



# DS3: System Services Review Preliminary Consultation

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13<sup>th</sup> December 2011

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## 1 Overview

The power system of Ireland and Northern Ireland is in a period of transition due to national and European policy drivers, particularly with respect to renewable energy. This has significant implications for the needs of the power system, particularly in terms of System Services. It is therefore timely to review the arrangements for System Services. This review, which forms a key component of the DS3 programme, will culminate in a decision on the future arrangements for System Services in Ireland and Northern Ireland.

The purpose of the review is to seek to achieve System Services arrangements that facilitate the efficient procurement of sufficient services for the secure operation of the power system both in the short-term and long-term, while complementing the other aspects of the wholesale electricity market.

Over the next 12 months, in cooperation with the Regulatory Authorities, the Transmission System Operators (TSOs) will undertake a multi-stage consultation process, to incorporate the views of industry on the arrangements for System Services. In addition to the formal consultation stages, there will be a number of industry forums and opportunities for bilateral meetings.

This preliminary consultation has been prepared by the two TSOs – EirGrid and SONI. The purpose of this document is to present the background and context, the proposed approach to the System Services review and to seek the views of the industry on the scope and nature of the review. In particular, the TSOs are seeking views on the approach to remuneration, the contractual arrangements and the eligibility of providers of System Services.

The responses to the preliminary consultation will inform the development of options for products, which will be presented in a second consultation in Q2 2012. The TSOs are currently investigating the specific definitions of System Services and the required quantities over the medium to long term and it is expected that this will form a key input to the second consultation. As such, this issue does not form part of this preliminary consultation.

This paper is structured as follows: section 2 sets out the obligations in respect of system service procurement and the basis for the review; section 3 provides some background and the policy context for this review; section 4 describes the proposed approach and timelines; section 5 details the questions for consideration and to which responses are sought; instructions on how to respond are given in section 6.

## 2 System Services Review

EirGrid and SONI have licence and/or statutory obligations to ensure sufficient services are available to be able to operate an efficient, reliable and secure power system. EirGrid, under paragraph 8 (1) (b) of SI 445/2000 and licence condition 3, will ensure sufficient services are available at all times. Similarly, under licence condition 29, SONI is obliged to contract for sufficient services as may be required to meet the operational and network standards applicable at the time.

System Services are those services, aside from energy, that are necessary for the secure operation of the power system. These services are also referred to as Ancillary Services and System Support Services.

The All Island Energy Market Development Framework (Nov 2004) included, as a goal, the harmonisation of Ancillary Services arrangements. The Harmonised AS (HAS) project, which began in

January 2008, culminated in the successful implementation of harmonised arrangements in February 2010<sup>1</sup>. The primary focus of the project was to align the arrangements in both jurisdictions consistent with the requirements under the SEM High Level Design (HLD), but without including a fundamental review of the services. These arrangements, together with the introduction of generator performance incentives (GPIs) and enhancement of performance monitoring, have brought about a number of benefits, including parity of treatment in both jurisdictions, greater transparency and a greater focus (from generators) on performance capability and Grid Code compliance. The Harmonised AS arrangements and GPIs provide a platform for a comprehensive review to be undertaken of the types and amounts of System Services required.

The policy objective of increasing the penetration of renewable generation is driving fundamental changes to the nature of the power system. These changes will have an impact on system operation that in turn drives a need to review the arrangements for System Services. The potential changes include: a change in the relative importance of existing services, the requirement to pay for services that were previously not remunerated, and the remuneration structure for services. This paper also seeks views on the mandatory provision of services. In addition, the review will consider the valuation of system services, in the context of the structure of the SEM and how generators and others are remunerated for the services they provide.

Current and future performance levels are an important consideration in the context of remuneration levels, mandatory provision of services and the importance of gaining value for money for the all island customer from the procurement of system services. Another workstream in the DS3 programme (Performance Monitoring) will examine the existing performance monitoring processes and facilities, and investigate potential opportunities for enhancement. Robust performance monitoring with accurate data is central to ensuring the delivery and quality of system services.

Incentivisation of the appropriate investments needed to maintain the secure operation of the system will be important. The review will aim to provide clarity in this area and will consider the valuation of system services, in the context of the structure of the SEM and how generators and others are remunerated for the services they provide.

Therefore, the System Services review should:

- clarify system needs – now and projected for the future,
- review effectiveness of existing services and payment structures,
- develop new services, determine appropriate valuations of these services and develop new/revised payment structures that foster a continued focus on performance and where appropriate drive investment,
- develop an appropriate timetable for the implementation of any new arrangements in order to provide early signals to investors.

Under the existing HAS arrangements, there are three main System Services that are remunerated: Operating Reserve, Reactive Power and Black Start. Potential future new services may include, but are not limited to: inertial response, negative reserve, ramping services and other forms of flexibility.

Under the HAS arrangements, service providers are remunerated based on regulated rates, which are reviewed annually. The total AS allowance for the period October 2011 to September 2012 is approximately €50m<sup>2</sup>. The costs of AS payments are recovered from the end consumer, via the

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<sup>1</sup> Please refer to SEM-09-003 and SEM-10-001

<sup>2</sup> This total is based on an EirGrid allowance of €37.7m and a SONI allowance of €11.0m. See SEM-11-064 for further details

System Support Services charge in Northern Ireland and via the Transmission Use of System charge in Ireland.

In the context of the obligations on the TSOs, the determination of the quantities of services required will remain a TSO responsibility. However, this consultation seeks to elicit the views of industry on what should be paid for, who should be paid and how much should be paid.

It should be noted that the annual tariff review for the Harmonised AS arrangements will continue in parallel to this work and is not part of the scope of this review.

### **3 Background and Context**

The Governments in Ireland and Northern Ireland have set ambitious renewable electricity targets. Driven by a combination of legal and policy requirements to increase energy security, enhance energy sustainability and reduce carbon emissions in the energy sector, Ireland and Northern Ireland have adopted 40% renewable electricity targets to be achieved by 2020.

The nature of the power system is changing to meet these policies with respect to renewable energy. Most significantly, there is a shift away from conventional fossil fuelled generation towards renewable generation, much of which will be non-synchronous and will utilise variable energy sources. In the case of Ireland and Northern Ireland, the principal renewable generation source will be wind (both on-shore and off-shore). In addition, the power system is changing because of other external policy drivers, e.g., increasing interconnection, SEM intra-day trading, future market coupling and the impact of increasing demand side management and SmartGrid initiatives.

In order to achieve the target levels of renewable electricity by 2020, the generation portfolio will change significantly. It is projected<sup>3</sup> that over the next eight years, the amount of installed wind generation will more than treble, to reach an installed capacity of over 6,000 MW. This is a fundamental change, particularly when considered in the context of the island power system of Ireland and Northern Ireland, which will have a projected peak demand of 5,500 MW, and a projected minimum demand of less than 3,000 MW.

It is estimated that the level of installed wind generation in Ireland and Northern Ireland in 2020 will be enough to meet around 37% of electricity demand. In percentage terms, this level of non-synchronous generation is greater than any other synchronous region in Europe over this timeframe, as illustrated in Figure 1 below.

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<sup>3</sup> All-Island Generation Capacity Statement 2011-2020, EirGrid and SONI, 2010

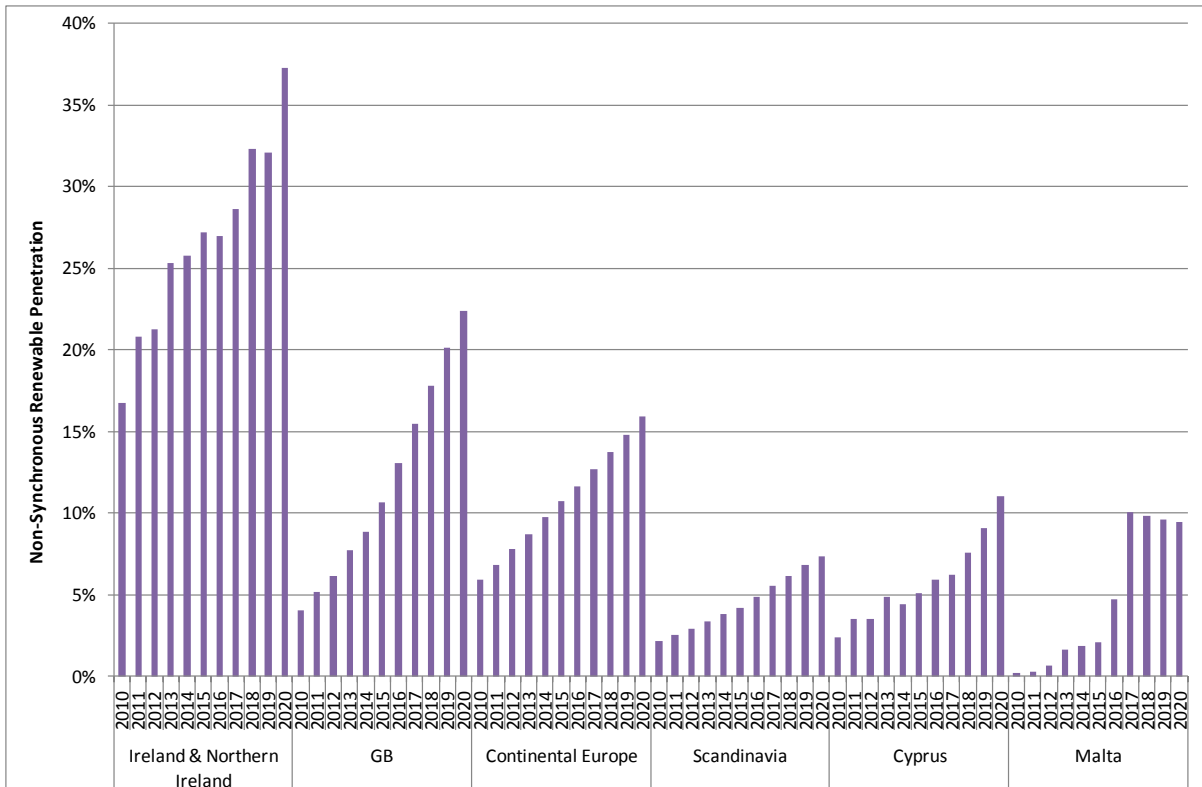


Figure 1: Non-synchronous renewable penetration (by annual energy) for each European synchronous system (source: EirGrid/SONI estimate, based on data submitted in NREAP submissions by EU Member States, June 2010)

Recognising these changes, the TSOs have carried out a number of studies on the impact of high levels of variable, renewable generation on the power system of Ireland and Northern Ireland, culminating in the publication of the *Facilitation of Renewables* (FoR) studies<sup>4</sup> in June 2010. Further analysis was carried out and a report entitled *Ensuring a Secure, Reliable and Efficient Power System*<sup>5</sup> was published, in which the implications of the FoR studies on the power system were presented and the DS3 Programme<sup>6</sup> was outlined.

These reports found that the behaviour of the power system will change with increasing levels of variable non-synchronous generation. In particular, the key operational functions of frequency control and voltage control will become more challenging, and a number of specific issues were identified that, if not mitigated, will limit the penetration of renewable generation. Some of these issues relate to the level of non-synchronous generation, which will present specific challenges to Ireland and Northern Ireland as illustrated in Figure 1. Some of the other issues are associated with the variable nature of renewable generation and will have wider applicability; for example, the Iberian peninsula has variable renewable generation penetration levels that are currently comparable to Ireland and Northern Ireland (see Figure 2), and due to its relatively weak interconnection to the rest of Continental Europe this region faces considerable challenges in managing the variability of this renewable generation. Maintaining system security in the context of these issues will require the provision of enhanced System Services, which will therefore become a key enabler of a more sustainable power system.

<sup>4</sup> <http://www.eirgrid.com/renewables/facilitationofrenewables/>

<sup>5</sup> Available at: [http://www.eirgrid.com/media/Ensuring\\_a\\_Secure\\_Reliable\\_and\\_Efficient\\_Power\\_System\\_Report.pdf](http://www.eirgrid.com/media/Ensuring_a_Secure_Reliable_and_Efficient_Power_System_Report.pdf)

<sup>6</sup> <http://www.eirgrid.com/renewables/deliveringasecuresustainableelectricitysystem/>

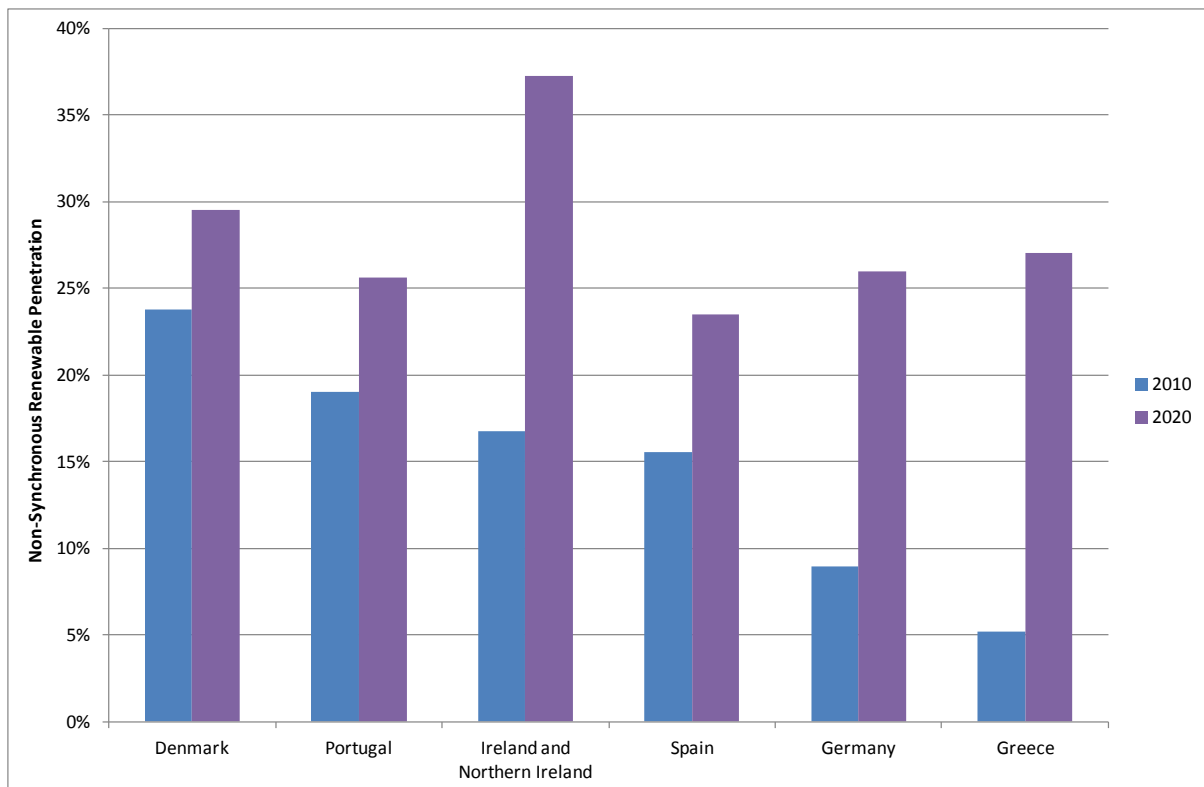


Figure 2: Non-synchronous renewable penetration (by annual energy) for the top six control areas in the EU in 2020 (source: EirGrid/SONI estimate, based on data submitted in NREAP submissions by EU Member States, June 2010)

The issues identified in these reports are complex and need to be addressed in order for the 40% renewable targets to be operationally achievable. The TSOs have established a coordinated three-year programme – Delivering a Secure Sustainable Electricity System (DS3) – which should put the necessary solutions in place. The System Services Review forms a central component of the DS3 programme, and will be a key enabler for future operational policy changes in the areas of frequency control and voltage control.

## 4 Approach

A multi-stage consultation process is proposed. The preliminary consultation is high level and seeks views from the industry on the scope of the review, the structures for System Services, eligibility considerations, the contractual arrangements and the degree of interaction with the wholesale market.

Following this consultation, the TSOs will meet with all interested parties, will consider all the responses and will issue a synopsis and discussion document based on the comments received. A second consultation will be developed, which will include options for System Services products. This will also be informed by studies that the TSOs will carry out to determine the future needs of the power system. The second consultation will be published in Q2 2012 and will be supplemented with an industry forum where the options developed will be presented. As for the first consultation, the TSOs will consider all responses received and will develop proposed recommendations for the SEM Committee, which will be issued for consultation in Q3 2012. Following submission of a set of final recommendations by the TSOs to the SEM Committee, the SEM Committee has indicated its intent to publish a decision on these by end 2012 / early 2013.

The TSOs have established a project team that will collaborate with the Regulatory Authorities to ensure that the review of System Services is coordinated and is carried out in the context of other related workstreams. It is intended that there will be regular engagement with the SEM Committee, particularly in respect of the consultation papers.

In parallel with this consultation process, the TSOs have engaged independent consultants to carry out an international review of System Services. This review will contain a comparison of the System Services (or ancillary services) arrangements in a number of markets around the world, with an emphasis on markets and/or services that are relevant to the SEM and the all island system. It is envisaged that the resulting report will be published so that the information can be shared with the industry.

### Proposed Timetable

The following timetable is proposed:

Date	Milestone
December 2011	Preliminary consultation paper issued
February 2012	Response deadline for preliminary consultation
February 2012	Industry engagement – bilateral meetings
May/June 2012	Second consultation paper issued
May/June 2012	Industry forum: options for consideration
July 2012	Response deadline for second consultation
September 2012	Industry forum: draft recommendations
October 2012	Draft recommendations paper issued for consultation
November 2012	Final recommendations to SEM Committee

It should be noted that this provisional timetable is dependent on the outcome of the consultations and the breadth of any changes identified in this review. To ensure that progress can be made, it is important that this review is cognisant of the wider industry structure, but does not seek to make fundamental changes outside the System Services arena.

## 5 System Services Review – questions for consideration

The TSOs would like to seek the views of industry on the scope and nature of the System Services review. The issues for consideration have been split into three areas as follows:

- 1) Remuneration approach
- 2) Contractual arrangements
- 3) Eligibility of providers

### 5.1 Remuneration Approach

#### 5.1.1 Obligations for service provision vs Remuneration

Generators are obligated under the Grid Codes to provide certain levels of System Services. It could be argued that the provision of System Services should be a mandatory requirement for participation in the energy market, rather than being separately remunerated. However, mandatory only provision would be likely to result in only the minimum Grid Code required levels of service being provided with a poor level of reliability. As indicated by the studies carried out to date, greater capabilities than are defined in the current Grid Codes are required in order for the renewable targets to be achieved.



- **Should system service provision be unrewarded and left as a mandatory service or should there be remuneration for system service providers?**
- **Should there be remuneration only above the minimum required level of service provision?**
- **Should there be charges applied to Generators for non-provision of services?**

The current HAS arrangements provide remuneration for three types of service: Operating Reserve, Reactive Power and Black Start<sup>7</sup>. Given the changing needs of the power system, these services may no longer be adequate. In addition, there may be other services that should be considered.

- **What additional system services should be included?**
- **Which System Services should be remunerated?**
- **Which services should be deemed mandatory and provided without remuneration?**

### 5.1.2 Purpose of payment for System Services

At present, payments for System Services are small relative to other payment streams in the wholesale electricity market. As such, they do not provide a strong signal for future investment but they do provide a signal to existing generators to provide services and maintain equipment such that service levels are maintained.

- **Should payments for System Services provide a signal for new investment or an incentive for ongoing maintenance of existing capabilities?**

### 5.1.3 Remuneration Mechanisms

In the event that System Services are remunerated, there is a range of mechanisms and structures that could be considered. Services could be paid for indirectly via the energy and/or capacity payments, directly via specific payments for specific services when realisable (as at present), or with a combination of both approaches.

- **Should there be direct or indirect payments for System Services?**

If direct payments are used, there are a number of options: regulated rates (as for generators at present), market-based mechanisms, long-term tendering process (as for STAR<sup>8</sup> service), directly negotiated bilateral contracts, etc.

- **How should services be procured (e.g. bilateral contracts, tendering process, market mechanisms, auctions)?**
- **What payment mechanism(s) should be considered?**
- **Should different mechanisms be used for different services?**
- **If the current mechanism is retained, are there changes to the process which should be considered?**

### 5.1.4 Basis of remuneration

There are a number of options in terms of how payments are made for services. These could range from utilisation-type payments, where providers are paid only when a service is actually used, to capability payments which are made to providers when the service is available. Capability-type

<sup>7</sup> Note that in Ireland Black Start is a service provided by a subset of generators and it is currently remunerated; in Northern Ireland, Black Start is a mandatory service provided by all power stations and is not currently remunerated.

<sup>8</sup> STAR (Short Term Active Response) is form of Operating Reserve that is provided by demand customers. It is procured via a competitive tendering process. See <http://www.eirgrid.com/operations/ancillaryservices/demandsidemanagementdsm/> for more details.

payments can be dispatch-dependent (e.g. reactive power payments in HAS) or independent of dispatch (e.g. black start).

- **Should payments be focused on capability to provide services or utilisation of those services?**
- **If capability-type payments are used, should payments depend on whether generators are synchronised or not?**

### 5.1.5 Interaction with the SEM

There is currently a degree of interaction between the different payment streams in the SEM. The current Ancillary Services arrangements interact with the capacity mechanism through the determination of the BNE price (which in turn determines the annual capacity pot). Depending on the payment structure for System Services, there will be a greater or lesser interaction with the SEM.

- **What interaction, if any, should there be between the System Services arrangements and other revenue streams in the SEM?**
- **Should a re-distribution of values between the various revenue pots in the SEM be considered in order to incentivise investment in system services? If so, how should this be achieved?**

Currently all providers of a service receive the same payment rate irrespective of the costs to the providers or costs to consumers. If overall costs are considered, differences between providers can arise. For example, some generators can provide operating reserve when off-line whereas others must be on-line to provide reserve, which will impact on constraint costs.

- **Should payments to providers consider other costs (e.g. constraint costs) associated with the provision of services, and if so, how should this be achieved?**

## 5.2 Contractual Arrangements

### 5.2.1 Basis of Contract

There are a number of ways that the arrangements can be implemented, including regulated bilateral contract (as for the current HAS arrangements), mandatory agreement (via licence), framework agreement (similar to the SEM).

- **How should the contractual arrangements be implemented?**

### 5.2.2 Frequency of review

Currently, AS rates are determined on an annual basis. This gives a reasonable level of control over expenditure but it exposes service providers to uncertainty around future revenue streams. If long-term contracts were used, with payment rates fixed for a multi-year period, providers would have greater certainty, albeit at the expense of greater risk for the end consumer. There would also be a potentially greater exposure to currency fluctuations over longer time periods. Conversely, more market-based arrangements would provide greater flexibility but would likely result in more frequent changes in payment rates.

- **Should the duration of the contractual arrangements be indefinite or time-limited?**
- **How frequently should payment rates and system parameters be reviewed?**
- **How frequently can contracted capabilities be changed?**

### 5.2.3 Incentivising performance

Adequate System Services are essential for the secure operation of the power system. Uncertain or unreliable service provision increases overall cost (since a safety margin needs to be incorporated in

dispatch) and jeopardises system security. It is therefore essential that there are commercial incentives for reliable provision of System Services. In the current HAS arrangements, charges for under-performance are applied, where performance is assessed following significant frequency events. Generator Performance Incentives provide an additional incentive for generators to maintain their capability to provide services and comply with Grid Code requirements.

- **What mechanisms should be used to incentivise reliable performance in respect of System Services?**

#### 5.2.4 Recovering the cost of System Services

At present, System Services costs are recovered from demand customers via System Support Services charges in Northern Ireland and Transmission Use of System charges in Ireland.

- **Should the existing approach continue into the future or should alternative mechanisms be considered?**

### 5.3 Eligibility of providers

#### 5.3.1 Service Providers

Traditionally, dispatchable generators have provided the vast majority of the System Services requirements. Some services, such as static reserve, have been provided by demand customers and interconnectors. Other potential service providers include: new technologies (e.g. flywheels), partially dispatchable generation, aggregated generators, aggregated demand side providers, and storage schemes.

- **What types of providers should be considered for System Services?**
- **Is the value of service from different types of provider the same?**

#### 5.3.2 New Technologies

There are new and emerging technologies (particularly in the demand side and storage arenas) that may have the potential to provide significant benefits in respect of system operation through the provision of necessary System Services. Some of these technologies may provide greater benefit in respect of the services they provide, rather than purely in terms of energy.

- **What special services, if any, does the demand side or storage provide?**
- **How can the full potential of new technologies in respect of System Services be realised?**
- **Should there be alternative remuneration mechanisms for these providers? If so, how can it be ensured that there is equity of treatment and that the best interests of the consumer are protected?**

#### 5.3.3 Network Considerations

Traditionally, System Services have been largely sourced from large centrally dispatched generation whose utilisation has not been impacted by network considerations. However, as the power system transitions from having a fossil-fuelled, concentrated generation portfolio to a more dispersed, renewable portfolio, there will be increasing instances in the future of service providers whose services cannot be utilised for network reasons. For example, it may not be possible to source operating reserve from a generator behind a binding transmission constraint.

- **Should providers of System Services that cannot be utilised because of network considerations be eligible for remuneration?**

## 6 Responding to the consultation

Views and comments are invited regarding all aspects of this document. Responses should be sent to:

[DS3@eirgrid.com](mailto:DS3@eirgrid.com) or [DS3@soni.ltd.uk](mailto:DS3@soni.ltd.uk) by Friday 3<sup>rd</sup> February 2012

Responses should be provided using the associated questionnaire template. It would be helpful if answers to the questions include justification and explanation. If there are issues pertinent to System Services that are not addressed in the questionnaire, these can be addressed at the end of the response.

It would be helpful if responses are not confidential. If confidentiality is required, this should be made clear in the response. Please note that, in any event, all responses will be shared with the Regulatory Authorities.