

Recommendations on Procurement of Low Carbon Inertia Service (LCIS)

Contractual Arrangements

18 August 2023



Glossary of terms

Term	Definition
Connection Offer	means the offer letter issued to a Service Provider for a Connection Agreement
Connection Point	means the point where the LCIS Provider is connected to the Transmission System (110 kV or above)
ECP	means Enduring Connection Policy in Ireland (Enduring Connection Policy (eirgridgroup.com))
EDIL	means the TSOs' electronic dispatch instruction logger
LCIS	means Low Carbon Inertia Service, including provision of Synchronous Inertia, Reactive Power support and Short-Circuit contribution, to be procured and delivered as part of this proposed procurement exercise
LCIS providers	means the units delivering the LCIS
MVA.s	means mega Volt-Ampere second (unit for inertia)
RES	means Renewable Energy Sources
Scalar	means a multiplier which adjusts the payment for a System Service to reflect the characteristics of the service delivery
SNSP	means System Non-Synchronous Penetration. It is a real-time measure of the percentage of generation that comes from non-synchronous sources, such as wind, solar and HVDC interconnector imports, relative to the system demand

Table 1: Glossary of terms

Executive Summary

In the SEM-21-021 Decision on the System Services Future Arrangements, the SEM Committee (SEMC) requested that the TSOs carry out an evaluation and bring forward proposals for a fixed term procurement in relation to Low Carbon Inertia Services (LCIS).

The TSOs' subsequently consulted on proposals for LCIS volumes to be procured, technical requirements and aspects of the commercial and procurement arrangements with a SEMC decision on these arrangements following in January 2023 in SEM-23-002.

From 28 April to 09 June 2023, EirGrid and SONI consulted stakeholders¹ on the proposed contractual arrangements governing the provision of LCIS and a number of areas relating to the design of the LCIS procurement process. A consultation paper and the following accompanying documents were published for consultation:

- proposed template for the Low Carbon Inertia Service Agreement between EirGrid and a service provider in Ireland;
- proposed template for the Low Carbon Inertia Service Agreement between SONI and a service provider in Northern Ireland;
- proposed Low Carbon Inertia Service Protocol which specifies the compliance requirements which a LCIS service provider must satisfy as well as the performance monitoring procedures that will be applied; and
- AFRY Management Consulting report entitled 'Low Carbon Inertia Services (LCIS) - price cap and imbalance price proposals' dated April 2023.

The TSOs received 13 responses to this consultation. This recommendation paper summarises these responses and the TSOs' subsequent recommendations related to:

- changes to the LCIS Agreement and Protocol documents; and
- elements of the design of the LCIS procurement process.

This recommendations paper, amended LCIS Agreements, and LCIS Protocol documents were submitted to the SEMC for its consideration.

¹ <https://consult.eirgrid.ie/en/consultation/consultation-contractual-arrangements-procurement-low-carbon-inertia-service-lcis>
<https://consult.soni.ltd.uk/consultation/consultation-contractual-arrangements-procurement-low-carbon-inertia-service-lcis>

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1. Introduction and Background

1.1. Background

EirGrid and SONI are the Transmission System Operators (TSOs) in Ireland and Northern Ireland respectively. It is our job to manage the electricity supply and the flow of power from generators to consumers. Electricity is generated from gas, coal and renewable sources (such as wind, solar and hydro power) at sites across the island. The electricity is transported via the high voltage transmission network to high demand centres, such as cities, towns and industrial sites.

We have a responsibility to facilitate connections to the power system including increased levels of renewable sources to generate on the power system while continuing to ensure that the system operates securely and efficiently.

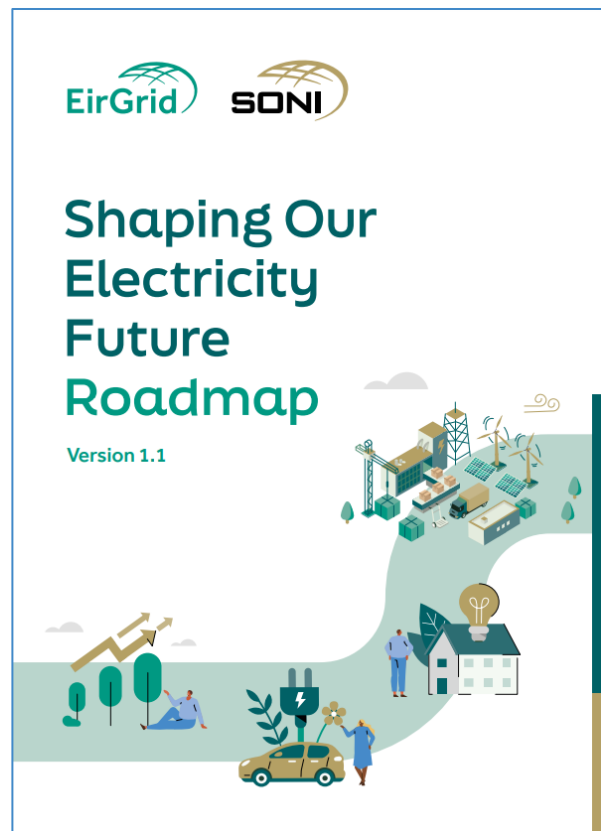
1.2. Shaping Our Electricity Future

In November 2021 we published the inaugural Shaping Our Electricity Future Roadmap² following consultation with stakeholders across society, government, industry, market participants and electricity consumers.

This Shaping Our Electricity Future (SOEF) Roadmap provided an outline of the key developments from a networks, engagement, operations and market perspective needed to support a secure transition to higher levels of renewables on the electricity grid (RES-E) by 2030. Inherent in this is a secure transition to 2030 whereby we continue to operate, develop and maintain a safe, secure, reliable, economical and efficient electricity transmission system.

In July 2023 we published an update to the SOEF Roadmap³ which builds on the original Roadmap launched in November 2021 and outlines a pathway towards meeting enhanced 2030 government electricity ambitions in Ireland and Northern Ireland.

A key action identified in the original and updated Roadmaps was the development of a process to procure Low Carbon Inertia Services (LCIS) that would support these RES-E objectives.



² https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping_Our_Electricity_Future_Roadmap.pdf
https://www.soni.ltd.uk/media/documents/Shaping_Our_Electricity_Future_Roadmap.pdf

³ https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping-Our-Electricity-Future-Roadmap_Version-1.1_07.23.pdf

https://www.soni.ltd.uk/media/documents/Shaping-Our-Electricity-Future-Roadmap_Version-1.1_07.23.pdf

1.3. LCIS Procurement

In the SEM-21-021 Decision on the System Services Future Arrangements⁴, the SEM Committee (SEMC) requested that the TSOs carry out an evaluation and bring forward proposals for a fixed term procurement in relation to LCIS. The motivation for this request is to support the integration of technologies which can facilitate a reduction in the quantity of carbon-intensive conventional generation required to run at any given time on the Ireland and Northern Ireland power systems. This reduction will facilitate the further integration of renewable generation and contribute towards achieving the 2030 Renewable Energy Source (RES) targets set in both Ireland and Northern Ireland.

1.4. Procurement Plan

In line with the SEMC request, EirGrid and SONI developed a project plan which will ultimately provide fixed term contracts for LCIS (including inertia, reactive power and short circuit contribution capability). The targeted date for completion of the procurement process and contract award is December 2023.

The overall procurement plan is set out in Table 1 below.

Description	Start Date	Finish Date
Detailed plan for the implementation of the project to be presented to the Industry (Completed)	Q4 2021	Q4 2021
Studies to identify the technical and locational requirements considering inertia, reactive power and short circuit level (Completed)	Q3 2021	May-22
Consultation, recommendation and SEMC decision on the procurement and requirements (Completed)	Jun-22	Jan-23
Consultation, recommendation and SEMC decision on the contractual arrangements (Ongoing)	Apr-23	Aug-23
Procurement - Pre-Qualification Questionnaire (PQQ) (Closing date of 18 August in Ireland and 22 August in Northern Ireland)	Jul-23	Aug-23
Procurement - Request for Proposal (RfP)	Sep-23	Nov-23
Award of contracts	Dec-23	Dec-23

Table 1: Overall procurement process timeline

To assist in the timely delivery of this plan, EirGrid and SONI published Pre-Qualification Questionnaires (PQQs), for Ireland on 17 July 2023⁵ and for Northern Ireland on 20 July 2023⁶, to invite qualification applications from interested parties for the provision of a LCIS.

The objective of these PQQ processes is to produce short-lists of suitably qualified Candidates who we intend to invite to tender for the provision of LCIS later in 2023.

⁴ [SEM-21-021 System Services Future Arrangements - Decision Paper 1 | SEM Committee](#)

⁵ [Link to PQQ for Ireland](#)

⁶ PQQ for Northern Ireland can be found on www.mytenders.co.uk (Mytenders ref: JUL166798)

EirGrid and SONI are of the view that the timeline presented in Table 1 can be achieved assuming that there is no material delay to the finalisation and approval of the contractual arrangements that are required to enable commencement of the tender (RfP) process.

Based on the plan presented in Table 1, the decision made in SEM-23-002 and the recommendations made in this paper, timelines/milestones post award of contract are expected to be as follows (subject to SEMC approval):

- In Ireland, commencement of the transmission connection offer process for LCIS devices, where a Connection Agreement is not in place (outside of the standard ECP process) in Q1 2024 (subject to CRU direction)⁷;
- The earliest LCIS Go-Live Date shall be the 1st of October 2024;
- The LCIS Target Go-Live Date shall be end of Q2 2027 (42 months after contract execution);
- All LCIS contracts shall end in Q2 2033 (6 years after Target Go-Live Date).

1.5. Previous Consultation on Technical Requirements and Procurement Approach

From 23 June 2022 to 12 August 2022, EirGrid and SONI consulted stakeholders⁸ on the requirements and a range of design elements underpinning the LCIS procurement process.

On 14 November 2022, a recommendations paper was submitted to the Regulatory Authorities and the SEMC Decision (SEM-23-002) was taken on 11 January 2023⁹.

Figure 1 summarises our 2026 LCIS requirement for Northern Ireland and Ireland as well as the incentivised zones recommended by the TSOs and approved by the SEMC.

⁷ In Northern Ireland, the standard connection offer process arrangements will apply as decided in SEM-23-002.

⁸ <https://consult.eirgrid.ie/consultation/consultation-low-carbon-inertia-service-lcis-competitive-procurement>
<https://consult.soni.ltd.uk/consultation/consultation-low-carbon-inertia-service-lcis-competitive-procurement-0>

⁹ <https://www.semcommittee.com/publications/sem-23-002-procurement-low-carbon-inertia-services-decision-paper>

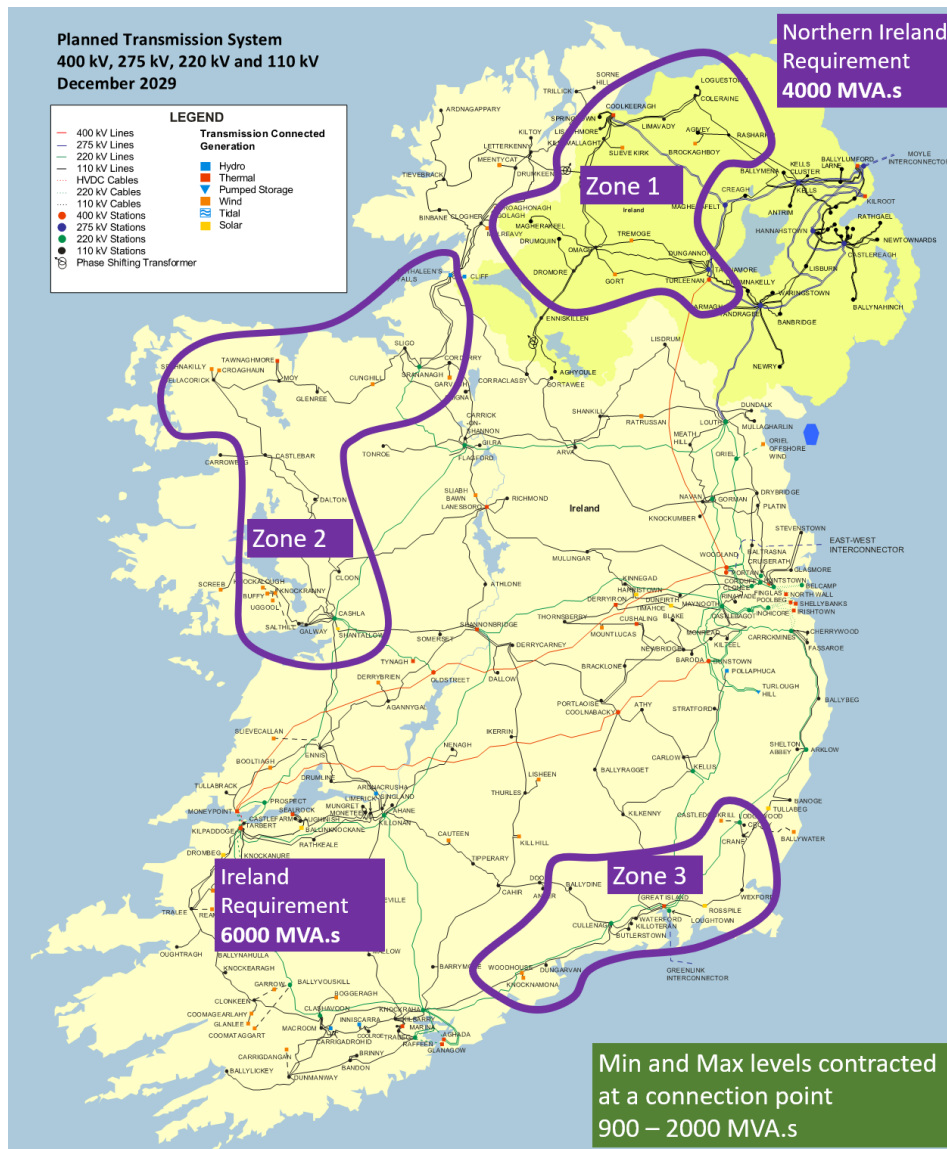


Figure 1: Zones incentivised and requirements (in MVA.s)

1.6. Consultation on Contractual Arrangements

The purpose of our consultation on the contractual arrangements for LCIS was to seek industry views on:

- the LCIS Agreement for the provision of LCIS;
- the LCIS Protocol which sets out the operational requirements and performance monitoring procedures, including the calculation of performance scalars;
- the price cap to be applied in the LCIS procurement process;
- a number of other items on the locational criteria, imbalance price to be used in the evaluation of losses, and contract execution deadline.

This consultation ran from 28 April 2023 to 9 June 2023.

1.7. Structure of this Paper

This recommendations paper is structured as follows:

- Section 2 provides a list of respondents to the consultation;
- Section 3 provides an overview of the TSOs' recommendations;
- Section 4 provides an overview of responses and recommendations related to the LCIS Agreement;
- Section 5 provides an overview of responses and recommendations related to the LCIS Protocol;
- Section 6 provides an overview of responses and recommendations related to the LCIS Procurement Design;
- Section 7 summarises next steps.

2. Respondents to the Consultation

The consultation on the LCIS Contractual Arrangements closed on 9 June 2023. In total, 13 responses were received (11 responses via the EirGrid portal and 2 responses via the SONI portal). The 10 non-confidential respondents are listed below:

- Irish Energy Storage Association (IESA)
- SSE
- Orsted
- ESB Generation and Trading
- Bord na Móna
- Wind Energy Ireland (WEI), Energy Storage Ireland (ESI) and RenewableNI (RNI)
- Energia
- Lumcloon Energy Ltd
- Electricity Association of Ireland
- Noriker

Note that all non-confidential responses have been published on the EirGrid consultation portal¹⁰. The 2 responses received on the SONI consultation portal¹¹ are confidential and therefore not published.

¹⁰ <https://consult.eirgrid.ie/node/2837/submissions>

¹¹ <https://consult.soni.ltd.uk/node/413/submissions>

3. Overview of TSOs' recommendations

The following table provides an overview of the key recommendations which are contained within this recommendations paper.

Section	Subject	TSOs' Recommendations	Impact
4.1.4	Target Go-Live Date/ Longstop date	<p>In order to address the timeline risk, we propose an extension of the maximum period between the LCIS contract Effective Date and Target Go-Live Date from 33 months to 42 months.</p> <p>We also recommend the introduction of a Service Provision Longstop Date in the LCIS Agreement which is defined as the date falling 12 months after the Target Go-Live Date.</p>	Agreements have been changed accordingly
4.2.4	Prohibition/ participation in other system services arrangements	<p>Parties to a LCIS Agreement will be prohibited from the provision of other related System Services (i.e. Synchronous Inertial Response and Steady State Reactive Power) as these services overlap with the LCIS service procured which bundles the provision of Synchronous Inertia, Reactive Power support and Short-Circuit Contribution.</p> <p>We recommend in clause 2.8 in the LCIS Agreement to address the potential participation of LCIS providers in future System Services arrangements as required by SEMC Decision SEM-23-002 and the potential associated costs for participating in these arrangements.</p>	Agreements (clause 2.8) have been changed to include that Service Provider costs for participating in future System Services arrangements shall be considered by the Regulatory Authority.
4.3.4	Grid Code compliance	<p>We recommend maintaining clauses 3.2.2 and 3.2.3 in the LCIS Agreement on Grid Code compliance as Grid Code modifications, in the respective Grid Codes, for LCIS devices may not be fully implemented by the contract execution date. In this event, appropriate Grid Code standards for Generating Units will be deemed applicable to LCIS units.</p> <p>We note the suggestions regarding provision of additional technical information to assist developers and we will explore the feasibility of developing this within the timeframe of the LCIS procurement process.</p>	<p>No changes made to the Agreements.</p> <p>Publication of further technical information under consideration by the TSOs.</p>
4.4.3	Shortfall charge	We recommend the introduction of a 95% threshold on the application of the Shortfall Charge.	Agreements (clause 3.6) have been changed to include a 95%

			threshold for application of Shortfall Charges.
4.5.3	Performance Security arrangements	<p>The possibility for the Company [i.e. the TSO] to drawdown in the event a reporting milestone is not achieved is removed (original clause 4.1.5(b)).</p> <p>In addition, the Company shall have the possibility to drawdown only up to 25% for any major milestone not achieved (clause 4.1.6).</p>	Agreements have been changed accordingly.
5.7	Scalars and LCIS protocol	<p>The impact of the Synchronisation Performance Scalar is reduced by the replacement of the term <i>Number of Instructions of u_i</i> by the maximum of the number instructions and 3 (i.e. <i>Max(Number of Instructions of u_i, 3)</i>). This will ensure that, in a month with a low number of dispatch instructions and one failure to Follow Notice to Synchronise, the scalar won't be set to a markedly low value.</p> <p>The Trip Charge Rate is reduced from €45/MVA.s / £39.82/MVA.s to €15/MVA.s / £13.27/MVA.s.</p> <p>The last paragraph of the Reactive Power Product Scalar section has been removed.</p>	The Protocol has been changed accordingly.
6.1.4	Planning application	<p>The planning reference number and a plan of the facility at least up to the connection point will need to be provided by the tenderer at RfP stage.</p> <p>The TSOs' evaluation team will check that planning is granted (with or without conditions)</p> <p>Additionally, prior to commencement of the RfP process, a desktop assessment of the potential connection method will be offered to prequalified developers in Ireland¹².</p>	Desktop assessment of connection arrangements to be offered to developers in Ireland.
6.2.4	Locational Quantity Criteria	<p>We recommend that both Locational Quantity Criteria shall be retained:</p> <ol style="list-style-type: none"> 1. The limit of 2000 MVA.s of LCIS capability at a transmission station will include any contribution from LCIS devices connected from 'tail-fed' transmission stations 2. A minimum of 900 MVA.s of LCIS service will be procured in each of the three incentivised zones, where offered. 	No changes
6.3.4	Price cap	As described in the consultation, a price cap will be used in the LCIS tender evaluation process that will limit payment rates including the Product Scalars and Locational Scalar. Tenderers should account for	No changes

¹² In Northern Ireland, the developers have the possibility to apply and receive a connection offer at any time in 90 days.

		<p>the impact of scalars in determining their LCIS bid price. Bids that result in payment rates above the price cap will be rejected.</p> <p>The price cap will be €2.02/MVA.s per hour in Ireland and £1.79/MVA.s per hour in Northern Ireland.</p>	
6.4.4	Imbalance price for the evaluation	<p>The proposed imbalance prices for the evaluation of LCIS providers of €97/MWh in Ireland and £85.8/MWh in Northern Ireland shall be retained.</p> <p>The proposed imbalance price will only be used for the purposes of the tender evaluation to account for the relative efficiency of the offered LCIS devices.</p>	No changes
6.5.4	Procurement Process and Contract Execution	<p>Preferred bidders must sign the LCIS Agreement 20 business days after TSOs' notification of preferred bidder status.</p> <p>In Ireland, once the contract is signed, providers will be eligible to enter the grid connection offer process outside of the ECP process by direction from CRU¹³.</p> <p>Multiple, mutually exclusive bids will not be permitted in the LCIS procurement process.</p>	No changes

¹³ In Northern Ireland, the standard connection offer process arrangements will apply as decided in SEM-23-002.

4. LCIS Agreement

This section of the recommendations paper summarises the consultation responses received on the Ireland and Northern Ireland versions of the LCIS Agreements and the TSOs' responses. Updated versions (including tracked changes) of the LCIS Agreements have subsequently been developed and accompany this recommendation paper.

4.1. Term of Agreement (Clause 2.1 of LCIS Agreement)

4.1.1. Consultation proposal

In our consultation paper, we outlined the proposal below regarding the Target Go-Live date:

TSOs' Proposal:

Extension of period between LCIS contract Effective Date and Target Go-Live Date:

We are proposing to extend the maximum period between the LCIS contract Effective Date and Target Go-Live Date from 33 months to 36 months. This will allow some additional time for project procurement and delivery given general pressures on supply chains. This extension does not prohibit projects connecting earlier and taking advantage of longer contract duration periods. This change will be subject to SEMC approval as the 33 months period was previously approved in SEMC Decision SEM-23-002.

The following question was asked:

Question 1: Do you have any comments on the extension of the period between LCIS contract Effective Date and the Target Go-Live Date from 33 months to 36 months?

4.1.2. Summary of consultation responses

Extension of the Target Go-Live Date

Most respondents welcome the extension proposed from 33 to 36 months. However, a number of respondents believe that it is still a very challenging timeline for service delivery given the timeline for the delivery of long lead items from equipment manufacturers and also raise concerns on meeting contract timelines due to the effect of potential grid delivery delays.

Two respondents have concerns about the strict cut-off after the 36 months. One respondent suggests the submission of a 'cure plan' for projects that overrun the 36 months, examined by a recognised independent technical adviser, and acceptable by TSOs, where an extension of up to 1 year may be agreed while the other respondent suggests having a longstop mechanism like the Capacity Market auction.

Contract duration

A number of respondents commented on the contract duration and have highlighted that a 6-year contract period is unnecessarily short given the magnitude of investment and/or the level of risks put on developers.

One respondent notes that "The contract mentions that two extensions of up to 18 months might become available if both parties agree. It's unclear, however, when such an extension might be agreed". This respondent suggests that it would be beneficial to the TSO and bidders if the contract is extended by 18 months resulting in a 7.5 year term contract.

4.1.3. TSOs' response

We note that most respondents welcomed the proposed extension of the period between the LCIS contract Effective Date and Target Go-Live Date from 33 months to 36 months.

We also note the general view that the timeline risk is still high for service providers given the uncertainty around transmission connection timelines, supply chain pressures coupled with the proposed 6-year contract duration.

The proposed 6-year duration for the contract was consulted on previously, recommended by the TSOs and approved in SEM Committee decision SEM-23-002.

In order to address the highlighted timeline risk, we propose a modification to our previous proposal on the extension of the period between LCIS contract Effective Date and Target Go-Live Date. Rather than a 3 month extension we now recommend a 9 month extension. This would result in the Target Go-Live Date being 42 months after the LCIS contract Effective Date. This would allow additional time for project delivery while not prohibiting projects connecting earlier and taking advantage of longer contract duration periods.

We also propose amending the ability of the TSOs to terminate the LCIS Agreement in the event that the service provider does not meet the Target Go-Live Date. In a proposed amendment to the LCIS Agreement, we now propose that the LCIS Agreement could only be terminated after a Service Provision Longstop Date which would occur 12 months after the Target Go-Live Date.

Consequently, we also propose to amend clause 4.2 allowing the Target Go-Live Date and the Service Provision Longstop Date to be adjusted when there is:

- a delay in the Transmission System Operator connecting the Providing Unit to the Transmission System by the Target Connection Date;
- a Force Majeure event.

Note, however, that the Target Connection Date may be later than the Target Go-Live Date. In such a case the contract duration will effectively be less than 6 years. See examples in the table below.

Scenario	Target Go-Live Date / +6 year End Date	Target Connection Date	Actual Connection Date	Contractual Outcome
Connection before Target Go-live date	June 2027 / June 2033	June 2026	June 2026	Contract commences at Go-Live Date post June 2026 and runs to June 2033.
Connection before Target Go-live date with subsequent connection delay	June 2027 / June 2033	June 2026	June 2027	Contract commences at Go-Live Date post June 2027 and runs to June 2034. Contract end date is extended due to the delay in provision of the connection.
Connection after Go-Live date	June 2027 / June 2033	June 2028	June 2028	Contract commences at Go-Live Date post June 2028 and runs to June 2033.

Connection after Go-Live date with subsequent connection delay	June 2027 / June 2033	June 2028	June 2029	Contract commences at Go-Live Date post June 2029 and runs to June 2034 Contract end date is extended due to the delay in provision of the connection.
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Notes:

1. The dates provided in these examples are for illustration purposes only.
2. The Target Go-Live Date will be set at 42 months after contract execution (as proposed by the TSOs in this recommendations paper). All contracts are expected to have the same Target Go-Live Date. All contracts will terminate 6 years after this date except in the case that there is a delay in the provision of the connection relative to that specified in the Connection Offer.
3. The Target Connection Date will be based on the connection lead times set out in the Connection Offer.
4. The Actual Connection Date will be the date that the actual connection is delivered.
5. The Go-Live date will be after connection once testing is completed.

To assist developers in their assessment of their connection to the transmission system, EirGrid proposes offering developers in Ireland a desktop assessment of their potential connection method as proposed in section 6.1.3.

We recommend these two measures to reduce the level of risk raised by respondents.

4.1.4. TSOs' recommendation

TSOs' Recommendation:

Extend the period between the LCIS contract Effective Date and Target Go-Live Date from 33 months to 42 months.

Introduce a Service Provision Longstop Date in the LCIS Agreement which is defined as the date falling 12 months after the Target Go-Live Date.

4.2. Prohibition/Participation in other System Services arrangements (Clauses 2.7 and 2.8 of LCIS Agreement)

4.2.1. Consultation proposal

In our consultation paper, we outlined the proposal below regarding the prohibition/participation in other system services arrangements:

TSOs' Proposal:

Clauses regarding other system services arrangements:

We are proposing in clause 2.7 of the LCIS Agreement that parties to the LCIS Agreement will be prohibited from the provision of other related System Services (i.e. Synchronous Inertial Response and Steady State Reactive Power) as these services overlap with the LCIS service procured which bundles the provision of Synchronous Inertia, Reactive Power support and Short-Circuit Contribution.

We are also proposing clause 2.8 in the LCIS Agreement to address the potential participation of LCIS providers in future System Services arrangements as required by SEMC Decision SEM-23-002.

The following question was asked:

Question 2: Do you have any comments on the clauses introduced regarding prohibition/participation in other System Services arrangements?

4.2.2. Summary of consultation responses

Prohibition on the provision of Related System Services (Clause 2.7)

There are varying opinions on clause 2.7.

Three respondents are not in favour of this clause. One respondent feels like they should not be prohibited if they want to participate, one believes that they should be allowed to participate in multiple and parallel markets while another one believes that no freeriding should occur and where the excess capability of any LCIS service provider is relied upon within the TSO's scheduling and dispatch procedures, this capability should be remunerated during the relevant periods through the DS3 framework initially and later the SSFA.

One respondent seeks clarity on why the Service Provider is prohibited.

Three respondents have no objections to this clause while one respondent supports the principle that units cannot avail themselves of two separate contracts for the same service simultaneously. One respondent also thinks that a DS3 contract should be terminated at the Effective Date of the LCIS contract and not the Go-Live Date and proposes to amend clause 2.7.2 accordingly.

Participation in the Future Arrangements for System Services (Clause 2.8)

One respondent supported participation in the future arrangements to promote competition, efficiency and transparency while most of the other respondents raise concerns on the implications of this section and open-ended risks given the lack of clarity on what is expected.

One respondent would like to understand that the participation would be subject to the technical capabilities of the facility and several respondents suggest that LCIS revenues should be secured and/or any costs placed on LCIS holders should be recoverable. One respondent suggests that they should be recoverable by the FASS mechanism.

4.2.3. TSOs' response

Prohibition on the provision of Related System Services (Clause 2.7)

As highlighted in our consultation paper, the Synchronous Inertial Response (SIR) and Steady State Reactive Power (SSRP) services overlap with the LCIS service procured which bundles the provision of Synchronous Inertia, Reactive Power support and Short-circuit contribution.

Having clearly indicated our requirements for the volume and characteristics of the LCIS service we require, we remain of the view that there should not be a parallel mechanism for contracting for equivalent services from service providers contracted under this LCIS process.

Participation in the Future Arrangements for System Services (Clause 2.8)

SEMC Decision SEM-23-002 stated that ‘When developing the contractual arrangements, the TSOs should include a requirement that providers bid into available competitive system services markets on the basis of cost-based bids.’

To reflect this requirement, clause 2.8 of the Agreement states that ‘During the term of the Agreement, the Service Provider acknowledges that it may be required to participate in future System Services arrangements as may be directed by the Regulatory Authority.’

We recognise that participation in future System Services arrangements may incur costs for the LCIS Service Providers and propose to amend clause 2.8 as follows:

‘During the term of the Agreement, the Service Provider acknowledges that it may be required to participate in future System Services arrangements as may be directed by the Regulatory Authority. In any potential requirement to participate in future System Services arrangements, the Regulatory Authority shall consider associated Service Provider costs for participating in these arrangements.’

4.2.4. TSOs’ recommendation

TSOs’ Recommendation:

We recommend in clause 2.7 of the LCIS Agreement that parties to the LCIS Agreement will be prohibited from the provision of other related System Services (i.e. Synchronous Inertial Response and Steady State Reactive Power) as these services overlap with the LCIS service procured which bundles the provision of Synchronous Inertia, Reactive Power support and Short-Circuit Contribution.

We recommend in clause 2.8 in the LCIS Agreement to address the potential participation of LCIS providers in future System Services arrangements as required by SEMC Decision SEM-23-002 and the potential associated Service Provider costs for participating in these arrangements.

4.3. Compliance with Grid Code

4.3.1. Consultation proposal

In our consultation paper, we outlined the proposal below regarding the compliance with the Grid Code:

TSOs’ Proposal:

Clause regarding Grid Code compliance:

We are proposing clauses 3.2.2 and 3.2.3 in the LCIS Agreement on Grid Code compliance as the Grid Code modifications for LCIS devices might not be fully implemented by the contract execution date. In this event, appropriate Grid Code standards for Generating Units will be deemed applicable to LCIS units.

The following question was asked:

Question 3: Do you have any comments on the clauses regarding Grid Code compliance?

4.3.2. Summary of consultation responses

Most of the respondents raise concerns that the non-implementation of the Grid Code requirements for LCIS units creates a risk for service providers. One respondent believes that TSOs should clarify the requirements in advance of bid submission while another respondent raises the importance of the Grid Code modifications for LCIS devices being in place by the contract execution date.

Three respondents also propose that the TSOs publish the provisional signal lists and test procedures which would help developers to clearly understand the Grid Code requirements.

Finally, in the event the Grid Code would impact the project, one respondent requests to not be penalised and one respondent asks if derogations will be used.

4.3.3. TSOs' response

We published a Grid Code Implementation Note for Synchronous Condensers in October 2022¹⁴ and sought industry feedback on applicable requirements. A further call for industry feedback was also made in July 2023. This Implementation Note is aimed at offering guidance to those planning to connect Synchronous Condenser Units to the transmission system. Following review of any feedback, this Implementation Note will proceed to the development of Grid Code modifications which will be brought to the respective SONI and EirGrid Grid Code Review Panels for review. Grid Code changes will ultimately be approved by the respective Regulatory Authority.

Our LCIS requirements consultation, and subsequent SEMC decision, also set out minimum technical requirements for the key characteristics of the LCIS devices we require.

We are of the view that these documents provide clear guidance regarding the main technical requirements for LCIS. We do not propose delaying the LCIS procurement process until the Grid Code modifications are implemented as this could add delays to the overall delivery timeframe of LCIS.

We note the suggestions regarding provision of additional technical information to assist developers and we will explore the feasibility of developing this within the timeframe of the LCIS procurement process.

4.3.4. TSOs' recommendations

TSOs' Recommendation:

We recommend maintaining clauses 3.2.2 and 3.2.3 in the LCIS Agreement on Grid Code compliance as the Grid Code modifications for LCIS devices may not be implemented by the contract execution date. In this event, appropriate Grid Code standards for Generating Units will be deemed applicable to LCIS units.

4.4. Shortfall Charge (Section 3.6)

A Shortfall Charge has been included in the LCIS Agreement and commented on by the respondents in response to the question:

Question 5: Do you have any comments on the remaining content of the main body of the LCIS Agreement?

¹⁴ [Synchronous-Condenser-Implementation-Note.pdf \(eirgridgroup.com\)](#)

[Synchronous-Condenser-Implementation-Note.pdf \(soni.ltd.uk\)](#)

4.4.1. Summary of consultation responses

Three respondents found the Shortfall Charge level to be excessive, and the application potentially too punitive. The main proposal among several respondents was to introduce a +-5% tolerance band around the Contracted Maximum Available Volume before any Shortfall Charge would be applied.

A respondent sought clarity on how the Shortfall Charge level has been determined.

One respondent suggests the Shortfall Charge should be capped, where the cap is informed by the level of the performance bond.

4.4.2. TSOs' response

The Shortfall Charge of €106,000 per MVA.s or £94,000 per MVA.s short has been determined based on the price cap over a 6 year period. This reflects the potential cost of procuring additional MVA.s to make up the shortfall.

The TSOs' view is that it is important that parties contracted to provide a specified volume of LCIS deliver this volume. However, in recognition of the concerns raised over the level and application of this charge, we now propose setting a 95% threshold on the application of the Shortfall Charge, i.e. that the Shortfall Charge would not apply if the installed capability is at or above 95% of the originally contracted volume.

4.4.3. TSO's recommendation

TSOs' Recommendation:

We recommend the introduction of a 95% threshold on the application of the Shortfall Charge as set out in the proposed amendments to clause 3.6 of the Agreement.

4.5. Performance Security (Section 4.1)

Section 4 of the LCIS Agreement provides the performance security arrangements. The following question was asked:

Question 4: Do you have any comments on the proposed Performance Security section?

4.5.1. Summary of consultation responses

Seven respondents believe that the performance security provisions are too penal and raise open-ended risks on developers. Most of these respondents suggest that a demand for payment under the Performance bond should only be allowable when a major milestone has not been achieved as the failure to achieve an intervening milestone may not be fatal for the project. There is a view that treating reporting milestones in the same way as major milestones is disproportionate.

One respondent is unclear on the necessity for these clauses as developers will have suitable security and insurance via their OEM arrangements to support issues such as force majeure related impacts and believe that it is inappropriate for the TSO to risk duplicating security requirements on these areas.

Other comments have been made regarding the performance bond and are addressed in section 5.6.

4.5.2. TSOs' response

Performance Security is required to make sure that contracted parties will commit and deliver the services. The TSOs do not believe that Performance Security is a duplication or related to other security or insurance that OEMs can provide.

However, given the consensus amongst respondents on the severity of these provisions, we propose to amend clause 4.1.5 to give the ability to the Company (i.e. the TSO) to drawdown only up to 25% of the bond for any single major milestone not achieved. In addition, we propose removing the ability for the Company to drawdown the bond for any reporting milestone not achieved and therefore propose to delete the original clause 4.1.5.b.

4.5.3. TSOs' recommendation

TSOs' Recommendation:

The possibility for the Company to drawdown in the event a reporting milestone is not achieved is removed (original clause 4.1.5(b)). In addition, the Company shall have the possibility to drawdown only up to 25% for any major milestone not achieved (clause 4.1.6).

4.6. Other Clauses and Schedules

Other responses have been provided in response to the following questions:

Question 5: Do you have any comments on the remaining content of the main body of the LCIS Agreement?

Question 6: Do you have any comments with respect to the content of the Schedules of the LCIS Agreement?

The table below summarises all the other consultation responses as well as the TSOs' responses.

Clause / Schedule	Theme	Consultation responses	TSOs responses
2.3.3	Planning	<p>1 respondent noted that planning is required prior to the Effective Date which is redundant as it is a pre-requisite at tender stage.</p> <p>1 respondent asked for clarity.</p>	<p>We confirm that planning consent is a pre-requisite at tender stage and are of the view that the requirement for planning consent should also be reflected in the LCIS Agreement.</p>
2.4.1	No exclusivity	<p>1 respondent sought clarity on the intention of the exclusivity clause as it is currently unclear what the impacts of it are on either the Service Provider or the Company.</p>	<p>The intention of this clause is for the Service Provider to acknowledge and agree that the Company has the right to use a different entity for any Service and does not necessarily have to use a particular Service Provider.</p>
2.6.1	Provision of the Service	<p>1 respondent suggested that the term “immediate provision” in the clause is ambiguous and should be clarified.</p>	<p>We propose to amend this clause in the LCIS Agreement so that instead of it stating that the Company may require the “immediate provision” of the required Service it states that it may require the provision of the required Service “without delay”.</p>
2.8.1	Participation in FASS	<p>1 respondent asked if participation in FASS includes batteries</p>	<p>Only technologies that can meet LCIS requirements and that are awarded a LCIS contract are subject to this clause.</p>
2.8.1	Participation in FASS	<p>1 respondent requested that the TSOs propose options for what happens after the 6-year contract. Otherwise, the TSO should provide the option to the provider to decide what happens after the 6-year contract.</p>	<p>The LCIS Agreement only covers the defined period of the LCIS Agreement.</p>
3.4.2	Provision and Purchase of the Service	<p>1 respondent requested clarity on whether there will be a requirement on the Service Provider to provide Commercial Offer Data.</p>	<p>There will be a requirement to comply with Trading and Settlement Code obligations in as far as they relate to the provision of this service.</p> <p>We do not envisage a requirement for provision of Commercial Offer Data other than that which might be necessary to meet data validation requirements. These requirements will be clarified in a future implementation note.</p>
4.2.1	Performance Security	<p>2 respondents suggested that “material delay” is not clearly defined and the reference to “material” should be either defined or removed.</p>	<p>We propose to amend this clause in the LCIS Agreement so that “material” is deleted.</p>

4.2.2	Performance Security	1 respondent requested confirmation that this section is applicable during the commercial term of the agreement after the Providing Unit has been commissioned and is delivering the contracted service.	We propose to amend this clause in the LCIS Agreement to clarify that this clause is only applicable before the Go-Live Date.
4.4 / Schedule 8	Performance Security	1 respondent proposes that a developer should be able to replace a Parent Company Guarantee (PCG) with Letter of Credit/bond in the event that an LCIS contract holder had to leave a corporate group. The respondent also asks for clarity as to whether the Service Provider's own form of PCG would be acceptable, or whether the TSO has a list of required elements to be contained within a PCG that it can share.	If a successful tenderer wishes to use a PCG, we will consider it at a later stage as the Company has discretion to deem appropriate other forms of security other than a Performance Bond. We propose to amend clause 4.3 of the LCIS Agreement slightly to give the Company more flexibility to consider other security arrangements.
5.3	Billing and Payment	1 respondent is unclear on the other agreements that could be included and requested clarity on this.	The purpose of this clause is to give us flexibility in term of settlement in the case a Providing Unit would hold multiple contracts. According to section 2.8, the Providing Unit might be required to participate in FASS.
6.3	Monitoring and metering	1 respondent requested confirmation that payment for LCIS services will not be affected by EirGrid-planned outages of the network.	As set out in the SEM-23-002, the same Grid Code Outturn Availability arrangements applicable to conventional generation will apply to LCIS providers. If the Connection Agreement identifies particular scenarios where the synchronisation of the LCIS unit is restricted, the LCIS provider shall be considered unavailable when the restriction is active.
7.1.2 & 7.1.3	Assignment	1 respondent believes that the Service Provider should be allowed to assign to an affiliate without requiring the consent of the Company.	We would always want to have to provide our consent before any assignment takes place.
7.2	Assignment	1 respondent believes that the Company's ability to assign or novate should be restricted to assignees of at least equal credit strength as the Company.	We need to be able to freely assign or novate agreements noting that such assignment would in turn be cognisant of and subject to the respective licencing arrangements.
9	Termination	1 respondent flags that the provisions are disproportionate given "unrealistic" timescales and insufficient uncertainty at this stage for developers.	We recommend different options through this recommendations paper to de-risk the projects, including proposals on the Target Go-Live date, a longstop date and reducing the impact of the performance scalars.

9.2.5	Termination	1 respondent believes that the clause is unreasonable and does not agree with all causes for termination.	We propose to amend clause 4.1.5 of the LCIS Agreement so that missing the reporting milestone is no longer an event that the Company can make a demand for payment under the Performance Bond for and therefore this would not be an Event of Default under clause 9.2.5 and would not give a rise to a termination right for the Company under clause 9.3.
9.2.14	Termination	1 respondent raises that the clause allows for the contract to be terminated if the Performance Scalar is zero for 3 months. It is important that the case of a material defect in a Providing Unit is considered and factored into this clause.	We do not agree to amend this clause. As per clause 9.3 “ <i>Once an Event of Default has occurred and remains extant, the Company may give notice of termination</i> ”. Emphasis added. This is a right to terminate in such an event and is not an obligation to do so.
11.5	Force Majeure	1 respondent suggests removing or amending the clause to read: “12 months and where there is no reasonable expectation of a resolution”.	We propose to amend this clause in the LCIS Agreement so that instead of “is continuing” it states “where the Company reasonably expects the relevant event of Force Majeure to continue”.
12.1.3	Limitation of Liability	1 respondent believes the clause to be an unreasonable double-hit and suggests deleting the clause.	We do not agree to delete this clause.
New Schedule	Step-in rights	1 respondent suggests that a new schedule providing for step-in rights should be included.	We do not agree with this proposal. It is neither appropriate nor practicable. There is no legal relationship between the TSO and a Service Provider’s lender(s). It is noted for context that ultimately providers of LCIS must hold a connection agreement which do not contain such provisions. Any obligations on a Service Provider to their lender(s) in terms of notifications is a matter for the Service Provider.
Schedule 1	Force Majeure definition	1 respondent requests that pandemics are specifically included as a type of force majeure event. 1 respondent suggests that Force Majeure Clause (f) should be expanded to also cover strikes in countries where the SCUs are manufactured, and not just be Ireland specific.	We do not think it is necessary to include pandemics in the definition of Force Majeure. We propose to amend the definition of Force Majeure to cover a strike which is part of a labour dispute of a national character occurring in the country where a person contracted by Service Provider to provide equipment for the Providing Unit is located.

Schedule 1	Force Majeure definition	1 respondent requests that Force Majeure Clause(g) shall be either removed or amended as it is unclear how the inability of the transmission system to receive import LCIS service constitutes a Force Majeure event.	We believe this requirement is still appropriate given that the Force Majeure is intended to capture circumstances beyond reasonable control of the party.
Schedule 1	LCIS definition	2 respondents suggest that the LCIS definition is inadequate as it does not specifically state that LCIS must be provided by low/zero carbon sources of inertia.	We propose to amend the LCIS definition to include that the Providing Unit must provide LCIS without exporting Active Power to the Transmission System when synchronised under normal system conditions.
Schedule 2	Available Volume declaration	1 respondent does not find it appropriate for the TSOs to adjust the Declared Available Volumes (Section 3.1(a)), and suggests the Service Provider should declare the Providing Unit availability. 1 respondent states that it is not clear how availability should be declared.	The Declared Available Volumes will be declared by the Providing Unit as stated in the definition of “Declared” in Schedule 1. However, we believe that the TSO should have the ability to adjust the Declared Available Volumes to reflect the Connection Agreement.
Schedule 2	Trading period payment	2 respondents highlight that the Trading and Settlement Code does not have “Trading Period” defined. One of the respondents suggests replacing “Trading Period” by “Imbalance Settlement Period”.	We suggest to retain “Trading Period” and to amend the definition in Schedule 1 to say that it has the same meaning as the “Imbalance Settlement Period”.
Schedule 3	Billing and Payment	1 respondent believes that in clause 1.3, 10 business days is an insufficient amount of time and suggests increasing to 15 business days.	We wish to maintain 10 business days to align with the settlement process already in place for DS3 System Services payments and Other System Charges arrangements.
Schedule 4	Performance milestones	“...to achieve Substantial Financial Completion, a director of the Service Provider is required to confirm that the Providing Unit will reach Substantial Financial Completion on or prior to the Target Go-Live Date.” 1 respondent flags that this could result in a case “where a Service Provider is forecasting to reach Substantial Completion one day after the Target Go-Live Date and so can’t pass Substantial Financial Completion”. It is proposed that the link to Target Go-Live Date be removed from this condition.	We think it is important to retain this provision but we propose to insert “(or such any other date as the Company in its absolute discretion may specify)” after “prior Target Go-Live Date” in the LCIS Agreement so that the Company may agree to a later date to allow some flexibility.

Schedule 8	Performance Bond	1 respondent believes that the amount of the bond should be included in the contract rather than in a footnote.	The amount will be specified in the contract/bond, but this amount will not be known until the contract is signed and the Contracted Maximum Available Volume is known. The footnote will be removed when the contract is signed.
Schedule 8	Performance Bond	1 respondent commented that the definition of the “Expiry Date” creates an issue for the Service Provider as it is not possible to obtain bonds which are effectively open ended (in that the term of the bond is determined by reference to the Target Go-Live Date plus 12 months). As such, the respondent requests that the TSO allows the bond to have a fixed expiry date. This date could be shorter than the Target Go-Live itself (e.g. 12 months from execution of the LCIS Agreement) with a positive obligation on the Service Provider to refresh the bond prior to expiry (and failure to do so allows the TSO to call on the bond). Alternatively, the respondent requests that that the bond has an effective longstop date, to the effect that the definition would read: “Expiry Date” means the earlier of (1) the date falling twelve (12) months after the Target Go-Live Date; and (2) [Longstop Date].	We propose amending the definition of “Expiry Date” to “means the earlier of the date falling twelve (12) months after the Go-Live Date or the date falling twelve (12) months after the Service Provision Longstop Date.”
	Contract indexation	2 respondents commented that the non-indexation of the contract exposes developers to commodity price/interest rate changes.	We propose to follow the same approach as the one used in previous procurement exercises (i.e. Volume Capped for Reserves) or the RESS auction which does not foresee to index the payment rate. Also, including such a change at this stage of the process would also require reviewing the assumptions used for determining the price cap as inflation projections have been factored in accordance with the Appendix of the AFRY report.

5. LCIS Protocol

This section of the recommendations paper summarises the consultation responses received on the LCIS Protocol and the TSOs' responses. The full version of the LCIS Protocol is available along with this paper and includes the recommended changes.

5.1. General approach on scalars

The following question was asked:

Question 7: Do you have any comments with respect to the Scalars (Synchronisation Dispatch Performance, Reactive Power Product, Availability Performance, Consumption Performance) and Trip Charge proposed?

5.1.1. Summary of consultation responses

12 of the 13 respondents set out their views to the question on the Scalars and Trip Charge proposed.

The most common concern respondents raised was on the Synchronisation Dispatch Performance scalar formula and the risk it could be overly punitive. There were concerns about a risk of triple penalty for a single event or underperformance (regarding the Availability Performance scalar, Synchronisation Dispatch Performance and the Trip Charge). There were also concerns that the scalars increase the balance of risk on the Service provider disproportionately.

Respondents flagged the lack of transparency by the TSOs on how the scalars have been set up, and raised concerns about the fact that scalars are new and untested. They raised concerns about scalars being generally complex and difficult to relate to real costs suffered by the TSO. One respondent in particular flagged that the potential penalty by the different scalars could be extreme, given the short duration of the contract. Respondents suggested that all scalars could be capped to a maximum number of dispatches per year.

5.1.2. TSOs response

Scalars are an important performance incentive mechanism for a long-duration, fixed-term contract.

While we are of the view that the scalars are designed appropriately, we acknowledge that they are new and that there is some level of risk of unintended consequences in their application. To manage this risk, and as described in the Protocol Governance section, the Protocol can be updated following industry consultation and approval of the Regulatory Authorities.

We also propose to reduce the impact of the Synchronisation Dispatch Performance Scalar and Trip Charge as described in the following sections.

5.2. Synchronisation Dispatch Performance Scalar (Section 4 of LCIS Protocol)

5.2.1. Summary of consultation responses

6 respondents mentioned that the Synchronisation Dispatch Performance scalar could be significantly punitive and that it was complex for them to assess the potential risk without having a view of the potential dispatch regime.

The proposed Synchronisation Dispatch Performance scalar considered the number of failures to dispatch divided by the number of Synchronisation Dispatch Instructions in a month. Respondents highlighted that without knowing the likely dispatch regime, and the likely number of instructions over a month, they were concerned the formula could result in a very low scalar. In particular, in case of a small number of instructions in the month, and assuming one of several failures to dispatch, the scalar would be greatly reduced. In addition, a respondent raised concerns about the fact that the scalar impact was rolled over the following 4 months after the incident and proposed a shorter duration for the Dynamic Time Scaling Factor.

A respondent proposed to adjust the formula to consider an assumption of a minimum number of dispatch synchronisation instructions (e.g., number of days in the month) in the scalar formula.

A respondent sought clarification on the $1/3$ factor in the scalar formula.

5.2.2. TSOs' response

We have taken into consideration the concerns raised by respondents about the formulation of the proposed Synchronisation Dispatch Performance Scalar. In order to reduce the potential impact of the scalar, and therefore the risk on the providers, we propose to introduce the following modification to the scalar:

Replacing the term *Number of Instructions of u_i* by the maximum of the number instructions and 3 (i.e. $\text{Max}(\text{Number of Instructions of } u_i, 3)$). This will ensure that, in a month with a low number of dispatch instructions and one failure to Follow Notice to Synchronise, the scalar won't be set to a markedly low value.

We propose to retain the number of months of the Dynamic Time Scaling Factor, in order to align as much as possible with the approach used under other arrangements and in other contracts.

For clarification, a $1/3$ factor is included in the formula to obtain a scalar of 1 in the case the provider doesn't miss Notice to Synchronise. The formula sums over five months weighted by the Dynamic Time Scaling Factor, and the weighted sum is equal to 3.

5.3. Reactive Power Product Scalar (Section 5 of LCIS Protocol)

5.3.1. Summary of consultation responses

One respondent suggested removing the statement that allows the TSO to maintain the declared reactive capability to zero until a Compliance Test is successfully passed. Their view is that the scalar shouldn't be set to the minimum value for an unspecified amount of time based on conditions for a Compliance Test that are not yet known.

5.3.2. TSOs' response

We propose removing this statement given that the Providing Unit has an obligation to declare the true capability under Grid Code and that we have the ability to performance monitor under Grid Code at any time.

5.4. Availability Performance Scalar (Section 6 of LCIS Protocol)

5.4.1. Summary of consultation responses

One respondent raised concerns about the level of 97% availability required to maintain the Scalar at a value of 1, stating that it is a significant challenge. One respondent sought clarity on why a poor month's performance affects revenues for the following 12 months.

Another respondent noted that the 12-month rolling average does not fully account for the period immediately before the Go Live Date. They, therefore, suggested a 12-month rolling process beginning at 00:00 hrs on the 1st day of the calendar month after the Go Live Date. The respondent also set an alternative suggestion to set the scalar to 1 for every Trading Period prior to the date and time of the Go Live Date.

It was flagged that the scalar could reduce revenues to zero which would make the project unbankable. It was also flagged that the scalar is difficult to model over the life of the asset, which would lead to higher bid prices and therefore a more expensive service for consumers.

A respondent proposed to change the equal weighting for each month to a weighting with the number of days in each month in the formula.

5.4.2. TSOs' response

The approach for this scalar was approved in SEMC Decision SEM-23-002:

SEM Committee Decision: Availability - Payment based on 97% annual availability requirement, exclusive of 15 days of planned outages allowed annually following notification to the TSOs.

Regarding the proposal to have an equal weighting for each month to a weighting with the number of days in each month, we consider it would add some complexity to the formula for a minor change in the resulting scalar.

The TSOs' recommendation is to retain the scalar as was proposed in the consultation.

5.5. Consumption Performance Scalar (Section 7 of LCIS Protocol)

5.5.1. Summary of consultation responses

Four respondents raised concerns over the Consumption Performance Scalar. One respondent strongly disagreed with the proposed structure while another respondent found the scalar imbalanced, stating that it may apply disproportionately among Service Providers. Their view was that given the scalar is based on the ratio between actual consumption and declared consumption, for the same deviation in absolute terms, a provider with a lower energy consumption would be more penalised than a provider with a higher consumption.

It was flagged that the scalar can reduce revenues to zero which would make the project unbankable.

One respondent suggested that the TSO pay extra if consumption is lower than the estimate as this can encourage participants to trim their consumption.

One respondent suggested it may be helpful if the Service Provider were able to submit to re-testing of the facility to reset the value of this scalar.

One respondent sought more detail on the Consumption Performance Scalar's impact on the procurement process, asking "How its usage will prevent the procurement of services from less efficient providing units?".

5.5.2. TSOs' response

The Consumption Performance Scalar is based on the ratio of the actual consumption volume (measured during Performance Testing) and the declared consumption, declared by the tenderer at the procurement stage. The declared consumption will be used in the procurement process and the winning bid selection; it will feed into the expected consumption cost added to the received bids.

The Consumption Performance Scalar effectively acts as a guarantee that developers declare consumption in line with technical characteristics at the tender stage. It isn't expected to be a penalty unless developers under-declare the expected consumption.

Regarding the fact the scalar can reduce revenues to zero, we deem it unlikely that any provider will have a consumption deviation above 200% and subsequently a scalar of 0. The scalar is only acting as a backstop in case of extreme deviation against the declared consumption.

5.6. Trip Charge (Section 8 of LCIS Protocol)

5.6.1. Summary of consultation responses

Four respondents flagged the risk of duplicated penalties between the Trip Charges and the Availability scalar, and the Synchronisation Dispatch Performance scalar.

One respondent found the Trip Charge punitive and not related to the costs to the TSO of managing a trip by the Service Provider. Similarly, one respondent sought clarity on the level of the proposed Trip Charge Rate, and whether it reflected the costs to the TSO. A suggestion from a respondent was to develop the Other System Charges framework to include LCIS and DS3 services providers, where their behaviours are demonstrated to be the drivers of increased system costs.

It was also suggested that the TSO provide an allowance for more trips in the first year of operation.

5.6.2. TSOs' response

While we acknowledge the issues highlighted with the level of the Trip Charges and interaction with other scalars, we believe that these devices will play a critical role as we will operate more frequently at high SNSP levels in the future and that an incentivise to not trip should be maintained.

In the consultation, we proposed the Trip Charge Rates based on the charge which would apply to a large conventional plant exporting a large amount of MW for a direct trip in accordance with the Other System Charges arrangements.

Based on the principle that a LCIS devices provide only a portion of the services provided by a conventional plant which also generate electricity and provide frequency reserves, we suggest applying a factor of 1/3 on the Trip Charge Rates initially proposed.

Therefore, we propose a reduction in the Trip Charge Rates from €45/MVA.s / £39.82/MVA.s to €15/MVA.s / £13.27/MVA.s.

5.7. TSOs' recommendations on scalar

TSOs' Recommendation:

The impact of the Synchronisation Performance Scalar is reduced by the replacement of the term *Number of Instructions of u_i* by the maximum of the number instructions and 3 (i.e. $Max(\text{Number of Instructions of } u_i, 3)$). This will ensure that, in a month with a low number of dispatch instructions and one failure to Follow Notice to Synchronise, the scalar won't be set to a markedly low value.

The Trip Charge Rate is reduced from €45/MVA.s / £39.82/MVA.s to €15/MVA.s / £13.27/MVA.s.

The last paragraph of the Reactive Power Product Scalar section shall be removed.

5.8. Other clauses

Other responses have been provided in response to the following questions:

Question 8: Do you have any comments on the remaining content of the LCIS Protocol?

5.8.1. Summary of consultation responses

6 of the 13 respondents set out their views on the remaining content of the LCIS Protocol.

The majority of these respondents set out some suggestions about the remaining content of the LCIS Protocol. One respondent supported the possibility for TSOs making changes to the LCIS Protocol.

Two respondents highlighted general commercial risks and suggested potential ways to improve the Protocol:

- one respondent suggested introducing a revenue protection mechanism in the Protocol to help with the bankability of projects;
- the other respondent suggested that contract requirements should be included in the contract schedules and not subject to changes in the Protocol Document.

Another respondent sought clarity on the Providing Unit's compliance tests and compliance with the Operational Requirement. Specifically, the respondent sought clarity on:

- whether the TSOs could provide any metering or data logging equipment and reporting processes that the Service Provider will be required to adhere to, and;
- further detail on the nature of Compliance Tests and the procedure that will be required for these tests.

5.8.2. TSOs' response

Regarding the commercial risk, we consider that the proposed changes as part of this recommendation will help reach an acceptable level of risk for providers. Concerning potential changes to the Protocol document during the contract period, we would like to clarify that any proposed change to the Protocol document will be subject to industry consultation and will require the Regulatory Authorities' approval.

Regarding the content of Compliance tests and the metering process, the TSOs will explore the feasibility of developing this within the timeframe of the LCIS procurement process. We provide more information on this aspect in section 4.3.3 on Grid Code compliance.

6. LCIS Procurement design

6.1. Planning application

6.1.1. Consultation proposal

In our consultation paper, we outlined the proposal below regarding the planning application requirement.

TSOs' Proposal:

The requirement for Planning Permission to be granted as a pre-requisite at the RfP stage was determined in SEM-23-002. We are now seeking feedback on an additional proposal to provide more detail on what is expected.

Additional proposal:

A planning reference number and a plan of the facility will need to be provided by the tenderer at RfP stage. The TSOs' evaluation team will check that planning is granted (with or without conditions) and that the plan includes the main equipment of the facility, including a step-up transformer.

Respondents were asked the following question:

Question 9: Do you have any comments on the additional clarification proposed regarding the planning permission requirement?

6.1.2. Summary of consultation responses

7 out of 13 respondents set out their views on the planning permission requirement.

One respondent flagged tight timelines and sought clarity on whether a delay in the SEMC decision would risk delaying the PQQ results as well as the beginning of the RfP process. Another respondent sought clarity on clause 2.33 as to whether bidders must also have planning permissions before tendering.

It was flagged that the planning permission requirement will exclude some participants who are not ready to submit planning but will still reach the required Target Go-Live date.

One respondent raised concerns over cost and timeline risks regarding the TSOs' evaluation of the planning requirements, flagging that the risk has the potential to undermine the auction process. The respondent's view was that the TSO should look at the type of connection at the tender stage, otherwise solutions might be accepted but might then be revealed to be more expensive or not viable due to an expensive connection solution not foreseen by the developer. Another respondent sought clarity on whether the grid connection for successful projects could be issued considering all four connection methods stated in the policy statement Pol_St_18, and not only options 2 and 4 exemplified in the LCIS consultation document.

Six respondents had no additional comments while one respondent supported this proposal.

6.1.3. TSOs' Response

We plan to follow the procurement timeline presented in the consultation, and we will communicate any delay in the process to the industry.

Regarding the connection design, the configuration of the connection will be determined by the TSO during the connection offer process. The Contractual Arrangements consultation paper (section 5.2) referenced connection options 2 and 4 in the EirGrid connection policy statement¹⁵ (which is only applicable in Ireland, not Northern Ireland) as these connection options (tail or direct connections into existing transmission stations) are considered to be the most likely arrangement for connection of LCIS devices. Other connection arrangements are not excluded from the potential connection design but are considered less likely given they involve construction of new looped transmission stations which could add significantly to project costs and timelines. The main aim of referring to connection options 2 and 4 in the consultation paper was to highlight to developers the need for a tail-fed transmission substation in the event that their connection was not directly adjacent to an existing transmission substation.

As noted in section 5.2 of our consultation paper on the Contractual Arrangements for LCIS, the connection assets connecting the facility of the Service Provider to the existing meshed transmission system will not be evaluated at the tender stage as the connection method might not be confirmed at this stage.

To assist developers in their assessment of which potential connection method would be appropriate, EirGrid¹⁶ is offering the opportunity to meet with developers to provide a desktop assessment of their connection design assumptions. Developers would be required to share designs (site layouts including relationship to any neighbouring transmission station) with EirGrid to facilitate this assessment. Information provided by EirGrid during this assessment would be on a purely advisory basis noting that actual connection design would be determined in the subsequent 90-day connection offer process.

6.1.4. TSOs' Recommendation

TSOs' Recommendation:

For the RfP process, the LCIS facility planning consent reference number and a plan of the facility, at least up to the connection point, will need to be provided by the tenderer.

The TSOs' evaluation team will check that planning consent has been granted (with or without conditions) and that the plan includes the main equipment of the facility, including a step-up transformer to the connection point.

6.2. Modified Locational Quantity Criteria

6.2.1. Consultation proposal

In our consultation paper, we outlined the proposal below regarding the modified locational quantity criteria.

Criterion 1:

¹⁵ [EirGrid Group Policies: Options for Connecting Customers to the Transmission Network](#)

¹⁶ This assessment is proposed in Ireland only because the Enduring Connection Policy process does not allow developers to receive a connection offer in a timely manner while in Northern Ireland, the standard connection offer process allow developers to receive a connection offer in 90 days.

TSOs' Proposal:

The limit of no more than 2000 MVA.s of LCIS service capability contracted at a transmission station will include any contribution from LCIS devices directly fed into that transmission station from 'tail-fed' transmission stations.

Criterion 2:

TSOs' Proposal:

Where offered, a minimum of 900 MVA.s of LCIS service will be procured in each of the three incentivised zones. If no LCIS service is offered in a zone(s), we will still aim to procure the jurisdictional targeted volume from LCIS services offered outside of the zone(s).

Respondents were asked the following question:

Question 10: Do you have any comments on the modified locational quantity criteria?

6.2.2. Summary of consultation responses

8 of the 13 respondents set out their views to the question on the modified Locational Quantity Criteria, with 3 respondents acknowledging that the modified locational quantity criteria is sensible.

Criterion 1:

A respondent raised concerns that the cap of 2000 MVA.s would limit competition and would likely result in a rise in consumer energy prices.

Criterion 2:

Several respondents commented that procuring a minimum of 900 MVA.s in each of the three incentivised zones adds some complexity to the process and may not be practical. An additional comment from several respondents was that the minimum criteria may be redundant with the locational scalar, given the scalar is already incentivising projects in the three zones. Some respondents highlighted that the minimum procurement criteria was introduced late in the process, therefore not allowing the market to adjust and bring new projects forward to the procurement process. The view of these respondents was that projects in the incentivised zones may benefit from weaker competitive pressure because of the locational criteria, while the locational scalar would further reward them, compared to Service Providers outside of the incentivised zones. This could lead to potentially higher costs to consumers.

The view of the respondents raising concern over the locational criterion 2 was either:

- for the TSO to define the incentivised zones and associated minimum inertia requirements as early as possible to the industry, especially for Phase 2, or;
- to include either a minimum volume constraint or locational scalar requirement, but not both elements.

Clarification:

One respondent sought clarification on whether the TSO will procure 10,000MVA.s and whether there will be any additional redundancy built into the service volume procured to cover against large single-site units having to drop out due to unforeseen circumstances.

6.2.3. TSOs' Response

Criterion 1:

The cap of 2000 MVA.s per station is based on the TSOs' recommendation and SEMC Decision (SEM-23-002) which sets out that no more than 2000 MVA.s at a single transmission station will be contracted. Our technical analysis of the size and location of LCIS devices indicated that system needs would be best met by multiple, dispersed devices in the range 900 MVA.s to 2000 MVA.s, rather than a smaller number of larger devices. The cap of 2000 MVA.s per device represents a significant proportion of our overall inertia requirement, while still allowing for multiple devices to contribute to this requirement.

Criterion 2:

The locational scalars aim at incentivising LCIS units to locate in three identified priority zones. The Minimum Locational Criteria was proposed to ensure a minimum level of service capability, 900 MVA.s, was actually procured in each zone. This total minimum quantity could be in the range 2700 MVA.s (3 x 900 MVA.s units) to 6000 MVA.s (3 x 2000 MVA.s units) of a total requirement of 10,000 MVA.s. We are of the view that these zonal minimum requirements remain an appropriate balance between the technical needs of the power system and the facilitation of an open, competitive, procurement process.

6.2.4. TSOs' Recommendation

Given the above, we recommend the following regarding the Locational Quantity Criteria:

TSOs' Recommendation:

Both Locational Quantity Criteria shall be retained:

1. the limit of 2000 MVA.s of LCIS capability at a transmission station will include any contribution from LCIS devices connected from 'tail-fed' transmission stations, and
2. a minimum of 900 MVA.s of LCIS service will be procured in each of the three incentivised zones, where offered.

6.3. Price Cap

6.3.1. Consultation Paper Proposal

In our consultation paper, we made the proposal below regarding the price cap to be used in the LCIS tender evaluation process.

TSOs' Proposal:

The price cap to be used in the LCIS tender evaluation process will be €2.02/MVA.s per hour in Ireland and £1.79/MVA.s per hour in Northern Ireland. Tenderers should account for the impact of Product Scalars and Locational Scalar in determining their LCIS bid price to avoid exceeding this price cap. Bids that result in payment rates above the price cap will be rejected. The proposed price cap, the assumptions underpinning it and the analysis set out in the AFRY Management Consulting report more generally, are still subject to review by the Regulatory Authorities. We will be engaging with the Regulatory Authorities on this analysis during the consultation period.

Respondents were asked the following question:

Question 11: Do you have any comments on the proposed approach for the price cap?

6.3.2. Summary of consultation responses

11 of the 13 respondents set out their views on this question.

Some respondents expressed disagreement with the principle of a price cap. Given the competitive nature of the procurement process, their view is that the introduction of a price cap isn't necessary.

While respondents generally supported the blended approach and the proposed value for the price cap, 2 respondents raised concerns about accounting for scalars when preparing their bid. Their view was that the price cap should apply for the bid before the application of scalars, and that scalars reflected additional value to the consumer and should not be included in the price cap (e.g. Product Scalar or Locational Scalars).

Four respondents raised concerns that the price cap may not be high enough considering that the Performance Scalars and charges could negatively impact the project. Their view is that there is significant risk that projects may become non-viable during the contract period due to penalties. The main concern is regarding the potential impact of the Synchronisation Dispatch Performance scalar, that could lead to low revenues. These respondents' position is that the uncertainty around the dispatch regime leads to potential risk coming from the Synchronisation Dispatch Performance scalar formula. In turn, a higher price cap could be required for them to be able to accommodate this risk.

One respondent sought clarity on whether the price cap is based on future indexation within the 6-year period.

6.3.3. TSOs' Response

We note the risk highlighted by respondents regarding the Synchronisation Dispatch Performance scalar and its link to the price cap. We have made a modified recommendation on this scalar as set out in section 5.2 and consider that this addresses the highlighted risk.

Given that an objective of the price cap is to protect consumers, we consider that it should limit excessive payments considering the Product and Locational scalars. We agree that the scalars reflect value of additional benefits or services to consumers. However, given the blended approach that was used to determine it, the price cap is deemed high enough to allow for bids even after application of Product and Locational scalars.

In addition, with the long run marginal costs for providers approach, we have assumed a 6-year depreciation period (see AFRY report) while these devices shall have a longer lifetime. The main reasons for that are that LCIS will be the only source of revenue over the contract period and there is no firm revenue mechanism beyond the contract.

Note also that in the long run marginal cost and implied value approaches used for determining the price cap, inflation over the contract period has been considered (see Annex A of the AFRY report on the inflation assumptions).

For clarity, below we have set out a correction to section 3.1.2 of the AFRY report 'LCIS - price cap and imbalance price proposals':

"In addition, when using this implied value for determining a price cap, we need to be mindful that: – solutions can earn additional revenue for their technical characteristics through scalars, and the price cap would then need to be adjusted accordingly;"

The paragraph should read instead: “[...] solutions can earn additional revenue for their technical characteristics through scalars, and the price cap should be sufficient to allow for bids after accounting for the impact of scalars”.

6.3.4. TSOs’ Recommendation

Given the above, we recommend the following regarding the proposed price cap.

TSOs’ Recommendation:

A price cap will be used in the LCIS tender evaluation process, that will limit payment rates including the Product Scalars and Locational Scalar. Tenderers should account for the impact of scalars in determining their LCIS bid price. Bids that result in payment rates above the price cap will be rejected.

The price cap will be €2.02/MVA.s per hour in Ireland and £1.79/MVA.s per hour in Northern Ireland.

6.4. Imbalance Prices

6.4.1. Consultation Paper Proposal

In our consultation paper, we made the following proposals regarding the imbalance prices to be used in the tender evaluation process.

TSOs’ Proposal:

The imbalance price to be used for the purpose of factoring the cost of imported energy into the tender evaluation is €97/MWh in Ireland and £85.8/MWh in Northern Ireland.

Respondents were asked the following question:

Question 12: Do you have any comments on the proposed imbalance prices to be used in the LCIS tender evaluation process?

6.4.2. Summary of consultation responses

6 of the 13 respondents set out their views to the question on the proposed imbalance prices to be used in the LCIS tender evaluation process, with 4 respondents supporting the proposed approach.

One respondent who supports the approach suggested some refinement to using the average of pre-war prices where a weighted average is used in the approach, with more recent years having a higher contribution to this average.

One respondent sought clarification on the decision to factor the cost of imported energy into the price cap at the tender stage, stating that this is a passthrough cost and therefore does not have value in distinguishing the best priced options for the TSO to procure. Similarly, another respondent notes that according to the SEMC decision¹⁷, units dispatched by the TSOs to system services modes are remunerated

¹⁷ Mod_13_19 relating to ‘Payment for Energy Consumption in SEM for non-Energy Services dispatch’

via imperfections; the respondent therefore questions the utility of factoring the estimated cost of imported energy in the evaluation given it is a pass-through costs.

6.4.3. TSOs' response

A majority of respondents agree with the proposed imbalance prices to be used in the LCIS tender evaluation process.

As noted in our consultation, energy costs will be recovered under the SEM market arrangements and are not part of the LCIS contractual arrangements.

The proposed imbalance price will only be used for the purposes of the tender evaluation to account for the relative efficiency of the offered LCIS devices.

We do not propose any change to the approach of determining the estimated energy consumption price using historical imbalance prices.

6.4.4. TSOs' recommendation

Given the above, we recommend the following regarding proposed imbalance prices for the evaluation:

TSOs' Recommendation:

The proposed imbalance prices for the evaluation of LCIS providers of €97/MWh in Ireland and £85.8/MWh in Northern Ireland shall be retained. The proposed imbalance price will only be used for the purposes of the tender evaluation to account for the relative efficiency of the offered LCIS devices. The actual cost of energy consumption by LCIS devices will be managed separately under SEM arrangements.

6.5. Procurement Process and Contract Execution

6.5.1. Consultation proposal

TSOs' Proposal:

Preferred bidders must sign the LCIS Agreement 20 business days after TSOs' notifications in both jurisdictions. In Ireland, once the contract is signed, providers will be eligible to enter the grid connection offer process outside of the ECP process by direction from CRU.

Question 13: Do you have any comments on the proposed contract execution deadline and the fact that, in Ireland, grid connection offer will be processed following contract execution?

6.5.2. Summary of consultation responses

11 out of 13 respondents set out their view on the procurement process and contract execution.

Four respondents found the timings and contract execution deadline sufficient while two respondents flagged the execution deadlines as tight. One respondent suggested an LCIS accelerated grid connection timeline.

Two respondents flagged that the proposed process creates risks to preferred bidders which are outside of their control. Another respondent noted that where there is a material delay not attributable to the developer, then the Service Provider should not be penalised and the 6-year contract should be maintained.

It was suggested that this risk should be mitigated by either adjusting the Target Go-Live Date or the preferred bidder having the option to terminate the LCIS contract.

One respondent asked if the TSO can countersign the contract prior to or on the day they sign, so that construction can commence, as a week delay of signatures is costly for bidders. In addition, the respondent noted that they must be able to terminate without any forfeit if the connection offer is not processed by the TSO.

One respondent flagged that there was no reference to how existing sites will be treated, in relation to transfer of access rights of their existing connections and use of existing connections for the provision of LCIS services. They also flagged that a high number of connections outside of the ECP risks the external process being slowed down.

One respondent sought clarity on how and when Service Providers can expect to be made firm connections while another respondent sought clarity on hybrid/shared connections. Information was sought on the expected grid costs, whether these will be done on a standard basis, and if there is a definitive timeframe to receive a connection post contract award.

Clarity was sought on whether two mutually exclusive bids can be submitted for one site, i.e. 900MVA.s and 2000MVA.s.

6.5.3. TSOs' response

The TSOs note the range of views on the 20 business day timeline for preferred bidders signing the LCIS Agreement. For the reasons outlined in section 5.6 of our Contractual Arrangement Consultation paper, we believe that this approach remains appropriate.

The TSOs note the risks raised by respondents on overall delivery timelines. In order to address this, we propose to further extend the Target Go-Live Date as described in section **Error! Reference source not found.**

On the issue of multiple, mutually exclusive bids, the TSOs' view is that facilitating this would add complexity to the procurement process and propose that multiple, mutually exclusive bids are not permitted.

6.5.4. TSOs' recommendation

TSOs' Recommendations:

Preferred bidders must sign the LCIS Agreement 20 business days after the TSO's notification of preferred bidder status.

In Ireland, once the LCIS Agreement is signed, providers will be eligible to enter the grid connection offer process outside of the ECP process by direction from CRU.

Multiple, mutually exclusive bids will not be permitted in the LCIS procurement process.

7. LCIS Funding Arrangements

The separate licencing and revenue arrangements in Ireland and Northern Ireland mean that there are two separate funding entitlements for system services payments provided on the island. This is because the Regulatory Authorities make two separate revenue decisions, each on its own legislative basis. Nonetheless, the two TSOs are obliged by licence to consider the system services available to each other when procuring these services.

In August 2011, the SEM Committee endorsed an ex-post mechanism which ensures that the cost of procuring reserve is rebalanced so that all consumers on the island make an equal contribution. This works by the two TSOs calculating the total cost of reserve provided on the island over the tariff year, then calculating what consumers in each country should pay under a 25/75 split for Northern Ireland/Ireland. A financial transaction is then made to rebalance the cost of reserve products to secure inter-jurisdictional equity.

A similar imbalance between costs and benefits will arise with the payments for LCIS. Over Phase 1, SONI will be procuring proportionally more LCIS than EirGrid, but the benefits will accrue across the island. The split of procurement in subsequent phases may differ and will be determined in due course based on system need.

The TSOs consider it is appropriate that there is a fair and equitable sharing of costs of the LCIS contracts on the island such that all consumers pay appropriately for the low carbon inertia services provided in proportion to the benefits received. To that end the TSOs believe it is appropriate that an ex post adjustment mechanism is also put in place in respect of the LCIS portion of the Ancillary Services outturn costs such that all consumers on the island make equal contribution (effectively a re-allocation on a 3:1 basis between Ireland and Northern Ireland). Both TSOs will need to have assurance of revenue recovery before signing these new contracts. We therefore seek endorsement from the SEMC of an LCIS rebalancing mechanism that allocates the total cost of low carbon inertia services between the jurisdictions on a 75/25 basis, and the equivalent confirmation from the UR and the CRU that the annual revenue entitlements will reflect these arrangements.

8. Next steps

This recommendations paper, amended LCIS Agreements and LCIS Protocol documents, have been submitted to the SEMC for its consideration and to inform the SEMC's decisions on the next steps in the procurement and delivery of LCIS including the form of the LCIS Agreements and LCIS Protocol.

The publication of this recommendations paper, LCIS Agreement and LCIS Protocol will also provide stakeholders with information on our recommendations.

Subject to the SEMC decisions on the proposals set out in this recommendations paper, and a SEMC decision on LCIS funding arrangements, the TSOs then expect to commence the RfP process for LCIS as well as implementation of other aspects of the arrangements as soon as possible.