



**Imperfections Charge  
October 2018 – September 2019  
And  
Incentive Outturn  
October 2016 – September 2017**

**Decision Paper**

**SEM-18-047**

**30 August 2018**

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## 1 EXECUTIVE SUMMARY

The Integrated 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.

On 20th July 2018, the Regulatory Authorities (RAs), together the Utility Regulator (UR) in Northern Ireland, and the Commission for Energy Regulation (CER) in the Republic of Ireland, published the “Imperfections Charge October 2018 to September 2019 and Incentive Outturn October 2016 to September 2017 Consultation Paper”<sup>1</sup> (the Consultation Paper). The Consultation Paper considered the Transmission System Operators’ (TSOs) submissions in relation to the:

1. ‘Forecast Imperfections Revenue Requirement for Tariff Year 1st October 2018 to 30th September 2019’<sup>2</sup> (2017/18 Forecast); and
2. ‘Imperfections Costs Incentive for Tariff Year 1<sup>st</sup> October 2016 to 30<sup>th</sup> September 2017’<sup>3</sup> (2015/16 Incentive Outturn).

Formal responses to this Consultation Paper were received from the following respondents<sup>4</sup>:

- Eirgrid and SONI, together the Transmission System Operators (TSOs);
- The Consumer Council NI; and
- Bord Gais Energy (BGE).

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

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<sup>1</sup> SEM-18-038

<sup>2</sup> SEM-18-038a

<sup>3</sup> SEM-18-038b

<sup>4</sup> Attached as Appendices 1 to 3 of this decision paper

## 1.1 2018/19 FORECAST

As part of their 2018/19 Forecast the TSOs provided an estimate of Imperfection Costs for the 2018/19 tariff year which is 28.17% higher than that forecast for the current 2017/18 tariff year.

This submitted revenue forecast of €231.17m gave an Imperfections Charge of €6.17 per megawatt-hour (MWh)

The RAs reviewed the forecast and proposed an overall revenue requirement of €197.63m which represented a 9.57% increase from the 2017/18 tariff year and gave an Imperfections Charge of €5.22/MWh, as proposed in the consultation.

There are an array of effects associated with the introduction of the I-SEM and new DS3 contracts that give rise to the increase. These are explained in chapter 3.

Given the TSOs forecast Imperfections Costs and allowing for a K-factor adjustment of (€13.86m), results in a 2018/19 Imperfections Charge of €5.22 per megawatt-hour (MWh), compared with €5.00 per MWh for the 2017/18 tariff year. This represents a 4.4% increase in tariffs from the levels currently experienced.

In the Consultation paper the RAs proposed that the adjusted TSOs forecast and K-factor adjustment be accepted and two respondents to the Consultation Paper acknowledged the lower tariff value. The SEMC has made the decision to allow for an Imperfections tariff of €5.22/MWh to be applied for the period from 1 October 2018 to 30 September 2019, as per the table below which shows the submitted Imperfections allowance by the TSOs, the allowance consulted upon by the RAs and the final decision by the SEMC along with percentage change from the final decision and 2017-18 Imperfections Charge.

Imperfections Charge and Incentive Outturn Decision Paper

	<b>2018-19 Submitted by TSOs</b>	<b>2018-19 Proposed in Consultation</b>	<b>2018-19 Final Decision</b>	<b>2017-18</b>	<b>Change 18/19- 17-18</b>
Imperfections Allowance (€m)	231.17	197.63	197.63	180.36	9.57%
K-factor (€m)	(13.86)	(13.86)	(13.86)	(7.34)	
<b>Total Allowance (€m)</b>	<b>217.31</b>	<b>183.77</b>	<b>183.77</b>	<b>173.02</b>	<b>6.21%</b>
Forecast Demand (GWh)	35,200	35,200	35,200	34,550	1.88%
<b>Tariff (€/MWh)</b>	<b>6.17</b>	<b>5.22</b>	<b>5.22</b>	<b>5.00</b>	<b>4.4%</b>

**Table 1: Imperfections Charge 2018/19 Final and 2017/18**

The higher tariff values are primarily a result of the higher Imperfections Allowance.

## 1.2 2016/17 INCENTIVE OUTTURN

Dispatch Balancing Costs (DBC) are passed on to the all-island consumer and represent the majority of the Imperfections Charge<sup>5</sup>. In light of the above, 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 2012<sup>6</sup>. 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 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 TSOs originally submitted a forecast DBC, for the 2016/17 tariff year, of €144.3 million, in April 2016. The PLEXOS element of this forecast stood at €125.8 million, with the supplementary modelling component equalling €18.5 million. In their 2016/17 Incentive Outturn the TSOs proposed that the PLEXOS component of this forecast be amended, to take account of the following ex-post review factors:

1. Model basecase refinements to include:
  - a) The '12 months of benefit' principle - allowing the TSOs to gain 12 months of benefit from the Dublin load based constraints / Dublin Generation Rules introduced from 24/05/16. SNSP was also increased from 50% to 55% on 01/03/2016. This is achieved by removing the effect of any initiative from the 2016/2017 forecast so as to enable the benefit of the initiatives to be realised when comparing the TSO's outturn performance to the forecast.
  - b) New generating units – Adjustment to account for all Demand Side Units (DSUs) which became operational during the 2016/17 tariff year.
2. Combination of actual demand, Commercial Offer Data (COD), wind and Modified Interconnector Unit Nominations (MIUNs) data.

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<sup>5</sup> DBC has accounted for 96-100% of the forecast Imperfections Charge over the last 5 tariff years

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

In the Consultation Paper the RAs proposed to allow for the above ex-post review factors. In relation to the '12 months of benefit' principle, the RAs noted that any period of benefit of less than 12 months may create a perverse incentive for the TSOs to delay new initiatives until the start of the following tariff year. Furthermore, the RAs felt that a period greater than 12 months may discourage the TSOs from implementing new initiatives as frequently.

The TSOs' 2016/17 Incentive Outturn submission detailed actual Imperfections Costs of €126.9 million, €15.3 million lower than the ex-post DBC baseline of €142.2 million<sup>7</sup>. This saving potentially entitles the TSOs to an incentive payment of €0.46 million<sup>8</sup> and the RAs recommended endorsement of this incentive payment in the Consultation Paper.

The SEMC has decided to provide the TSOs with an incentive payment of €0.46 million in light of the efficiency gains achieved by them in reducing outturn Imperfections Costs below the ex-post DBC baseline.

This is the fourth year in which the TSOs have claimed entitlement to an incentive payment, having received an incentive payment of €0.15m last year, based on the outturn Imperfections Cost for tariff year 2015/16.

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<sup>7</sup> Calculated as original DBC forecast (144.3m) less basecase refinements and actual data(5.4m) less actual data plus supplementary modeling adjustments (3.33m) = 142.2m

<sup>8</sup> SEM-18-038b – Table 10: Method of calculating the incentive payment with ex-post adjusted baseline



## 2 INTRODUCTION

### 2.1 THE INTEGRATED SINGLE ELECTRICITY MARKET

The I-SEM is a new wholesale electricity market arrangement for Ireland and Northern Ireland. The new market arrangements are designed to integrate the all island electricity market with European electricity markets, enabling the free flow of energy across borders.

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 I-SEM market rules are set out in the Trading and Settlement Code (TSC)<sup>9</sup>. The I-SEM is governed by the SEMC which was set up by the Governments in the Republic of Ireland and Northern Ireland. This Committee has representatives from both RAs, UR in Northern Ireland and CER in the Republic of Ireland, together with an Independent Member. The I-SEM is operated by the Single Electricity Market Operator (SEMO) which is a contractual joint venture between the System Operators EirGrid and SONI.

### 2.2 OBJECTIVE OF PAPER

This decision paper outlines the SEMC's determination on the Imperfections Charge for the 2018-19 tariff year and also allows for the fourth Imperfections based TSO incentive payment to be made. Comments received from interested parties, following the publication of the Consultation Paper on 20th July 2018, are summarised throughout this paper and published on the SEMC website<sup>10</sup>. 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

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<sup>9</sup> <http://www.sem-o.com/MarketDevelopment/MarketRules/TSC.docx>

<sup>10</sup> Attached as Appendices 1 to 3 of this decision paper

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.

In 2012 the RAs introduced an incentive mechanism to encourage the TSOs to minimise Imperfection Costs where possible. The TSOs' entitlement to an incentive payment is assessed by comparing outturn Imperfections Costs against the ex-post DBC forecast for the same period. This is the fourth year where an incentive payment is due, with the TSOs receiving an incentive payment of €0.15 million last year. Payment of the €0.46 million incentive amount will be paid to the TSOs in line with the specified 75/25 proportions between Eirgird and SONI respectively.

### 3 THE 2018/19 FORECAST

The TSOs' 2018/19 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 €231.17 million for the 2018/19 tariff year. This forecast has been revised by the RA to €197.63m for the consultation paper. This gives a final Imperfections revenue requirement of €197.63m and represents a 9.57% increase from the €180.36 million forecast for the 2017/18 tariff year. A number of key factors influenced the 2018/19 Forecast submitted by the TSOs, including:

- An increase in available priority dispatch generation in the unconstrained PLEXOS model of 9% leading to an additional €17 million compared to the 2017/18 forecast;
- An increase in forecasted wholesale fuel costs increases constraint costs by approximately €8 million in the PLEXOS model.
- An improvement in generator parameters through the introduction of the TSO's System Services Contracts contributes to a reduction of €49 million compared to the 2017/18 forecast.
- In I-SEM wind generation that is constrained or curtailed down from their market position will have to pay back either ex-ante market revenue or the imbalance settlement price rather than retaining their revenue under the SEM This can result in additional charges which can offset DBC leading to a reduction of the forecast of €8.9 million.
- Inclusion of an Interconnector Ramp Rate Disparity forecast of €8 million.
- Inclusion of an Imbalance Price Impact Forecast of €45.54 million.
- Long Notice Adjustment Forecast of €0.0 million.
- Inclusion of a Dispatch down of DSUs forecast of €8.34 million.
- Inclusion of a Northern Ireland Gas Product Charge forecast of €7.0 million

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

- Allow the €0.0 million forecast for Long Notice Adjustment Factors.
- Provide a €0 allowance for the Interconnector Ramp Rate Disparity instead of €8.0m requested, as this is considered a volatility issue rather than an expected cost.
- Allow a provision of €20m for the Imbalance Price Impact, having considered the €45.54m forecast as too conservative an allowance.
- NI Gas Product Charge forecast of €7.0m will be included as the cost has been viewed as reasonable.
- Allow the forecast amount of €8.34m for the dispatch down of DSUs.

Detail on the rationale for the decisions for each of the Imperfections Charge components is provided in the sections below.

### 3.1 DISPATCH BALANCING COSTS

DBC refers to the sum of Constraint Payments, Uninstructed Imbalance Payments and Generator Testing Charges. DBC makes up 96.4% of the Imperfections Charge in the 2018/19 Forecast. Final DBC for the 2018/19 tariff year is forecast as €190.44 million.

### 3.2 CONSTRAINT PAYMENTS

Constraint Payments make up the entirety of the 2018/19 final DBC forecast (€190.44m), 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 PLEXOS element of the TSOs' Constraint Costs forecast is €149.48 million, which has increased from the forecast Constraint Costs of €140.04 million for the PLEXOS component of the 2017/18 tariff year. The reasons for this increase are detailed in the bullet points in section three above. The assumptions underlying the TSOs' PLEXOS Constraints are detailed within their submission<sup>11</sup>.

## 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 factors<sup>12</sup>. The supplementary modelling component of the 2018/19 forecast for Constraint Costs, is €66.50 million plus €8 million for Interconnector Ramp rate Disparity. The allowed figure for the 2017/18 tariff year was €37.60 million.

A provision of €0.77 million for Secondary Fuel start-up tests was made within the supplementary model. The TSOs anticipate that the fuel switching arrangements will come into place in NI in 2018/19. The obligations have been in place in ROI since 2010.

Combining both the PLEXOS and supplementary modelling Constraints, a revised forecast of €190.44 million is included for 2018/19 Constraint Costs, representing an increase of 7.2% from the 2017/18 forecast of €177.6 million.

## 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

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<sup>11</sup> SEM-18-038a

<sup>12</sup> See SEM-18-038a 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.

### 3.4 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 occur in SEM in the event that the sum of Energy Payments to generators does not equal the sum of Energy Charges to suppliers. An Energy Imbalance will generally impact Constraint Costs in the opposite direction, artificially increasing or decreasing the total Constraint Costs. A forecast of zero is included as it is assumed that if Energy Imbalances do occur that they will have an equal and opposite effect on Constraint Costs and will offset any increase or decrease accordingly.

### 3.6 MAKE WHOLE PAYMENTS (FIXED COST PAYMENTS)

Make Whole Payments account for any difference between the total Energy Payments to a generator and the production cost of that generator on a weekly basis. As such, Make Whole Payments are a feature of the SEM rules and are generally independent of dispatch and DBC. SEMO is responsible for administering all Make Whole Payments and they are funded through the Imperfections Charge. The TSOs included a forecast of €7.19 million for Make Whole Payments, based on the TSOs' experience of actual outturn, from 1st October 2017 to 31st March

2018, extrapolated out for a 12 month period. Make Whole Payments are not included within the incentive mechanism, as they are viewed as being independent of dispatch and DBC.

### 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 2018/19 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.

### 3.8 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:

- 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.

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 to be applied to the Imperfections Charge for 2018/19 is (€13.86m). This is comprised of the following:

**Summary of K-factor adjustment**

Over-recovery in tariff year 2016/17	(€13.86m)
Estimated over-recovery for tariff year 2017/18	(€0m)
Total Imperfections K-factor to be applied in 2018/19	<u>(€13.86m)</u>

This €13.86 million over-recovery is netted off the 2018/19 forecast Imperfections Charge leading to a reduction in the Imperfections Charge for the 2018/19 tariff year. This over recovery is composed of an over recovery in the 2016/17 tariff year and an estimate of the over recovery for the current 2017/18 tariff year. The over recovery has arisen for different reasons and essentially reflects differences between the TSOs estimate of Imperfections Costs and the actual Imperfections Costs incurred.

**3.9 DEMAND FORECAST**

Based on outturn 17/18 demand and 18/19 year to date figures the TSOs have forecast demand for the 2018/19 tariff year at 35,200 GWh, representing a 1.9% increase from the 2017/18 forecast demand of 34,550 GWh.

**3.10 IMPERFECTIONS CHARGE**

As stated in section 3.2 above, the final forecast Constraint Costs are €190.44 million for the 2018/19 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 €7.19 million, based on 2017/18 outturn to date. The remaining elements of the Imperfections Charge are forecast at zero, meaning the forecast Imperfections Charge for 2018/19 stands at €197.63 million. Allowing for the K-factor adjustment, provides a total forecast Imperfections Charge of €183.77 million, which when divided by the forecast demand, of 35,200 GWh, equates to an Imperfections Charge of €5.22/MWh for the 2018/19 tariff year.



The comparable figure for the current 2017/18 tariff year is €5.00/MWh. Any under or over recovery of Imperfections Costs in the 2018/19 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	2018-19 Final	2017-18	2016-17	2015-16	2014-15	2013-14
Total Constraints costs	190.44	177.6	144.3	163.5	177.6	165.5
Uninstructed Imbalances	-	-	-	-	-	-
Testing charges	-	-	-	-	-	-
Dispatch Balancing Costs	190.44	177.6	144.3	163.5	177.6	165.5
Energy Imbalance	-	-	-	-	-	-
Fixed Cost (Make whole) payments	7.19	2.7	2.5	7.2	3.6	0.1
K-factor Adjustment	(13.86)	(7.34)	(77.6)	(22.1)	5.2	(18.9)
Other System Charges	-	-	-	-	-	-
<b>Total Imperfections Charge</b>	<b>183.77</b>	<b>173.02</b>	<b>69.2</b>	<b>148.6</b>	<b>186.4</b>	<b>146.7</b>
Forecast Demand ('000 MWh)	35,200	34,550	33,700	33,230	33,320	33,220
<b>Imperfections Charge/ MWh</b>	<b>5.22</b>	<b>5.00</b>	<b>2.05</b>	<b>4.47</b>	<b>5.60</b>	<b>4.42</b>

Table 2: Imperfections Charge over time

## CONSULTATION PAPER PROPOSALS

As stated in the Consultation Paper, the RAs have sense checked the assumptions within the TSOs' forecast against the RAs' validated PLEXOS model. The RAs focused on any values, in the TSOs' forecast, that differed from those contained in the RAs' validated model and the TSOs provided explanations for any differences.

## RESPONSES

### BGE

BGE raised a concern on the possibility that imperfections charges may be revised mid year with little notice or that the contingency fund may be drawn from, to address Imperfections funding. They requested this action should only be taken as a last resort and asked that contingency fund levels be monitored and notification given to Market Participants of the fund levels, at least

monthly. BGE requested a mid-year review with stakeholders be conducted to assist forecasting and mitigation of constraint costs.

### TSOs

The TSOs raised concerns around the removal of the Interconnector Ramp Rate Disparity forecast and stated that based on the I-SEM imbalance pricing design the expectation on average is that when the imbalance market is short the imbalance price will be higher than when the imbalance is long and interconnector imbalances will both impact and be exposed to the price differential.

The TSOs raised a number of concerns around the reduction of the Imbalance Price Impact forecast from €45.54m to €20m. They were concerned that this revision was not based on a detailed model with little consideration being given as to whether this is a reasonable cost as €16.3m had been included for the 2017/18 Revenue Requirement to cover only a four month period of I-SEM.

The TSOs also stated that the contingency fund is in place to cover unexpected shortfalls and that the RAs were apparently using it as a rationale for disallowing expected costs. Their concern is then that the RAs will seek to disallow costs the TSOs expect to incur on the basis shortfalls will be covered through the contingent capital facility.

### Consumer Council

The Consumer Council acknowledged that imperfections Charges can have significant impact on consumer bills and welcomed the illustration of financial impacts on consumers within the consultation paper. They also raised concern that the Imperfections revenue forecast was €34m higher than the RAs proposal and highlighted the importance that the RAs analysis in all areas of electricity prices within their control. The Consumer Council also noted that the RAs pass over recovery to charges for the 2019/20 period.

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## SEMC DECISION

### BGE

With regard to the BGE points on a mid-year tariff revision with little notice the SEMC would only take this action as a last resort if it became apparent that the Imperfections tariff was not collecting sufficient revenue or was collecting substantially more than needed. The monitoring of the contingency fund will be undertaken by the RAs who would request the Market Operator to notify participants in line with the Trading and Settlement Code requirements when required.

In relation to the BGE point on a mid-year tariff review to assist forecasting and mitigation of constraint costs, the SEMC does not support this process as it is a long one with work currently starting early in the calendar year followed by forecast submissions and a stakeholder consultation and decision process finishing in August.

### TSOs

The RAs previously liaised in some depth with the TSOs on the issue of Interconnector ramping and interactions with balancing markets and concluded that the allowance should be €0m during the (now non-applicable) I-SEM period between May and September 2018. The RAs are of the view that the disparity between real rates and those given to EUPHEMIA will be dealt with under contingent capital via the relevant price control. Regarding the potential tendency for short markets to have higher imbalances than long markets, the RAs will observe the outturn in the context of the 2018-19 imperfections exercise. The RAs are not persuaded that there is enough material bias to warrant a specific allowance above the amount for imbalance price uncertainty already included under the Imbalance Price Impact allowance of €20m.

With regard to the Imbalance Price Impact Allowance, the RAs acknowledge the application of €20m is not based on a modelling exercise. However, we note that the original €16.3m allowed for the first four months was also not based on a modelling exercise, and the trebling of this value for the first full year presents a significant consumer cost at €45.54m.

While there is some merit in drawing on SEM experience to set the value ahead of the first year of I-SEM, we do not consider that the occurrence and cost of Uninstructed Imbalances is a suitable comparator for a full year estimate for the Imbalance Price effects, recognising the adoption of the method as a means to set tariffs for the (now non-applicable) I-SEM period between May and September 2018.

The RAs acknowledge that the phenomenon in question can only result in a cost to SEMO (ie there is a positive bias), but are reluctant to allow €45.54m to account for this. We consider that €20m strikes a balance between acknowledging the possibility of this phenomenon causing a cost to SEMO, and the burdening of consumers with unnecessary costs in the first year of the I-SEM. We also note the additional backstops available in the form of the contingency fund, and the ability to re-open tariffs mid-year; albeit recognising that these would also represent a degree of unwanted cost / disruption.

### Consumer Council

The SEMC noted the Consumer Councils response and comments and the RAs will continue to ensure that Imperfections Charges are assessed on behalf of consumers.

Conclusion

Given the level of RA sense checking the SEMC are satisfied that the TSOs' assumptions are reasonable and have made the decision to endorse the TSOs' 2018/19 revised Forecast and a K-factor adjustment of (€13.86m), in line with that proposed in the Consultation Paper.

SEMC Decision: 2018/19 Imperfections Charge to be set at €5.22/MWh in line with Table 2 above.

#### 4 INCENTIVE OUTTURN REVIEW FOR 2016/17

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 parameters, as detailed in the Decision Paper<sup>13</sup>, are presented in Table 3 below. Any payments or penalties associated with the incentivisation of DBC are administered across both TSOs on a 75:25 split basis.

	<b>Lower Bound</b>	<b>Dead Band</b>	<b>Upper Bound</b>	<b>Below Target</b>	<b>Above Target</b>
Dispatch Balancing Costs	7.5% - 20% below baseline	7.5% below and above the baseline	7.5% - 20% above baseline	TSOs retain 10% of every 2.5% below	TSOs penalised 5% of every 2.5% above

**Table 3: DBC incentive parameters**

The cost categories included in the incentive baseline are detailed in the Decision Paper and listed in Table 4 below:

<b>INCLUDED</b>	<b>NOT INCLUDED</b>
Constraint Costs	Make Whole Payments
Uninstructed Imbalances	Capacity Imbalances
Testing charges	Other Imperfection Charge Components
Energy Imbalances	
Other System Charges	
SO-SO Trades	

**Table 4: Cost categories included in the DBC incentivisation mechanism**

The 2016/17 tariff year is the fifth year to fall within the incentive mechanism and the fourth year where an incentive payment has been claimed. The TSOs' 2016/17 Incentive Outturn submission detailed outturn Imperfections Costs of €126.9 million; €15.3 million lower than the ex-post DBC baseline. Based on this, the TSOs are potentially entitled to an incentive payment of €0.46 million. The resultant incentive payment would be applied on a 75:25 split between Ireland's

<sup>13</sup> SEM-12-033 Incentivisation of All-Island Dispatch Balancing Costs Decision Paper, dated 5 June 2012

Transmission Use of System (TUoS) and Northern Ireland’s System Support Services (SSS) revenues respectively.

#### 4.1 EX-POST REVIEW FACTORS

The ex-post review is designed to take into account any external factors which heavily influenced DBC during the tariff period, e.g. unforeseen long-term outage of plant and other High Impact Low Probability events (HILPs). An effective ex-post adjustment mechanism should ensure the protection of both the TSOs and the all-island consumer from potential windfall gains or losses, as it removes some of the risk for events outside of the TSOs’ influence.

Table 6 of the Decision Paper details the allowable ex-post review factors as follows:

- Changes in SEM market rules or any RA decision affecting DBC.
- Changes in demand forecast/exchange rates/fuel prices (inc. bids)/wind generation.
- High Impact Low Probability (HILP) events: long-term unforeseen outage of generators, key reserve providers or transmission network.

In addition to the above, the Decision Paper states that the RAs will, as part of the ex-post review, examine any significant factors not identified above which affected DBC outturn. Combinations of the above factors which lead to DBC outturn being 10% either side of the ex-ante baseline will also be reviewed in detail by the RAs. The SEMC consider the ex-post review process enables a more accurate and effective incentive mechanism.

The TSOs submitted the ‘Forecast Imperfections Revenue Requirement for Tariff Year 1<sup>st</sup> October 2016 to 30<sup>th</sup> September 2017’ (ex-ante DBC forecast) in April 2016. This submission forecast DBC for the 2016/17 tariff year at €144.3 million. The 2016/17 Incentive Outturn paper contains the TSOs’ ex-post adjustments to this €144.3 million baseline, to form an ex-post DBC baseline of €142.2 million. Details of the adjustments made to the ex-ante DBC forecast are discussed in the preceding paragraphs.

#### 4.2 PLEXOS MODEL BASECASE REFINEMENTS

In their 2016/17 Incentive Outturn submission the TSOs assert that the combined effect of the PLEXOS model basecase refinements, detailed below, is to decrease the originally submitted (ex-ante) PLEXOS model from €125.8 million to €120.4 million.

### **Initiatives introduced in 2015/16**

The TSOs introduced a number of operational initiatives at various points in the 2015/16 tariff year. The TSOs adjusted the 2016/17 ex-ante DBC forecast to allow for 12 months of benefit from each initiative. These initiatives are outlined below:

- a. Dublin Load Based Constraints / Dublin Generation Rules - From 24/05/2016 the requirement for generation in North and South Dublin was changed to reflect changing generation characteristics. The system stability requirements were also changed.
- b. SNSP- increased from 50% to 55% on 01/03/2016

### **Other System Changes**

The TSOs made the following adjustments to the ex-ante DBC baseline to account for these new generating units:

- a. Demand Side Units (DSUs) – DSUs can become commercially operational significantly quicker than conventional generating units and windfarms. The ex-ante DBC model was therefore updated to include all DSUs which became operational during the 2016/17 tariff year.
- b. Generator Technical Offer Data – A number of units in Dublin reduced their minimum load value during 2016/17 and can now provide operating reserve from a lower value. This helped reduce DBC as the units had been constrained on and the reduction in minimum load helped bring them into merit in the SEM.

### 4.3 SEM RULES OR ANY RA DECISION

The TSOs reviewed the changes to SEM market rules and the RA decisions that became effective between the data freeze date of 11/04/2016 and the end of the 2016/17 tariff year. The TSOs identified that there were no changes to the SEM rules or RA rule changes which impacted on the 2016/17 ex-post review process.

### 4.4 DEMAND

The actual all-island monthly demand was 0.5% higher than forecast. Ireland was 1.1% higher than forecast and Northern Ireland was 1.4% lower. When actual demand figures were rerun in PLEXOS, DBC decreased by 6.1% therefore meeting the criteria for inclusion in the ex-post adjustment process<sup>14</sup>.

### 4.5 WIND, SOLAR, DSU AND PEAT

Actual all-island wind, Solar, DSU and Peat availability was higher than the assumed respective availabilities in the submitted forecast.

It was found that the shape of DSU available energy does not have a flat profile but varies considerably with time. The actual DSU available energy was included in the ex-post model.

The PLEXOS check of the combination of these availability changes indicated that it had a material impact on DBC for tariff year 2016/17. This resulted in a 15.3% decrease in DBC. As this was greater than +/-3% threshold of the baseline, this was included in the ex-post adjusted model.

### 4.6 COMMERCIAL OFFER DATA & MIUNS

Actual COD was compared to the submitted ex-ante forecast COD and these differed enough to consider for inclusion. Actual Interconnector flows for 2016/17 were updated as these differed significantly from the forecast flows.

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<sup>14</sup> Per SEM-12-033 Incentivisation of All-Island Dispatch Balancing Costs, Table 6



The actual COD (including actual MIUNs) was considered material and a rerun of the PLEXOS model was carried out. This resulted in a 5% decrease to DBC. As this exceeds the threshold of 3% of the baseline, this warrants inclusion in the ex-post adjusted model.

#### 4.7 COMBINATION OF DEMAND, WIND AND COD & MIUNs

When rerun in PLEXOS the combination of actual demand, actual wind availability and actual COD (including MIUNs) caused a €37.9 million decrease to the ex-ante DBC baseline (including model refinements discussed above). This equates to a 26.7% decrease in DBC and meets the 8% threshold for inclusion in the ex-post DBC model.

#### 4.8 HILP EVENTS

Transmission outages, both forced outages and scheduled outage overruns, were assessed by the TSO for the 2016/17 tariff year. Generator forced outages, scheduled outage overruns and generator issues were also examined. The combination of the generation and transmission outages met the HILP criteria as they resulted in an increase in DBC of 8%. This was therefore considered material and was included in the ex-post adjustment process.

## 4.9 CONCLUSION ON EX-POST PLEXOS ADJUSTMENTS

### **PLEXOS Results**

The above amendments relate to the PLEXOS modelled component of the DBC forecast and result in an ex-post PLEXOS component value of €120.4 million. The PLEXOS portion of the DBC forecast has decreased, relative to the ex-ante forecast of €125.8 million, largely due to actual COD & MIUN levels differing from forecasts.

	<b>€m</b>
Ex-ante DBC PLEXOS forecast	125.8
Net of base case refinements and actual data change adjustments	(5.4)
Ex-post DBC PLEXOS value	120.4

**Table 5: PLEXOS amendments in the Ex-post review process**

### CONSULTATION PAPER PROPOSALS

As with the TSOs' 2018/19 Forecast, the RAs sense checked the reasonableness of the TSOs' PLEXOS models against the RAs' validated PLEXOS model for the same period. The RAs investigated any reasons for differences between the models and the TSOs provided justification and evidence to explain any divergences. As noted previously, in some cases the TSOs used actual data rather than the forecast data contained in the RAs' validated PLEXOS model. Additionally, certain parameters were updated within the TSOs' models to enable a more realistic PLEXOS outcome, based on the TSOs' experience.

### SEMC DECISION

For the reasons stated in the paragraphs above the SEMC has decided to endorse the proposals contained in the Consultation Paper and to include the ex-post review factors detailed in Table 5 above.

**SEMC Decision: Ex-post review adjustments to the ex-ante DBC baseline to be included per Table 5 above.**

## 5 SUPPLEMENTARY MODELLING RESULTS

The supplementary modelling component of the DBC forecast is designed to take account of the specific external factors that cannot be captured by the PLEXOS model. The TSOs calculated an ex-post supplementary model DBC value of €21.8 million. This represents an increase of €3.3 million from the submitted ex-ante forecast of €18.5 million. System Operator Interconnector Trades for countertrading account for the majority of this €3.3 million movement from the ex-ante forecast. The results of the supplementary modelling process are summarised in the TSOs 2015/16 Incentive Outturn submission<sup>15</sup>.

The table below shows the effect of both the PLEXOS and supplementary modelling ex-post amendments on the ex-ante DBC forecast.

€m	Ex-ante DBC baseline	Ex-post DBC baseline
PLEXOS	125.8	120.4
Supplementary model	18.5	21.8
Total constraints	144.3	142.2

Table 6: Ex-ante DBC v Ex-post DBC

### CONSULTATION PAPER PROPOSALS

As stated previously, the supplementary modelling takes account of the specific external factors that cannot be captured by the PLEXOS model. The RAs sense checked the TSOs' supplementary model for accuracy and reasonableness of assumptions and were minded to endorse the above amendments.

### RESPONSES

No responses were received in relation to the ex-post adjustments to the supplementary modelling component of the DBC baseline.

<sup>15</sup> SEM-18-038b Table 8

**SEMC DECISION**

The SEMC has decided to endorse the ex-post adjustments to the supplementary modelling element of the DBC forecast.

SEMC Decision: Ex-post review adjustments to the ex-ante DBC baseline to allow for amendments to the supplementary modelling element of the DBC forecast as detailed in Table 6 above.

**6 AMENDMENTS TO OUTTURN DBC**

The table below shows actual outturn Imperfections Costs:

	<b>Actual Outturn €m</b>
Dispatch Balancing Costs	127.6
Energy Imbalance	(2.6)
Other System Charges	(9.0)
SO Trades	10.9
<b>Total Imperfections Costs</b>	<b>126.9</b>

**Table 7: Actual Outturn Imperfections Costs**

SEMC Decision: No amendment to the Outturn Imperfections Costs equal €126.9 million per Table 7 above.

**7 IMPERFECTIONS OUTTURN AND INCENTIVE CONCLUSIONS**

As shown in Table 7 above, actual Imperfections Costs for the tariff year 2016/17 equalled €126.9 million. This is €15.3 million lower than the ex-post DBC baseline of €142.4 million, shown in Table 6 above. The table below summarises how actual Imperfection Costs compare to both the ex-post and ex-ante DBC baseline.

€m	2015/16		
	Actual	Ex-post baseline	Ex-ante forecast
Total constraints	144.1	142.2	144.3
Uninstructed Imbalances	(4.1)	-	-
Testing charges	(1.5)	-	-
<b>Total DBC</b>	<b>138.5</b>	<b>142.2</b>	<b>144.3</b>
Energy Imbalance	(2.6)	-	-
Other System Charges	(9.0)	-	-
<b>Total Imperfections Charge</b>	<b>126.9</b>	<b>142.2</b>	<b>144.3</b>

Table 8: Actual v Forecast Imperfections Costs

Based on this the TSOs are entitled to an incentive payment of €0.46 million. The incentive payment has been calculated in accordance with Table 3, 'DBC Incentive Parameters' above. The €15.3 million saving equates to an 10.73% reduction to the ex-post adjusted Imperfections Cost, and the TSOs have calculated the €0.46 million by extrapolating between 10% and 12.5% under the budget.

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#### CONSULTATION PAPER PROPOSALS

The TSOs calculation is in accordance with the Decision Paper on DBC incentivisation<sup>16</sup>. The RAs were minded to endorse the payment of €0.46 million to the TSOs, in line with the specified proportions.

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#### RESPONSES

No Responses were received on this proposal.

The SEMC has decided pay the TSOs an incentive amount of €0.46 million, to be split between SONI and Eirgrid on a 25% to 75% basis between Ireland's TUOS and Northern Ireland's SSS revenues respectively.

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<sup>16</sup> See SEM-18-038b Table 10 for further details on calculation

SEMC Decision: TSOs to be paid €0.46 million incentive payment in line with specified proportions.

## 8 DBC FORECAST & INCENTIVISATION IN THE I-SEM

The 2018/19 Forecast covers the first year of the I-SEM. The forecast for 2018/19 tariff year is based on different parameters, under the new European Integrated model. As the Integrated Single Electricity Market (I-SEM) design differs from the previous SEM design any incentivisation mechanism, around DBC in the I-SEM will have to reflect these market differences. Given times constraints, there may not be an incentive mechanism in place for the first year of the I-SEM, however it is important that an accurate DBC forecast is in place for tariff setting purposes.

### RESPONSE

BGE had concerns about the suggestion that there may not be an incentive mechanism in place for the first year of I-SEM and on the negative impact the removal of this incentive may have on TSO actions to maximize cost efficiencies and introduce operational initiatives to reduce imperfections costs. BGE asked for further insight into why the RAs' do not intend to roll-over the current DBC mechanism in regard to dead band, penalty and reward on at least an interim basis.

### SEMC DECISION

In response to concerns that there may not be an incentive mechanism in place for commencement of I-SEM, the TSOs have submitted a proposal for the DBC incentive to the RAs and the RAs will be engaging with the TSOs in this area in coming months.

SEMC Decision: TSO incentives for the I-SEM yet to be developed, decisions on the same are outside the scope of this paper.

## 9 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 2018<sup>17</sup> and includes a year-to-date section.

### RESPONSE

No responses were received.

## 10 IMPERFECTIONS CHARGE SUMMARY

Based on the above decisions, the Imperfections Charge will be €5.22/MWh for the period from 1 October 2018 to 30 September 2019. The €5.22/MWh tariff represents a 4.4% increase from the current tariff of €5.00/MWh, as shown in the table below.

	2018-19 Final	2017-18	Change
Imperfections Allowance (€m)	197.63	180.36	9.57%
K-factor (€m)	(13.86)	(7.34)	
<b>Total Allowance (€m)</b>	<b>183.77</b>	<b>173.02</b>	<b>6.21%</b>
Forecast Demand (GWh)	35,200	34,550	1.88%
<b>Tariff (€/MWh)</b>	<b>5.22</b>	<b>5.00</b>	<b>4.4%</b>

Table 9: Imperfections Charge 2018/19 Final and 2017/18

<sup>17</sup> [SONI Ltd - Publications](#)