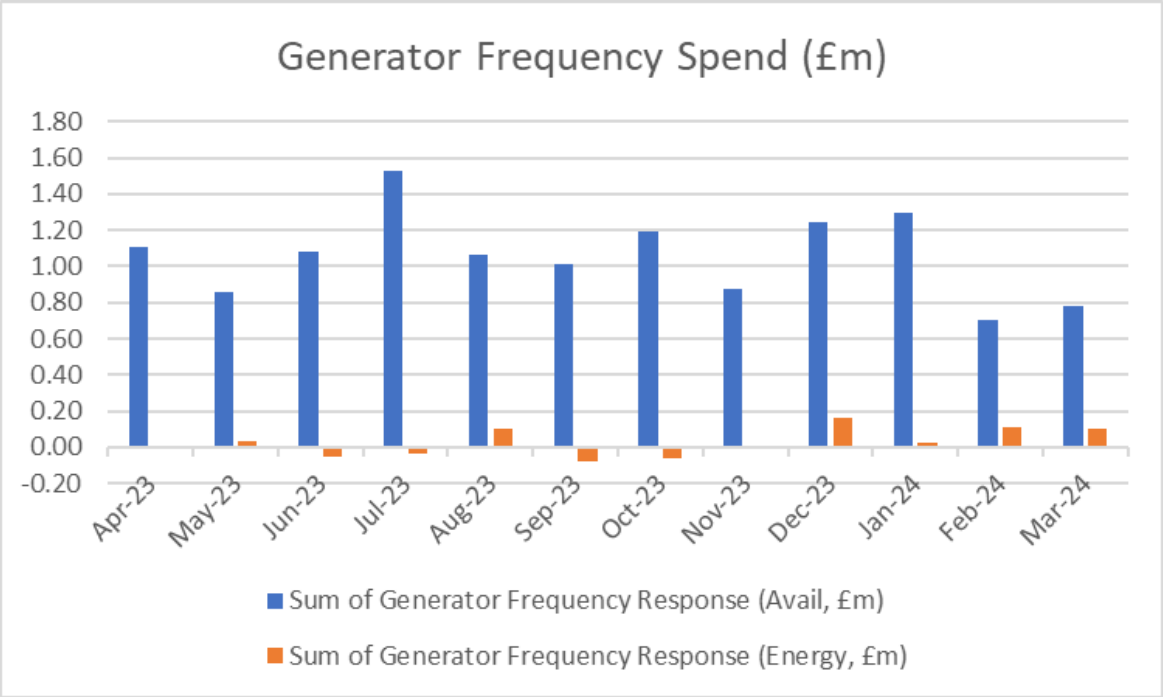

Figure 25 Generator Frequency Response Spend Breakdown Chart

Month	Generator Frequency Response (Avail, £m)	Generator Frequency Response (Response Energy, £m)
Apr-23	1.11	0.01
May-23	0.86	0.03
Jun-23	1.08	-0.05
Jul-23	1.52	-0.04
Aug-23	1.06	0.10
Sep-23	1.01	-0.07
Oct-23	1.20	-0.06
Nov-23	0.88	-0.01
Dec-23	1.24	0.16
Jan-24	1.29	0.03
Feb-24	0.70	0.11
Mar-24	0.78	0.10
Total	12.75	0.31

Figure 26 Generator Frequency Response Spend Breakdown Table

Response Avoidance

These are Forward Trades made to reduce the volume of Response required by the system and enable the Response costs which would be incurred via MFR to be avoided.

In total, ESO spend is -£143,845.56 for Response Avoidance trades over the last regulatory year. This full amount was incurred during May 2023, no other month incurred spend. This represents a decrease of 101%, the total spend figure has swung from a payment incurred to a payment made to ESO. This large decrease is thought to be due to the increased performance of the dynamic frequency response services which means less reliance on MFR and Response Avoidance trades.

7. Stability

Stability is the inherent ability of the system to quickly return to acceptable operation following a disturbance. The term is used to describe a broad range of topics, including inertia, short circuit level and dynamic voltage. If the system becomes unstable it could lead to a partial or total system shut down leading to the disconnection of consumers. To keep the power system stable, we need to maintain sufficient amounts of inertia, SCL and dynamic voltage support.

Stability services have traditionally been provided by synchronous generation, which can contribute inertia and Short Circuit Level (SCL) when supplying the grid with electricity, as well as dedicated network assets. Some forms of low-carbon generation do not automatically provide the same level of stability as they are non-synchronous. Therefore, ESO needs to procure additional stability services to ensure the system can be operated with the same stability in a low-carbon world. To date, these have been procured via a number of Pathfinder tenders. Phase 1 is now live. Phase 2 and 3 tenders have concluded but the contracts are not yet live so spend has not yet been incurred on the services. Additionally, in October 2023 ESO launched the Stability Midterm (Y-1) market. This enduring market looks to award 12-month Inertia and SCL contracts (subject to requirements), a year ahead of go live. The first tender round has not yet concluded; contracts are due to be awarded in Autumn 2024.

On a more enduring basis, ESO are looking to develop a Stability Market and work has already commenced on this project. You can find out more at this link:
https://www.nationalgrideso.com/future-energy/projects/stability-market-design

Stability Pathfinder Phase 1

Phase 1 of the stability pathfinder was looking for the most cost-effective way to increase inertia, provide short circuit level and the ability to dispatch the assets to provide Reactive Power. A request for information was issued in July 2019 and a tender concluded in January 2020 awarding 12 contracts to 5 different providers. All contracts for this phase are now live.

In total, ESO spent £88,611,513.44 on Phase 1 stability contracts last year. Please see below for further breakdown.

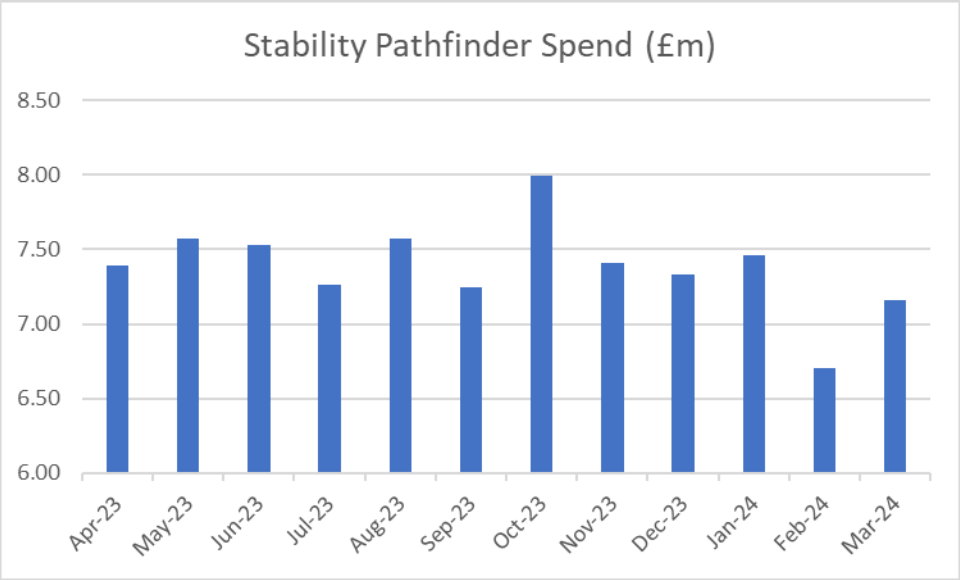

Figure 27 Stability Pathfinder Spend Breakdown Chart

Month	Stability Pathfinder Spend (£m)
Apr-23	7.39
May-23	7.57
Jun-23	7.53
Jul-23	7.26
Aug-23	7.57
Sep-23	7.24
Oct-23	7.99
Nov-23	7.41
Dec-23	7.33
Jan-24	7.46
Feb-24	6.70
Mar-24	7.16
Total	88.61

Figure 28 Stability Pathfinder Spend Breakdown Table

8. Thermal

There are several types of constraints but one of the most common on the network are thermal constraints. Thermal constraints refer to an area of the network where the power is congested due to the thermal capacity of the equipment. At times, to ensure system security, the ESO must reduce generation / increase demand behind a constraint and increase generation / reduce demand in front of the constraint to ensure generation and demand remain in balance and the integrity of equipment is maintained.

Costs incurred in managing these thermal constraints are mitigated wherever possible through innovative commercial solutions which avoid reliance on the BM. These include:

- **Constraint Management Intertrip Services (CMIS) –** secures a pre-determined volume of generation capacity which can be reduced to 0MW almost instantaneously in the event of a fault. Contracts are awarded yearly via a competitive tender and providers are paid an arming fee (£MWh) and a tripping fee (£/trip). The service is live on the B6 boundary between England and Scotland and the EC5 boundary in East Anglia is under consultation.
- **Trades** – trades are carried out, outside of the BM in order to secure volume ahead of a fault.
- **BM Constraints for Voltage Support –** This category is for Constraints Payments entered into for the purpose of voltage support.
- **BM Constraints – Other –** This category is for Constraints Payments entered into for purposes other than voltage support.
- **Local Constraint Market (LCM) -** is a new market which aims to reduce constraint costs by increasing demand or reducing embedded generation within constrained regions, specifically the B4 and B6 boundaries (the Anglo-Scottish boundaries). This will be achieved through increased competition from new assets who currently have challenges in accessing the BM. This service went live in December 2023. The LCM is not attempting to 'resolve' the B6 boundary constraint, only to relieve it through Distributed Energy Resource (DER) options, or provide competition to prices seen in the BM. The market will help to manage rising constraint costs on GB's most congested boundary. LCM is dispatched on Pre-fault Operation scenarios. Pre-Fault is designed to address constraint at the B6 boundary and provide a more cost-effective alternative to BM actions. The LCM will operate ahead of Gate Closure and real-time and provides a mechanism to curtail generation / increase demand for periods of high B6 constraints, most notably in periods of high wind generation.

  You can find more details about LCM here: Local Constraint Market | ESO (nationalgrideso.com)

LCM is procured through a day ahead auction on the third party Piclo platform. Information about the

day ahead auctions, competitions and results can be found here: https://data.piclo.energy/

Under the service, providers do not receive an Availability Payment. Instead they are paid based on Utilisation only

- **MW Dispatch** - is a transmission constraint management service and the first service to be developed through our joint Regional Development Programmes (RDP) with Distribution Network Operators (DNOs). This service went live in September 2023 and was initially only open to DERs connected to specific Grid Supply Points in National Grid

Electricity Distribution (Southwest) and UK Power Networks (South East Coast region) areas where ESO anticipate or have a potential transmission constraint issue to mitigate. This enables those DER with specific connection terms and conditions built into their Connection Agreement to fulfil these obligations. The ESO is investigating whether there is a need or commercial value in opening this service up to more parties in the coming months.

Under MW Dispatch, ESO may at any time in a Trading Day issue a Dispatch Instruction for Active Power Response to the DNO which is then fulfilled by the DER. You can find more detail about the MW Dispatch service here: https://www.nationalgrideso.com/industry-information/balancing-services/system-security-services/megawatt-dispatch.

MW Dispatch instructions are available here: https://www.nationalgrideso.com/data-portal/non-bm-ancillary-service-dispatch-platform-asdp-instructions.

The service, regardless of technology, requires providers to reduce real power output to zero ('turn to zero') when instructed by ESO under certain network conditions and when it is economic to do so. If instructed, and providing they comply with the instruction, MW Dispatch Service Providers will be paid for the volume of energy they have curtailed - there is no availability payment under this service.

- **Interconnector Intertrips** – the interconnectors will be paid an arming fee and capability fee for reducing their volume in the event of a fault.
- **Intertrips via Commercial Contracts** – providers are paid an arming fee and capability fee for reducing their volume in the event of a fault.

In total, ESO spent £276,208,267.30 on Thermal services in the past regulatory year. See below for further breakdown.

CMIS

In total, ESO spent £957,158.15 on CMIS in the past regulatory year. This is a 90% decrease compared to the previous year. The significant decrease in spend seen here is because the contracts which are live currently under CMIS are for the B6 boundary. This year, constraints have been active on other boundaries and as such less spend has been incurred for B6. See below for further breakdown.

Month	CMIS Spend (£m)
Apr-23	0.00
May-23	0.08
Jun-23	0.00
Jul-23	0.11
Aug-23	0.00
Sep-23	0.05
Oct-23	0.00
Nov-23	0.07
Dec-23	0.00
Jan-24	0.07
Feb-24	0.30
Mar-24	0.28
Total	0.96

Figure 29 CMIS Spend Breakdown Table

Trades

In total, ESO spent £258,630,993.21 on Thermal trades in the past regulatory year. See below for further breakdown.

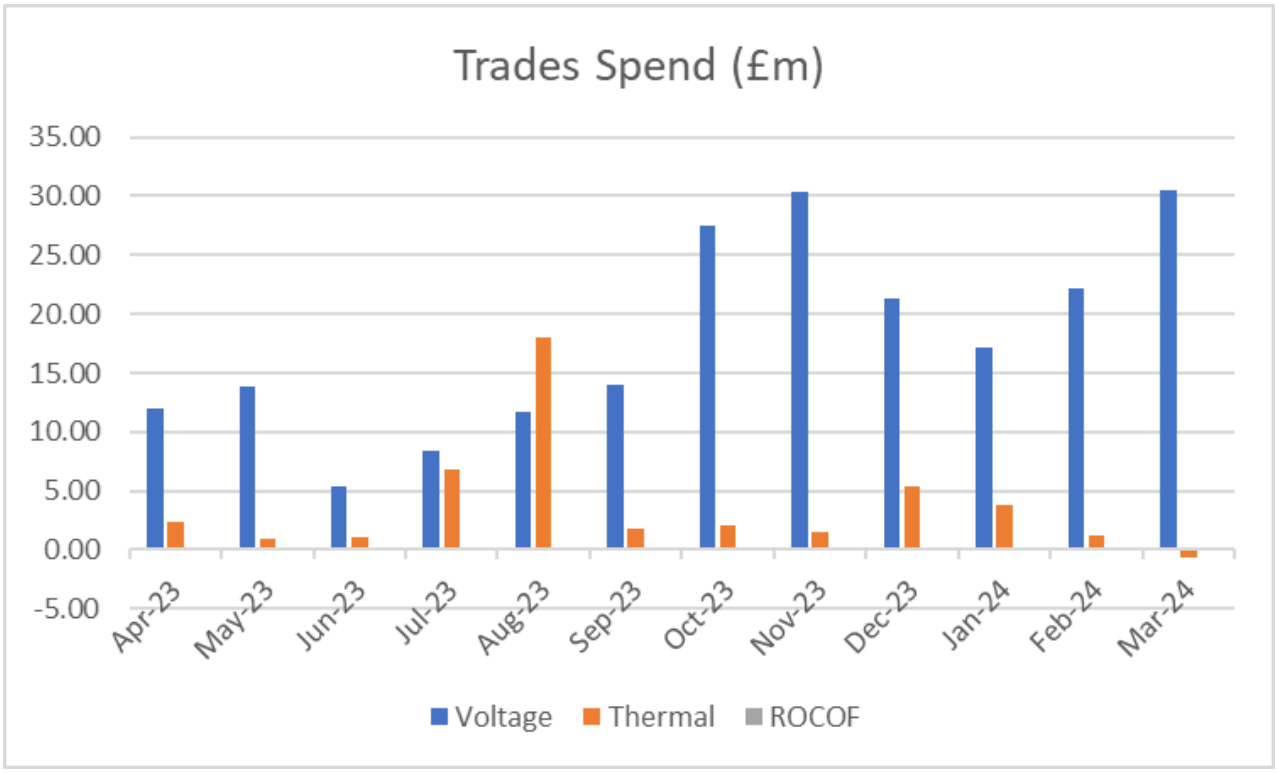

Figure 30 Trades Spend Breakdown Chart

Month	Voltage (£m)	Thermal (£m)	ROCOF (£m)
Apr-23	11.95	2.32	0
May-23	13.83	0.92	0
Jun-23	5.32	1.03	0
Jul-23	8.44	6.78	-0.03
Aug-23	11.76	18.08	0
Sep-23	14.00	1.81	0
Oct-23	27.46	2.02	0
Nov-23	30.43	1.51	0
Dec-23	21.38	5.32	0
Jan-24	17.19	3.80	0
Feb-24	22.15	1.25	0
Mar-24	30.49	-0.58	0
Total	214.40	44.26	-0.03

Figure 31 Trades Spend Breakdown Table

The figures above show a spike in Thermal trade spend in August. This was due to constraint called SCOAST which is an import constraint on the south coast. SCOAST is usually an issue when the Interconnectors are at maximum export (pulling more power across the constraint) and there are active circuit outages. This leads to the ESO having to buy power back on the relevant Interconnectors to relieve the constraint.

BM Constraints

In total, ESO spent £9,436,592.55 on BM constraints in the past regulatory year. See below for further breakdown.

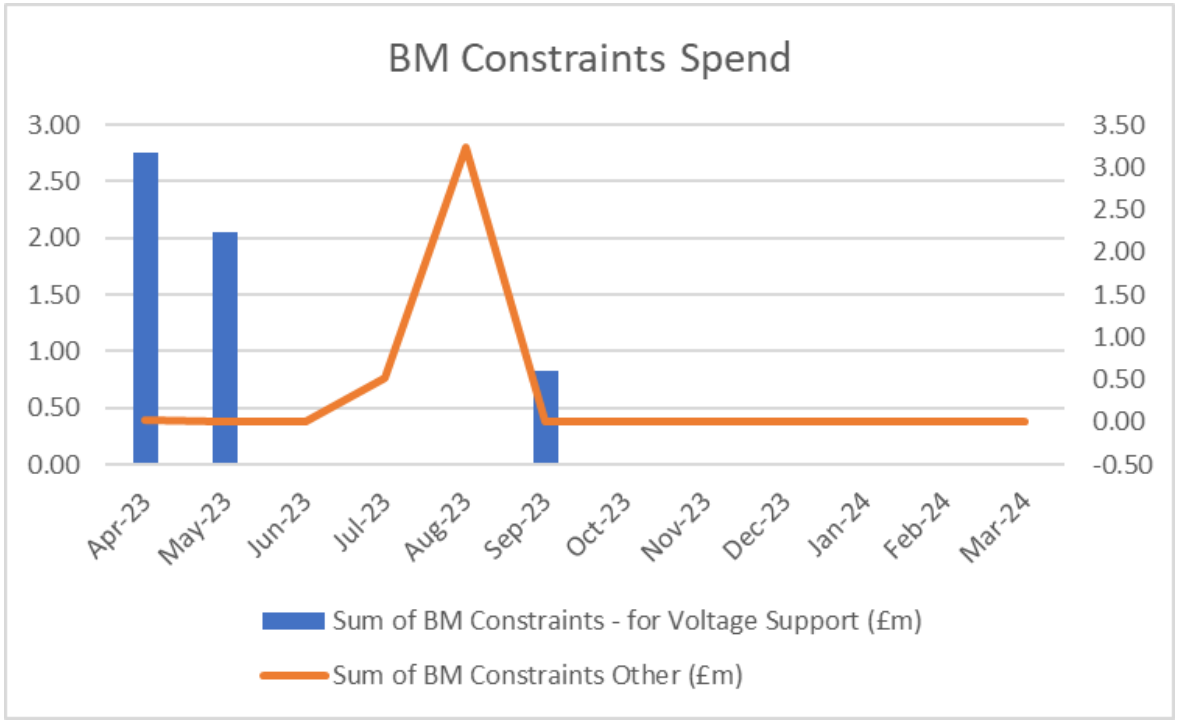

Figure 32 BM Constraints Breakdown Graph

Month	BM Constraints - for Voltage Support (£m)	BM Constraints - Other (£m)
Apr-23	2.76	0.02
May-23	2.05	0.00
Jun-23	0.00	0.00
Jul-23	0.00	0.52
Aug-23	0.00	3.23
Sep-23	0.82	0.00
Oct-23	0.00	0.00
Nov-23	0.00	0.00
Dec-23	0.00	0.01
Jan-24	0.00	0.00
Feb-24	0.00	0.01
Mar-24	0.00	0.01
Total	5.63	3.80

Figure 33 BM Constraints Spend Breakdown Table

Intertrips

In total, ESO spent £7,180,350.27 on Intertrips in the past regulatory year. See below for further breakdown.

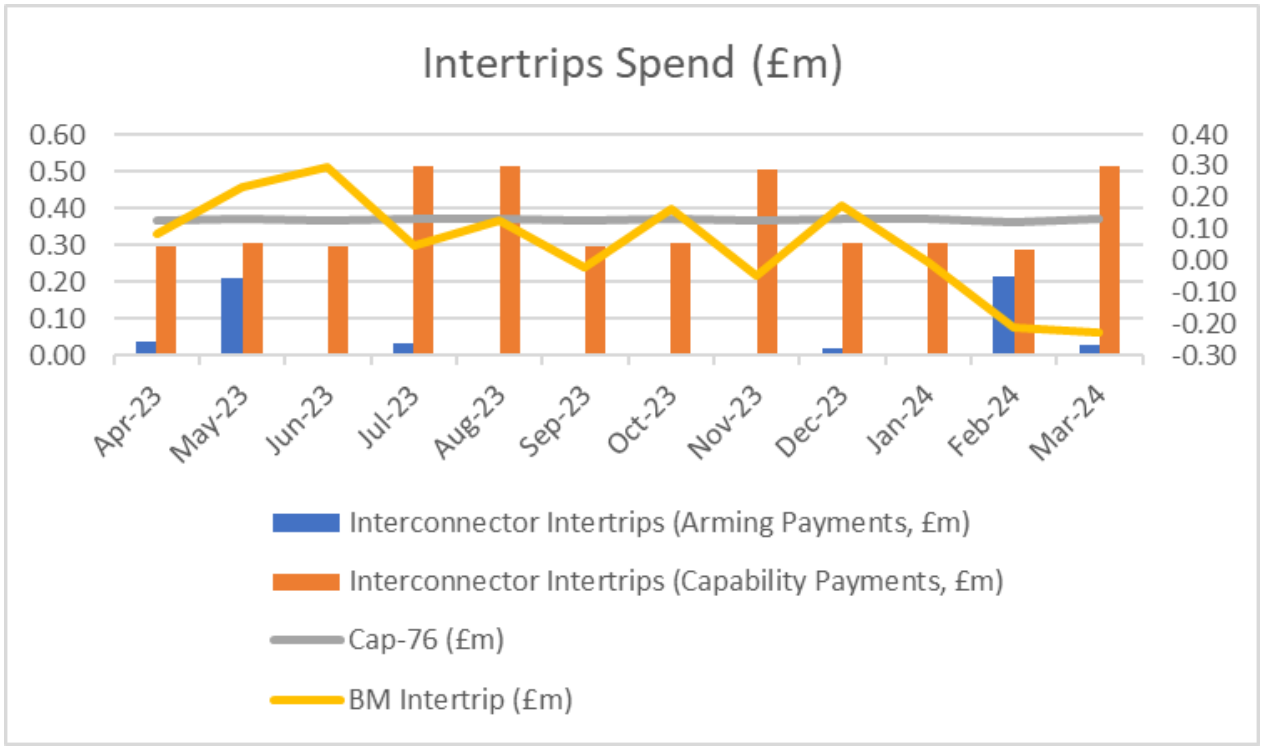

Figure 34 Intertrips Spend Breakdown Chart

Month	Interconnector Intertrips (Arming Payments £m)	Interconnector Intertrips (Capability Payments, £m)	Cap-76 (£m)	BM Intertrips (Arming & Capability, £m)
Apr-23	0.04	0.30	0.13	0.09
May-23	0.21	0.30	0.13	0.23
Jun-23	0.00	0.30	0.13	0.30
Jul-23	0.03	0.51	0.13	0.05
Aug-23	0.00	0.51	0.13	0.13
Sep-23	0.00	0.30	0.13	-0.02
Oct-23	0.00	0.30	0.13	0.17
Nov-23	0.00	0.51	0.13	-0.05
Dec-23	0.02	0.30	0.13	0.18
Jan-24	0.00	0.30	0.13	0.00
Feb-24	0.22	0.29	0.12	-0.21
Mar-24	0.03	0.51	0.13	-0.23
Total	0.54	4.44	1.57	0.63

Figure 35 Intertrips Spend Breakdown Table

Local Constraint Market (LCM)

Total spend on LCM for the Regulatory Year 2023/2024 was £3,173.12.

MW Dispatch

The only spend incurred on MW Dispatch for the Regulatory Year 2023/2024 was through payments made to Providers as part of the trial. Total spend was £2,068.00.

9. Voltage

The ESO manage voltage levels across the grid to ensure they stay within operational standards and avoid damage to transmission equipment. Voltage levels are controlled by Reactive Power, and ESO pay providers to help manage voltage levels on the system by controlling the volume of Reactive Power that they absorb or inject.

You can find more detail about Reactive Power https://www.nationalgrideso.com/industry-information/balancing-services/reactive-power-services

Generators covered by the requirements of the Grid Code are obliged to have the capability to provide Reactive Power. Payment for the service will start from the date that the reactive capability has been tested and the final Mandatory Services Agreement (MSA) is signed. Providers are paid via the default payment mechanism. Under the default payment mechanism all service providers are paid for utilisation in £/MVArh at the ORPS rate. The utilisation payment is updated monthly in line with market indicators as set out in Schedule 3 of the Connection and Use of System Code (CUSC). The latest utilisation payment figures can be found on ESO's website: https://www.nationalgrideso.com/industry-information/balancing-services/reactive-power-services/obligatory-reactive-power-service?getting-paid.

There are also some commercial agreements which are in place with providers for Reactive Power.

To try and mitigate some of the significant spend on reactive power ESO launched a number of pathfinder tenders, Mersey, Pennines and Voltage 2026. Both Mersey and Pennines tenders have concluded with the Mersey contracts live and delivering the service. Pennines is still in construction phase. Voltage 2026 is due to award contracts in Autumn 2024. Providers under these contracts are paid in £/Settlement period for their availability.

In total, ESO spent £187,116,069.35 on Reactive Power this regulatory year. This was made up of £3,568,195.76 spend on the commercial contracts, £182,545,287.19 on mandatory payments and £1,002,586.40 on the Mersey Pathfinder. Please see the below figure for a further breakdown.

Month	Reactive Power (Commercial, £m)	Reactive Power (Mandatory, £m)	Mersey Pathfinder (£m)
Apr-23	0.32	18.45	0.08
May-23	0.29	19.10	0.08
Jun-23	0.30	15.50	0.08
Jul-23	0.30	15.82	0.09
Aug-23	0.30	14.96	0.09
Sep-23	0.30	14.16	0.08
Oct-23	0.11	15.07	0.09
Nov-23	0.30	15.10	0.08
Dec-23	0.29	16.05	0.09
Jan-24	0.27	13.93	0.08
Feb-24	0.24	12.43	0.08
Mar-24	0.54	11.96	0.08
Total	3.57	182.55	1.00

Figure 36 Voltage Spend Breakdown Table

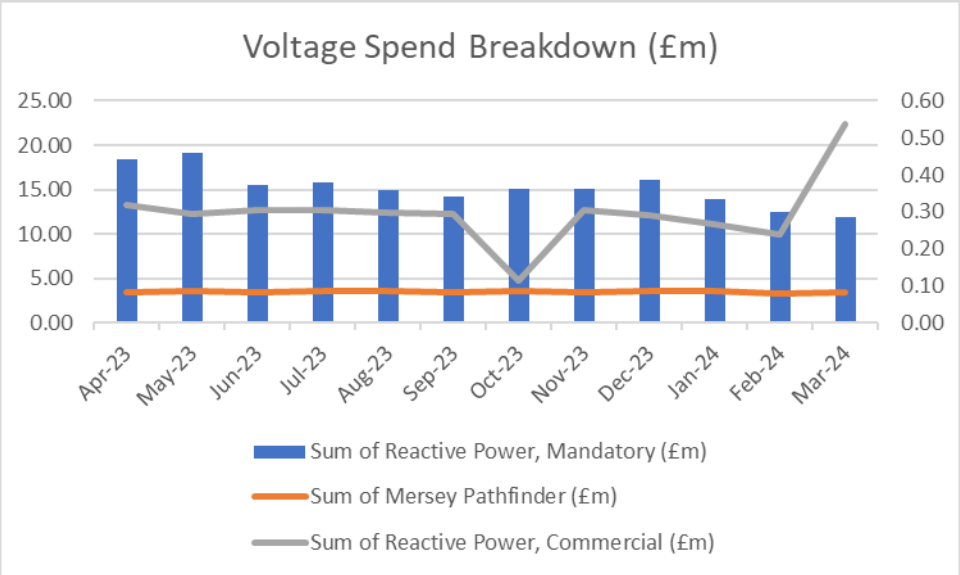

Figure 37 Voltage Spend Breakdown (£m)

10. Restoration

Restoration is the procedure used to restore power in the event of a total or partial shutdown of the transmission system. A total or partial shutdown of the national electricity transmission system is an unlikely event. However, if it happens, ESO are obliged to make sure there are contingency arrangements in place to ensure electricity supplies can be restored in a timely and orderly way. Restoration Services are used to recover from such a shutdown and ESO have agreements with providers in order to do so. You can find more detail about Restoration on ESO's website at Electricity System Restoration Standard | ESO (nationalgrideso.com)

Restoration Services are procured via regional, competitive tenders and bilateral agreements. No new bilateral contracts were signed during this regulatory year. One competitive tender for the Southeast region concluded and a number of contracts were awarded.

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

- **Availability Payments –** these are paid to the service provider to maintain capability throughout the year and offered as part of a tender or bilateral contract negotiation.
- **Capital Investment –** new Restoration service providers are likely to require significant capital investment. This is typically agreed at the start of the contract and is either paid upfront before the service commences, smeared over the duration of the contract or at pre-agreed periods.
- **Feasibility Studies –** costs covered by ESO for new providers looking to demonstrate that the unit can provide Restoration capability. ESO will ensure any costs incurred by service providers have been procured in an economic manner and as such would expect providers

to tender for the work where possible with evidence to the extent where possible. The feasibility study costs are agreed in the commercial side letter between ESO and the provider.

- **Testing –** ESO will work together with the provider to develop a strategy to test the unit at the most economic and efficient time, mitigating any distortion to the market and all providers will be tested at least every three years in accordance with the EU Code. Like the feasibility study costs, the parties agree the basis of payment in a commercial side letter.
- **Warming Requirements –** Restoration providers must be able to respond in a specified time, (normally within two hours), to be deemed available for Restoration. If service providers of certain technology types have not generated for a period, the units may not be warm enough to meet that response time. In such circumstances, ESO will assess the overall availability in the region, and may instruct a capable unit for warming to maintain the minimum service level. This is typically during summer months when demand is lower and contracted stations are on outage or out of merit. Spend on warming may be instructed through the BM, trades, or by forward contracting. The costs are calculated based on what has been agreed either through a forward's contract or in the case of a trade through a Schedule 7A or in the BM through a BoA and like availability payments, the cost is paid monthly.

In total, ESO spent £42,832,744.31 on Restoration Services last year. Please see below for a further breakdown.

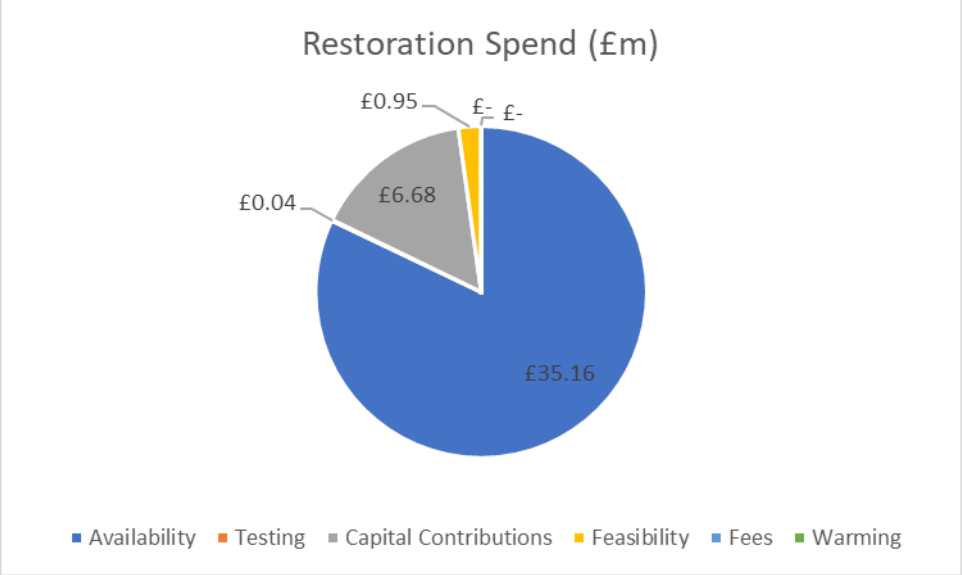

Figure 38 Restoration Spend Breakdown Chart

Cost Component	Annual Spend (£m)
Availability	35.16
Testing	0.04
Capital Contributions	6.68
Feasibility	0.95
Warming	0.00
Total	42.83

Figure 39 Restoration Spend Breakdown Table

11. Fees and Liabilities

Fees and Liabilities have been included here for completeness – primarily, they are interest payments made in relation to adjustments, but may also include payments due to providers that have not yet been settled.

Total figure for fees and reconciliations over the regulatory year 2023 - 2024 is £100,299.60.