



SINGLE ELECTRICITY MARKET COMMITTEE

System Services

Future Arrangements

High Level Design Consultation

SEM-21-069

26 August 2021

1 EXECUTIVE SUMMARY

The System Services Future Arrangements (SSFA) project was formally launched by the SEM Committee in July 2020 with the publication of a Scoping Paper for consultation. A period of stakeholder engagement followed this, through the consultation window, which closed on 3 October 2020. Following on from this, the SEM Committee published the SSFA Decision Paper 1 in March 2021. The Decision Paper set the project out into three Phases, with Phase I (Scoping Phase) closing and Phase II (High Level Design Phase) commencing at that point.

The Decision Paper made a number of decisions on the points raised in the Scoping Paper, and noted that some areas required further consultation during the High Level Design Phase. It was noted that a High Level Design Consultation would take place in summer 2021 to cover the remaining points. This paper sets out a number of proposals and recommendations in relation to this.

In summary the SEM Committee is proposing to:

1. build upon existing governance arrangements by formalising the processes and ensure adequate consultation between the TSOs, DSOs, and industry;
2. put in place a Post-DAM daily System Services auction consistent with EU requirements coupled with a layered procurement approach to allow for longer timeframes where appropriate; and
3. set out a range of market design issues to be progressed in the detailed design phase.

The SEM Committee has set out a number of governance arrangement proposals, including how units will qualify or register, recommending that a rolling qualification process be introduced, and has proposed a formalisation of the Qualification Trial Process. Proposals are also included for the governance of rules changes, and it is proposed that all System Services rules be housed under a single System Services Codes, and modifications be governed through a System Services Panel.

Additionally, a number of proposed options on how the market will be funded are set out, with a proposal that it be settled in line with the corresponding energy market trading period, to ensure appropriate economic signals are sent. It is also proposed that it be funded through suppliers, and additionally a causer pays approach is also being explored. How distribution connected providers interact with the market is also explored.

In terms of the auction design, three options are set out, a market for Post-DAM Day Ahead System Services, Pre-DAM Day Ahead System Services, and an ex-post BM market. The SEM Committee has proposed a Post DAM Day Ahead market as on balance being the most beneficial approach. This option best meets the SEM Committee's assessment criteria, and

stood out as being most in line with the majority of stakeholders views that were received during the Scoping Phase.

In relation to additional market design considerations, views are sought on the level of visibility and transparency needed from the TSO on forecasting and volumes, whether a Secondary Trading market should be introduced, and whether the concept of Firm Access currently applied to the energy market should be adopted for the SSFA. Proposals are set out in terms of introducing a financial penalty and reliability scalar to ensure commitment obligations are met, and it is recommended that the majority of existing scalars are retained with the exception of the temporal scarcity scalar. Finally, it is proposed that a layered procurement approach be developed, with longer term alternative procurement methods be used for some volumes of services if there is insufficient competition and/or locational constraint issues, among other considerations.

The consultation paper will be open for a period of eight weeks, and a number of stakeholder engagement events will be arranged during the period.

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2 INTRODUCTION

The purpose of this paper is to seek the views of stakeholders on the proposed High Level Design of the System Services Future Arrangements, to apply from 1 May 2024.

On 8 July 2020, the SEM Committee published a Scoping Paper on the Future Arrangements for System Services (SEM-20-044). This paper was open for public consultation for a period of 12 weeks. It set out at a high level the SEM Committee's initial thinking on the System Services arrangements that will apply following the conclusion of the Regulated Arrangement contracts and invited views from stakeholders. The consultation period ended on 2 October 2020, and 24 responses were received. The responses were published in November 2020 (SEM-20-074).

Following on from this, the SEM Committee published Decision Paper 1 of the Future Arrangements on 30 March 2021 (SEM-21-021). This paper provided a summary of the responses to the Scoping paper and made a number of decisions. Specifically, decisions were made on the Objective and the Assessment Criteria for the project, the Regulated Arrangements were extended by 12 months to 30 April 2024, and a framework for procurement of System Services through Fixed Contract Arrangements was put in place. The paper also set out the SEM Committee's approach to the project, with three phases, the Scoping Phase which concluded with publication of SEM-21-021, the High Level Design Phase which commenced following conclusion of the Scoping Phase, and the Implementation Phase which was set to commence following conclusion of the High Level Design Phase. Following further review the SEM Committee considers that there will need to be further consultation during the Detailed Design Phase ahead of the Implementation Phase to allow the RAs to further develop the detailed design of the arrangements.

This High Level Design consultation will cover the auction design and governance arrangements. The SEM Committee has considered options and proposals in these areas, and seeks the views of stakeholders. The consultation will be open for eight weeks; similar to the consultation process for the Scoping Paper there will be workshops scheduled, and requests for bilateral meetings are invited. Additional considerations such as market power will be covered during the Detailed Design Phase which will commence following the conclusion of the High Level Design.

2.1 Objective and Assessment Criteria

SEM-21-021 set out a final decision on the Objective of the project and Assessment Criteria. The objective of the project is:

- to deliver a competitive framework for the procurement of System Services, that ensures secure operation of the electricity system with higher levels of non-synchronous generation.

In order to better facilitate the achievement of this objective, the SEM Committee has developed a set of criteria for assessing the proposed framework:

1. **Consumer Value:** The pricing of services will be market-based in so far as these secure competitive outcomes in order to deliver consumer value, while taking into account levels of market power for each service;
2. **European Compliance:** The arrangements will comply with relevant legislation including the Clean Energy Package (CEP) and the Electricity Balancing Guideline (EBGL) Network Code;
3. **System Need:** The framework will operate in a manner which ensures the needs of the system including security of supply are maintained;
4. **Alignment:** The SEM Committee will seek to ensure appropriate alignment between the markets in energy, capacity and System Services, along with all other relevant revenue streams, to ensure an efficient overall outcome for consumers;
5. **Accuracy:** The volume of services procured should match the requirements of the system as accurately as possible;
6. **Adaptability:** The framework should be sufficiently agile to meet any system changes caused by future policy developments;
7. **Simplicity:** The framework should be sufficiently simple and transparent to be readily understood and accessible to all stakeholders;
8. **Enable the Energy Transition:** The arrangements will be cognisant of policy decisions in Ireland, Northern Ireland and the UK, and will enable the energy transition in so far as possible;
9. **Clarity for Investors:** The arrangements will be clear in terms of how auctions will operate, in order to give a reasonable degree of clarity to developers in terms of financing; and
10. **Transparency:** The framework will be transparent such that there will be no imbalance of information among market participants, and full sight of auction results and procurement requirements will be fully visible.

The SEM Committee considers that these arrangements will be in place on an enduring basis. The SEM Committee recognises the importance of ensuring the stability of the arrangements, particularly through to at least 2030 and beyond, in providing clarity for investors and transparency for stakeholders.

The SEM Committee envisages that the arrangements should be sufficiently adaptable in order to meet system and policy driven changes while maintaining the core principles of the framework over a long period of time. Therefore, the SEM Committee considers it important that the High Level Design appropriately balances the above assessment criteria to ensure the arrangements are sustainable, delivering consumer value on an enduring basis.

Furthermore, the SEM Committee considers that system services will play an increasingly central role in the market. Therefore, the SEM Committee is of the view that clear economic signals are sent to the market to ensure appropriate investment in the sector delivering an overall efficient outcome across energy, system services, and capacity.

2.2 Document Structure

Sections 1 and 2 set out the Executive Summary and Introduction of the paper.

Sections 3 and 4 detail the SEM Committee's proposals on the Governance Arrangements and Market Design of the project respectively, and seeks views of stakeholders on both.

Section 5 sets out the next steps for the project.

Consultation Questions – Introduction:

Question 1: Do stakeholders consider that the commitment to putting these arrangement in place on an enduring basis, at least to 2030, represents sufficient certainty of process?

3 GOVERNANCE ARRANGEMENTS

The governance arrangements of the framework encapsulate how units will qualify and register to participate in the markets, how the detailed rules will be updated and administered, and how the services will be funded. Following review of the Scoping Paper responses, further analysis, and further engagement with the TSOs, distribution operators and other stakeholders, the SEM Committee has developed a number of options in each of these areas. These are set out below and stakeholder views are sought on these options.

3.1 Qualification/Registration Arrangements

The current qualification arrangements involve a procurement window or gate every six months under the TSOs' Gate Tendering Process. In general, tender submissions for each gate must be submitted two to three months ahead of the contract execution date, while testing must be completed approximately two months ahead of the contract execution date.

The responses to the Scoping Paper indicated a general preference among stakeholders for increased flexibility in terms of the qualification process. While some stakeholders acknowledged that the Gate Tendering Process may be fit for purpose with some additional flexibility in terms of either testing or frequency of gates, other stakeholders were of the view that arrangements akin to the registration process for an energy market may be more appropriate. The SEM Committee has separately received representations in terms of the need for increased flexibility in the Gate Tendering Process, which were highlighted as a result of the recent Covid-19 related issues.

The SEM Committee wishes to implement a framework that facilitates this increased flexibility while maintaining an appropriate level of oversight to ensure that participating providers are capable of reliably providing services. To that end, the SEM Committee has developed two options and has considered them against the Assessment Criteria set out in Section 2.1. The options are set out below. In developing the detailed design of either option it will be important to ensure that the approach is compliant with Articles 155, 159 and 162 of EU Regulation 2017/1485 relating to the System Operator Guidelines (SOGL) in terms of prequalification process requirements for reserve services.

3.1.1 Option 1: Gate Tendering Process

Under this approach, the basic structure of the existing Gate Tendering Process would be maintained but with more gates than the current two per year. The biannual Gate Tendering Process has worked well under the Regulated Arrangements as it provided a clear route to service provision for developers, a relatively predictable administrative process for the TSOs, while enabling the TSOs to maintain control over the entry process. This is particularly important

under the current arrangements where any qualifying provider will put upwards pressure on the overall expenditure and not downwards competitive pressure on prices.¹

With the objective of the project to move to a competitive framework, the SEM Committee considers there to be benefit in increasing the frequency which providers can access the market in any event. This increased accessibility and flexibility would allow a greater volume of providers to access the market more quickly, which should be beneficial to meeting system needs. Additionally, this greater volume of available provision should increase competition, which in turn could increase consumer value.

The SEM Committee seeks views on whether, if this option is implemented, procurement gates should be held quarterly. This option also maintains consistency of approach, allows for efficient allocation of resources by the TSOs, providing simplicity to stakeholders and clarity for investors on how to access the market, while the addition of two extra gates may reduce some of the issues around lack of flexibility in the current arrangements.

3.1.2 Option 2: Rolling Application Process

Under this option an open application process would be maintained throughout the year. Potential providers could submit an application to the TSOs to provide services at any time, this would then commence a process with a clearly defined end-to-end timeline. The SEM Committee's initial thinking is that this would follow a similar process as exists under the gate process currently, albeit the gates would essentially be open year round. The SEM Committee proposes that the responsibility for defining the process would sit with the TSOs but that the process should take a maximum of 90 days from date of application to the TSO's qualification decision (i.e. the point at which the provider could participate in the system services market).

This proposal grants greater flexibility for providers than Option 1, which in turn should provide higher levels of consumer value over time as efficient service providers needed by the system could be more quickly brought into the market. Additionally, it facilitates greater alignment with other markets in the SEM and clarity for investors as the developers of projects would be in greater control over the timing of their market entry. However, the success of this option will depend on the TSOs' ability to process applications in a timely manner.

3.1.3 Assessment of the Options

As option two provides greater flexibility and facilitates faster market entry than option 1, the SEM Committee considers that several of the criteria (consumer value; system need; accuracy and adaptability) are better met by option two. Additionally, stakeholders have previously raised concerns with the barriers to entry brought about by holding fixed gates for entry. As option two

¹ It is noted that the Regulated arrangements do provide for tariff reviews where, inter alia, the TSOs have procured excess volumes relative to system need (SEM-17-080)

allows the provider to determine its timeline for market entry, thereby avoiding the need to line up with the next procurement gate, the SEM Committee considers that several other criteria (alignment; simplicity; clarity for investors; and transparency) are better met by option two. Accordingly, the SEM Committee proposes to adopt Option 2.

SEM Committee Proposal: Option 2, Rolling Application Process

3.2 Qualification Trial Process

The Qualification Trial Process (QTP) is carried out in order to determine the ability of technologies to provide System Services products and has also been used to trial communications protocols and performance monitoring improvements. This is done either because the technology itself is new, its use as a provider for a particular service has previously been unproven, or a new service is being introduced which must be trialed for new and existing providers. The parameters for any QTP trial are set by the TSOs in advance and the participants are invited to tender to take part in the trial.

The SEM Committee acknowledges the positive impact of the QTP to-date in facilitating the entry of different technology types to the System Services market. This is also reflected in the comments of stakeholders in response to the Scoping Paper. On this basis, the SEM Committee proposes that the QTP should be maintained. However, as the arrangements set out in this paper are intended to be enduring the SEM Committee considers it appropriate that the QTP should be a formal, predictable, and transparent process for the design of trials and the selection of technologies and participants.

Accordingly, the SEM Committee proposes that each year the TSOs would issue a call for evidence to allow for industry, new entrants, and new technologies to input into the design of the trial. Following this the TSOs would then design a trial and would publicly consult on its proposed trial design. Taking the output of the consultation process into account the TSOs would then submit a recommendation to the SEM Committee for approval.

It is envisaged that this recommendation would include the objectives of the trial, the technologies and services to be included, the cost of the trial, and the period for which the trial would run (including the dates of key milestones). It is noted that while the process proposed in this paper is an annual process, it may be appropriate for any given trial to be of a longer or shorter duration than a year. Therefore, the conclusion of one trial may not line up with the start of the next trial. It is proposed that the TSOs publish update reports at each key milestone of a trial and a full report when the trial has been completed. It is proposed that the outcome report should include sufficient technical detail and clear conclusions and recommendations. In

addition, the report should outline lessons learned for process improvements to subsequent trials.

The SEM Committee considers that these additions to the process will improve the transparency and adaptability of the QTP while also ensuring greater industry input into the process. Stakeholder views are sought on these proposals.

3.3 Governance of Rules Changes

The Scoping Paper sought stakeholder views on the collection of documents which set the rules and procedures for System Services arrangements, these being:

- the Regulated Arrangements contracts;
- the Protocol Document, which sets the technical requirements; and
- the Market Ruleset, which governs how providers are compensated based on their physical and market position.

As set out in the summary of consultation responses under SEM-21-021, the majority of respondents (12 of 21) were in favour of simplifying the arrangements and moving to a single document or Code. The SEM Committee considers that this is an appropriate approach, as under a framework that includes daily auctions for services, the contractual framework of the Regulated Arrangements will no longer apply following the termination of these contracts on 30 April 2024.

Therefore, the SEM Committee has decided that a single document or code should be developed in conjunction with the design of the Future Arrangements. This should include all market processes for procurement of System Services, the technical requirements for providers, and house terms which would previously have been included in the contracts.

There is further exploration required on how this document will be governed. The majority of industry stakeholders indicated a preference to have increased involvement and transparency in the governance of changes to System Services rules and policy. Against that, the TSOs argued for the importance of the TSOs retaining control over the content of these documents, citing their interpretation of the legal requirements under Article 40 of the Clean Energy Package² for TSOs to procure ancillary services to ensure system stability. Additionally, the SEM Committee consider it important that the RAs retain the ability to progress modifications as are deemed necessary to ensure compliance with European requirements and governmental targets, and alignment with other Codes governing the electricity network and other markets.

² Directive 2019/944 – Article 40 para 1(i)

SEM Committee Proposal: A System Services Code is to be developed which will replace the current multiple System Services documents.

Having considered the points raised in response to the Scoping Paper, the SEM Committee has developed a number of options for consideration, set out below. The SEM Committee has considered these options by reference to the Assessment Criteria set out in Section 2.1, above. Specifically, the SEM Committee has considered the European Compliance, system need, adaptability, simplicity, clarity for investors and transparency criteria.

3.3.1 Option 1: Current Approach with Additional Oversight

Under the current approach to modifications of System Services documents, the TSOs are responsible for their maintenance and for identifying any necessary modifications, in order to ensure system security and the efficient operation of the arrangements. Consultation is carried out at the TSOs discretion, and approval is sought from the Regulatory Authorities. While the TSOs have improved the level of public engagement around modifications throughout the lifetime of the Regulated Arrangements, there remains no formal, routine and transparent approach to consultation. Additionally, initiating any modifications is at the discretion of the TSOs with industry having limited ability to propose or progress changes.

Option 1 proposes largely maintaining this approach, with the TSOs retaining responsibility for maintaining the System Services Code and for initiating any modifications to the Code. Any modification to the Code would continue to require SEM Committee approval. However, the SEM Committee proposes requiring the TSO to consult on any modifications prior to seeking SEM Committee approval. Additionally, there is currently a restriction on the TSOs updating the system services documents more than once in a three-month period. The SEM Committee proposes to remove this restriction under this option, on the basis that the arrangements have now bedded in and the additional requirement for consultation should place a practical limit on the frequency of changes to the Code.

This maintains a TSO-led approach mitigating potential risks of the TSO not being able to progress urgent modifications in order to meet system needs. It is also simple, in that the process has existed previously. However, it may not provide sufficient transparency and clarity for investors and other stakeholders in terms of input to modifications and how these modifications are developed.

3.3.2 Option 2: System Services Code Panel

Under this option a Panel would meet regularly throughout the year to discuss and agree recommendations for modifications to be made to the Code. The SEM Committee proposes the following high level format for the Panel.

The TSOs, distribution operators and a set number of members selected by industry would attend the Panel. It is proposed that:

- One of the TSOs would act as chair and secretariat.
- Any member of the panel could propose a modification for consideration by the Panel.
- A modification recommendation would be submitted to the SEM Committee for approval by the TSOs following discussion at a panel meeting.
- All submissions to the RAs would include the recommendations of the TSOs and also a summary of comments from Panel members (including situations where the TSOs' recommendation differs from that of the Panel).

The selection process for the Panel members and the terms of reference for the Panel are not within the scope of this paper, however, it is noted that the selection of members based on technology type may not be appropriate for system services. Additionally, it is envisaged that the Panel would operate transparently with the publication of minutes on the TSOs websites for example. Where a modification is initiated by the RAs, the RAs will present the proposals to the Panel for discussion and may also consult publicly before presenting to the SEM Committee for decision.

The SEM Committee recognises that the governance of industry arrangements through panels represents a cost to the industry and that the matters considered by each panel will, necessarily, impact those considered by others. The SEM Committee further notes that, in response to the issues of cost and coordination, other jurisdictions are looking to merge some panels to reduce this burden. In light of this experience, the SEM Committee welcomes stakeholder views on the potential to amalgamate aspects of governance of the System Services Code with other panels such as the Grid Code Review Panels and the Trading and Settlement Code Panel.

3.3.3 Assessment of the Options

Both options support consumer value, European compliance, and enabling the energy transition. Option one may be more administratively straightforward and better facilitate system needs as the TSO has greater control over the process, while option two may require a greater balancing of commercial concerns with the TSOs' requirements. The greater role for industry under option two should improve alignment between markets as participants will have an interest in ensuring the markets operate effectively together at an operational level. Similarly, this process should improve adaptability relative to option one as issues are more likely to be discussed earlier and in greater detail through a Panel process. The additional transparency and industry input in option two is likely to better facilitate clarity for investors.

Therefore, having considered both options against the assessment criteria the SEM Committee proposes to adopt option two.

3.4 Funding Arrangements

In the Scoping Paper the SEM Committee sought views on how the arrangements could be funded. Currently, the TSOs provide a forecast as part of their respective Annual Revenue Requirement submissions. The forecast amounts are then recovered through the System Services Charge under DTUoS in Ireland, and through the SSS Tariff in Northern Ireland.

Following review of the comments the SEM Committee has developed a number of options, set out below. In assessing these options, the SEM Committee has considered which option provides the best balance between maximising the accuracy of expected costs, and ensuring the charges are levied in an appropriate and proportionate manner.

3.4.1 Option 1: Network Charges

Under this approach, the process for recovering the System Services costs would remain the same. The TSO would provide a forecast of expected expenditure on an annual basis. This would be a factor in the calculation of the DTUoS and SSS tariffs, and any over or under recovery would be accounted for in the respective k factor calculations.

This approach applied for ancillary services prior to the development of System Services. These arrangements remained in place when the Regulated Arrangements were implemented. Given the scale of the increase in both quantum and variability of costs over the past number of years and the expectation that this will continue into the future, the SEM Committee considers that this may no longer be the optimum approach.

The annual revenues associated with System Services are significant, and also tend to outturn at significant variance to the original forecast. This can lead to volatility in network charges. This may therefore cause significant annual swings in the network tariffs in each jurisdiction. Competitive arrangements are likely to increase the volatility of charges as it becomes more challenging to forecast a year of revenue requirements. This can lead to large k-factors and variance to the network charges year-on-year, variances which are not driven by the underlying controllable costs of the TSOs.

3.4.2 Option 2: Annual Supplier Based Charge

This option would see a new standalone all-island charge to Suppliers being created. Similar to Option 1, the TSOs would provide an annual forecast of the required revenue, and similar to the Imperfections Charge, a MWh charge would be levied on Suppliers based on the all-island

energy demand forecast. Variance in the forecast would be carried by the TSOs and would be recovered through a k-factor applied subsequently.

Under the Trading and Settlement Code, there is a facility to apply a multiple to the Imperfection Charge in case of significant over or under recovery of the revenues; a similar facility could be considered under this option.

The SEM Committee considers this approach to be more appropriate than the network charge approach as it improves the transparency of the costs by clearly distinguishing between the TSOs' operational costs and the costs for system services.

3.4.3 Option 3: Trading Period Supplier Based Charge

Under this option the System Services costs over a defined trading period would be levied on Suppliers based on their MWh demand for that trading period. It is envisaged that costs would be published shortly after the auction(s). Where the auctions are held before the Balancing Market end-users would be able to adjust their demand in response to the combined energy and system services prices in that period.

This approach provides more day-to-day variability in system services costs for suppliers (potentially similar to that seen in the energy market), however, it avoids the potential for large swings in tariffs between tariff years. Additionally, it more closely aligns the cost of providing energy to a customer to the time that customer is actually consuming the energy. This improves the accuracy of economic signals being sent by the market. However, it is noted that there are currently not the same opportunities for access to hedging products that exists in the energy markets. It is also noted that the impact this may have on demand side participation may require further consideration in the detailed design.

Additionally, this approach would ensure that the costs are levied in a manner which accurately reflects the cost of providing services in a given trading period, and are levied on the parties who call upon energy during that trading period.

3.4.4 Option 3a: Allocation of costs to grid users causing increased costs

Under this option the incremental costs driven by grid users (e.g. generators, interconnectors, etc) would be borne by those grid users. For example, the difference in system services costs associated with the Largest Single Infeed between the largest and second largest infeed would be borne by the largest infeed. This would ensure that the incremental cost of system services would be allocated to the grid users driving those costs. This should incentivise users to, all things equal, impose lower costs on the system relative to other grid users –putting downwards pressure on overall system services costs.

The SEM Committee notes that there may be practical challenges in terms of implementing such a proposal.

3.4.5 Assessment of the Options

Option 3 is the preferred option as it ensures that the costs are levied in a manner which accurately reflects the cost of providing services in a given trading period, resulting in the right economic signals across the markets. There is merit in further considering Option 3a, however this may be too complex to effectively implement from the outset. The RAs will continue to explore the feasibility of this option.

Overall, the SEM Committee has a preference that the principle of applying charges through each trading period is retained, as periods of low energy prices as a result of high renewable penetration may have high System Service costs, and applying the charges collectively at a given period is a more equitable approach compared to smearing the forecast costs over the year.

SEM Committee Proposal: Option 3

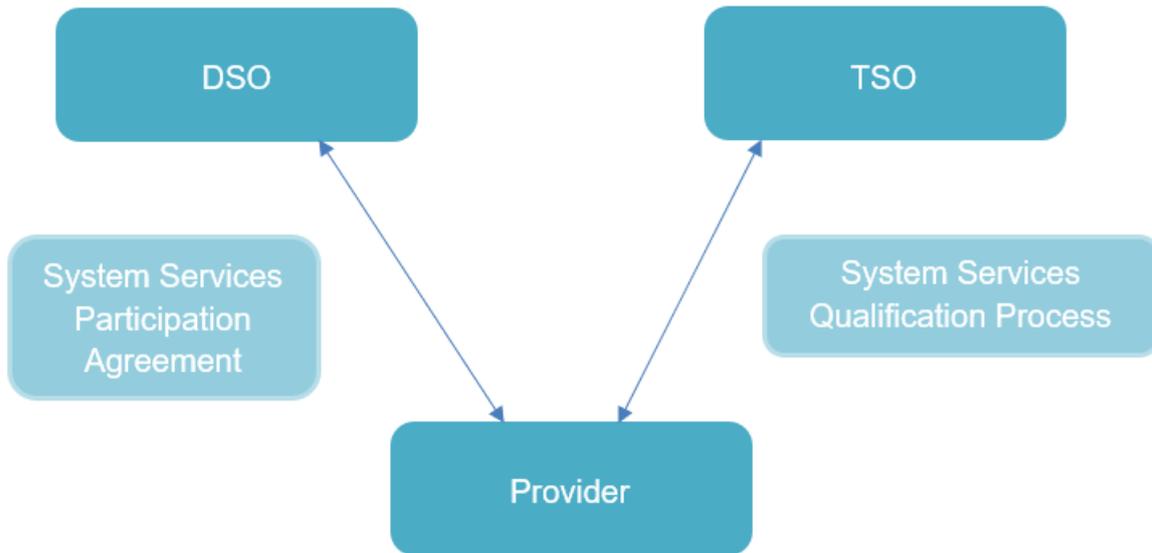
3.5 Distribution System Interactions

Following consideration of the responses to the Scoping Paper in relation to the interaction with the distribution systems the SEM Committee's view is that the important role of the distribution operators are accounted for in the arrangements. In terms of the governance of ongoing rule changes the SEM Committee considers that its proposals in section 3.3 ensure that the needs of the distribution systems will be adequately represented. Additionally, the SEM Committee has developed the following proposals in relation to potential system services providers connected to the distribution system. Under all three options below, it would be the responsibility of the relevant DSO to set any restrictions on a provider's ability to offer system services to the TSOs.

3.5.1 Option 1: Provider-Led

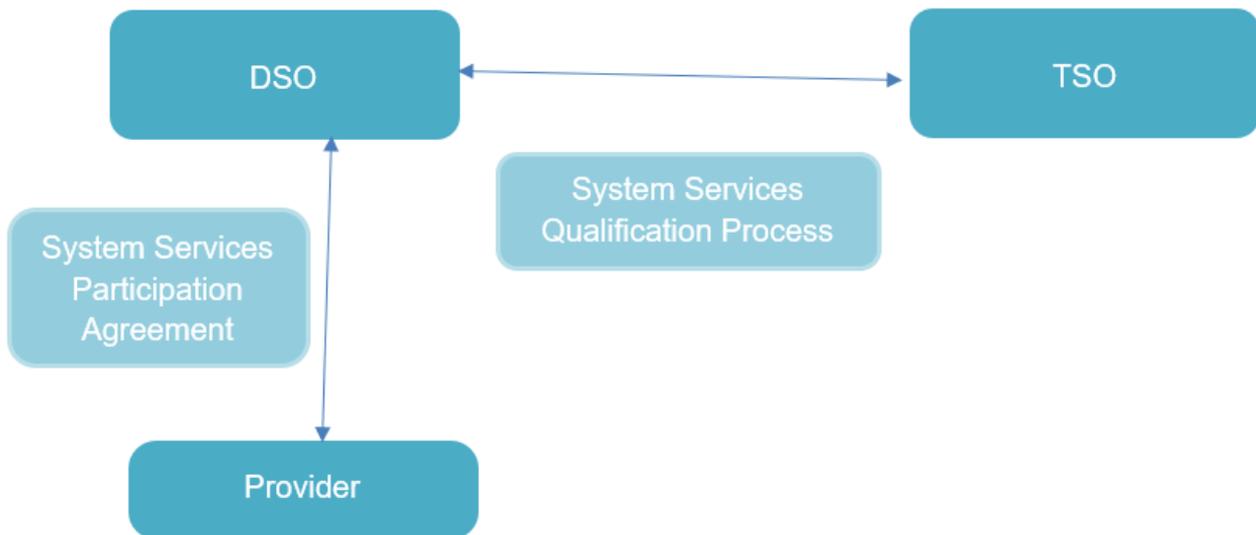
Under this option, the provider would be responsible for engaging with the relevant DSO and TSO separately, that is the provider would engage directly with the relevant TSO to qualify as a system services provider and would also engage directly with the relevant DSO to obtain their consent to provide system services to the TSO. It would be the provider's responsibility to comply with the requirements of both the TSO and DSO, for example only contracting with the TSO for the volume of services agreed with the DSO.

This approach has the benefit of flexibility, allowing the provider to have more control over the process as they can engage directly with both system operators. It also allows the TSOs and DSOs respectively to develop their own processes and maintain a direct point of contact with the provider, which may accommodate a more diverse range of circumstances than a more centralised approach. It is noted that this does not preclude the system operators separately agreeing a set of overarching principles or guidelines to maintain an efficient whole-of-system approach.



3.5.2 Option 2: DSO-Led

Under this option the provider would have its primary relationship with the relevant DSO who would then engage with the relevant TSO. This approach has the advantage of allowing the DSO to optimise the contracted system services volumes and consider system level issues directly with the TSO given the needs of the distribution and transmission systems. However, this approach may provide less flexibility for the provider and may complicate the TSOs' qualification process.



3.5.3 Option 3: TSO-Led

Under this option, the provider would have its primary relationship with the relevant TSO who would then engage with the relevant DSO. This approach is similar to the current process where providers apply directly to the TSO and has the benefit of maintaining a direct relationship between the provider and the TSOs while allowing the TSOs and DSOs to co-ordinate a system level approach. However, there is a risk that this approach will not facilitate a granular and dynamic evaluation of the constraints on the distribution systems. The DSO and DNO have also raised concerns that this approach may be an impediment to their ability to operate the distribution networks securely.

Consultation Questions – Governance Arrangements:

Question 2: What are stakeholders views on the options and recommendations presented for qualification/registration? Are there further options that may be considered?

Question 3: What are stakeholders views on the proposed formalisation of the QTP?

Question 4: What are stakeholders views in terms of the introduction of a single System Services Code?

Question 5: What are stakeholders views on the options in terms of governance of rules changes?

Question 6: Do stakeholders have views on the potential to amalgamate different Panel meetings?

Question 7: What are stakeholders views on the funding arrangement proposals?

Question 8: What level of involvement should the DSO/DNO have in the governance process?

Question 9: How should the interactions with distribution connected parties be governed?

Question 10: Are there any further considerations for the High Level Design of the Governance Arrangements?

4 AUCTION DESIGN

Following the scoping phase and discussions with stakeholders, the SEM Committee is now in a position to bring forward potential market designs for the competitive daily procurement of System Services. These proposals aim to ensure that the system will have sufficient volumes of provision across the range of necessary services at all times.

The SEM Committee recognises that a whole system approach will be required in such a project. This includes energy and capacity market considerations and the role of the DSO/DNO. For example, as electricity flows at the transmission and distribution level become more diverse and variable, both network operators will need to play a more active role in managing the network by further facilitating technologies such as demand side response (DSR), Solar PV, and batteries. These technologies both contribute to a reduction in carbon emissions and provide a growing portion of the balancing capacity services required to support the system.

The SEM Committee therefore considers it vital that the System Services market is aligned with and considered in the context of the wider energy market, including the energy trading arrangements and capacity market. For this reason, a number of auction designs are considered. Guided by European requirements, the EBGL and CEP in particular, three options are proposed for the procurement of System Services. There remains uncertainty as to whether daily auctions will be suitable for procuring all volumes of all services, and the SEM Committee has developed proposals around 'layers' of procurement, with the daily auctions being the central layer.

In summary, the design options are as follows:

- The first design option is based on auctions that would take place after the publication of results from the Day Ahead Market for energy (DAM).
- The second option would see the System Services auction take place ahead of the opening of the DAM; and
- The third option outlined is based procurement taking place after the real time balancing of the market. Participation in this system services market is then constrained to those services plant could actually deliver given their implied running following the balancing market.

All solutions have been analysed against the SEM Committee's criteria set out in the previously published decision paper (SEM-21-021). However, as this is a high-level design any proposed solution would need to retain a level of adaptability and simplicity so that any system changes caused by future policy developments can be facilitated.

4.1.1 Option 1: Post DAM Day Ahead System Services

Under Option 1, the short-term auction for the competitive procurement of System Services will be based upon a number of key stages, as illustrated in figure 1 below. The process will involve the TSOs carrying out an auction after the close of the DAM market to procure sufficient volumes of Services required to balance the system for the upcoming trading day and help to ensure security of supply. A new auction platform will developed, enabling the procurement of Services.



Figure 1: End-to-End Process for System Services Procurement

In summary, the steps are set out below. Further detail is also included under Appendix 1.

1. **Publication of Indicative Volumes:** The publication of indicative volumes should be the start of the process to procure System Services. Within this step, the TSOs will be required to publish forecast volumes for each System Service for which daily auctions are held. This will be made publicly available before the close of the DAM market and will cover all periods throughout the trading day for System Services.
2. **Publication of updated Volumes:** The TSOs will publish updated volumes following the closure of the DAM, when the results are known. These updated volumes will have greater accuracy as the DAM results will be known, and these will be the basis for the auctions.
3. **Submission of Offers:** Participants will be able to submit offers for each trading period. These offers will include volumes and prices for each service. The design will ensure that participants will be able to submit a set of offers for each service, with offers comprising a price for each volume of service offered for each trading period. Gate closure for bids will take place at a defined time following publication of DAM auction results.
4. **Initial Auction:** The timing of the initial auction will be bounded by a number of factors. It will be:
 - i. after the results of the DAM auction have been published; and
 - ii. before the first day ahead Long-Term Schedule (LTS) run.

The auction will procure sufficient System Services volumes to meet forecast requirements determined by the TSO for each service. The auction will procure each service and it is envisaged that it will have a single clearing price for each product.

5. Publication of Auction Results: Following completion of the auction, both the clearing price and volume procured for each service in each period will be made publicly available by the TSO. Participants will then be responsible for reflecting the outcomes in their PNs.

This approach would clearly be compliant with European Legislation. Under the definitions contained within Article 2 of the EBGL there is a clear distinction made between Balancing Capacity and Balancing Energy. Balancing capacity being a product for which procurement is carried out based on a forecast requirement and which must be kept available for use as balancing energy if required. Holding daily auctions that treat balancing capacity and balancing energy as distinct and separate would be compliant with the EBGL and the CEP from the perspective of the competitive auction requirements.

Additionally, at a high level, such a market could be simply designed, and would be easy to understand in terms of regulatory oversight, and for investment decisions. Clarity for investment decisions and clear price signals would also encourage the development of new renewable projects, which would support facilitating the energy transition and also help meet issues around system need.

The clarity and simplicity will also enable this approach to be adaptable to any potential future changes to market design. This simplicity would further be beneficial in giving providers an understanding of interactions with the energy and capacity market.

However, if System Services auctions are run after the day-ahead energy market, service providers may only be able to ensure they meet their System Service provision obligations through reflecting them in their PN submissions. This may require adjustment of their energy position in the Intraday Markets and potentially through secondary trading of System Services.

This approach will also rely on the accuracy of the TSOs forecasting of the required volumes, in order to maximise the efficiency of what is procured and minimise the amount of redispatch required. The requirements might not be easy to accurately forecast at all times, so the knock-on impact may be that services may be over procured or under procured from time to time. This would have an economic impact on consumers and may require the TSOs to constrain on units to securely manage the system.

Market power issues may arise if users have sight of the DAM results prior to entering System Service market bids. A potential mitigant could be to hold price auctions prior to DAM opening and volumes auctions following closure of the DAM. Views are sought on progressing such an approach.

4.1.2 Option 2: Pre-DAM Day Ahead System Services

This option will involve the TSOs carrying out the auction before the close of the DAM market, allowing units to bid into the DAM knowing their system services position, reflecting this in their

offers. The outcome of the system services auctions, for each unit, may be reflected in the TSO scheduler.

In summary, these steps are set out below. Further detail is also included under Appendix 2.

- 1. Publication of Volumes:** Again, the publication of volumes should be the start of the process to procure System Services. Within this step, the TSOs will be required to publish forecast volumes for each System Service. This will need to be made publicly available before the close of the DAM market and earlier on D-1 than would perhaps be expected under Option 1. This will cover all periods throughout the trading day for System Services.
- 2. Submission of Offers:** Participants will be able to submit offers up to an as yet to be determined point in time. These offers will include volumes and prices for each service. The design will ensure that participants will be able to submit a set of offers for each service, with offers comprising a price for each volume of service offered for each trading period.
- 3. Initial Auction:** The initial auction will run before the Day-Ahead Energy Market at a time to be decided upon in the detailed design phase. The auction will procure sufficient System Service volumes to meet forecast requirements determined by the TSO for each service. The auction will procure each service and it is envisaged that it will have a single clearing price for each product.
- 4. Publication of Auction Results:** Following completion of the auction, both the clearing price and volume procured for each service in each period will be made publicly available by the TSO. Participants will then be responsible for reflecting the outcomes in their PNs.

As this approach would also see daily auctions carried out that treat balancing capacity and balancing energy as distinct and separate, it would be compliant with the EBGL and CEP from the perspective of the competitive auction requirements.

Additionally, at a high level, such a market could be simply designed, and would be easy to understand in terms of regulatory oversight, and for investment decisions. Clarity for investment decisions and clear price signals would also encourage the development of new renewable projects, which would support facilitating the energy transition and also help meet issues around system need. The clarity and simplicity will also enable this approach to be adaptable to any potential future changes to market design. This simplicity would further be beneficial in giving providers an understanding of interactions with the energy and capacity market.

If the system services auctions are run before the day-ahead energy market, service providers may be able to forecast energy prices and/or opportunity costs, if any, of offering system service volumes and this would be reflected in all of their energy market trading and system service bids. It may allow providers to trade in such a way that they can meet their system services obligations.

However, the publication of required volumes by the TSO would be estimated at the day ahead stage before providers have achieved any energy market positions and other information from

the energy market is known. This could increase forecast error of the system service requirement of certain units (wind, solar & DSUs) as this information governs the real-time requirements and may lead to a large amount of redispatch in order to take account of technical constraints. Similar to Option 1, services may be over procured or under procured on any given day and may require the TSOs to constrain on units to securely manage the system.

This may only benefit those technology types who are prioritising system services commitments and would prefer to bid their balance into the energy market after confirmation of their system service commitments. The majority of other stakeholders indicated a preference to hold the auctions post-DAM, as they would prefer confirmation of energy market commitments before making system services bids.

4.1.3 Option 3: Ex-Post Balancing Market Solution

The third option under consideration by the SEM Committee is based upon an ex-post Balancing Market solution.

After the day-ahead energy market and any potential System Services procurement process(es) outlined in option 1 above, the TSO must take further actions to ensure overall system security and stability in real time i.e. after gate closure. This calls for continuous matching of electricity supply and demand. These actions are required after the day-ahead and intra-day markets because these markets do not currently account for the physical complexities of operating the power system. This separation comes at a cost, which is the appearance of potential infeasibilities that have to later be solved by the TSO. It may be the case that even with development of state-of-the-art operational tools, by the TSO, that some operational and reliability considerations remain impossible to incorporate into the day-ahead System Service market process(es).

Therefore, the SEM Committee have considered an approach similar to option 5 of the proposed auction designs submitted by the TSOs as part of their response to the Scoping Paper SEM-20-044. The general understanding of this approach is that bids for System Services would be submitted pre-balancing market, and following the balancing market the TSOs would match the bids with the optimal dispatch schedule.

In summary, these steps set out below. Further detail is also included under Appendix 3.

- 1. Publication of Indicative Volumes:** The publication of indicative volumes should again be the start of the process to procure System Services. Within this step, the TSOs will be required to publish forecast volumes for each system service. This will be made publicly available before the close of the DAM market and will cover all periods throughout the trading day for System Services. These publications are indicative volumes only and may not reflect real-time requirements.

- 2. Submission of Offers:** The main difference with this option is that while it remains a competitive process, the selected volumes are determined by the TSO, based with reference to the merit order and defined service requirement volume. Prices are based on participant bids where they will be required to submit a simple offer price per trading period per service.
- 3. Auctions:** Auctions will be run after real-time operations, with exact timing dependent on the data needed and processes for calculating this data. The auction will remunerate the volumes to meet the volume requirements determined by the TSO and will procure each service individually in parallel ex-post.
- 4. Publication of Firm Cleared Volumes and Prices:** Following completion of the auction, both the firm cleared price and firm cleared volume procured for each service in each period will be made publicly available by the TSO.

This option would see the system scheduled in largely the same way as it is today. The primary benefit of this approach is that it empowers the TSOs to manage the dispatch of System Services in a manner that would be expected to reflect operational practice to maintain system security. Having sight of the post balancing market outcomes will enable the TSOs to easily match up service providers to where service provision was actually required. This alignment alleviates most concerns with constraints or inefficiencies, as only in-merit volumes up to the TSO volume requirement will be paid i.e. consumers will only be paying for the services that are required and could be utilised based on network constraints.

However, the design may lack clarity in how bids are settled and would have less explicit alignment between energy market positions and procured services, with relatively more complexity than the simpler post DAM Day-Ahead auction option. As there is no commitment on the providers at the point of bid submission price formation may be particularly complex. The TSOs would maintain control on settling the market in what they consider to be the most efficient manner³, and a framework based on the operational practice of the TSOs may lead to issues around clarity and transparency. Moreover, this may mean that this approach will not send the right price signals for products, if the price is set by what the TSOs view as the effective decision based on system needs rather than the price being set by the value determined by participant bidding. This uncertainty may lead to issues with progressing new projects and may have a knock on impact on the energy transition and on security of supply.

It is also noted that this approach does not align as closely with the European approach to the procurement of balancing capacity as the other options, and therefore there is potential that the arrangements may need to be revised in the future, which may create uncertainty for investors.

³ For clarity, the SEM Committee acknowledges that the TSO determines the most efficient dispatch of the system with a view on constraints and maintaining system security.

4.1.4 Assessment of Options

Given the need for European Compliance, and the SEM Committee's considerations that Options 1 and 2 would be more readily adaptable to future changes in policy and developments in other markets, the SEM Committee considers that both Option 1 and 2 are more favourable compared to Option 3. Both these options also provide greater clarity for investors, and the SEM Committee considers that market based solutions send appropriate economic signals. Option 3, while having the benefit of taking into account constraints, does not align as closely with European legislation as the other two options. Moreover, it could be interpreted as not being a market based solution, and the determination of successful units may be unclear to bidders into the market as it is driven by TSO operational practice rather than price determined.

Between Options 1 and 2 the SEM Committee considers that, while both offer clarity for investors, European compliance, simplicity and adaptability, on balance Option 1 is more preferable. Under Option 1, the volumes forecast and auction would take place closer to real time, reducing the risk of variance with outturn requirements. Additionally, the majority of Scoping Paper responses indicated a preference for having sight of energy market outcomes prior to bidding on System Services. The SEM Committee will continue to explore the merits of both Options 1 and 2 throughout the consultation and HLD decision making process.

SEM Committee Proposal: Option 1, Post-DAM Day Ahead System Services Auction

Consultation Questions – Auction Design:

Question 11: What are stakeholders views on the Auction Design options and SEMC Recommendation?

Question 12: Are there any further considerations in terms of the Auction Design options?

5 MARKET DESIGN

The Market Design section set out a number of proposals which would support the auction design. A number of associated issues and proposals are also set out. The first of these is the importance of volumes and proposals on how to ensure transparency for the market; regardless of the auction design accurate and timely forecasts of the volumes to be procured will be essential.

Additionally, views are requested on the merits of secondary trading held after the first auction and before gate closure of the Balancing Market in each relevant trading period, to allow providers an opportunity to adjust their positions in the energy and system services markets.

Consideration is also given to how commitment obligations can be enforced; setting clear and enforceable commitments on auction winners is an essential component of price formation and the reliability of the auction results. The SEM Committee also sets out its proposals on scalars; scalars have proven a valuable element of the current Regulated Arrangements and the SEM Committee considers that some of the scalars should be retained in the Future Arrangements.

A further issue is how to deal with in-merit providers who cannot be dispatched by the TSOs due to constraints. Essentially, while the provider is making the service available, the services are not available to the TSO in practice. A similar issue has been the subject of policy decisions in the energy market. In the energy market, a concept of firm and non-firm access was used; where generators with firm access were held financially whole in the event of network constraints preventing the export of their power. This approach was also applied in the auction for System Services Fixed Contracts held in 2018.

The SEM Committee also sets out its proposals for layered procurement which will provide for competitive procurement of services where the daily auctions may not be appropriate, where there is limited competition or locational issues for example. The format of the auction is not discussed in detail in this paper, and will be explored further in the detailed design phase. However, some initial thinking is presented to seek views from stakeholders which will facilitate the development of more detailed options.

5.1 Volumes

The SEM Committee has consistently emphasised the importance of the TSO providing accurate, detailed, and timely analysis on volumes for system services. Unfortunately however, the TSO's approach to this analysis has progressed slowly. Indicative forecast volumes for 2020 were provided for a number of scenarios. However, the operational requirements have not been provided to the RAs and it is understood that the TSOs do not actively analyse and consider available volumes or volume requirements in the context of system services.

It is important for the market to have accurate information on the future needs of the system in addition to the current needs of the system in order to make investment decisions. Additionally, as a practical matter the TSOs will have to select a volume for each service that will be procured in the auction.

The SEM Committee proposes that the TSOs produce annual reports on the long term system services requirements, in addition to frequent publication of shorter term forecast requirements. Daily volumes will also be required for the purposes of the auctions. The SEM Committee requests stakeholders' views on what information is required of the TSOs to ensure the efficient operation of the market.

5.2 Secondary Trading

The SEM Committee seeks views on whether a framework for secondary trading should be developed. The advantage of secondary trading would be to allow for providers to adjust their System Service market positions in response to changes in the energy market.

This should facilitate greater efficiency and alignment between the energy and system services markets. It would also facilitate providers who rely on closer to real time forecasts participating in the market. However, it may introduce additional complexity, and given that it would depend on the primary auction design decision, this may be more appropriate to consider as part of the Detailed Design.

5.3 Commitment Obligations

For an auction to work effectively there must be a clear commitment placed on the winners of that auction. The cost of meeting a commitment will determine the minimum price at which a provider will be willing to provide the service. In the case of auction design options 1 and 2 i.e. those auctions that take place before the Balancing Market, the obligation would be for the provider to make the services they have been contracted for available to the TSO at their FPN.

In the case of an auction taking place after the Balancing Market it is less straightforward how a commitment could be placed on the providers winning in the auction as this would occur after their actual dispatch; this also raises questions as to how price formation would work under this option. This is a significant complexity that would need to be considered subsequently if that auction design were progressed.

It is proposed that where an auction winner does not make its contracted volumes⁴ available at its FPN a penalty would apply. It is proposed that this penalty would be made up of two parts, a fixed element and a scalar. The purpose of the fixed element is to disincentivise the provider

⁴ In the event that secondary trading arrangements are progressed, contracted volumes would be based on the position at the conclusion of the secondary trading market.

from breaking its commitment and also to compensate the customer for the provider's failure which is likely to require the procurement of additional services by the TSO in the Balancing Market.

The purpose of the scalar element is to disincentivise the provider from repeatedly breaking its commitment and to ensure the reduced reliability of the provider's service is reflected in the price the customer pays. It is envisaged that the fixed element would be a one-off penalty applying in respect of that trading period and that the reliability scalar would reflect the providers reliability in previous trading periods. So, a provider that had perfect reliability over a defined period of time would have a scalar equal to 1.0, whereas a provider that had not met all of its commitments over that defined period of time would have a scalar of less than 1.0. The SEM Committee anticipates that this will decrease the competitiveness of unreliable providers, and lead to greater reliability from the auction winners.

The SEM Committee seeks stakeholders' views on how commitment obligations should be enforced, and the proposals set out above.

5.4 Scalars

Under the current Regulated arrangements, the following scalars are in place: a performance scalar; a product scalar; a locational scarcity scalar; and a temporal scarcity scalar. It is proposed to retain each of these scalars with the exception of the temporal scarcity scalar.

As the auction prices will reflect the relative scarcity of services under current system conditions the temporal scarcity scalar is no longer considered necessary. The product scalar can continue to work in an auction framework as it will incentivise higher quality services without the complexity of segmentation of the existing product categories. Similarly, the locational scalar will incentivise provision of services where they have most value to the system and the performance scalar will continue to incentivise high performance in delivering the service when activated by the TSOs.

Performance Scalar and Reliability Scalar: The SEM Committee considers it important to highlight the distinction between the performance scalar and the reliability scalar. The performance scalar relates to the provider's performance when called upon (e.g. delivering reserve when dispatched in response to a system event). The reliability scalar relates to the provider's reliability in making its contracted volume available (e.g. ensuring its PN's reflect its contracted position so the reserve is available for the TSO whether or not the reserve is actually called upon).

5.5 Imperfections & Firm Access

It is the nature of electricity systems that the real time dispatch will have some deviation from the economic dispatch that would occur with a “perfect network”, i.e. with no constraints. In the case of the energy market this results in the dispatch schedule differing from the outcome produced by the market and in the TSOs taking non-energy actions in the Balancing Market.

In the case of system services, network constraints could mean that a system services provider could win the auction and in theory make its service available to the TSOs. However, if the TSOs could never call on this provider for those services in practice due to network constraints the auction result would not reflect the true volume of services available to the TSOs. Against this is that unconstrained energy markets are commonly used as they promote long-term efficiency and create transparency around constraint costs.

The SEM Committee seeks views on whether it is appropriate to apply a firm access like approach to system services, reflective of the principle of usability. Providers with firm access to the system services market would be able to fully participate in the auctions and (if they met their commitments) would be paid even where network conditions on the day meant that the TSOs could not have activated those services. Non-firm providers would have restrictions placed on them whereby they may not be eligible to participate in the auction under certain system conditions. It is also proposed that where the TSOs were required to constrain on units, including for system services reasons, that were not successful in the auction that this would be done through the Balancing Market.

This approach would ensure that units were held whole but that the auction would continue to send the appropriate economic signals. Additionally, this approach would facilitate the transparent identification of constraints on the system. However, it is worth noting that this approach may lead to providers with firm access bidding into the System Services market despite knowing that they will not be called upon to provide services (but still paid).

An alternative approach [would be to consider that all providers have non-firm access to the market for the provision of System Services. This would prevent consumers paying for services that could not be dispatched due to network constraints. Investors and bidders would need to consider this risk and would consequently be likely to avoid seeking to connect to constrained areas of the network.](#)

It is further noted that the proposed High Level Design has several elements, including the locational scalar and layered procurement, that should assist the TSOs in developing market solutions to constraints until the necessary network reinforcements had been made.

5.6 Products & Layered Procurement

As noted in the Scoping Paper the necessary market conditions may not be fully in place for all services. This may be due to the nature of the service itself, the need for new technology, locational issues or a lack of competition.

The SEM Committee has considered a number of options that would allow the integration of the economic decision making of operating the system along with optimising the procurement of System Services required to run the system in an economic and efficient manner. Moreover, new arrangements for the procurement of Services will need to provide a pathway for investment in additional services that the system requires to operate in any future 70% RES-E environment. The SEM Committee is of the view that this can be ensured by taking a flexible approach to the procurement of System Services.

It is the SEM Committee's view that procurement over a longer timeframe than daily may be needed to provide clarity for investors. A short-term approach on its own could result in an inability to deliver any required investment and a failure to accommodate increasing levels of SNSP and government RES-E targets.

The SEM Committee recognises that continued investment by service providers will be needed in order to innovate and address scarcities and system needs, both through the optimisation of existing technologies and through investment in new technologies. However, it is also the SEM Committee's view that investment will need to be targeted and linked to increased operational capability.

To facilitate this, the SEM Committee proposes to require the TSOs to publish a document that would, at an early stage, help to identify System Service scarcities required to operate the system at ever-increasing levels of SNSP, as we move toward a 95% - 100% SNSP target in 2030. This will supplement the work already completed in EU-SysFlex Task 2.4.

The SEM Committee expects that this will allow for a layered approach to the procurement of System Services and that this approach will allow for fixed contracts, longer-term procurement and daily auctions. This approach should offer a balance between stimulating investment in service provision, where this is required, and enabling competition to drive down the price of servicing provision where the market is competitive. It is noted that this builds upon the Fixed Contract framework set out in SEM-21-021, that is currently being explored by the TSOs with a view to procuring inertia and related services initially.

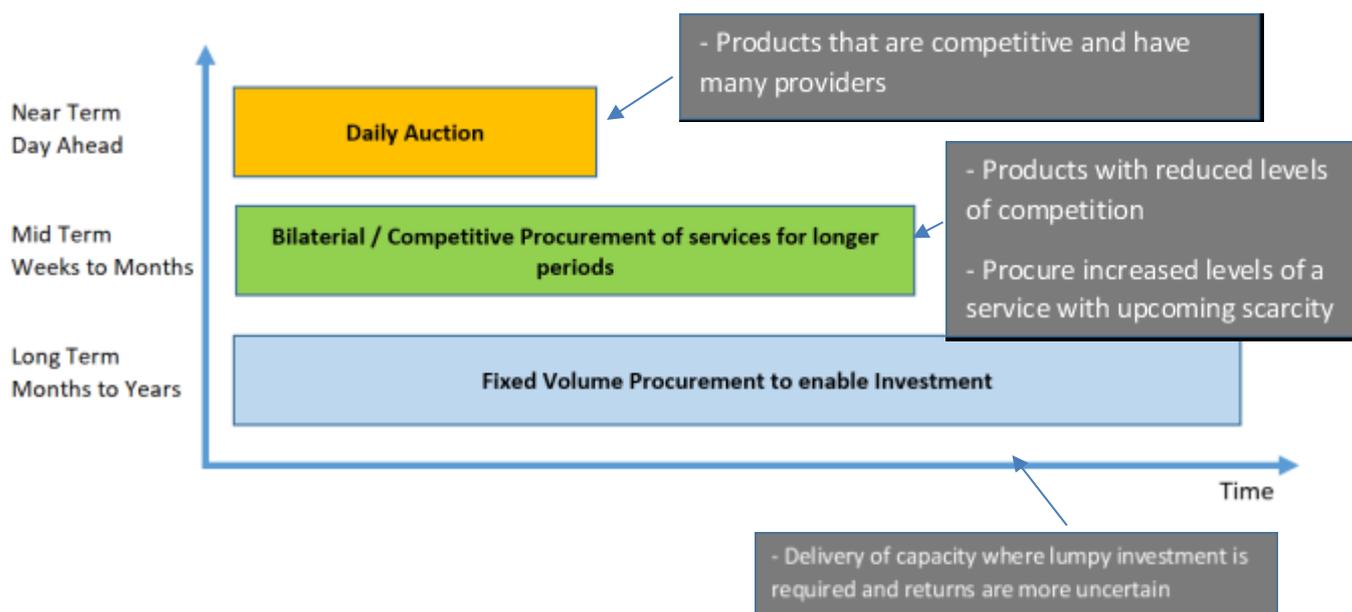


Figure 2: High-level overview of a layered approach to investment in System Services

It is likely that certain services will naturally lend themselves to competitive auctions where others may require longer-term contracts that have some market power mitigation measures attached to their procurement. Other service investments may require longer-term revenue certainty to enable product delivery, and this would be covered in the new arrangements. In summary, there may be certain services that are more conducive to procurement using a near-term (Day Ahead), Mid-term (weeks to months) and a long term (months to years) approach.

For example, it may be the case that voltage and inertial response products are initially suited to longer-term auctions or bilateral contracts given the more locational nature of the product and limited number of providers. The TSO have already identified concerns with voltage stability and associated localised scarcities as part of their response to the Scoping Paper SEM-20-044. In the near-term, a daily auction design may be more appropriate for reserve and ramping products that are strongly related to energy markets.

Decisions around the procurement of individual products will form part of the detailed design and may change over time as system scarcities and requirements change. The SEM Committee also considers that an approach of procuring some services across several time-periods may be advantageous to promoting a mix of technology solutions, mitigating market power concerns and facilitating a transition to short-term markets for most services over time.

It is the SEM Committee's view that longer-term procurement can be covered under the fixed contract process established by SEM-21-021, which sets out that each fixed contract procurement process will be tailored to products required by the System Operators. With regard to mid-term procurement, the SEM Committee is of the view that this may require elements of the Fixed Contract approach and elements of the daily auction approach. The detailed design

will need to consider these processes further and some form of price caps may need to be introduced should there be limited competition in the procurement of System Services for any service.

5.7 Additional Considerations for Market Design

Further considerations in designing the System Services Market include market power considerations. Market power considerations will be a focus following the decision on the High Level Design, when the approach to auction design will be determined.

Consultation Questions – Market Design:

Question 13: What information is required to get a full view of the volumes requirements for System Services?

Question 14: What are stakeholders views on the development of Secondary Trading of System Services?

Question 15: What are stakeholders views on the proposals regarding Commitment Obligations and Scalars?

Question 16: Do Stakeholders have views on the introduction of the concept of Firm Access to the System Services market?

Question 17: Do stakeholders have views on layered procurement of System Services? What approach could be taken to support this?

Question 18: Are there any further considerations in terms of Market Design?

6 NEXT STEPS

The High Level Design consultation will remain open for 8 weeks, closing on 21 October 2021. Similar to the Scoping Phase, workshops will be arranged during the consultation period, and bilateral engagements can be arranged at the request of stakeholders.

Should stakeholders have any queries or comments please contact Dylan Ashe (dashe@cru.ie) or Owen Kearns (owen.kearns@uregni.gov.uk). All responses should be submitted by email to both these addresses.

7 APPENDICES

7.1 Appendix 1

Post DAM Day Ahead System Services: Further Detail

The following section takes each of the stages above and explores their design in further detail.

Publication of Volumes

Determining the appropriate volume of System Services required to maintaining a safe and secure network is the first critical juncture in the design of the new competitive arrangements. Participants will require in advance, a forecast from the TSOs of required volumes of each product that will be procured for each trading period.

Manually initiated runs may also be performed to consider significant changes to inputs (such as a forced outage of a large unit) so that the TSO can, if necessary, update plans to ensure that, for example, system security requirements are met.

The TSOs will be required to publish this analysis daily to the market in sufficient time for that information to be taken into account in both DAM market bidding and system services bidding, for example before 10am for an 11am DAM gate closure time. This should provide participants with sufficient time to assess the estimated need for each service in every trading period of the trading day.

The SEM Committee is also of the view that the TSOs should be required to publish and update as necessary, a document that outlines how they will determine the requirements for each individual system service. Where appropriate this will include a clear methodology for determining the volume of procurement of each service. The SEM Committee also understands that there may be instances where volumes will diverge from the methodology and the TSOs may be asked to provide an explanation from time to time.

Submission of Offers

The detailed design will consider the appropriate time for the trading day for System Services products. Deadline for submission of all offers for all System Services will also form part of the detailed design, along with the trading period length. Should any service require trading periods to be amalgamated into longer periods then this should be accommodated in the detailed design of the platform. Units will submit offers comprising a service volume and a bid price per trading period.

Auction

The initial Auction will run after the DAM closure and before completion of the first day ahead LTS run. The detailed design of the auction, including the auction format and timings, will be developed further in the detailed design.

All successful units will be obligated to provide the capacity volumes of each system service they offered in the auction at their FPN. If the capacity is activated by the TSOs in the Balancing Market the providers will be required to delivery in line with the Balancing Market rules. If the successful bidder does not provide the service at FPN or is unable to deliver the service in the Balancing Market when called upon penalties will be applied, as covered in section 5.3 of this paper.

Publication of Results

Results will be published on the TSOs website, following the auction. This would include a firm cleared volume for each of the relevant system services for each unit for each trading period and a firm cleared price for the volumes based on the highest offer price associated with a cleared volume in the period.

The TSO will also publish a summary of the volumes cleared for each product in each trading period alongside the market results. The TSOs will also publish volumes of each service activated in the previous trading day.

7.2 Appendix 2

Pre DAM Day Ahead System Services: Further Detail

The following section takes each of the stages above and explores their design in further detail.

Publication of Volumes

Determining the appropriate volume of System Services required to maintaining a safe and secure network is the first critical juncture in the design of the new competitive arrangements. Participants will require in advance, an forecast from the TSOs of required volumes of each product that will be procured for each trading period.

Manually initiated runs may also be performed to consider significant changes to inputs (such as a forced outage of a large unit) so that the TSO can, if necessary, update plans to ensure that, for example, system security requirements are met.

The TSOs will be required to publish this analysis daily to the in sufficient time for that information to be taken into account in both DAM market bidding and system services bidding, for example before 10am for an 11am DAM gate closure time.. This should provide participants with sufficient

time to assess the estimated need for each service in every trading period of the trading day. The deadline for this publication may need to be much earlier given the closure of the DAM at 11:00 D-1.

The SEM Committee is also of the view that the TSOs should be required to publish and update as necessary, a document that outlines how they will determine the requirements for each individual system service. Where appropriate this will include a clear methodology for determining the volume of procurement of each service. The SEM Committee also understands that there may be instances where volumes will diverge from the methodology and the TSOs may be asked to provide an explanation from time to time.

Submission of Offers

The detailed design will consider the appropriate time for the trading day for System Service products. Deadline for submission of all offers for all System Services will also form part of the detailed design, along with the trading period length. Should any service require trading periods to be amalgamated into longer periods then this should be accommodated in the detailed design of the platform. Units will submit simple offers comprising a service volume and a bid price per trading period.

Auction

The initial Auction will run before the opening of the DAM. The detailed design of the auction, including the auction format, will be developed further in the detailed design.

All successful units will be obligated to provide the capacity volumes of each system service they offered in the auction at their FPN. If the capacity is activated by the TSOs in the Balancing Market the providers will be required to deliver in line with the Balancing Market rules. If the successful bidder does not provide the service at FPN or is unable to deliver the service in the Balancing Market when called upon penalties will be applied, as covered in section 5.3 of this paper.

Publication of Results

Results will be published on the TSOs website, following the auction. This would include a firm cleared volume for each of the relevant system services for each unit for each trading period and a firm cleared price for the volumes based on the highest offer price associated with a cleared volume in the period.

The TSO will also publish a summary of the volumes cleared for each product in each trading period alongside the market results. The TSOs will also publish volumes of each service activated in the previous trading day.

7.3 Appendix 3

Ex-post Balancing Market Solution: Further detail

The following section takes each of the stages above and explores their design in further detail.

Publication of Indicative Volumes

This stage of the design will reflect that presented in step 1 of Section 2.1 above. The SEM Committee again believe that determining the appropriate volume of System Services required to maintaining a safe and secure network is the first critical juncture in the design of the new competitive arrangements.

Participants will require in advance, an indicative view from the TSO as to the volumes of each product that will be procured for each trading period. The frequency of these publications will be decided in the detailed design phase. Manually initiated runs can also be performed to consider significant changes to inputs (such as a forced outage of a large unit) so that the TSO can, if necessary, update plans to ensure that, for example, system security requirements are met.

In any case, the TSOs will be required to publish this analysis daily to the market in sufficient time to consider in DAM energy market bidding. This should provide participants with sufficient time to assess the estimated need for each service in every trading period of day D.

The SEM Committee is also of the view that the TSOs should be required to publish, and update as necessary, a document that outlines how they will determine the requirements for each individual system service. Where appropriate this will include a clear methodology for determining the volume of procurement of each service. The SEM Committee also understands that there may be instances where volumes will diverge from the methodology and the TSOs may be asked to provide an explanation from time to time.

Submission of Offers

This design will ensure that participants will be able to submit a set of offers for each service. However, with this option, offers will only include a simple offer price per trading period per service. Offer volumes submitted will be calculated for participants based on what they could actually provide in real-time based on their constrained ex-post position.

The trading day for System Service products will likely be from, 23:00 GMT/IST the day before (D-1) to 23:00 GMT/IST on the day (D), which is midnight Central European Time (CET) but will be determined in the high level design. Deadline for submission of all offers for all System Services will also form part of the detailed design, along with the trading period length. Should any service require trading periods to be amalgamated into longer periods then this should be accommodated in the detailed design of the platform.

Auction

The auction will be developed by the TSOs and each service will likely be procured individually in parallel ex-post using the auction platform. The volume requirements per service would be a calculated representation of actual real-time requirements based on a combination of real-time system measurements and scheduling system outputs.

Given that all constraints are already accounted for in the volumes submitted, the output of the auction would therefore be a firm cleared volume, for each of the relevant system services for each unit for each trading period. There would also be a firm cleared price for the volumes based on the highest offer price associated with a cleared volume in the period.

In addition, there would be no obligation on successful units to deliver the capacity volumes of each system service given this is an ex-post process. Units would instead be incentivised to maintain real-time availability of services based on their FPN and balancing market bids to maximise their chances of being scheduled for the service.

Furthermore, only units who could, and did, provide the service would be paid. No ruleset would be required for settlement of units which could not provide the service in real-time, or settlement of units who were not successful in the auction but which were dispatched to provide the service in real-time.

Publication of Results

Results will be published following the auction(s) on the TSOs website. The TSO will also publish a summary of the volumes cleared for each product in each trading period alongside the market results. Furthermore, as with option 1, the TSO will also be required to publish 'utilised volumes' of each product procured, the following trading day.

5.1 Appendix 4

As noted above in this paper the auction format is not within the scope of this paper. It is appropriate to consider this in the context of the rest of the High Level Design following a decision from the SEM Committee. There are trade-offs with any auction format and the conditions in which the auction will run and the high level design of the auction will inform the relative merits of any particular auction format.

However, at this point the SEM Committee would like stakeholders initial views on the issue and requests views on what considerations the SEM Committee should take into account when developing options for the auction format. The SEM Committee's initial thinking is that the following formats could be developed into options in a subsequent paper:

- Multiple Sequential Auctions;
- Multiple Simultaneous Auctions;

- Combinatorial Auction; and
- Open Auction

One of the complexities in auctions for balancing capacity is that there are multiple services that interact in different ways for different providers. So for one provider, providing one service might allow them to provide three or four other services at no additional cost. But this may not be true of another provider.

Under a sequential auction each product would be auctioned separately in sequential order, with a price and volumes set for one product before bidding for the next product began. This would allow providers to take into account their commitments in the previous auction in each subsequent auction. The sequence would be important, and could be difficult to design without inadvertently benefiting one technology over the other.

The simultaneous auction would run the auctions for all products at the same time, this avoids some of the complexities of the sequential auction but does not allow the bidders to account for the results in one product in the bids for another product.

The combinatorial auction would allow bidders to submit multiple combinations of bids, allowing them to account for the interactions between products. This auction can be complex to solve however and the results may be less transparent than other approaches.

The open auction would run auctions for all services simultaneously but would allow bidders revise their bids in each in response to other bids. This approach allows for the bidders to arrive at an optimal combination of prices and volumes for all products given other bids. However, this approach may be more open to gaming than the other approaches.