

Imperfections Charge October 2020 – September 2021 And

Reforecast Report

October 2018 – September 2019

Decision Paper

SEM-20-058

27 August 2020

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1 EXECUTIVE SUMMARY

The Single Electricity Market (SEM) Imperfections Charge is made up of a number of components, the largest of which relates to Dispatch Balancing Costs (DBC). The purpose of the Imperfections Charge is to recover the anticipated DBC (less Other System Charges), Fixed Cost Payments and any net imbalance between Energy Payments and Energy Charges over the tariff year. The K-factor adjustment mechanism enables any under or over recovery of Imperfections Costs, in the previous year and an estimate for the current year, to be accounted for in the following tariff year.

On 22 July 2020, the Regulatory Authorities (RAs), together the Utility Regulator (UR) in Northern Ireland, and the Commission for Regulation of Utilities (CRU) in Ireland, published the "Imperfections Charge October 2020 to September 2021 and Reforecast Report October 2018 to September 2019 Consultation Paper" (the Consultation Paper). The Consultation Paper considered the Transmission System Operators' (TSOs) submission in relation to the:

- 1. 'Forecast Imperfections Revenue Requirement for Tariff Year 1 October 2020 to 30 September 2021'² (2020/21 Forecast); and
- 2. 'Reforecast Report for Tariff Year 1 October 2018 to 30 September 2019'3.

Formal responses to this Consultation Paper were received from the following respondents⁴:

- Eirgrid and SONI, together the Transmission System Operators (TSOs);
- PrePay Power.
- Bord Gais Energy (BGE).

These responses have been considered by the SEM Committee (SEMC) in coming to the decisions outlined in this paper.

² SEM-20-046 appendix 1

¹ SEM-20-046

³ SEM-20-046 appendix 2

⁴ Attached as Appendices 1 to 3 of this decision paper

1.1 2020/21 FORECAST

As part of their 2020/21 forecast the TSOs provided an estimate of Imperfection Costs for the 2020/21 tariff year.

The submitted revenue forecast of €356.67m gave an Imperfections Charge of €10.60 per megawatt-hour (MWh). The RAs reviewed the forecast and in the Consultation Paper proposed a lower overall revenue requirement of €286.47m.

In the Consultation paper the RAs invited views from respondents on the revised revenue and in light of responses has amended some Consultation Paper proposals to give a final revenue requirement of €301.47. The amendments are discussed in section 3.1.

The SEMC has decided to implement the revisions, giving an Imperfections tariff of €8.96/MWh to be applied for the period from 1 October 2020 to 30 September 2021, as per the table below:

	2020-21 Submitted by TSOs	2020-21 Proposed in Consultation	2020-21 Final Decision	2019-20	Change 19/20 to 20/21
Imperfections Allowance (€m)	356.67	286.47	301.47	271.33	11.1%
K-factor (€m)	(0.37)	(0.37)	(0.37)	84.44	
Total Allowance (€m)	356.30	286.10	301.10	355.77	-15.36%
Forecast Demand (GWh)	33,600	33,600	33,600	34,200	
Tariff (€/MWh)	10.60	8.51	8.96	10.40	-13.84%

Table 1: Imperfections Charges

The SEM Committee would like to acknowledge the additional modelling work performed by the TSOs, in particular in the period between April and May to facilitate a meaningful

consultation process in the circumstances of significant interruption and challenge caused by the Covid-19 pandemic.

1.2 2018/19 REFORECAST

Dispatch Balancing Costs (DBC) represent the majority of the Imperfections Charge⁵. In light of this the 'Single Electricity Market Incentivisation of All-Island Dispatch Balancing Costs Decision Paper SEM-12-033' (the Decision Paper) introduced an all-island DBC incentive mechanism, with effect from 1 October 2012⁶. The purpose of the incentive mechanism is to give the TSOs a reward for reducing DBC below the forecasted value, while penalising them for the reverse result; subject to reasonable ex-post model adjustments to the original forecast. Any incentive payment/penalty incurred was split on a 75:25 basis between Ireland's Transmission Use of System (TUoS) and Northern Ireland's System Support Services (SSS) revenues respectively.

The Reforecast Report was included for information purposes and as the current incentive mechanism is no longer appropriate for the revised SEM, the RAs have determined no incentive will apply for 2018/19.

2 INTRODUCTION

2.1 THE REVISED SINGLE ELECTRICITY MARKET

The new market arrangements are designed to integrate the all island electricity market with European electricity markets. It consists of a number of markets including the Day Ahead Market, Intra Day Market and the Balancing Market.

Participants are responsible for meeting their ex-ante commitments, and when they cannot they are financially exposed in the Balancing Market. The market rules are set out in the Trading and Settlement Code (TSC). The SEM is governed by the SEM Committee which was set up by the Governments in Ireland and the United Kingdom. This Committee has representatives from both RAs, UR in Northern Ireland and CRU in Ireland, together with an Independent Member. The SEM is operated by the Single Electricity Market Operator (SEMO) which is a contractual joint venture between the System Operators EirGrid and SONI.

⁵ DBC has accounted for 95-100% of the forecast Imperfections Charge over the last 5 tariff years

⁶ SEM-12-033 Incentivisation of All-Island Dispatch Balancing Costs Decision Paper, dated 5 June 2012

2.2 OBJECTIVE OF PAPER

This decision paper outlines the SEMC's determination on the Imperfections Charge for the 2020-21 tariff year. Comments received from interested parties, following the publication of the Consultation Paper on 22 July 2020, are summarised throughout this paper and published on the SEMC website⁷. All responses received have been considered in preparation of this decision paper.

2.3 OVERVIEW

The Imperfections Charge is levied on suppliers by SEMO. The purpose of the Imperfections Charge is to recover the anticipated DBC (less Other System Charges), Fixed Cost Payments, any net imbalance between Energy Payments and Energy Charges and Capacity Payments and Capacity Charges over the year, with adjustments for previous years as appropriate. The K-factor adjustment mechanism enables any under or over recovery of Imperfections Costs, in the previous year and an estimate for the current year, to be accounted for in the upcoming tariff year.

3 IMPERFECTIONS FORECAST 2020/21

The TSOs' 2020/21 Forecast was prepared jointly by EirGrid and SONI, and captures an all-island estimate of the Imperfections Charge for that year. All costs are estimated ex-ante and recovered from suppliers on a MWh basis through the Imperfections Charge. The TSOs forecast an Imperfections revenue requirement of €356.67 million for the 2020/21 tariff year. This forecast had been revised by the RAs to €286.47m for the consultation paper. This would represent a 5.57% increase from the €271.33 million approved forecast for the 2019/20 tariff year. A number of key factors influenced the 2020/21 Forecast submitted by the TSOs, including:

- An increase in the scale of scheduled transmission outages
- Update of Gas Transportation Capacity charges

⁷ Attached as Appendices 1 to 3 of this decision paper

- Revised interconnectors flow and wind profiles
- Network and Operational Constraint updates
- Reductions in demand
- Reductions in fuel prices

The RAs reviewed the key factors and made the following proposals in the consultation paper.

- Interconnector Ramp Rate Disparity forecast, €1.6m. The RAs were minded to make a €0
 allowance for this.
- Provision of €19 million for the inclusion of NI Gas Transportation Charges (GTC). The RAs
 did not see evidence for an increase in this element and proposed to exclude from the
 calculation.
- An inclusion of €30 million was requested for additional risks which included a €15m provision for a "must not run" transmission constraint group coming into effect on 25 May 2020. The RAs understood an allowance for "must not run" exists within the PLEXOS modelling and proposed to exclude this item.
- Provision of €11.6 million for the settlement of Pumped Storage units in the new market. The RAs did not consider there to be any change to the treatment of these units in the market since the previous exercise in which this amount was not fully allowed, and so proposed to make a reduced supplementary allowance of €6 million, and would expect the TSOs to continue to strive to match the market position of the units in dispatch as closely as possible.
- A forecast reduction in demand which has increased the PLEXOS model constraint costs by €14m. Acknowledging the significant reduction in demand at the height of the Covid crisis when the models were re-run, the RAs proposed to exclude this cost on the basis that the reduction in demand then appeared to be less severe than that used for the purpose of the Plexos model.⁸

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⁸ The demand figure used in the PLEXOS modelling is different form demand forecast used in section 3.9

3.1 RESPONSES AND RA COMMENTS

BGE

BGE are of the opinion that the TSO forecast models need to be reviewed, including modelling assumptions, data sets and methods, to better reflect the dynamics of the new I-SEM.

BGE raise concern on the large K factor swing between last year and this year and ask how this can be reduced in future, and request whether a forecast can be made for this.

The rise in Fixed Cost Payments is highlighted by BGE and question raised as to why these costs have shown an increasing trend.

BGE were in support of the amendments made by the RAs on the DBC reduction proposals.

RA Response

The RAs welcome the detailed response from BGE. Regarding model improvements of the magnitude envisaged in the response, this will require a research and development of modelling of coupling and the ex - ante markets, which is not presently implemented in the other modelling workstreams and would represent something of a ground-up reworking of the modelling approaches used presently. The RAs will however consider the arguments put forward in the broader context of modelling work carried out across the TSOs and RAs.

With regard to K factor swings the overarching objective of the tariff setting exercise is to deliver K-factors over time that are reasonably close to zero, and this would be the value of any forecast made of K by the RAs. The chief cause for the significant under-recovery that caused the €85m adjustment in the last exercise, was an underestimate of the impact of the I-SEM reform, coupled with the impact of system errors that manifested in the first few months of I-SEM.

Regarding the Fixed Costs, the TSO advised that, for the forecast last year (2019/20) the costs were based on a small portion of the year and then scaled, as this was all the useful data available. This year (2020/21) there is a full 12 months of defect free data and trends can be observed that tend to support the amount requested. The RAs are content with this approach and the amount requested for Fixed Costs on the basis of observed trends in the real data.

TSOs

The TSOs have stated no request was received from the RAs to include alternate values in the context of the Trading and Settlement Code paragraph 4.153 thus contravening the purpose of the report as set out in paragraphs 4.155 and 4.156.

The TSOs further suggest that should the RAs adopt this different approach they should use the alternative calculation envisaged in 4.153 and submit a request to the TSOs for alternative values to be provided.

The TSOs report that they perceive an incompatibility between the recent RA Network consultation papers and the proposal to reduce the amount requested for Imperfections.

The TSOs within their response, have assured the RAs that the €15m included in the supplementary modelling for the Must Not Run Transmission Constraint Group (TCG) has not been included within the PLEXOS modelling. They further opined that the allowance against additional risks should be included.

The TSOs have asserted that the request for €19m for GTCs is the additional cost for all relevant generators both in IE and NI and are derived from actual bid costs.

The TSO forecast reduction in demand cost increase of €14m has been tested and modelled further by the TSOs by increasing the demand in the models to the GCS median forecast, which has been shown to increase rather than decrease the imperfections costs.

The TSO response on Pumped Storage indicates that the provision of €11m is to cover settlement costs which have occurred under the revised market arrangements and is separate to the station efficiency modelling. They state that the full allowance should be made for this rather than the reduced amount proposed in the consultation.

The TSOs have noted that the RAs proposal was for no provision in relation to Interconnector Ramp Rate and have undertaken to closely monitor these costs.

RA Response

The RAs did not request alternate calculations to be made as part of the TSO submission. However, the RAs decision to ask for this, or not, has no logical or causal connection to the validity of any amendments that the RAs might then propose in the consultation.

The RAs disagree with the interpretation of F.12.1.2 of the Code (set out in the TSO response as referencing 4.153 of Part A of the Code), and do not consider that the potential request of an alternate calculation places any obligation on the RAs to either do so; or to institute separate engagements with the TSO in the event that the consulted-upon amount is not in keeping with what was requested by the TSO.

The issues raised around the RA Price Control reviews for the TSO business fall outside the scope of this exercise. While the RAs appreciate that there is a relationship between the Imperfections Tariff and the degree of likelihood that the contingent capital will be drawn on, the RAs view is that the contingency fund level remains adequate at this time.

The RAs analysis of the TSO PLEXOS model suggested that the Must Not Run TCG was present within the model, however following discussion with the TSO modelling team are satisfied that this was not reflected inside the model; and the RAs have decided to re-instate the €15m deduction.

The RAs note the arguments put forward by the TSOs in relation to the basket of other potential risks inside the €30m provision, including the TSO's opinion as to the adequacy of the funds provided in the price controls, but remain unpersuaded that these risks warrant an explicit inclusion with the tariff.

Regarding the €19m cost, the RAs met with the TSOs to explore this element in more depth following publication of the Consultation Paper. It is the view of the RAs following this discussion that the €19m isolated in the submission is essentially a catch-all for the basket of unassigned / otherwise unexplained changes in the historical bidding patterns of the generation fleet, and that the label 'GTC' is perhaps a mis-label, as the changes include the impact of all otherwise unaccounted for changes from one year to the next. On balance the RAs have decided to adhere to the consulted-upon decision to withhold this €19m value from the final amount.

Regarding the impact of the demand forecast and the proposed decision to withhold €14m to reflect rebounding demand in June/July, the RAs were able to reconcile some of the concerns that were present initially; particularly with reference to the representation of data center load in the Plexos model. With regard to the fresh forecast made using median-GCS, the RAs are not persuaded to change the consulted upon position on foot of this indicative modelling outcome. Again on balance, the RAs have decided to withhold the proposed amount of €14m to account for uncertainty in the impact of Covid-19 on demand in 2020/21 but acknowledge the work the TSOs have taken in this area.

Regarding Pumped Storage, the RAs note the arguments put forward by the TSO in relation to these elements. It is still unclear how and why the treatment of pumped storage leads to such high amounts to flow into CPremium and CDiscount, and how this interacts with the TSO's choice to reflect a significantly worse efficiency for the units in the constrained PLEXOS model. The RAs are happy to engage further with the TSOs to understand these interactions going forward, but for the purpose of this exercise, the RAs have decided to retain their minded-to position and apply the reduction proposed in the consultation paper.

The RAs note the support of BGE on this item.

Prepay Power

PrePay Power responded to the consultation raising detailed concerns around participants using the reliability option strike price as an offer price target and the balancing market floor price as a bid price target.

RA Response

The RAs note the arguments and concerns put forward by Prepay Power regarding the interaction between bid / offer prices and imperfection costs and the potential for locational market power to worsen these costs. The RAs welcome the response and will consider these arguments in the broader context of the work being done around priority dispatch and market monitoring. In the context of this tariff setting exercise, the RAs are satisfied that the Plexos configuration and supplementary modelling does not allow for or anticipate the exercising of local market power to inflate balancing market revenue.

Following the consultation and in consideration of the responses the RAs have decided to re adjust the proposal above as follows:-

 The deduction of €30m for additional risk has €15m re-instated following clarification from the TSOs that no provision for Must Not Runs has been included within the Plexos model.

3.2 DISPATCH BALANCING COSTS

DBC refers to the sum of Constraint Payments, Uninstructed Imbalance Payments and Generator Testing Charges. DBC makes up over 95% of the Imperfections Charge in the 2020/21 Forecast.

3.3 CONSTRAINT PAYMENTS

Constraint Payments make up the entirety of the 2020/21 final DBC forecast, as Uninstructed Imbalances and Testing Charges are forecast at zero. Constraint Costs arise due to the TSOs having to dispatch some generators differently from the ex-post market unconstrained schedule, in real time, to ensure security of supply on the system. Generators receive Constraint Payments to compensate them for any difference between the market schedule and actual dispatch. A generator that is scheduled to run by the market but which is not run in the actual dispatch (or run at a decreased level) is 'constrained off/down'; a generator that is not scheduled to run or runs at a low level in the market, but which is instructed to run at a higher level in reality is 'constrained on/up'.

PLEXOS Constraints

The majority of the forecast Constraint Costs are derived using the PLEXOS modelling tool. The RAs performed validation of the TSOs' PLEXOS model and have sense checked the TSOs' modelling assumptions. The RAs investigated any differences between the models and the TSOs provided explanations for any divergences. The assumptions underlying the TSOs' PLEXOS Constraints are detailed within their submission.

Supplementary Modelling Constraints

As it is not possible to model all Constraint Cost drivers in PLEXOS, part of the TSOs' Constraint forecast is made up of supplementary modelling results. The supplementary model includes forecasts for the following areas that PLEXOS is unable to effectively model; perfect foresight, specific reserve constraints, specific transmission system constraints, market modelling assumptions, system security constraints and other factors¹⁰.

3.4 UNINSTRUCTED IMBALANCES

Uninstructed Imbalances occur when there is a difference between a generator unit's dispatch quantity and its actual output. Uninstructed Imbalances and Constraint Costs are related, with

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⁹ SEM-20-046 appendix 1

¹⁰ See SEM-20-046 appendix1 for further detail on these components

Uninstructed Imbalances having a direct effect on Constraints Costs, as TSOs re-dispatch generators to counteract the impact of Uninstructed Imbalances on the system.

A forecast of zero is included for Uninstructed Imbalances as it is assumed that the additional Constraint Costs as a result of Uninstructed Imbalances will, on average, be recovered by the Uninstructed Imbalance payments for the forecast period.

3.5 TESTING CHARGES

The testing of generator units results in additional operating costs to the system, in order to maintain system security. As a testing generator unit typically poses a higher risk of tripping, additional operating reserve will be required to ensure that system security is not compromised, which will give rise to increased Constraint Costs.

A zero forecast has been included for Testing Charges, as it is assumed that any testing generator unit will pay Testing Charges to offset the additional Constraint Costs that will arise from out-of-merit running of other generators on the system as a result of the testing.

3.6 ENERGY IMBALANCES

Energy Imbalances that were considered a part of imperfections in SEM are assumed to be managed by the new balancing design, for the purposes of the TSO submission and will be monitored by the TSOs throughout the tariff year.

3.7 FIXED COST PAYMENTS

Fixed Cost Payments in the new market comprise of : Make Whole Payments , Recoverable Start Up Costs and recoverable No-Load Costs. A provision for the Fixed Costs Payments for the entire 2020/21 year is included in the TSO submission based on the Fixed Cost Payments estimate for the 2020/21 tariff year. As the Recoverable Start Up Costs were already captured in the PLEXOS production cost difference in order to avoid double counting the Recoverable Start Up part was subtracted from the total yearly estimate. A provision of €15.38 million has been made by the TSOs for Fixed Cost Payments.

3.8 OTHER SYSTEM CHARGES

Other System Charges (OSC) are levied on generators whose failure to provide necessary services to the system lead to higher DBC and Ancillary Service Costs. OSC include charges for generator units which trip or make downward re-declarations of availability at short notice.

In their submission the TSOs assume that generators are compliant with Grid Code and that no charges will be recovered through Other System Charges i.e. a forecast of zero is included for OSC for the 2020/21 tariff year. The TSOs argued that any deviation from this assumption would result in an increase to DBC, and that any monies recovered through Other System Charges will net off the resultant costs to the system in DBC.

3.9 RECOVERY OF IMPERFECTIONS COSTS

Imperfections Costs are estimated ex-ante and recovered during the following tariff period, through the Imperfections Charge.

Differences between the amount of Imperfections Charges paid out by SEMO to generators and the amounts paid to SEMO by suppliers will lead to instances where SEMO will:

- Require working capital to fund Imperfections Costs that exceed revenue collected through the Imperfections Charge, or,
- Have collected revenue through the Imperfections Charge that exceeds the amount being paid out on Imperfections Costs.

Any allowed under-recovery of revenue during the tariff period will be paid to SEMO, in the subsequent tariff period(s), with the appropriate amount of interest. This reflects the cost of short-term financing required to meet SEMO's working capital needs.

Similarly, for situations where the revenue recovered by SEMO through the Imperfections Charge is greater than that paid out in Imperfections Costs (second scenario above), the Imperfections Charge in the following tariff period will be reduced by an appropriate amount to reflect the allowed over-recovery and the associated interest.

The K-factor mechanism accounts for any under or over recovery of Imperfections Costs, in previous periods and the current period and adjusts the following period's tariff accordingly. The K-factor submitted by the TSOs to be applied to the Imperfections Charge for 2020/21 is €(0.37)m. This is comprised of the following:

Summary of K-factor adjustment

under-recovery in tariff year 2018/19 €-29.63m Estimated over-recovery for tariff year 2019/20 $\underline{\epsilon}$ +30m Total Imperfections K-factor to be applied in 2020/21 $\underline{\epsilon}$ +0.37m

This €0.37million over-recovery would usually be applied to the 2020/21 forecast Imperfections Charge leading to a decrease in the Imperfections Charge for the 2020/21 tariff year.

3.10 DEMAND FORECAST

Based on outturn 19/20 demand and 20/21 year to date figures the TSOs have forecast demand for the 2020/21 tariff year at 33,600 GWh, representing a 1.75% decrease from the 2019/20 forecast demand of 34,200 GWh.

3.11 IMPERFECTIONS CHARGE

The final forecast Constraint Costs are €286.09 million for the 2020/21 tariff year. As the other components of DBC are forecast at zero, this figure also equates to the forecast for DBC. As discussed in section 3.6 above, the TSOs forecast Fixed Cost (Make Whole) Payments of €15.38 million, based on 2019/20 outturn to date. The remaining elements of the Imperfections Charge are forecast at zero, meaning the forecast Imperfections Charge for 2019/20 stands at €301.47 million. Allowing for the K-factor adjustment, provides a total forecast Imperfections Charge of €301.10 million, which when divided by the forecast demand, of 33,600 GWh, equates to an Imperfections Charge of €8.96/MWh for the 2020/21 tariff year.

The comparable figure for the current 2019/20 tariff year is €10.40/MWh. Any under or over recovery of Imperfections Costs in the 2020/21 tariff year will feed into the K-factor of subsequent tariff years. The trend in the Imperfections Charge is summarised in Table 2 below:

€m	2020-21 Final	2019-20	2018-19	2017-18	2016-17	2015-16
Total Constraints costs	286.09	256.97	190.44	177.6	144.3	163.5
Uninstructed Imbalances	-	÷	-	i	Ĭ.	-
Testing charges			=	(-	-	-
Dispatch Balancing Costs	286.09	256.97	190.44	177.6	144.3	163.5
Energy Imbalance	3. 5.	-	-	875.	-	-
Fixed Cost Payments	15.38	14.35	7.19	2.7	2.5	7.2
K-factor Adjustment	(0.37)	84.44	(13.86)	(7.34)	(77.6)	(22.1)
Other System Charges	-	-	-	·#	-	-
Total Imperfections Charge	301.10	355.76	183.77	173.02	69.2	148.6
Forecast Demand ('000 MWh)	33,600	34,200	35,200	34,550	33,700	33,230
Imperfections Charge/ MWh	8.96	10.40	5.22	5.00	2.05	4.47

Table 2: Imperfections Charge over time

3.12 SEMC DECISION

The SEMC have considered all the responses as summarised above and acknowledge the points of concern from the TSO of the decrease of the Imperfections revenue for the 2020/2021 tariff year.

The areas raised by other respondents have also been considered.

SEMC Decision: 2020/21 Imperfections Charge to be set at €8.96/MWh in line with Table 2 above.

4 IMPERFECTIONS CHARGE FACTOR

Under the current SEM arrangements as per the Trading and Settlement Code part B the RAs are required to approve the Imperfections Charge Factor (FCIMPy).

The intent of this is to enable Eirgrid and SONI, should it become evident within a given year that the Imperfections Charge is not providing the adequate recovery of anticipated costs, to seek approval from the RAs to increase the factor thus increasing the Imperfections Charge to a level which adequately recovers the costs without requiring amendment to the underlying approved forecast requirement.

The Imperfections Charge Factor is approved to be set to 1 for the period of 1 October 2020 to 30 September 2021.

5 TSOS REPORTING AND TRANSPARENCY MEASURES

In order to increase transparency around DBC, the SEMC 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. The most recent report relates to the period April to June 2020¹¹ and includes a year-to-date section.

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¹¹ SONI Ltd - Publications