Network Imperfections Charges
October 2026 – September 2027

and

Reforecast Report
October 2024 – September 2025

Consultation Paper
SEM-26-29

30 June 2026

EXECUTIVE SUMMARY

The Regulatory Authorities (the RAs, i.e. UR & CRU) are consulting on proposals from the Transmission System Operators (i.e. EirGrid & SONI; TSOs) in relation to their forecast for the Network Imperfections Charge for Tariff Year 2026/27 (to apply 01/10/2026 to 30/9/2027). These charges are largely driven by constraint and curtailment costs.

The purpose of this charge is for the TSOs to recover their forecast total costs associated with:

- managing the costs that arise given the transmission system (the wires) cannot deliver the efficient outcomes from the electricity market; and
- the operational requirements of the electricity system (e.g. minimum number of generating units on requirements, local Security of Supply (SoS) requirements in Dublin and Northern Ireland).

Network Imperfections Charges ensure that the TSOs can recover the costs associated with addressing these network constraints and maintaining system security. Given the annual charge is based on a forecast, the overall charge for each year includes a K-Factor adjustment which adjusts the difference between forecast and actual costs in the preceding periods.

These charges across Europe have followed an increasing trend in recent years due to various changes in market conditions, including, inter-alia, significant increases in underlying wholesale energy prices (the cost of deviating from the market position increases as the cost of energy itself increases).

On the 18th June 2026, the TSOs submitted the final versions of the following documentation to the RAs in order to enable a decision on setting the 2026/27 Imperfections Tariff:

- 'Imperfections Charges Forecast for Tariff Year 2026/27' (reference Annex 1); and
- 'Imperfections K-factor Submission' (reference Annex 2).

The RAs also received the related 'Imperfections Outturn Report' for Tariff Year 2024/25 from the TSOs.

In the submission, the TSOs forecast an Imperfections cost of €810.14 million for the Tariff Year 2026/27. The TSOs note forecast that the following factors, inter-alia, will have an inflationary impact on forecast Imperfections costs for Tariff Year 2026/27:

i) Costs attributed to the Clean Energy Package Article 13(7);
ii) Costs attributed to Interconnector Net Transfer Capacity Restriction;
iii) Wholesale fuel and carbon prices;
iv) Increased Renewable Capacity;
v) Increased Interconnector Imports;
vi) Generator Outages; and
vii) Transmission Outages.

The TSOs have proposed a K-Factor adjustment of €13.22 million, and this has decreased the total cost proposed. Accounting for the K-Factor adjustment, the TSOs estimate the Tariff Year 2026/27 Network Imperfections Charge to be €796.92 million. For the first time the TSOs have included a Customer Impact Assessment as part of their submission. This assessment shows the impact of the proposed charge on consumer bills. **As currently proposed, the TSOs estimate the forecast Network Imperfections Charge equates to an Imperfections Price of €18.90 per megawatt-hour (MWh)[1]. This equates to a potential reduction in annual consumer bills in 2026/27 by approximately €4.33 in (Ireland) and £2.89 (Northern Ireland)**. By comparison, in Tariff Year 2025/26[2], the approved Network Imperfections Charge was €790.24 million, and the Imperfections Price was €19.93/MWh.

While Network Imperfections Costs have increased in the SEM and Europe (where these are generally referred to as balancing costs) the SEM RAs and TSOs have been engaged in a number of actions to help mitigate/control these costs. Some of these

[1] The TSOs forecast demand for the 2026/27 tariff year is 42,160 GWh, which represents a 6% increase from the 2025/26 forecast demand of 39,650 GWh.

[2] The TSOs' original submission for Tariff Year 2025/26 was €883.24 million, reference Decision Paper SEM-25-053.

actions are set out below and referenced in other relevant sections of this consultation paper.

North South Interconnector (NSIC): The delivery of the second NSIC will reduce system constraints and thus reduce imperfections costs and will also improve security of supply, while also contributing to decarbonisation objectives.

Action Plan on Dispatch Down: In 2024, SONI undertook an action plan to reduce renewable dispatch down in Northern Ireland, Eirgrid commenced a similar review in Ireland in 2025. The combination of these reviews and subsequent action plans should reduce imperfections costs across the SEM.

Network investment: In addition to the NSIC, both RAs have approved extensive network investment to modernise and increase the ability of the system to transmit electricity (and reduce constraints).

Bidding rules: In March 2024, the SEM Committee (SEMC) published a note reminding market participants of the requirement to meet the BCOP bidding rules. The SEM RAs are actively considering enhancements to the bidding rules in the SEM.

All Island Programme: The SEM Committee has an extensive All Island Programme of work (covering Interconnection, Future Arrangements for System Services, and Scheduling and Dispatch programme) to enhance flexibility within the SEM which will allow more effective delivery of renewable electricity to consumers (SEM-24-034).

Quality of reporting of constraints and curtailment: As part of the SEMC Imperfections Charge 2022/23 Decision Paper (SEM-22-045), SEMC requested the TSOs to develop an enduring method for monitoring Imperfections costs within the Tariff Year in the form of a biannual review. The RAs continue engaging with the TSOs to improve the reporting, readability, and forecasting of imperfections charges. Better and earlier identification of costs and the drivers will allow better targeted actions to be taken sooner.

TSO Operational roadmap: The SEM RAs are working with the TSOs to deliver on their operation roadmap in an expedited manner. This should help to reduce renewable dispatch down and thus curtailment costs in particular.

Incentives: SONI's Forward Work Plan for 2025/26[3] states that it will continue to take steps to minimise dispatch balancing costs, with the KPI on Imperfections Costs to be reported on in their 2026 Performance Report. The current price control framework "Price Review 5"[4] financially incentivises EirGrid to deliver on actions outlined in its multi-year plan, as part of this process the CRU have put in place mechanisms to improve and incentivise reporting of Imperfections and network constraints. A similar approach to incentives is expected in the forthcoming Price Review 6 period.

During the 2025/26 Network Imperfections Charges consultation process, NERA was engaged by the RAs to provide support in relation to the review of the TSOs' modelling to set the Network Imperfections Charge for Tariff Year 2025/26. NERA reviewed the reports pertaining to the Network Imperfections Charge that are published by the TSOs and the modelling work that underpins their proposal and provided RAs with recommendations for future implementation. Some of the measures include at a high level, inter-alia, the following:

- Reporting: Expansion of the analysis of costs in order to increase the transparency between mapping historical and forecast cost elements; and
- Modelling: Alignment of assumptions between models, consideration of the use of historical data as an input for future conditions, forward looking changes to modelling analysis undertaken, and improvements to the thermal supplemental model.

Engagement between the RAs and TSOs progressed in recent months and improvements to the modelling and reporting as recommended by NERA was implemented, where feasible and practical. The TSOs have addressed the recommendations within their submission.

[3] SONI Forward Work Plan 2025/26
[4] Price Review 5 Electricity Networks | CRU.ie

In this Consultation Paper, the RAs are requesting stakeholder feedback on the TSOs' proposed forecasts and views on actions the TSOs could take to minimise Imperfections costs. In response to views received, the RAs may request the TSOs to adjust these forecasts. Subsequently, the RAs will approve values for the Imperfections Price and Imperfections Charge Factor for the 2026/27 period.

The RAs have reviewed the TSOs' report, and seek stakeholders' views on any aspect of the proposals and, in particular, on the following:

- The TSOs' forecasts of costs and assumptions for Tariff Year 2026/27. In particular, stakeholders' views of the inclusion of the following costs are requested:
    i. Inflationary cost drivers such as:
        - wholesale fuel and carbon prices;
        - increased renewable capacity and interconnector imports; and
        - generator and transmission outages.
    ii. Provision of costs attributed to the Clean Energy Package Article 13(7) (€141 million);
    iii. Provision of costs attributed to Interconnector Net Transfer Capacity Restriction (€56.68 million);
    iv. The TSOs' modelling and reporting of Imperfections costs and drivers; and
    v. Additional actions the TSOs/RAs could take to minimise Imperfections Charges (€796.92m) for the upcoming tariff year and in the medium/long term.

The RAs request comments by close of business on Friday 24th July 2026. Following consideration of stakeholders' feedback, SEMC intends to publish its decision in early September 2026.

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1. Introduction

1.1 Background

The RAs are consulting on the TSOs' Imperfections Charges Forecast submission for Tariff Year 2026/27 (i.e. 1st October 2026 to 30th September 2027), prior to issuing a final decision on the 2026/27 Imperfections Price and Imperfections Charge Factor.

Network Imperfections Charges allow SEMO to recover forecast costs associated with the real-time balancing and secure operation of the transmission system, and are levied on suppliers, under the provisions of the Trading and Settlement Code. These costs primarily arise from actions taken by the TSO to manage system constraints and ensure system security, including out of market redispatch of generation.

Imperfections Charges allow SEMO to recover the forecast costs associated with the real-time balancing and secure operation of the transmission system and are levied on suppliers under the provisions of the Trading and Settlement Code. These costs primarily arise from actions taken by the TSOs to manage system constraints and ensure system security, including out-of-market redispatch of generation. Where generators are instructed to deviate from their market schedules (for example, to increase or decrease output for system security reasons), they are compensated for the difference between their instructed dispatch and market position. These compensation payments, including CPREMIUM and CDISCOUNT, form a key component of Imperfections costs.

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 Dispatch Balancing Costs (DBC), Fixed Cost Payments and Charges, and any other imbalances between Trading Payments, Trading Charges, Capacity Payments and Capacity Charges over the Year (reference Figure 1).

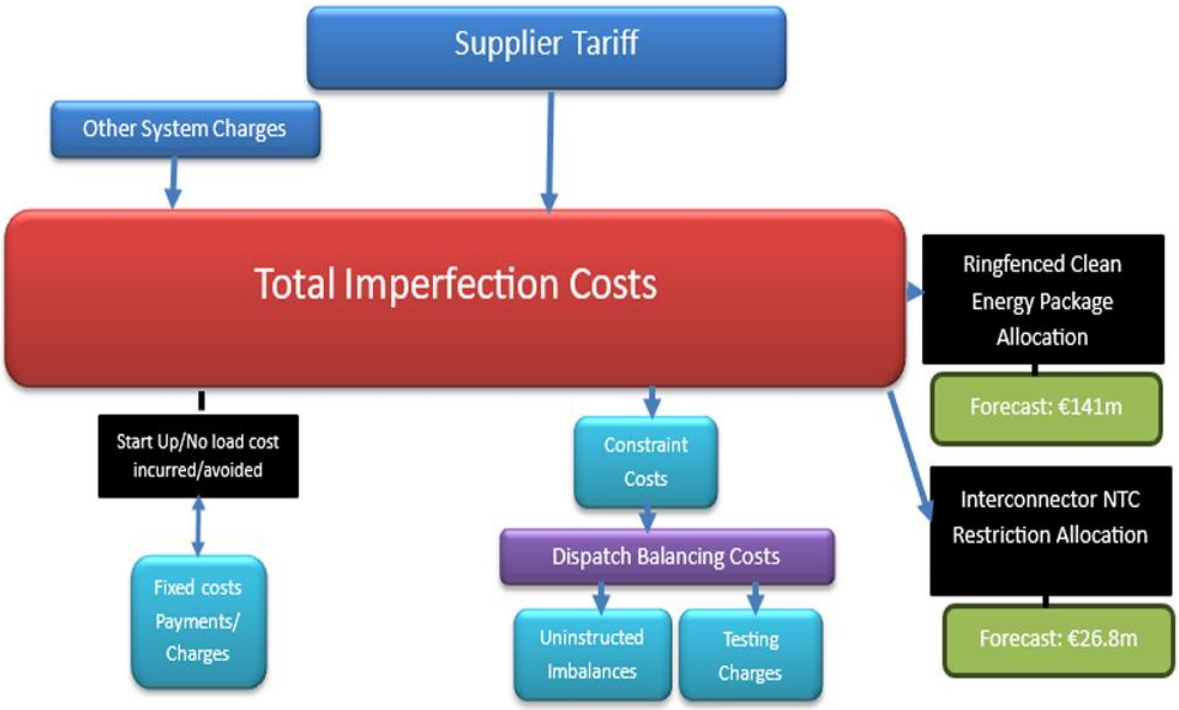

Figure 1: *Network Imperfections Charges Cost Components (Source: EirGrid plc and SONI Ltd)*

DBCs are one of the most material components of Imperfections Charge costs. DBCs cover the costs associated with redispatching of units to meet network and system constraints and result from a combination of offer and bid prices of redispatched generation and how successfully the TSOs manage network and system constraints, including through measures such as network and outage planning. The vast majority of DBCs are caused by constraints on the network and system.

Section F.12 of the Trading and Settlement Code requires SEMO to report to the RAs proposed values, for approval, 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 of analysis and justifying the values proposed.

The TSOs have submitted a report, 'Imperfections Charges Forecast submission for Tariff Year 2026/27' (reference Annex 1), with their forecasts of the costs to be covered by Imperfections Charges during the period 1 October 2026 to 30 September 2027.

1.2 Key Drivers of Dispatch Balancing Costs Increases.

Several factors can contribute to the increase of Dispatch Balancing Costs.

1. **Fuel Prices:** In the electricity market, there is a strong correlation between fuel prices and balancing costs. When fuel prices rise, particularly natural gas which sets the marginal price in the wholesale market, balancing costs tend to increase as well. This is because balancing mechanisms are used to procure additional electricity when demand exceeds supply or when there are unexpected changes in generation. The cost of these mechanisms is directly influenced by the price of the fuel used to generate that additional electricity. In recent years wholesale energy prices have shown a sustained upward trend. Within the last year, wholesale energy prices in both the SEM and international markets have increased further due to global geopolitical developments, increasing actual and forecasted Network Imperfection Costs. By way of illustration, average daily SEM Day Ahead Market prices in the first five months of 2026 were approximately 128% higher in comparison to the same time period of 2019.

2. **The intermittent nature of Renewable Energy:** The intermittent nature of wind and solar energy means their output can be unpredictable and variable compared to conventional generation sources. To ensure a secure, stable and reliable electricity supply, additional balancing measures are necessary to manage these fluctuations in real time. For example, it may be necessary for renewable energy sources to be constrained due to limitations in the electricity grid or demand fluctuations. In such cases, generators (i.e. Wind or Solar) are compensated for the lost or reduced output as a result of the constraint contributing to overall DBCs. These costs can be significant during periods of high renewable energy production and limited grid capacity or demand. In recent years, the SEM has experienced a significant increase in renewable energy as part of Ireland's and Northern Ireland's transition to a "greener grid". This transition aims to combat climate change and create a more sustainable energy system. While the actions required to balance intermittent renewables can lead to increases in DBCs, it is important to note that renewable energy enhances security of supply, reduces our dependence on volatile fossil fuel prices, and lowers reliance on imported fuels (which may be influenced by wider

geopolitical market dynamics). Additionally, renewable generation contributes to lowering wholesale electricity prices[5].

Grid Congestion: Grid congestion arises when the demand for electricity exceeds the transmission network's capacity to deliver it efficiently. This situation typically occurs during peak usage periods, due to infrastructure limitations or unexpected outages. It can also occur at times of high renewable generation where the network cannot transport all the available generation to where the demand is located. Consequently, higher balancing costs are incurred because of the increased reliance on more expensive generation sources. Additionally, ensuring reliability under these conditions necessitates implementing supplementary measures, such as utilising more costly and carbon intensive generation. These actions, combined with the inherent inefficiencies caused by congestion, contribute to higher overall balancing costs.

4. **Transmission outages:** Transmission outages can significantly increase balancing costs by limiting access to certain generation sources, which forces reliance on more expensive, carbon intensive, or less efficient alternatives.

1.3 Network Imperfections (Constraints) Charges Across Europe

The increasing trend in Network Imperfections Charges is not unique to the SEM and is observed across European electricity markets. These costs, which arise from the need to balance supply and demand in real-time, have increased as power systems transition towards higher shares of renewable generation and the enhanced system flexibility this transition requires. At a European level, ENTSO-E highlights that integrating intermittent renewable generation necessitates a greater volume of balancing actions to maintain secure and efficient system operation.

In Great Britain, balancing costs continue to trend upwards, with costs in Financial Year (FY) 2024/25[6] reaching approximately £2.7 billion, with constraint costs

[5] How renewable energy helps Irish electricity consumers | Baringa
[6] Balancing costs | National Energy System Operator

accounting for around £1.9 billion (c.70% of total balancing costs) this represents more than a 108% increase since FY2021/22.

Similarly, in Germany, the costs associated with balancing the grid have also risen. In 2024, the cost of redispatch actions in Germany was €2.8 billion, a ten folder increase within a decade[7].

1.4 Structure of Paper

The remainder of this document is structured as follows:

- **Section 2 - The TSOs' Imperfections Charges Forecast:** Provides details of the components of the TSOs' estimated total Imperfections Charges for the forthcoming Tariff Year 2026/27.
- **Section 3 - Provisional Imperfections Charge for Tariff Year 2026/27:** Outlines the forecast Imperfections Price and the trend of Imperfections Costs and Prices in recent years.
- **Section 4 - Next Steps**

[7] Redispatch explained: How does Germany balance its grid?

2. The TSOs' Imperfections Charges Forecast for Tariff Year 2026/27

The TSOs' Imperfections Charges Forecast for Tariff Year 2026/27 was prepared jointly by the TSOs (EirGrid and SONI). It presents an all-island estimate of the Network Imperfections Charge for Tariff Year 2026/27. All costs are ex-ante estimates to be recovered from suppliers on a per MWh basis.

The TSOs forecast total constraint costs of €810.14 million for Tariff Year 2026/27. When the forecast K-Factor adjustment (–€13.22 million) is applied, the total Network Imperfections Charges are estimated at €796.92 million. This represents a marginal increase of 0.85% compared to the €790.24 million approved for 2025/26. Notably, despite the increase in underlying costs, the impact on customers is mitigated through higher demand and the K-Factor adjustment. If approved, the resulting charges will be recovered through an estimated Imperfections Price of €18.90/MWh, representing a reduction of €1.03/MWh compared to 2025/26[8].

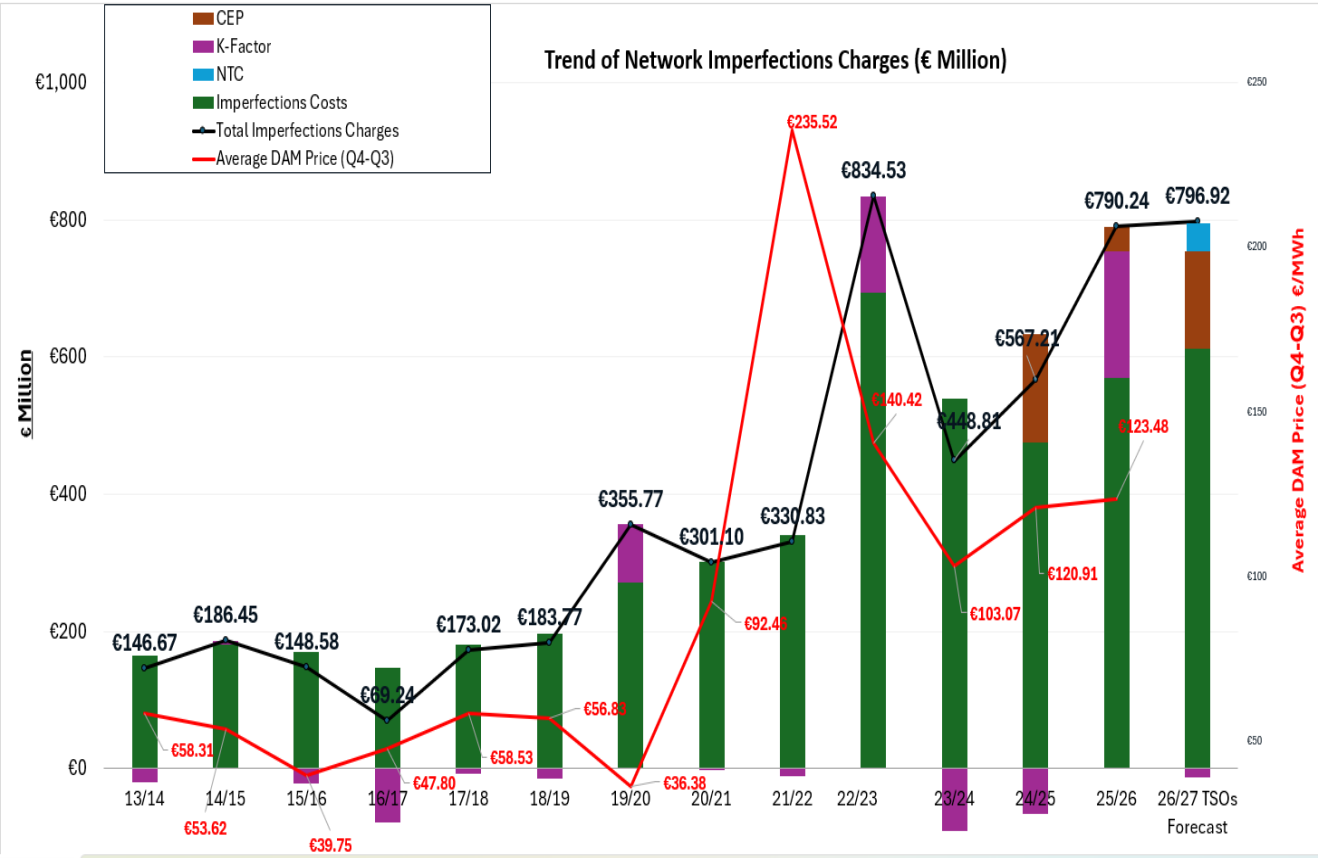

***Figure 2**. Trend of approved Imperfections Charges and the TSOs' Proposed Imperfections Charge in Tariff Year 2026/27*

[8] Based on the TSOs' estimated total forecast demand in the SEM for Tariff Year 2026/27 of 42,160 GWh

A significant cost driver is the inclusion of a provision for potential payments to market participants under Article 13 of Regulation (EU) 2019 / 943 (€141 million). This provision is comprised of:

i) €98 million (a re-estimation of the potential payments for 1st January 2020 – 30th September 2026); and
ii) €43 million (forecast costs associated with Tariff Year 2026/27).

As mentioned above the SEMC Decision SEM/22/009 is currently the subject of a judicial review in Ireland.

Another key cost driver of the proposed 2026/27 Imperfections Charge is the TSOs' inclusion of a provision of €56.68 million attributed to the historic liabilities in respect of the Interconnector Net Transfer Capacity Restriction. These costs arise from actions taken by the TSOs since 2021 to reduce interconnector capacity in order to maintain system security, particularly in managing stability risks on the SEM-GB interconnectors. Such reductions effectively limited cross-border electricity flows, giving rise to compensation claims from interconnector operators

The TSOs provided analysis (reference Figure 3) of the upward cost drivers of Imperfections Costs in the 2026/27 forecast by comparison to the 2025/26 forecast. Their analysis showed that fuel/carbon costs, interconnector and RES profiles, and generator outages are the top three upward drivers of imperfections costs in the 2026/27 forecast. Such drivers are estimated to have approximately 9 times and 3 times the impact on the forecast versus the change in demand levels observed. The main deflationary cost driver is the change observed in Commercial Offer Data relative to Tariff Year 2025/26.

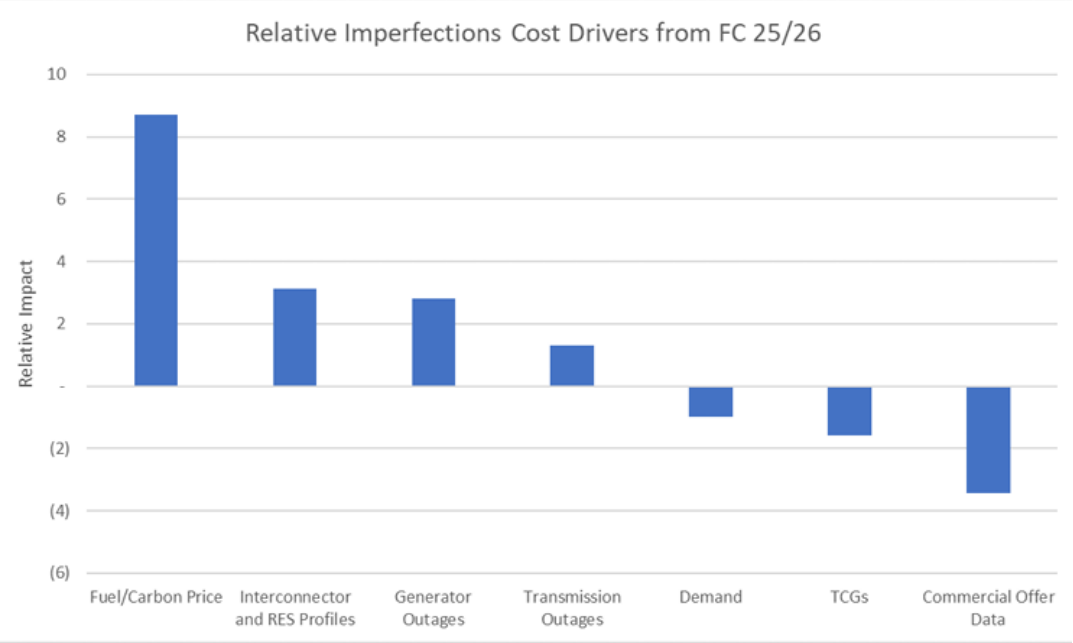

Figure 3. *The relative impact of the key Imperfections cost drivers within the 2026/27 forecast by comparison to the 2025/26 forecast (source – EirGrid plc and SONI Ltd)*

Details on the forecasts for each of the Imperfections Charge components, comprising Dispatch Balancing Costs (DBC), Fixed Costs payments and Other System Costs, are provided below and in the TSOs' submission, which is attached as Annex 1.

2.1 Dispatch Balancing Costs

Dispatch Balancing Costs (DBCs) form the majority of the TSOs' forecast costs for Tariff Year 2026/27[9]. DBCs include but are not limited to the following:

- Constraint Costs;
- Uninstructed Imbalance Payments; and
- Generator Testing Charges.

Constraints arise when the TSOs need to reduce the output of one or a specific group of generation units to manage an issue, such as a restriction in the transmission network. In such an instance, the TSOs compensate generators for costs incurred as

[9] In order to increase transparency around DBC, the SEMC has reporting requirements for 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 and SONI's websites.

a result of being ran differently by the TSOs (constrained up or on or down or off) than the market scheduled.

As Uninstructed Imbalances and Testing Charges are both forecast by the TSOs' to be zero for Tariff Year 2026/27 (reference Section 2.1.2 and 2.1.3) the TSOs' forecast Constraint Costs is comprised of DBCs only. Constraint Costs are forecast using a combination of a PLEXOS model and Supplementary modelling.

2.1.1 Constraint Costs

2.1.1.1 PLEXOS Modelled Constraints

The TSOs' PLEXOS Model forecasts Imperfection Costs in Tariff Year 2026/27 to be €525.68 million. The TSOs used two PLEXOS Models;

1) an unconstrained model representing the market schedule of generation dispatch; and
2) a constrained model representing actual generation dispatch with consideration of constraints in the transmission system.

The model used an ex-post adjusted "2024/25 backcast" model from Tariff Year 2024/25 as the base model and anticipated changes for the 2026/27 Tariff Year were incorporated to assess their impact within the forecast model[10] [11].

The RAs invite stakeholders to share their views both on the overall TSOs' PLEXOS modelled constraints costs as well as the relative impact of its individual component parts (reference Figure 3). The most significant components are outlined below.

i. Wholesale Fuel and Carbon Prices

The TSOs state that wholesale fuel and carbon prices are a fundamental driver of Imperfections Costs. The TSOs' analysis notes that fuel prices are estimated to increase costs significantly due to the change in wholesale fuel prices between the

[10] Note, this is the third year that the TSOs used a backcast model based on the Y-2 (2024/25) Tariff Year.

[11] The TSOs conducted a "Take-Out-One-at-a-Time" (i.e., TOOT) analysis to determine the approximate scale of each input change relative to the final model. This allowed the TSOs "*to see how each individual factor relatively affects costs in comparison to another input that is passed through the same analysis. This involved starting with the final 2026/27 Forecast model and then taking out one input at a time and replacing it with what was in the previous 2025/26 forecast model".*

2025/26 and 2026/27 forecast models. This cost driver is estimated to increase costs by ~9 times versus the outcome that changing demand levels have had on the forecast. Higher fuel costs make the cost of constraining an out-of-merit generation more expensive and drives a higher production cost in the constrained model. The result is that the disparity between the unconstrained and constrained model production costs increases, and consequently, the DBC increases.

The RAs are aware that ongoing geopolitical developments may impact fuel prices in the near term and the RAs will continue to review the potential impact a significant change in commodity prices may have on forecast Imperfections Costs.

ii. Interconnector Flows and Renewable Energy Sources (RES) Capacity Updates

Interconnector flows and RES Capacity Updates (combined) have the second greatest inflationary impact on the PLEXOS modelled Imperfections costs and are forecast to increase Imperfections Costs by ~3 times greater than the impact of demand in Tariff Year 2026/27. The TSOs state for the 2026/27 Forecast, an annual historical profile of these linked inputs from the 1st February 2025 to 1st February 2026 was used to represent the annual variability of these over a full Tariff Year. Although their modelling analysis shows that increasing renewable capacity leads to lower overall system generation production costs (and consequently lower market prices), it tends to elevate Imperfection Costs. The TSOs note this is because it "*becomes less likely for units to clear in the market that are necessary to satisfy operational constraints for system security requirements and will therefore have to be run by an out of market action by the TSOs at an Imperfections Cost*". The TSOs add that the savings derived from lower generational costs outweigh any increase in Imperfections Costs.

The introduction of the Greenlink Interconnector on 29th January 2025 has increased overall imports into SEM from the UK BETTA market[12]. Although this is a deflationary market price driver, it tends to increase Imperfections Costs. The TSOs state, similar to the impact of increased RES Capacity, "*units that would otherwise have cleared in*

[12] The TSOs note this outcome has continued since the go-live of the Carbon Border Adjustment Mechanism on 1st January 2026

the market are now required to be run without clearing in the market to satisfy system security requirements at an Imperfection Cost".

iii. Forecast Generator Outages

Similar to the 2025/26 forecast, the TSOs have indicated that their PLEXOS model results show that generator outages have had an inflationary impact on Imperfection Costs forecasts for 2026/27. Generator outages are found to have the third largest impact on forecast constraints costs and are estimated to have ~3 times the impact versus the demand forecast impact.

The TSOs note the impact of generator outages are "*significantly influenced by other system factors and conditions, including wind levels, other units experiencing forced outages, and demand levels".* The TSOs add that one of the primary reasons for the forecast increase in the impact of generator outages is due to the costly replacement of units needed to satisfy certain Transmission Constraint Group requirements. The high number of recent forced outages in 2024/25 and 2025/26 has increased the forced outage rate in the TSOs' model and consequently has increased the forecast DBCs.

iv. Transmission Outages

Transmission outages continue to be an increased driver of Imperfections Costs in 2026/27. Such outages are forecast to increase Imperfections costs marginally by 1.31 times versus the impact of the change in demand forecasts during Tariff Year 2026/27.

For the 2025/26 Tariff Year forecast, the TSOs changed their modelling approach to quantify the impact that Transmission Outages have on forecast Imperfections Costs and this approach was maintained for 2026/27. The new approach uses actual availability profiles that occurred in the backcast period and these are scaled up based on the new available Renewable Capacity planned to be connected throughout 2026/27. Such profiles were input into the PLEXOS unconstrained model. In their submission, the TSOs have outlined risks of their approach that could underestimate the costs forecast. For example, once transmission outage schedules mature, restrictions on conventional units in low renewable conditions may be anticipated or

additional operational constraint rules may need to be applied to facilitate the programme of outages.

v. Demand

The TSOs forecast demand for the 2026/27 tariff year is 42,160 GWh, a 6% increase from the 2025/26 forecast demand of 39,650 GWh. The TSOs' analysis estimates the cost impact due to the change in forecast demand is a marginal reduction on Imperfections costs. Although higher demand puts inflationary pressure on market prices, it puts deflationary pressure on Imperfections Costs. The TSOs note "*higher demand increases the likelihood of units to clear in the market that otherwise would have to be run out of market to satisfy System Security requirements at an Imperfections Cost".* While overall Imperfections Costs remain unchanged, higher demand spreads costs over a larger volume, lowering PIMP and unit costs for customers.

vi. Transmission Constraint Groups (TCGs)

The TSOs note the best estimate of operational policies/TCGs changes with effect for Tariff Year 2026/27 were considered as part of the modelling process. Some of the operational pathway changes include changes to the treatment of System Non-Synchronous Penetration (SNSP), the Northern Ireland Minimum Set Requirement. These measures have a deflationary impact of DBCs and the negative reserve from Wind in Northern Ireland.

vii. Commercial Offer Data (COD)

COD has the largest deflationary effect on forecast Imperfections Costs in 2026/27. The TSOs changed the approach they use to estimate the impact of COD on Imperfections Costs. In previous years, the TSOs reviewed COD submissions of all generator units and then determined if there was an increase/decrease in the production costs of units from the data used to represent the given backcast period. In 2025/26, the TSOs cited updated COD data as the primary reason for the forecast increase in costs attributable to Generator Outages. This year as part of the forecasting process, the TSOs:

- analysed hourly COD for all units for a 12 month period, and removed the daily fuel cost to determine the underlying COD parameters;

- analysed COD on an hourly basis to determine any intra-day variation, and implemented 24 hour COD profiles for units with pronounced intra-day bidding behaviour;
- within the backcast, determined that units with the high intra-day variation produced a higher cost outcome than actual; and
- implemented the new finding into the PLEXOS model.

The TSOs believe this change in approach reflects improves accuracy and has consequently resulted in a reduction in forecast Imperfections Costs associated with COD in 2026/27.

2.1.1.2 Supplementary Modelled Constraints

The TSOs' Supplementary Model forecast for the tariff year 2026/27 is for €86.78 million. As it is not possible to model all constraint cost drivers in the TSOs' PLEXOS model, the TSOs include further costs that are derived through Supplementary Modelling. Further information can be found in Annex 1.

i. Constrained Wind/Solar

Similar to 2025/26, constrained wind forms the largest cost component of the TSOs' Supplementary Modelling Results amounting to €44.25 million an increase from €33.60 million in the TSOs' 2024/25 backcast model findings. The TSOs note this provision is based on the actual payments that wind/solar participants received in the last 12 months up to 30th April 2026.

ii. Interconnector Counter Trades

Interconnector counter trades are forecast to be the second largest inflationary cost driver modelled during the Supplemental process. Based on the actual cost of countertrades to Imperfections in the last 12 months through 30th April 2026, an allowance of €22.64 million has been requested by the TSOs for the 2026/27 forecast. This compares to €16.13 million in costs output from the 2024/25 backcast exercise. The TSOs note the increase in costs can be attributed to increased system security requirements to counter trade interconnector exports. This requirement is expected to persist and/or increase for the duration of the 2026/27 Tariff Year.

iii. Dispatch of Pump Storage Units

The TSOs Supplementary Modelling results show the cost of Pump Storage Running is forecasted to be the third largest Supplementary Model cost component in Tariff Year 2026/27 (€18.97 million). The TSOs state that pump storage units are mostly dispatched overnight in pump mode in order to minimise curtailment levels and facilitate more priority dispatch. The TSOs note the running profile of such units is different than the profile that clears in the Day Ahead Market and therefore, the units differ from their Physical Notifications in the Balancing Market. Consequently, large CPREMIUMS and CDISCOUNTS payments are made to the pump storage units. The TSOs state the provision of €18.97 million is based on 83% (10/12) of the actual CPREMIUM and CDISCOUNT payments that the pump storage units received in the last 12 months (1st May 2025 – 30th April 2026). The TSOs note that full pumped storage sites are scheduled to take simultaneous outages for 2 months within the 2026/27 Tariff Year.

iv. Payment for Energy Imports for Units in System Service Modes

The TSOs note Modification 13_19 allows the remuneration of energy consumption for units that are dispatched by the TSOs in system services mode. The TSOs forecast the cost of redispatching units to cover the imported energy of units in system services mode will be €0.93 million during Tariff Year 2026/27. The TSOs note the cost was determined based on only Imperfections costs *"waived by the TSOs from the system service provider*". The TSOs note that costs have increased considerably since January 2026 due to a new system service provider being connected. Therefore costs from January 2026 to April 2026 have been projected forward to derive the 2026/27 allowance.

v. Additional CPREMIUM and CDISCOUNT

CPREMIUM is paid when an offer is scheduled in balancing (and delivered) at an offer price above the imbalance settlement price. CDISCOUNT is paid when a bid is scheduled in balancing (and delivered) at a bid price below the imbalance settlement price. For the purpose of forecasting in Tariff Year 2026/27, the TSOs have carried out a detailed review of the standard process to calculate costs attributed to CPREMIUM and CDISCOUNT and they have "*become less confident of its capability to accurately*

adjust PLEXOS determined cost elements for conventional units to account for market rules not catered for through PLEXOS. As a result, the TSOs will not be submitting this requirement for the 2026/27 Imperfections forecast".

2.1.1.3 Interconnector Net Transfer Capacity (NTC) Restriction Costs

For the first time, a provision for costs associated with Interconnector NTC restrictions is included in the TSOs' submission. Such costs relate to Moyle Interconnector Ltd. seeking compensation for the TSOs periodically implementing NTC reductions on the SEM-GB interconnectors in order to maintain security standards. The submission also reflects an anticipated claim by EirGrid Interconnector DAC (EIDAC) for NTC reductions imposed on the East West Interconnector (EWIC).

The TSOs have included a €56.68 million revenue requirement within the 2026/27 Imperfections Charge forecast relating to the recovery of historic NTC compensation costs. The TSOs note "*additional costs arising in respect of NTC reductions from future actions are currently expected to be limited; where such costs arise, it is anticipated that they would be addressed through the applicable K-factor reconciliation processes, in accordance with the Trading and Settlement Code*".

2.1.1.4 Article 13.7 Costs

Another significant cost driver is the inclusion of a provision for potential payments to market participants under Article 13 of Regulation (EU) 2019 / 943 (€141 million). For context, the SEMC Decision (SEM-22-009) was challenged in the High Court in two sets of proceedings and judgment, covering both proceedings, was delivered on 10th November 2023 (the "First High Court Judgment"); a further judgment was delivered on 1st July 2024 (the "Second High Court Judgment"); and an ex tempore ruling delivered on 10th July 2024 (together the "High Court Judgments"). The High Court quashed the SEMC's decision and made various declarations, with a stay placed on the High Court orders until the Hearing of the appeal. The CRU, as the Respondent, issued appeals in both cases on 8th August 2024. The matter was heard by the Supreme Court in December 2024 and the Court made a preliminary reference to the Court of Justice of the European Union ("CJEU"). After the CJEU has delivered its

judgment, the case returns to the Irish Court, which must apply the CJEU's judgment to resolve the case before it. The matter is expected to return to the Supreme Court for their consideration in 2026.

The TSOs seek a provision of €141 million for potential payments to participants under Article 13 of Regulation (EU) 2019/943. The €141 million provision is comprised of:

- €98 million for an under-estimation of the potential payments for 1st January 2020 – 30th September 2026; plus
- €43 million forecast costs attributable to Tariff Year 2026/27.

The TSOs state a provision is sought to "*to ensure sufficient funding to meet any potential liability, without prejudice to the ongoing judicial review process".*

2.1.1.4 Risk-factors in the TSOs' Forecast

The TSOs included several risk factors that should be considered when assessing the forecast Imperfections Costs for 2026/27. The TSOs note the following factors could result in a "*significant difference between the forecast and actual imperfections costs*":

i) Wholesale fuel prices;
ii) SEM Design and modifications to the SEM Trading and Settlement Code;
iii) Items of uncertain impact;
iv) Participant behaviour;
v) High Impact, Low Probability Events (HILPs);
vi) Reduced generator availability;
vii) Variable renewable generation;
viii) Forced outages of transmission plant;
ix) Testing charges;
x) Increased CPREMIUM and CDISCOUNT Costs;
xi) Additional security constraint; and
xii) Impact of CBAM and SEM-GB Interconnector Flows.

Refer to Section 3.4 of the *TSOs' Imperfections Charges Forecast Tariff Year 2026/27* report for further details of the TSOs' comments of the above risk factors.

2.1.2 Uninstructed Imbalances

Uninstructed Imbalances occur when there is a difference between a Generator Unit's Dispatch Quantity and its Actual Output. Uninstructed Imbalances have a direct effect on DBCs as TSOs re-dispatch generators to counteract the impact of Uninstructed Imbalances on the system. The forecast for Uninstructed Imbalances is zero in the TSOs' Imperfections Charges submission for Tariff Year 2026/27 and the TSOs note the costs are "*not accounted for due to its difficultly to forecast and relatively marginal size".*

2.1.3 Generator Testing Charges

The TSOs have not included specific DBC provisions for new units that will be under test before they are commissioned or units returning from a significant outage. The TSOs assume that testing charges will offset the additional DBC incurred and will primarily consist of constraints, due to out-of-merit running. However, the TSOs add that due to the difficulty in forecasting, testing charges do not cover any transmission-related constraints that arise due to new unit commissioning. There is no provision included in the TSOs' forecast for any future changes. The TSOs note there is a requirement as part of PR6 arrangements to develop a methodology to be used to estimate Imperfections Costs to definitive reasons.

2.2 Fixed Cost Payments

Fixed Cost Payments in the market are comprised of the following: Make Whole Payment, Recoverable Start Up Costs, and recoverable No-Load Costs. In their report, the TSOs have assumed that these costs have largely been captured in the PLEXOS model. There is no provision included in the TSOs' forecast for fixed cost payments.

2.3 Other System Charges (OSC)

Other System Charges (OSC) include Generator Performance Incentive Charges, Short Notice Declaration Charges and Trip Charges. OSC are charges levied outside the SEM by the TSOs. The TSOs did not include a provision for OSC for Tariff Year 2025/26.

2.4 K-Factor

2.4.1 2026/27 K-Factor

The K-Factor is the TSOs' within-year estimate of the funding position of the current Tariff Year (i.e., 2025/26). The K-Factor is based on the actual outturn Imperfections costs for the first seven and half months (i.e., 1 October 2025 to 9 May 2026), plus an estimate for the remaining five months (i.e., 10 May 2025 to 30 September 2026).

Differences between the Imperfections Charges paid out by the TSOs to generators and the amounts paid to the TSOs by suppliers based on the Imperfections Price for the current Tariff Year can lead to a surplus or shortfall across the Tariff Year. The TSOs refund any surplus or seeks to recover any shortfall through an adjustment to the Imperfections Price in the following Tariff Year. A further adjustment, to account for differences between the estimate and the outturn made for the remaining five months, may be required in the next Tariff Year plus 1 i.e., 2028/29.

The TSOs have proposed a K-Factor adjustment of €13.22 million for inclusion in the Tariff Year 2026/27 Imperfections Charge. The proposed K-Factor is comprised of an actual over-recovery of €5.56 million for Tariff Year 2024/25 and an estimated over-recovery for Tariff Year 2025/26 of €9.46 million (reference Table 1 below and Annex 2 for the TSOs' submission). For the first time, the forecasted interest associated with the Market Working Capital Credit Facility (MWCCF) is included as part of the K-Factor calculation. The TSOs note the forecasted interest is €1.8 million.

	€ Million
Actual Over-Recovery in 2024/25	5.56
Estimated Over-Recovery in 2025/26	9.46
Forecasted MWCCF Interest 2025/26	(1.8)
Total Estimated Over Recovery	13.22
Total Proposed K-Factor to be Applied in 2026/27	**13.22**

***Table 1**. K-Factor calculation for 2026/27*

In calculating the K-Factor for Tariff Year 2026/27 as shown above, the TSOs considered two factors for the within year K-Factor for 2025/26: Estimated Outturn Expenditure and Estimated Outturn Revenue. The within year K-Factor for 2025/26 Estimated Outturn Expenditure resulted in €0 difference and no net over or under

recovery, whilst the Estimated Outturn Revenue estimated an over recovery of €9.46 million. Combined, these figures resulted in an estimated over recovery of €9.46 million for 2025/26. In terms of the 2024/25 actual over recovery calculation, the TSOs note this is comprised of a €167.06 million under recovery for 2024/25 (which was included when setting the 2025/26 tariff), plus an actual €161 million K-Factor under recovery arising from the 2024/25 year. There was also an inclusion of a cost provision for MWCCF Interest accrued in 2024/25 amounting to €500,000. These factors combined results in an outturn over recovery of €5.56 million for Tariff Year 2024/25 to be included in the 2026/27 forecast calculation.

3. Ongoing actions to Reduce Imperfection Costs.

In May 2023, EirGrid published the "TSO Imperfections & Constraints Multi-Year Plan 2023-2027". Within this document, the TSOs outlined a multiyear plan to manage and reduce imperfections and constraints in the electricity system. These actions include updating reserve policies, reviewing and reducing transmission constraints, lowering the minimum number of conventional units online, conducting trials to reduce system inertia, developing procedures for new interconnectors, and enhancing imperfection reporting. These measures aim to optimise system efficiency, support renewable energy integration, and reduce operational costs. Under the current price control framework (PR5:2021-2025), the TSO is financially incentivised to deliver on the actions set out in its multi-year plan.

In Q2 2025, the System Operator for Northern Ireland (SONI) reduced the Minimum Number of Inflexible Units (MINNIU) Technical Constraint Group (TCG) from three units to two. In addition to this the RAs are considering the operation of the Bidding Code of Practice (BCOP) as the basis of the bidding rules in the SEM.

Furthermore, the introduction of the North-South Interconnector will potentially alleviate system constraints and therefore Imperfections Costs. The SEMC has requested regular updates from the TSOs and Transmission Asset Owner (TAO) on its delivery.

4. Summary

The TSOs proposed a Network Imperfections Charge of €796.92 million for the Tariff Year 2026/27. This comprises of total constraints costs of €810.14 million (includes €141 million of costs associated with the Clean Energy Package and €56.68 million of costs associated with the Net Transfer Capacity restrictions) and a K-Factor adjustment of -€13.22 million. When the total forecast Imperfections Charge is divided by the forecast demand, of 42,160 GWh, it equates to an Imperfections Price of €18.90 MWh for Tariff Year 2026/27. This is a 5% decrease by comparison to the Imperfections Price during Tariff Year 2025/26 (€19.93/MWh). The trend in the Imperfections Prices and costs is summarised in Table 2 below.

€ Million	TSOs' Proposed 2026-27	2025-26	2024-25	2023-24	2022-23	2021-22	2020-21	2019-20	2018-19	2017-18
Total Constraints Costs (DBC)	612.46	569.81	475.62	539.98	694.14	341.01	271.09	256.97	190.44	177.6
CEP Art. 13(7)	141	37	158	-	-	-	-	-	-	-
NTC Restriction Payments	56.68	-	-	-	-	-	-	-	-	-
Fixed Cost Payments	-	-	-	-	-	-	15.38	14.35	7.19	2.7
K-factor Adjustment	(13.22)	183.43	(66.41)	(91.17)	140.36	(10.18)	(0.37)	84.44	(13.86)	(7.34)
Total Imperfections Charge	**796.92**	**790.24**	**567.21**	**448.81**	**834.53**	**330.83**	**286.10**	**355.76**	**183.77**	**173.02**
Forecast Demand (GWh)	42,160	39,650	38,800	38,950	38,200	36,000	33,600	34,200	35,200	34,550
Imperfections Price / MWh	**18.90**	**19.93**	**14.62**	**11.52**	**21.85**	**9.19**	**8.51**	**10.40**	**5.22**	**5.00**

Table 2: *Network Imperfections Charge Trend Since 2017/18*

5. Next Steps

The RAs seek stakeholders' views on any aspect of the proposals, in particular, on the following:

- The TSOs' forecasts of costs and assumptions for Tariff Year 2026/27. In particular, stakeholders' views of the inclusion of the following costs are requested:
  i. Inflationary cost drivers such as;
     - wholesale fuel and carbon prices;
     - increased renewable capacity and interconnector imports; and
     - generator and transmission outages;
  ii. Provision of costs attributed to the Clean Energy Package Article 13(7) (€141 million);
  iii. Provision of costs attributed to Interconnector Net Transfer Capacity Restriction (€56.68 million);
- The TSOs' modelling and reporting of Imperfections costs and drivers; and
- Additional actions the TSOs/RAs could take to minimise Imperfections Charges (€810.14 million) for the upcoming tariff year and in the medium/long term

Responses to this paper should be forwarded to the Market Modelling Group (mmg@cru.ie) and the All-Island Regulation team (tsc@uregni.gov.uk) by close of business on 24 July 2026. Following consideration of stakeholders' feedback, the SEM Committee intends publishing its decision in early September 2026.