DS3 System Services

Competition Metrics - Consultation Paper

21st September 2015

CONTENTS

1 INTRODUCTION

On 15th May 2013 EirGrid and SONI (the "TSOs") formally submitted their Recommendations Paper regarding DS3 System Services to the SEM Committee. This paper was published for information on 24th May 2013. This concluded an extensive period of consultation with industry by the TSOs on their proposals to redesign the Ancillary Services arrangements in order to meet the needs of the system in 2020.

Following a review of the TSOs' Recommendations the SEM Committee issued a Consultation Paper (SEM-13-060) on 3rd September 2013 setting out its view that it was minded to approve the technical definitions of the proposed new system services and that it would be conducting further economic analysis on the commercial recommendations made by the TSOs. On 20th December 2013 the SEM Committee issued its Decision paper (SEM-13-098) on the technical definitions of the system services. SEM-13-098 also set out the SEM Committee's approach to its economic analysis. The SEM Committee subsequently, on 22nd January 2014, published for information advice received from Pöyry Management Consulting (SEM-14-007).

On 9th July 2014 the SEM Committee published a Consultation Paper (SEM-14-059) setting out the results of the economic analysis and five options for the design of the System Services procurement mechanism. On 19 December 2014 the SEM Committee published its decision on DS3 System Services Procurement Design and Emerging Thinking (SEM-14-108).

1.1 BACKGROUND

The TSOs formally commenced the DS3 Project in September 2011, following a review by the Regulatory Authorities of the TSOs' Report on Ensuring a Secure, Reliable and Efficient Power System in July 2011. This followed a request by the SEM Committee for the TSOs to put in place a programme of work to solve the challenges which would occur with operating the electricity system in a secure manner as levels of wind penetration increase. These issues had been identified by the TSOs in the Facilitation of Renewables Studies, a large body of work which concluded in 2010.

One of the key work streams in the DS3 programme is the Review of System Services (or Ancillary Services). The aim of the system services review is to put in place the correct structure, level and type of service in order to ensure that the system can operate securely with higher levels of non-synchronous generation such as intermittent wind penetration (up to 75% instantaneous penetration). The TSOs have statutory and licence responsibilities in Ireland and Northern Ireland in relation to the economic purchase of

services necessary to support the secure operation of the system. The role of the Regulatory Authorities, as exercised by the SEM Committee where a function is deemed to be a SEM matter, is to approve the revenues and tariffs of the TSOs, which will be recovered from consumers, as well as the methodologies, deployed by the TSOs for procuring energy and related system services[1]. The Regulatory Authorities must also monitor and may issue directions to the TSO in respect of their statutory functions.

The Decision Paper followed a number of consultative processes run separately by the TSOs and the SEMC between 2011 and 2014 as well as a number of independent reports.

The SEM Committee's decision framework aims to achieve the following:

- Provides a framework for the introduction of a competitive mechanism for procurement of system services:
- Provides certainty for the renewables industry that the regulatory structures and regulatory decisions are in place to secure the procurement of the required volumes of system services;
- Provides certainty to new providers of system services that the procurement framework provides a mechanism against which significant investments can be financed;
- Provides clarity to existing providers of system services that they will receive appropriate remuneration for the services which they provide;
- Provides clarity to the TSOs that the required system services can be procured from 2016 onwards in order to maintain the secure operation of the system as levels of wind increase;
- Provides clarity to the Governments in Ireland and Northern Ireland (and indeed the European Commission) that appropriate structures are in place to assist in the delivery of the 2020 renewables targets;
- Ensures that Article 16 of Directive 2009/EC/28 is being effectively implemented (duty to minimise curtailment of renewable electricity).
- Provides assurance to consumers that savings in the cost of wholesale electricity which can be delivered through higher levels of wind on the electricity system, can be harnessed for the benefit of consumers;
- Provides assurance to consumers that they will not pay more through system services than the benefit in terms of SMP savings which higher levels of wind can deliver.

This paper sets out the SEM Committees thoughts on how to measure the competitiveness of each of the 14 products.

[1] SEM Committee paper on HAS and OSC are available here

1.2 RELATED DOCUMENTS

Previous publications relating to DS3 are set out below including month and year of publication.

DS3 System Services Project Plan	(May 2015)	SEMC Consultation Paper	(September 2013)
SEMC System Services Decision Paper	(December 2014)	TSO Recommendations paper	(May 2013)
SEMC Information Paper	(August 2014)	Third TSO Consultation paper	(December 2012)
SEMC Consultation Paper	(July 2014)	Second TSO Consultation paper	(June 2012)
IPA Report	(July 2014)	First TSO Consultation paper	(December 2011)
TSO Report	(July 2014)	Secure, Reliable and Efficient Power System	(July 2011)
Pöyry Advice on Procurement Options	(January 2014)	Facilitation of Renewables Study	(June 2010)
SEMC Decision Paper	(December 2013)		

The RAs in conjunction with the TSOs will publish a quarterly update on DS3 System Services delivery, with the first report due to be published by the end of September 2015.

1.3 STRUCTURE OF THIS PAPER

The SEM Committee proposed that work to deliver the DS3 System Services arrangements be undertaken across six workstreams. Under Workstream 3 the SEM Committee have committed to developing "Competition Metrics" to facilitate the assessment of whether or not the market for a particular service or group of services could be considered competitive. This is a necessary first step to assessing whether an auction process or regulated tariff is appropriate for that group of services.

This paper sets out the proposed approach of the SEM Committee in relation to assessing the potential for effective competition within the market for DS3 system services. This paper is only in relation to assessing competition with respect of DS3 system services. In addition to this the assessment of competition is intended to be conducted for the purposes of deciding whether a product can be auctioned; the framework developed here-in is not intended to apply to the real-time operation of DS3 services. The auction process is intended to deliver the price that will be paid for the period that the auction covers.

The importance of understanding competition and market power in respect of DS3 system services will be set out in section 2. In addition to this it will outline some of the key market power concerns.

In order to be able to assess the level of competition in any market it is important to understand the definition of the relevant market. Section 3 will establish the proposals for determining the relevant product market.

Section 4 will build on this by introducing the potential measurements of market concentration that could be used to determine whether or not a product market is competitive. The purpose of introducing a measurement of market power is to determine whether sufficient competition exists to facilitate auctions.

Section 5 will summarise the potential interactions with the approved DS3 system services products, setting out potential substitutes between products.

Where market concentration or potential market power can be identified it may be possible to still auction the relevant product. This may require the introduction of mitigation measures to facilitate competitive auctions further information is set out in section 6.

Finally section 7 will summarise the key points raised in the paper, and set out the key questions being asked in this consultation.

2 COMPETITION AND MARKET POWER

2.1 INTRODUCTION

Competition and Market Power in the context of system services (also referred to as ancillary services) is a new concept in the all-island electricity market. Previous arrangements for the procurement of system services have focused on a tariff based approach whereby those generators who could provide a service could receive a payment based on a harmonised ancillary service (HAS) tariff. Under DS3 the TSOs are required to procure system services on a competitive basis, where sufficient competition exists.

In order to assess whether sufficient competition exists, the Regulatory Authorities will invite potential service providers to offer to provide each service. A qualification process will be consulted on (expected publication for September 2015) which will identify those existing market participants and potential new entrants who meet the relevant qualification criteria,

The Regulatory Authorities will then apply appropriate competition metrics and tests to each of the services cognisant of the potential competitors for the provision of each service, and the volume of each service which the System Operator will procure.

The Regulatory Authorities have committed to providing regulatory guidance on what competition metrics and test will be used to define whether any given DS3 market is sufficiently competitive for a competitive tender / auction, or whether any potential providers may be able to exercise market power in a competitive process. Where any given DS3 market does not meet these competition tests, that service will continue to be procured on a tariff. This paper consults on the competition tests and metrics to be employed.

The SEM Committee also needs to consider its objective to: *"protect the interests of consumers of electricity in Northern Ireland and Ireland supplied by authorised persons, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the sale or purchase of electricity through the SEM.*

Having regard to

(a) the need to secure that all reasonable demands for electricity in Northern Ireland and Ireland are met; and
(b) the need to secure that authorised persons are able to finance the activities which are the subject of obligations imposed by or under Part II of the Electricity Order or the Energy Order or any corresponding provision of the law of Ireland; and
(c) the need to secure that the functions of the Department, the Authority, the Irish Minister and CER in relation to the SEM are exercised in a co-ordinated manner,
(d) the need to ensure transparent pricing in the SEM;

(e) the need to avoid unfair discrimination between consumers in Northern Ireland and consumers in Ireland."

2.2 DEFINING MARKET POWER

It is widely accepted[2,3] that a perfectly competitive market has the following features based on the assumption that it is a single homogenous good:

- The consumers of the good in question are happy to have the good from any of the many producers/vendors of the good. No vendor of the good has any particular advantage in selling to any consumer; no consumer would knowingly pay a higher price to one vendor if the good can be had from another vendor at a lower price.
- The consumers have perfect information about the prices being charged by the various vendors of the good.
- Vendors of the good are willing to sell to any buyer, and they wish to get as high a price as they can. They have perfect information about prices being paid by consumers elsewhere, and they have the ability to "undercut" competitors if it is worth their while.
- Resale of the good in question cannot be controlled, and both sale and resale are costless (Zero transaction costs).

The role of regulation is to promote effective competition. To do this it is essential that we can identify and understand what market power is and the relevance of market power in relation to promoting effective competition for DS3 System Services. There are multiple definitions of market power that have been used with reference to various types of market

Market Power has been defined by the OECD as:

"The ability of a firm (or group of firms) to raise and maintain price above the level that would prevail under competition is referred to as market or monopoly power."

Market Power is not just limited to being able to increase prices above a competitive level. Predatory pricing is another example of market power, whereby a firm (or group of firms) can artificially lower prices below the competitive level. This can have the effect of forcing competitive firms out of the market, or send insufficient investment signals which could jeopardise long term prices.

[2] Kreps, D. M. (1990), A Course in Microeconomic Theory, New York: Harvester Wheatsheaf.
[3] McNulty, P. J. (1967), "A note on the history of perfect competition", *Journal of Political Economy*, vol. 75, no. 4 pt. 1, August, pp. 395–399

In order to assess market power in existing markets, competition policy authorities typically:

- Define the market, with reference to potential product substitution. The first step is to define the relevant product grouping to which competition test will be applied. Where a consumer can easily substitute a product for another product if a hypothetical monopolist seeks to increase the price, then that product does not constitute a relevant market definition, for the purpose of market power analysis, and the substitute product should also be included in the market definition. For instance, both the Irish[4] and UK[5] competition policy authority guidelines refer to the SSNIP (Small but Significant Non-transitory Increase in Price) test to define the relevant market. In the context of DS3, if the System Operator, who is the monopsony buyer of DS3 services, can easily substitute the contracting of one DS3 service X for DS3 service Y, service X does not constitute a relevant market.
- Assess the competitiveness of the relevant market with reference to relevant competition metrics.

In the context of DS3, the Regulatory Authorities face the challenge in assessing the competitiveness of a market which is yet to be created, rather than an existing market where there is data on existing unregulated prices and profits.

2.3 MARKET POWER CONCERNS

Under the SEM arrangements the Regulatory Authorities have been concerned with the capability to exert market power. It is expected that a similar definition, at least in part, would be relevant for I-SEM, albeit with differences taking account of the emerging I-SEM design as discussed below. Such a definition could also account for the fact that a generation company with market power might also have the ability and incentive to foreclose competition in other ways; for example, by weakening existing competition, raising entry barriers or slowing innovation.

Market power is more likely to be exercised in markets with limited competition; this does not mean that market power is always exerted in markets with limited

[4] See for example Guidelines for Merger Analysis, adopted by the Competition and Consumer Protection Commission on 31 October 2014

[5] in the UK the Office of Fair Trading guidelines, are still used by the new Competition and Market Authority. See for example, Merger Assessment Guidelines, CC2 (Revised), joint publication by the Competition Commission and the Office of Fair Trading

competition. Many factors can influence the ability to sustain prices above or below the competitive level for any length of time.

When a firm (or a group of firms) have the ability to affect price in such a way that deviates from a competitive level they have the potential to exert market power. Sustaining any such deviation away from the competitive level has the potential to harm consumers, either through higher prices today, or higher prices in the future.

The exercise of market power can have a negative impact on consumers in both the short-term and the long-term. In energy, generation is capital intensive and therefore entry and exit from a market is generally slow, therefore interventions may be required to mitigate market power or to prevent the abuse of market power.

3 MARKET DEFINITION

3.1 INTRODUCTION

Market definition is in effect a first step in the process of evaluating whether or not market power exists. The aim of defining a market should be to ensure that the measurements employed are representative of market realities (insofar as this is possible). A relevant market is commonly defined across several dimensions including:

- Product – such as energy production, baseload generation, short term capacity or long term capacity.
- Location – is the relevant market the island of Ireland? Is it RoI and NI as separate markets? Or will it develop with interconnection and market coupling to become RoI, NI and GB as one market?
- Time – this last aspect is particularly important given the non-storable and instant nature of electricity. Electricity production during the morning hours are not substitutable with production in the afternoon peak hours. Similarly electricity production in the winter is not substitutable with production in the summer.

It is important to understand that market definition is a key process in understanding if market power exists, however the definition of a given market may not be fixed, and over time may require further analysis as the market changes, and as investment in generation and networks changes over time.

3.1.1 Product Definition:

In order to define a distinct product market the first step is to describe and define the service(s) to be supplied. After the service has been defined it is then useful to identify services that could be considered as practical substitutes. It should be noted that the European Commission has stated that, in relation to competition law, "a relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use"[6].

[6] European Commission, "Commission Notice on the definition of the relevant market for the purpose of competition law"

The TSO may be able to benefit from substituting volumes of one service for another where the desired outcome is the same but a lower cost can be achieved. It is anticipated that the volumes workstream will identify the level of substitutability between various system services through a system of equations, or through a similar quantitative framework.

Substitutability of products can lessen the ability to exert market power, where more than one product can deliver the same output then it is possible to widen the market. An example of this may be fast frequency response and synchronous inertial response. Both products can be used to mitigate fluctuations in frequency in the very short term, the relationship between synthetic inertia/fast frequency response type devices to provide a power response to help prevent high RoCoF events is currently being explored as part of the RoCoF alternative solutions project. There are other features of these products that might not make them perfect substitutes however when assessing the market for a particular product the outcome of product delivery is essential. Where there is a market for a single product and there are no substitutes the market definition, in respect of the product, will be derived from a smaller pool of providers.

Competition law uses the Small but Significant non-Transitory Increase in Price (SSNIP) test as the standard for identifying demand side substitution. The SSNIP test assesses whether a hypothetical monopolist could profitably increase the price of Product A by a small but significant non-transitory amount (5% is a typical benchmark[7]). If a sufficient number of customers would respond to the price increase by purchasing another product, say product B, such that the hypothetical monopolist would find it unprofitable to impose such a price rise, then it is appropriate to include product B in the same relevant product market as product A.

The SSNIP test is then reapplied to a hypothetical monopolist of both products A and B and asks whether a hypothetical monopolist of both products could profitably increase the price by a small but significant non-transitory amount. If a sufficient number of customers would switch to another product, say product C, the test is then reapplied by including product C with products A and B. The SSNIP test is thus iteratively applied until a hypothetical monopolist of some group of products could profitably increase the price of products in the group by a small but significant non-transitory amount. This group of products is thus defined as the relevant product market.

[7] If the prevailing product prices are deemed to be competitive. If prevailing product prices are not deemed to be competitive, a lower benchmark may be applied.

Both the Irish[8] and UK[9] competition policy authority guidelines refer to the SSNIP (Small but Significant Non-transitory Increase in Price) test to define the relevant market.

In the context of DS3, if the System Operator, who is the monopsony buyer of DS3 services, can easily substitute the contracting of one DS3 service X for DS3 service Y, service X does not constitute a relevant market, but services X + Y might (subject to the iterative test described above). The market definition therefore depends upon the extent to which the System Operator can substitute a certain volume of Service X for service Y.

It is envisaged that RAs will conduct the necessary iterative computation using the SSNIP methodology to identify the relevant product market. This calculation will require inputs from the volumes workstream which will identify volumes of each service required, the volumes of installed capacity of services and the calculation of substitutes. In addition to this the qualifications process will identify potential new entrants that can be included for the purposes of identifying the relevant market.

3.1.2 Location Definition:

In competition investigations the European commission has taken the view that a "relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area"[10].

Location constraints will need to be considered in defining the market for any product. This is of particular importance in the constrained operation of the network, which takes into account all of the physical constraints. An example of such a constraint could be a localised transmission constraint , a volume requirement may be needed for one or more services in the constrained region with a different volume requirement for the rest of the island.

[8] See for example Guidelines for Merger Analysis, adopted by the Competition and Consumer Protection Commission on 31 October 2014

[9] in the UK the Office of Fair Trading guidelines, are still used by the new Competition and Market Authority. See for example, Merger Assessment Guidelines, CC2 (Revised), joint publication by the Competition Commission and the Office of Fair Trading

[10] European Commission, "Commission Notice on the definition of the relevant market for the purpose of competition law"

A situation such as the one set out above could lead to the introduction of zonal pricing for system services, and lead to market power being considered on a zonal basis.

If such a case was brought forward for zonal pricing significant work would need to take place to evaluate how to allocate cost to consumers between zones. Potential options include:

- Socialise costs –Tariffs passed through to consumers would be calculated in the same way as they are today under the existing HAS arrangements i.e. a single price. By contrast service providers would be paid the zonal price.
- Cost reflective zones – Consumers in each zone pay the zonal price[11]. This would result in one zone have lower average tariffs than the other as a result.

It should be noted that in defining the relevant market too wide could miss the potential for observable market power. On the other hand if the market definition is too narrow there is a risk of overstating market power.

3.1.3 Time Definition:

The market timeframe will need to be considered in defining the market for any product. The market for a particular service or group of services could be considered competitive at certain times of the year or day but not considered competitive at other times.

This could result in different market prices for different time periods, for example within day there could be variations in price between peak mid merit and baseload hours, or there could be potential differences in prices between seasons. This could produce a similar effect to zonal pricing and will need to be considered by the RAs in defining the relevant market.

The RAs need to be cognisant of defining the relevant market too wide as this could miss the potential for observable market power. Again if the market definition is too narrow there is a risk of overstating market power.

[11] Zonal bidding itself may result in the creation of some form of Settlement Residue (SR). This arises from because the amount required to be paid by Market Participants (generally Consumers) in respect of market transactions will generally differ from the amount required to be paid by to other Market Participants (generally Generators or in the case of DS3 Service Providers) for those spot market transactions. Energy markets deal with SR in different ways for example NEM (Australia) uses an auction process (http://www.aemo.com.au/Electricity/Market-Operations/Settlement-Residue-Auction/~/media/Files/Other/electricityops1/Methodology_for_the_Allocation_and_Distribution_of_Settlements_Residue_July_14.ashx);

4 MEASURING LEVEL OF COMPETITIVENESS

4.1 INTRODUCTION

This section will outline the basic concepts of market power and why it is considered harmful for consumers from an economic point of view.

The section identifies the key metrics that are considered in measuring market power, including their strengths and weaknesses.

It should be noted that the metrics used to measure the potential existence of market power do not necessarily suggest that market power is being exerted or that it would be advantageous for any party with market power to successfully exert market power to gain an advantage.

Some of the special features of wholesale electricity markets such as: Electricity is instantaneous; non-storable and demand is relatively inelastic, may not hold true for some system services. Therefore not all measures of competition as identified in this paper may be appropriate for all system services.

Measuring the level of competitiveness will utilise the TSO work on identifying volumes of services required. The information gathered as part of the Volumes methodology will provide key information relating to potential market size, the number of competitors, market share and potentially the ability to influence price. The Volumes methodology work is not likely to estimate the potential bids involved, additionally the RAs will utilise the information provided under the qualifications process to enhance the assessment of competition.

4.2 MARKET POWER METRICS

The main focus of calculating market power is being able to assess a market participant's ability to influence price. The following sections outline the way market power is assessed of measured in various different markets. Section 5 will discuss the applicability of these metrics for the different System Services.

4.2.1 Lerner Index and other measures of profitability

Measuring the level of competitiveness is difficult to assess in most markets. Competition policy authorities often use measures of profitability as evidence in assessing the competitiveness of the market. In economics terms normal profit is defined as the minimum level of profit necessary to keep a firm in that line of business it occurs when Average Revenue equals Average Total Cost.

Supernormal profit on the other hand is defined as extra profit above that level of normal profit. Supernormal profit occurs where Average Revenue is greater than Average Total Costs. Supernormal profit should provide a signal for other firms to enter the industry (if they can) and is usual considered as evidence of a lack of competitiveness in the market.

The Lerner index[12] provides one measure of market power, which measures the difference between price and marginal cost expressed as a percentage of price. For a monopoly the Lerner index is assumed to be the inverse of the price elasticity of demand.

Lerner has argued that market power can be measured by how high price (P) can be elevated above the marginal costs (MC) of production. His work indicates that the ability to raise prices above costs depends on the price elasticity of market demand (E) facing the monopolist. The Lerner index of monopoly power (L) is as follows:

$$L = \frac{P - MC}{P} = \frac{1}{|E|}$$

The extent to which a firm can take advantage of its monopolistic condition is dependent on the flexibility of its demand curve. If demand is inelastic, the monopolist will only have to reduce its production in order to achieve a higher price. However the more elastic the demand curve is the less market power the firm has to increase prices. Therefore, Lerner index will always be between 0 and 1: the closer it is to 0, the closer it is to perfect competition; the closer it is to 1, the higher market power the seller has and hence closer to a monopoly.

The Lerner index can also be applied to markets in which a firm is not a sole monopolist, but one of a number firms which have market power in that market. Where there is more than one firm, the elasticity of demand is with respect to the firm's demand curve, not the market demand curve, and reflects buyers' ability to substitute between producer firms. Whilst the Regulatory Authorities may be able to compute the elasticity of the TSO's demand[13], the RAs cannot compute the elasticity of a firm's demand curve, until price bids have been received, i.e. until after a competitive process has been entered into.

[12] Lerner, Abba P. "The Concept of Monopoly and the Measurement of Monopoly Power." *Review of Economic Studies 1 (1934)*, pp. 157-175.

[13] which may be infinite at certain points of the curve, if there is a must buy quantity.

There are significant challenges in applying any profitability metrics *ex ante* to the future DS3 markets. Profitability metrics rely on the ability to estimate the market price and the firms' costs of providing the service. One of the big challenges for DS3 is that there is no existing market determined price for these services. In order to do this accurately we need to be able to measure the costs[14] of production which in many markets can be challenging.

In the context of DS3 markets, the problems include:

- Producers will typically be producing a number of products- energy, capacity and multiple DS3 products, which may make it difficult to estimate the marginal costs associated with the production of a particular service;
- The cost of a providing a particular DS3 service is likely to include opportunity costs, and is likely to be directly related to foregone energy revenue (infra-marginal rents), as well as being a variable function of wholesale electricity prices and fuel costs

Whilst we would welcome consultation feedback on this point, it is not clear that the Regulatory Authorities will be able to use any profitability metrics as ex ante measure of competition prior to the first DS3 procurement round. The regulatory Authorities may review this position in subsequent auctions as more data becomes available.

4.3 MEASUREMENTS OF MARKET CONCENTRATION

This section will set out potential ways of measuring market concentration. There is significant literature relating to how market concentration can be identified in the SEM. AIP/SEM/31/06 sets out the market power mitigation strategy for the SEM, with bidding principles and local market power covered in AIP/SEM/116/06 and the decision on Market Monitoring in the SEM set out in AIP/SEM/217/06. The SEM committee also conducted a review of market power and liquidity which provides further information relating to how market concentration can be identified in the SEM (SEM-12-002). This section will also look to build on the work carried out so far in the SEM and utilise the experience of other energy markets where appropriate.

[14] Given that calculating marginal cost is not easy to measure, a proxy for assessing the level of competition is to substitute marginal cost for average variable cost

4.3.1 Market Concentration Ratios

The most simplistic way of assessing potential market power is to assess market concentration. There are a number of widely used methods for carrying out this assessment which will be set out in this section.

Market concentration measures are easily understood, as well as being simple to calculate and transparent. Measurements of market shares, concentration ratios and HHIs are calculated in the context of a defined market. Further information on the definition of the relevant market is set out in section 4 of this paper.

4.3.2 HHI

The Herfindahl-Hirschman-Index (HHI) is one method of measuring concentration in a market. It is different from other concentration ratios as, rather than calculating the sum of the n largest firms in the market, it calculates the sum of the squared market shares of all market participants in a market. The index can be display as either a range between 0 and 10,000 or 0 and 1.

By using the square of the market shares, rather than the actual shares, the HHI places additional weight on larger market shares than on lower ones and will highlight if a particular market is concentrated to a few large firms.

The result is commonly characterised into three categories:

HHI below 1000 (0.1) – unconcentrated;
HHI between 1000 (0.1) and 2000 (0.2) – moderately concentrated; and
HHI above 2000 (0.2) – highly concentrated.

These ranges are supported by the Office of Fair Trading and Competition Commission[15] as well as the European Commission[16]. The European Commission have reviewed HHI measures in the specific context of European wholesale electricity markets and stated that they regard electricity wholesale markets with an HHI in excess of 1,800 to be highly concentrated[17].

[15] "Merger Assessment Guidelines", Office of Fair Trading & Competition Commission, September 2010 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284449/OFT1254.pdf
[16] "Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings" (2004/C31/03)
[17] See for instance, COMMISSION STAFF WORKING PAPER, 2009-2010 Report on Progress in Creating the Internal Gas and Electricity Market, Technical Annex published June 2011

Since the inception of the SEM, the Regulatory Authorities have used HHI to set the level of Directed Contracts (DCs), and have used a target HHI of 1,150 to set the volume of DCs, the rationale for selecting the HHI figure was set out in AIP/SEM/208/06, the main reason for choosing a HHI figure of less than 1500 was due to price inelasticity. In determining the Quantification and Pricing of the DCs in 2007[18] the SEM Committee set the HHI to 1150. This final figure of 1150 was reaffirmed in the SEM Committee's review of market power and liquidity (SEM-12-002) where it was acknowledged that a change to the HHI threshold for the electricity spot market would require a separate consultation.

The HHI analysis for the system services requires outputs from the volumes work-stream as well as the qualification process. The SEM Committee are therefore not in a position to provide a HHI threshold at this stage.

HHI is useful in identifying market concentration but may not fully demonstrate the ability to exploit market power. For example:

- If the demand for a product exceeds the potential supply, and demand is highly price inelastic, producers may have the ability to increase price, even if there are a large number of small producers. As discussed below Pivotal Supply Indexes and Residual Supply Indexes aim to capture the relationship between demand and supply, and the resulting ability of firms to exert market power;
- Whilst production may be fragmented amongst many firms, with resulting low HHI, if firms have quite different costs of production, certain producers may have a disproportionate influence on market price setting. The Regulatory Authorities recognise this issue in the treatment of DCs, with HHI being calculated separately on baseload, mid-merit and peak market segments.

4.3.3 Pivotal Supplier Index/Residual Supplier Index

The Pivotal Supplier Indicator (PSI) is an electricity specific indicator that makes an assessment that combines supply and demand conditions in the electricity markets. The PSI assesses if a particular generator is "pivotal" in serving demand. In other words it examines if demand could be met without the capacity of that generator. The exercise is repeated for each period of the dataset being investigated.

The measure is, however, not without faults as it for example does not take into account contracting of generating units (which would limit the ability of the generator to exercise

[18] http://www.allislandproject.org/GetAttachment.aspx?id=26efea8f-d3f7-453b-9875-bc6e82ec2a4a

his market power in practice). In addition to this, it does not address the potential for collusion or coordinated behaviour.

Some of the shortcomings of the PSI are addressed in the Residual Supply Index (RSI), which is an evolution of the former. While the PSI is a binary metric (you are either pivotal or not), the RSI uses a continuous scale.

A number of US markets, including PJM and California use the Three Pivotal Supplier (TPS) test to determine whether generators have local market power behind a transmission constraint. Generator X is deemed to fail the TPS test in any period, if the withdrawal of Generator X's capacity plus the withdrawal of the two largest suppliers will make the constraint bind. The TPS is used in real time to cap the offers of pivotal suppliers. Generators may submit two sets of offers into the market. Commercial offers apply if it passes the TPS test, and Default Energy Bids (DEBs) which reflect SRMCs of its units apply if it fails the TPS.

The Residual Supply Index (RSI) measures the extent to which a market participant's capacity is necessary to meeting demand after taking into account the capacity held by other suppliers. The formula for the RSI is:

RSI = (System capacity (including import capability) – Uncommitted capacity of investigated generator) / demand

Uncommitted capacity here is that part of capacity that has not been contracted forward, and requiring an increase in the RSI for the investigated generator is equivalent to requiring an increase in its contract cover. If the RSI is below 115 then the capacity of the generator is necessary to meet demand (allowing for a reserve margin of 15%). The ability to set a threshold is useful - however, similar to market shares and HHIs, there are no consensus rules as to what the critical value should be.

The California Independent System Operator (CAISO) first developed the RSI to measure the ability of a generating unit to set the prices and possibly abuse market power in the spot energy market. The CAISO estimated that in general the RSI should not be less than 1.2 at the time of the peak, or less than 1.1 for more than 5% of the hours in a year. Thus, firms with an RSI of less than 1.2 are found to significantly influence the market price. In addition to this the studies undertaken as part of the European Commission Sector enquiry highlighted a critical RSI value of at least 1.1 for 95% of the periods observed.

The use of RSI as a relevant metric for the SEM energy market has also been discussed in SEM papers previously[19].

There are a number of issues in applying an RSI critical value test to the DS3 markets:

- The CAISO and European Commission critical values relate to the spot energy market, and the spot energy market can pass the RSI critical value test even if market power can be exercised in a small number of peak hours- indeed in an energy only market, unless some market participants are able to exercise market power in peak hours, there is likely to be a "missing money" problem. The DS3 is a single annual competition rather than a competition which is repeated in 8,760 hours a year and which low RSI values are permissible in certain hours. Thus a critical value for the DS3 market must relate to the annual contracting process rather than x% of hours per year, in the absence of further information at this time the RAs are not able to provide this critical value.
- How should "uncommitted" capacity be judged? In the context of the energy market, "uncommitted" is construed as energy not hedged in forward markets- i.e. by CfDs in the context of the SEM. Prior to the DS3 contracting process, no providers will be contracted on system support service contacts prior to the first procurement round, but can potential providers be "committed" as a result of interaction with other markets, such as the energy market or capacity market?

We welcome feedback on the question of the applicability of an RSI to DS3 markets, on a relevant critical value and on whether there are any issues related to "commitment" and interaction with other markets.

4.3.4 Alternative Approaches

Alternative approaches to measuring market power include:

- Adjusted HHI
- Residual Demand Analysis
- Ex-Post Revenue Analysis

Adjusted HHI

One adjustment to HHI that has been employed previously in the SEM is to assess HHI on the basis of competitive capacity. A further description of this process is set out

[19] See SEM-10-084 and SEM-10-084a

below. Other research has indicated that that, in markets where close substitutes exist, the HHI should be adjusted for the factors in which substitutes differ[20].

As part of the Directed Contract volumes calculation in the SEM, the Regulatory Authorities out a number of steps, the first is to model future wholesale market prices; the second step is then to assess the level of

The market share calculations that underlie the HHI analysis in the Concentration Model are based on potentially competitive capacity. Put another way, in the model the "market" is defined as the total amount of capacity that is relevant to competition in any given hour. Potentially competitive capacity – that capacity that is relevant to competition – is calculated hourly for the various generation owners based on the cost of each generation owner's units. In a given hour, a unit's capacity is considered potentially competitive so long as its cost is less than or equal to SMP * (1.05). Further, wind and hydro units, as well as imports over Moyle, have custom criteria in the Concentration Model to determine their quantity of potentially competitive capacity. Units that have no incentive to raise the market price are treated as fully competitive supply in the HHI calculation.
We welcome feedback on the question of the applicability of using an adjusted HHI (in a similar manner to SEM) to DS3 markets. We also welcome feedback from potential investors in relation to how "off-line" units could be accommodated in such a framework.

Residual Demand Analysis

The residual demand facing a firm (or a group of firms) is the demand function, specifying the level of sales made by the firm as a function of the price they charge, net of the influence of the amount of product provided by all other firms in the industry.

Lianos and Genakos (2012)[21] in their assessment of quantitative techniques used in antitrust analysis provide a useful overview of how residual demand analysis can be applied.

In summary residual demand analysis focuses on analysing the demand of a market can be met by a dominant firm. It requires an assessment of the supply that can be met by competitive firms within the market. Where all firms are willing to supply at the market

[20] "Adjusting the Herfindahl index for close substitutes: an application to pricing in civil aviation"
[21] Lianos & Genakos "Econometric Evidence in EU competition law: an empirical and theoretical analysis" CLES Working Paper, Series 6/2012, October 2012

price the residual demand is the amount left to the dominant form after all the competitive firms have met supply.

The elasticity of the residual demand curve provides valuable information in relation to the competitiveness of any market. A dominant firm operating in a market where the constraints imposed by other firms are high, will be left with no power to raise the price above the competitive level. Therefore as competitive constraints are reduced, the less elastic the residual demand curve by the firm is going to be.

Ex-post Revenue Analysis

Revenue analysis can be used to assess the health of any given market. By analysing the net revenue of market participants it may be possible to assess profitability. This is useful for the purposes of entry/exit signals from the market.

5 MEASURING MARKET CONCENTRATION FOR DS3 PRODUCTS

5.1 INTRODUCTION

This section will investigate the potential use of the metrics identified under section 3 in each of the 14 services. A brief description of each of the services will be set out, further detail on the system services definitions is set out in SEM-13-098.

This section is concerned with defining the relevant market, and assessing the level of competition of that market at the procurement stage, and does not relate to the real-time provision of services.

5.2 INERTIAL RESPONSE PRODUCTS

Synchronous Inertial Response (SIR)

SIR is the response in terms of active power output and synchronising torque that a unit can provide following disturbances. It is a response that is immediately available from synchronous generators, synchronous condensers and some synchronous demand loads (when synchronised) because of the nature of synchronous machines and is a key determinant of the strength and stability of the power system. It has significant implications for rate of change of frequency (RoCoF) during power imbalances and for transmission protection devices and philosophy.

Fast Frequency Response (FFR)

Fast Frequency Response (FFR) is a new service. With appropriate control systems, both synchronous and non-synchronous generators can provide fast-acting response to changes in frequency that supplements any inherent inertial response. In particular, FFR provides a MW response faster than the existing Primary Operating Reserve times and may, in the event of a sudden power imbalance, increase the time to reach the frequency nadir and mitigate the RoCoF in the same period, thus lessening the extent of the frequency transient. This product runs in conjunction with SIR so providers who can maintain or increase their outputs in these timeframes are eligible for both services. FFR is defined as the additional increase in MW output from a generator or reduction in demand following a frequency event that is available within two seconds of the start of the event and is sustained for at least eight seconds. The extra energy provided in the two to ten second timeframe by the increase in MW output must be greater than any loss of energy in the 10 to 20 second timeframe due to a reduction in MW output below the initial MW output (i.e. the hatched blue area must be greater than the hatched green area in Figure 3 below). The FFR volume be measured as the additional MW Output that can be provided when connected.

Fast Post-Fault Active Power Recovery (FPFAPR)

Fast Post-Fault Active Power Recovery (FPFAPR) is a new service. Units that can recover their MW output quickly following a voltage disturbance (including transmission faults) can mitigate the impact of such disturbances on the system frequency. If a large number of generators do not recover their MW output following a transmission fault, a significant power imbalance can occur, giving rise to a severe frequency transient. Therefore the Fast Post-Fault Active Power Recovery service provides a positive contribution to system security. Fast Post-Fault Active Power Recovery is defined as having been provided when, for any fault disturbance that is cleared within 900 ms, a plant that is exporting active power to the system recovers its active power to at least 90% of its pre-fault value within 250 ms of the voltage recovering to at least 90% of its pre-fault value. The generator must remain connected to the system for at least 15 minutes following the fault. It is proposed that the FPFAPR volume be based on MW output.

Defining the market for Inertial Response products:

It first has to be demonstrated if there any of these three products are substitutable for each other or if there are any other services that could provide a substitute, the key effect here is to respond quickly to changes in frequency therefore is it possible to substitute volumes of required SIR for FFR or FPFARP. If this is possible it may increase the market that should be examined to ascertain if market power exists. This allows for the definition of the product market, for instance by applying a SSNIP test.

After the product market has been identified it is important that the assessment of potential market power for Inertial Response products evaluates any locational constraints for these services. Are there likely to by any constraints that would require minimum volumes in any region or zone? This may present an opportunity to define the zones.

Measuring competitiveness in Market for Inertial Response products:

Given these are new services the main challenge facing the initial competition assessment is estimating the marginal cost of production for each unit of each product that can be delivered by every technology. This will impact on the ability to use one particular measure of competition. Therefore a combination of one or more competition metrics may be applicable.

In the absence of being able to estimate costs it would seem appropriate as a starting point to at assess market concentration of the relevant market using HHI. Initial estimates provided by the TSOs indicates that SIR and FFR are two of the products that will require the biggest increase in installed capacity in order to meet the 2020 targets, this may prove challenging to be able to have a competitive auction for these services unless significant investment is forthcoming.

The outputs from the TSO volumes methodology work would also be useful in analysis of the PSI or RSI for each firm for each product, it is likely that the scenario analysis developed by the TSOs will inform the likely new entrants and further information relating to potential new entrants. By using a combination of HHI and PSI/RSI we would be able to demonstrate the level of concentration in a market, and if that market is reliant on one or more participants in order to meet demand.

In order to use RSI or Residual Demand analysis further work would need to be carried out to better understand of the market.

5.3 RESERVE PRODUCTS

Primary Operating Reserve

Primary Operating Reserve (POR) is an existing service, POR is the additional MW output (and/or reduction in demand) required at the frequency nadir (minimum), compared to the pre-incident output (or demand) where the nadir occurs between 5 and 15 seconds after an event. If the actual frequency nadir is before 5 seconds or after 15 seconds after the event, then for the purpose of POR monitoring the nadir is deemed.

Secondary Operating Reserve

Secondary Operating Reserve (SOR) is an existing service, SOR is the additional MW output (and/or reduction in demand) required compared to the pre-incident output (or demand), which is fully available and sustainable over the period from 15 to 90 seconds following an event.

Tertiary Operating Reserve 1 (TOR1)

Tertiary Operating Reserve 1 (TOR1) is an existing service, TOR1 is the additional MW output (and/or reduction in demand) required compared to the pre-incident output (or demand) which is fully available and sustainable over the period from 90 seconds to 5 minutes following an event.

Tertiary Operating Reserve 2 (TOR2)

Tertiary Operating Reserve 2 (TOR2) is an existing service, TOR2 is the additional MW output (and/or reduction in demand required compared to the pre-incident output (or demand) which is fully available and sustainable over the period from 5 minutes to 20 minutes following an event.

Defining the market for Reserve products:

Given that each of these services relates to a different time frame for delivery may present challenges in identifying substitutes. The definition of each service is established in such a way as to prevent overlapping of these products. The RAs are minded to consider that faster products can be substituted for slower products for the purposes of

defining the market. For example POR can provide a substitute for SOR but not vice versa. TSOs and market participants are requested to provide evidence to demonstrate substitutability between reserve services or any other services.

Again an assessment of the potential for market power will rely on an evaluation of any locational constraints which could restrict the market definition. Again an obvious constraint may include the North-South constraint, where reserve requirements cannot be shared then the market for reserve products may need to be considered on a zonal basis.

Measuring competitiveness in Market for Reserve products:

These are products that have been in place for some time, as a result they should be products that information relating to costs and demand/supply should be readily available for.

Therefore it should be possible to assess competition using more than say just HHI and PSI/RSI. The outputs from the TSO volumes methodology work would also be useful in analysis of the, it is likely that the scenario analysis developed by the TSOs will inform the likely new entrants and further information relating to potential new entrants. By using a combination of the methods outlined in section 3 it should be possible to demonstrate the level of concentration in a market, and if that market is reliant on one or more participants in order to meet demand.

An initial assessment of volumes carried out by the TSOs indicated that the reserve products are the most abundant in the SEM at present, and may require an increase of around 10% to meet the 2020 targets.

5.4 RAMPING PRODUCTS

Replacement Reserve (De-synchronised) (RRD)

RRD is an existing service however it was proposed to modify the service. It was proposed that, to avoid overlap with the 1 hour ramping service, the timings associated with the RRD service are redefined. Therefore, RRD is the additional MW output (and/or reduction in demand) provided compared to the pre-incident output (or demand) which is fully available and sustainable over the period from 20 minutes to 1 hour following an event.

Replacement Reserve (Synchronised) (RRS)

RRS is an existing service however it was proposed to modify the service. It was proposed that, to avoid overlap with the 1 hour ramping service, the timings associated with the RRS service are redefined.

Therefore, RRS is the additional MW output (and/or reduction in demand) provided compared to the pre-incident output (or demand) which is fully available and sustainable over the period from 20 minutes to 1 hour following an Event.

Ramping Margin (1 hour, 3 hour and 8 Hour)

The Ramping Margin (RM) services are new services. The management of variability and uncertainty is critical to a power system with high levels of variable generation. Detailed analysis by the TSOs has shown that portfolios that are capacity adequate are unlikely to be adequate in terms of ramping over all the necessary timeframes to efficiently and effectively manage the variable renewable sources and changes in interconnector flows while maintaining system security. The new ramping-up service covers three distinct product time horizons; one, three and eight hours.

Ramping Margin is defined as the guaranteed margin that a unit provides to the system operator at a point in time for a specific horizon and duration. There are horizons of one, three and eight hours with associated durations of two, five and eight hours respectively. The Ramping Margin is defined by both the minimum ramp-up and output durations. Thus the Ramping Margin represents the increased MW output that can be delivered by the service horizon time and sustained for the product duration window.

Defining the market for Ramping products:

As with reserve products it is expected that, where the only difference between products is the notice period shorter notice can provide a substitute for products requiring a longer notice period, but not vice versa.

An assessment of the potential for market power will rely on an evaluation of any locational constraints which could restrict the market size. Again an obvious constraint may include the North-South constraint, where ramping requirements may not be able to be shared, if this is the case then the market for ramping products may need to be considered on a zonal basis.

Measuring competitiveness in Market for Ramping products:

Replacement Reserve products are not new (albeit slightly modified) therefore a significant amount of information should be available around this product, such that a combination of the methods outlined in section 3 it could be employed to demonstrate the level of concentration in a market, this may not be the case for the ramping margin products further work would be required to evaluate costs.

5.5 VOLTAGE CONTROL PRODUCTS

Dynamic Reactive Response (DRR)

DRR is a new service. At high levels of instantaneous penetration of non-synchronous generation there are relatively few conventional (synchronous) units left on the system and the electrical distance between these units is increased. The synchronous torque holding these units together as a single system is therefore weakened. This can be mitigated by an increase in the dynamic reactive response of wind farms during disturbances. Therefore, this new service is particularly important at high levels of renewable non-synchronous generation.

Steady-state Reactive Power (SRP)

SRP is an existing service which the TSOs proposed to modify. The need for reliable steady-state reactive power control is important for the control of system voltages and for the efficient transmission of power around the system. Both synchronous and non-synchronous sources can contribute to this requirement.

The need for reactive power varies as demand varies and as the sources of generation vary. Since reactive power is difficult to transmit over long distances (unlike active power), reactive sources are required to be distributed across the system. Thus there is not necessarily a strong link between the need for active power and reactive power from the same sources. This is a change from the “leading and lagging” approach currently employed and contracting for reactive power (MVars).

6 ADDRESSING MARKET POWER IN SYSTEM SERVICES

6.1 INTRODUCTION

The SEM Committee aim to facilitate auctions where possible, in order to do this there may be a requirement to introduce Market Power Mitigation measures for DS3 system services.

The current SEM utilises three key market power mitigation measures which include:

- Bidding code of practice
- Directed contracts
- Market Monitoring

Additional measures to mitigate market power in the energy market include:

- Ring-fencing arrangements
- Economic Purchase Obligation

The applicability of utilising some form of directed contract is minimised by the SEMC decision on system services procurement design. Where it was established that a tariff would be implemented for services where there was insufficient competition.

In addition to this auctions are currently designed to take place on an annual basis for system services products. This auction process will include long-term auctions for new investment. Given the longer term nature of the contracts on offer it would limit the benefit of offering directed contracts which have been utilised to minimise market power concerns with-in the prompt market.

The regulatory authorities have also set out a cap on system services costs. This has been linked to the consumer benefit derived from increased Renewables on the system.

A number of potential options for dealing with market power are set out below.

6.2 EXCLUDING SYSTEM SERVICES FROM AUCTION PROCESS

Where it has been identified that market power exists relating to a specific system service this system service should be excluded from the auction process and the tariff applied.

This may be applicable where a lack of competition has been identified and there is insufficient new entry to that particular market to increase the level of competitiveness in the market. This is in line with the decision paper.

6.3 PREVENTION OF LEVERAGED BIDDING STRATEGY

Where the potential to exert market power has been identified by one or more participants it may still be feasible continue with an auction for that service.

There is a risk that market participants with market power in one particular services (or market for a number of services) may use that to their advantage by bidding low for all other services and high for those services in which they can exert market power.

A participant with market power could be prevented from including a particular service within a portfolio bid. A portfolio bid could still be submitted by that market participant however the portfolio could only be made up of the services in which they do not have market power in. A mutually exclusive, single bid, for the system service in which the participant has market power would still be permitted.

6.4 REGULATED BIDS

Market participants who have significant market share could participant in an auction process whereby their bids were regulated. Regulated bids could take the form of a price cap, above which the participant with market power could not bid.

This process could be refined further in that the participant with market power would be paid the lower of the price cap or the market price. This would provide incentives for the participant with market power to bid below the price cap if it is cost effective to do so.

For system services where it has been identified that local market power exists behind a constraint a similar approach to the "Three Pivotal Supplier" test that has been employed in the PJM energy market could be applied. This would result in a cap being applied to pivotal generator(s) behind a constraint only where certain criteria are met with relation to provision of services behind the constraint, thus permitting a relaxation of a cap where there is potential for competition to exist behind that constraint. This would only be applicable to the auction process for setting price rather than for the real-time dispatch.

6.5 GRID CODE MANDATED SERVICES AND UNCONTRACTED SERVICE PROVIDERS

There are a number of services that are required to be provided under the Grid Code. This was recognised in section 6.9 of SEM-14-108. Market participants are required to submit bids for the system services auction where they are capable of providing such services. The Decision Paper stated that "the provider will not be paid on the same basis as those providers that were successful in the competitive process".

In the absence of arrangements such as these that directly correspond to DS3 system services there would be no need to make additional provisions. The RAs are cognisant of the fact that this grid code obligation would imply that the potential availability of some system services would be at zero marginal cost to the consumer.

Taking the above information into consideration as well as market dynamics the Regulatory Authorities are minded to review their approach to how a provider who failed to win in the auction should be remunerated for providing services they are required to do so under grid code (in the event that they have been unsuccessful in the auction process).

A participant who wins in the auction should earn more for the provision of services than a participant who fails to win. The decision paper had proposed that these providers would receive the market price for any volume of system service provided while constrained on by the TSO.

However it is possible that a generator that failed to win in the auction could be on the schedule through their bids in the energy market, and therefore could be providing system services such as reserve. The Regulatory Authorities propose that in such events those generators should also receive a regulated price related to the market price. This is to ensure that there is a benefit from being successful in the market over being unsuccessful.

7 CONCLUSIONS

7.1 SUMMARY

This section summarises the key points raised in the paper, the proposed approach to assessing completion, and details on how to respond to this consultation. The previous sections of this paper set out the key building block to assessing market power for the purposes of purchasing DS3 system services.

Section 2 of this paper set out the importance of understanding competition and market power in respect of DS3 system services as well as outlining some of the key market power concerns.

A key issue for determining whether or not a product is competitive, and therefore can be auctioned, is to establish the relevant product market. Section 3 set out the proposals for determining what is the relevant product market. To do this effectively there needs to be an understanding of the product or proposed outcome, as this can affect the market definition. Additionally the RAs will need to consider whether or not there are significant constraints that would require a product market to be defined on a locational basis.

Identification of the relevant market is the first step, section 4 set out potential measurements of market concentration. This includes both ex-ante and ex-post metrics that could be employed. The purpose of introducing a measurement of market power is to determine whether sufficient competition exists to facilitate auctions.

Section 5 summarised the potential interactions with the approved DS3 system services products.

Section 6 of this paper introduced mitigation measures that could be employed to facilitate competitive auctions where potential market power exists.

7.2 PROPOSED APPROACH TO ASSESSING COMPETITION IN DS3 SYSTEM SERVICES

The assessment of competition for DS3 system services product markets can be broken down into a number of key steps:

Key Step	Considerations
Market Definition	• System service product or outcome • Location • Time
Ex-ante Market Power Metrics	• Market Share • HHI • RSI
Ex-post Market Power Metrics	• Residual Demand Analysis • Revenue analysis
Level of competition	• Competitive Market • Market concentration present • Uncompetitive
Market Power Mitigation Measures	• Unregulated Auction • Auction with mitigation measures imposed on participants with market power • Regulated Tariffs

The SEM Committee's current thinking is that ex-post market power analysis will require market data. This information is unlikely to be available in the first year of auctions.

At this stage in the process the RAs are not in a position to be able to define the thresholds for either HHI or RSI, however it is likely that a combination of both of these could be employed to assess competition in each distinct market. Section 4 set out the current thinking from the SEM Committee in relation to HHI thresholds.

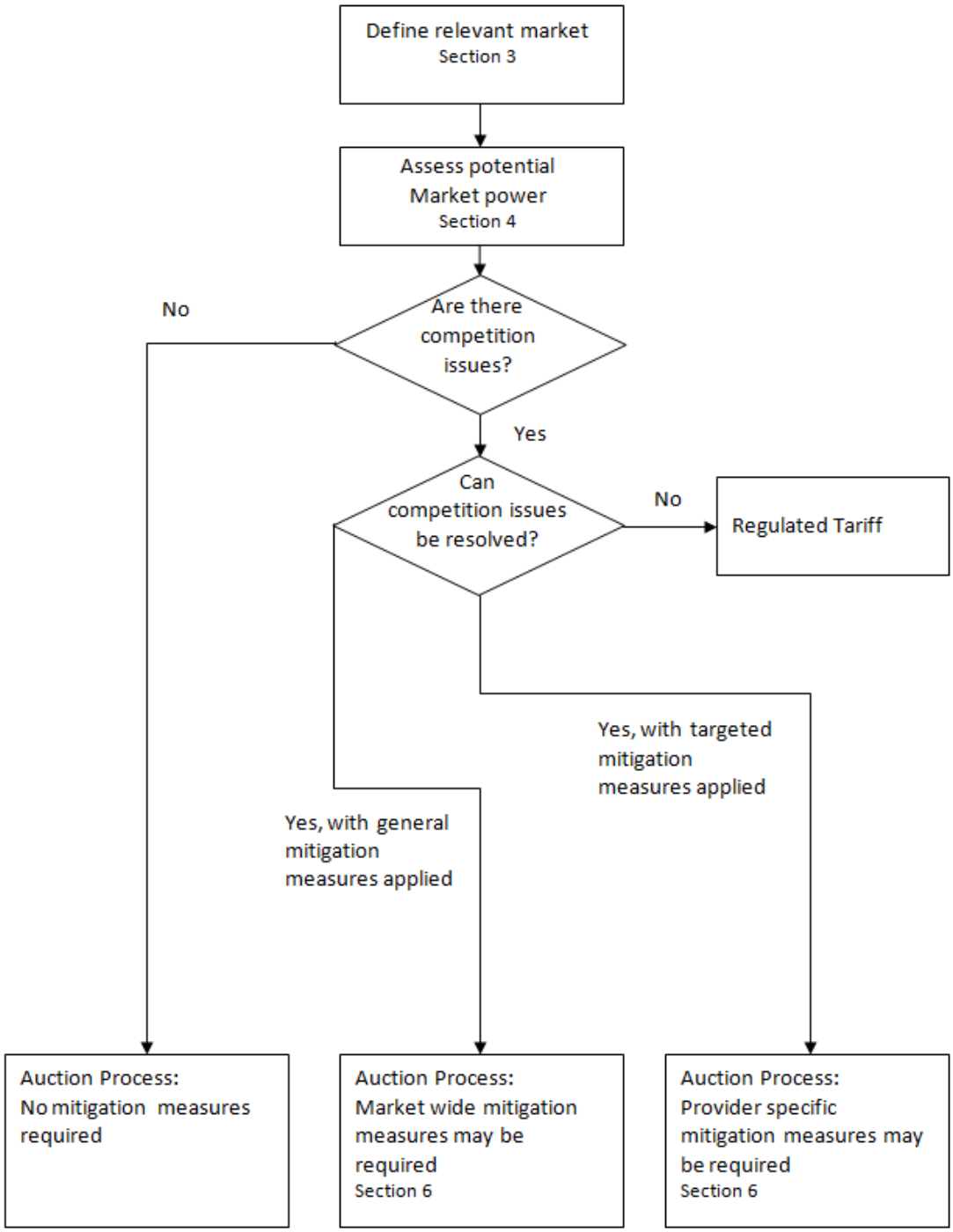
Through the Volumes workstream the TSOs will be required to define a number of key inputs required to assess competition in System Services these include:

- Volumes – this will cover the estimated required volumes to be purchased by the TSOs as well as the information relating to the estimated volumes that could be provided by existing service providers, please note that volumes to be derived from potential providers of system services will come from the Qualifications workstream.
- Substitutes – The TSOs will be required to provide a quantitative system to identify substitutes at the procurement stage.
- Constraints – These will be required for identifying potential markets

When all of the above information has been made available the RAs will analyse the data to identify markets

The decision process that the RAs propose to follow is summarised in the figure 1 below:

Figure 1



7.3 SPECIFIC CONSULTATION QUESTIONS

Respondents are asked to provide their views on all sections of this paper, however in doing so we would request that responses also address the following specific questions relating to this consultation:

1. Do you agree with the high level approach set out for identifying and defining the relevant market as set out in section 3?
2. Do you agree with the use of the proposed metrics for assessing potential market power as set out in section 4?
3. Given that the approach to assessing market power is for the purposes of determining whether a product is auctioned or is paid for under a regulated tariff mechanism, do you agree with the proposed approach to analysing market power for DS3 system services?
4. Respondents are asked to provide views on potential interactions between the system services products.
5. Do you agree with the high level proposals for when to apply market power mitigation measures as set out in section 6?
6. Do you agree with the proposals for the types of market power mitigation measures that may be employed as set out in section 6?
7. Do you think there are alternative market power mitigation measures that could be employed that have not been mentioned in this paper?
8. Are there any other issues, relating to assessing whether or not a market is competitive, that have been omitted from this paper?

8 NEXT STEPS

Responses to this paper are requested by 17.00 2nd November, 2015. Following a review of the responses to this paper the SEM Committee will publish its decision on the proposals set out in this paper, it is anticipated this will be published in early 2016.

Responses should be sent to Andrew McCorriston (Andrew.McCorriston@uregni.gov.uk) and Mo Cloonan (mcloonan@cer.ie). Please note that the SEM Committee intends to publish all responses unless marked confidential.

Andrew McCorriston
Utility Regulator
Queens House
14 Queen Street
Belfast
BT1 6ED

Mo Cloonan
Commission for Energy Regulation
The Exchange
Belgard Square North
Tallaght
Dublin 24