

# BSUoS Forecast Model, Revenue vs Costs and Tariff Updates

17<sup>th</sup> April 2024

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## Supporting the webinar today + others!



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- ***We will be recording the session – available [HERE](#)***
- ***Please use teams chat to ask any questions & we will have time at the end to run through them***
- ***If you want to ask a question verbally during the Q&A session please raise your hand to be unmuted***

# BSUoS Fixed Tariff Recap

## BSUoS Fixed Tariff

Final Tariff 4 - Oct 2024 - Mar 2025

Draft Tariff 5 - Apr 2025 – Sep 2025

Published 22<sup>nd</sup> December 2023

### Introduction

From 1<sup>st</sup> April 2023 BSUoS costs have been recovered under a new fixed tariff methodology as defined by CMP361. The CMP361 decision determined that the tariff should be fixed for 6 months with 9 months' notice of the tariff values being provided by the ESO. This report defines the final BSUoS tariff for the Oct 2024 to Mar 2025 period as well as providing a draft view of the Apr 2025 to Sept 2025 tariff period. We are calling these BSUoS Fixed Tariffs 4 and 5 respectively.

### Background

The costs of balancing the system change and are difficult to predict. This makes the BSUoS charge also difficult to predict.

CMP361 introduced an ex-ante fixed volumetric BSUoS tariff set over a total fixed and notice period of 15 months which was designed to deliver the recommendations of the Second BSUoS Task Force. The decision on implementing CMP361 was made by Ofgem on the 15<sup>th</sup> December 2022.

The decision was made to implement WACM3 (Workgroup Alternative CUSC Modification) from the 1<sup>st</sup> April 2023. WACM3 fixed BSUoS for 6 months with 9 months' notice and defined that there would be no BSUoS fund to support the tariff.

Final BSUoS tariffs for Apr 2023 to Sep 2023 (Fixed Tariff 1) and Oct 2023 to Apr 2024 (Fixed Tariff 2) were published at the end of January 2023.

Final BSUoS tariff for Apr 2024 to Sep 2024 (Fixed Tariff 3) was published at the end of June 2023.

### Webinar – 11<sup>th</sup> January

We will be running a webinar on the 11<sup>th</sup> January to discuss this final and draft tariff and answer any questions that you may have about it.

Click the button below to register for the webinar.

[Register for the BSUoS Tariff Webinar Here](#)

### 1. BSUoS Fixed Tariffs Overview/Calculation

The forecasting model we have developed is used to determine balancing costs for the fixed tariff period ahead. The central forecast number determines the cost that goes into the tariff.

1

Document or Webpage	Links
CMP308 – BSUoS charged on final demand only from 2023/24	<a href="#">Web link</a>
BSUoS Fixed Tariff Model Methodology	<a href="#">Download</a>
BSUoS Fixed Tariff Model Q&A	<a href="#">Download</a>
BSUoS Fixed Tariff Model Consultation 2	<a href="#">Download</a>
CMP361/362 – Ofgem minded-to 21/09/2022	<a href="#">Web link</a>
CMP361/362 – Ofgem update on minded-to 15/11/2022	<a href="#">Web link</a>
Draft BSUoS Fixed Tariff Published 31/10/2022	<a href="#">Download</a>
CMP406/407 – Raised but rejected	<a href="#">Web link</a>
Draft Tariff Webinar Held 23/11/2022	<a href="#">Download</a>
Ofgem Decision CMP361	<a href="#">Download</a>
CMP408 Raised – Change tariff notice period to 3 months	<a href="#">Web Link</a>
Final BSUoS Fixed Tariff Published 31/01/2023	<a href="#">Download</a>
Final Tariff Webinar Held 07/02/2023	<a href="#">Download</a>
BSUoS Fixed Tariff 3 Published 30/06/2023	<a href="#">Download</a>
BSUoS Fixed Tariff 4 Published 22/12/2023	<a href="#">Download</a>

## Model Update: Hartree Project

Last year, we worked with the Hartree Centre to investigate whether state-of-the-art machine learning techniques could be employed to improve our forecast of balancing costs.

We explored a range of new approaches: new variables, daily granularity forecasts, and different forecasting techniques (timeseries approaches, machine learning, and deep learning).

The best variables were found to be the ones already used in the model (renewable generation as a proportion of demand and wholesale electricity prices).

The best modelling technique was the ‘Prophet’<sup>1</sup> modelling package

- This gave a modest improvement in accuracy compared to the existing model, when using actual (rather than forecast) values for the input variables.
- Unfortunately, when tested using forecast versions of the input variables, it is harder to see the improvement because the error in the forecast of the variables is much larger.
- We decided that it is better to use a theoretically better relationship, even if there isn’t much expected improvement in practice because over time it should give a small net benefit.

See the ENA portal for more information on the project and findings:

[https://smarter.energynetworks.org/projects/nia2\\_ngeso022/](https://smarter.energynetworks.org/projects/nia2_ngeso022/)

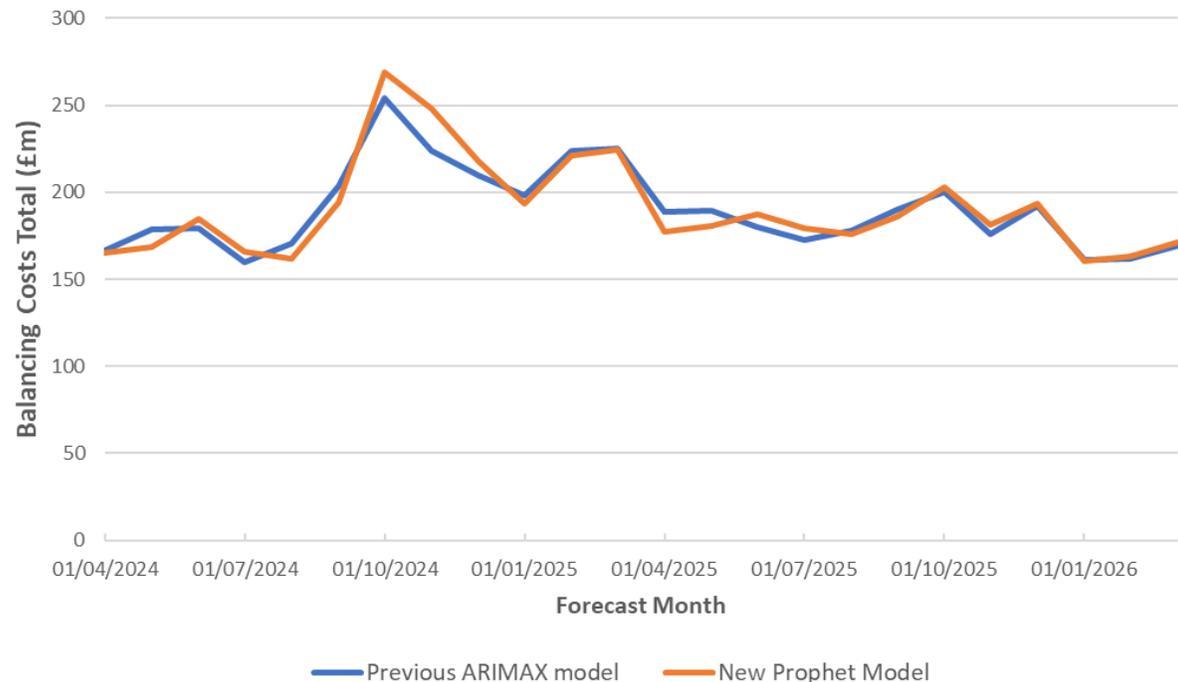
1: <https://facebook.github.io/prophet/>

# Model Update: Implementation & Impact

The new model with Prophet implementation went 'live' in the May Monthly BSUoS Forecast (published in April), which can be found on our website<sup>1</sup>.

As part of the go-live we ran a full parallel run so we could see the impact of just this model update (separated from the usual monthly updates e.g. new forward electricity prices). The **impact of this model update is relatively small**, which is as expected given Prophet only slightly improved accuracy when tested in the Hartree project.

Balancing Costs (£m)	Apr25-Oct25 tariff
Draft Tariff	1267
Previous ARIMAX Model	1099
New Prophet Model	1087
Diff (New – Previous)	-12



1: <https://www.nationalgrideso.com/industry-information/charging/balancing-services-use-system-bsuos-charges>

# Model Update: 'Prophet' Forecasting Package

## Context

The previous live model has a range of forecasting techniques used at different time horizons and then blended together: Persistence, ARIMAX, and a Monte Carlo Long Term Model (and Plexos for constraints). **Implementing Prophet only affects the ARIMAX model**, which is the main model up until ~month 14 of the forecast.

## What is Prophet<sup>1</sup>?

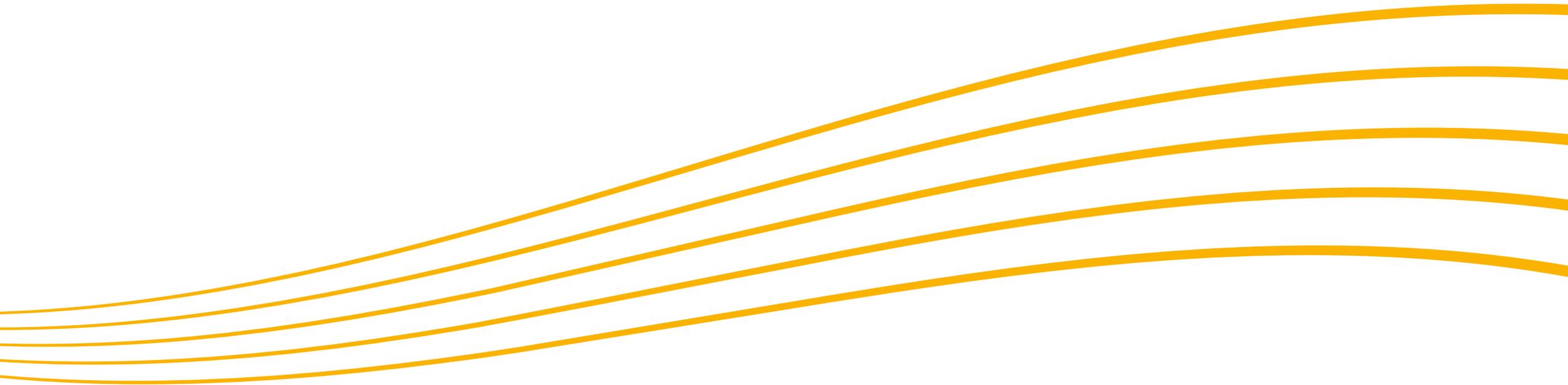
Prophet is open source software released by Facebook/Meta's Core Data Science team. It is a library designed for making forecasts of time series data based on an additive model.

## How does Prophet compare to ARIMAX?

- Both ARIMAX and Prophet are techniques that use historic data to forecast a time series.
- ARIMAX is a very established approach, developed in the 1970s. Prophet was developed much more recently (2017).
- Prophet has a few benefits over ARIMAX: it can fit non-linear trends (including detecting changes in the trend), various seasonal effects, plus special day effects.
- Prophet is also robust to missing data and shifts in the trend, and typically handles outliers well.
- Both implementations also fit linear relationships between balancing costs and forecast input variables, which are the main drivers of costs.

1: <https://facebook.github.io/prophet/>

# Tariff Setting Inputs and Uncertainties



# Inputs and Uncertainties for Final Tariff 5 and Draft Tariff 6

## Balancing Costs – Final and Draft Tariff

- Balancing costs will be based on our July-2024 forecast

## Internal ESO Costs - Final and Draft Tariff

- The final details of the funding as part of the creation of the new, independent Future System Operator have yet to be determined

## Forecast Over/Under-Recovery – Final and Draft Tariff

- Final over/under-recovery to be included within Fixed Tariff 5 will be determined based on the latest available outturn data and monthly BSUoS forecast as at Final Fixed Tariff 5 setting (June 2024)
- There remains the possibility of a tariff reset should forecast recovery position fall between now and the end of Fixed Tariff 4

## CMP398 CUSC Recovery Mechanism for CUSC parties – Final and Draft Tariff

- CMP398 introduces a cost recovery mechanism to prevent affected parties being commercially disadvantaged by the implementation of the Grid Code Mod GC0156 and the new Electricity System Restoration Standard (ESRS) (details [HERE](#))
- This will be passed through the BSUoS charge, with earliest payment starting Apr-25, and therefore included within Fixed Tariffs

## Winter Security of Supply – Draft Tariff

- ESO has previously received requests from the Secretary of State to undertake enhanced actions to ensure ongoing security of supply across the winter period. There may be the potential for similar requests for Winter 2025/26 which could impact Tariff 6

## Volume – Final and Draft Tariff

- Volume will be based on our July-2024 forecast

# Uncertainties - Modifications

## CMP408 – Final and Draft Tariff

- CMP 408 looks to change the BSUoS notice period from 9 months to 3 months. If approved, the proposer's preferred option would be to reset any tariffs that fall within the current 9 months' notice period and the revised 3 month notice period that this modification would enforce.

## CMP420 – Final and Draft Tariff

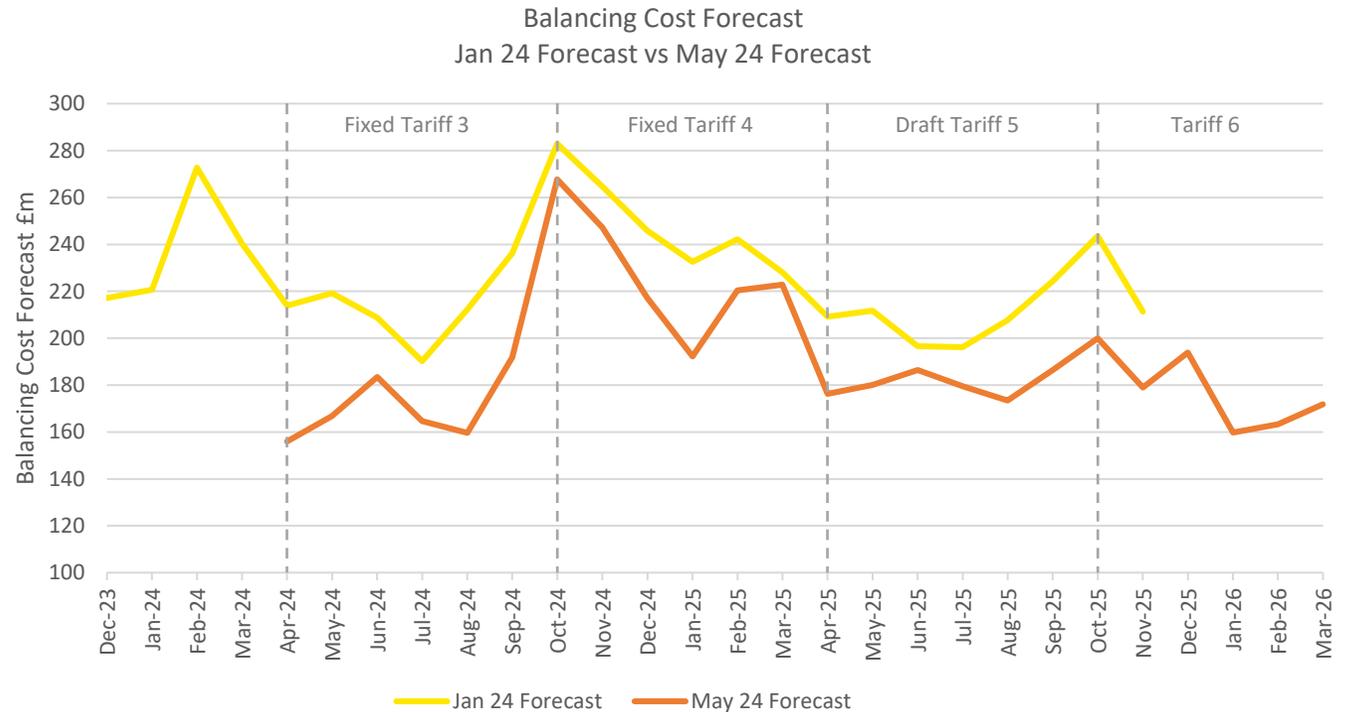
- This modification looks to codify the treatment of over-recovery and allow the potential use of over-recovery to reduce the risk of reopening prices during a future Fixed Period.
- This modification also seeks to add interest on the amount of over-recovery seen over a financial year. The interest could firstly be included in Fixed Tariff 5. Based on analysis performed in December, this could amount to an additional £15m to be returned within Fixed Tariff 5.

# Updates since December 2023



# Balancing Cost Forecast

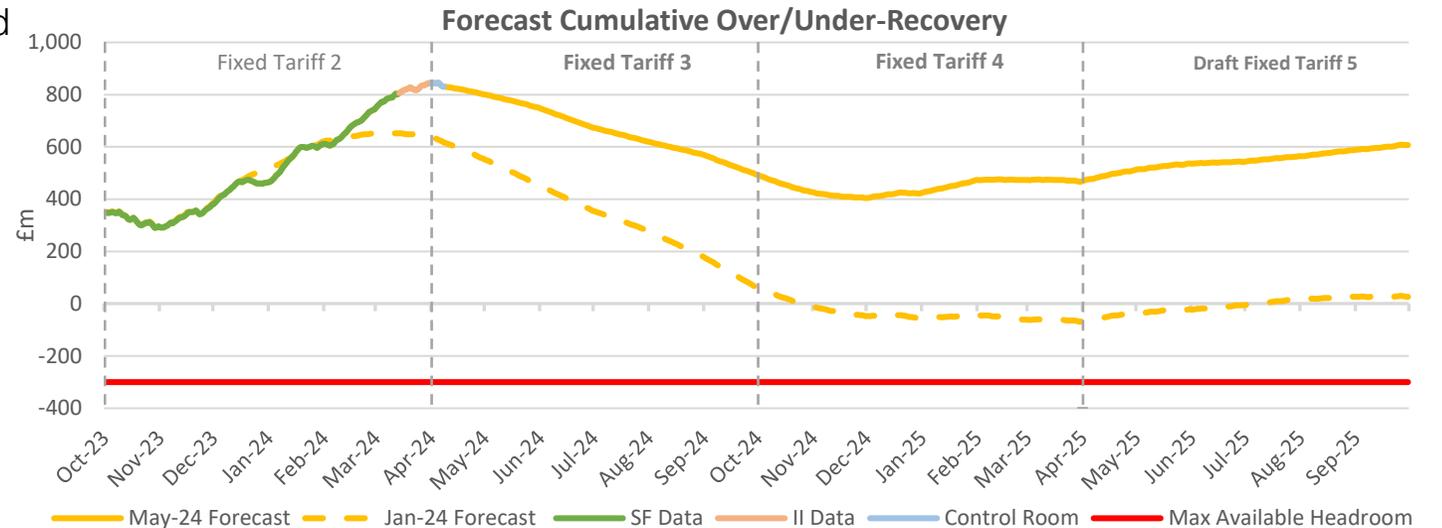
- Draft Tariff 5 was set based on our January-2024 forecast, based on average forward price curve derived between 1<sup>st</sup> and 7<sup>th</sup> December 2023
- May-24 Forecast based on average forward price curve derived between 3<sup>rd</sup> and 8<sup>th</sup> May
- There has been an average 28% drop in the forward wholesale price forecast from Apr – 24 – Sep-25 since Draft Tariff 5 was set.
- For Fixed Tariff 5, and Draft Tariff 6 balancing costs will be based on our July-24 BSUoS forecast (produced June 2024)



# Forecast Over Recovery

Since Draft Tariff 5, the forecast over-recovery has increased across all Fixed Tariffs:

- **Fixed Tariff 2**
  - Constraints for Jan, Feb and Mar were £90m below forecast
  - Wholesale prices 30% below Jan-24 forecast
  - Offset by a 3% reduction in outturn volume
- **Fixed Tariff 3, Fixed Tariff 4 and Fixed Tariff 5**
  - Decrease in balancing cost forecast, as shown on slide 11



## Over-Recovery Tariff Adjustments

We have assumed a continuation of the approach used with Draft Tariff 5 for adjustments for over-recovery

- Tariff 5 includes forecast over-recovery to the end of Fixed Tariff 3, less any adjustment within Fixed Tariff 4
- Tariff 6 includes forecast over-recovery to the end of Fixed Tariff 4, less any adjustment within Fixed Tariff 5

	Forecast Cash Position at end of Tariff	Over-Recovery Adjustment in Tariff	New Forecast Cash Position at end of Tariff
<b>Fixed Tariff 1</b>	349.3	0.0	349.3
<b>Fixed Tariff 2</b>	844.4	0.0	844.4
<b>Fixed Tariff 3</b>	455.8	-504.0	455.8
<b>Fixed Tariff 4</b>	430.1	-182.0	430.1
<b>Latest View Fixed Tariff 5</b>		<b>-273.8</b>	<b>156.3</b>
<b>Early View Tariff 6</b>		<b>-156.3</b>	<b>0.0</b>

Please note, the methodology for over/under-recovery used in Final Tariff 5 will be dependent on our forecast cash position as of tariff setting (June -2024)

# Latest View of Tariff 5 (Apr 25 – Sep 25)

Financial Year 2025/26 - Tariff 5- Draft		
	Description	Draft Tariff
Draft Tariff 5 Apr-Sep	Balancing Costs (Central) £m	1,267.4
	Internal Costs £m	271.8
	Forecast under-recovery from FT3 in FT5	73.0
	Total BSUoS £m	1,612.2
	Estimated BSUoS Volume TWh	129.2
	BSUoS Tariff £/MWh	<b>£12.48</b>

Financial Year 2025/26 - Tariff 5 - April Update		
	Description	Draft Tariff
Draft Tariff 5 - April Update Apr-Sep	Balancing Costs (Central) £m	1,092.5
	Internal Costs £m	271.8
	Forecast over-recovery by end of FT3, less any adjustment already made in FT4	-273.8
	Total BSUoS £m	1,090.5
	Estimated BSUoS Volume TWh	120.1
	BSUoS Tariff £/MWh	<b>£9.08</b>

# Early View of Tariff 6 (Oct 25 – Mar 26)

Financial Year 2025/26 - Tariff 6 - Early View	
Description	Tariff
Balancing Costs (Central) £m	1,072.1
Internal Costs £m	270.4
Forecast Over-Recovery within FT4	-156.3
<b>Total BSUoS £m</b>	<b>1,186.2</b>
Estimated BSUoS Volume TWh	141.0
<b>BSUoS Tariff £/MWh</b>	<b>£8.41</b>

Tariff 6 - Early View  
Oct - Mar

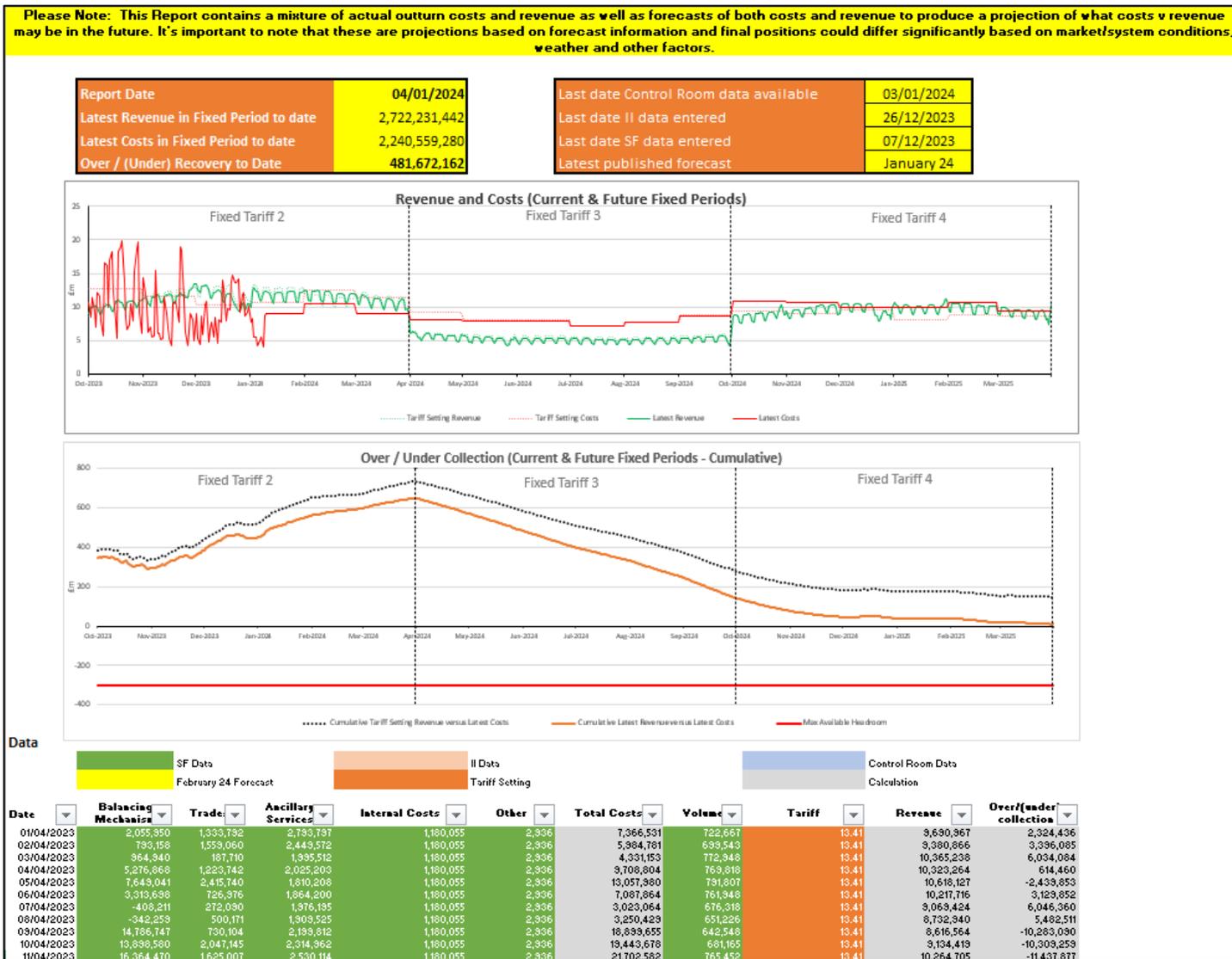
# Revenue vs Cost Report

Weekly report is available on the ESO website

Shows the latest forecast over/under recovery position based on:

- Control Room Data (+1 WD)
- II Cost and Volume Data (+5 WD)
- SF Cost and Volume Data (+16 WD)
- Monthly BSUoS Forecast (15<sup>th</sup> of each month)

Costs at daily granularity are also available through our web prices file for II and SF Data



## Report Specifics

Invoices/Backing Sheet

Fund recovery shown as a separate line item, as will RF interest

BPA Report

Additional information added for fixed tariff

[Web Prices](#)

Additional columns for main tariff, fund tariff and volume were added

[BCR Report](#)

Currently produced by the system for old methodology (RF runs only)

[Monthly Forecast](#)

Continue to be provided for costs

[Monthly Outturn](#)

Continue to be provided for costs

[Daily Cost Report](#)

Continue to be provided for costs

[Weekly Rev v Costs](#)

That we are publishing weekly to show Revenue v Costs

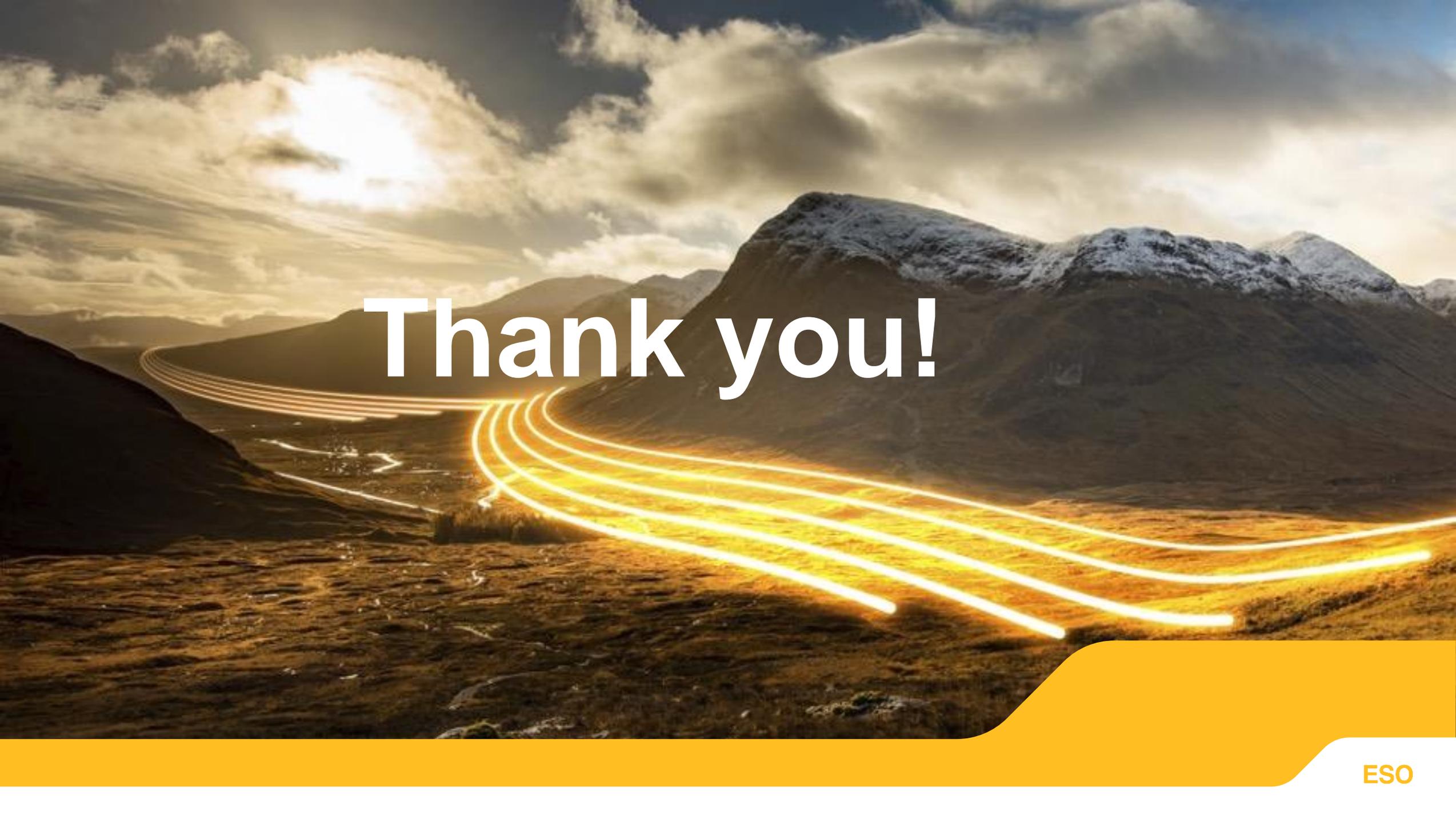
## Next Steps

- Webinar recording and Q&A published next week
- Ongoing monitoring of current recovery v costs – see our weekly report
- Monitoring published future tariffs v revised forecasts
- Final Tariff for Apr 2025 to Sep 2025 by end of June 2024
- Any updates as a result of CUSC modifications:
  - CMP408 raised to change tariff notification period to 3 months
  - CMP420 raised to codify treatment of over-recovery
- Continuous monitoring of forecast performance and updates as required
- We are currently reviewing the monthly forecasting process/report
- New system development and integration post go live
- Changeover from existing to new system date tbc

# Q&A

- Please enter your questions in teams chat
- If you would like to ask a question verbally then please raise your hand so that you can be unmuted
- If you have any questions or feedback after this webinar please email [bsuos.queries@nationalgrideso.com](mailto:bsuos.queries@nationalgrideso.com) and put “BSUoS Fixed Tariff Webinar” in the subject line of your email

Thank you for your time and input today!



**Thank you!**