DS3:
System Services Review
TSO Recommendations

A Synopsis for the SEM Committee

1. Executive Summary

1.1 Introduction

The power system of Ireland and Northern Ireland is in a period of transition driven by national and European policy, particularly with respect to renewable energy. This transition will result in a fundamental change to the power system generation portfolio and the operational characteristics of the system under both steady state and transient conditions. Given the importance of the reliability and resilience of the power system to the wider economy, it is essential that this transition is managed securely. It will therefore significantly transform the requirement for, and composition of, essential system services.

EirGrid and SONI (the TSOs) have put in place a multi-year, multi-stakeholder programme of work, "Delivering a Secure Sustainable System" (DS3), to address these challenges. EirGrid and SONI also have licence and statutory obligations to ensure sufficient system services are available to enable efficient, reliable and secure power system operation. The System Services Review, which forms a central component of the DS3 programme, was initiated to ensure system services would be available to meet the needs of the system in line with policy objectives. It has involved a multi-stage consultation process, culminating in this recommendations paper.

The consultation process to date has included three consultation papers. The first paper set out the proposed approach to the system services review, and sought industry input on the scope and nature of the review. In conjunction with this paper, the TSOs published an international review of system services that had been carried out by independent consultants. Prior to the System Services Review, the TSOs had established the need for system services through detailed studies and technical analysis, and in the second consultation paper proposed new products which address the emerging challenges associated with achieving the governments' renewable energy policy objectives. The third consultation paper focussed on the financial aspects of system services. A detailed summary of the responses to the third consultation has been included in this paper, with an explanation of how the respondents' views have been incorporated into the TSOs' recommendations.

The report to the SEM Committee the TSOs' recommendations on a number of aspects of the System Services Review: the new system service products required, the contractual arrangements including the remuneration approach and the need for an increased focus on reliable performance, a value-based approach to determining the pot of money available for system services, and how that pot could be first distributed between consumers and service providers and then allocated between products.

The TSOs recommendations are of three types: 1) principles with enduring applicability, 2) specifics for the period 2015 to 2020, and 3) details that warrant further consultation. A summary of the recommendations is provided below.

1.2 Key considerations in arriving at TSOs' recommendations

The following are the key considerations that have underpinned the TSOs' recommendations. Further details on these points are provided in the recommendations report.

- Enhanced System Services (ESS) are necessary to achieve both governments' targets for renewable sources from electricity (RES-E) economically, or perhaps even at all

- With ESS as contemplated in this proposal, a reasonable scenario is that 40% RES-E penetration (in 2020) could be achieved and the system operated in an efficient and secure manner with:
    - 5200 MW installed wind[1] on the Ireland and Northern Ireland power system;
    - operational policies equivalent to a System Non-Synchronous Penetration (SNSP) limit of 75%;

  which would result in the level of wind energy curtailment being less than 5%.

- Without ESS, the current operational policies, including SNSP, cannot materially change to accommodate more wind thus resulting in greater levels of curtailment. Hence, either the RES-E targets would not be met, or to meet the RES-E targets significantly more wind capacity would need to be installed (with still higher curtailment levels), resulting in additional capital costs (including additional network) and associated environmental impacts.

- To provide ESS, service providers will, in the TSOs' view, incur additional capital and/or operating costs above that required today to build a least cost energy provider. These additional costs need to be remunerated or the services will not be provided. However, in the long term with appropriate incentivisation, it may be the case that technology will evolve to provide these services more efficiently to meet the broader policy objectives.

- In keeping with normal industry arrangements these additional costs will have to be recovered from customers. However, the overall cost to customers will be reduced as compared to the "business as usual" scenario of not procuring ESS while trying to meet the policy objectives. In the business as usual scenario, costs to customers would increase due to higher total production costs, and potentially also due to: impacts on the System Marginal Price the consumers are exposed to in the energy market, additional support costs for wind capacity which is operating at higher levels of curtailment, and costs of failing to achieve the RES targets.

- Service Providers providing ESS need to earn more for those services than Service Providers providing the current level or "basic" System Services. This differential should be established through the System Services payment mechanisms.

- A related point raised extensively in the third System Services consultation, is the extent to which there should be any adjustment to Capacity Payments as a result of additional payments for ESS. Current generators and other Service Providers commented that capacity payments should be unchanged and the interaction decoupled.

[1] The level of installed wind is based on the estimate made at the time of the data freeze of the wind capacity required to meet the 40% RES-E target in 2020. The precise level will vary depending on other factors including demand growth, capacity factors and other RES-E sources.

- On this point the TSOs' position is that the level of Capacity Payments is a matter for the SEM Committee. The level of Capacity Payments is set with a view to achieving certain objectives, and is outside the scope of the System Services review. While the level of payments for System Services may have a relationship with the Capacity Pot, other factors are more fundamental to it, such as the future energy market structure and market revenues.

- That said, if one assumes that the level of payments for Capacity and Ancillary Services taken together, is correct for today's system service needs, then;

  for a current Best New Entrant (BNE) Open Cycle Gas Turbine (OCGT) plant, if it earns more from System Services due to the revised arrangements then it seems reasonable that it would earn less from capacity payments, as its costs are unchanged.

  Conversely for ESS (whether a new provider or a current provider which enhances its capabilities), the toal revenue required from SS and Capacity should be more than for a "standard" provider.

- Another point implicitly raised by a small number of respondents was that the TSOs should take other impacts on customer costs into account when designing the System Services arrangements. For example, if a new generation plant which can provide ESS is also very efficient, it may reduce market prices. In this instance the energy market design is the main vehicle for rewarding energy efficiency and is outside the direct remit of the TSOs.

- A related concern was that the analysis presented did not take into account whole of life costs to consumers. While the TSOs' have a role and obligation to take into account the objective of minimising the overall costs of the generation, transmission, distribution and supply of electricity to final customers this is only in the context of other regulations and structures established under law. In this regard the TSOs' role is limited as the wholesale energy market is the main determinant of costs and efficiencies with respect to generator, and associated service provision, investment.

- A key consideration from many respondents to the consultations is that the System Services arrangements should provide investible revenues. For a service provider or potential service provider to invest in ESS, it requires:
  - Adequate remuneration of the additional costs incurred in providing ESS;
  - Adequate predictability of revenue, which relates to:
    i. The period of certainty of the overall arrangements;
    ii. The period of certainty of payment rates;
    iii. The degree of certainty of volumes of ESS the SP will provide.

  In regard to points (i) and (ii) above, the period of the mechanism and particularly the period of certainty on payment rates, is a balance between providing adequate certainty to Service Providers and potentially locking out innovation. These considerations have informed the recommendations made by the TSOs and are likely to be further discussed during the SEMC's consultation.

- In regard to point (iii) a key issue is the extent to which volumes are dispatch dependent. While dispatch related payment is desirable for at least some SS as it targets payment at where the value is actually being delivered, it could reduce the predictability of SS volumes and hence revenue for SS

providers. On the other hand, capability-based payments may spread payments too thinly, thus not adequately remunerating the enhanced System Services which are needed to add real value.

- To address these issues, the TSOs propose a novel arrangement, which is similar to ideas put forward by some respondents in response to the 3rd SS consultation. In this mechanism a number of products are recommended to be dispatch dependent and others capability-based. In addition, for the capability-based products, a "price scalar" is proposed. This has been adopted from the regulatory approved mechanism in Capacity Payments and has two distinct advantages that address the main limitations identified above. Specifically as it is designed for capability-based products but scaled with respect to the BNE it effecively gives very predictable revenues which are more targeted towards plant that are more likely to be dispatched.

- Some respondents raised a concern that the approach favoured large portfolio players. The TSOs acknowledge that, for dispatch-dependent products, a large portfolio player is likely to gain and lose equally across their service providing units and, in that sense, it has a natural hedging mechanism. This advantage, which is gained from having a larger portfolio, is a common feature of the electricity industry and there is nothing necessarily anti-competitive in this. The TSOs also note that having priority dispatch reduces the exposure to dispatch dependent products too.

- The TSOs have carried out some analysis of the likely costs of providing ESS from a limited range of potential sources. This is not exhaustive and only needs to be sufficiently adequate to be able to:
    - inform a view that the overall SS mechanism has a reasonable likelihood of working effectively and delivering the required levels of ESS; and
    - inform the allocation of benefits between SPs and customers.

  The analysis done by the TSOs is intended to be fit for these purposes only, it is not exhaustive nor does it attempt to rigorously estimate costs or to identify the optimum set of service providers. The mechanism itself is intended to do that by setting out a payment structure based on value of the services and allowing the most economic providers to respond.

- A number of respondents commented on the portfolios (generation etc) derived by the TSOs for the purpose of estimating the value of ESS. The scenarios used by the TSOs are (a) fundamentally a "business as usual" scenario and (b) a scenario with additional/enhanced SS such that the 75% SNSP can be achieved. Some respondents expressed concern that investments/technologies of the nature that they may be contemplating were not specifically included in one or other or both scenarios. The TSOs' comments on this are as follows:
    - The portfolios are not intended to be, and are not represented to be, optimised. They are only required to be fit for purpose, i.e. to provide a reasonable basis for estimating the value of ESS.
    - The "business as usual" scenario was derived based on information contained in the All-Island Generation Capacity Statement 2011-2020, which is a reasonable basis for this purpose. In particular, it would be inappropriate to "enhance" the "business as usual" scenario with new technologies as this could be considered selective In addition the use of more efficient, flexible plant which might possibly connect as a baseline study would reduce the value the improvements gained in moving to the ESS scenario would bring and ultimately might undermine the investment assumed in the first place.

1.3 Summary of Recommendations

1.3.1 Recommendation on principles:

The TSOs recommend that:

- The system service products are designed by the TSOs to address the needs of the power system to meet all appropriate policy objectives in an efficient manner.
- The system service products are, in so far as possible, technology neutral.
- The existing ancillary services are included as system services in this process with the exception of Blackstart. Specifically these include Primary, Secondary, Tertiary and Replacement reserves and Reactive Power (with modifications to the definitions of last two products).
- The following products are implemented as new system services: Synchronous Inertial Response, Fast Frequency Response, Ramping (1, 3 and 8 hour), Fast Post Fault Active Power Recovery and Dynamic Reactive Power.
- A "Value Based" approached is utilised in determining the aggregate value of system services. This is determined with reference to the production cost savings of being able to operate the power system more efficiently with the addition of new system services as compared with the current "business as usual" level of services.
- The distribution of the total value between the end consumer and the system services providers should be informed by the incremental capital and/or operating costs of the enhanced system services required to meet a transparent and published set of policy objectives.
- The determination of the annual system services pot and resultant payment rates should be fixed for a five year period. This is to achieve an appropriate balance between reducing risk to the investor (service provider), without locking out innovation to the costs of consumers.
- The allocation of the system services pot between the system service products should be based on a relative marginal benefit approach as outlined in Option 3 of the third system services consultation. This weighting between the products should remain fixed for at least the tariff period to provide reasonable certainty to investors.
- The required monies are recovered through appropriate regulated consumer tariffs in Ireland and Northern Ireland.
- If the market does not deliver the required system services, or in the event of unexpected circumstances, the TSOs should be allowed to enter into contracts for services to take into account the needs of the power system and the policy objectives.
- The contractual arrangements for system services are, in so far as possible, technology neutral.
- A single payment mechanism will be used for all services and will include a performance scalar to incentivise reliability of delivery.
- Product rates used for payments to service providers should be fixed (i.e. not time-varying)
- For services that align with a minimum requirement in the Grid Code, the TSOs are obliged to contract with all compliant providers for that minimum requirement.
- Contracting for quantities in excess of the minimum Grid Code requirement will be at the discretion of the TSO, based on the needs of the system. The use of this discretionary power will be exercised transparently with appropriate regulatory approval.
- For services which require performance in excess of the minimum Grid Code standard or where there is no similar Grid Code requirement, the TSOs will only contract with providers that meet the enhanced standards in full.

1.3.2 Recommendation on specifics for period Oct 2015 – Oct 2020

Specifically for the period Oct 2015 – Oct 2020, the TSOs recommend that:

- The system service rates should be determined by the approach and principles outlined above. For the 2020 system analysed, the total benefit from System Services is €355 million.
- €355 million should be used to determine the system service product tariffs to be employed from 1st Oct 2015.
- The determination of how these revenues interact with Capacity Payments is a matter for the SEMC. Assuming the existing design of the Capacity Payment Mechanism, the following is recommended:
    - The system services remunerated on a Dispatch Dependent basis are:
        - Ramping Margin (1, 3, 8 hour)
        - Primary, Secondary, Tertiary and Replacement Reserves
        - Fast Frequency Response
    - The system services that are remunerated on a Capability basis are:
        - Synchronous Inertial Response
        - Dynamic Reactive Power
        - Fast Post Fault Active Power Recovery
        - Steady State Reactive Power
    - Capability based payments should employ an additional rate scalar, which adjusts the remuneration received by a provider based on their average production cost (relative to a reference price). This rewards more efficient providers with relatively higher remuneration vs. less efficient providers.
- October 2015 should be set as a firm target date for "go live" of the new System Service arrangements.

1.3.3 Recommendation on details requiring further consultation

The TSOs recommend that, for a number of aspects of system services, a high level decision is made at this point on the principles, with further consultation on some of the details and implementation aspects to follow. In particular, it is proposed that further consultation would take place on the following:

- The exact portfolios and methodology to be used in determining the allocation between system services as per the relative marginal benefit approach (Option 3) recommended above.
- The System Services contract framework
- The process and implementation details for determining the performance scalars.
- The details associated with the implementation of the products and their remuneration.
- The process for determining and setting the rate scalars (including reference price).