

Constraints Costs (Imperfections Charges) October 2023 – September 2024

and

Reforecast Report

October 2021 – September 2022

Decision Paper

SEM-23-067

15 September 2023

EXECUTIVE SUMMARY

This SEM Committee paper sets out the Decision regarding the 2023/24 Imperfections Charge.

On 30th June 2023, the Regulatory Authorities (RAs) published a SEM Committee Consultation Paper, <u>SEM-23-049</u> (the "Consultation Paper"), which considered the TSOs' submission in relation to their:

- 'Forecast Imperfections Revenue Requirement for Tariff Year 1st October 2023 to 30th September 2024'; and
- 'Reforecast Report for Tariff Year 1st October 2021 to 30th September 2022.

In their submission, the TSOs estimate total Imperfections costs of €522.06m for the Tariff Year 2023/24, compared to the forecast of €834.53m allowed for Tariff Year 2022/23¹, a €312.47m decrease. This reduction has been driven predominately by a significant lowering in the estimated forward prices of the key commodities that determine electricity prices i.e. gas, and to a lesser extent coal and carbon. However, it should be noted fuel prices remain at substantially elevated levels contributing to Imperfections costs.

There were also new elements included in calculating of Imperfections for Tariff Year 2023/24 which drive up the overall cost. The most significant of these is Demand Side Unit (DSU) Energy Payments. There is a proposed Modification to the Trading and Settlement Code that will allow additional energy payments to DSUs². If this Modification is approved, then the energy payments to DSUs will be funded through the Imperfections Charge. The TSOs forecast a cost of €56m based on unit data in the 12 months preceding 1 May 2023.

The TSOs also proposed a K-factor negative adjustment of -€91.17m (an over-recovery) for inclusion in the Tariff Year 2023/24 Imperfections Charge. This compares to the positive K-factor adjustment of €140.36m (an under-recovery) for Tariff Year 2022/23.

Together, this means the TSOs proposed an Imperfections Charge of €522.06m for Tariff Year 2023/24, giving an Imperfections Price of €13.40 per megawatt-hour (MWh)³.

¹ The TSOs' submission for Tariff Year 2022/23 was €870.81m , see Decision Paper SEM-22-045

² See <u>SEMO Mod 02 23 DSU Energy Payments 22 February 2023</u>

³ The TSOs forecast demand for the 2023/24 tariff year is 38,950 GWh compared to 38,200 GWh forecast used for the 2022/23 Imperfections calculations.

In the consultation, which was open from 30th June to 28th July 2023, the SEM Committee sought stakeholders' views on the TSOs' submitted costs and whether there are any actions the TSOs could take to minimise Imperfections costs⁴.

The RAs received four responses, the focus of which were mostly on suggested measures to reduce system constraints (which are the main cause of Imperfections costs), and improvements which could be made to the modelling and reporting of Imperfection costs.

During the consultation period, the RAs conducted further analysis of the TSOs' submission. This resulted in revising downwards the costs for the dispatch of pump storage, constrained wind and System Operator interconnector countertrading (see Section 3.1). Also during the consultation period, the SEM Oversight Committee acknowledged that the Modification to the Trading and Settlement Code⁵ relating to receipt of energy payments by DSUs has not yet been implemented. Further to the impact assessment of implementation of the Modification, as drafted, indicating a significant impact on the Imperfections Price, the SEM Committee has requested further consideration of this matter (see Section 2.5).

Taken together, these decisions reduced overall Imperfections costs by €73.25m to €448.81m, giving an Imperfections Tariff of €11.52/MWh. See Table 1.

	SEMC Decision Tariff Year 2023/24	TSOs Tariff Year 2023/24	Difference	Difference
Total Constraint Costs €539.98m		€613.23m	-€73.25m	11.94%
K-factor	-€91.17m	-€91.17m	-€0m	0%
Total Imperfections costs	€448.81m	€522.06m	-€73.25m	14.03%
Imperfections Price (€/MWh) ⁱ	11.52	13.40	- 1.88	14.03%

¹Imperfections Price based on estimated metered demand. For 2023/24 = 38,950 GWh

Table 1. 2023/24 SEMC Decision compared to TSOs submitted Imperfection costs

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⁴ SEM-23-049 Constraints Costs (Imperfections Charges) Consultation Paper 2023-24

⁵ See SEMO Mod 02 23 DSU Energy Payments 22 February 2023

After review of consultation responses, the SEM Committee has decided that:

- 1. The Tariff Year 2023/24 Imperfections Charge will be €448.81m, equivalent to an estimated Imperfections Price of €11.52/MWh⁶.
- **2.** Following successful development and introduction of Imperfections Mid-Year Review⁷, and updated Imperfections submission report format, the RAs will continue to work with the TSOs to review and improve Imperfections forecasting, application and reporting, with the objective of lowering consumer costs.
- **3.** The Imperfections Charge Factor (FCIMPy) will be set to 1 for the period of 1 October 2023 to 30 September 2024, subject to any alterations following the Mid-Year Review process.

⁶ Based on estimated metered demand 38,950 GWh, as estimated by SEMO

⁷ See: 2022/23 Imperfections Mid-Year Review

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1 INTRODUCTION

This paper sets out the SEM Committee's decision on the Tariff Year 2023/24 Imperfections Charge and Imperfections Price.

Under the Trading and Settlement Code, Imperfections Charges are levied on the Loss-adjusted Metered Quantities of Supplier Units. These charges are intended to recover the expected cost of Dispatch Balancing Costs (DBCs), Fixed Cost Payments and Charges, and any other imbalances between Trading Payments, Trading Charges, Capacity Payments and Capacity Charges in the upcoming Tariff Year.

DBCs form the largest component of Imperfections costs, and result from network constraints and the resulting compensation paid to generators for re-dispatch. These costs result from a combination of offer and bid prices of the re-dispatched generation, and the volumes of re-dispatched generation, resulting from how successfully the TSOs manage network constraints. The RA's note that both prices and volumes have increased recently.

Section F.12 of the Trading and Settlement Code⁸ requires SEMO to propose values, for approval by the RAs, of the Imperfections Price (PIMPy) and Imperfections Charge Factor (FCIMPy), which are used in the calculation of Imperfections Charges. The Trading and Settlement Code also requires that SEMO sets out relevant research and analysis justifying the values proposed.

The TSOs submitted reports to the Regulatory Authorities (RAs)⁹ with their forecasts of the costs to be covered by Imperfections Charges during the period 1 October 2023 to 30 September 2024. Following discussions between the RAs and TSOs, the Consultation Paper was published on 30th June 2023.

The RAs received four consultation responses, one of which was confidential. Table 2, below, lists the non-confidential respondents.

Having considered all responses, the SEM Committee through the publication of this Decision Paper sets out the Imperfections Price for Tariff Year 2023/24.

⁸ See Trading and Settlement Code Part B, April 2017

⁹ See <u>Imperfections Revenue Requirement submission for Tariff Year 2023/24</u> and <u>Imperfections K-factor</u> Submission

Respondent		
Wind Energy Ireland		
Bord Gais Energy		
Energia		

Table 2: List of non-confidential respondents

2 OVERVIEW OF TSOS' TARIFF YEAR 2023/24 IMPERFECTIONS CHARGE SUBMISSION

The TSOs had forecast an Imperfections cost of €613.23m for Tariff Year 2023/24 which, with the addition of the negative K-factor of -€91.17m, would give total of €522.06m, equivalent to an Imperfections Price of €13.40/MWh¹⁰ (see Table 1). This represents a 37.4% decrease from the €834.53m allowed Imperfections cost for Tariff Year 2022/23.

2.1 DISPATCH BALANCING COSTS (DBCs)

DBCs include Constraint Costs, Uninstructed Imbalance Payments and Generator Testing Charges. These contribute to the majority of the TSOs' forecast costs for Tariff Year 2023/24¹¹.

2.1.1 DBC - CONSTRAINT COSTS

Constraints costs arise when a TSO instructs one or more generators to deviate from their intended generation schedules to manage issues such limitations in the transmission system's capacity to transmit power. The TSOs are required to compensate generators for deviating from their generation schedules, in accordance with Offer Prices and Bid Prices for each generator¹².

The TSOs forecast Constraint Costs for the upcoming Tariff Year, using a combination of a PLEXOS model and supplementary modelling. The TSOs estimate 'PLEXOS Modelled Constraints' at €407.24m compared to €532.94m for Tariff Year 2022/23, with the greatest proportion of the

¹⁰ Based on a TSO estimated total demand of 38,950 GWh in the SEM for 2023/24, as forecast by SEMO.

¹¹ In order to increase transparency around DBCs, the SEM Committee has introduced reporting requirements on the TSOs. The TSOs provide quarterly updates on the levels of Constraint Costs, drivers behind Constraint Costs, mitigating measures being taken and other information or commentary that the TSOs believe will aid transparency in this area. These Quarterly Imperfections Costs Reports are available on EirGrid's and SONI's websites.

¹² See: Incentivisation of All-island Dispatch Balancing Costs (SEM-12-033)

decrease due to reductions in projected fuel prices (see Figure 1). Nevertheless, constraints on the system are the usual cause of the costs.

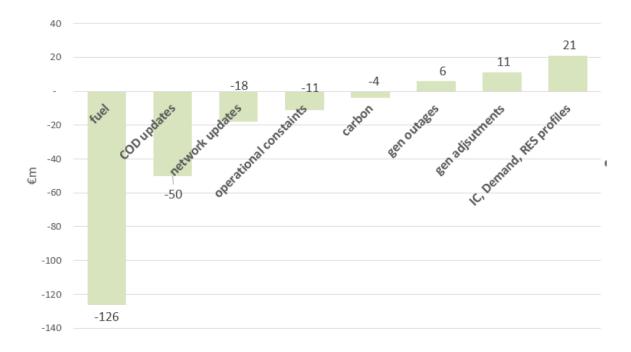


Figure 1. The key drivers of change in the TSOs' Tariff Year 2023/24 Plexos Imperfections Costs relative to Tariff Year 2022/23¹³

'Supplementary Modelled Constraints' are costs not captured in the PLEXOS modelling. For Tariff Year 2023/24, the TSOs forecast them at €205.99m, up from €197.51m in Tariff Year 2022/23.

For Tariff Year 2023/24, these Constraint Costs comprise the forecast DBC, with Uninstructed Imbalances and Testing Charges forecast at zero (see Sections 2.1.2 and 2.1.3).

2.1.2 DBC - UNINSTRUCTED IMBALANCES

Uninstructed Imbalances occur when a generator deviates from the output it has been instructed by the TSOs to generate at. To balance the system the TSOs must redispatch other generators which incurs additional costs.

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¹³ See: Imperfections Charges Forecast Tariff Year 2023/24 pg.13

The TSOs' forecast of Uninstructed Imbalances for Tariff Year 2023/24 is zero, as the TSOs have assumed that the additional redispatch costs will be recovered through a separate Uninstructed Imbalance Charges.

2.1.3 DBC - TESTING CHARGES

As a testing generator unit typically poses a greater risk of tripping, additional operating reserve is required to ensure system security is not compromised, giving rise to increased system operating costs.

The TSOs' forecast of Testing Charges for Tariff Year 2023/24 is zero, as they have assumed recovery of such costs will be through separate Testing Charges.

2.2 FIXED COST PAYMENTS

Fixed Cost Payments comprise Make Whole Payments, Recoverable Start Up Costs and recoverable No-Load Costs.

The TSOs have assumed PLEXOS Modelled Constraints captures these costs.

2.3 OTHER SYSTEM CHARGES

Other System Charges (OSC) include Generator Performance Incentive Charges, Short Notice Declaration Charges and Trip Charges, which are Transmission Use of System Charges levied on Generators in respect of events or the provision of services that affect DBCs and Ancillary Service Costs.

The TSOs have assumed Generators are compliant with the Grid Code requirements resulting in no charges for recovery and a forecast of zero for OSC for Tariff Year 2023/24.

2.4 CLEAN ENERGY PACKAGE COSTS

The Clean Energy Package has implications for the compensation of generator re-dispatch. However, as per the SEM Committee's Decision (SEM-22-009¹⁴) to implement and compensate

¹⁴ See SEM-22-009 Decision Paper on Dispatch, Redispatch and Compensation Pursuant to Regulation (EU) 2019

any payments for curtailment beginning in Tariff Year 2024/25, the TSOs have not included provision for additional costs because of the Clean Energy Package in Tariff Year 2023/24.

2.5 DEMAND SIDE UNITS (DSUs)

The TSOs included a cost of €56m for DSUs in their Supplementary Modelling, based on the expected impact of the implementation of Mod_02_23 to the Trading and Settlement Code¹⁵, as drafted. This Modification is an outworking of the SEM Committees' decision SEM-22-090.

Additional analysis on this impact has been undertaken by the RAs. This found these costs would arise from two broad categories of DSU: those broadly 'always on' and those which usually only provide demand response on the system when called upon by the TSOs.

It is the latter category which the SEM Committee's decision applies to. As such, the SEM Committee has decided to amend the TSOs' submission so only these are included in the calculations for the Imperfections charge. This reduces the DSUs cost component of the Supplementary Modelling from €56m to €4.29m. Further consideration will be given by the RAs in advance of implementation of the Modification to ensure that it is worded to be in line with decision SEM-22-090¹⁶.

2.6 K-FACTOR

The K-factor has two parts: the actual under or over-recovery for the previous Tariff Year (2021/22), and a within-year estimated under or over-recovery for the current Tariff Year (2022/23).

Differences between Imperfections costs and Imperfections Charges paid by suppliers lead to a surplus or shortfall over the Tariff Year. The TSOs refund any surplus or recover any shortfall through an adjustment to the Imperfections Price in the following Tariff Year.

Fuel costs are the main component of Constraints Costs that result in Imperfections charges. As estimated fuel costs for the upcoming Tariff Year starting in October are taken from forecasts

¹⁵ See <u>SEMO Mod 02 23 DSU Energy Payments 22 February 2023</u>

¹⁶ See SEM-22-090 DSU Energy Payments Decision Paper

made in May, they are inevitably higher (or lower) than the actual outturn, leading respectively to an under or over-recovery of Imperfections costs.

Table 3 shows the TSOs submitted actual K-factor for Tariff Year 2021/22 and their within-year forecast for 2022/23.

Item	€ million	
Actual under-recovery 2021/22	28.83	
Estimated over-recovery 2022/23	-120.00	
Total K-factor to be applied 2023/24	-91.17	

Table 3. TSOs' K-factor calculation for 2023/24

For the 2021/22 outturn K-factor, in their Decision Paper for Tariff Year 2022/23, the SEM Committee approved the TSOs' forecast under-recovery for 2021/22 of €150m¹⁷. This was the TSOs' then within-year K-factor estimation. The outturn for Tariff Year 2021/22 was an under-recovery of €178.83m. Taking this figure into account results in an outturn under-recovery of €28.83m for Tariff Year 2021/22.

For the within-year K-factor estimate, in the current Tariff Year, i.e. Tariff Year 2022/23, the TSOs say that, as of May 2023, Imperfections costs are estimated to total €120m more than originally forecast in their 2022/23 Imperfections submission. This is based on seven month's outturn data (from October 2022 to April 2023) and a revised forecast for the remaining five months of the Tariff Year. It results in an estimated over-recovery, mostly attributable to lower than forecast fuel costs.

3 REVIEW OF THE TSOs' 2023/24 IMPERFECTIONS CHARGE SUBMISSION

In the Consultation Paper, the RAs requested stakeholders' views on:

- 1. Feedback on the TSOs' forecasts for Tariff Year 2023/24 (see Section 3.1)
- 2. Views on actions the TSOs could take to minimise Imperfections costs (see Section 3.2)

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¹⁷ See Decision Paper SEM-22-045

3.1 FEEDBACK ON THE TSOS' FORECASTS FOR TARIFF YEAR 2023/24

As with previous years' submissions, the primary Imperfections costs are DBCs, in particular Constraint Costs.

The Consultation Paper requested stakeholders' views on the TSOs' Tariff Year 2023/24 costs forecasts and the assumptions used.

Comments Received

Of the three non-confidential consultation responses, two provided feedback on the TSOs' forecasts.

Energia proposed forecasting could be improved through applying multi-annual calculations of the charges over a longer period e.g. looking three or four years in advance. A longer-term forecast approach could allow cost increases to be spread over an extended period, reducing customer exposure to volatility.

Bord Gáis Energy (BGE) raised concerns around the accuracy and transparency of the TSOs' forecasting model that underlies the calculation of the annual Imperfections Charge, which they noted has effects on TLAFs and GTUoS. BGE also questioned transparency on K-factor calculation and the exactness of interconnector modelling, in particular basing estimates on a single forgoing year. Alongside this, they suggested there would be benefit in also modelling interconnected markets, especially following the soon-to-be introduced Greenlink interconnector.

Nevertheless, BGE welcomed the TSOs data-freezing fuel prices in May 2023, rather than February, which they saw as improving accuracy. In addition, they considered the introduction of the Mid-Year Review as beneficial in providing a more accurate picture of the expected significant changes in Imperfections costs and associated K-factor.

RAs' Response

Applying multi-annual calculations could have the advantage of then spreading any forecast increase across several years and therefore smoothing variability. However, the difficulty in such an approach is that the longer-range the forecast, the greater the uncertainty, and this is particularly the case for fuel. As such, while there may be advantage in spreading cost over a

number of years, basing this cost on long range estimates would likely increase - rather than decrease - volatility in Imperfections charges through the magnitude of the K-factor correction.

The RAs note that following work with the TSOs over the previous year that the Imperfections forecast submission has improved both in its readability and provision of relevant information. Nonetheless, the RAs acknowledge this work is ongoing, and it should also extend to applying similar improvements to both the K-factor and backcast reporting.

At present, the TSOs use the previous 12 months' interconnector costs to calculate the cost for the upcoming Tariff Year. A similar approach is used to calculate two other components of the TSOs' Supplementary Modelling: Pump Storage Running and Constrained Wind.

While there is some merit in using the most up-to-date data for estimates, effectively assuming what happened in the previous 12 months will be replicated in the next will not take account of an individual year's unusually high (or low) costs, which could be smoothed by averaging over a number of previous years. One example are the costs submitted by the TSOs for interconnectors as part of their Tariff Year 2022/23 Supplementary Modelling. There were two weeks where costs were some 35 times greater than the average for the year. These outliers had the effect of more than doubling the annual cost, from €16.68m to €38.79m. In this scenario, the SEM Committee approved the lower figure for 2022/23¹⁸ but it demonstrates that seemingly isolated anomalies can have a significant impact on overall costs.

SEM Committee Decision

Having considered the comments raised by stakeholders in relation to the TSOs' cost forecasts, the SEM Committee has decided that while using multi-annual forecasting in theory may have benefits, these are outweighed by the risk of increasing volatility due to inherent uncertainties in long-range forecasting of fuel prices.

Using multi-annual backcasting, however, can have the advantage noted above in smoothing out anomalous years that incur significantly higher (or lower) costs. Therefore, the SEM Committee has decided to use an average of the three previous years costs for Interconnector Counter Trades, Pump Storage Running and Constrained Wind. The process for Tariff Year 2023/24 is outlined in Table 4, below. Each of the three years is based on the previous-but-one's outturn as

¹⁸ <u>Decision Paper SEM-22-045</u>

modified by previous SEM Committee decisions. The main objective of this alteration to the methodology is that it should smooth year-on-year volatility.

This will reduce Constraint Costs for Tariff Year 2023/24 by €21.99m from €522.06m to €500.07m. See Table 4.

	TSOs' 23/24 Forecast (€m)	22/23 Approved (€m)	21/22 Approved (€m)	3-year avg. (€m)	Diff. with 23/24 TSOs' (€m)
Interconnector Countertrades	20.61	16.68	5.60	14.30	6.31
Pump Storage Running	24.79	18.00	8.00	16.93	7.86
Constrained Wind	26.37	23.58	5.72	18.56	7.81
Totals	71.77	58.26	19.32	49.78	21.99

Table 4 Revised costs based on three-year average for Interconnectors, Pump Storage and Constrained Wind

3.2 VIEWS ON ACTIONS THE TSOs COULD TAKE TO MINIMISE IMPERFECTIONS COSTS

All three of the non-confidential responses provided suggestions which the TSOs could take to lower Imperfections costs, with a focus on minimising system constraints.

Wind Energy Ireland noted DBCs represent a significant cost to consumers (and increased carbon emissions) that should be mitigated through TSO actions to reduce constraints through network development and alternative solutions such as energy storage.

BGE set out their opinion that the continuing high levels of Constraint Costs undermines the benefit of the significant reduction in fuel prices seen during Tariff Year 2022/23 and adds to the year-to-year unpredictability of Imperfections costs. To address this, BGE propose that the TSOs report on the causes and costs of constraints and actions considered to remove them.

BGE also recommend that the over-recovery in the Imperfections Charge be reallocated across a three-year period to manage volatility.

Energia stated that they were supportive of continued network investment and development in areas with high levels of constraints to reduce their associated costs.

RAs' Response

The RAs agree with respondents that constraints need to be closely managed by the TSOs to ensure the Imperfections Price borne by consumers remains reasonable. While the general trend in Imperfections costs is one of increase, the recent spike is mainly due historically high and continuing elevation of fuel prices which was driven by external geopolitical events.

The RAs acknowledge the ongoing work between the individual TSOs and RAs around constraints.

Following a review and consultation process in 2020/2021 of its TSO licence by the UR, SONI no longer has specific incentives to reduce level of DBCs, with these now being within the scope of SONI's Evaluative Performance Framework. SONI's Forward Work Plan for 2022/23¹⁹ states that it will continue to take steps to minimise dispatch balancing costs and will report on the outturn of those when completed. SONI is developing a performance measure and continues to publish Quarterly Imperfections Cost Reports which provides evidence of the imperfections reductions actions and the future improvements that SONI will make to remove or reduce the cost of each constraint in the next period.

As part of the Price Review 5 Electricity Networks process²⁰, EirGrid and the CRU have put place mechanisms to improve and incentivise reporting of Imperfections and network constraints.

In their Tariff Year 2022/23 Imperfections Decision Paper, the SEM Committee noted that demonstrable progress in 2021 by EirGrid was weaker than expected: the CRU had raised concerns around EirGrid's failure to provide requested items including a report on all constraints, a methodology on how it intends to address them, and EirGrid's lack of plan to resolve Transmission Constraint Groups. The CRU has since assessed EirGrid's performance against the Imperfections and Constraints Incentive for 2022, and while there was some improvement on 2021 performance, the CRU continues to have significant concerns about the failure to provide requested reporting and satisfactory methodology²¹.

¹⁹ See SONI Forward Work Plan 2022-23 pg. 19

²⁰ See CRU Price Review 5 Electricity Networks

²¹ See CRU letter to EirGrid Re: TSO Incentive Outturn Performance 2022

In relation to TSOs reporting of Constraint Costs and their reasons, the RAs note reference in the Consultation Paper that the SEM Committee will require the TSOs to report annually on redispatch.

The SEM Committee has issued letters to all the electricity transmission and distribution system operators on the topic of redispatch reporting. Under Article 13.4 of Regulation 943 of 2019 on the internal market for electricity²², the system operators are required to submit an annual report to their relevant RA on a range of topics related to redispatch volumes, reasons for redispatch, and measures being taken to reduce the need for such actions. Following receipt of responses from the system operators, the SEM Committee will consult on the system operators' proposals.

The suggestion of spreading the cost of the K-factor over several Tariff Years to smooth cost to consumers and lessen volatility was explored as part of the Tariff Year 2022/23 consultation process, where it was decided not to do so due to the potential affect in raising future year's Imperfections Prices.²³

SEM Committee Decision

Notwithstanding the work EirGrid are currently carrying out as part of the Price Review 5 Electricity Networks process, the improvement in TSOs reporting, and the implementation of the Mid-Year Review, the SEM Committee has decided that the RAs should continue to engage with the TSOs regarding improvements to Imperfections reporting in the main forecast report, the K-factor and Backcast reports, and ancillary data spreadsheets.

The SEM Committee has also decided not to partially defer the K-factor in part due to concerns around causing larger K-factors in subsequent Tariff Years. The SEM Committee remain of the view that any deferral could cause significant future K-factors which could impact on suppliers and customers.

4 SEM COMMITTEE DECISIONS

Following the consultation process, the SEM Committee has made the following decisions in relation to the Imperfections Charge:

²² See Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity

²³ See SEM Committee Imperfections Consultation Paper 2022/23

- 1. The Tariff Year 2023/24 Imperfections Charge will be €448.81m, equivalent to an estimated Imperfections Price of €11.52/MWh²⁴.
- 2. Following successful development and introduction of Imperfections Mid-Year Review²⁵, and updated Imperfections submission report format, the RAs will continue to work with the TSOs to review and improve Imperfections forecasting, application and reporting, with the objective of lowering consumer costs.
- **3.** The Imperfections Charge Factor (FCIMPy) will be set to 1 for the period of 1 October 2023 to 30 September 2024, subject to any alterations following the biannual review process.

²⁴ Based on estimated metered demand 38,950 GWh

²⁵ See: <u>2022/23 Imperfections Mid-Year Review</u>