



# EirGrid plc response to SEM Committee Consultation on DS3 System Services Procurement Design (SEM-14-059)

---

*5<sup>th</sup> September 2014*

## Executive Summary

EirGrid welcomes the SEM Committee Consultation on DS3 System Services Procurement Design. The SEM Committee has developed a number of positions that clearly define the scale of the challenge in moving from conceptual design to implementation. EirGrid agrees that these positions define the scope of the challenge that the DS3 System Services procurement design has to solve. These positions are:

- There is an estimated €500-600 million capital investment required in appropriate system services capability in the power system of Ireland and Northern Ireland to meet the public policy objectives by 2020;
- The benefit of this investment is at least €241 million a year compared to a business-as-usual case where this capability is not available;
- The cost of this investment to the consumer should be as close to the cost of delivering the performance capability as practicable, while acknowledging that an appropriate risk-adjusted return is required to incentivise merchant investment; and
- The best way to achieve this investment, where there is sufficient competition, is to employ market mechanisms to achieve true competitive outcomes.

The SEM Committee's procurement design proposals can be distilled to two of the five options presented. The SEM Committee's most-favoured design is a Multiple Bid Auction across all of the DS3 System Services products, allowing for varying bid prices and contract lengths. It is the function of the clearing mechanism to select winning bids. EirGrid believes, following consideration of the arguments presented in the paper, that:

- As indicated by the SEM Committee, the competitive forces necessary for such a Multiple Bid Auction to deliver reasonable market outcomes do not exist in Ireland and Northern Ireland, nor are they likely to exist for some time, and a degree of regulatory intervention is necessary at this time in any implementation;
- The Multiple Bid Auction design will not deliver the efficient outcomes desired. The best outcome that any practically implementable Multiple Bid Auction system can deliver will be sub-optimal and to a degree "selective";
- The inherent complexity of any such Multiple Bid Auction mechanism would result in a lack of transparency for market participants and potentially hinder the development of market confidence; and
- The proposed option risks a costly and lengthy implementation phase that may ultimately not deliver the required system services in the timely manner required to meet the public policy objectives.

The SEM Committee's fallback option is a version of a Regulated Tariff option. EirGrid believes that this mechanism:

- Is implementable, less complex and more transparent than the Multiple Bid Auction;
- Provides greater certainty to investors in a timeframe consistent with public policy requirements;
- Is designed to ensure that payments are proportionate to the overall value that the services

bring;

- Provides oversight and control mechanisms to monitor outcomes and allows for tuning through price reviews in the medium term to ensure consumers are protected; and
- Builds on the existing administration structures currently in place thereby minimising implementation costs for service providers and TSOs.

EirGrid concludes from these considerations that a DS3 System Services Regulated Tariff approach is the only appropriate mechanism, at this point in time, that can satisfy the dual requirements of protecting the interests of consumers and achieving the time-critical public policy objectives. However, building on the ideas in the consultation paper, the Regulated Tariff design could be further enhanced to better achieve the SEM Committee's desired outcomes.

Further to this main conclusion, EirGrid has significant concerns that the proposed product payment basis will reduce revenue certainty for service providers. EirGrid's original recommendation discounted utilisation and event-driven type product payments only after significant consultation with the industry. Furthermore, significant economic analysis was provided supporting and highlighting the revenue adequacy for the recommendation of individual products to be either "Capability" or "Dispatch-Dependent"<sup>1</sup>.

In EirGrid's view, the proposed procurement design does not adequately recognise the interaction between the system services and energy market arrangements. If the auction is conducted based on the system services bid prices alone as proposed, the result could be uneconomic as it does not take account of the cost of actually deploying the services i.e. dispatching a unit to deliver those services.

Implementation of the commercial arrangements is urgently required to ensure that investment decisions can be made and the projects delivered in the timeframe required to provide the enhanced performance capabilities. This SEM Committee consultation is an important step towards achieving this goal. EirGrid is available, and looks forward to, the opportunity to discuss the issues raised in this paper.

#### Key Messages

**EirGrid believes that:**

- **The competitive forces necessary for a Multiple Bid Auction to deliver efficient market outcomes do not currently exist in Ireland and Northern Ireland.**
- **Aside from market power issues, there are significant issues associated with the practical implementation of a Multiple Bid Auction design, associated with the need to:**
  - **Co-optimize across all 14 system services products**
  - **Account for interactions with the energy market, in particular the cost of actually deploying the system services**
- **The proposed product payment basis will reduce revenue certainty for service providers.**
- **A Regulated Tariff approach is the only appropriate mechanism, at this point in time, that can satisfy the dual requirements of protecting the interests of consumers and achieving the time-critical public policy objectives.**

<sup>1</sup> As defined in EirGrid's DS3 System Services consultations and Recommendation Paper, but not as used by the SEM Committee in its consultation paper.

## Contents

Executive Summary.....	2
Contents.....	4
1. Introduction .....	5
2. Demand and supply side analysis .....	8
2.1 Demand side .....	8
2.2 Supply side .....	8
2.3 Level of payments .....	8
3. Procurement design: Assessment criteria .....	9
4. Procurement design options.....	12
4.1 Option 5: Multiple-Bid Auction .....	12
4.2 Option 1: Regulated Tariff (modified).....	12
4.3 System Services Obligation Trading Scheme .....	14
5. Results of EirGrid’s assessment of procurement design options .....	17
5.1 Option 5: Multiple-Bid Auction .....	18
5.2 Regulated Tariff option .....	20
5.3 System Services Obligation Trading Scheme .....	21
5.4 Conclusions from the assessment .....	22
6. Product payment basis .....	24
6.1 Dispatch-based payment .....	24
6.2 Capability-based payment .....	24
6.3 Scalars .....	25
7. I-SEM interaction .....	26
7.1 Interaction with the energy market.....	26
7.2 Interaction with the capacity market .....	26
8. Other issues .....	28
8.1 System services volumes .....	28
8.2 Grid Code obligations.....	28
8.3 Management of system services payments by EirGrid.....	28
8.4 First mover advantage .....	28
8.5 Interaction with EU Network Codes .....	29
8.6 Risk to the consumer of under and over-investment in system services .....	30
9. Conclusions .....	31
Appendix A: Results of qualitative assessment .....	32
Appendix B: Lessons learnt from the GB market.....	35
Appendix C: Product volume determination .....	36
Appendix D: TSO consultations on ancillary services/ system services .....	39

## 1. Introduction

The SEM Committee has recognised that the island of Ireland is at the forefront of the transition from a traditional electricity system to one with a large penetration of variable non-synchronous renewable generation. This transition poses significantly different technical and operational challenges which can only be managed with a materially new and enhanced power system performance envelope. Ensuring appropriate incentives are in place for investment in needed system performance capability is a critical success factor in facilitating a power system that meets the multi-policy objectives of Ireland and Northern Ireland.

Against this background, EirGrid Group (“EirGrid”) welcomes the SEM Committee’s Consultation Paper on the DS3 System Services Procurement Design and the accompanying Information Paper. They are comprehensive documents that cover multiple issues but with particular focus placed on the two substantive issues associated with putting in place new and enhanced system services arrangements i.e. the procurement design and the product payment basis.

As the SEM Committee has concluded, the selected procurement design and payment basis will need to incentivise €500m-€600m of investment in the appropriate performance capabilities in a timely manner if the policy objectives are to be achieved. EirGrid also welcomes the SEM Committee’s acceptance of EirGrid’s financial analysis, which concluded that this investment in performance capabilities can unlock value of €241m per annum.

In assessing the procurement designs and selecting its preferred option, the SEM Committee has sought to put in place a competitive market-based solution with the objectives of achieving price discovery and safeguarding consumers. EirGrid shares these goals. EirGrid wants to see market outcomes where the most efficient and flexible plant are incentivised to enter the market, enabling the value from system services to be extracted at lowest cost to the consumer, thus maximising overall societal benefit.

The desire to see a market-based design must however be balanced against the characteristics and maturity of the all-island electricity market. The IPA report commissioned by CER and Utility Regulator expresses concerns about the level of market concentration in the Irish system services market with their analysis indicating that each system service represents a “highly concentrated” market. EirGrid echoes the SEM Committee’s concerns in this regard and believes that any competitive procurement mechanism will need to have strong regulatory supervision to mitigate against market power. EirGrid believes that there are also significant liquidity concerns that need to be considered with the size of the market such that the availability of a single large unit has a significant effect on market and power system operations.

Aside from market power issues, EirGrid has particular concerns about the capability of Option 5 and the auction methodology described in the SEM Committee’s Information Paper to deliver efficient outcomes. Based on EirGrid’s analysis of the proposals, the auction can only provide efficient market outcomes if co-optimisation is performed across all 14 products while simultaneously taking into account interactions with the energy and capacity market, in particular the cost of actually deploying the services. A service may be offered into the auction at a competitive price but if there is a high

cost incurred in “enabling” the service (e.g. starting and running a peaker to get the service) then it will not represent good value. Conducting the optimisation on the system services auction costs alone could result in uneconomic outcomes.

On a practical level, undertaking such a co-optimisation would be challenging and the issues may prove either to be insurmountable or require considerable time to work through and develop solutions. Given the complexities, the assumptions on product volumes and service provider portfolios required to make it work may mean that this market-based approach might not actually result in efficient outcomes. With significant pressure to put in place the new system services arrangements in time to facilitate the necessary investment in performance capabilities ahead of 2020, a procurement design that can be implemented in a timely manner is of paramount importance.

The procurement design selected must be made with full consideration of the market power and liquidity issues. While the system services market may be highly concentrated at present, market concentration will likely reduce over time with possible further divestment of generation assets to new parties, new entrants to the all-island market and particularly the introduction of smaller service providers and increased demand side participation.

Therefore EirGrid recommends the introduction of a Regulated Tariff option in the short term transitioning to a competitive market-based approach in the longer term as the system services market matures. The proposed Regulated Tariff option is effectively an extension of the present Harmonised Ancillary Services (HAS) procurement arrangements meaning that it can be implemented in a relatively straightforward manner, facilitating the urgent investment in the new system services needed.

EirGrid recognises that this approach will not provide for price discovery. However, given the market power and liquidity issues inherent in the current market, EirGrid believes that prices that would arise from a Multiple Bid Auction would not be robust. The likely regulatory oversight required to mitigate market power (bidding code of practice rules etc.) will dilute the benefits of a market-based approach, and the possibility of auction failure is risky given the 2020 target. There is greater liquidity in the energy and capacity markets in the short term. The proposals for these two markets will ensure competition is facilitated in the broader electricity trading arrangements. This will result in the combined remuneration of energy, system services and capacity being market-based.

EirGrid believes that the optimal procurement design for system services in the long-term is market-based. The structure and framework that would be put in place under a Regulated Tariff approach can evolve and segue into a competitive procurement mechanism as the system services market matures with the advent of new entrants/technologies, and becomes less concentrated and more liquid. In the interim period, the issues with the proposed Multiple Bid Auction design raised in this paper can be worked through and alternative competitive design options such as obligation-type arrangements (introduced in this paper) can be explored further. The assessment underpinning this conclusion is presented in this paper.

In addition to the procurement design assessment, this paper also covers the overarching product payment basis, which EirGrid believes will affect revenue certainty for service providers and make it difficult to bring forward investment if implemented as proposed, regardless of the procurement design selected. In addition, the paper considers interactions with the arrangements proposed for I-SEM including the Capacity Remuneration Mechanism. Finally, this paper also provides an overview of the issues involved in determining the required volumes of each system services product. Firstly however, the paper outlines EirGrid's views on the demand and supply analysis presented in the consultation paper.

## 2. Demand and supply side analysis

### 2.1 Demand side

EirGrid welcomes the SEM Committee's acceptance of the TSOs' demand analysis, which was conducted to provide an estimate of the value of the proposed system services arrangements. The overall annual value resulting from these new services is €241m .

### 2.2 Supply side

On the supply side, EirGrid also welcomes the SEM Committee's conclusion that the estimated total capital cost of ensuring that the required system services are in place by 2020 would be in the range of €500m - €600m, which aligns with EirGrid's analysis. However, EirGrid considers that the assumptions used by the SEM Committee's consultants, IPA Energy and Water Economics ("IPA"), to translate these capital costs to estimated annualised costs of €70m - €84m are overly optimistic. In particular, EirGrid has concerns about the WACC assumed for the calculation:

- IPA has assumed a WACC of 6.6%, which EirGrid believes is too low for merchant generation investment resulting in an underestimation of the annualised costs.
- In EirGrid's "DS3: System Services Review Recommendations Paper", we examined what the possible range for the WACC might be, the results showing levels of return required by investors generally being higher than this value. The proposed product payment basis which places greater risk on service providers than EirGrid's product payment recommendation would increase the required returns further.

EirGrid welcomes the SEM Committee's acknowledgement that the short and long term interests of consumers must be balanced and that in doing so, a higher annual spend than the estimated annualised costs of €70m - €84m may be needed to ensure the economic signals are such as to achieve the levels of investment required in new performance capabilities.

### 2.3 Level of payments

Given the challenging investment environment intensified by the necessary on-going transformational changes to the electricity market arrangements, EirGrid believes that there is a greater risk of under-investment than over-investment in the necessary system services provision particularly in the timely manner required to efficiently support and facilitate meeting the two governments' RES-E targets by 2020.

Mindful of this, EirGrid reiterates the view that while the incremental capital costs required to provide enhanced system services should inform the decision regarding the system services arrangements, a value-based approach rather than cost-based approach to determination of the level of system services payments should be adopted. EirGrid believes that a cost-based approach will not ensure the revenue adequacy required to stimulate investment with the result that the identified societal benefit arising from the implementation of system services will not be achieved.

### 3. Procurement design: Assessment criteria

The SEM Committee has developed a number of positions that clearly define the scale of the challenge that the DS3 System Services procurement design has to solve. EirGrid agrees that these positions define the scope of the challenge. These positions are:

- There is an estimated €500-600 million capital investment required in appropriate system services capability in the power system of Northern Ireland and Ireland to meet the public policy objectives by 2020;
- The benefit of this investment is at least €241 million a year compared to a business-as-usual case where this capability is not available;
- The cost of this investment to the consumer should be as close to the cost of delivering the performance capability as practicable, while acknowledging that an appropriate risk-adjusted return is required to incentivise merchant investment; and
- The best way to achieve this investment, where there is sufficient competition, is to employ market mechanisms to achieve true competitive outcomes.

The SEM Committee has conducted an assessment against the four selected criteria of “Consumer Interest”, “Investment”, “Curtailment” and “RES Targets” in order to assess the suitability of each of the procurement designs to achieve these desired outcomes. EirGrid agrees that the criteria of “Consumer Interest” and “Investment” are appropriate and recognises that the provision of investment certainty to service providers must be balanced with ensuring that customers are protected from excessive costs.

However, EirGrid believes that the two other criteria employed by the SEM Committee, “Curtailment” and “Renewable Targets”, could be covered using a single “Public policy met by 2020” criterion. The achievement of public policy objectives by 2020 will effectively be determined by the level of investment in the performance capabilities required by the power system and the timeline for that investment. In essence, if the procurement design does not provide sufficient revenue certainty to investors, consumers will not enjoy the savings associated with reduced curtailment while still incurring the cost of procuring the lower than required volumes, and there will also be a failure to meet the renewable targets.

EirGrid considers that an expanded set of criteria can be used to evaluate the procurement design options that takes account of the multiple issues influencing selection of the most suitable design and the ability of each design to deliver the desired outcomes. The set of criteria that EirGrid believes to be important is as follows:

1. Investment in performance capability in a timely manner
2. Protection from over-payment
3. Public policy met by 2020
4. Transparency and equity
5. Appropriateness of the design option given market power
6. Practical implementation
7. Cost of implementation (establishment and enduring)

In the following sections, each of these criteria is described and their suitability for use in the evaluation of the various procurement designs is explained. Note that the payment basis, which differs between the various procurement options proposed by the SEM Committee, is not considered in this assessment. The overarching issue of the most appropriate payment basis to adopt is dealt with separately in Section 6. Similarly, the interaction of the product payment basis and the proposed Multiple Bid Auction procurement design with I-SEM are discussed separately in Section 7.

### **3.1.1 Investment in performance capability in a timely manner**

Meeting the 2020 40% renewables target efficiently will require that the TSOs have the capability of operating the power system with System Non-Synchronous Penetration (SNSP) levels up to 75%. This will only be achieved with timely investment in the assets (whether new build or upgrade works) required to deliver the necessary performance capabilities. This criterion assesses the likelihood of each procurement option delivering the certainty required (in terms of both size and timing of cashflows) for developers to take on the investment risk, and whether that investment can be delivered in a timely manner.

### **3.1.2 Protection from over-payment**

In keeping with normal industry arrangements, the cost of putting in place enhanced system services will have to be recovered from consumers. It is vital that prices paid for system services are not too high or volumes contracted too large to ensure that the interests of consumers are protected. This criterion assesses the risk to the consumer of over investment in service provision associated with each procurement option.

### **3.1.3 Public policy met by 2020**

Given the on-going transition in terms of electricity trading arrangements, power system operation, and increasing levels of renewable generation, this criterion assesses whether the procurement option is appropriate to meet these challenges and to ultimately achieve the public policy objectives, particularly the Irish and Northern Irish Governments' targets for electricity generated from renewable sources by 2020.

### **3.1.4 Transparency and equity**

Any procurement design needs to be transparent, equitable, and understandable to market participants. If a procurement design is overly complex or opaque it would result in a lack of transparency for market participants and hinder market confidence.

In addition, the approved system services products are, in so far as possible, technology neutral from a product design perspective. Therefore, in line with the TSOs' obligation to be independent and non-discriminatory and further to the underlying principle of equitable treatment for market participants, EirGrid believes that the approach ultimately selected should allow any technology that is capable of providing a service to be eligible for reward. Technology neutrality facilitates market choice to be brought to bear on the outcomes, thereby enabling delivery of long-term efficient solutions.

This criterion will assess the transparency of each procurement design option as well as its equity for market participants.

### **3.1.5 Appropriateness of the design option given market power**

Market power is a key consideration in the selection of an appropriate procurement option. Given the market concentration concerns raised by IPA and which EirGrid shares, this criterion assesses the ability of the options to control or mitigate against market power without adversely affecting other desired outcomes, and ultimately assesses the appropriateness of each option in that light.

### **3.1.6 Practical implementation**

This criterion aims to assess the practical difficulties involved in the implementation of each system services procurement design option. This will take account of, *inter alia*, the complexity of the procurement design, the interdependence of system service products and the capability of the procurement design to handle it, the level of regulatory intervention required, and the ability to deliver efficient outcomes.

### **3.1.7 TSOs' cost of implementation (establishment and enduring)**

There will be costs incurred by the TSOs in procuring the system services, firstly in establishing the process and/or systems required and afterwards during subsequent procurement processes. This criterion will assess the comparative costs of implementation for each of the design options examined.

## 4. Procurement design options

In this section, the procurement designs to be assessed against the criteria introduced in Section 3 are described. Three procurement designs are considered, as follows:

- Option 5: Multiple-Bid Auction
- Option 1: Regulated Tariff (modified)
- System Services Obligation option

Options 2, 3 and 4 introduced and assessed in the SEM Committee's Consultation Paper are not included in this assessment as these were considered by the SEM Committee to have less merit than Options 1 and 5. The System Services Obligation option is an innovative new design that is introduced for the first time in this paper. However, and as we set out further in the paper, while EirGrid believes it would be possible to implement this type of trading scheme today, it would not be appropriate to do so as there is insufficient liquidity, market maturity or competitive structures to achieve the desired market outcomes.

### 4.1 Option 5: Multiple-Bid Auction

The Multiple-Bid Auction design assessed is as described in the SEM Committee's Consultation Paper. The additional clarifications provided in the supplementary SEM Committee Information Paper are also taken account of in the assessment.

### 4.2 Option 1: Regulated Tariff (modified)

The SEM Committee has proposed a number of changes to the Regulated Tariff option recommended by EirGrid in our Recommendations Paper. The key changes proposed are as follows:

- **Total expenditure permitted:** SEM Committee would set a total allowance for the TSOs' procurement of system services, which once reached would preclude the TSOs from entering into further contracts except with the prior approval of the SEM Committee.
  - *EirGrid view:* The TSOs have a statutory obligation to ensure that there are sufficient quantities of system services available to operate a safe, secure, and reliable system. EirGrid recognise that there would be a need to operate within the budget allocated for system services and would only seek to exceed the allowance where there is a risk of breaching this statutory obligation.
- **Pricing methodology:** SEM Committee proposes that the tariffs would be set based on the cost plus regulated return required by a BNE providing a range of services. The relative value of each service would then be estimated as previously described in the TSO Recommendations paper.
  - *EirGrid view:* We believe that a value-based approach rather than cost-based approach to determination of the level of the system services allowance should be adopted. However, if the cost-plus approach is adopted then appropriate consideration is needed for an effective premium. This should recognise the risks to

participants in making the necessary investment particularly if the SEM Committee is minded to consider a twenty year payback period as the IPA report appears to imply. We agree with the methodology for determining the relative value of services.

- **Contract length:** SEM Committee proposes that contracts signed during a tariff review period would be guaranteed the prevailing rate for a period of five years.
  - *EirGrid view:* We agree with this proposal. However, the TSO proposal allows for lifetime-length contract with a tariff price review every five years. This would necessitate qualification and termination criteria. Nevertheless, it provides a degree of certainty to participants compared to contract lengths of only five years. This is particularly relevant if the SEM Committee considers the payback period should be significantly longer than five years.
  
- **Product payment basis:** SEM Committee has proposed changes to the payment option terminology (Capability, Availability, Dispatch) and payment basis.
  - *EirGrid view:* EirGrid consider this and other payment basis issues to be overarching across all of the procurement designs. These issues are examined separately in Section 6.

In summary, with the exception of the product payment basis and contract length proposals, the proposed SEM Committee changes outlined above are assumed for this modified Regulated Tariff option. For the purposes of the assessment in this paper, the product payment basis is as defined in EirGrid's Recommendations paper.

#### Other potential modifications

A criticism levelled at the Regulated Tariff option is that investors would have insufficient investment certainty with a five year tariff price review period. EirGrid is mindful of the need to keep costs to the consumer at an appropriate level and recognises that there is a risk of over-investment with a Regulated Tariff approach. However, EirGrid considers that there is a greater risk of under-investment in the necessary service provision particularly within the time required to facilitate meeting of the 2020 targets.

In order to bring about the required levels of investment, there are a number of possible mechanisms that could be employed. For example, a new contract structure could be adopted that allows for price guarantees of greater than five years duration to be allocated for a subset of system services and/or for providers undertaking capital investments in new or existing plant. Existing providers would be restricted to five year price guarantees. This would facilitate greater investment certainty for potential new service providers. For the selected products, price guarantees could be provided as follows, for example:

- *Existing providers:* 5 year price guarantee
- *Retrofit or new build:* 10 year price guarantee

Another possible modification that may be worth further examination involves allocating a certain percentage of the total estimated volume requirement for particular products strictly for new service providers.

The system service products for which longer price guarantees might be permitted and/or the system services volumes that might be kept for new service providers only would be considered during the detailed design phase.

It might also be possible to introduce an element of competition into the Regulated Tariff design. One possibility, for example, is to set a regulated price for a product but, in the event that there is a risk of over-subscription, potential service providers would be allowed to offer their services at less than the regulated price to ensure that they get a contract. Options like this one could be investigated further in the detailed design phase

### **4.3 System Services Obligation Trading Scheme**

In the recent I-SEM impact assessment and high-level design papers there is consideration of appropriate designs for a Capacity Remuneration Mechanism complementary to the target model energy market. EirGrid supports this consideration and favours a market-wide volume-based CRM model. This is fully consistent with the TSOs' Regulated Tariff approach in the DS3 System Services Recommendation paper.

Importantly there is a recognition by the SEM Committee that reliability issues have economic properties of a Public Good. This is a determination that EirGrid strongly agrees with. However this reliability is not solely captured by "adequacy" products as inferred and implied on its own in these papers. EirGrid consider that this power system "reliability" or "resilience" is maintained by having sufficient quantities of all necessary services. These not only include capacity, but also the range of DS3 system services products identified and designed by the TSOs and approved in principle by the SEM Committee. The technical analysis contained in the "Facilitation of Renewables" study and follow-on DS3 studies fully support this broader definition of technical reliability.

If this definition is accepted there is a natural conclusion that the I-SEM CRM approach on its own could lead to inefficient outcomes for the consumer and a failure to facilitate government policy. However, there is also an opportunity to design a novel and theoretically sound procurement mechanism that could achieve the market outcomes and satisfy the reliability issues associated with meeting the government targets provided there are low transaction costs.

In the first instance, if the reliability issues consist of multiple components then it may not be appropriate to assign all the value for reliability to just one, in general capacity. For traditional power systems with relatively low levels of variable synchronous generation where there is little scarcity in these other services, due to the inherent design of synchronous plant this singular focus on capacity may not lead to material distortions to efficient outcomes. However, for power systems where these other services are material, which has been demonstrated for the Ireland and Northern Ireland power system through the DS3 work programme, then solely focusing on capacity is likely to lead to inefficient outcomes for the consumer and frustrate the achievement of government RES-E policy targets.

In the second instance as reliability is deemed to be a public good, there is a possibility to establish a “System Services Obligation Trading Scheme” across the range of products and allow suppliers to trade their way out of the obligations or invest in the necessary service capability. The main benefit of this mechanism is that if there is a low transaction cost, efficient outcomes will result. This arises fundamentally from the long term choice of service provision residing not with the TSO with appropriate regulatory oversight as in essence with Option 5 and to a lesser extent with the Regulated Tariff approach, but rather with the supplier and consumer. This is as it should be for market outcomes to occur. Options on a centralised platform to provide new entrants with trading opportunities and to enhance liquidity and reduce transaction costs would need to be explored. This would also be consistent with the preference for centralised arrangements in I-SEM.

At a high level, a System Services Obligation Trading Scheme could function in the following manner:

- The TSOs would forecast how much of each system service product is required in the years ahead. This is a similar period to the regulated tariff (say 5 years). This would be done against a regulatory-approved portfolio of the power system compliant with government policy. System service providers would be awarded a certificate by the TSO for each eligible unit of a system service product that they provide following assessment and approval of their performance (via performance monitoring). For example, the provision of one MWh of operating reserve would entitle the provider to one certificate. These certificates would be scaled by performance and scarcity scalars as appropriate.
- Each supplier would have a quota of system service certificates that they would need to have and which they obtain by purchasing certificates from service providers. The size of a supplier’s quota is a function of the total volume requirement determined by the TSOs and the supplier’s share of overall electricity demand. These certificates are used by suppliers to demonstrate that they have met their obligation. Where suppliers fail to present a sufficient number of certificates to meet their obligation, they must pay set prices into a “buy-out” fund. The RAs would oversee the determination of these “buy-out” prices in an agreed process. The determination of rates in the Regulated Tariff approach provides a methodology for determining these. The fund would not be retained by the TSO but could be used to fund capital network investment or redistributed back to suppliers more generally. For example, the administration cost of the scheme could be recovered from the fund with the remainder distributed at the end of the year on a pro-rata basis to those suppliers who presented certificates. In other words, if a supplier meets part or all of its obligation, but other suppliers don’t, the supplier who has certificates is rewarded with a share of the penalties.
- The TSOs, with approval from the Regulatory Authorities, would set the quota for a period of time (say five years to provide medium term certainty reducing down as the confidence in the process is established) using a fixed target and ensuring that there is a set margin between the predicted level of system services (supply of certificates) and the level of the obligation (demand for certificates). This would safeguard against the possibility of supply

exceeding the obligation in any given year resulting in reduced market value of a certificate, thereby providing greater certainty to investors and helping to stabilise the certificate price.

## 5. Results of EirGrid’s assessment of procurement design options

In this section, the results of a qualitative assessment of the three procurement design options against the seven criteria described in Section 3 are presented. While each option is dealt with in detail later in this section, Table 5.1 provides a high-level illustrative overview of the results. Further detail is also provided in Appendix A.

As can be seen, each option has been scored individually against each criterion using a high (green), medium (amber) or low score (red), with high indicating that the option meets the criterion to a strong degree.

The assessment has been conducted taking full consideration of the current high level of market concentration in the Irish system services market and the related market power and liquidity issues. The scoring would be different were the market to become more mature, less concentrated and more liquid as may be the case in the future as the market evolves.

<u>Criteria</u>	<u>Options</u>		
	<b>Option 1: Regulated Tarriff (modified)</b>	<b>Option 5: Multiple-Bid Auction</b>	<b>System Services Obligation Trading Scheme</b>
<b>Investment in performance capability in a timely manner</b>			
<b>Protection from over-payment</b>			
<b>Public policy</b>			
<b>Transparency and equity</b>			
<b>Appropriateness of the design option given market power</b>			
<b>Practical implementation</b>			
<b>Cost of implementation (establishment and enduring)</b>			

Table 5.1: High-level illustrative overview of the assessment results.

## 5.1 Option 5: Multiple-Bid Auction

EirGrid shares the SEM Committee's desire to introduce system services arrangements that will deliver efficient outcomes i.e. the most cost-effective affordable plant would be incentivised to enter the market to provide energy and system services and ensure reliability of electricity supply to consumers.

Based on EirGrid's analysis, the recommended Option 5 procurement design will not deliver an efficient outcome and may frustrate public policy objectives. The issues discussed further below relate to, *inter alia*, market power, the inherent complexity and lack of transparency, and practical implementation. EirGrid has concerns that these fundamental issues will not be resolved in the detailed design phase.

### Market power

The desire to see a market-based procurement design must be balanced against the characteristics and maturity of the all-island electricity market. It is clear that there are high levels of market concentration and illiquidity in the Irish system services market. For example, the market concentration assessment<sup>2</sup> included in the IPA report concluded that each system service represents a highly concentrated market.

There are also lessons to be learnt from the Great Britain market. Despite being over ten times the size of the SEM and with a more diverse mix of market participants, some system services (fast reserve, for example) are dominated by a very small number of providers with the result that costs increased following the introduction of a more market-based procurement solution (costs in the frequency response market doubled). Further information on the lessons learnt from the GB market is included in Appendix B.

In the all-island market, given its much smaller relative size, it will likely be several years before the system services market matures with the advent of new entrants/technologies, and becomes sufficiently less concentrated and more liquid.

### Complexity and transparency

The inherent complexity, opaqueness and selectivity of the Multiple Bid Auction mechanism would result in a lack of transparency for market participants. Any procurement design needs to be transparent, equitable, and understandable to market participants.

In addition, running an auction requires that assumptions be made on the portfolio volume requirement for each system service product, which in turn requires assumptions to be made on the portfolio itself. This requires pre-supposing which technologies will be commercially available as well as the amount of each technology installed. Pre-judging the portfolio in this manner effectively means picking technology "winners and losers" in advance and, given the interdependence of system service products, will influence the outturn portfolio i.e. this market-based design will not actually result in efficient market outcomes. The issues with product volume determination are explored further in Appendix C.

---

<sup>2</sup> Based on the Herfindahl-Hirschman Index.

### Practical implementation

There are also practical implementation issues including:

- The proposed sequential selection methodology means that the outcome is dependent on which service is optimised first. It is unclear whether a feasible outcome will result.
- The auction can only provide efficient market outcomes if co-optimisation is performed across all 14 products as well as taking into account the interaction with the energy and capacity markets, in particular the cost of actually deploying the system services. At this point, it is unclear whether this co-optimisation can be done in practice.
- If optimisation is conducted on the system services auction costs alone as proposed, the result could be uneconomic. For example, it may be more economic to select service providers which appear comparatively expensive based on their auction bid prices as, when taken together with the cost of deploying the services, they are much cheaper than other offerings. However, this in turn could mean setting a high clearing price on the system services auction, which is not desirable.
- There are also issues of optimising over one year while contracting for several years that could also result in uneconomic outcomes and be open to manipulation, and which would therefore need careful consideration. For example, it is possible that bidding behaviour may price short term products (reserve/ramping) very low in the first year so as the bidder can get a long term contract for all its other services.

### Other issues

Aside from the issues and risks highlighted above, there would also likely be significant costs incurred in developing an auction platform and in the enduring regime. While the product payment basis is dealt with in detail in Section 6, the settlement system required to handle the ex-post calculations for dispatch-based products could be complex and costly to develop. This contrasts sharply to the Regulated Tariff design which can leverage the existing Harmonised Ancillary Services (HAS) frameworks and systems.

In addition, there is added complexity for service providers in developing auction strategies and bids. This would better suit larger portfolio market players and potentially disadvantage smaller service providers and new entrants.

### Conclusion

Given the market power and liquidity issues and the resulting requirement for strong regulatory oversight and intervention in the auction, combined with the inherent complexities highlighted above, it is EirGrid's view that this market-based approach will not result in efficient market outcomes under existing market conditions.

With significant pressure to put in place the new system service arrangements in time to facilitate the necessary investment in performance capabilities ahead of 2020, a procurement design that can be implemented in a timely manner is of paramount importance. Aside from the time required to undertake the detailed design and auction platform establishment, if the identified issues cannot be overcome in the detailed design phase, or if the auction fails, there is a real risk that the performance capabilities will not be delivered thus frustrating achievement of the public policy objectives.

## 5.2 Regulated Tariff option

Given the prevailing system services market concentration and liquidity issues, EirGrid believes that the Regulated Tariff option is the only procurement design that can satisfy the dual requirements of protecting the interests of consumers and ensuring investment in the essential performance capabilities.

Previous TSO consultations on Harmonised Ancillary Services and the more recent DS3 system services consultations did consider alternative procurement approaches but concluded that a regulated tariff approach was the most appropriate based on TSO examination of other international procurement designs and industry feedback. Appendix D contains further detail on the views expressed and outcomes from these consultations.

The Regulated Tariff option has the following key advantages:

- Simplicity: This option is simple, implementable and suffers from none of the complexities arising with the Multiple Bid Auction. Above all, it is transparent, equitable, and understandable to market participants;
- Investment certainty: The proposed modifications to the contract structure allow for longer contracts to be allocated for a subset of system services and/or for providers undertaking new build or retrofit works. It will provide greater investment certainty for potential service providers in the shortest timeframe;
- Consumer protection: This option does not provide for price discovery so it is difficult to ensure an efficient price. However, it is designed to:
  - Ensure that costs are proportionate to the overall value that the services bring, so consumers are at least better off in this scheme in meeting public policy objectives. The TSOs will only contract for services to the extent that total expenditure remains within the regulatory-approved allowance (other than in exceptional circumstances);
  - Provide oversight and control mechanisms to monitor outcomes and allows for tuning through price reviews in the medium term to ensure consumers are fully protected and the services are delivered;

- Ensure that lower cost units that are more likely to be dispatched (and of use to the system) are rewarded more than more expensive units. This is achieved through the proposed rate scalar mechanism applied to the capability-based payment products.

EirGrid recognises that there is a risk of over-investment with a Regulated Tariff approach. This can be mitigated through price reviews and the ability of the TSOs to decide on contracting for service provision above and beyond Grid Code requirements.

However, EirGrid considers that there is a greater risk of under-investment in the necessary service provision particularly in the timely manner required to facilitate meeting of the 2020 targets. The proposed Regulated Tariff option would have administration structures similar to the present Harmonised Ancillary Services (HAS) procurement arrangements meaning that implementation is more straightforward than for other options, facilitating investment in the new system services needed in the timely manner required. Moreover, from a cost implementation perspective, establishment and enduring costs will be lower than other options due to simplicity of implementation.

Given the market power and liquidity issues, a Regulated Tariff design is more appropriate in the short term with the likely regulatory oversight required to mitigate market power (bidding code of practice rules etc.) diluting the benefits of any market-based approach, and the risk of auction failure risky given the 2020 target. However, EirGrid believes that the optimal procurement design in the long-term is market-based. The structure and framework that would be put in place under a Regulated Tariff approach can evolve and segue into a competitive procurement mechanism as the system services market matures with the advent of new entrants/technologies, and becomes less concentrated and more liquid.

There is greater liquidity in the energy and capacity markets in the short term. The proposals for these two markets will ensure that there will be competition facilitated in the broader electricity trading arrangements resulting in the combined remuneration of energy, system services and capacity being market-based.

### **5.3 System Services Obligation Trading Scheme**

At this stage, while EirGrid believes it would be possible to implement this type of trading scheme today, it would not be appropriate to do so as there is insufficient liquidity, market maturity or competitive structures to achieve the desired market outcomes. In essence the transaction costs are too high.

Nevertheless, once there are sufficient competitive forces, this option would achieve the market outcomes for which the SEM Committee and EirGrid strive for consumers, and could be developed from the Regulated Tariff approach that EirGrid recommends as it can leverage the necessary service volume determination, price cap setting and performance certification issuing methodologies that are required for that approach.

This scheme also has the advantage that innovative new technologies which can deliver system services more efficiently than existing technologies will be incentivised as suppliers will source certificates from the lowest cost service providers. As a result, there are clear entry and exit signals. In addition, the scheme is technology neutral. If a centralised platform were employed, it would provide new entrants with trading opportunities, enhance liquidity, and reduce transaction costs. This would also be consistent with the preference for centralised arrangements in I-SEM.

However, most importantly it has none of the drawbacks relating to lack of transparency that Option 5 has as the suppliers have options to trade out their service positions on a central clearing system. Clearly, the administration structures would take some time to develop (with associated costs) but there are similar trading schemes employed in other markets so the issues are well understood.

In summary, this System Services Obligations Trading Scheme in principle delivers on the aims of achieving public policy through true outcomes of competitive forces and trading opportunities, which EirGrid and the SEM Committee share. However, the market conditions required for such a scheme are not sufficiently developed.

## **5.4 Conclusions from the assessment**

EirGrid concludes from the assessment that a modified DS3 System Services Regulated Tariff approach is the only mechanism, at this point in time, that can satisfy the dual requirements of protecting the interests of consumers and not frustrating the achievement of time-critical public policy objectives.

While the market power and liquidity issues mean that a competitive market design is not appropriate in the short term, EirGrid believes that the optimal procurement design in the long-term is market-based. Market concentration will likely reduce over time with possible further divestment of generation assets to new parties, the advent of new entrants/technologies to the all-island market, and particularly the introduction of smaller service providers and increased demand side participation.

The structure and framework that would be put in place under a Regulated Tariff approach can evolve and segue into a competitive procurement mechanism as the system services market matures. In the interim, the proposals for the energy and capacity markets (which are more liquid than the system services market) mean that competition will be facilitated in the broader electricity trading arrangements resulting in the combined remuneration of energy, system services and capacity being market-based.

In relation to Option 5 specifically, it is not, in our view, appropriate to implement a Multiple Bid Auction as it will not achieve what is needed and there are other mechanisms such as the System Services Obligation Trading Scheme that potentially better achieve the shared EirGrid and SEM Committee desired outcomes, when conditions permit, that have not yet been considered by the industry.

In summary, EirGrid recommends the introduction of a modified Regulated Tariff option in the short term transitioning to a competitive approach in the longer term.

## 6. Product payment basis

The product payment basis is the second substantive issue dealt with by the SEM Committee in its consultation. Similarly to the preferred procurement design, EirGrid has significant concerns about the SEM Committee's minded-to position on the product payment basis.

Firstly, EirGrid wishes to highlight the change in meaning attributed to the payment option terminology (i.e. Capability, Availability, Dispatch) made by the SEM Committee versus that used by the TSOs in their consultations to date. For the avoidance of doubt, unless otherwise stated, all product payment terms used in this paper are assumed to have the meaning set out in the SEM Committee's "Clarifications to SEM-14-059 Information Paper".<sup>3</sup>

Investment in performance capabilities in a timely manner will be necessary to reduce curtailment and achieve the 2020 targets. Investment certainty requires revenue adequacy in terms of both size and timing of cashflows.

### 6.1 Dispatch-based payment

Dispatch-based payment for products is consistent with a natural desire to pay only for the minimum service required or "utilised" in any trading period, thereby rewarding only the most efficient and reliable service providers. However, dispatch-based payments for reserve and ramping products are difficult to forecast and would also likely lead to significant volatility of cashflows for service providers and corresponding volatility in relation to the TSO making such payments.

This could result in a higher cost of debt for service providers and negatively affect project bankability more generally (in a worst-case scenario, rendering the needed investments un-bankable). Dispatch-based payments are particularly risky for single project players i.e. non-portfolio market participants or for generators without priority dispatch.

The TSOs' original recommendation discounted such utilisation and event-driven type product payments only after significant consultation with the industry.

### 6.2 Capability-based payment

Separately, capability-based payments appear to have been dismissed in favour of availability-based payments on the basis that they aren't targeted at the most useful units on the system and they don't send the right signals for units to be available when needed. However, EirGrid recognised this issue previously and therefore proposed the use of a "rate scalar". This "rate scalar" would help offset the risk associated with capability-based payments by providing increased certainty of revenues which are more targeted towards those providers that are more likely to be dispatched.

EirGrid is mindful that there is a conflict between the provision of investment signals versus minimising costs to consumers. However, EirGrid considers that there is a significant risk of under-

---

<sup>3</sup> There are differences in the definitions of Capability, Availability and Dispatch between the SEM Committee's Consultation Paper and subsequent "Clarifications to SEM-14-059 Information Paper". The definitions are assumed to be those used in the SEM Committee's "Clarifications to SEM-14-059 Information Paper".

investment in the necessary service provision owing to the product payment basis, which could lead to an inability to meet the 2020 targets and to benefit from the associated production costs savings identified in the TSOs' financial analysis.

EirGrid is conscious from the three consultations with industry and in preparing our TSO Recommendations paper that substantial analysis on the required investment levels is necessary. EirGrid provided significant economic analysis to support and highlight the revenue adequacy for the recommendation of individual products to be either "Capability" or "Dispatch Dependent"<sup>4</sup>.

## 6.3 Scalars

### 6.3.1 Performance scalar

There is a need for transparency and certainty on the performance capabilities and reliabilities expected from service providers. This will help to foster industry confidence in the arrangements and enable potential providers to make the investment decisions required.

In that context, EirGrid welcomes the SEM Committee's acceptance of the TSOs' proposed performance scalar which will incentivise reliable performance by all service providers regardless of the payment basis adopted for each product.

### 6.3.2 Scarcity scalar

EirGrid also welcomes the SEM Committee's decision to use fixed pricing rather than relative pricing for the moment until there is greater certainty around both the volumes of system services required and greater operational experience in utilising the new services. However, the proposal to introduce a scarcity scalar is inconsistent with this decision on fixed pricing. A scarcity scalar would effectively result in variable pricing as it would alter the product payment to reflect both locational scarcity and prevailing system conditions.

EirGrid envisages two problems with this scalar as currently proposed. Firstly, from a practical perspective it would be complex to accurately determine the requirement for different products (whether on an ex-ante basis or, as proposed, on an ex-post basis). Secondly, the ex-post nature of its application means that the ability of the scalar to incentivise availability is questionable.

### 6.3.3 Rate scalar

As originally designed by the TSOs, the rate scalar was envisaged as providing a more targeted incentive than a simple capability payment, to those providers that offer better value services, while removing the revenue risk associated with dispatch-based payments<sup>4</sup>. The SEM Committee appears to rule out the use of a rate scalar (in all but the Regulated Tariff option) as a result of the proposed replacement of the current Capacity Payment Mechanism with a Capacity Remuneration Mechanism. However, the rate scalar could still function if adapted slightly. For example, a suitably chosen reference price other than the BNE price could be used, which would have the same result of rewarding lower cost service providers. This should be further investigated in the detailed design phase.

---

<sup>4</sup> As defined in the TSOs' DS3 System Services consultations and recommendations, but not as used by the SEM Committee in their consultation paper.

## 7. I-SEM interaction

The energy, capacity and system services markets should collectively incentivise the type of performance capabilities needed for reliable, efficient and economical operation of the power system. It is therefore important that any interaction between the three markets supports, and certainly does not adversely affect, the achievement of this objective. The following sections consider some of the possible interactions between the SEM Committee's recommended system services market arrangements and the proposed energy and capacity markets.

### 7.1 Interaction with the energy market

Under the proposed Multiple-Bid Auction option, system service providers are selected by auction based solely on prices submitted for system service provision with no consideration of the cost of actually deploying these services. Consequently there is a risk that some units which have low efficiency / high running costs will be successful at auction at the expense of units which have high efficiency / low running costs.

This may well result in the TSOs being forced to constrain on some of these out-of-merit units to provide the system services necessary to facilitate safe secure operation of the transmission system. In other words, a service offered at a competitive price and successful in the auction could result in high balancing costs in "enabling" the service (e.g. starting and running a peaker to get the service) resulting in poor value overall.

In addition, under current balancing market proposals, non-energy TSO balancing actions would be remunerated on a pay-as-bid basis. Unless appropriate local market power mitigation measures are put in place, this could lead to very high balancing costs being incurred by the TSO if providers increase their energy bids in the expectation of being dispatched for non-energy reasons i.e. system services.

With regard to the product payment basis, EirGrid agrees with the SEM Committee that availability-based payments would interact with the energy market as providers would be expected to include the opportunity cost of system service revenues into their energy bids. There would also be interactions associated with dispatch-based payments but, with less certainty associated with this payment basis (as defined by SEM Committee rather than the TSOs), providers may decide not to discount their energy bids to the same extent as for availability payments.

### 7.2 Interaction with the capacity market

The SEM Committee has stated that the system services auction should take place before the proposed capacity auction. This could be problematic for those projects requiring capital investment, with such projects likely needing to be successful in both auctions to justify their business case. Of course, the advantage of running the auctions sequentially is that service providers that are successful in the system services auction may discount their bids in the capacity auction (although market power could affect the level of discounting). In that regard, EirGrid agrees with the SEM

Committee that capability-based payments would interact with the capacity market more than availability-based and dispatch-based payments as they have the greatest revenue certainty.

The timing of the auctions and the contractual implications for parties that are successful in the system services auction but which fail to get a capacity contract would need careful consideration.

Adopting a Regulated Tariff approach for DS3 System Services in the presence of market-based mechanisms for both energy and capacity (as proposed for the I-SEM) provides sufficient freedom to market participants to compete in both long term investment timescales and short term operational timescales. If market participants have a degree of certainty with regard to the payment basis for system services, they could reflect these revenues in their offers to the capacity and energy markets respectively. Thus, generator and demand side resources that provide more system services become more competitive in the capacity and energy markets without exposing the consumer to significant increased costs.

## 8. Other issues

### 8.1 System services volumes

Shortfalls in system capability were identified in the “Ensuring a Secure, Sustainable Power System” report of 2011. In this report, estimated shortfalls in inertia, reactive power, and ramping based on a comparison between the 2010 portfolio and a forecast 2020 portfolio were discussed. This subsequently led to the development of new system service products. A potential portfolio with enhanced capability that can provide the necessary system services was described in the TSOs’ third consultation<sup>5</sup>.

EirGrid recognise that determination of required system services volumes is important to send investment signals to potential service providers. However, there are a number of issues associated with determining volumes. These issues are discussed in Appendix C.

### 8.2 Grid Code obligations

The SEM Committee consultation is focused on the commercial arrangements for system services i.e. the procurement design and product payment basis. For the avoidance of doubt, Grid Code obligations have a higher order of precedence and therefore system services contracts will not affect obligations under the Grid Code. Seeking derogations from the Grid Code is the only way a unit can change these obligations.

Furthermore, currently in the Grid Code in Ireland and Northern Ireland there is an obligation on generators to meet standards and to submit “true” characteristics. In effect, a unit must always inform the TSO as to what it can achieve and the TSO has rights to utilise this capability irrespective of whether the unit is being paid for it. However, many of the new DS3 System Services products are not explicitly covered in the Grid Code (e.g. SIR).

### 8.3 Management of system services payments by EirGrid

While the primary importance is that the necessary System Services are delivered, whatever arrangements are put in place will have to be managed and paid for by EirGrid. Given the scale of that which is necessary, this will fundamentally change the financial position of the EirGrid business and the regulatory regime must recognise this.

Within this, the various payment mechanisms proposed could be expected to have different impacts with those which are by their nature being more volatile for providers also as a corollary likely to create greater volatility for EirGrid in their management. Ultimately whatever arrangements are put in place will have to be appropriately provided for under the regulatory regimes pertaining including appropriate arrangements to enable EirGrid to manage any such imbalances as may arise.

### 8.4 First mover advantage

Both the Multiple Bid Auction option and the Regulated Tariff option have the shortcoming of providing first mover advantage to those potential service providers that are investment-ready and

---

<sup>5</sup> DS3: System Services Consultation Finance Arrangements (pg. 17):  
[http://www.eirgrid.com/media/System\\_Services\\_Consultation\\_-\\_Finance\\_Arrangements.pdf](http://www.eirgrid.com/media/System_Services_Consultation_-_Finance_Arrangements.pdf)

in a position to secure contracts following launch of the market arrangements.

With a Multiple Bid Auction, the first auction will result in potentially numerous long term (e.g. 15 year) contracts being awarded, which would have the effect of locking out new lower cost technologies that may arise in the coming years. The shorter term price guarantees in the Regulated Tariff option should ensure that future lower cost technologies which can deliver at the right price will have a route to market provided the system services allowance cap has not been reached.

The first mover advantage issues would need further analysis in the detailed design stage regardless of the procurement design selected.

## 8.5 Interaction with EU Network Codes

There has been some concerns raised about DS3 System Services with respect to the EU Network Codes and the broader aspiration of a single pan-European energy market. This section summarises EirGrid's view with respect to these and how they relate to the latest versions of the EU Network Codes. EirGrid acknowledge that the comitology process may result in material changes in the codes which could materially impact on the positions taken here. Furthermore, some of the issues raised are ultimately a Member State concern and will need to be managed and dealt with at that level.

The Framework Guidelines on Electricity Balancing refers to the procurement and settlement of balancing energy, including cross-border reserves which have been activated. This includes obligations with respect to cross-border balancing products. The specifications for these balancing products are further set out in the Network Code on Electricity Balancing (NCEB).

Many of the new system services products lie outside the scope of these guidelines and network codes. Where this is the case a Member State is entitled to design a mechanism for their procurement as they see fit in so far as it consistent with more general European principles including State Aid. Specifically, as the NCEB is only concerned about the utilisation and capacity of balancing energy the SIR, steady-state reactive power and dynamic reactive power products are not included in any consideration in the NCEB. Furthermore, the NCEB has a planned approach to create standard products for the balancing energy, first bilaterally between TSOs, then regional, and finally at a pan-European level. This process will take six years. The categorisation of the faster-acting containment reserves is explicitly placed outside the NCEB. Therefore FFR, POR and SOR are not considered under the NCEB. However, it is clear that standard products similar to TOR and replacement reserves will be in place and this needs to be factored into DS3 System Services design.

EirGrid considers that none of the proposed ramping products are contained in the scope of the NCEB. Ramping products reward for the certainty of provision of the capability over varying timeframes. This is fully complementary to the reward for utilisation and capacity for balancing energy as allowed for in the NCEB. A service provider will be rewarded for ramping only when they had the capability to provide the energy but chose to offer in the certainty not to be utilised. Whenever they are utilised this is likely to be in accordance with local and regional cross-border electricity balancing rules and rewarded as such. This complementarity avoids potential double

payments, offers increasing hedging capability in an uncertain financial world as well as incentivising operating margin consistent with increasing physical volatility.

Nevertheless should there be a consideration that ramping products are implicitly in the scope of the NCEB then EirGrid consider that DS3 System Services could still be implemented as recommended. However, in this case, a settlement process would need to be created which would net any revenues from cross-border balancing from associated system services revenue. This approach could apply to all of the products as desired. Effectively revenues for system service products could be guaranteed to the provider, consistent with meeting reliability and performance standards, and still allow them to obtain upside for trading cross-border. This approach would need to be monitored to ensure the appropriate benefit of performance capability was reached for the local consumer who effectively has provided a form of investment certainty that the target model on its own could not. However, this needs to consider rules on State Aid subvention.

## **8.6 Risk to the consumer of under and over-investment in system services**

EirGrid acknowledges that in all forms of price regulation there is a risk of either over or under investment. In that regard, this section discusses the risks of over and under investment arising from the Regulated Tariff design proposal and examines the mitigation measures.

### **8.6.1 Risk of over-investment in service provision**

If the price paid for system service products is higher than it should be then it may lead to over-investment. Given the range of uncertainties including the implementation of the new electricity market arrangements, the possibility of 2030 RES targets, the timing and delivery of infrastructure build etc., EirGrid believes that over-investment in service provision is unlikely to occur prior to 2020, irrespective of the price.

Nevertheless, EirGrid believes that price reviews and the ability of the TSOs to decide on contracting for service provision above and beyond Grid Code requirements provides the oversight and control necessary to mitigate the risk of over-payment and ensure that consumers are protected.

### **8.6.2 Risk of under-investment in service provision**

EirGrid considers that there is a greater risk of under-investment in the necessary service provision particularly in the timely manner to efficiently support and facilitate meeting the governments' RES-E targets by 2020. Clearly, any undervaluation of the services could contribute to this arising. EirGrid considers that the principled methodology and analysis presented in its Recommendations Paper would materially mitigate this risk as much as it is practicable to do so. However, if there is significant under-investment in the necessary services, it is difficult to see how the governments' targets for RES-E could be met by 2020.

EirGrid considers it appropriate and consistent with our primary statutory duties to procure sufficient system services to maintain the resilience and reliability of the power system, that an alternative avenue should be available to the TSOs. In particular, if the market does not deliver the necessary services, or in the event of unexpected circumstances, it may be necessary for the TSOs to enter into longer-term contracts for services to take into account the needs of the system and the policy objectives.

## 9. Conclusions

The energy, capacity and system services markets should collectively incentivise the types of performance capabilities needed for reliable, efficient and economical operation of the power system. Investment in the required performance capabilities will only happen where there is sufficient investment certainty across all revenue streams. Moreover, if system services revenues are too low or unpredictable, or if the procurement design is too complex, potential service providers may choose not to invest in system services and focus instead on optimising energy and capacity revenues.

EirGrid shares the SEM Committee's desire to introduce market-based system services arrangements that will deliver efficient market outcomes. However, the desire to see a market-based procurement design must be balanced against the size and maturity of the all-island electricity market. It is clear that there are high levels of market concentration and illiquidity in the Irish system services market. It will likely be several years before the system services market matures (for the majority of services at least) with the advent of new entrants/technologies, and becomes sufficiently less concentrated and more liquid.

In that context, based on EirGrid's analysis of the proposals, the recommended Multiple Bid Auction procurement design won't deliver an efficient outcome and may frustrate public policy objectives. The competitive forces necessary for such a Multiple Bid Auction to deliver reasonable market outcomes do not exist in Ireland and Northern Ireland, nor are they likely to exist for some time, and a degree of regulatory intervention is inevitable at this time in any implementation.

Aside from market power issues, EirGrid has particular concerns about the capability of the auction methodology described in the SEM Committee's Information Paper to deliver efficient outcomes for consumers. There are significant issues associated with its practical implementation. In addition, its complexity would result in a lack of transparency for market participants and potentially hinder the development of market confidence. Any procurement design needs to be transparent, equitable, and understandable to market participants.

The procurement design selected must be made with full consideration of the market power issues. Therefore, EirGrid recommends the introduction of a modified Regulated Tariff option in the short term transitioning to a competitive market-based approach in the longer term as the system services market matures. EirGrid notes that SEM Committee proposed a number of improvements to the Regulated Tariff design, which can be further built on and combined with new enhancements proposed in this paper.

Finally, EirGrid has significant concerns about the SEM Committee's system services product payment basis proposal. The proposed payment basis will affect revenue certainty and make it difficult to bring forward investment regardless of the procurement design selected.

## Appendix A: Results of qualitative assessment

In this appendix, further detail of the results of the qualitative assessment of the three procurement design options against the seven criteria described in Section 3 is presented.

As can be seen, each option has been scored individually against each criterion using a high (green), medium (amber) or low score (red), with high indicating that the option meets the criterion to a strong degree.

The assessment has been conducted taking full consideration of the current high level of market concentration in the Irish system services market and the related market power and liquidity issues. The scoring would be different were the market to become more mature, less concentrated and more liquid as may be the case in the future as the market evolves.

<b>Investment in performance capability in a timely manner</b>		
<b>Option 1: Regulated Tariff (modified)</b>	<b>Option 5: Multiple-Bid Auction</b>	<b>System Services Obligation Trading Scheme</b>
<ul style="list-style-type: none"> <li>Proposed new contract structure will encourage investment</li> <li>Longer term price guarantees available to subset of system services and/or for providers undertaking capital investments in new/existing plant</li> <li>Price certainty provided to investors for duration of price review period</li> </ul>	<ul style="list-style-type: none"> <li>Long-term contracts available with contract length determined by investors</li> <li>Price certainty provided to investors for duration of contract</li> <li>Potentially lengthy detailed design and implementation phases</li> <li>Risk of auction failure resulting in delays</li> </ul>	<ul style="list-style-type: none"> <li>No contracts are awarded so unlikely to get investment levels required in present market</li> <li>Requires mature market conditions</li> </ul>

<b>Protection from over-payment</b>		
<b>Option 1: Regulated Tariff (modified)</b>	<b>Option 5: Multiple-Bid Auction</b>	<b>System Services Obligation Trading Scheme</b>
<ul style="list-style-type: none"> <li>No price discovery so regulated price unlikely to be efficient price</li> <li>Cap on total expenditure protects the consumer</li> </ul>	<ul style="list-style-type: none"> <li>Market power and low liquidity likely to result in high clearing prices</li> <li>Auction outcome as proposed is dependent on which service is optimised first =&gt; unlikely efficient outcome achieved</li> <li>Auction doesn't take account of cost of deploying services</li> <li>Cap on total expenditure protects the consumer</li> </ul>	<ul style="list-style-type: none"> <li>Suppliers will source certificates from cheapest service provider</li> <li>Encourages efficient new entrants and least cost service provision</li> </ul>

Public policy met by 2020		
Option 1: Regulated Tariff (modified)	Option 5: Multiple-Bid Auction	System Services Obligation Trading Scheme
<ul style="list-style-type: none"> <li>Can be implemented quickly (faster than the other options) thus reducing risk of missing 2020 targets</li> </ul>	<ul style="list-style-type: none"> <li>Significant work required in detailed design phase =&gt; possible delays to implementation</li> <li>Risk of auction failure, which would result in further delays to investment</li> </ul>	<ul style="list-style-type: none"> <li>No contracts are awarded so unlikely to get investment levels required in present market</li> <li>Requires mature market conditions</li> </ul>

Transparency and equity		
Option 1: Regulated Tariff (modified)	Option 5: Multiple-Bid Auction	System Services Obligation Trading Scheme
<ul style="list-style-type: none"> <li>Transparent, equitable, and understandable to market participants</li> <li>Technology neutral</li> </ul>	<ul style="list-style-type: none"> <li>Inherent complexity would result in a lack of transparency for market participants</li> </ul>	<ul style="list-style-type: none"> <li>Long term choice of service provision not with TSO but with suppliers/providers.</li> <li>Technology neutral</li> </ul>

Appropriateness of the design option given market power		
Option 1: Regulated Tariff (modified)	Option 5: Multiple-Bid Auction	System Services Obligation Trading Scheme
<ul style="list-style-type: none"> <li>Provides oversight and control mechanisms to monitor outcomes</li> <li>Allows for tuning in the medium term to ensure consumers are fully protected</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient liquidity, market maturity or competitive structures to achieve the desired market outcomes</li> <li>Measures would be required to mitigate market power</li> <li>Significant risk of auction failure</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient liquidity, market maturity or competitive structures to achieve the desired market outcomes =&gt; transaction costs are too high</li> </ul>

Practical implementation		
Option 1: Regulated Tariff (modified)	Option 5: Multiple-Bid Auction	System Services Obligation Trading Scheme
<ul style="list-style-type: none"> <li>Simple to implement</li> <li>Administration structures can seamlessly segue into a competitive procurement mechanism as market evolves</li> </ul>	<ul style="list-style-type: none"> <li>Auction design will not deliver the efficient outcomes claimed =&gt; co-optimisation across 14 products and interaction with energy/capacity markets may not be possible</li> <li>The best outcome that any practically implementable Multiple Bid Auction system can deliver will be sub-optimal and to a degree "selective";</li> <li>Regulatory intervention required to mitigate market power</li> </ul>	<ul style="list-style-type: none"> <li>Administration structures would take time to put in place</li> <li>Similar trading schemes employed in other markets so issues are well understood</li> </ul>

<b>Cost of implementation (establishment and enduring)</b>		
<b>Option 1: Regulated Tariff (modified)</b>	<b>Option 5: Multiple-Bid Auction</b>	<b>System Services Obligation Trading Scheme</b>
<ul style="list-style-type: none"> <li>• Small establishment costs due to simplicity of implementation</li> <li>• Enduring structure similar to existing HAS arrangements</li> </ul>	<ul style="list-style-type: none"> <li>• Auction platform expensive to design and implement</li> <li>• Annual auctions required</li> <li>• Market monitoring required</li> <li>• Additional expense in establishing settlement system to handle ex-post calculations for dispatch-based products</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of central clearing system required</li> <li>• On-going administration costs in awarding certificates</li> </ul>

## Appendix B: Lessons learnt from the GB market

In 2011, EirGrid commissioned KEMA to undertake a review of the system service regimes adopted in a number of international island markets. The review focused on the prevailing operating frameworks in each of the markets examined and built on a previous study undertaken for EirGrid in 2007.<sup>6</sup> Of the electricity markets reviewed, GB is by far the most advanced and it is therefore useful to understand the challenges it has faced in developing system service procurement arrangements.

The following provides some context for the comparison between the GB market and the SEM:

- The GB market is over ten times the size of the SEM;
- Unlike the SEM, the GB market enjoys a healthy competitive mix of system service providers reflecting the presence of 17 market participants with generation assets exceeding 500MW;
- However, this apparent diversity masks the differing technical capabilities of various generation technologies; and
- Even in such a large market as GB, some system services, fast reserve for example, are dominated by a very small number of providers with unique technical capabilities. In the case of fast reserve, pumped storage plant owned by First Hydro dominates the market.

As a result, the transition to a market-based solution in GB has not been particularly successful. As an example, costs have doubled in the frequency response market following the introduction of a more market-based solution. KEMA attribute this to market power and states that “National Grid has since sought to modify the supporting market mechanisms to mitigate these higher costs with limited success and thus continue to examine a more appropriate solution”.

Clearly, there are important lessons to take from GB’s negative experience following the introduction of market-based arrangements where competition for system services provision is weak or monopolised by a dominant provider. In particular,:

- Development of system services procurement arrangements in Ireland and Northern Ireland must be mindful of the degree of active competition available to deliver the required system services.
- Premature implementation of market-based solutions where strong market power exists will result in inefficient outcomes.

These lessons are particularly important for Ireland and Northern Ireland given the much smaller size of the market and the higher market concentration levels.

---

<sup>6</sup> KEMA’s System Services International Review report is available to view at:  
<http://www.eirgrid.com/media/System%20Services%20International%20Review%20-%20Final.v2.pdf>

## Appendix C: Product volume determination

The determination of DS3 System Services product volumes needed is an important requirement in order to be able to provide information and signals on likely future investment opportunities. There are two separate considerations in this regard. These are:

- What volumes of system services are required to ensure system reliability?
- What volume of each service has the greatest beneficial impact on the overall ability of the power system to accommodate wind?

The answer to the first question is that it is possible to determine volume requirements but there are issues associated with this that need to be understood. The second question is more problematic. EirGrid considers that there is no practical mechanism to determine such sensitivities and even if there were it is unlikely that the answers could be used to realise market outcomes. Both of these positions are explained further below.

### B.1 Determination of needed system services volumes

The assumptions made on the portfolio influence the volumes of system services required. However, if an assumption is made on the location and capability of system service providers into the future it is possible to determine the likely needed volumes of system services for that particular portfolio.

A version of this has already been completed and presented in EirGrid's "Facilitation of Renewables"<sup>7</sup> and "Ensuring a Secure, Sustainable Power System"<sup>8</sup> reports. In particular there was increased volumes of between 20-30% estimated for each ramping product needed for the modelled 2020 system relative to 2010. In addition there was a reduction of almost 3000 MVar in reactive lagging capability in 2020 relative to 2010.

The estimation of needed Synchronous Inertial Response (SIR), Fast Frequency Response (FFR) and Dynamic Reactive Response (DRR) is more problematic but reasonable estimates can be made. However, these requirements will heavily interact with assumptions on system RoCoF capability, network reactive compensation and transmission grid build-out.

There is considerable effort required to construct the base case scenario in both economic production cost and dynamic simulation platforms on which the economic and technical studies to estimate volumes are done. This should not be underestimated. The "Facilitation of Renewables" and "Ensuring a Secure, Sustainable Power System" studies each required 18 months to complete using EirGrid resources/expertise and a range of consultants where necessary. While this level of effort will reduce in the enduring regime, establishing the process robustly in the first place will require at least a similar effort.

---

<sup>7</sup> "All Island TSO Facilitation of Renewables Studies" report:

<http://www.eirgrid.com/media/FacilitationRenewablesFinalStudyReport.pdf>

<sup>8</sup> "Ensuring a Secure, Reliable and Efficient Power System in a Changing Environment" report:

[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)

Through the DS3 System Services consultation several stakeholders expressed dissatisfaction with their units not being included in an assessment of requirement as they believed it was materially disadvantaging them. While EirGrid does not believe this to be the case, nevertheless it would be prudent that the assumptions underlying the assessment undergo regulatory approval before processing. These assumptions would at a minimum include information on the portfolio, network configuration, system service provider capability and demand profile. These portfolios should be constructed with the best available information but also be consistent with stated public policy or have fundamental reasons why they are not.

EirGrid considers that the determination of volumes is dependent on the nature and capability of distinct system services on the system. If the power system evolves in a different manner than assumed it is likely that a reliable and resilient power system can still emerge. However this could have fundamentally different requirements. This has important consequences. The first is that with an illiquid market<sup>9</sup> and with the volumes procured aligned to those calculated, EirGrid does not believe market outcomes will be achieved. Rather this approach is likely to lead to only the assumed portfolio being developed. This is in effect a centrally-planned system both in network and system service provision. This was a consideration in EirGrid recommending a price-regulated rather than a volume-based approach as the DS3 system services market will not be competitive for a number of years.

## **B.2 Sensitivity of wind curtailment benefit with a unit of each system services product**

A second consideration is if it is possible to calculate the services which have the greater impact on wind curtailment, and more importantly their cost of provision. If this were possible it would be a relatively simple task to optimise the cost of system service provision for a given scenario with the level of curtailment. Unfortunately EirGrid does not believe it is possible to determine such sensitivities nor if it were, would it be prudent to use them to inform the development of appropriate market signals. The rationale behind this thinking is presented below.

The DS3 programme is ultimately trying to address the technical challenges that arise for large scale deployment of windfarms. From the technical work conducted the material issues that result from large penetrations of wind generation are:

- Lower inertia and higher rates of change of frequency
- The increased need for higher ramping margins to manage greater uncertainty and variability
- Increased difficulties in steady state reactive power management and voltage collapse
- Transient stability of the power system.

These issues are in addition to some of the challenges already solved in the system including having full control over windfarms, Grid Code compliance and reasonable forecasting capability.

While these issues may seem to be independent they are not. Indeed there are multiple interactions in solving any of the issues. There are few, if any, practical solutions that only mitigate a distinct issue. For example, solving the RoCoF issue could be achieved by the following, but not exhaustive, three ideas:

---

<sup>9</sup> Where the regulated tariffs are set or the auctions capped at the costs of a given portfolio

- Reduce the minimum load on a range of generators allowing more units to be kept online. This will also increase the ramping capability of the system as well as reducing the need for reactive power and transient support.
- Increase the inertia of all existing plant. This will lower the expected RoCoF but also will increase the transient stability of the power system. However this would have no impact on the ramping capability of the system or the reactive power needs.
- Install significant volumes of synchronous condensers. This addresses the need for inertia but also helps mitigate reactive and transient stability issues but would have no impact on ramping.

The set of studies required to do this is orders of magnitude more complex than determining the overall volumes for a given wind level at 75% SNSP. In addition, by definition, the technology selection will be “selective” at best. This calls into question the use of this information in determining market outcomes as the technology mix is effectively chosen from the assumptions employed.

## Appendix D: TSO consultations on ancillary services/ system services

There have been a number of major consultations by the TSOs on the design of Ancillary Services / System Services since 2007. In August 2007, the TSOs consulted on “Proposed System Operations Services’ Payments and Charges in SEM” ([Link](#)) as part of the move to harmonisation of Ancillary Services across Ireland and Northern Ireland. Between December 2011 and December 2012, the TSOs ran three consultations ([Link](#)) that led to the TSOs’ System Services Recommendation Paper to the SEM Committee in May 2013.

This appendix summarises relevant views expressed and outcomes from these consultations regarding the form of the contractual arrangements for procuring the services (regulated bilateral contract, tender, market, auction) and the basis of payment for the services (capability, dispatch, utilisation).

### Harmonised Ancillary Services (HAS) Arrangements - August 2007 to January 2009

The TSOs’ “Proposed System Operations Services’ Payments and Charges in SEM” consultation of August 2007 considered in detail a number of approaches to the procurement of operating reserve and reactive power (regulated tariff, tender, market). Based on experiences observed in other markets and the nature of the SEM, the proposal made by the TSOs was for a regulated tariff approach.

The SEM Committee decision paper of February 2008 (SEM-08-013) noted that a majority of respondents to the TSOs’ consultation agreed with the TSOs’ proposed regulated tariff approach for the procurement of reserve-based and reactive power-based ancillary services.

The resulting SEM Committee decision paper of January 2009 (SEM-09-003) approved harmonised, regulated bilateral arrangements for the procurement of ancillary services. These arrangements have remained in place to date.

### System Services Arrangements - December 2011 to May 2013

Each of three system services consultations was accompanied by a questionnaire that sought views from industry on specific topics such as the form of the contractual arrangements for procuring the services (regulated bilateral contract, tender, market, auction) and the basis of payment for the services (capability, dispatch, utilisation).

While there was strong agreement through the consultations on the preferred form of the contractual arrangements, the system service payment basis evolved through the consultations to the final recommendations based on feedback from industry. A summary of the relevant outcomes of the consultations and the final recommendations relating to these two topic areas is provided below.

#### 1<sup>st</sup> System Services Consultation – Preliminary Consultation

In this consultation the TSOs asked how system services should be procured (e.g. regulated bilateral contracts, tendering process, market mechanisms, auctions). Bilateral contracts were favoured by

the vast majority of respondents (80%) although some respondents indicated a preference for market-based or tendered approaches for services beyond those required by the Grid Code.

The TSOs also asked if payments for system services should be based on capability to provide services or utilisation of those services. Responses to this were mixed with many indicating that the payment basis would depend on the nature of the service.

### 2<sup>nd</sup> System Services Consultation – New Products and Contractual Arrangements

Based on the views expressed by respondents to the preliminary system services consultation and the TSOs' view that the Ireland and Northern Ireland power system may not be sufficiently large to allow truly competitive system services markets to develop, the TSOs proposed in the second consultation that regulated bilateral contracts between TSO and system service provider were the most pragmatic way forward at this stage of the evolution of system services. Only one respondent to this consultation indicated disagreement with the TSOs' proposed regulated bilateral contract approach.

The majority of generation respondents to the second consultation paper stated that they would prefer the payment basis for system services to be on capability rather than utilisation in order to achieve greater financial certainty for investment decisions.

### 3<sup>rd</sup> System Services Consultation – Finance Arrangements

While in previous consultations the TSOs and respondents generally indicated a preference for capability-based payments (to provide investment certainty), the TSOs' position was reviewed in the third consultation with a view to protecting consumers from excessive costs and avoiding a negative impact on the Capacity Payment Mechanism. In the third consultation, the TSOs proposed a dispatch-dependent<sup>10</sup> approach for most products. This provides a more targeted incentive by focusing on providers that are "used" while avoiding payments to providers that are not required thus protecting consumers from excessive costs. Note that utilisation payments (i.e. payments only when the service is called upon) were considered by the TSO to provide insufficient revenue certainty to service providers.

Responses to this consultation were generally opposed to the TSOs' dispatch-dependent payment proposal given the uncertainty and risk that this introduced for service providers. Most generation respondents reiterated their preference for capability-based payments. Some respondents suggested refinements to the payment basis.

### **TSOs' System Services Recommendations to SEM Committee**

The TSOs' System Services Recommendations Paper of May 2013 took on-board the feedback relating to the basis of payment for services and recommended a combination of dispatch-dependent payments for some services and capability payments incorporating a "rate scalar" for others. This proposal sought to de-risk service providers, incentivise efficient provision of services and reduce the impact on the Capacity Payment Mechanism.

---

<sup>10</sup> As defined in the TSOs' DS3 System Services consultations and recommendation paper, but not as used by the SEM Committee in its consultation paper.