2024/25 Imperfections

Outturn Report

29 May 2026

EirGrid SONI

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Revision History		
Revision	**Date**	**Description**
R0	29/05/26	Issued to RAs

1. Executive Summary

This report to the Commission for Regulation of Utilities (CRU) and the Northern Ireland Authority for Utility Regulator (UR), collectively known as the Regulatory Authorities (RAs), has been prepared by EirGrid and SONI, in their roles as the TSOs for Ireland and Northern Ireland respectively, concerning the 2024/25 Imperfection Costs Backcast. This report covers the period from 01/10/2024 to 30/09/2025 inclusive, referred to as Tariff Year 2024/25.

Imperfections costs are an inherent feature of the SEM design and arise due to the differences between the ex-ante market schedule and the real-time dispatch. These costs are levied on suppliers through the Imperfections Charge.

The TSOs submitted a 2024/25 Forecast to the RAs on 31 May 2024. Using the submitted forecast as a base, the TSOs then updated inputs based on actual data for this period, to create an ex-post adjusted forecast, the "backcast". A summary comparison of the 2024/25 forecast (Submitted and Allowed), the 2024/25 backcast, and the 2024/25 actual costs are shown in Figure 1 below.

The current resettled actual costs for the 2024/25 year are €631.7m (shown in green in Figure 1), and the total backcast cost is €630.57m. The 2024/25 backcast cost is €1.09m (0.17%) lower than the 2024/25 actual cost. There will always be a variance between the backcast and actuals due to limitations in modelling (including necessary simplifications/approximations in representing reality and the inherent complexity of the system being modelled), and a variance of 0.17% is relatively strong performance compared with recent years.

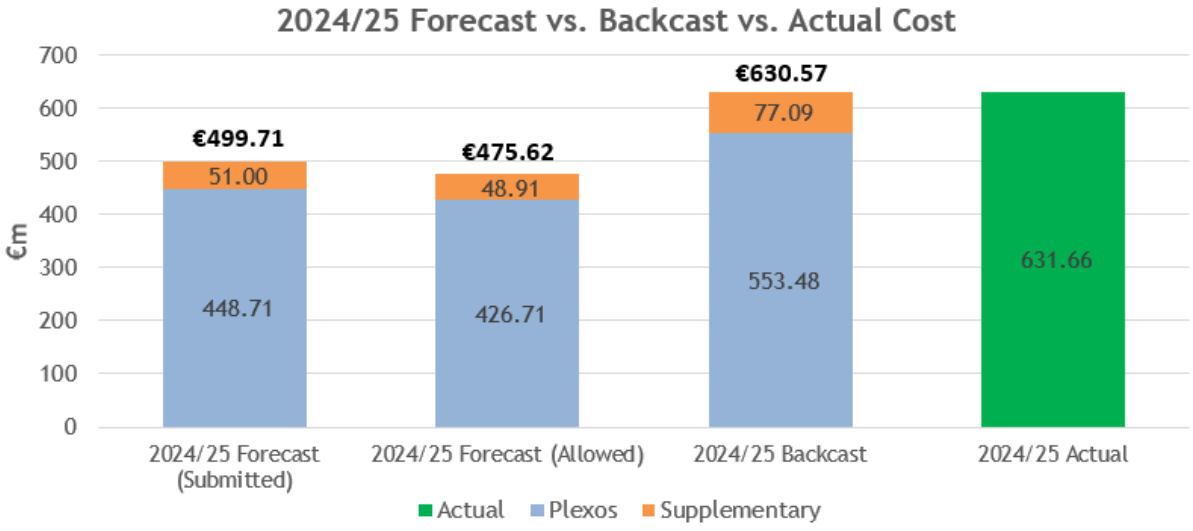

Figure 1 2024/25 Forecast vs. Backcast vs. Actual cost comparison

2. PLEXOS Comparison

The PLEXOS model component of the backcast for 2024/25 was found to be €553m. This is an increase from the submitted PLEXOS forecast cost of €449m (i.e., as shown in Figure 2, updating the 2024/25 Forecast PLEXOS model with actual data led to an increase of €105m).

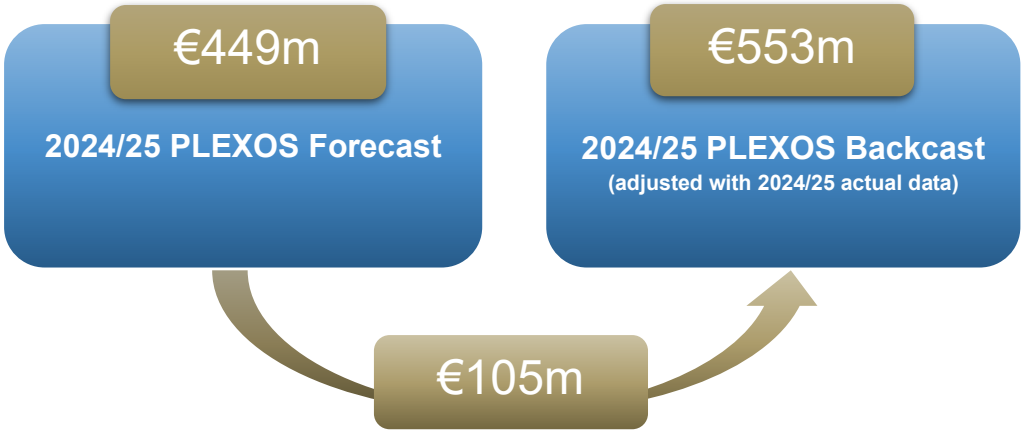

Figure 2 PLEXOS change when updated with actual 2024/25 data

Figure 3 shows the relative drivers which contribute to this increase in costs.

The outputs captured in the graph below have been determined by using the final backcast model (i.e., based on actual outturn data), and then removing each input, on its own, from that model and replacing it with the inputs used in the original 24/25 forecast. This is known as a TOOT analysis (Take One Out at a Time). This allows for a comparative approach to be taken to see the relative impact of an input on the same model.

This analysis is intended to demonstrate the relative weight of each input on the overall model and in that way serve a similar analytical purpose as do coefficients of a linear regression analysis. This type of analysis is not suitable to provide a quantitative measure in euro terms on the application of updated inputs to the PLEXOS model based on real outcomes but instead provides a relative impact of each individual input relevant to all other inputs that passed through the same analysis to the overall accuracy of the original 2024/25 forecast model.

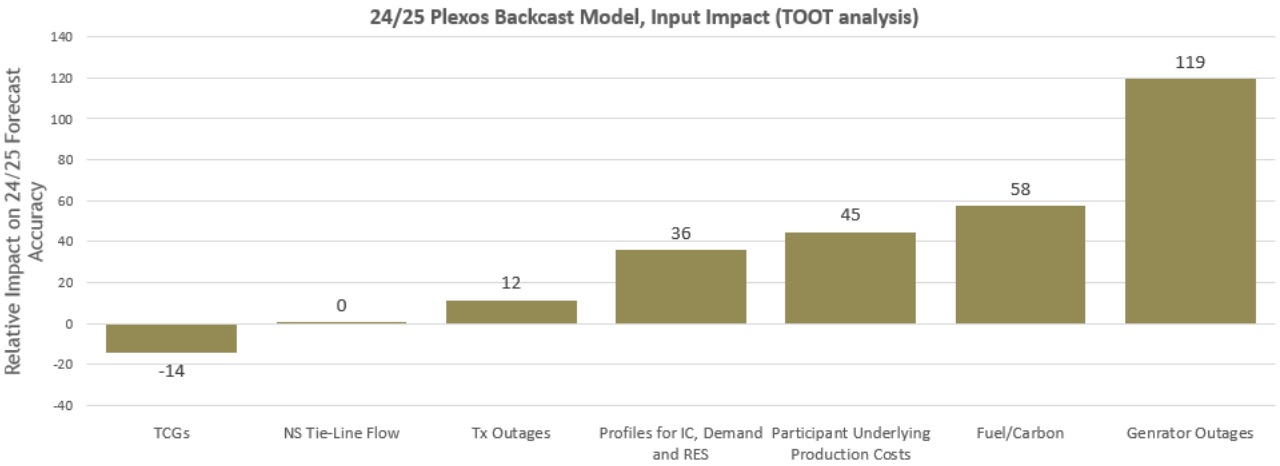

Figure 3 2024/25 Backcast PLEXOS - Input Impact

2.1. Fuel and Carbon Prices

Updating the model for actual fuel/carbon prices increased model costs significantly and was the second biggest upward correction of costs between the 2024/25 forecast model and 2024/25 backcast model. This was due to a significant increase in gas price from the price assumed for the 2024/25 forecast. See summary of model input prices below:

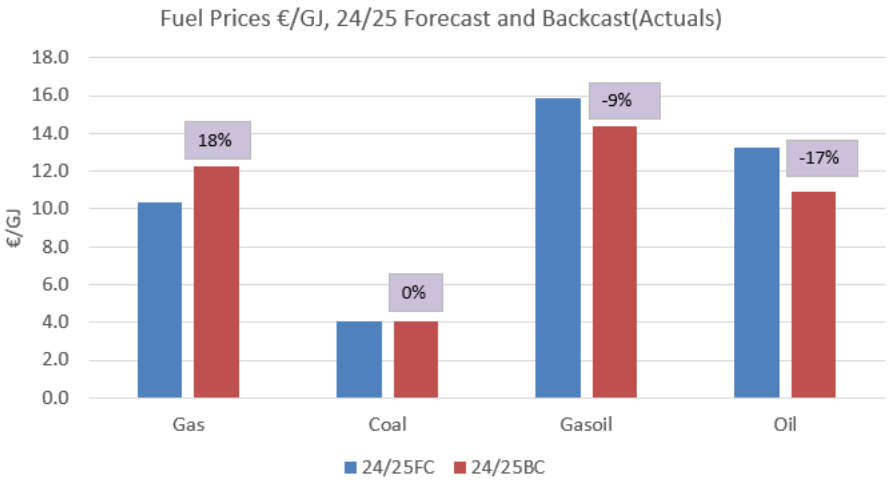

Figure 4 Fuel Prices - 2024/25 Forecast vs 2024/25 Actual

There was a decrease in carbon prices however between the 2024/25 forecast and the 2024/25 backcast but overall fuel/carbon prices were an upward driver to correct costs between the 2024/25 forecast and backcast models, See summary of model price changes for carbon below:

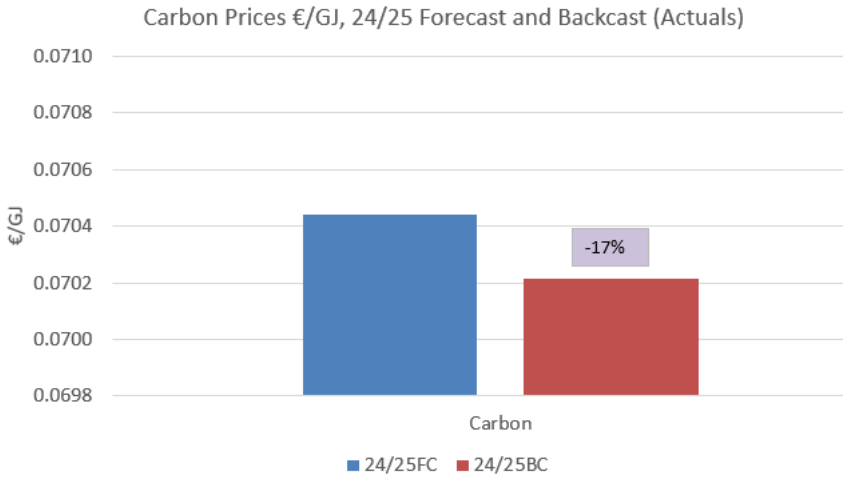

Figure 5 2024/25 Carbon Prices - 2024/25 Forecast vs 2024/25 Actual

2.2. Participant Underlying Production Costs

A detailed review of participant commercial offer data was carried out on a unit level between what was assumed to be the participant baseline production costs at the time of the 2024/25 Imperfections forecast and what was inferred to be the participants baseline production costs ex-post based on actual submitted commercial offer data over the same period. The baseline production costs are assumed to be participants production costs with the influence of fuel and carbon prices stripped out. The TSO's determine these baseline costs so that in a forecast horizon new fuel/carbon costs can be applied as a factor to these costs and the overall output equates to the forecast overall production costs of a unit is the particular forecast horizon.

Following this detailed review and update of our 2024/25 forecast model with our new participant baseline production costs for the 2024/25 backcast model resulted in the upward correction of our forecast Imperfections costs.

The TSO's would like to qualify however that the scale of this upward correction factor determined through the TOOT analysis is mainly, due to the fact that forecast baseline costs included in the 2024/25 forecast model were for new participants that were not expected to run too often and did not run too often in this forecast model. When converting this 2024/25 forecast model to the 2024/25 backcast model significant running of these units were required due to a Northern Ireland system security requirement caused because of an unforeseen lengthy forced outage of several large Combined Cycle Gas turbine generator units in Northern Ireland for the period. As a result of the increased running of these units, the baseline production costs included in the model had a much greater impact on the outcome of the Imperfections forecasts costs and when these baseline production costs were updated based on actual commercial offer data submitted by the units it resulted in a significant upward correction factor being determined through the TOOT analysis.

2.3. Generator Outages

2024/25 Forecast Generator outages and representative forced outages were updated to reflect the actual outages and forced outages that happened in 2024/25. This was the single most significant upward correction factor when rationalising the 2024/25 forecast Imperfection model to the 2024/25 backcast model. This was due to an unforeseen 5-month simultaneous outage of three large Combined Cycle gas turbine units in Northern Ireland. The combination of these outages and the resulting system security requirements that had to be introduced in Northern Ireland resulted in several high-cost units without market position being run for prolonged periods during the 2024/25 tariff year. The costs of running these units were funded through Imperfections and was the biggest contributary factor in why forecast costs were significantly below actuals for the 2024/25 tariff year.

2.4. Tie-Line Flows

The transmission limits of the Louth-Tandragee tie-line were updated in the 2024/25 Backcast model. In the original 2024/25 Forecast model we had flow limits set to "400 MW North to South and 300 MW South to North". For the 24/25 Backcast, these were set to 450 MW North to South and 250 MW South to North. These updates were based on an analysis of actual flow data in the 2024/25 year representing actual dynamic stability limitations in flowing power across the Tie-Line. Updating the model with these changes resulted in a marginal upward correction of 2024/25 forecast costs

2.5. Transmission Outages

The model was updated to reflect a selection of actual transmission outages that took place in 2024/25. The model indicates that the number of outages impacting imperfection costs was higher than anticipated in the original 2024/25 forecast. The implementation of this update resulted in a relatively lower upward correction of Imperfection Costs.

2.6. Transmission Constraint Groups (TCGs)/ Operational Policies

The Operational Policies in the model were updated to align with the latest policies in 2024/25 (which had not been included in the original forecast).

- Multiple new temporary TCGs for "Load Flow Control in Dublin" were included in the 2024/25 Backcast from 01/10/24 to 24/11/24. These represented new temporary TCGs introduced on the system throughout the 2024/25 Backcast period to securely manage a number of complex Transmission Outage combinations in the wider Dublin region that increased Imperfections Costs on forecast.
- Additional TCG changes outlined below had the opposite impact and reduced Imperfections Costs on forecast:
    - Moneypoint must run removed earlier than forecast on 17th November 2024
    - All South Voltage TCG's, STHLO1, STHLO2 and STHHI1 were removed earlier than forecast on 01st October 2024
    - The NI Must Run TCG, "MINNIU" changed from a 3-unit requirement to a 2-unit requirement earlier than forecast on 03/08/2025
    - SNSP Limits were forecast to change to 80% for 2024/25. This did not occur in practice and as a result this operational security requirement was reverted to 75% for the 2024/25 backcast model

These adjustments applied collectively in the TOOT analysis led to the only downward correction factor of 2024/25 Imperfections costs on forecast. These TCG changes were not anticipated at the time of the 2024/25 Imperfections Forecast publication.

2.7. Demand, IC Flows & Renewable Availability

As there is a link between demand, interconnector flows and renewable availabilities, these were analysed together rather than individually. Analysing these inputs together resulted in an upward correction of Imperfection Costs on forecast.

The availability of renewable generation sources is extremely difficult to forecast to any degree of accuracy a year in advance, as this is driven by ambient conditions. Even so, this input has significant influence on the Interconnector flows and the demand curve. For the 2024/25 Forecast, an annual historical profile of these three linked inputs was used to represent the annual variability of these variables over a full Tariff Year. When these parameters were replaced with actual outcomes it resulted in an upward driver of costs on forecast.

3. Backcast Results Compared to Actuals

This section contains a comparison of the following:

- 2024/25 Forecast Submission & RA Allowance.
- 2024/25 Backcast Model Result.
- 2024/25 Actual Outturn

3.1. 2024/25 Forecast Submission & RA Allowance

For the 2024/25 Tariff Year, the TSOs submitted an Imperfections forecast of ~€500m. This comprised of €449m for the PLEXOS model and €51m for the supplementary model. Following consultation, the RAs determined a total allowance of ~€476m for the tariff year, deducting elements from the Plexos and supplementary modelling. These values are represented by the first two bars in Figure 6 below:

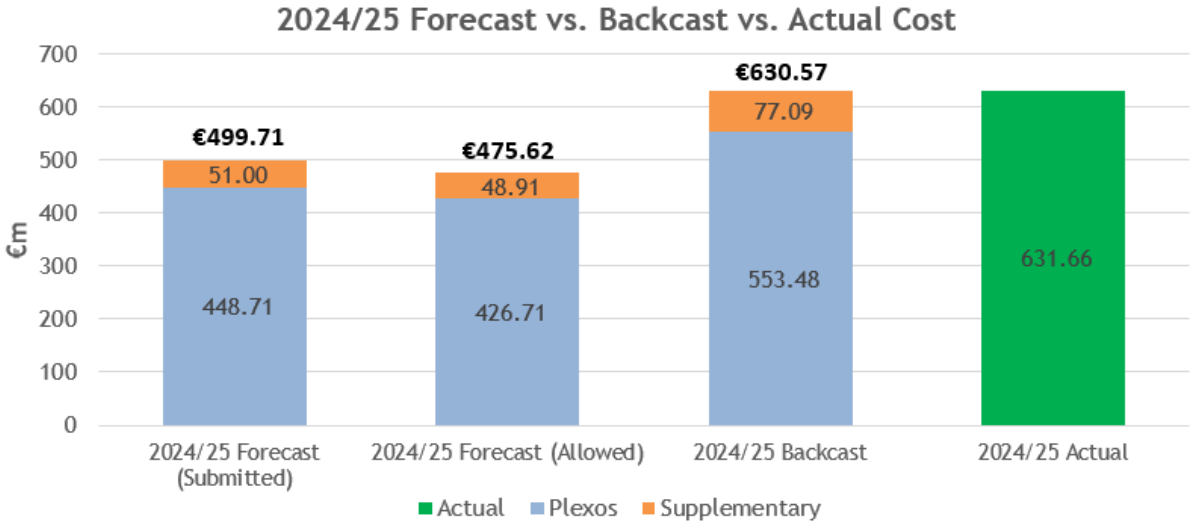

Figure 6 2024/25 Forecast vs. Backcast vs. Actual cost comparison

3.2. 2024/25 Backcast & Actual Outturn

Regarding the PLEXOS backcast Figure 6 shows that by updating the original forecast with actual data, the PLEXOS element increased from €449m to €553m (as detailed in Section 2).

When reviewing the forecast costs against the actual costs incurred through the supplementary modelling, we can see that there were considerable upward drivers of costs for Interconnector trading, Constrained costs for renewable generators and pumped storage running. These increased costs were considered to be linked to larger forecast wholesale fuel costs on forecast and its subsequent influence on the Imbalance Price.

The main changes in the supplementary modelling are shown in Figure 7 below:

Description	24/25 Submitted (€m)	24/25 Allowed (€m)	24/25 Backcast (€m)
PLEXOS Model	**448.71**	**426.71**	**553.48**
Additional PREMIUM and DISCOUNT impact	1.46	1.46	0.00
Interconnector Counter Trades	6.90	6.90	16.13
Pump Storage Running	17.98	15.17	25.83
Constrained Wind	23.02	23.02	33.60
Payment for energy imports for units in system services modes	2.36	2.36	1.52
Supplementary Model Total	**51.72**	**48.91**	**77.09**
TOTAL	**500.43**	**475.62**	**630.57**
	Actual 2024/25		**631.66**
	€m variance		**- 1.09**
	% variance		**- 0.17%**

Figure 7 2024/25 Forecast vs. Backcast vs. Actual cost comparison

The current resettled actual costs for the 2024/25 year are €631.66m (shown in green in Figure 6), and the total backcast cost is €630.57m. The 2024/25 backcast cost is €1.09 (0.17%) lower than the 2024/25 actual cost. As noted in section 2 the predictive power of the PLEXOS model was quite strong, and overall variance reflects the inherent limitations in simplifying a complex system. Overall, a 0.17% delta suggests the modelling approach is strong.