

DS3 System Services Qualification Trial Process **DECISION PAPER**

DS3 System Services Implementation Project

3 October 2016



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Executive Summary

Introduction and Background

The Interim Arrangements for DS3 System Services will be in place from 1 October 2016. The Interim Arrangements will be superseded by the implementation of the Enduring Arrangements, currently envisaged as Enduring Tariff based procurement in 2017, and competitive procurement beginning in 2018. The first year of the Interim Arrangements consists of a Central Procurement Process for 11 of the 14 System Services where “Proven” and “Measurable” service providers can tender for the large-scale provision of System Services. The three remaining System Services, which are not covered by the Interim Arrangements, will form a part of the initial Qualification Trial Process.

The initial Qualification Trial Process will comprise of both “*Provenability*” and “*Measurability*” trials. The Provenability Trials will afford technologies (unproven from a Service provision perspective) an opportunity to demonstrate their capabilities to provide a subset of Services, that are representative of a number of Services. This allows the TSOs to prudently consider large-scale reliance on these technologies in the future. The Measurability Trials will be used to establish the necessary measurement approaches so that reliable performance metrics can be established for the provision of services from new or existing Service Providers. This is a necessary and essential step, whether in the Interim Arrangements or the Enduring Arrangement for System Services, to allow for the development of robust, efficient and effective performance payment mechanisms.

The initial Qualification Trial period will be operational from Q1 2017, following an open competitive tender process in Q4 2016 to select the Service Providers to participate in both the Provenability Trials and the Measurability Trials. This initial Qualification Trial Process will provide a mechanism for both existing and new Service Providers to prove the technical capability (from a service provision and performance monitoring perspective) of technologies or technology classes for a subset of System Services. It is anticipated that the Qualification Trial Process will ultimately facilitate participation of an enhanced suite of technologies and portfolio of Services Providers in the provision of System Services, while ensuring the integrity and security of the power systems of Ireland and Northern Ireland are maintained.

The Qualification Trial Process set out in this paper is predominantly focused on the first year of the new System Services arrangements. As the System Services arrangements mature and more technology classes become qualified to provide System Services, the format of the annual Qualification Trial Process will be reviewed. In future years, depending on the number of new / emerging technologies, a smaller-scale, bespoke process may be possible.

Purpose of this Paper

The purpose of this paper is to provide an overview of the TSOs' approach to the Qualification Trial Process, following the input from the industry and following consideration of the outcome of the Central Procurement process. The paper summarises the feedback received from industry to the consultation paper on the TSOs proposals for the Qualification Trial Process and provides the response of the TSOs to that feedback.

Overview of the Qualification Trial Process

The Qualification Trial Process for Year 1 will involve both Provenability and Measurability Trials which will enable new and existing Service Providers to show provision of Services or measurement of the Services from a range of technologies. "Provenability" refers to proof of reliable delivery of service and "Measurability" refers to proof of the mechanism to monitor the delivery of that service. Services or Service Providers will be selected on the basis of an open, competitive procurement process during Q4 2016. Detailed criteria and weightings on those criteria will form a key part of the tender documents for the Qualification Trial Process

The Provenability and Measurability Trials are expected to run from Q1 2017 to 30th September 2017, subject to the completion of the procurement process, as illustrated in Figure 1 below. The Trials will run concurrently and will conclude in advance of the next Central Procurement Process. The Trials will be open to all Service Providers in Ireland and Northern Ireland and parties connected to the Transmission System or Distribution System or Network.



Figure 1 – Timeline for initial Qualification Trial Process

The 14 System Services can be categorised as follows:

- The **Reserve** category comprising POR, SOR and TOR1 with POR representative of Services in that category.
- The **Ramping** category comprising TOR2, RM1, RM3, RM8, RRS and RRD, with RM3 representative of Services in that category.
- The **Inertia** category comprising SIR.
- The **Fast-acting** category comprising FFR, FPFAPR and DRR.
- The **Reactive Power** category comprising SSRP.

There will be no trials for the Inertia or Reactive Power category. SIR and SSRP are inherent capabilities of technologies and no trial is required to demonstrate capability

Provenability Trials

There will be Provenability Trials in the Reserve and Ramping categories, on the basis of one Service as representative of all System Services in that category. POR will be trialled as representative of the Reserve category and RM3 will be trialled as representative of the Ramping category. Proof of provision of these Services (POR and RM3) will represent proof of provision of all Services in those categories. There will be 3 distinct technology classes in the Provenability Trials: Wind, Demand Side and 'other technologies'. The technologies captured in the 'other technologies' class include, but are not limited to:

- Battery storage
- CAES
- Flywheels
- Rotating Stabilisers
- Solar PV
- Synchronous Compensators
- HVDC Interconnectors
- Hybrid applications consisting of the following combinations of the above technologies including hybrid applications with wind generation

Other applications will be examined on a case-by-case basis.

The minimum size of service provision from a Providing Unit is 1MW for Wind and Demand Side – this is in-line with the minimum Providing Unit size in the Central Procurement Process. For ‘other technologies’, the minimum Providing Unit is 100kW to facilitate participation by a range of smaller-scale technologies. The maximum service provision per Providing Unit is 5MW.

The volumes proposed and the maximum size per Providing Unit will mean that at least 4 Service Providers from Wind, 4 Service Providers from Demand Side and at least 4 Service Providers from ‘other technologies’ will be able to qualify for a range of System Services. The volumes of the Services to be trialled in the Provenability Trial are summarised in Figure 2 below.

Provenability Trials	Total Volume
Trial 1 – Provenability of Provision of POR & RM3 from Wind	40MW (20MW POR, 20MW RM3)
Trial 2 – Provenability of Provision of POR from Demand Side	20MW POR
Trial 3 – Provenability of Provision of POR and RM3 from ‘other technologies’	40MW (20MW POR, 20MW RM3)
Total	100MW

Figure 2 – Volumes and Services in the Provenability Trial

During the Provenability Trial, the TSO will monitor the provision of the Services in response to real events on the power systems of Ireland and Northern Ireland. Should

there be no suitable events on the system over the entire duration of the trial, the TSOs may utilise smaller frequency disturbances on the system to assess Service provision. In addition, the TSO may also use scheduled system events to determine responses from Service Providers. Scheduled system events are rare and will not be specified driven by the Qualification Trial Process.

Measurability Trials

There will be Measurability Trials to measure the provision of the Fast-acting category of Services. This will include an FFR Measurability Trial and a Measurability Trial of DRR and FPFAPR. The Measurability Trials will also demonstrate a Service Provider's capability to provide the Fast-acting category of Services.

The number of Service Providers to be included in the Measurability Trials is outlined in Figure 3 below. The number of Service Providers applies across Ireland and Northern Ireland to facilitate parties in both jurisdictions to participate in the Qualification Trial Process. An allocation on a technology basis has been provided for in the Measurability trial of FFR, with 6 Service Providers to include at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from 'other technologies'.

Measurability Trials	Target number of Service Providers
Trial 4 – Measurability of FFR	6 Service Providers with at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from 'other technologies'
Trial 5 – Measurability of FPFAPR and DRR	3 Service Providers

Figure 3 –Service Providers in the Measurability Trial

Participation in the Measurability Trial will be required Service Providers to provide an independent mechanism to measure the delivery of the Services in response to real events on the power system of Ireland and Northern Ireland. Should there be no suitable frequency events on the system over the entire duration of the trial, the TSOs may utilise smaller frequency disturbances on the system to assess Service provision. In the case of FPFAPR and DRR, these will be on locational basis.

Once a technology has successfully completed a trial or trials, it can enter the next Central Procurement Process. However, success in the Qualification Trial Process and

qualification of a technology or technologies does not guarantee the success of an individual Service Provider in the subsequent Central Procurement Process, nor does it oblige a Service Provider to offer all Services that it qualified for through the Qualification Trial Process. The TSOs will publish the high-level results of the Qualification Trial Process, including summary of the technologies that have proven Service provision. Upon completion of the Year 1 Qualification Trial Process, the TSOs will review the process to assess its effectiveness in facilitating new technologies and enabling entry into the Central Procurement Process.

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1. Introduction

1.1. EirGrid and SONI

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

We have a responsibility to enable increased levels of renewable energy to generate on the power system while continuing to ensure that the system operates securely and efficiently. In 2010, we published the results of the “*Facilitation of Renewables*” studies. Those studies identified a metric called “*System Non-Synchronous Penetration*” (SNSP) as a useful proxy for the capability to operate the power system safely, securely and efficiently with high levels of renewable generation. SNSP is a real-time measure of the percentage of generation that comes from non-synchronous¹ sources, such as wind generation, relative to the system demand.

The studies identified 50% as the maximum level of non-synchronous renewable generation allowable on the power system until solutions could be found to the various technical challenges identified. If this limit is not increased, curtailment on installed wind could rise to over 25% per annum.

1.2. The DS3 Programme

Our ‘*Delivering a Secure Sustainable Electricity System (DS3)*’ programme seeks to address the challenges of increasing the allowable SNSP up to 75% by 2020 where the TSOs’ analysis has shown that the curtailment of wind would be reduced to approximately 5% per annum.

¹ Non-synchronous generators supply power to the electrical grid via power electronics. Power electronics are used to adjust the speed and frequency of the generated energy (typically associated with wind energy) to match the speed and frequency of the transmission network.

DS3 incorporates mutually reinforcing innovative technical, engineering, economic and regulatory initiatives. It is divided into three pillars:

- System Performance
- System Policies
- System Tools

DS3 is not only making the necessary operational changes to manage more renewable generation, it is also about the evolution of the wider electricity industry and implementing changes that benefit the end consumer. From the onset, the integration of wind generation presents a range of challenges previously unseen in the power sector. Through collaboration with the Regulatory Authorities and the wider electricity industry, DS3 has developed a number of innovative and progressive solutions.

The results of the programme are now beginning to deliver benefits to the consumer. In recent months the allowable SNSP level has been increased to 55% following the successful conclusion of a 55% SNSP operational trial. It is expected that similar trials will be conducted in the coming years with a view to achieving the overall goal of 75% SNSP by 2020 in a controlled manner.

1.3. DS3 System Services

One of the key work streams in the DS3 Programme is the System Services work stream. The aim of the System Services work stream is to put in place the correct structure, level and type of services in order to ensure that the system can operate securely with higher levels of non-synchronous renewable generation (up to 75% instantaneous penetration). Operating in this manner will reduce the level of curtailment for wind (and solar) farms and should deliver significant savings to consumers through lower wholesale energy prices.

The implementation of the DS3 System Services arrangements is divided into two phases – interim and enduring. The enduring arrangements will deliver competitive procurement, where appropriate, for the 14 services. A cost-reflective tariff will be applied to services where there is insufficient competition. During the Interim Arrangements period (2016-2018), the TSOs will contract for services with all eligible

providers, who will be paid at an interim rate, approved by the RAs, for the volume of services they are able to deliver in each trading period.

The first year of the Interim Arrangements consists of a Central Procurement Process for 11 of the 14 System Services where “Proven” and “Measurable” service providers can tender for the large-scale provision of System Services. Through the Central Procurement process for the Interim Arrangements, it has emerged that some technologies and Service Providers have not qualified for the Central Procurement Process and therefore, are excluded from Service provision for 2016/2017. A Qualification Trial Process would provide a mechanism for those Service Providers and new technologies to prove their capability to provide and measure System Services in advance of the next Central Procurement Process.

1.4. Requirement for a Qualification Trial Process

As part of the DS3 System Services approach, there is a need to procure essential System Services from Service Providers, whilst allowing for and facilitating a range of new technologies classes to provide these services in the future. A range of Service Providers have already been successful in the Central Procurement Process; however, we wish to facilitate new Service Providers and technologies that can demonstrate capability.

Facilitating new technologies to provide System Services on the system will increase competitive pressures on the long-term costs of System Service provision to the consumer by expanding the range of Service Providers. This will enable safe, secure and resilient power system operation across future energy scenarios, including higher levels of non-synchronous renewable generation. We support this facilitation of new technologies for non-energy service provision. However, the large-scale deployment of new technology on a power system could undermine the resilience of the power system. In addition, we are conscious of the potential economic exposure of contracting with technologies over the full range of System Services where robust and efficient measurement approaches to monitor performance do not exist or are not fully proven.

The Qualification Trial Process is the means by which we are proposing to balance the desire to facilitate new technologies in DS3 System Services provision, the duty to manage the security of the system prudently, and to only contract for what can be

robustly measured. The Qualification Trial Process is the mechanism by which new System Service providers from a range of technologies can ultimately gain access to the next available Central Procurement Process.

1.5. Structure of Paper

Section 2 contains the TSOs decision on the Qualification Trial Process, following input from industry and Section 3 covers the issues raised by respondents to the consultation and sets out our views on each issue and our associated decision.

2. TSOs' Decision on the Qualification Trial Process

Following input from the industry and the outcome of the Central Procurement Process, the Year 1 Qualification Trial Process will involve both Provenability Trials and Measurability Trials which will enable new and existing Service Providers to demonstrate provision of Services or measurement of the Services from a range of technologies. These Provenability and Measurability Trials best address the needs of the industry and the needs of the TSOs in the most cost-effective and timely manner. The Qualification Trial Process provides a fair, transparent, competitive process to select a range of Service Providers and technologies to participate in the Provenability and Measurability Trials and remunerates those Service Providers that are selected to participate in the trial.

2.1. Categories of Services

There are fourteen System Services in total which can be broken into five categories: Reserve, Ramping, Inertia, Fast-Acting and Reactive Power. The Qualification Trial Process will include Provenability and Measurability Trials to demonstrate capability in the Reserve, Ramping and Fast-Acting categories. SIR and SSRP are inherent capabilities of technologies and no trial is required to demonstrate capability. The Service categories and associated Trials are summarised in the following table:

Category	Services in the category	Trial required
Reserve	POR, SOR, TOR1	Provenability Trials with POR as representative of the Reserve category
Ramping	TOR2, RM1, RM3, RM8, RRS, RRD	Provenability Trials with RM3 as representative of the Ramping category
Inertia	SIR	SIR is an inherent capability of technologies and no trial is required
Fast-acting	FFR, FPFAPR, DRR	Measurability Trials for all Services – FFR, FPFAPR and DRR
Reactive Power	SSRP	SSRP is an inherent capability of technologies and no trial is required

Figure 4 – Summary of Service categories and associated Trials

2.2. Services to be Trialled

There will be Provenability Trials in the Reserve and Ramping categories, on the basis of one Service as representative of all System Services in that category. POR will be trialled as representative of the Reserve category and RM3 will be trialled as representative of the Ramping category.

There will be Measurability Trials to measure the provision of the Fast-acting category of Services. This will include a FFR Measurability Trial and a Measurability Trial of DRR and FPFAPR. The Measurability Trials will also demonstrate a Service Provider's capability to provide the Fast-acting category of Services.

2.3. Technologies in the Qualification Trial Process

2.3.1. Technologies in the Provenability Trial

In the Provenability Trial, there will be 3 distinct technology classes: wind, demand and 'other technologies'. The technologies captured in the 'other technologies' class include, but are not limited to:

- Battery storage
- CAES
- Flywheels
- Rotating Stabilisers
- Solar PV
- Synchronous Compensators
- HVDC Interconnectors
- Hybrid applications consisting of the following combinations of the above technologies including hybrid applications with wind generation

Other applications will be examined on a case-by-case basis.

2.3.2. Technologies in the Measurability Trial

All technologies, including but not limited to conventional generation, Demand Side and Wind, will be admissible to the Measurability Trials.

2.4. Volumes of Services and Service Providers in the Qualification Trial Process

2.4.1. Volumes of Services in the Provenability Trial

The volumes of Services in the Provenability Trials on a technology basis are outlined in Figure 5 below. The volume applies across Ireland and Northern Ireland to facilitate parties in both jurisdictions to participate in the Qualification Trial Process.

Provenability Trials	Total Volume
Trial 1 – Provenability of Provision of POR & RM3 from Wind	40MW (20MW POR, 20MW RM3)
Trial 2 – Provenability of Provision of POR from Demand Side	20MW POR
Trial 3 – Provenability of Provision of POR and RM3 from ‘other technologies’	40MW (20MW POR, 20MW RM3)
Total	100MW

Figure 5 – Volumes and Services in the Provenability Trial

2.4.2. Number of Service Providers in the Measurability Trial

The number of Service Providers to be included in the Measurability Trials is outlined in Figure 6 overleaf. The number of Service Providers applies across Ireland and Northern Ireland to facilitate parties in both jurisdictions to participate in the Qualification Trial Process. An allocation on a technology basis has been provided for in the Measurability trial of FFR, with 6 Service Providers to include at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from ‘other technologies’.

Measurability Trials	Target number of Service Providers
Trial 4 – Measurability of FFR	6 Service Providers with at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from ‘other technologies’
Trial 5 – Measurability of FPFAPR and DRR	3 Service Providers

Figure 6 –Service Providers in the Measurability Trial

2.5. Providing Unit Minimum & Maximum Size for Provenability Trial

There will be a minimum Providing Unit size of 1MW from Wind and Demand Side, and a minimum size of 100kW per Providing Unit from ‘other technologies’. There will be a maximum size of 5W of Service provision per Providing Unit in any Provenability Trial.

2.6. Criteria for the Provenability and Measurability Trials

Detailed criteria and weightings on those criteria will form a key part of the tender documents for the Qualification Trial Process. The trial period will run from Q1 2017 to 30th September 2017, subject to the successful completion of the procurement process. The TSOs may utilise smaller frequency disturbances on the system to assess Service provision, should there be no suitable events on the system over the entire duration of the trial. In addition, the TSO may also use scheduled system events to determine responses from Service Providers. Scheduled system events are rare and will not be specified driven by the Qualification Trial Process.

2.7. Participation and Remuneration in the Qualification Trial Process

The Provenability and Measurability Trials are expected to run from Q1 2017 to 30th September 2017, subject to the completion of the procurement process, as illustrated in Figure 7 below. The Trials will run concurrently and will conclude in advance of the next Central Procurement Process. The Trials will be open to all Service Providers in Ireland and Northern Ireland and parties connected to the Transmission System or Distribution System or Network.

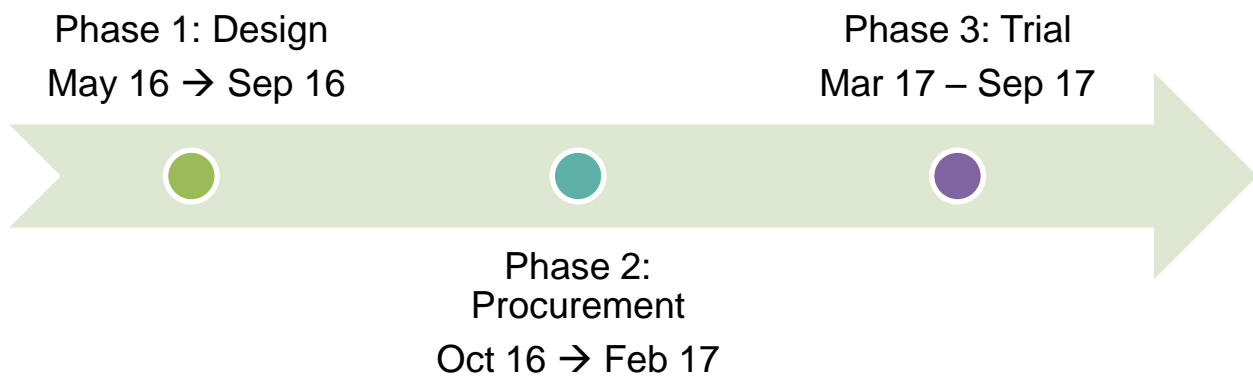


Figure 7 – Timeline for initial Qualification Trial Process

For Service Providers, participation in the Qualification Trial Process will be carried out in two phases. The first phase will be an open, competitive tender process to select a number of Service Providers to participate in either one of the Provenability Trials and/or one or both of the Measurability Trials, depending on the technology of the Service Provider. The intention is to carry out this procurement process in Q4 2016, following approval of this decision paper on the Qualification Trial Process by the Regulatory Authorities (Phase 1 in Figure 7 above). The procurement process will be carried out in-line with the Utilities Directive, national public procurement guidelines and general public procurement principles.

Subject to the successful completion of the procurement process, the trial period will commence in Q1 2017 and will conclude on 30th September 2017. It is expected that participants in the Provenability Trials will be paid on a Service-provided basis. The tariff paid for the Service(s) provided to each Service Provider will be determined as part of the procurement process. It is expected that remuneration in the Measurability Trials will be on a one-off participation payment of €50,000 per Service Provider.

3. Qualification Trial Process Consultation

3.1. Consultation Process

In June 2016, EirGrid and SONI published a consultation paper covering the proposed Qualification Trial Process, the Provenability and Measurability elements of the trial, the Services to be trialled, the technologies targeted in the trial, the volumes of Service provision and number of Service Providers, the minimum size of Providing Unit and some indicative evaluation criteria for Provenability and Measurability Trials. The consultation paper provided stakeholders with information about our proposals and a guide to the consultation process.

The proposed outline of the Qualification Trial Process in the consultation paper was as follows:

- A Qualification Trial Process to consist of 2 elements: “Provenability” - proof of reliable delivery of service - and “Measurability” - proof of the mechanism to monitor the delivery of that service.
- The trials would commence in Q1 2017 and conclude in advance of the next Central Procurement Process.
- Participation in the trial would be on the basis of an open, competitive procurement process.
- For the Provenability Trial
 - Trial period to be six months
 - 2 Services (POR and RM3) would be trialled from 2 Service categories – Reserve and Ramping – as representative of all services in those categories
 - 3 technologies classes would be targeted: Wind, Demand Side and ‘other technologies’ with a volume of Services allocated on a jurisdictional basis.
 - Minimum service provision size from a Providing Unit to be 1MW for Wind and Demand Side, 100kW proposed for ‘other technologies’. Maximum Service provision per Providing Unit to be 5MW to facilitate more than one Service Provider per technology class
 - A range of indicative criteria and commercial terms were proposed.

- For the Measurability Trial
 - Trial period to be three months
 - A trial for each FFR, FPFAPR and DRR in each jurisdiction, targeting 1 Service Provider per Service.
 - Technology neutral
 - A range of indicative criteria and commercial terms were proposed

The consultation paper posed the following consultation questions to structure responses around:

- **Question 1: Do you agree that the Qualification Trial Process should focus on both “Provenability” and “Measurability”?**
- **Question 2: Do you agree that the Provenability Trials should focus on proving only two System Services, as representative of all System Services in those categories of System Services?**
- **Question 3: Do you agree that the Provenability Trials should focus on the Reserve and Ramping categories of System Services?**
- **Question 4: Do you agree that the technology classes targeted in the Provenability Trials should be wind, demand side and ‘other technologies’?**
- **Question 5: Do you agree that the Measurability Trials should be technology neutral?**
- **Question 6: Do you agree with the proposed service provision volumes and proposed number of Service Providers to be included in the Provenability and Measurability Trials respectively?**
- **Question 7: Do you agree with the minimum sizes of Providing Unit proposed for the Provenability trials?**
- **Question 8: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Provenability Trials?**
- **Question 9: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Measurability Trials?**

- **Question 10: Given the stated aims of the Qualification Trial Process, are there different criteria that would better achieve those outcomes than what is proposed here? If so, what are they and how will they work?**

3.2. Responses to the Consultation

The consultation period concluded on 21st July 2016 and 26 responses were received in total. Of these, 3 responses were marked confidential. The 23 non-confidential responses were received from:

- AES
- BGE
- Bord na Móna
- Brookfield Energy
- DRAI
- Electric Ireland
- Electricity Exchange
- Energia
- ESB GWM
- Freqcon
- Gaelectric
- Indaver Ireland Ltd
- IWEA
- Lumcloon
- Moyle Interconnector Ltd
- Power NI PPB
- RES
- Schwundgrad Energie Ltd
- Siemens Limited

- Solo Energy
- SSE
- Systemex
- WFSO

The views of respondents have been summarised and addressed in the narrative below. A number of respondents provided a more specific reply, often reflecting the respondents' particular circumstances or technology. In keeping with previous System Service consultation papers, all responses that were not marked as confidential will be published by the TSOs.

There was broad agreement among the majority of respondents that the proposed approach for the Qualification Trial Process was reasonable. A number of comments from Service Providers within the proposed technology classes were received and reflected the specific nature of those technologies and their ability to deliver System Services. Changes have been proposed to address those concerns. However, no alternative methodology for delivering a Qualification Trial Process was proposed.

A number of respondents requested that TSOs clarify the arrangements once technologies have successfully completed these trials. The TSOs can confirm that once a technology has successfully completed a trial or trials, it can enter the next Central Procurement Process. However, success in the Qualification Trial Process and qualification of a technology or technologies does not guarantee the success of an individual Service Provider in the subsequent Central Procurement Process, nor does it oblige a Service Provider to offer all Services that it qualified for through the Qualification Trial Process.

Some respondents requested confirmation that non-participation or unsuccessful participation in the Qualification Trial Process would not be a barrier to entry to the Central Procurement Process. In the event that a Service Provider participates in the Qualification Trial Process and is unsuccessful, then that Service Provider will be excluded from the Central Procurement Process. In the event that a Service Provider that does not participate in the Qualification Trial Process and their technology is not proven in a similar size system elsewhere, then that Service Provider will likely not meet the consideration for Central Procurement Process. The TSOs will publish the high-level results of the Qualification Trial Process, including summary of the technologies

that have proven Service provision. The TSOs will conduct a review of the effectiveness of the Qualification Trial process and how it may work in the future.

A number of respondents replied with comments outside of the scope of this consultation. These include:

- the provision of Services under the HAS arrangements
- the criteria in the Central Procurement Process for the Interim Tariff in 2016-2017 for DS3 System Services
- the proposed Interim Tariffs for DS3 System Services
- the Enduring Auction for DS3 System Services & proposed long-term System Services contract duration
- Changes in the Capacity Payment Mechanism
- Changes in the ISEM
- Impact of other support mechanisms such as REFIT
- Connection and Grid Access Transitional Arrangements

3.3. Responses to the Purpose of the Qualification Trial Process

The majority of respondents were in agreement with the proposal that the Qualification Trial Process' focus on two elements, "Provenability" and "Measurability". A number of respondents provided comments and queries in relation to the specifics of the trials, volumes and criteria which are encapsulated in the other consultation questions and responses.

Some respondents requested that proof of provision of Services in other systems or in a test environment should constitute part of the Qualification Trial Process. The real-time trialling of Services on the power systems of Ireland and Northern Ireland provides the most benefit to Service Providers and the TSOs in terms of facilitating the proof of the provision of Services from a range of technologies and experience of operating the system with a range of different technologies providing System Services.. However, the Central Procurement Process has allowed for new Services Providers to qualify with relevant information from TSOs from similar sized systems as Ireland and Northern Ireland, who are already scheduling and contracting there for these Services. In the

Qualification Trial Process, the TSOs may consider relevant information from other systems, information from OEMs and from test environments as a part of the overall assessment of Service Providers' capabilities and may use this information to augment analysis of performance post-event.

One respondent sought further clarity on technologies that have already 'qualified' for System Services through the Central Procurement Process. The outcome of the Central Procurement Process will be published in advance of the Qualification Trial Process and will show which Service Providers have qualified for Central Procurement Process.

One respondent sought assurances that the Qualification Trial Process would be open, transparent and equitable to all technologies. The TSOs can confirm that procurement of Service Providers for the Qualification Trial Process will be carried out in line with the Utilities Directive, national public procurement guidelines and general public procurement principles.

TSOs' Decision

Following input from the industry and the outcome of the Central Procurement Process, the Year 1 Qualification Trial Process will involve both Provenability Trials and Measurability Trials which will enable new and existing Service Providers to show provision of Services or measurement of the Services from a range of technologies. These Provenability and Measurability Trials best address the needs of the industry and the needs of the TSOs in the most cost effective and timely manner. The Qualification Trial Process provides a fair, transparent, competitive process to select a range of Service Providers and technologies to participate in the Provenability and Measurability Trials and remunerates those Service Providers that are selected to participate in the trial.

3.4. Responses to the Focus of the Provenability Trials

Some respondents were in agreement that proving 2 System Services, as representative of all System Services in those categories, was appropriate. However, a number of respondents, depending on their technology, stated that different services

within System Service categories would be more representative of capability across that category. Some respondents were concerned that technologies would be excluded from a trial or multiple trials if it cannot provide the representative Service for that category of Service. Other respondents requested clarity on the definition of 'representative'.

The TSOs have considered all input provided by the respondents and reviewed the representative Services from each category. A Service is deemed to be 'representative' of that category of Services (i.e. POR as representative of the Reserve category) because if a Service Provider can provide that Service, then it can be deemed to have the capability to provide the other Services in that category. The rationale for choosing a 'representative' Service in place of trialling all Services is that it is an effective and efficient manner of prudently qualifying new Service Providers and Services expediently. This will lead to more competition in the Central Procurement Process in a shorter time frame whilst meeting the needs of the TSOs to act in a prudent manner.

It is the view of the TSOs that POR remains the most appropriate service as representative of the Reserve category as it is the characteristic response of the Reserve category and demonstrates the Service Providers' capability to deliver POR, SOR and TOR1. Equally, RM3 remains the representative Service from the Ramping category as it is the characteristic response of the Ramping category and demonstrates the Service Providers' capability to deliver TOR2, RM1, RM3, RM8, RRS and RRD.

One respondent sought acknowledgement that should a technology be successful in the Qualification Trial Process, then that technology is proven for all installations of that technology. The TSOs can confirm that the broad technology class, and not a specific OEM or specific control systems, are being proven in the Qualification Trial Process.

One respondent sought clarification that should a Providing Unit be successful in proving a Service in the Qualification Trial Process, which is representative of a number of System Services in the category, it would not be obliged to offer all those Services in the next Central Procurement Process. Success in the Qualification Trial Process does not oblige a Service Provider to offer Services in the Central Procurement Process – rather it enables the Service Provider to do so should it wish.

One respondent requested the TSOs rank the Services in the Qualification Trial Process relative to the value to the TSOs and assess applications based on ability to deliver the most valuable Services. The TSOs confirm that an assessment of the

System Services that are required is the basis of the DS3 System Services Volumes and Tariffs analysis. A relative ranking has already been determined through the Interim Tariff rate calculations for the 2016-2017 period.

One respondent sought more detailed and in-depth trials for Services, whilst another sought to include performance on other systems as part of trial. The real-time trialling of the Services on the power system of Ireland and Northern Ireland is the most appropriate method for testing the provision of Services. Performance on the system in real-time is the preferred proof of Service by the TSOs. In the Qualification Trial Process, the TSOs may consider similar relevant information from other systems, information from OEMs and from test environments as a part of the overall assessment of Service Providers' capabilities and may use this information to augment analysis of performance post-event.

One respondent stated that certain technologies should be required to demonstrate all Services in the System Service category in place of a representative Service. It would be discriminatory to certain technology classes to require some technologies to demonstrate all Services and other technologies to demonstrate the representative Services. The TSOs seek to deliver the Qualification Trial Process in an equitable manner to all relevant technologies.

One respondent noted that the DS3 Interim Arrangements required Providing Units connected to the Distribution System to have formal notification that Operational Protocols will be in place by the relevant DSO/DNO and requested the TSOs publish a document summarising what operational protocols which are currently in place and which technology classes these cover.

The TSOs' understanding is that the 'operational protocols' refer to the consent granted by the DSO/DNO to the connecting party so that the site or sites can operate in a manner that enables Service provision and a specific operational procedure relating to the connecting party at that specific location or locations on the Distribution System or Distribution Network. Since this is a DSO/ DNO issue and a site or sites-specific issue, it will not be appropriate to publish consents or operational procedures on that basis.

TSOs' Decision

There are fourteen System Services in total which can be broken into five categories: Reserve, Ramping, Inertia, Fast-Acting and Reactive Power. The Qualification Trial Process will include Provenability and Measurability Trials to demonstrate capability in the Reserve, Ramping and Fast-Acting categories. SIR and SSRP are inherent capabilities of technologies and no trial is required to demonstrate capability. The Service categories and associated Trials are summarised in the following table:

Category	Services in the category	Trial required
Reserve	POR, SOR, TOR1	Provenability Trials with POR as representative of the Reserve category
Ramping	TOR2, RM1, RM3, RM8, RRS, RRD	Provenability Trials with RM3 as representative of the Ramping category
Inertia	SIR	SIR is an inherent capability of technologies and no trial is required
Fast-acting	FFR, FPFAPR, DRR	Measurability Trial for all Services – FFR, FPFAPR and DRR
Reactive Power	SSRP	SSRP is an inherent capability of technologies and no trial is required

Figure 8 – Summary of Categories of Services and Trials

3.5. Responses to the Services targeted in the Provenability Trial

The majority of respondents were in agreement that the Reserve and Ramping categories should be part of the Provenability Trial. However, a number of respondents sought to add all categories of services to the Qualification Trial Process: Fast-acting, Reactive Power and Inertia. These respondents stated that certain technologies had capability to provide these Services and the absence of a defined trial for these services was a barrier to those technologies, particularly those connected to the Distribution Network/ System.

For the categories of Reactive Power and Inertia, since these are inherent capabilities of technologies, there is limited benefit in having a Provenability trial for SIR and/or SSRP in comparison to the benefit of Provenability Trials for the time-bounded energy-based services in the Reserve and Ramping categories. However, given the feedback

from industry on the criticality of proving Fast-acting Services, it is proposed to have a distinct FFR Measurability Trial, open to all Service Providers from all technologies. The TSOs can confirm that success in the Measurability Trial for Fast-acting Services will also constitute demonstrate provision of the Service, subject to the terms of the Measurability Trial. This is covered in more detail in Section 3.8.2

One respondent sought clarity in relation the real-time dispatch and use of Services under trial and whether these would be factored into the reserve-constrained unit commitment in the Control Centre. The TSOs can confirm that for the duration of the trial, Services from Qualification Trial participants will not be factored into real-time system operation.

Another respondent sought assurance that technologies that prove the measurability of a service (e.g. FFR) are also proving the provision of that Service. The TSOs can confirm that this is correct, subject to the terms of the Measurability Trial. More detail on the FFR Measurability Trial, which will be open to all Service Providers from all technologies is covered in Section 3.8.2.

TSOs' Decision

The Provenability Trials in the Reserve and Ramping categories on the basis of one Service as representative of all System Services in that category. However, based on feedback from the industry, it is proposed to have a distinct FFR Measurability Trial, open to all Service Providers from all technologies. This trial will seek Service Providers from conventional generation, wind generation and Demand Side. More detail on this is provided in Section

3.6. Responses to the Technology Classes in the Provenability Trials

All respondents were in agreement that the technology classes to be targeted in the Provenability Trials should be wind, demand side and 'other technologies'. A number of respondents required clarity on the technologies that would qualify in the 'other technologies' class. The TSOs can confirm that the technologies captured in the 'other technologies' class include, but are not limited to:

- Battery storage

- CAES
- Flywheels
- Rotating Stabilisers
- Solar PV
- Synchronous Compensators
- HVDC Interconnectors
- Hybrid applications consisting of the following combinations of the above technologies including hybrid applications with wind generation

Other applications will be examined on a case-by-case basis.

One respondent requested a distinct category for Storage. Given the outcome of the Central Procurement Process and the potential for a range of technologies applying to the Qualification Trial Process, including hybrid applications, the TSOs do not believe that this is appropriate.

Another respondent requested clarification that conventional units, which currently do not provide a particular System Service, would not be precluded in tendering for a System Service in future procurement as it does not have an existing System Service contract. The TSO can confirm conventional units, that do not provide a particular System Service at present, will not be excluded from entering the Central Procurement Process, subject to complying with the relevant technical requirements of providing that Service.

One respondent expressed concerns about the differences in Original Equipment Manufacturer (OEM) of technology. The TSOs do not aim to discriminate between different technology OEM/ control system providers or any other elements of the Service Providers proposal. Rather the objective of this Qualification Trial process is to qualify technologies. As a further point of clarification, success in the Qualification Trial Process and qualification of a technology or technologies does not guarantee the success of an individual Service Provider in the subsequent Central Procurement Process, nor does it oblige a Service Provider to offer all Services that it qualified for through the Qualification Trial Process.

One respondent proposed that any unused volume for any of the technologies classes could be used in any class that is oversubscribed. The procurement process will be carried out in line with the Utilities Directive, national public procurement guidelines and general

public procurement principles. However, we will bear this in mind when developing the detailed criteria and weighting for the procurement.

TSOs' Decision

Following input from the industry and the outcome of the Central Procurement Process, the TSOs can confirm that the technologies to be trialled in the Provenability Trial are wind, demand and 'other technologies'. The technologies captured in the 'other technologies' class include, but are not limited to:

- Battery storage
- CAES
- Flywheels
- Rotating Stabilisers
- Solar PV
- Synchronous Compensators
- HVDC Interconnectors
- Hybrid applications consisting of the following combinations of the above technologies including hybrid applications with wind generation

Other applications will be examined on a case-by-case basis.

3.7. Responses to the Technology Neutrality of the Measurability Trials

The majority of respondents were in agreement that the Measurability Trials should be technology neutral. The focus of the Measurability Trials is on the Fast-Acting category of System Services: FFR, FPFAPR and DRR.

A number of respondents from the Demand Side expressed concern in relation to the proposed remuneration of the Trial – given the potential cost of hardware for Demand Side participants across the range of demand sites. This will be discussed in Section 3.11.

One respondent stated that different technologies have different capabilities and they should be tested on that basis. The TSOs wishes to test Service “measurability” since this will be the basis of the long-term remuneration for Service Providers. Investigations

into the Service “capability” of different technologies will be inherent in the Measurability Trials because in order to be able to measure the provision of a Service, a Service Provider must have the “capability” to provide that Service.

Another respondent requested that Measurability Trials be followed by a corresponding Provenability Trial. The TSOs can confirm that success in the Measurability Trial for Fast-acting Services will also constitute demonstrate provision of the Service, subject to the terms of the Measurability Trial.

One respondent requested further detail on the specifications of the measuring equipment that would be required to measure provision of the Services and stated that this was a risk for respondents to invest in equipment that may not deliver the desired outcome. The TSOs will provide detailed specification of the measurements requirement as part of the procurement process. Another respondent requested that the method of measurement be applicable to other technologies. The experience and learnings gained by the TSO in running the Measurability Trials will input to the determination of industry-wide standards for the measurement of the Fast-acting Services.

One respondent stated that as parties in Northern Ireland have had fast-acting event recorders operating and proven for many years and with data readily available for historic events, is the measurability of the provision of Services already proven for Service Providers in Northern Ireland. It is the TSOs’ view that whilst Services in the Fast-Acting category (FFR, FPFAPR and/or DRR) may have been available and inadvertently provided by some conventional plant to date, the TSOs did not measure the level of response for the Service provided. This is the rationale for the Measurability Trial. Should parties already have equipment installed at their site/sites to independently measure the provision of FFR, FPFAPR and/or DRR, their costs for participating in the trial will be lower.

TSOs’ Decision

No change is proposed to the admission of all technologies, including conventional generation, to the Measurability Trial.

3.8. Responses to the Volumes of Services and Service Providers in the Qualification Trial Process

3.8.1. Volumes of Services in the Provenability Trials

The majority of respondents were in agreement with the proposed volumes in the Provenability Trial. A number of respondents expressed concern at the necessity of having a defined volume for trialling in both jurisdictions and stated that this may provide a competitive advantage to Service Providers in Northern Ireland. The TSOs note the concerns of the respondents and will remove the jurisdictional allocation. The volume for each Service being trialled and each technology class is outlined in Figure 9 below, noting that POR is no longer being trialled for Demand Side.

One respondent stated that the limited volumes to be trialled could delay the deployment of new technologies. The volumes proposed for the different technology classes, coupled with the outcome of the trial being technologies (as opposed to specific OEMs or Service Providers) qualified for the next Central Procurement Process, are sufficient to demonstrate capability across a range of technologies. This will be a key enabler to the deployment of new technologies. The volumes proposed and the maximum size per Providing Unit will mean that at least 4 Service Providers from Wind and at least 4 Service Providers from Demand Side will be able to qualify for a range of System Services.

One respondent requested an increase in the volume for the 'other technologies' class. The removal of the jurisdictional allocation addresses this concern as there is a total of 40MW available for 'other technologies' in both jurisdictions. Given that the maximum Providing Unit size is 5MW and the minimum size is 100kW, this allows for a minimum of 4 Service Providers in the 'other technologies' class, should the Service Provider be successful to participate in both elements of the trials – Provenability and Measurability.

Following the outcome of the Central Procurement Process, and the success of a number of Demand Side participants in obtaining a contract for the provision of Ramping services, the TSOs do not see a requirement for the trialling of RM3 from Demand Side as the Service is already proven for Demand Side, through the Central Procurement Process.

Provenability Trials	Total Volume
Trial 1 – Provenability of Provision of POR & RM3 from Wind	40MW (20MW POR, 20MW RM3)
Trial 2 – Provenability of Provision of POR from Demand Side	20MW POR
Trial 3 – Provenability of Provision of POR and RM3 from 'other technologies'	40MW (20MW POR, 20MW RM3)
Total	100MW

Figure 9 – Volumes and Services in the Provenability Trial

3.8.2. Number of Service Providers in the Measurability Trial

A number of respondents requested that an increase in the number of Service Providers in the Measurability Trial on the basis that the failure of one Service Provider for one category of Service could result in all technologies being excluded from next Central Procurement Process. The TSOs also note the concerns of the respondents in relation to jurisdictional allocation and confirms that this will be removed. In addition, it is proposed to expand the overall number of Service Providers and expand the Services targeted on a technology-specific basis. This is to address the concerns of respondents that failure by a single Service Provider would act as a barrier to other Service Providers with a similar technology. Additionally, since the Measurability Trial acts as a proof of provision of the Service, this addresses the concerns of respondents who sought a defined FFR trial. This is summarised in Figure 10.

Measurability Trials	Target number of Service Providers
Trial 4 – Measurability of FFR	6 Service Providers with at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from 'other technologies'
Trial 5 – Measurability of FPFAPR and DRR	3 Service Providers

Figure 10 – Number of Service Providers and Target Technologies in the Measurability Trials

On respondent sought assurances that a Service Provider could qualify for both elements of the Measurability Trial. The TSOs can confirm that this is the case.

A number of respondents also expressed concern at the proposed remuneration for Service Providers in the Measurability Trial (as outlined in Section 3.11). This will be addressed in Section 3.11.

One respondent requested clarity on future trials. The TSOs can confirm that a Qualification Trial Process will be available in future years and the nature of the trial will be determined by the outcome of the Qualification Trial Process for this year. Upon completion of the Year 1 Qualification Trial process, the TSOs will also review the process to assess its effectiveness in facilitating new technologies and enabling entry into the Central Procurement Process.

One respondent requested confirmation that Service provision would be sought from both transmission and distribution-connected parties. The TSOs can confirm that this is the case, subject to agreement being sought and approval granted by the relevant DSO or DNO as appropriate.

TSOs' Decision

Based on the input from the industry through this consultation process and the outcome of the Central Procurement Process for System Services, the following table summarises the volumes and Services in the Provenability Trial. The jurisdictional allocation has been removed, , and given the success of the number of Service Providers in the Central Procurement Process, the need to trial RM3 from Demand Side has also been removed.. This is summarised in Figure 11 below.

Provenability Trials	Total Volume
Trial 1 – Provenability of Provision of POR & RM3 from Wind	40MW (20MW POR, 20MW RM3)
Trial 2 – Provenability of Provision of POR from Demand Side	20MW POR
Trial 3 – Provenability of Provision of POR and RM3 from 'other technologies'	40MW (20MW POR, 20MW RM3)
Total	100MW

Figure 11 – Volumes and Services in the Provenability Trial

No change is proposed to the admission of all technologies, including conventional generation, to the Measurability Trial. However, following feedback from the industry, the changes from the consultation proposal are that the jurisdictional allocation has been removed, and an increase in the overall number of Service Providers to be included in the 2 Measurability Trials. An allocation on a technology basis has been provided for in the Measurability trial of FFR, targeting 6 Service Providers with at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from 'other technologies', given the input from industry. This is summarised in Figure 12 below.

Measurability Trials	Target number of Service Providers
Trial 4 – Measurability of FFR	6 Service Providers with at least 1 Service Provider from Conventional Generation, 1 Service Provider from Demand Side, 1 Service Providers from Wind and 1 from 'other technologies'
Trial 5 – Measurability of FPFAPR and DRR	3 Service Providers

Figure 12 - Number of Service Providers and Target Technologies in the Measurability Trial

3.9. Responses to the Providing Unit Minimum & Maximum Size for Provenability Trial

The majority of respondents were in agreement with the minimum sizes of Providing Unit for the Provenability trials. A number of respondents sought clarity as to whether individual wind turbines were being tested or a wind farm in its entirety. The TSOs can confirm that individual wind turbines are not being tested – rather it is the response from the wind farm, noting that this may indeed be provided by a single turbine. Equally, clarity was sought from respondents in relation to accreditation for batteries or other modular technologies. The TSOs can confirm in all cases that the broad technology class and not specific OEMs or specific control systems are being proven in the Qualification Trial Process.

A number of respondent suggested that the TSOs should permit parties to specify a lower and upper volume that they are willing to be procured for and an achievable step size for volumes between their lower and upper limit. This may form part of the procurement process for the Qualification Trial Process.

One respondent requested clarification the minimum size requirement is based on an aggregated volume from Demand Side / Aggregated Generating Units. The TSOs can confirm that this is the case. Another respondent requested assurance that the minimum size in the Provenability Trial will also be mirrored in future Central Procurement Process. The minimum size of a Providing Unit for the next Central Procurement Process has not yet been determined and may be influenced by the findings of the Qualification Trial Process.

One respondent sought clarity on maximum size of 5MW relating to the maximum level of payment that a provider can receive as opposed to the maximum capability of Service Provision. The TSOs can confirm that that maximum Service offering is 5MW, irrespective of the capability of the Providing Unit. This is to maximise the number of Service Providers per technology, per Service.

Another respondent proposed that a distinct volume be reserved within the 'other technologies' volume for smaller Service Providers from emerging technologies. Given the proposed volume allocated to the 'other technologies' class, the TSOs do not expect that additional volume will be required. There will be a minimum of 4 Service Providers in the 'other technologies' class – subject to each Providing Unit delivering the maximum of 5MW of POR and RM3. If there are Providing Units smaller in size or if

Providing Units only are selected to provide POR or RM3 (and not both), then the number of Providing Units will increase and hence a larger range of Service Providers and technologies can be facilitated. The procurement of Services and/or Service Providers will be in line with the Utilities Directive, national public procurement guidelines and general public procurement principles.

One respondent proposed that preferential treatment, during the connection application process, should be granted to parties connecting technology to the Distribution Network or System. Connection and Grid Access policy is a matter for the Regulatory Authorities.

TSOs' Decision

Based on the feedback from the industry, no change is proposed to the minimum Providing Unit size of 1MW in the Wind and Demand size trials, or to the minimum size of 100kW per Providing Unit in the 'other technologies' class. Equally, no change is proposed to the maximum size of Service provision per Providing Unit in any trial is 5MW.

3.10. Responses to the Proposed Criteria for the Provenability Trial

Many respondents did not agree with the proposed evaluation criteria on the basis that the evaluation criteria were not specific and therefore it was unclear to respondents how each criterion would be evaluated. In addition, there was concern from a number of parties that the weightings for each criterion were not specified. The proposed criteria were provided on an indicative basis only and TSOs note the concerns of the respondents. Detailed criteria and weightings will form part of the tender documents in the procurement process. Upon completion of the Year 1 Qualification Trial process, the TSOs will also review the process to assess its effectiveness in facilitating new technologies and enabling entry into the Central Procurement Process.

A number of respondents also indicated that price should not be an assessment criterion for the Provenability Trials. On the basis that there will be an open competitive procurement process to select the Service Providers, price per Service provided will be used as a differentiating criterion in the Provenability Trials.

A number of respondents were also concerned in relation to linking performance in events with the outcome of the trial. Furthermore, respondents expressed concern that events may not occur, especially when wind generation is curtailed. The TSO have considered this and whilst the most appropriate trial mechanism is the response to real-time events, the TSO may utilise smaller frequency disturbances on the system to assess Service provision, should there be no suitable frequency events on the system over the entire duration of the trial. In addition, the TSO may also use scheduled system events to determine responses from Service Providers. Scheduled system events are rare and will not be specified driven by the Qualification Trial Process.

A number of respondents requested clarification as to whether the TSOs would dispatch-down, with full compensation, wind generation in order to demonstrate Service provision. It is not within the scope or budget of the trial to dispatch-down wind generation (or any other energy-limited generation or technology such as Solar PV), with compensation, solely for the purpose of demonstrating Service provision. Response to events will be possible when wind generation is curtailed during the times of high levels of wind penetration.

Another respondent requested that the TSOs engage with industry on System Service updates that reflect capability of wind to provide System Services under future market

and penetration level scenarios. As the focus of System Services is to define the Services that are required to operate the system under a range of operational scenarios, Service provision should be sought from a range of new and existing Service Providers from a range of new and existing technologies, including wind generation. Service provision should not be focused on one specific technology.

A number of respondents expressed the view that when a Service Provider passes a trial successfully they should be awarded a contract of System Service provision for the remainder of the interim tariff period. The mechanism for all Service Providers to be awarded a System Services contract is the Central Procurement Process, which has now concluded for 2016/2017. All Service Providers that are successful in the Qualification Trial Process will be eligible to enter the next Central Procurement Process.

Respondents also requested that where the trial period overlaps with the next Central Procurement Process, all Service Providers in that category should be allowed to provisionally pass through the Central Procurement Process until the trial is concluded. The TSOs considered this issue and will extend the trial period to 30th September 2017, to align with the next Interim Tariff period. All Service Providers that are successful in the Qualification Trial Process will be eligible to enter the next Central Procurement Process.

A number of respondents also provided specific feedback and sample criteria that could be used by the TSOs in the procurement. These inputs will be used when determining the criteria that are included in the tender documents.

A number of respondents expressed concern that EirGrid projects would receive precedence in the Qualification Trial Process. The procurement of Service Providers for the Qualification Trial Process will be carried out on the same basis as the Central Procurement Process and in line with the Utilities Directive, national public procurement guidelines and general public procurement principles.

One respondent requested that the TSOs would further consult on the detailed criteria that would form part of the tender process. Due to the timelines associated with delivering an open, transparent procurement process and a trial period in advance of the deadline for the next Central Procurement Process, further consultation is not possible at this time.

Another respondent queried the impact of trialling new Service Providers on the existing Service Providers. The TSOs can clarify that Services from Qualification Trial participants will not be factored into real-time system operation requirements during the trial period and the TSO will assess this following each event. However, once qualified, Service Providers will be eligible to enter the next Central Procurement Process and, if successful, may be dispatched from 1 October 2017.

One respondent expressed concern at limiting the payment for Service provision in the Provenability Trial at that of the interim tariff rate. On the basis that there will be an open, competitive procurement process to select the Service Providers, price per Service provided may be used as a differentiating criterion in the Provenability Trials. This may result in Service Providers being paid less than the interim tariff rate.

TSOs' Decision

Noting the issues raised by the industry, the TSOs confirm that detailed criteria and weightings on those criteria will form a key part of the tender documents for the Qualification Trial Process. The duration of the trial period will run until 30th September 2017, subject to the successful completion of the procurement process. The TSOs may utilise frequency disturbances on the system to assess Service provision, should there be no suitable frequency events on the system over the entire duration of the trial. In addition, the TSO may also use scheduled system events to determine responses from Service Providers. Scheduled system events are rare and will not be specifically driven by the Qualification Trial Process.

3.11. Responses to the Proposed Criteria for the Measurability Trial

Many respondents did not agree with the proposed evaluation criteria on the basis that the evaluation criteria were not specific and therefore it was unclear to respondents how each criterion would be evaluated. In addition, there was concern from a number of parties that the weightings for each criterion were not specified. The proposed criteria were provided on an indicative basis only and TSOs note the concerns of the respondents. Detailed criteria and weightings will form part of the tender documents in the procurement process.

A number of respondents expressed concern at limiting the success of the trial to only 1 event. Respondents also expressed concern at events not occurring over the trial period and one respondent proposed a lower level of frequency disturbance could be used to verify the measurability of the provision of Services.

In response to this, the TSOs propose that the Measurability trial period will be extended to run concurrently with the Provenability trial period, until 30th September 2017. As responses to all system disturbances will be measured over the trial period, sufficient data will be gathered for the measurement of FFR, FPFAPR and DRR.

Some respondents requested confirmation whether the remuneration for participating in the Measurability Trials was on a successful participation basis or on delivery of the Service or Services in the Measurability Trial. The TSOs can confirm that remuneration is on the basis of participation on not on the Service provision basis.

A number of respondents were concerned with the proposed remuneration, a one-off payment of €25,000 per Service Provider, particularly in the context of investments in hardware that Service Providers, such as Demand Side, may need to make. The TSOs have considered this feedback and assessed the potential cost to trial participants. In this context, we propose to increase the one-off payment to €50,000 per Service Provider as this is more reflective of the cost of off-the-shelf measurement equipment. The TSO has experience of installing this type of equipment for power system monitoring and analysis in transmission stations.

One respondent requested that the TSOs would further consult on the detailed criteria that would form part of the tender process. It would not be appropriate to consult on the detail of the criteria and weightings that would form part of the procurement process.

One respondent proposed that preferential treatment, during the connection application process, should be granted to parties connecting technology to the Distribution Network or System. Connection and Grid Access policy is a matter for the Regulatory Authorities.

One respondent proposed that the one-off payment be increased to €250,000 on the basis that there was no incentive for parties to enter the Measurability Trial. The TSOs have increased the one-off payment to better reflect the costs associated with participating in the Measurability Trial.

TSOs' Decision

Noting the issues raised by the industry, the TSOs confirm that detailed criteria and weightings on those criteria will form a key part of the tender documents for the Qualification Trial Process. The TSOs have proposed the following changes: the duration of the 2017 trial will be increased. The 2017 trial period will run concurrent to the Provenability Trial up to 30th September 2017, subject to the successful and timely completion of the procurement process. This increase in the trial duration will also increase the probability of events occurring to which a trial participant may respond. In addition, the TSOs propose an increase to the one-off payment to €50,000 per Service Provider.

3.12. Alternative Criteria proposed by Industry

Respondents sought clarity around the application of the criteria in the trial and alternatives to the proposed trial. These can be summarised as follows:

- Incidence of events over the duration of the trial
- Use of scheduled tests to determine performance
- Use of forecasted availability profiles
- Capping of the trials
- Testing of capabilities of specific technologies rather than Service provision
- Use of historical performance in place of the trials
- Impact on Grid Code Compliance testing

A number of respondents stated that, should there be insufficient events over the trial period performance in other system disturbances should be included in the assessment of performance. The TSOs notes participants' concern in relation to the occurrence of events over the trial period. Whilst the most appropriate trial mechanism is the response to real-time events, the TSO may utilise frequency disturbances on the system to assess Service provision, should there be no suitable frequency event on the system over the entire duration of the trial. In addition, the TSO may also use scheduled system events to determine responses from Service Providers. Scheduled system events are rare and will not be specified driven by the Qualification Trial Process

One respondent also stated that for the Measurability Trials, given the dependence on performance in an event at a specific location, the number of service providers to be trialled for the FPFAPR and DRR services should be increased. The TSOs has noted this concern and removed the jurisdictional allocation and increased the number of Service Providers in this element of the trial. Additionally, a Service Provider will be eligible to participate in both elements of the Measurability Trials.

Another respondent stated that scheduled tests could provide useful information, and proposed the use of forecasted availability profiles for energy-limited Service Providers. Whilst the most appropriate trial mechanism is the response to real-time events, the TSOs may use scheduled system events to determine responses from Service Providers if possible. The TSOs acknowledges the need for forecasted availability

profiles for energy-limited Service Providers and this is likely to be a requirement in the next Central Procurement Process.

One respondent stated that the trials should be unlimited. The respondent proposed that there should be a minimum set of criteria assessed by the TSOs with no limit on the number of Service Providers. An assessment-based mechanism may be appropriate in the future when a range of technologies have been proven for a range of System Services. However, for the initial period, a defined set of trials are better suited to proving System Services from a range of technologies.

One respondent provided a detailed proposal on assessing the operational complexities of FFR, POR and SOR. The TSOs have noted this but believe on balance that real-time trialling of Services is the optimum solution for Service Providers and the TSOs at this time.

One respondent noted that historical performance could be used to establish a level of provision of each of Services that is available from existing conventional plant. The TSOs has monitored Service provision for the Services that formed part of the Harmonised Ancillary Services arrangements and remunerated on that basis. However, whilst Services in the Fast-Acting category (FFR, FPFAPR and/or DRR) may have been available and inadvertently provided by some conventional plant to date, the TSOs did not measure the level of response for the Service provided. This is the rational for the Measurability Trial.

One respondent expressed concern in relation to consequential Grid Code testing, should a Service Provider make changes to their control system in order to provide the Service. There is no Grid Code testing proposed as part of the Qualification Trial Process – rather the response of the Service Provider to a system event (in the Provenability Trial) will be the basis of the Trial.

TSOs' Decision

No further change is proposed to the trials as outlined in this decision paper.

3.13. Other issues raised by respondents

A number of issues were raised by respondents in their general response. The majority of those concerns have been addressed in the changes proposed in the above Sections. A number of respondents sought clarity on a range of issues which are provided in this section. These can be summarised as follows:

- Qualification of sub-classes of Technology
- Participation in the next Central Procurement Process
- Simultaneous Participation in both Provenability and Measurability Trial
- Outcome of other tests/ trials/ investigations by the DSO/ DNO
- Levels of proposed remuneration in the trials
- Grid Code limitations for certain technologies
- Ownership of Data
- Deadline for participation in the Qualification Trial Process

A number of respondents sought clarity on whether specific sub-classes of the technologies were being qualified or broad technology classes. Sub-classes of technologies will not be individually qualified. The capability of some installations to provide Services is contingent on both the capability of modules of technologies (such as wind turbines at a wind farm, a battery array or an aggregation of Demand Side and/ Generation Units) and their associated control systems. In this respect, these installations will respond in line with control systems. It is the TSOs' understanding that hybrid applications consisting of combinations of technologies may be amongst the Service Providers that participate in the Qualification Trial Process. In that context, it would be not reasonable to qualify sub-classes of technologies, given the potential complexities, interactions between technologies and their control systems.

A number of respondents requested the TSOs clarify that Service Providers (and/or technologies) that do not enter the Qualification Trial Process will not be discriminated in the next Central Procurement Process. In the event that a Service Provider that does not participate in the Qualification Trial Process and their technology is not proven in a similar size system elsewhere, then that Service Provider will likely not meet the consideration for Central Procurement Process. The TSOs will publish the high-level results of the Qualification Trial Process, including summary of the technologies that

have proven Service provision. One respondent requested clarification that a Service Provider participating in both Provenability and Measurability Trials. The TSOs can confirm a Service Provider can participate in a Provenability Trial and one or both elements of a Measurability Trial, subject to the outcome of the procurement process. As a further note of clarity, a Providing Unit can only participate in one Provenability Trial – either Wind or Demand Side or ‘other technologies’ but may provide one or both Services in that category, where applicable e.g. the same Providing Unit may provide both POR and RM3 on a technology class but would not be remunerated twice for the provision of the same Service in different technology classes.

One respondent queried if the outcome of a test by the DSO at a specific location on the system would prequalify that Service Providers for System Services. The TSOs can confirm that the only mechanism to qualify Service provision from the technologies outlined in this document is via the Qualification Trial Process.

One respondent proposed that the payment for Service provision should be higher than that of the interim tariff to incentivise participation in the Qualification Trial Process. On the basis that there will be an open competitive procurement process to select the Service Providers, price per Service provided will be used as a differentiating criterion in the Provenability Trials. This may result in Service Providers being paid less than the interim tariff rate.

Another respondent noted that the Grid Code provisions were inadequate for a range of emerging technologies. The TSOs note this and confirm that the development of the relevant Grid Code, Distribution Code and other standards will be informed by the findings of the Qualification Trial Process. The same respondent noted that the timing of the trial, along with a number of other electricity market changes, may prohibit entry to the Trial. The TSOs acknowledges the concern of the respondent and notes that whilst the Qualification Trial Process will provide a mechanism for technologies to gain access to remuneration for System Services, it does not address the implications of wider electricity market structural changes for Service Providers.

One respondent requested clarification over the ownership of data in the trial. It is the TSOs’ view that in the case of the Provenability Trial, the TSOs will monitor the provision of Services in the Provenability Trial, subject to the adequate provision of data from the Service Provider and therefore, the TSOs will own the data. In the case of Measurability Trial, it is the TSOs’ view that the Service Provider will own the data. The

exception to this is if the Service Provider is utilising TSO-owned measurement equipment, where such equipment pre-exists the trial.

One respondent stated that some Service Providers may not be in a position to commence a trial in early 2017 and they should not be excluded from this process. The TSOs will only be able to include those parties connected and operational at a date to be specified for the Qualification Trial Process for that year. Service Providers that miss the deadline for the 2017 Qualification Trial Process may be eligible to enter the next Central Procurement Process, if a technology in their class qualifies through the 2017 Qualification Trial Process. If not then they will be eligible to enter the 2018 Qualification Trial Process.