Single Electricity Market

Incentivisation of All-island Dispatch Balancing Costs

Consultation Paper

23 June 2011

SEM-11-048

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1. INTRODUCTION

With the implementation of the SEM on 1 November 2007 Constraint costs were no longer recovered separately by EirGrid and SONI (TSOs) in the Republic of Ireland and Northern Ireland respectively. Instead an all-island levy, administered through the all-island SEMO (Single Electricity Market Operator) Imperfections Charge, has been established to cover these costs.

For the current tariff period of 1 October 2010 to 30 September 2011 the Imperfections Allowance, approved by the Single Electricity Market Committee (SEMC) is €110.8 million, excluding K-Factor¹. This is set to recover all-island Make Whole Payments, Energy Imbalance Charges and TSO Dispatch Balancing Costs (DBC).

The Imperfections Allowance for the upcoming tariff period 1 October 2011 to 30 September 2012 is expected to rise, mainly due to fuel costs increases over the last 12 months. As a result, the cost of constraining-on out-of-merit generation for reserve, transmission and/or system security constraints is expected to be greater.

A consultation paper on 2011/2012 DBC is to be published in the coming weeks.

In December 2010 the CER published a consultation paper on 2011/2012 transmission incentives (CER/10/220), which stated that management of DBC was a priority for the CER. The paper stated that:

"However this (setting incentives to manage Constraints costs and Ancillary Services costs) remains an objective and a priority for the CER. Reducing constraints costs (within DBC) and ancillary services costs are dealt with on an all-island basis and are regulated by the SEM Committee. The CER intends to work with the Northern Ireland Authority for Utility Regulation (NIAUR) and the Transmission System Operators north and south (SONI for Northern Ireland and EirGrid for Ireland) to develop and implement an appropriate incentive (s) in this area throughout the PR3 period".

In January 2011 the UR published a consultation paper on the SONI Price Control 2010-2015 which also discussed the issue of DBC incentivisation².

"The costs of constraints and congestion management are increasing due to increasing interconnector trade, security of supply concerns, connection of wind generation and network congestion and these are included within the Imperfections Tariff. The Utility Regulator will work closely with CER to investigate further options for incentivisation, ensuring that all parties that influence the

² Please refer to the following link on the UR website: http://www.uregni.gov.uk/uploads/publications/SONI_Price_Con

¹ €107.3 million including K-Factor. Please refer to SEM-10-055.

http://www.uregni.gov.uk/uploads/publications/SONI_Price_Control_Consultation_Paper_-_14_January_2011.pdf

magnitude of the Dispatch Balancing Costs are incentivised to manage the aspects within their control, for the benefit of all consumers on the island".

DBC costs represent nearly 100% of the Imperfections Allowance³, a significant cost which is passed on to the all-island customer. In the previous tariff period (1 October 2009 to 30 September 2010) DBC represented nearly 5% of the entire value of the SEM⁴. The CER and UR as Regulatory Authorities (RAs) are now consulting on the incentivisation of the TSOs to manage all-island DBC from the period 1 October 2011 onwards.

Please note this paper consults on the issue of DBC incentivisation and not the incentivisation of all-island Ancillary Services.

Responses to this paper should be submitted to Jamie Burke (jburke@cer.ie) in CER and Billy Walker in UR (billy.walker@uregni.gov.uk) by 5pm Friday 29 July 2011.

Unless marked confidential, all responses will be published by placing them on the AIP website at the following address <u>http://www.allislandproject.org/</u>.

Respondents may request that their response is kept confidential. The RAs shall respect this request, subject to any obligations to disclose information. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality.

³ Please refer to SEM-10-055.

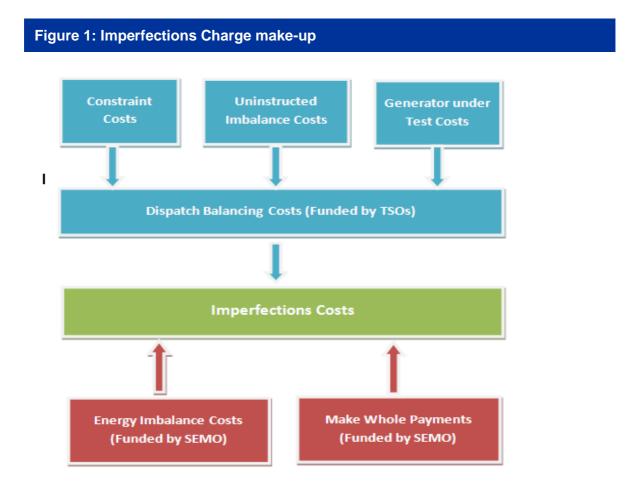
⁴ Please refer to the homepage of the SEMO website: http://www.sem-o.com/Pages/default.aspx

2. BACKGROUND

The SEMO Imperfections Charge is set on an annual basis to recover TSO DBC which includes Constraint Payments (Costs), Uninstructed Imbalances and Testing Charges associated with Generators. The charge also recovers Make Whole Payments and Energy Imbalance Costs.

Constraint costs arise due to the differences between the market determined schedule of generation to meet demand (the 'market schedule') and the actual instructions issued to generators by the TSOs (the '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'.

The costs associated with Imperfection Charges are depicted in the figure below. Three of the costs covering constraints, uninstructed imbalance and testing charges (Dispatch Balancing Costs) are provided by the TSOs. In addition to these, there are also Energy Imbalances and Make Whole payments. The budget required for these two costs is funded through the Imperfections Charge in the SEM, administered by SEMO.



With Uninstructed Imbalances and Testing Charges being set to $zero^5$ for the 2010/2011 tariff period, TSO DBC are made up entirely of Constraint Costs. Energy Imbalance Costs have also been set to zero, while there is an allowance of €330k for Make Whole Payments⁶. Therefore, nearly the entire Imperfections Charge for the tariff period 2011/2012 is made up of DBC. Note that the Imperfections Charges are levied only on Suppliers in the SEM.

Factors for consideration

Both RAs have indicated that incentivising the management of all-island DBC by the TSOs is an issue which needs to be investigated in a joint fashion. There are a number of factors which need to be taken into consideration. Please note that the below does not represent a complete set and the RAs would welcome any other points of consideration raised by respondents.

(i) Level of DBC

Dispatch Balancing Costs have been a significant cost of the SEM⁷ since its introduction in 2007.

Figure 2: Forecast DBC since SEM implementation in nominal terms

2007/2008	2008/2009	2009/2010	2010/2011
€109.3 million	€114.4 million	€106 million	€110.5 million

The outturn of 2010/2011 DBC is expected to be significantly above the ex-ante allowed cost detailed in SEM-10-055. This is due to a number of factors, such as the divergence of actual fuel costs from those assumed in the forecast of Constraint Costs and the forced long-term outage of key reserve providers. However, it must be recognised that fuel price changes and forced outages are not directly within the control of the TSOs. Such impacts on DBC outturn cannot obviously be avoided by incentivisation of the TSOs. This must be taken into account in the setting of any incentive mechanism and this point is discussed further below.

This will result in a considerable K-Factor adjustment for the 2011/2012 Imperfections Charge. As noted earlier, DBC for the upcoming tariff period 1 October 2011 to 30 September 2012 is expected to increase significantly. The primary driver of this expected increase in DBC is the rising cost of fuel. The RAs believe that it is important that efforts are made to manage this expected cost and reduce DBC to the extent within the control of the TSOs.

⁵ Please refer to SEM-10-041.

⁶ Please refer to Appendix 1 of SEM-10-041 for a description of each of these costs.

⁷ Ex-ante allowance of €106 million in 2009-2010 tariff period and €110.5 million in the 2010-2011 period.

Although Constraint costs within DBC arise due to the design of the SEM⁸, the need for their effective management by the TSOs, where possible, is a key feature of the market.

Effective management, and indeed reduction of DBC protects and benefits the allisland customer and the RAs should be exploring measures to promote this.

(ii) Response to CER & UR consultations

One of the main themes advanced by nearly all respondents to both the CER Transmission Incentives consultation paper (CER/10/220) and the UR consultation of SONI costs 2010-2015 is the need for introduction of an all-island DBC incentive mechanism.

In contrast, both TSOs have made the point that incentivisation of DBC would not be appropriate at this point. They argue that current industry structure (split TSO/TAO model) and the limited ability of the TSOs to exert influence on DBC reduces the effectiveness of such a mechanism.

However, there appears to be an appetite in industry for the introduction of some form of incentive around DBC. The RAs are keen to ascertain the thoughts of stakeholders on this matter.

(iii) Balancing Incentive mechanism in BETTA

There is evidence in other markets; such BETTA in Great Britain, that effective incentivisation can have a positive impact on system balancing costs. Ofgem have operated a balancing incentive mechanism (in various forms) for over a decade⁹. Although the figures quoted are not relevant to the SEM in 2011 it is worth referencing the 2003-2004 Ofgem incentive paper, published in March 2003¹⁰. The paper states the following:

"Between 1994 (when the first incentive scheme was introduced) and 2001, NGC reduced the annual costs of system operation by more than £400 million. Over the course of the first external SO incentive scheme under the New Electricity Trading Arrangements (NETA) from 27 March 2001 to 31 March 2002, NGC substantially reduced the level of SO costs. As a result of NGC's performance during the first incentive scheme under NETA, Ofgem was able to reduce the target for the current external SO incentive scheme for the period 1 April 2002 to 31 March 2003 by approximately £25 million".

⁸ Please refer to following webpage on the EirGrid website;

http://www.eirgrid.com/operations/ancillaryservices/dispatchbalancingcosts/

⁹ Please refer to the following page on the Ofgem website for associated documents:

http://www.ofgem.gov.uk/Markets/WhIMkts/EffSystemOps/SystOpIncent/Pages/SystOptIncent.asp x

¹⁰ Please refer to "NGC System operator Incentive scheme from 1 April 2003 – 31 March 2004 Final Proposal and Statutory Licence obligations".

It must also be acknowledged that the transmission industry structures differ between SEM and BETTA. EirGrid and SONI, as TSOs, do not own or carry out maintenance on the transmission assets, National Grid in Great Britain do. This implies greater ability in GB to influence constraints costs in the short-term (e.g. ability to make trade-offs between costs of returning an outage more quickly versus the costs of constraints). This would need to be taken into account in the setting of any DBC incentive mechanism.

(iv) Areas within/outside TSOs control

As noted in the previous point the degree to which the TSOs can control DBC is primary to the setting of any incentive. The various factors influencing DBC and how they interact are set out in the Venn diagram below.

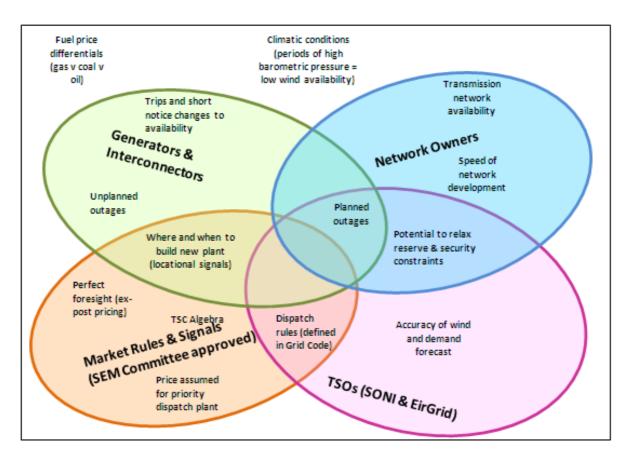


Figure 3: Factors Influencing DBC

The factors affecting DBC are also described in more detail in the following table.

Figure 4: Factors affecting DBC

Item	Description	Who can influence	Current incentives
Perfect foresight	The SMP is calculated 4 days after the trading day, with perfect knowledge of the events that took place. There is no reference point for the real time dispatch to minimise deviations.	SEM Committee	Not applicable
TSC algebra	The formulae used to calculate the SMP determines the gap between actual production costs and market revenue. The market engine also uses simplified assumptions about the technical characteristics of the generating stations. Therefore the market schedule of generation could not be used to meet demand.	SEM Committee	Under review by the "scheduling and dispatch" workstream
Dispatch rules	The grid code requires the system operators to dispatch in order to achieve the lowest production cost, without any reference to a prediction of SMP.	UREGNI & CER TSOs	Fit for purpose (reviewed as part of the SEM establishment)
Price assumed for variable price takers in the dispatch optimisation	The value placed on variable price takers in the market engine and during real time dispatch will affect both the SMP and the amount of plant that is constrained. The lower the value the bigger the impact on Dispatch Balancing Costs.	SEM Committee	Under review by the "scheduling and dispatch" workstream
Accuracy of demand and wind forecasts	The SMP is calculated based on the actual demand and wind availability. Differences between the forecast and actual net demand will result in a sub-optimal real	TSOs	None (proposed in this consultation paper)

	time dispatch		
Where and when to build new plant (locational signals)	The SMP calculation assumes that all available generation can reach all consumers. The DBC are increased when low cost plant are built behind transmission constraints. Generators are responding to locational signals required by the SEM committee.	Generators SEM Committee	Locational signals workstream is reviewing this area.
Speed of network development	The time lag between the commissioning of new low cost generation and the completion of the deep network reinforcements affects the total payments made under the dispatch balancing costs.	Network owners & operators	Potential incentive in PR3 Electricity Transmission in ROI.
Reserve and security constraints	The SMP calculation is based on the actual market demand. The real time dispatch considers the requirements for reserve and security of supply. This means that a higher number of generating units are required to be operating than in the market schedule. These can only be relaxed when the physical system improves.	Network owners TSOs SEM Committee	Security requirements are based on largest in-feed
	Market design does not take reserve and security requirements into account.		
Transmission network availability	The transmission network can be unavailable for a number of reasons, including capital projects, planned maintenance and weather conditions. These outages affect the size of the DBC.	Network Owners (and TSO in Rol)	Potential incentive in PR3 Electricity Transmission in ROI – System Minutes Lost.
Planned outages	SEM licences require the TSOs to work with generators and the network operators to maintain system security during planned outages. They do not include	Network owners TSOs	None

	any reference to minimising the cost impact of these works. Outages affect both SMP and DBC, and can increase the gap between the production cost and market revenue.	Generators	
Trips and short notice changes to generator availability	The SMP is based on actual availability during the trading day. When a unit trips, or reduces its availability at short notice, fast start plant must be used by the TSOs. The market engine assumes that the plant can be ramped down early to allow low cost plant to compensate. The market schedule will therefore produce a lower price for the relevant trading periods than that which could have been achieved by the TSOs.	Generators	Charges made via the harmonised arrangements for ancillary services and other system charges.
Unplanned outages	Unplanned outages will increase DBC above that which was assumed during the budgeting process. While they can be mitigated by generator behaviour they cannot be eliminated, and could be considered to be an external factor.	Generators External factor	Loss of capacity, energy and Ancillary Services payments as relevant.
Climatic conditions (wind availability)	The DBC budget will assume average wind conditions, however some years are windier than others and the amount of wind will affect the total magnitude of the DBC.	External factor	Not applicable
Fuel price differentials	The bigger the gap between the different fuel types the higher the cost of dispatch balancing.	External factor	Not applicable

The SEM Committee also considers that the TSOs have some control over the total volume of losses on the system and can implement methods to reduce losses where it is economically efficient to do so. However, it is noted that the all-island review of Transmission Loss Adjustment Factors (TLAFs) is ongoing and it may be more appropriate to consider any such loss reduction mechanisms as part of the wider objectives of that project.

It is difficult to attribute a set level (percentage or otherwise) of contribution for each factor, considering the number of them that work in isolation and in tandem to form DBC outturn.

For example, in one year the TSOs forecast of fuel prices and wind/demand levels may be accurate to within 5% of ex-ante assumed, but an unforeseen forced long-term outage of a reserve provider may result in the DBC outturn increasing 25% over ex-ante allowed. In this case the forced outage may be the sole contributor to outturn DBC being over ex-ante assumed. In the following year there may be no forced outages, but the wind/demand levels may be less than that assumed in the ex-ante forecast and the transmission system may not have developed as expected, which results in say DBC outturn being 10% above exante assumed.

It can be seen from the above example that influencing factors can have varying levels on impact from year to year on DBC outturn. Therefore it is difficult to assign a particular level of control that the various stakeholders, including the TSOs, have on DBC outturn.

Clearly there are a number of factors which are outside the control of the TSOs, including fuel costs, wind generation levels, unplanned outages etc. However as indicated in figure 3 above there are factors within the control of the TSOs (both directly and indirectly) that can have an impact on DBC.

The UR consultation paper on SONI Costs 2010-2015 points out that one area that the TSOs control and "that has a direct impact on the magnitude of (DBC) is the forecasting of both demand and wind generation". The UR has proposed an incentive around accurate forecasting for implementation from 1 October 2011. The application of such a 'Forecast' incentive on SONI, and indeed on an-island basis, needs consideration by the UR before any all-island DBC incentive mechanism could be put in place.

The TSOs working with the TAOs and Generators in their jurisdictions can establish measures to effectively manage outages both planned and unplanned¹¹, therefore improving transmission system availability, which in turn effects Constraint costs outturn.

¹¹ In the case of unplanned outages management can only be attained to a certain degree. However measures have been put in place by the TSOs for ongoing performance monitoring of Generators in relation to reserve and the provision and development of better quality/more flexible Ancillary Services.

The RAs acknowledge that for incentives to function effectively the parameters that are incentivised must be largely in the control of the party being incentivised. In this case it is clear that there are factors both inside and outside the control of the TSOs. However, no TSO has <u>complete</u> control over any incentive parameter, whether it is designed around improving system performance or system development, e.g. System Minutes Lost or System Frequency in ROI. There is always going to be a certain level of uncertainty and outturn being affected by external factors.

It could be argued that lack of complete control should not impede the introduction of a new incentive, but rather shape its parameters. This point is discussed further in the next point below.

(v) Incentive design

If certain factors are outside the control of a party then the incentive design must reflect this. A number of measures could be introduced which both protect the party from effectively being punished for factors outside of its control, while easing it into the incentive framework.

- A degree of asymmetry can be built into the upside and downside available (i.e. either greater upside reward than downside penalty available). Asymmetry is relatively common internationally, particularly where there is significant potential upside benefit to consumers as it does allow for an increase in the power of the incentive.
- Incentive dead-bands can be applied whereby there is a band around the central target before the incentive kicks in. This will allow a certain level of protection around the TSOs where factors outside of their control have increased DBC above forecast and also the all-island customer where external factors leave outturn below forecast.

Dead-bands and asymmetric incentive parameters correctly applied should overcome the lack of complete control the TSOs have over DBC, to the ultimate benefit of the all-island customer.

Furthermore, any DBC incentive mechanism must be administered by both RAs and across both TSOs to be effective and non-discriminatory. It cannot be introduced in one jurisdiction and not in the other, without being to a certain degree discriminatory.

Take the following example where there is a DBC incentive mechanism in place for ROI, but not NI. There is an unscheduled outtage on the Moyle Interconnector, which results in the need for constrained on additional units for spinning reserve, outside of the market schedule. These constrained on units are paid by SEMO. However, as there is only a DBC incentive mechanism in place for EirGrid in ROI this outtage and the payments to the constrained on units results in the outturn DBC going above the ex-ante allowed amount. A penalty payment is to be paid by EirGrid, even though its ability to mitigate the effects of the problem was limited. Therefore, the ROI customer sees a reduction in its cost (for example through a reduction in allowed TUoS revenue), even though the reason for the reduction can attributed to an event in NI.

(vi) Complementary Incentives

As discussed above the transmission system ownership/operation split in EirGrid and SONI should not be, in its own right, a hindrance to the implementation of an all-island DBC incentive. Complementary incentives should promote the TSOs and TAOs in both jurisdictions working together, because it is in both their financial interests to do so.

The key point is that incentives need to be complementary and should promote system performance to be increased at a number of levels across both TSO and TAO. A holistic approach to incentivisation across both TSO and TAO will determine the success of any all-island DBC incentive mechanism.

3. ALL-ISLAND DBC INCENTIVE PROPOSAL

Firstly, taking the points raised in section 2 into consideration, the RAs are asking stakeholders to comment on (among other things):

- the applicability of a potential all-island DBC incentive mechanism in the current industry structure;
- how such an incentive may be introduced;
- monitoring of DBC costs; and
- the design of and parameters/rewards/penalties of such a mechanism for the upcoming tariff year and indeed the years ahead.

Potential Incentive design

In this paper the RAs are consulting on whether to introduce an all-island DBC incentive mechanism for 1 October 2011 onwards. All responses will be fully considered before implementation of any mechanism. However, to promote debate the RAs could introduce a model similar to that employed in GB around National Grid for EirGrid and SONI, combined with a proposal to incentivise TSO forecasting.

Below is an example of potential targets, payments and penalties for the upcoming tariff period. These payments and penalties could be administered across both TSOs on a 75:25 split basis upon ex-post review. For example if the reward for the 2011/2012 period is €1 million then EirGrid will receive €750k, while SONI will receive €250k. Payments and penalties upon completion of the ex-post review could be fed through annual TUoS revenue allowances in ROI and NI.

It is important that any ex-post review would need to take into account any external factors which heavily influenced DBC outturn in the tariff period, e.g. unforeseen long-term outage of plant and other High-Impact Low-Probability events (HILPs) outside the control of the TSOs.

For example a potential mechanism could be for the baseline target to be adjusted ex-post to take account of actual changes in fuel prices which have had an impact, both up or down, of greater than or equal to say 5% of the baseline forecast. It could also look at HILP events which have an impact of greater than or equal to say \in 5m on DBC. The RAs would welcome comments from stakeholders on how such an ex-post review could be structured.

Figure 5: Potential DBC incentive mechanism

	Lower		Upper	Below	
€m's	Bound	Dead Band	Bound	Target	Above target
	10-20%	10% either	10-20%	TSO retains	TSO penalised
	below ex-	side of the ex-	above ex-	20% of	10% of every
Dispatch	ante	ante SEMC	ante	every 5%	5% above
Balancing	allowed	allowed	allowed	below	
Costs	amount	amount.	amount		

The incentive placed on the ex-ante SEMC allowed amount for DBC could be combined with an incentive on wind/demand forecasting, as discussed in section 2 above. Again, this would act in a complementary role to the proposal outlined in figure 3 and would incentivise the TSOs to not just focus on reducing DBC, but also improving its forecasting methodology. This will in turn, lead to a more accurate picture for the tariff year ahead and help limit the impact of K-Factor adjustments on the all-island customer.

The format of the proposed incentive in section 12.4 of the SONI Price Control 2010-2015 paper could be developed in discussion with the TSOs.

The RAs would welcome views from respondents on the mechanism outlined above (or indeed alternative mechanisms).

The SEM Committee considers that it is important that clarity around levels of DBC (both at a total level and a local/ regional level) is provided to market participants. This will allow participants to understand the drivers behind DBC, the impact that DBC has on all-island customers and the steps being taken by the TSOs to reduce DBC. Informative TSO seminars (similar to that held in EirGrid offices 26th May 2011) on DBC also help promote this.

In order to increase transparency around DBC, the SEM Committee proposes that the TSOs develop a report template for submission to the SEM Committee, which outlines a regular update on levels of constraints, drivers behind constraints, mitigating measures being taken and other information or commentary which the TSOs believe will aid transparency in this area. Following approval of this report template by the SEM Committee, the TSOs would be required to publish the report on a quarterly basis on their websites.

4. CONCLUSION & NEXT STEPS

Dispatch Balancing Costs are a significant charge passed on to the all-island customer every tariff year. In the previous tariff period (1 October 2009 to 30 September 2010) they represented nearly 5% of the entire value of the SEM.

The Imperfections Allowance for the upcoming tariff period 1 October 2011 to 30 September 2012 is expected to rise, mainly due to fuel costs increases over the last 12 months. As a result, the cost of constraining-on out-of-merit generation for reserve, transmission and/or system security constraints is greater.

A consultation paper on 2011/2012 DBC costs is to be published in the coming weeks.

In light of the points made in Section 2 above the RAs believe it prudent to consult on the incentivisation of the TSOs to manage all-island DBC from the period 1 October 2011 onwards.

Any potential incentive would need to take account of the current industry structure, the degree to which DBC are outside of the control of the TSOs and whether it can ultimately benefit the all-island customer.

The next steps are as follows:

- Responses to this consultation should be submitted to Jamie Burke (jburke@cer.ie) in CER and Billy Walker in UR (billy.walker@uregni.gov.uk) 5pm Friday 29 July 2011.
- SEMC decision paper on all-island DBC incentivisation programme published by mid September. The decision will be based on a review of the responses received and further consideration by the RAs to the applicability of such an incentive. If an incentive is introduced for the upcoming tariff period then parameters, payments and penalties will be published for view by stakeholders.