Single Electricity Market (SEM)

15-Minute Imbalance Settlement Period Exemption

Information Paper

SEM-21-015

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EXECUTIVE SUMMARY

The Guideline on Electricity Balancing (the EBGL Regulation) puts an obligation on all European Union Member States to implement a process of harmonisation whereby all Imbalance Settlement Periods (ISPs) will be set to 15 minutes by December 2020, 3 years after entry into force. The EBGL Regulation also allows the relevant regulatory authorities of a synchronous area to grant an exemption from this requirement where, at least every three years and in cooperation with ACER, a cost-benefit analysis (CBA) is undertaken concerning the harmonisation of the ISP.

Article 8 of Commission Regulation (EU) 2019/943 on the internal market for electricity (recast) (the "Clean Energy Package (CEP") Regulation) also requires a 15-minute ISP to be implemented in all areas by 1 January 2021 unless the RAs have granted a derogation or exemption.

In the all-island Single Electricity Market (SEM), the ISP is currently set at 30 minutes. Due to the extent of the potential changes involved, it was deemed unlikely that a 15-minute ISP could be implemented in the SEM by January 2021. As a result, the RAs' preferred position was to follow a process to provide an exemption from this requirement with the exemption being for a period of three years and based on a CBA carried out in cooperation with ACER.

This Information Paper details the results of the CBA that was undertaken as part of this process. With the final CBA results showing a significant net welfare cost to the SEM consumer, the RAs intend to issue an exemption from this requirement.

Although this is an Information Paper, any comments or views regarding the proposed exemption process and the CBA would be welcome and may be provided to Thomas Quinn (tquinn@cru.ie) or Ian McClelland (Ian.McClelland@uregni.gov.uk).

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1. INTRODUCTION

1.1 BACKGROUND

Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing (the EBGL Regulation)[1] puts an obligation on all European Union Member States to implement a process of harmonisation whereby all Imbalance Settlement Periods (ISPs) will be set to 15 minutes by December 2020, 3 years after entry into force. Article 2(10) of the EBGL Regulation defines an Imbalance Settlement Period as "*the time unit for which balance responsible parties' imbalance is calculated*".

Article 8 of Commission Regulation (EU) 2019/943 on the internal market for electricity (recast) (the "Clean Energy Package (CEP) Regulation")[2] also requires a 15-minute ISP to be implemented in all areas by 1 January 2021.

In the synchronous area of the all-island Single Electricity Market (SEM), the ISP is currently set at 30 minutes. In order to change to a 15-minute ISP, the Utility Regulator (UR) and the Commission for Regulation of Utilities (CRU), (the "RAs"), working in cooperation with the Transmission System Operators (TSOs) and the Market Operator (MO), believe that a number of practical considerations such as potential changes to metering and to the market systems would have to be addressed. Due to the extent of these changes, it was deemed unlikely that a 15-minute ISP could be implemented in the SEM by January 2021.

For those Member States that cannot meet the requirements to implement a 15-minute ISP, two mechanisms are available – a derogation or exemption. Any derogation granted by the RAs would allow the current 30-minute ISP to continue up until 1 January 2025 while any exemption would be based on the outcome of a cost-benefit analysis (CBA) that would be performed in cooperation with ACER at least every three years and would be initially applicable until the 1 January 2024.

The TSOs of a synchronous area may request an exemption or the RAs, at their own initiative, may grant an exemption. Exemptions granted by the relevant RAs of a synchronous area are for a period of three years and must be based on a CBA undertaken in cooperation with ACER. It is possible for Member States to have more than one exemption.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2195&from=EN
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943&from=EN

The original CBA that was used to support the chosen ISP of 15-minutes in the EBGL Regulation was completed by Frontier Economics[3] in 2016 on behalf of ENTSO-E. The results of the CBA indicated that a move to a 15-minute ISP would have a negative net welfare effect for Northern Ireland and Ireland under all scenarios presented. It is as a result of this analysis and predicted negative net welfare effect that the UR and the CRU consider it appropriate for an exemption to be sought, with this being re-visited every three years.

Using the 2016 CBA results as a starting point, an updated CBA model was developed with the assistance of external consultancy support. Cognisant of the significant changes to the structure of the all-island market with the advent of new market arrangements in October 2018, the original data inputs and assumptions were reviewed. A questionnaire was developed with this to be completed by industry.

The questionnaire was published on the SEM Committee's website on the 17 August 2020[4] and represented a critical step in the wider CBA process. The questionnaire was aimed at all stakeholders in order to capture a broad and accurate picture of the costs and benefits of changing from a 30-minute ISP to a 15-minute ISP. The compiled results were fed into the CBA model.

The results of the CBA process are detailed later in this Information Paper.

1.2 LEGISLATIVE BASIS

The development of this Information Paper is principally driven by the requirements in the EBGL Regulation and the CEP Regulation relating to the duration of an Imbalance Settlement Period.

Article 2 (8), (9) and (10) of the EBGL Regulation provide definitions which underpin the concept of an ISP.

(8) 'imbalance' means an energy volume calculated for a balance responsible party and representing the difference between the allocated volume attributed to that balance responsible party and the final position of that balance

[3] https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/Network%20codes%20documents/Implementation/CBA_ISP/ISP_CBA_Final_report_29-04-2016_v4.1.pdf
[4] https://www.semcommittee.com/news-centre/questionnaire-published-cba-imbalance-settlement-period

responsible party, including any imbalance adjustment applied to that balance responsible party, within a given imbalance settlement period;

(9) *'imbalance settlement' means a financial settlement mechanism for charging or paying balance responsible parties for their imbalances;*

(10) *'imbalance settlement period' means the time unit for which balance responsible parties' imbalance is calculated;*

In terms of the obligations under the EBGL Regulation to implement a 15-minute ISP, these are provided under Article 53.

1. *By three years after the entry into force of this Regulation, all TSOs shall apply the imbalance settlement period of 15 minutes in all scheduling areas while ensuring that all boundaries of market time unit shall coincide with boundaries of the imbalance settlement period.*

2. *The TSOs of a synchronous area may jointly request an exemption from the requirement laid down in paragraph 1.*

3. *Where the relevant regulatory authorities of a synchronous area grant an exemption from the requirement laid down in paragraph 1 upon a joint request of the TSOs in the concerned synchronous area or at their own initiative, they shall perform, in cooperation with the Agency and at least every three years, a cost-benefit analysis concerning the harmonisation of the imbalance settlement period within and between synchronous areas.*

The provision to derogate away from the requirements as laid out in Article 53 of the EBGL Regulation is provided by Article 62 (2) (d).

Article 62

1. *A regulatory authority in accordance with Article 37 of Directive 2009/72/EC may, at the request of a TSO or at its own initiative, grant the relevant TSOs a derogation from one or more provisions of this Regulation in accordance with paragraphs 2 to 12.*

2. *A TSO may request a derogation from the following requirements:*

......

(d) *the harmonisation of the imbalance settlement period in Article 53(1);*

Additional references are made to the 15-minute ISP requirement under Article 8 of the Clean Energy Package Regulation.

Article 8 (4) *By 1 January 2021, the imbalance settlement period shall be 15 minutes in all scheduling areas, unless regulatory authorities have granted a derogation or an exemption. Derogations may be granted only until 31 December 2024.*

From 1 January 2025, the imbalance settlement period shall not exceed 30 minutes where an exemption has been granted by all the regulatory authorities within a synchronous area.

1.3 PURPOSE OF THIS INFORMATION PAPER

Based on the results of the 2016 CBA completed by Frontier Economics on behalf of ENTSO-E which indicated that a move to a 15-minute ISP would have a negative net welfare effect for both Ireland and Northern Ireland, the RAs' preferred position is to seek an exemption from this requirement.

An updated CBA has been undertaken in an attempt to review and ascertain potential costs that might be incurred by industry through such an implementation versus the possible benefits. The results are intended to assist the RAs in determining whether an exemption is the most appropriate mechanism to pursue or whether alternative options should be explored.

The purpose of this document is to set out the findings of the CBA and to provide reasoning and evidence to support the approach adopted by the RAs. The following section provides an overview of the CBA and its accompanying questionnaire for industry before providing details of the outcomes and the RAs' final position.

Throughout this work, both the CRU and UR have cooperated with ACER as per the requirement under the EBGL Regulation.

2. COST-BENEFIT ANALYSIS (CBA)

Questionnaire

As part of the CBA, a questionnaire was developed with the aim of capturing a broad and accurate picture of the potential costs and benefits a change to a 15-minute ISP would have on stakeholders. The questionnaire comprised four worksheets.

- Worksheet 1 – “Cover”

  This consisted of a Cover sheet which provided details on the purpose of the questionnaire and its background, as well as how the required information should be completed.

- Worksheet 2 – “Respondent-ID”

  After asking respondents to provide details of their identity, this sheet asked for a breakdown of costs and benefits between particular business activities which fell under the one entity. For example, an allocation of costs and benefits between a respondent’s generation and supply businesses.

- Worksheet 3 – “Costs”

  This worksheet is where the majority of cost information was requested with respondents being asked to provide estimated costs for a number of different line items. These were categorised under the following headings:

  - Trading Systems / Platforms
  - Metering Systems and Meter Reading
  - Notification Systems
  - Scheduling Systems
  - Settlement Systems
  - Billing Systems
  - Other Costs

  These costs were to be split between the initial capital investment costs up to 2022 and the annual operational costs for the period 2023 to 2032. Where possible, three scenarios were sought covering lower, central and upper scenario expenditure. Respondents were only asked to provide estimated costs against those areas which were relevant to them and, importantly, which related only to any potential move to a 15-minute ISP, or in other words, only the incremental costs of a change to the ISP from 30 minutes to 15 minutes.

- Worksheet 4 – “Benefits”

  This worksheet was the section of the questionnaire where the majority of information on potential benefits was requested. Following a similar structure to Worksheet 4, this part asked respondents to provide details of estimated benefits for a number of different line items. These were categorised under the following headings:

    - Reduced Balancing Costs
    - Increased Liquidity in IDM and/or DAM
    - Improved Investment Outcomes
    - Improved Power Plant Dispatch
    - Frequency Results
    - Other Benefits
    - Other Non-Monetary Benefits

  In the questionnaire, 2022 is assumed to be the earliest implementation date for the establishment of a 15-minute ISP and the requested estimated benefits are to be submitted for 2022 and 2032. Again, low, central and high estimated benefit scenarios were requested.

As the SEM is a dual-currency market, the questionnaire facilitated the submission of relevant financial data in either Euro (€) or Sterling (£) with an appropriate exchange rate being utilised to allow for comparable data analysis.

A detailed guidance note[5] also accompanied the questionnaire and provided further information on its completion.

The final questionnaire was published on the SEM Committee website on the 17 August 2020 with respondents asked to have responses returned to the RAs by the 14 September 2020. Due to the extent and nature of the information being sought, several stakeholders asked if the deadline could be extended to allow them to acquire the necessary information. The RAs were keen to obtain as many high quality responses from industry as possible and it was agreed that for several stakeholders the deadline could be extended. This was caveated with

[5] https://www.semcommittee.com/sites/semc/files/media-files/SEM-20-054%20Guidance%20note%20for%20questionnaire_0.pdf

the fact that as the RAs were working to tight EBGL Regulation deadlines, no further extensions would be likely.

In total, the RAs received seventeen responses to the questionnaire with 12 submitting completed questionnaires and a further 5 making representations in a format other than the questionnaire. Respondents covered a broad section of industry including, amongst others, TSOs, Demand Side Operators (DSOs), Generators, Suppliers and Traders.

It should be noted that for the CBA itself, only completed questionnaires were used. While data provided by other means such as text responses were useful in terms of providing supplementary views, these were not included in the CBA model.

In addition to the cost and benefit data (provided via the questionnaires) being input into the CBA model, a range of historic market data was also utilised. This included Day Ahead Demand, Intraday Prices, Balancing Volumes and Balancing Prices. The granularity of the market data ranged from 30 minutes to 5 minutes and covered a period of twelve months (June 2019 to May 2020).

CBA elements

The analysis itself is made up of separate cost and benefit elements used to determine the final welfare benefit or cost. These elements are determined as follows:

Costs:

The total costs net welfare value is calculated using submitted cost data from the range of industry stakeholders who responded via the questionnaire. The questionnaire asked for estimated initial CAPEX (over the next two years) and annual OPEX for the period 2023 to 2032 for different line items (e.g. for trading systems/platforms, scheduling systems, and settlement systems etc.,) with completed questionnaires capturing the costs of stakeholders such as the MO, TSOs, DSOs, Generators and Suppliers. The submitted cost values were attributed to different business activities and the different respondents' costs weighted against their market share. These adjusted cost numbers were then summed to determine the total costs net welfare effect, providing a low, medium and high cost number.

Benefits:

The total benefits net welfare number in the CBA is comprised of a number of components. These include a benefit value for lower reserve capacity costs as well as increases in liquidity (bid-ask-spread reducing in the intraday market). The values for these two components were determined by Frontier Economics in 2016. The team used the same components in the 2020 assessment. A further component determined the net welfare effect of a shift in volumes from the balancing market to activity in the intraday market. Furthermore, the net welfare effect of a greater entry of BSPs into the intraday market was also established.

The reduction of the ISP duration to 15 minutes should enable participants to better predict the actual demand curve with this leading to less deviation between supply and demand and ultimately to a lower volume of energy managed through the balancing market. It is calculated as: V x P x Y.

V is the volume effect (volume shifted from balancing to intraday market).

P is price effect (average difference in price between intraday and balancing market)

Y is a scaling factor (reflecting high and low probability scenarios).

This produces a low, medium and high benefit number. The volume and price effects are determined using historic market data (day-ahead demand, intraday prices, balancing market prices and balancing market volumes) for a year (June 2019 to May 2020). The total benefits net welfare effect captures these key components and produces a low, medium and high benefit number.

CBA Outcomes

The final results of the cost benefit analysis will ultimately lead to one of two possible policy outcomes. The first possible outcome is the retention of the 30-minute ISP status quo through the granting of an exemption with this meaning that the SEM would not be required to make any changes; potential market-related benefits would not be realised; and consumers would pay no additional costs.

The second possible outcome is a move away from a 30-minute ISP and the implementation of a 15-minute ISP. This would require a number of changes across the SEM in order to facilitate the conversion, with such changes incurring costs but, at the same time, realising potential benefits for the consumer.

With the CBA having been completed, the following sections provide details of the likely costs of changing to a 15-minute ISP; the potential benefits of moving to a 15-minute ISP; and the net welfare of such a change.

Costs of Changing to a 15-minute ISP

The CBA showed that the largest potential costs incurred solely as a result of a change from a 30-minute ISP to a 15-minute ISP would fall under the categories of “Trading Systems/Platforms” and “Settlement Systems”. Here, in comparison to the other categories listed, costs were considerably higher across all three low, medium and high scenarios. While recognising that a change to a 15-minute ISP would undoubtedly incur some level of cost for the SEM, based on the information received, these two categories alone would incur the majority of expense. Costs for Trading System/Platforms ranged from €27 to €43 million (predominantly comprising initial capex outlays), while those for Settlement Systems ranged from €15 to €25 million (these included annual OPEX expenditure as well as initial capex outlays).

Significant costs were also shown to be incurred under the category of “Metering and Meter Reading”. These would likely be a product of some meters having to be re-programmed to facilitate the new granularity whilst others would have to be replaced. The RAs note that any potential change to a 15-minute ISP may not necessarily require a comprehensive replacement of the meters currently in use as a significant proportion may be changed via reprogramming. Further work in this area may be undertaken by the RAs in due course. A detailed impact assessment would be needed to accurately ascertain the full extent of these changes with costs resulting from any changes ultimately being met by consumers. Furthermore, the current roll-out of smart metering would also need to account for any change to a 15-minute ISP. This too could incur significant expenditure.

In summary, the CBA showed that the total costs likely to be incurred as a result of a change to a 15-minute ISP would be in the region of €68 - €115 million.

Benefits of Changing to a 15-minute ISP

In the questionnaire, respondents were asked to provide details of estimated benefits they might attain in 2022 (the assumed date that any change to a 15-minute ISP might be implemented) and in 2032. Based on the results of the CBA, any move from the current 30-minute ISP to a 15-minute ISP would likely result in some, albeit limited, benefits.

Of those benefits that may be realised, consideration was given to a potential shift in volume from the balancing market to the intraday markets. However, it appears that for the period examined (June 2019 to May 2020), the extent of financial benefits were minimal as average prices were generally higher in the intraday markets than the balancing market. While this difference in prices between the two markets has been a characteristic of the revised SEM arrangements to date, it does not necessarily suggest that such a differential will remain as the market matures and develops in line with future regulations, and in line with experience in other EU markets with similar or comparable ex-ante and balancing markets. With more volume already being traded through the intraday markets, any move between the intraday and balancing markets may be of less significance.

Of those respondents who completed the CBA questionnaire, none provided substantive data detailing potential benefits of a move to a 15-minute ISP. It was noted that in a centrally dispatched market such as the SEM where the TSOs dispatch in real-time, a shorter ISP had limited gains. This is due to the fact that the TSOs' systems already dispatch dispatchable units on a minute-by-minute basis which significantly reduces the unit's ability to cause imbalances on the system, compared with self-dispatch markets, which then lead to TSO costs for redispatch.

Benefits from lower reserve capacity costs and an increase in liquidity were also relatively low at €4 million and €7 million respectively.

The initial CBA outputs showed that the total potential benefits resulting from a change to a 15-minute ISP would be in the region of €7 - €10 million. These figures were extrapolated from the CBA calculations using average prices across the intraday and balancing markets. The RAs re-ran this calculation using volume weighted averages for the intraday 1 (IDA1) and balancing markets. The IDA1 was chosen to represent the wider intraday markets as it covers the same time period as the balancing market and is arguably more closely aligned to it.

This modification resulted in the average balancing market price being slightly lower than that used in the first assessment and the average intraday 1 price now being slightly higher than the original average intraday price (which include all three auctions). The modest change in pricing also impacted on the potential benefits of a move to a 15-minute ISP with these increasing to between €12 - €14 million. This was possibly a reflection of an enhanced saving should volume move from the balancing market to the intraday market(s).

<u>Net Welfare</u>

The CBA results have shown that the net welfare of moving to a 15-minute ISP would be an overall cost of between €61 and €105 million. If the benefits suggested by the volume weighted calculation are used instead, this is slightly reduced and would be an overall cost in the region of €56 and €101 million.

	Costs (€ million)	Average Prices		Volume Weighted Average Prices	
		Benefits (€ million)	Net Welfare (€ million)	Benefits (€ million)	Net Welfare (€ million)
Net Welfare Effects (Low)	-68	7	-61	12	-56
Net Welfare Effects (Medium)	-91	9	-82	13	-78
Net Welfare Effects (High)	-115	10	-105	14	-101

Regardless of the type of averaging used, both methods show a significant cost to the consumer and, at this time, the SEM RAs believe that the most pragmatic response is to grant an exemption.

<u>Other Non-Monetised Impacts and Responses</u>

Several respondents to the CBA submitted content which was not within the questionnaire format. While this information was not input into the CBA model, a variety of opinions and views are listed below.

- A number of respondents favoured the introduction of a 15-minute imbalance settlement period but believed that, at this moment in time, it was premature in light of the limitations of the current metering regimes.

- A number of respondents stated that implementing such a change may result in Ireland and Northern Ireland failing to implement other reforms due to limited skilled resources and a limited quantum of change over a given period of time that market systems and industry more generally can support. With the all-island market having evolved and being significantly transformed around two years ago, it was felt that market systems were still catching up with that transformation.

- The UK's exit from the EU was also mentioned along with potential impacts to market operations. Given the requirement for stability, a move to a 15-minute ISP was considered unwise.

- Referencing the previous CBA undertaken by Frontier Economics, one respondent noted that the total estimated benefits for the island of Ireland of circa €21 million were completely outweighed by estimated costs of circa €120 million – an adverse ratio of 6:1. The respondent stated they saw no significant change in benefits relative to costs estimated within the Frontier Economics 2016 report over the intervening period, such as might recover the skewed adverse position established at that time.
- One respondent queried why there is a necessity at this time to seek an exemption for this specific aspect of the EBGL as, post Brexit and until the SEM recouples to Euphemia when the Celtic interconnector is energised, Ireland had some lee way in complying with the EBGL.

3. CONCLUSION

In all three scenarios examined through the CBA (low, medium and high), the net welfare results show a significant cost to the consumer with these ranging from €61 to €105 million. These figures illustrate the disproportionate costs of a 15-minute ISP compared to the potential benefits.

Given the ratio and scale of the negative impact, the SEM RAs believe that harmonising the SEM's ISP to 15-minutes currently remains unfavourable and therefore, it is their intention to grant an exemption from this obligation. Although this exemption will be applicable for a period of three years, the RAs consider it important that industry is cognisant of potential, future trading arrangements with other EU countries which may be implemented once new interconnection is energised between the SEM and continental Europe. It is important that, where possible, new systems should be able to cope with both a 15-minute and a 30-minute ISP, noting that as of today, after 1 January 2025, the SEM will be the only market in the Internal Energy Market which may have a 30-minute ISP.

The SEM RAs recognise that even with the granting of this exemption, there will be a requirement to undertake a review and re-evaluation of the evidence in three years' time.

Although this is an Information Paper, any comments or views regarding the proposed exemption process and the CBA would be welcome and may be provided to Thomas Quinn (tquinn@cru.ie) or Ian McClelland (Ian.McClelland@uregni.gov.uk).

The RAs intend to issue a final decision by 22 March 2021.