IWEA,
Sycamore House,
Millennium Park,
Osberstown, Naas,
Co. Kildare.
W91 D627

NIRIG,
Arthur House,
41 Arthur Street,
Belfast BT1 4GB

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Emailed to: Dylan Ashe (dashe@cru.ie) & Bronagh McKeown (Bronagh.McKeown@uregni.gov.uk)

RE: System Services Future Arrangements Scoping Paper - SEM-20-044

The Irish Wind Energy Association (IWEA) and the Northern Ireland Renewables Industry Group (NIRIG) welcome the opportunity to engage with the SEM Committee and provide feedback on the System Services Future Arrangements Scoping Paper.

IWEA is the largest representative body for the Irish wind industry, working to promote wind energy as an essential, economical and environmentally friendly part of the country's low-carbon energy future. NIRIG is a collaboration between IWEA and RenewableUK and is the voice of the renewable electricity industry in Northern Ireland. Together we represent a large majority of the renewable industry supply chain on the island.

Introduction

Meeting ambitious climate change targets for renewable energy and decarbonisation over the next decade will require a fundamental re-think of how the power system has been operated up until this point and will require new operational procedures, policies, services and control centre tools to help manage the system.

The DS3 programme has been an extremely successful initiative that has enabled Ireland and Northern Ireland to be a world leader in the integration of renewable electricity onto the grid. The Regulatory Authorities and System Operators should be commended for their efforts in delivering the DS3 programme and the success it has had in minimising curtailment and very likely hitting 40% renewable electricity across the island for 2020.

The DS3 programme was developed with our 2020 targets in mind. Going forward the successful delivery of the enhanced DS3+ programme will be essential to managing increasing

volumes of renewable generation and meeting a minimum of 70% RES-E on the all-island system by 2030.[1,2]

It is extremely likely that operating a system capable of achieving 70% RES-E will require increasing the SNSP operational limit to 95%, or above, and removing many of the other existing operational constraints which limit the penetration of renewable generation on the system. The DS3 programme has so far maintained curtailment at levels of less than 5% but, as the volume of renewables connecting to the system continues to grow, it is certain that without a strong DS3+ programme and further SNSP increases, curtailment levels will increase substantially. IWEA's Saving Power report sets out that with current system operational constraints, and no new mitigation measures, curtailment levels could increase to 44% and the Ireland system alone would need over 21 GW of installed wind capacity to meet 70% RES-E due to these high curtailment levels.[3]

Removing these operational constraints, i.e. increasing SNSP limits and reducing Minimum Generation (Min Gen) levels is the single most important measure we can take to minimise curtailment out to 2030 and maximise the efficiency of our renewable resources. As demonstrated in Figure 1, moving to 95%+ SNSP and reducing Min Gen levels to 300 MW will be essential to minimising curtailment levels and maximising installed generation.

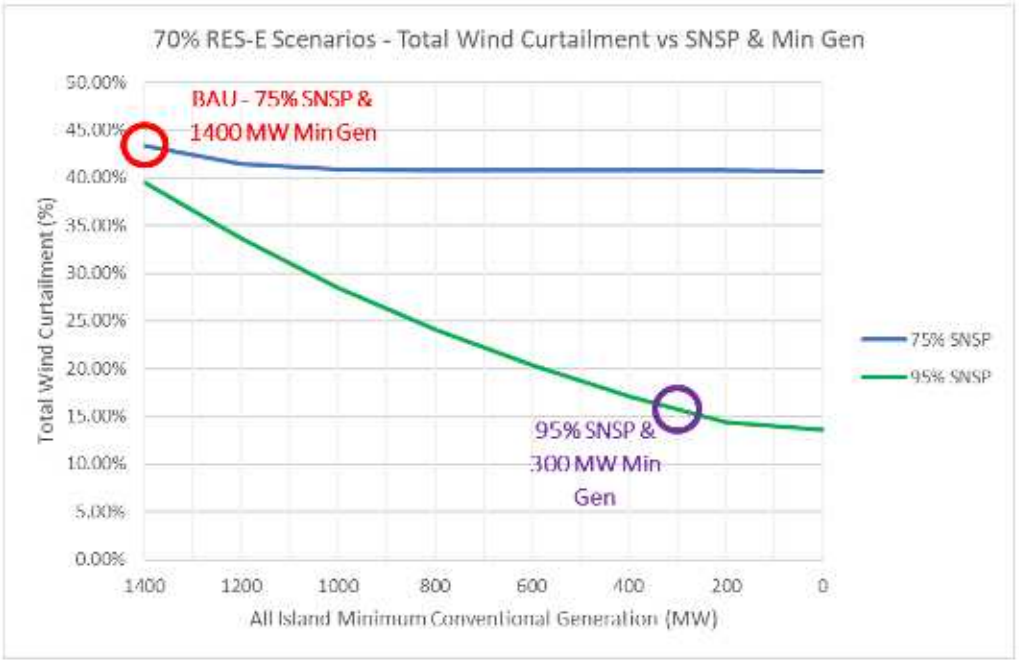


Figure 1: Curtailment vs minimum system conventional generation for 75% and 90% SNSP limits for 70% RES-E systems (Both lines represent a 70% RES-E system with the level of curtailment related to changes in Min Gen levels, all other system assumptions based on 2020 system).

[1] https://www.newsletter.co.uk/news/environment/my-vision-renewable-energy-sector-northern-ireland-2984852
[2] https://www.dccae.gov.ie/en-ie/climate-action/publications/Pages/Climate-Action-Plan.aspx
[3] https://www.iwea.com/images/files/iwea-saving-power-report.pdf

Achieving these goals for SNSP and Min Gen also has the added benefit of minimising the levels of dispatch down which developers factor into financial models when developing future renewable projects. A developer needs to factor in the future costs of dispatch down in their bid prices for the ongoing Renewable Electricity Support Scheme (RESS) auctions, and it is very likely this will be required in any future Northern Ireland support scheme auction also. Therefore, delivering higher levels of SNSP, coupled with reduced levels of Min Gen will lead to substantial cost savings through reduced auction bids which could save billions in consumer costs over the 15-year lifetime of the current contracts.

An area of work under the DS3 programme which has greatly improved the flexibility of the operating fleet and has already delivered huge value to the consumer is that of System Services. It is also an area which can deliver greater system flexibility, further savings and emissions reductions over the next decade as highlighted in Baringa's Store, Respond and Save report.[4]

To deliver these benefits it is critical that the System Services framework supports investment in new zero-carbon technologies that can provide System Services and reduce our reliance on conventional fossil fuel generation for service provision. Increasing SNSP to 95% and above will mean that the system must be capable of running with all our demand being met by renewable generation at any one time. Achieving such an operational state will likely require new System Services, but also require all of the existing and new services to be provided from zero-carbon technologies that can support the system with no conventional fossil fuel generation running during these times.

In IWEA's Saving Power report, and shown in Figure 2, we have categorised the existing System Services into groups and highlighted some of the zero-carbon technologies that can provide these services. The majority of these technologies exist today so it is important that investment signals are put in place to support their development as soon as possible as the emissions, cost savings and curtailment benefits can be delivered now rather than waiting until later in the decade.

[4] https://www.energystorageireland.com/wp-content/uploads/2020/02/Energy-Storage-Ireland-Baringa-Store-Respond-Save-Report.pdf

Figure 2: Categories of existing System Services and examples of zero carbon technologies which can provide the services

Baringa's Store, Respond and Save report highlights the benefits which can be delivered to the power system through delivering all System Services from zero-carbon technologies.

Baringa modelled scenarios with System Service constraints in place for the years 2021, 2023, 2025, 2027 and 2030, and then removed these constraints in turn – reflecting provision of system services (i.e. inertia, reserves, voltages) from 'non-energy market' zero-carbon sources such as battery energy storage, demand side response and synchronous condensers.

The modelling results show a potential system cost saving of €90 million per annum by 2021, increasing to €117 million by 2030 when all system services are sourced from zero-carbon sources instead of system services from fossil fuel i.e. power plants. Figure 3 below highlights the system cost savings under these different scenarios.

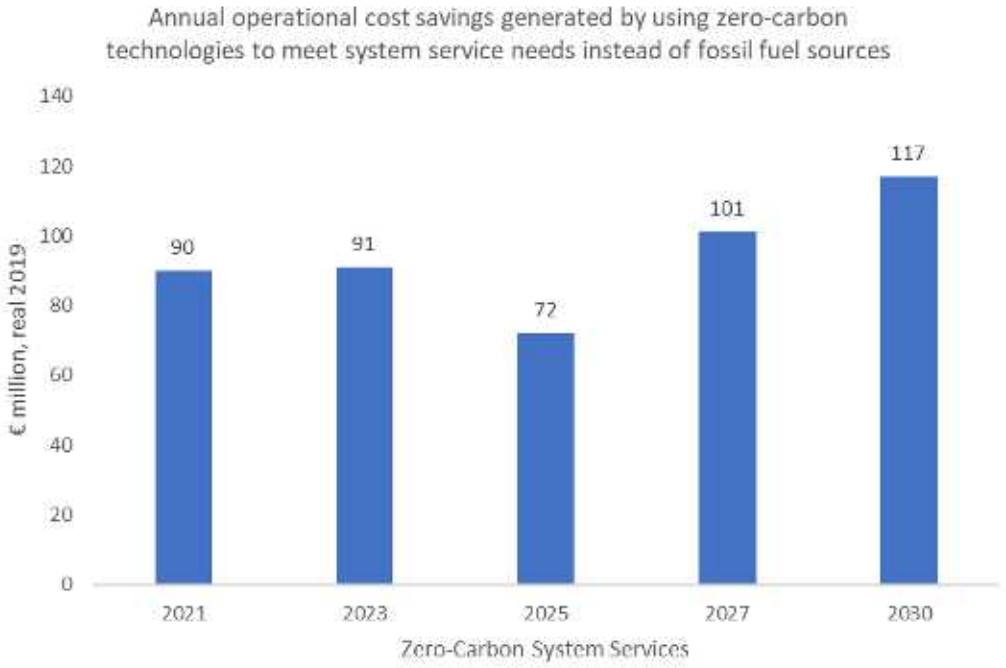


Figure 3: System Cost Savings from Zero-Carbon System Services Provision

The Baringa analysis also shows that there is a huge benefit from avoided CO2 emissions from full zero-carbon provision of system services, equating to almost 2 million tonnes of CO2 avoided by 2030. To put this in context, Baringa estimates that this would be equivalent to around one third of total power sector emissions that could be avoided by 2030. Figure 4 highlights the annual avoided emissions from zero carbon service provision under this zero-carbon System Services scenario.

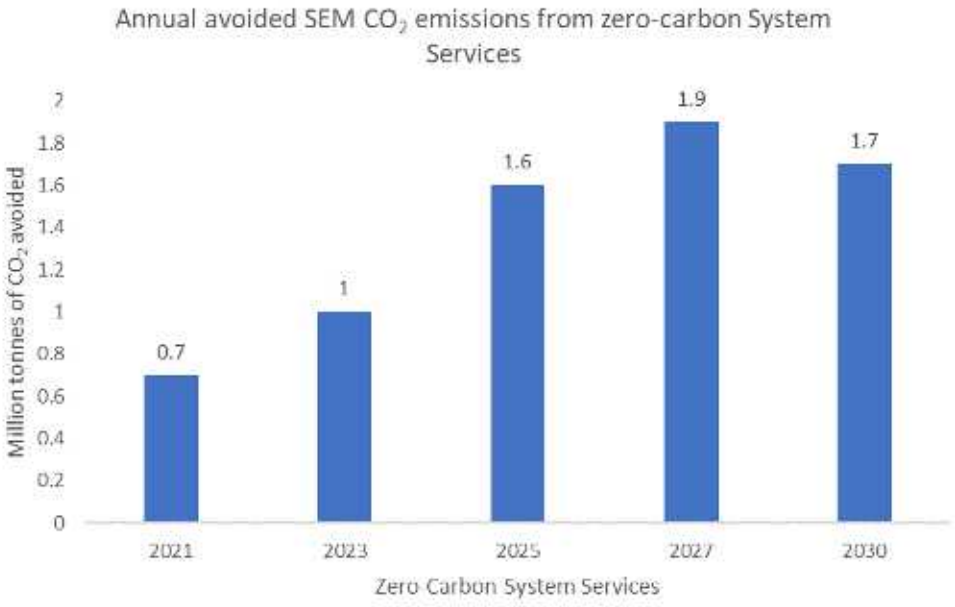


Figure 4: Annual avoided emissions by zero-carbon System Services provision

Baringa's zero-carbon System Services analysis has also analysed the potential benefits for renewable curtailment in a 70% RES-E scenario where all system service constraints are met using zero-carbon service providers. Baringa's analysis assumes several existing system constraints have already been alleviated, an operational SNSP limit above 90% and approximately 2,000MW of interconnector export capacity by 2025. Baringa estimates a reduction in curtailment from around 8% to 4% in 2030, when meeting all system constraints using zero-carbon providers, which allows more space on the system for wind generation and removes the need to constrain on fossil fuel generation (Figure 5).

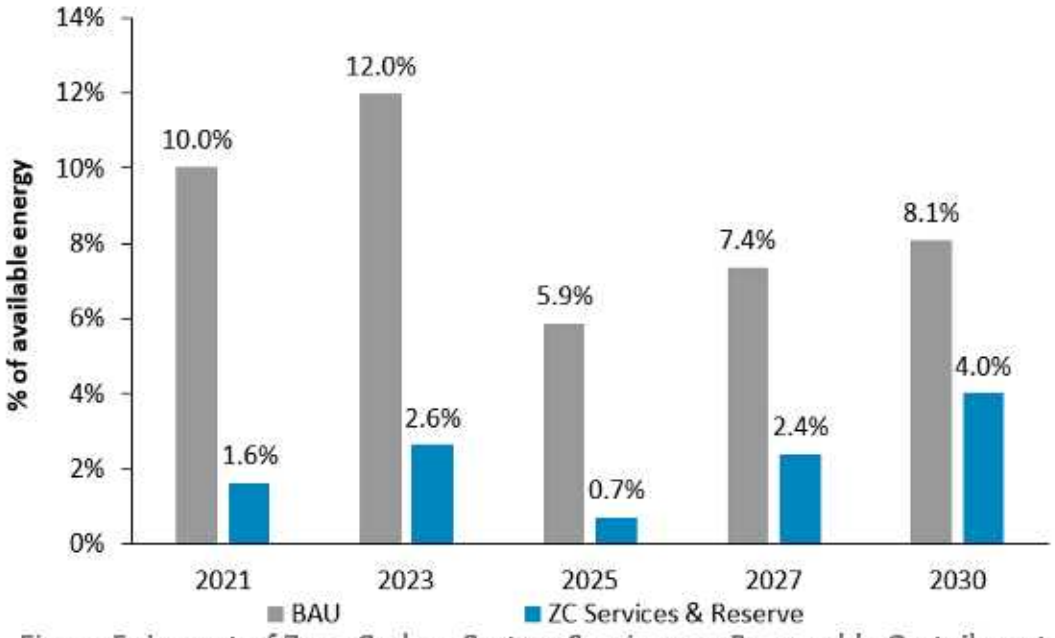


Figure 5: Impact of Zero-Carbon System Services on Renewable Curtailment.

Taking into account this analysis, the following sections outline our responses to the individual questions put forward in the scoping paper.

Background to the scoping paper

1) Are there additional requirements in EU legislation or national policy that should be considered as key guidance for the project?

The scoping paper references Ireland's Climate Action Plan; however, we wish to highlight that the recent Programme for Government has set out newer ambitions concerning a target of an average 7% per annum reduction in overall greenhouse gas emissions in order to achieve new zero emissions by 2050. There has also been a revised target of 5 GW of offshore wind set for 2030.

This will be set in law by the Climate Action Bill which will be produced before the end of the year.

In in Northern Ireland the future Energy Strategy is currently in development, but the Minister for the Economy has recently committed to a minimum 70% RES-E target by 2030.[5] This will support the UK's net zero ambitions by 2050.

It therefore makes sense that the System Services project supports the delivery of these national policy goals.

2) What should the role of DSOs be in development of the new arrangements?

IWEA and NIRIG fully support a strong and active DSO role in the procurement and provision of services from the distribution system. This is an area we believe holds massive potential as a flexible resource to support the integration of renewables on the power system.

For instance, one area that is of particular interest to our members is the provision of reactive power from distribution connected renewable generators. This service cannot be fully utilised and at present generators are not being remunerated for providing reactive power when connected to the distribution system. Progress on this issue has been slow over the past 5 years. There are ongoing Nodal Controller projects in Ireland and Northern Ireland to access this capability but the outcomes of these trials and next steps for wider implementation have been slow. EirGrid & SONI analysis has previously highlighted over 250 Mvar of capability in Ireland and 235 Mvar of capability in Northern Ireland for this service. This is an area that must be addressed, and a clear roadmap provided to industry for future rollout. It is also an area where we would welcome further engagement on how industry might contribute where capital investment is required.

Congestion management is also a potentially important service that can help manage constraints on the network. Constraints are a very material issue for renewable generators and have been steadily rising over recent years. There is the potential for congestion products to work in tandem with strategies such as grid reinforcements and alternative network solutions to help alleviate constraints in parts of the network. The DSO will play a crucial role in procuring these services from the distribution system, as it is likely such a service could come from business and customer loads, as well as large-scale demand customers connected to the transmission system.

For such services, DSO connected units must be able to compete fairly and equally with TSO connected units for all services to maximise competition and deliver the best value to the end consumer.

Finally, it is important to ensure the DSO can control, monitor and forecast the needs and use of new technologies such as renewables, batteries, demand side management, and smart

[5] https://www.newsletter.co.uk/news/environment/my-vision-renewable-energy-sector-northern-ireland-2984852

network devices in order to minimise constraint and curtailment - and that these service providers can be remunerated accordingly. We would emphasise that this requires step changes in many existing DSO business areas and therefore we highlight the importance of DSO resourcing and new systems to be able to deliver these changes. Resources and financial support for these must be provided through the Price Review and Price Control processes respectively.

3) Should any further assessment criteria be included in this workstream?

We believe the objective of the workstream takes too narrow an approach and is focused too much on compliance and putting in place a competitive framework rather than what the framework should be helping to deliver as its ultimate goal, which is the decarbonisation of the power system.

We do not believe these are mutually exclusive. A framework that is compliant and delivers value to consumers while helping deliver on our national decarbonisation aims can be developed.

We believe the framework should support national energy policy goals and specifically target operation at up to 100% SNSP - with a core focus of the framework being to encourage and incentivise the investment required in new technologies to achieve these targets.

To that end we believe additional assessment criteria should be considered as follows:

- Decarbonisation – The framework should aim to put in place the services and technologies such that the system can operate with all demand being met by 100% renewable generation at any point in time. The only means of doing this is by developing the capability for all System Service requirements to be met at these times by zero-carbon service providers such as DSUs, storage, synchronous condensers and renewable generators for example.
- Investment Certainty – This is a key consideration that must be addressed in the new framework. New investment will be required and these units need an adequate level of certainty to invest and deliver when they are needed. Simply putting in place a framework over 10-15 years will not deliver this if there is no long-term certainty on future volume needs or some form of price certainty or mitigation against price risk. Developers require clear investment signals and there is also a substantial lead time required for new builds that must be accommodated within the framework. If the new framework cannot provide the needed certainty for new investment, and this is a clear need for the 2030 system, then it cannot deliver on its goals.

- **Transitional Arrangements** – IWEA and NIRIG believe an adequate transition period between the current and future arrangements needs to be put in place to ensure the best outcome from this process. The timelines put forward by the Regulators are extremely ambitious and we have significant concerns that the framework will not be delivered on time for 2023, considering the scope of consultations, engagement and system changes that will be required, or that the framework will be delivered in a sub-optimal manner, considering the compressed timeframe, that will have negative impacts over the long-term. We recognise that the System Operators are anxious to put in place a framework as soon as possible that can start to bring forward new investment on time for 2030 but we believe a transitional period can deliver this and at the same time not upset the current market that is developing at present to provide new service capability to the TSOs. This could be via extension of the current arrangements for all or some of the services, or new Fixed Contracts to deliver new capability where it is needed. The benefits of a transition period are also that it allows time to trial the move to new arrangements for certain services or portions of services, which allows time for industry and policy-makers to learn from and become accustomed to the new approach, and allows more time to put in place the best enduring arrangements possible.

  In parallel with this, the DS3 System Services expenditure cap needs to be reviewed. The existing cap was set with 2020 targets as their primary objective but this will likely need to be increased to achieve our 2030 targets and accommodate new service needs and technologies. The TSOs' EU SysFlex analysis has estimated a value of €750 million+ per annum from System Services by 2030.[6] We believe a new glide path should be put in place to reflect this in order to deliver new investment, increase SNSP limits and minimise curtailment.

- **Non-Discrimination** – The concept of integrating with energy markets must be handled with care. Subsidised priority dispatch units are not likely to actively participate in the balancing market yet are likely to be very active in providing services. As renewable generators are developed without priority dispatch or come off subsidy, the interactions with the balancing market, any potential discrimination against these units, should be reviewed and included in the assessment criteria.

Proposed Overall Approach

4) Is the general approach to the Project appropriate and complete?

Please see our comments in response to question 3.

In addition, IWEA would also like to get clarity on the scope and definition of Balancing Capacity, System Services (in particular Operational Reserves) and a projection of the need for

[6] https://eu-sysflex.com/wp-content/uploads/2020/05/Task_2.5-Deliverable-Report_for_Submission.pdf

these services over the coming years. We understand that, for example, upwards and downwards Balancing Capacity is required to be procured separately. Operational Reserves, which are purely upwards in nature, are aligned with upwards Balancing Capacity in the paper, but there is no reference to the potential need for downwards Balancing Capacity.

Such services would be of use for the decarbonisation agenda, as conventional generators are rarely kept at the full minimum generation during curtailment events. There is also an existing Negative Operating Reserve constraint in operation within the market which is provided by conventional generators only at present. If renewable generators were willing to offer that downwards Balancing Capacity, they would only be turned off during the time when this downwards regulation headroom was required.

5) For which products is a market based approach appropriate? What sort of market based approach is most appropriate?

A short-term market-based approach is appropriate for services where there is a sufficiently mature market to ensure adequate competition and consumer value. This is probably most relevant for the reserve services (POR out to RR), at least for a certain proportion of these service volumes. Competition in short-term markets (i.e. a few hours in advance of delivery) will depend on the level of new investment in the system over the next 1-2 years from technologies such as DSUs and storage (which can also compete in longer-term markets) which will be needed to facilitate the delivery of the 75% SNSP target and alleviate existing operational constraints.

Existing windfarms provide large amounts of predictable and reliable short-term System Services (mostly POR, SOR and TOR1) when constrained/curtailed using Active Power Control. In a post subsidy world for renewables, it is important that windfarms can continue to access this value through the market design. Sole reliance on day-ahead procurement of system services with firm commitment obligations will preclude such windfarms from System Services participation, as the procurement timeframes render the capability of the windfarms unpredictable over that timeframe.

IWEA appreciates that the TSO needs sufficient predictability of any System Services in order to securely schedule generator and System Services providers, and some form of commitment regime will therefore be required. IWEA nevertheless urges that the timeframes for that predictability are challenged and shortened where possible.

Finally, priority dispatch wind generation, today, if participating in short-term markets selling services to the TSO are dependent on the TSO's own constraint/curtailment decisions in order to deliver certain operational reserve capability. The rules for non-priority dispatch renewables have yet to be defined. This places such generators at a disadvantage to other participants.

Uniquely, they have to predict to the TSO the TSO's own dispatch in order to participate in certain system services markets.

IWEA recommends in summary that Operational Reserves within System Services (including new downwards services) are suitable for market based procurement under certain conditions, but the timeframes for those services procurement should have short-gate closure, and the commitment model, in particular for Priority Dispatch generation, should not be discriminatory in nature.

Procuring a proportion of reserves via shorter term competitive auctions should not preclude the framework from allowing for longer-term mechanisms that can be progressed in tandem to drive investment in new providers that will be required to meet additional system requirements, which may arise from the connection of the Celtic interconnector or increasing SNSP limits.

For other System Services such as inertia and reactive power there exists a clear need for new capability from zero-carbon sources such as synchronous condensers and STATCOMs. This could be targeted at certain areas of the network where the need is most evident. The issue is that there is currently no adequate route to market for these technologies so the framework must provide clear investment signals for developers. There are a number of options that could be pursued to achieve this such as extending the current tariff arrangements for services where new capability is needed, thus providing up to an additional 3-year investment signal for these services. Another means would be a form of competitive tender similar to the Fixed Contracts arrangements to drive new investment on the system. This could be progressed in parallel with the development of the enduring framework and would enable new investment that could be used to mature the market before potentially moving to shorter-term auctions at a later stage.

For products such as FFR or potential frequency regulation services, these would appear to be outside the scope of the defined EBGL standard products and it is likely that sufficient new capability will be required to support the system with less conventional units online. We would recommend a similar approach to those services such as inertia and reactive power in terms of longer-term support mechanisms to get the needed capability online in the first instance.

While not discussed under the scope of this paper, from initial discussions with the TSOs we understand that new services and products will be required to meet the needs of the 2030 system. Without fully understanding the specific services that will be brought in it is difficult to comment on the adequacy of a market-based approach to their procurement. However, it does stand to reason that the introduction of new services will require long-term signalling in advance and the potential for longer-term contracting mechanisms to deliver new capability where it is needed. For example, this may be the case for a congestion management service where new capability is needed in a certain location. This will require longer-term certainty for investors and a lead-time for new development to be put in place.

6) For which products is a market based approach not appropriate? Why is a market based approach not appropriate for these products? Will an alternative approach be more economically efficient? What sort of alternative approach should be considered?

We do not believe this question should be product specific as it could apply to a certain proportion of volumes required for a service rather than the service itself. As noted, a shorter term market based approach may be appropriate for a proportion of the reserve services, where enough competition exists and where there is a sufficient volume of zero-carbon providers such as DSUs and storage. However, there may be a need to progress other procurement options in parallel to drive new capability in line with changing system requirements.

We believe products such as inertia, reactive power and potential congestion products would benefit from longer-term investment certainty via mechanisms such as an extension to the current tariff arrangements or Fixed Contracts. This does not preclude these services from being procured closer to real time as the market matures and where new zero-carbon investment has delivered.

It should not be forgotten that longer term contracting mechanisms or forms of price certainty have the potential to deliver greater value for consumers as investors have greater sight of their revenues over the longer term so there is less price risk as opposed to shorter term arrangements. Furthermore, in terms of economic efficiency, long-term contracting frameworks such as REFIT and ROCs, and other international renewable support schemes, have also driven significant advances in the wind industry by providing investor confidence and a base from which to grow the industry. This has allowed the industry to mature and innovate over the last two decades, as newer and more efficient turbines are constantly being developed, to the point where it is now one of the cheapest forms of new generation on the planet. This would not have happened without the initial support provided by policymakers via long term price certainty mechanisms.

Market Based Arrangements

7) Do stakeholders believe the current qualification process, is the most efficient approach? Do stakeholders have any alternative proposals?

The existing Qualification Trial Process is an appropriate mechanism for testing the potential of new service technologies to provide services or existing technologies to provide additional services.

At a provider level, a market-based registration process may be appropriate for existing providers, but we reiterate our comments in relation for the need for investment certainty and appropriate development lead times to facilitate new build investment.

8) What are stakeholder views on the overall current governance arrangements including the contractual principles, the Protocol Document and the market ruleset? Should these be modified into an overall protocol document which captures all of the rules for providing and procuring System Services with increased regulatory oversight?

It is apparent that the TSOs want to maintain control over the technical aspects of System Services but a move to greater industry involvement via mechanisms similar to how the energy and capacity markets are managed may be more appropriate, such as the Modifications Committee-like structure. It is a material risk to projects that the TSOs can alter service conditions during a contract that have financial implications for projects. Greater industry involvement and collaboration with the TSOs and RAs in the review process is therefore necessary.

9) Should System Services continue to be funded through network tariffs? Are there views on any alternative arrangements?

The most important consideration is that System Services are adequately funded. A move to a supplier-based charge, similar to imperfections, may be more appropriate; however, as it is possible that some service providers will be paying for System Services via Use of System charges which leads to circularity in terms of revenues and charges.

Auction Design

10) Should all services be procured through a single daily auction framework or should bespoke arrangements be developed for the separate products?

Please see our comments in response to questions 5 and 6 in response to this.

11) What are stakeholders' views on the timing of auctions?

We believe this is an area which requires much further engagement between the System Operators, Regulators, and industry to get the views of all stakeholders. From a wind generators' perspective, auctions after the day-ahead market closes (potentially closer to real-time for variable renewables) would potentially make sense as it is at this point that generators, priority dispatch and non-priority dispatch, would know of their ability to provide System Services. However, we recognise that there are considerations for multiple technologies in how

they participate in the markets that must be factored in and this is an area we would welcome further engagement on and understanding of.

12) Do stakeholders have any proposals on how best to ensure commitment obligations are met?

We recognise that the performance scalar mechanism is an existing option that may be appropriate in this context. We also note that the Fixed Contracts arrangements put in place a performance scalar based on ex-ante availability which may be feasible as an option to ensure unit commitment. This would need to be considered in light of possible incidents outside of the control of the provider that may impact unit availability in real-time. We believe considerations should be built in that do not unduly penalise providers for non-availability which is outside of their control. Our response to question 5 relates in the specific instance of Priority Dispatch windfarms' capability to deliver System Services being impacted by TSO dispatch instructions, and then being potentially penalised by the same TSO for non-delivery of System Services.

13) What are the significant interactions within potential System Services product markets and between Systems Services markets and the energy and capacity markets? How should issues arising be addressed?

This is an area which needs significant further engagement and thought between all stakeholders. It is not possible to comment at this stage before getting into more detailed design options what the interactions may be with other markets.

Nevertheless, the overall design should credibly allow windfarms, including post-subsidy windfarms, to actively participate and compete in all markets.

14) Do stakeholders have further views or proposals in relation to auction design?

No additional comments other than those expressed in previous questions.

Fixed Contract Arrangements

15) Do stakeholders believe there would be benefit in maintaining the Fixed Contract Arrangements for future procurement runs?

As noted in our response to questions 5 & 6 we believe there is a role for the Fixed Contracts to drive new investment where it is needed on the system before potentially moving to shorter term arrangements when the market is more mature. This should be an option for all services where there is a clear need.

We believe there may be an advantage to the Regulators and System Operators considering the use of further Fixed Contract arrangements which could be developed now as part of a transitional period for services such as inertia and reactive power. New zero-carbon technologies are needed on the system prior to 2030 to deliver these services and the advantages in deploying these technologies as soon as possible to reduce Min Gen and our reliance on the conventional generation fleet to provide these services can deliver significant benefits.

This should also be considered as an option for new services such as congestion management and frequency regulation in order to grow the domestic market for these services in the first instance.

The success of the Fixed Contracts for reserve services is not just in the 110 MW of battery energy storage capacity procured through the contracts, but in the newly formed market which those contract competitions seeded for the Volume Uncapped tariff arrangements. A similar competitive Fixed Contract scheme for other services would likely lead to a more rapid deployment of these much-needed technologies too.

Additional Considerations

16) Do stakeholders have views on the list of additional considerations above? Are there any further issues to consider?

Please see our comments in response to question 3.

17) What are stakeholders' views on the potential existence of, and options for mitigation of, market power?

It would be useful to have a breakdown of how the existing services are currently provided to understand where market power issues might be present (e.g. if 75% of one were provided by pumped storage and how that might change in future). In general, this points to the need for more transparency in the current and future arrangements as regards ongoing reporting on the volumes of service procured on a provider/technology basis as well as monthly expenditure outturns. This is something that was mandated under the existing DS3 framework but has not been delivered.

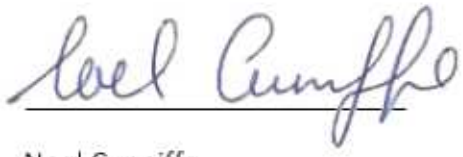
We note that the exclusion of a technology class, such as variable renewables, from provision of System Services arising from overly onerous predictability requirements and long gate closures continues to concentrate market power amongst fewer providers.

Conclusion

In conclusion, we would like to thank the SEM Committee for the opportunity to provide feedback on the System Services Future Arrangements Scoping Paper. As set out in the introduction to our response, we fundamentally believe that moving to higher levels of SNSP and lower levels of Min Gen are critical to the successfully deployment of renewable generation across the island in this decade. It is only through a well-considered and well-designed System Services framework that this will be achieved.

We are available to discuss any of the points raised in this response if you require and we look forward to continued collaboration with the Regulatory Authorities and System Operators on the arrangements in the coming months. We would strongly encourage further industry workshops in the coming weeks and months to progress the arrangements and ensure the views and suggestions proposed by all parties are understood by all participants.

Best Regards,



Noel Cunniffe

Head of Policy

IWEA

On behalf of IWEA and NIRIG