

An aerial photograph of a river delta with intricate, branching waterways. Overlaid on the right side of the image are several glowing, wavy blue lines that resemble energy or data streams. The overall color palette is dominated by deep blues, greens, and yellows.

Balancing Costs: Annual Report and Future Projections

Key Messages Report

May 2024

Executive summary

Welcome to the first Annual Balancing Cost Report. This provides a look back on recent trends and provides a broad view of potential future balancing costs along with the ESO's role in minimising costs.

Our role as the Electricity System Operator (ESO) is to ensure electricity supply meets demand second-by-second, as well as managing the physical constraints of the network. This is what we refer to as 'balancing' the grid. Balancing costs pay for the wide range of tools, such as the Balancing Mechanism and balancing services, that help us to keep the electricity system stable and secure.

GB is leading globally on decarbonising electricity and connecting renewable and low carbon intermittent sources of generation. The variable nature of these energy types (i.e. wind and solar) can require us to undertake additional balancing actions which is managed by either turning down generation when there is too much or bringing on generation when there is too little.

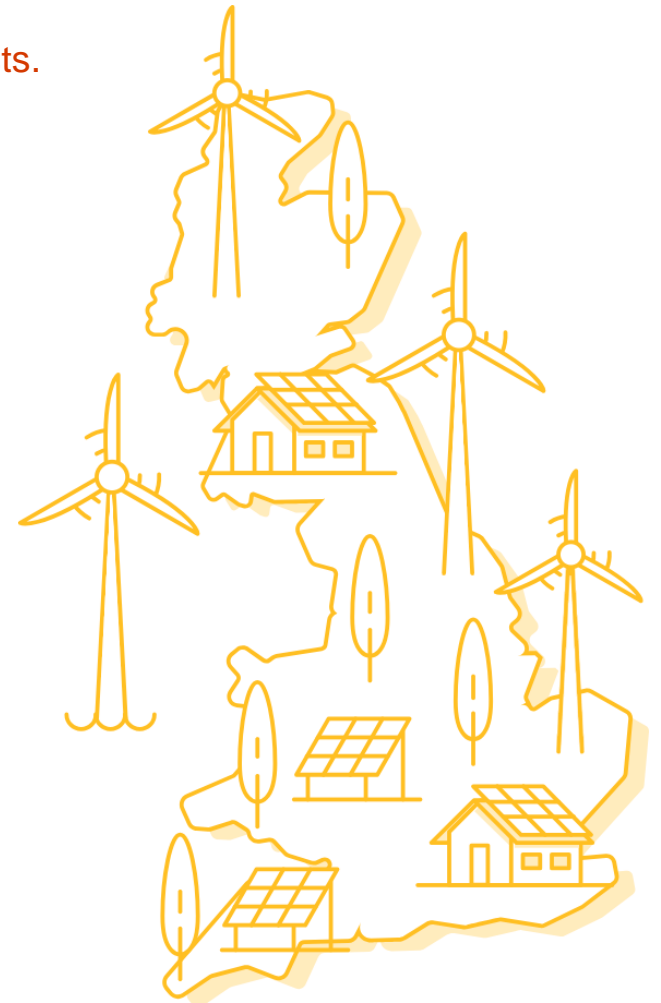
We continue to recommend new transmission infrastructure to support a fully net zero carbon grid by 2035 and in March this year, we outlined our [Beyond 2030 report](#), setting out network recommendations for network investment into the 2030s. Network optimisation is the most impactful lever available to minimise balancing costs as we progress with the energy transition. However, new network can take up to 14 years to build, far longer than connecting a new, renewable generation source. This results in a lag between new generation connecting and the infrastructure to transmit this renewable clean energy coming online.

We will continue to balance generation and demand,

manage system constraints and operate a safe and secure network. Delivering these in the most economically efficient manner is paramount and why we closely monitor and report on system balancing costs. Balancing costs are predicted to rise until 2030, and the ESO will do everything within its control to minimise this as outlined in this report. We will continue to work closely with industry to identify and accelerate new activities which will help us achieve savings.

In 2023/24 Balancing Services Use of System (BSUoS) charges contributed to ~4% of electricity bills for an average domestic consumer which works out to be about £4 a month on a typical domestic electricity bill. Although we are projecting balancing costs to rise out to 2030, balancing costs are one of many components making up energy bills and the energy transition will have variable impacts on these costs. For example, the integration of more renewables is often linked to reductions in the wholesale cost of energy. This report focuses only on costs related to balancing the electricity system.

Balancing costs in the future are also not fixed and can be lowered through proactive measures from the ESO and industry. The ESO strongly welcomes the Government's Transmission Acceleration Action Plan and its progress with the Review of Electricity Market Arrangements – both of which contain measures that can bring balancing costs down further in the coming years.



Executive summary

Work is already underway to ensure that the balancing component on consumer bills is kept as low as possible while maintaining security of supply and utilising market principles.

The ESO is continuing to undertake many significant endeavours, initiatives, and reforms to equip ourselves and the industry with the right systems, markets and capabilities to be able to manage an evolving electricity market and system at the optimal cost. We are working with industry to deploy new, world first technologies and services to balance the system, drive innovation and growth in the energy sector and create new opportunities for both businesses and consumers. We continue to see significant industry engagement with new workstreams such as our Network Services Procurement Projects which have already realised millions of pounds of savings in thermal, voltage, and stability constraints in recent years. We greatly welcome and value this support from across the energy sector and continued input and collaboration will help us to keep balancing costs as low as possible.

Our Balancing Costs Strategy is helping us minimise balancing costs by leveraging initiatives in:

- **Network Planning & Optimisation.** Designing the GB network and manage a new generation mix and reduce Constraints.
- **Commercial Mechanisms.** Designing and Procuring new services, with greater competition at an optimised price.
- **Research, Innovation, Engagement.** Experimenting with first in sector approaches and technologies, collaborating with Industry and Academia.
- **ESO Capabilities.** Using enhanced products and services provided to the Control Room, optimising security, supply and cost.

ESO initiatives are already contributing to significant savings in balancing costs and we have identified further savings worth billions of pounds to consumers that we can achieve out to 2030. We will continue to work with Ofgem, Government and industry to realise these savings and identify further opportunities to minimise balancing costs.



Key messages

In FY23/24 balancing costs were still recovering from their peak in 2022 as gas prices eased off, but balancing costs lowered notably last year as we returned to less volatile conditions. Looking forward, balancing costs will continue to be subject to a range of drivers, notably changes to the GB generation mix and network build as we work to decarbonise the electricity system by 2035 while ensuring that the balancing component on consumer bills is as low as possible. In this report we explore work underway to manage balancing costs against the complexities associated with the whole system energy transition and key inflection points over the next decade.

Key Messages:

Balancing costs are projected to rise out to 2030.

Although wholesale prices have been a major driver of balancing costs in recent years, constraint costs are also rising due to significant changes to the GB generation mix, with up to 80 GW connecting by 2030 in our most ambitious decarbonisation scenario. Constraints will be the main driver of future balancing costs. ESO initiatives are mitigating this increase.

Decisions made now will shape balancing costs into the 2030s.

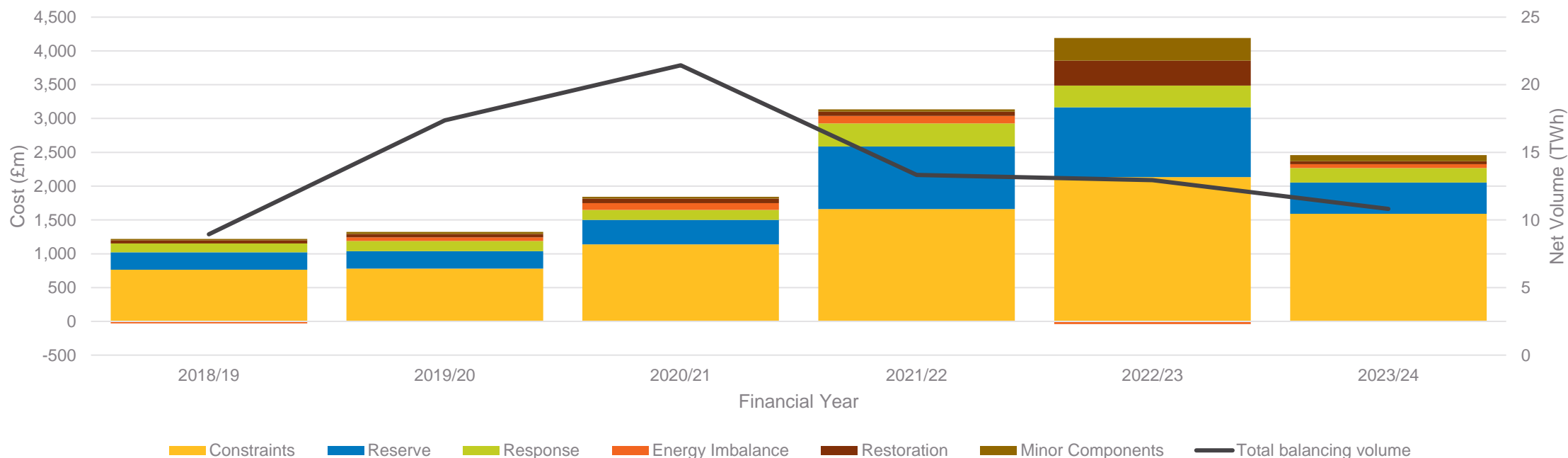
As we take on new roles in whole system planning, we can have a positive impact post-2030. Key decisions that will impact Balancing Costs include those considered in REMA, and those in Network Development, Connections, and new markets to aid balancing.

ESO initiatives create savings worth ~£18bn before 2030.

Future balancing costs are not fixed and can still be influenced by proactive initiatives from us and industry to reduce costs. We have been undertaking a wide range of initiatives within our balancing costs strategy that are aimed at minimising balancing costs, including our Beyond 2030 report, ASTI, new markets such as Balancing Reserve, and many others.

Outturn balancing costs and volumes

Figure 1. Outturn balancing costs and volumes 2018/19-2023/24



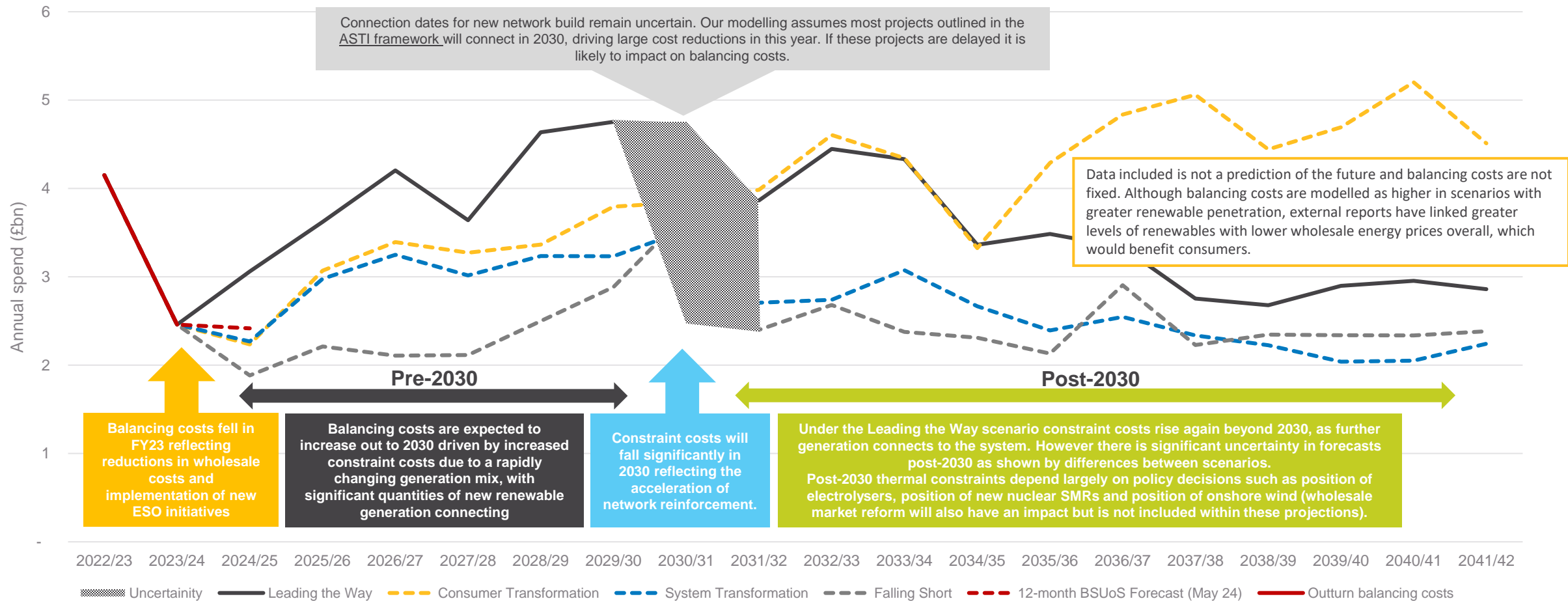
Overall Balancing Costs are significantly lower in 2023/24 (total spend £2.4 bn) compared to 2022/23 (total spend £4.1 bn). Net Balancing Volumes have also reduced in 2023/24 (10.8 TWh) and are much lower than the 2020/21 peak (21.4 TWh).

This decrease in costs can be attributed in part, to a substantial reduction in wholesale energy prices. The ESO has also directly contributed to this reduction through implementation of the initiatives outlined in our balancing costs strategy and elaborated upon in this report.

Balancing costs are projected to rise out to 2030 and decisions made now will shape balancing costs into the 2030s

Balancing costs currently contribute to ~4% of electricity bills for an average domestic consumer, making them a minor component of electricity bills.

Figure 8. Projection of balancing costs extrapolated from Leading the Way residual thermal constraint projection

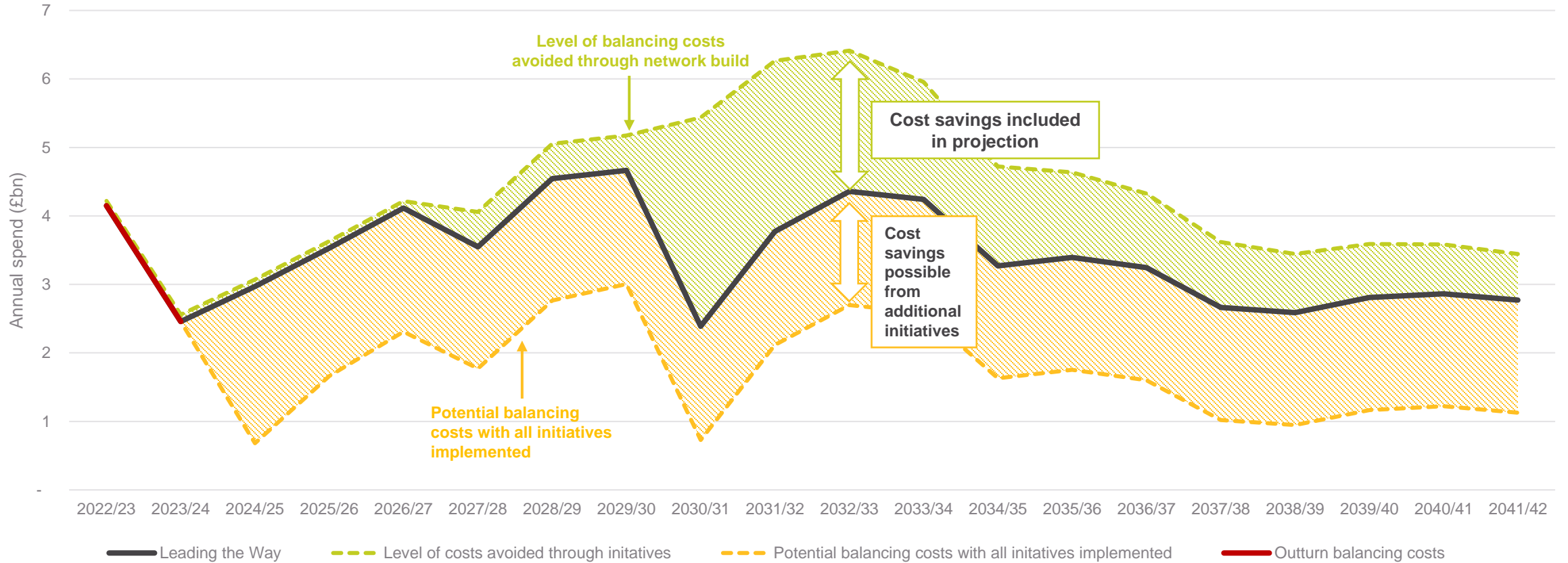


For more information on pathways see our latest [Future Energy Scenarios \(FES\) report](#)



ESO initiatives create savings worth ~£18bn before 2030

Figure 10. Balancing cost savings delivered through network reinforcement and initiatives



Some cost saving initiatives are already baked into the cost projection and are therefore already reflected in our baseline balancing cost assumptions. These avoided costs (green), largely account for network reinforcement projects outlined in initiatives such as the Holistic Network Design (HND) that aim to manage thermal constraints. Network delivery in 2030 is expected to deliver £13.1bn savings in constraint costs across asset lifetime, significantly lowering costs around this period.

The ESO is also undertaking a number of further initiatives that have the potential to reduce balancing costs below the projection. Additional potential savings (orange) consider a much broader range of options to lower costs associated with reserve, voltage, response, inertia, ESO operations, and market activities. Many of these initiatives are already underway, such as the roll out of the Open Balancing Platform which is creating savings by increasing control room capabilities.

ESO initiatives create savings worth ~£18bn before 2030

In our efforts to operate a decarbonised system, we have been undertaking a wide range of initiatives within our balancing costs strategy that are aimed at minimising balancing costs. Outlined below are a few key initiatives that are delivering or expected to deliver further balancing cost savings. For more information on the full range of balancing cost initiatives please see the [Balancing Cost Report 2024 - Technical Report](#).

Thermal Constraints

Network delivery in 2030 is expected to deliver £13.1bn savings in constraint costs across asset lifetime.

The Constraint Management Intertrip Service (CMIS) looks for intertrip services from new providers to help manage network congestion. CMIS B6-Interim is continuing to deliver consumer savings.

The Constraints Collaboration Project. This project is intended to enable the ESO and industry to work together to find solutions for thermal constraints, whether through new markets or using flexible assets more effectively.

Response and Reserve

Reform to the response and reserve markets is expected to increase liquidity and optimise service acquisition. Several new services are being introduced for reserve and reform.

The ESO held the first auction for the **Balancing Reserve (BR)** service on 12 March. The BR service will see us move to day-ahead procurement of the energy reserves we need to respond to system demand in real time, rather than the current on-the-day system – reducing costs and improving system security. Saving are estimated to total £639m over 2024-2027.

Voltage Constraints

Voltage Network Services Procurement looks for the most cost-effective ways to address high voltage system issues created by the need to absorb more reactive power on the transmission network. Mersey contracts started in April 2022 and is continuing to deliver balancing costs savings.

ESO is investigating proposed solutions to reform the reactive power services through the development of an **Enduring Voltage Market**. The project looks to enable more participants across technologies and connection types, through introduction of long-, mid- and short-term markets.

Stability Constraints

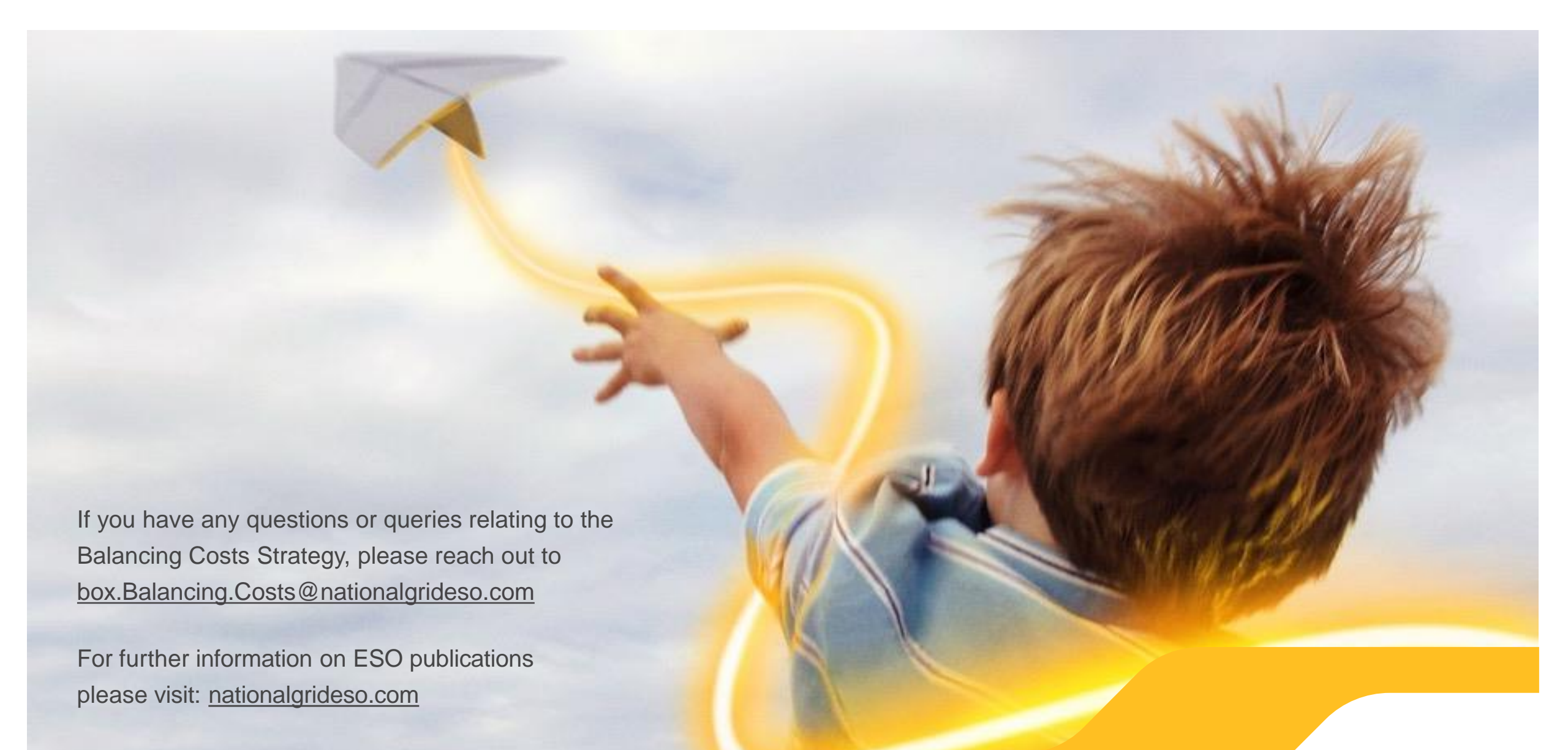
Stability Network Services Procurement looks for the most cost-effective way to address stability issues in the electricity system. Contracts signed under Phase 1 started delivering in April 2020 and is continuing to deliver consumer savings.

The Stability Market Design project is considering current GB stability arrangements and investigating the best option for an end-to-end stability market design, including long-term, mid-term, and short-term stability procurement. Initial assessment indicates the recommended approach would reduce re-dispatching costs by up to ~£58m in 2030.

Improving System Operation

The Open Balancing Platform (OBP) went live in December 2023. Control room engineers can now send hundreds of instructions to smaller Balancing Mechanism Units and battery storage units at the press of a button, which is expected to provide £15m consumer benefit per annum.

Integration of Distributed Energy Resource (DER) into ESO, DSO and TO decision making. Roadmap is being co-created with industry, setting out 5 DER visibility programme phases, with full implementation targeted by 2030. Initial work has identified consumer benefits of up to £150m / year.



If you have any questions or queries relating to the Balancing Costs Strategy, please reach out to box.Balancing.Costs@nationalgrideso.com

For further information on ESO publications please visit: nationalgrideso.com