



**Imperfections Charge
October 2020 – September 2021**

And

**Reforecast Report
October 2018 – September 2019**

Consultation Paper

SEM-20-046

22 July 2020

CONTENTS

CONTENTS	2
1 EXECUTIVE SUMMARY	3
1.1 2020/21 Forecast.....	3
1.2 2018/19 Reforecast.....	5
1.3 PROVISION OF COMMENTS	6
2 INTRODUCTION	6
2.1 Objective of Paper	6
2.2 Overview	6
3 THE 2020/21 FORECAST	7
3.1 Dispatch balancing costs	8
3.2 Constraint Payments	8
3.3 Uninstructed Imbalances	10
3.4 Testing charges.....	10
3.5 Energy Imbalances	10
3.6 Fixed Cost Payments	10
3.7 Other System Charges.....	11
3.8 Recovery of Imperfection Costs.....	11
3.9 Demand forecast	12
3.10 Imperfections Charge.....	12
3.11 RA’s Proposal.....	13
4 REFORECAST REPORT SUMMARY 2018/19	15
5 TSOS REPORTING AND TRANSPARENCY MEASURES	15
6 PROVISION OF RESPONSES	16

1 EXECUTIVE SUMMARY

The Single Electricity Market (I-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 and Capacity Payments and Capacity 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.

Eirgrid and SONI, together the Transmission System Operators (TSOs), have prepared and submitted the:

1. 'Forecast Imperfections Revenue Requirement for Tariff Year 1st October 2020 to 30th September 2021'¹ (2019/20 Forecast); and
2. 'Reforecast Report for Tariff Year 1st October 2018 to 30th September 2019'². No Incentive to apply.

The Utility Regulator (UR), in Northern Ireland, and the Commission for Regulation of Utilities (CRU), in the Republic of Ireland, together the Regulatory Authorities (RAs), have analysed the forecast submission and the models underpinning it. The Reforecast submission is presented for information. This paper details the RAs proposals in relation to the forecast submission and invites responses from stakeholders.

1.1 2020/21 FORECAST

The TSOs have forecast an Imperfections revenue requirement of €356.67 million for the 2020/21 tariff year. The RAs have reviewed this forecast and proposed some amendments, resulting in an overall revenue requirement of €286.47m.

The forecast provided by the TSOs included a number of items and factors which have been affected by the impact of the COVID pandemic such as demand, outage plans and project delivery dates. The TSOs have needed to re run their modelling process which has caused increased time pressure on the overall process, and model assumptions were updated in May 2020. The RAs acknowledge this has offset the normal approach and is a "best effort model" given the constraints that COVID 19 has imposed. The RAs have revised a number of items and invite the

¹ Appendix 1

² Appendix 2

TSOs to consider these during the consultation period and respond with updated modelling if considered useful.

The RAs are minded that specific adjustments and amendments, on the basis of a heuristic approach, should be made to the proposed values by the TSOs. These are:

- Interconnector Ramp Rate Disparity forecast, €1.6m. The RAs are minded to make a €0 allowance for this.
- Provision of €19 million for the inclusion of NI Gas Transportation Charges (GTC). The RAs do not see evidence for an increase in this element and propose to exclude from the calculation.
- An inclusion of €30 million has been requested for additional risks which includes a €15m provision for a “must not run” TCG coming into effect on 25 May 2020. The RAs understand an allowance for “must not run” exists within the PLEXOS modelling and propose to exclude this item.
- Provision of €11.6 million for the settlement of Pumped Storage units in the new market. The RAs do 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 propose 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 propose to now exclude this cost on the basis that the reduction in demand now appears to be less severe than used for the purpose of the Plexos model.³

The TSOs have proposed a K factor adjustment of €0.37m, to correct for previous years and to include an estimate of the costs above forecast for the remainder of the 2019/20 year. The RAs note this amount and are minded to deduct this over recovery from the forecast figure.

³ The demand figure used in the PLEXOS modelling is different from demand forecast used in section 3.9

Taking into account the Imperfections Allowance and the proposed K factor adjustment of €-0.37m, this results in a 2020/21 Imperfections Charge of €8.51 per megawatt-hour (MWh), compared with €10.4 per MWh for the 2019/20 tariff year, as shown in Table 1 below.

	2020-21 RA Revision	2020-21 TSO Proposal	2019-20	Change revision-19/20
Imperfections Allowance	286.47	356.67	271.33	+5.57%
K factor (€m)	(0.37)	(0.37)	84.44	
Total Allowance (€m)	286.10	356.30	355.77	-19.6%
Forecast Demand (GWh)	33,600	33,600	34,200	
Tariff (€/MWh)	8.51	10.60	10.40	-18.2%

Table 1: Imperfections Charge 2020/21 versus 2019/20

1.2 2018/19 REFORECAST

Dispatch Balancing Costs (DBC) are a significant cost element passed on to the all-island consumer and represent the majority of the Imperfections Charge⁴. 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 2012⁵. The purpose of the incentive mechanism is to give the TSOs a reward for reducing DBC below the forecast, while penalising them for the reverse result; subject to reasonable ex-post model adjustments to the original forecast. Any incentive payment/penalty is 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 current incentive mechanism is no longer appropriate for the revised SEM and the RAs have determined that no incentive will apply for the first year of the new market arrangements.

⁴ DBC has accounted for 95-100% of the forecast Imperfections Charge over the last 5 tariff years

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

1.3 PROVISION OF COMMENTS

Comments on the 2020/21 Forecast and the RAs' recommendations are invited from industry and the public by 12.00 on Friday 14 August 2020, as detailed in section 11.

Comments on this paper should be forwarded, in electronic form, to Billy Walker at Billy.Walker@uregni.gov.uk.

2 INTRODUCTION

2.1 OBJECTIVE OF PAPER

The objective of this consultation paper is to solicit comments, from interested parties, on the TSOs' submissions in relation to the Imperfections in the I-SEM, namely the 2020/21 Forecast.

2.2 OVERVIEW

The Imperfections Charge is levied on suppliers by SEMO. The purpose of the Imperfections Charge is to recover the anticipated Dispatch Balancing Costs (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. The costs making up the Imperfections Charge are depicted in Figure 1 overleaf and a description of each provided in section 3 below.

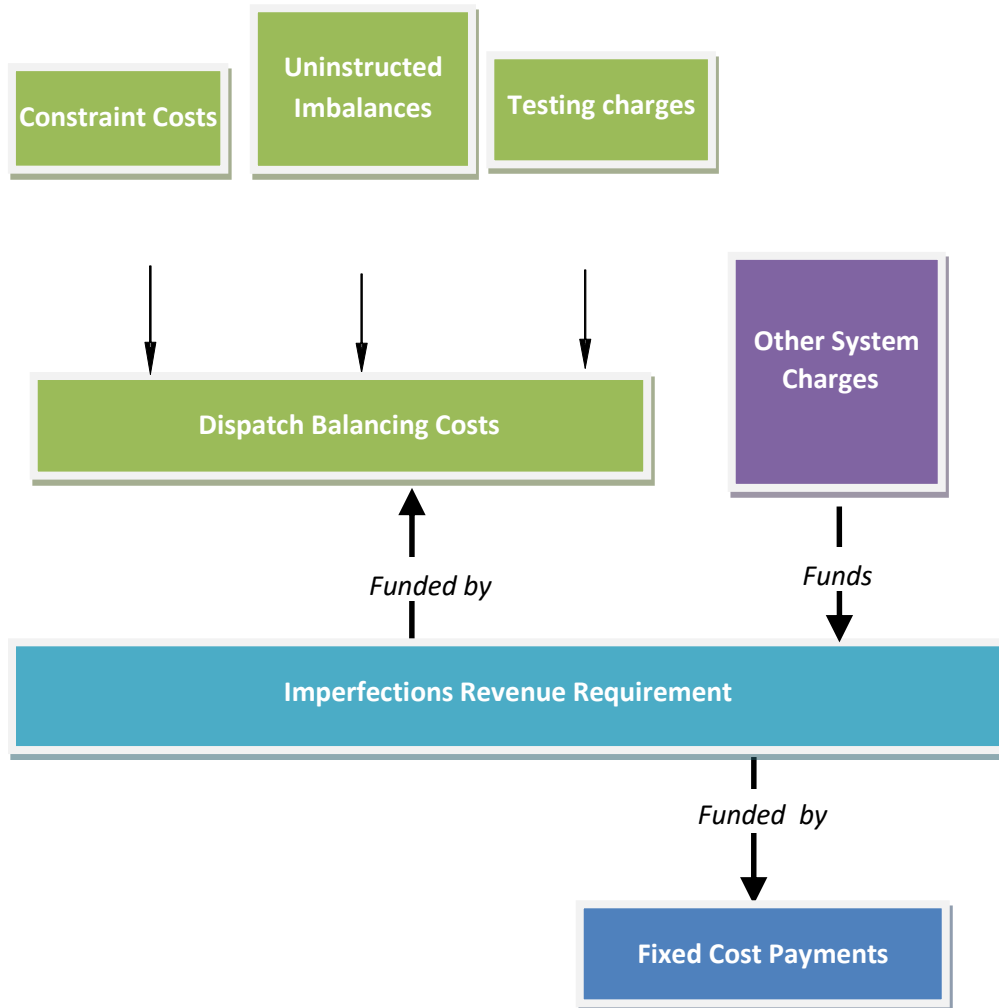


Figure 1: Imperfections Charge Components

3 THE 2020/21 FORECAST

The TSOs’ 2020/21 Forecast was prepared jointly by EirGrid and SONI, and captures an all-island estimate of the Imperfections Charge for the 2020/21 tariff year. All costs are estimated ex-ante and recovered from suppliers on a MWh basis, through the Imperfections Charge. The TSOs have forecast an Imperfections revenue requirement of €356.67 million for the 2020/21 tariff year. The RAs are minded to revise the forecast to €286.47 million.

This represents a 5.6% increase from the €271.33 million final decision for the 2019/20 tariff year. There are a number of key factors influencing the revised 2020/21 forecast, including:

- An increase in the scale of scheduled transmission outages
- Update of Gas Transportation Capacity charges
- Revised interconnectors flow and wind profiles
- Network and Operational Constraint updates
- Reductions in demand
- Reductions in fuel prices

Detail on the forecasts for each of the Imperfections Charge components is provided below and further information regarding the 2020/21 Forecast is provided by the TSOs in Appendix 1.

3.1 DISPATCH BALANCING COSTS

DBC refers to the sum of Constraint Payments, Uninstructed Imbalance Payments and Generator Testing Charges. DBC makes up 95% of the revised Imperfections Charge in the 2020/21 Forecast. Revised DBC for the 2020/21 tariff year is forecast as €271.09 million.

3.2 CONSTRAINT PAYMENTS

Constraint Payments make up the entirety of the 2020/21 DBC revised forecast (€271.09m), 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 have performed validation of the TSOs' PLEXOS model and have sense checked the TSOs' modelling assumptions. The RAs have investigated any differences between the models and the TSOs have provided explanations for any divergence from the RAs' internal models. The PLEXOS element of the TSOs' Constraint Costs revised forecast is €232.60 million, which has increased from the forecast Constraint Costs of €216.57 million for the PLEXOS component of the 2019/20 tariff year. The reasons for this increase are detailed in the bullet points in section 3 above. The assumptions underlying the TSOs' PLEXOS Constraints are detailed within their submission⁶.

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 factors⁷. The 2020/21 revised forecast for Constraint Costs, derived from supplementary modelling, is €38.49 million. The allowed figure for the 2019/20 tariff year was €40.40 million.

A provision of €0.4 million for Secondary Fuel start-up tests has been made within the supplementary model.

Combining both the PLEXOS and supplementary modelling Constraints, a revised forecast of €271.09 million is included for 2020/21 Constraint Costs, representing an increase of 5.5% from the 2019/20 revised forecast of €256.97 million.

⁶ Appendix 1 page 11

⁷ See Appendix 1 page 15

3.3 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 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.

3.4 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.

3.5 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.

3.6 FIXED COST PAYMENTS

Fixed Cost Payments in the new market comprise of: Make Whole Payment, Recoverable Start Up Costs and recoverable No-Load Costs. A provision for the Fixed Cost Payments for the entire 2019/20 is included in the TSO submission based on the Fixed Cost Payments estimate for the 2019/20 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.

3.7 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 argue that any deviation from this assumption will result in an increase in DBC, and that any monies recovered through Other System Charges will net off the resultant costs to the system in DBC.

3.8 RECOVERY OF IMPERFECTION 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:

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

To allow for the first scenario, SEMO may require funding from EirGrid Group to cover fluctuations during the tariff period. 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 comprises of:

Summary of K factor adjustment

Under-recovery in tariff year 2018/19	€-29.63m
Estimated Over-recovery for tariff year 2019/20	<u>€+30m</u>
Total Imperfections K factor to be applied in 2020/21	<u>€+0.37m</u>

This €0.37 million 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. The RAs are minded to allow the full over-recovery to be applied to the 2020/21 tariff.

3.9 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. This value is used to divide into the total revenue requirement to derive the imperfections charge.

3.10 IMPERFECTIONS CHARGE

As stated above, the RAs revised forecast Constraint Costs of €271.09 million are proposed 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 have forecast Fixed Cost 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 €286.47 million. Allowing for the K factor adjustment, provides a total forecast Imperfections Charge of €286.10 million, which when divided by the forecast demand, of 33,600 GWh, equates to an Imperfections Charge of €8.51/MWh for the 2020/21 tariff year.

The comparable figure for the current 2019/20 tariff year stood at €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	2019-20	2018-19	2017-18	2016-17	2015-16
Total Constraints costs	271.09	256.97	190.44	177.6	144.3	163.5
Uninstructed Imbalances	-	-	-	-	-	-
Testing charges	-	-	-	-	-	-
Dispatch Balancing Costs	271.09	256.97	190.44	177.6	144.3	163.5
Energy Imbalance	-	-	-	-	-	-
Fixed Cost (Make whole) 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	286.10	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	8.51	10.40	5.22	5.00	2.05	4.47

Table 2: Imperfections Charge over time

3.11 RA'S PROPOSAL

As stated previously, the RAs have sense checked the assumptions within the TSOs' forecast against the RAs' validated PLEXOS model. The RAs examined any values, in the TSOs' forecast, that differed from those contained in the RAs' validated model and the TSOs provided explanations for the differences. The RAs requested additional information on specific elements of the TSO Forecast Report such as network assumptions, interconnector capacity, GTC costs, battery connection assumptions and transmission outages. The TSOs provided additional information and further detail and where appropriate the RAs have taken this into account in the proposals below.

The RAs reviewed the forecast which included new items for consideration for the 2020/21 tariff year and propose that the following items, totalling €70.2m are revised and withheld from the allowed amount.

- Interconnector Ramp Rate Disparity forecast, €1.6m –The RAs have not been persuaded that this effect leads to an expected loss (i.e. a bias in the financial exposure to balancing during ramping) and consider this to be a volatility issue. The RAs are minded that this element has not been shown to be an underlying expected cost, but rather a cost that can vary either positively or negatively during the Year and recommend a €0 allowance.
- Provision of €19 million for the inclusion of NI Gas Transportation Charges (GTC). The RAs do not see evidence for an increase in this element and propose to exclude from the calculation.
- An inclusion of €30 million has been requested for additional risk including a €15m provision for a Must Not Run Transmission Constraint Group along with associated risks flowing from the Clean Energy Package, Brexit and COVID 19. In examining the PLEXOS models it appears that Must Not Run is already modelled within the constrained model. Regarding the other elements, while there may be risks in these areas they relate to variance in cost rather than an underlying expectation of cost. The TSOs have access to a substantial draw-down facility to cope with this variance should outturn cost not match expectation. The RAs therefore propose to exclude the entirety of this item.
- Provision of €11.60 million for the settlement of Pumped Storage units in the new market. While the RAs acknowledge the treatment of these units in PLEXOS differs from the new market, we note that the PLEXOS models already include a gap between the efficiencies, with the unconstrained and constrained set to 70% and 48% respectively. The RAs propose to make a reduced allowance for this element in keeping with the decision for 2019-20 and propose an allowance of €6 million, and would expect the TSOs 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. In examining the PLEXOS models the RAs observed a significant reduction in the level of assumed demand inside the model, in particular the value of the peak demand in RoI. This reduction is in apparent isolation to the 33.6TWh value proposed for the derivation of the tariffs discussed earlier. The RAs have observed a recovery of demand in both jurisdictions since April 2020 at the height of the crisis when demand had reduced year-on-year by in excess of 20%. With recent indicators showing a less pessimistic outlook for demand during 2021, the RAs propose to adjust this cost out of the total based, and will continue to liaise with the TSOs in more detail regarding the demand settings inside PLEXOS during the consultation period.

The RAs propose that the following items are included within the forecast.

- A provision of €24.25 million for the exposure to the new imbalance pricing design in the new market calculated through CPREMIUM and CDISCOUNT
- An increase in the scale of scheduled transmission outages which has increased the PLEXOS model by €36m
- Revised interconnectors flow and wind profiles have increased the PLEXOS model constraint costs by €15 million
- Network and Operational Constraint updates have increased the model by €15m

All these elements were detailed by the TSOs in submissions and there does appear a strong argument relating to the impacts of more substantial network maintenance during 2021. The RAs are minded to endorse the revised 2020/21 Forecast amended as above, and a K factor adjustment of €0.37 million.

The RAs welcome any comments on this proposal and on the TSOs' submission.

4 REFORECAST REPORT SUMMARY 2018/19

The TSOs are responsible for managing DBC through efficient dispatch of generation, while still maintaining a secure electricity system. In light of this, a process to incentivise the TSOs to reduce DBC was introduced by the SEMC, with effect from 1 October 2012. The current process is now no longer suitable for the new market, however the Reforecast Report is an overview of how the original forecast, reforecast (PLEXOS) only and the actual outturn compare.

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 January to March 2020⁸ and includes a Year-to-Date section.

6 PROVISION OF RESPONSES

The RAs request responses on the proposals set out in this consultation paper. All responses received will be published, unless the author specifically requests otherwise. Accordingly, respondents should submit any sections that they do not wish to be published in an appendix that is clearly marked "confidential".

Responses to this paper should be forwarded, in electronic form, to Billy Walker at billy.walker@uregni.gov.uk by 12:00 on Friday 14th August 2020.

⁸ [SONI Ltd - Publications](#)