

Proposed supplemental market share restrictions and the introduction of the Oman spot market

Consultation document
10 July 2019

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1- Introduction

This paper seeks comments on the requirement for and nature of certain supplemental measures and restrictions in relation to market share in the Oman power generation market. In doing so it takes particular account of the forthcoming introduction of the spot market. This reflects the fact that the spot market will introduce, at least in relation to the Main Interconnected System (MIS) changes that, progressively and in time, reduce the impact of the single point in time view of prices generated through the periodic award of long-term power purchasing agreements (“PPAs”). The spot market will feature half-hourly price competition and its introduction can therefore be characterised as an evolution from “competition for the market” to “competition in the market.”

The Authority considers that, in order to effectively protect the interests of customers and to guarantee fair and effective competition in the market, for the benefit of all generators, the Authority needs to introduce additional measures to ensure that it is able to both restrict opportunities to exercise market power (positions of market dominance) and to discourage and take action against observed abuses of market power. This consultation paper focusses on the restriction of opportunities to exercise market power in the spot market, whilst also referring to the arrangements already put in place in the market rules and generator licence conditions to discourage and take action against abuses of market power.

The Authority further considers that market power in a spot market, characterised by half-hourly competition, will be quite different in its nature from the present market share restrictions applicable in relation to competition for the market. These are set out in generation licences as described in section 2.2 below and, as the Authority indicated in its 2009 Annual Report, are largely concerned with the risks of over concentrated ownership and related market financial instability.

The primary question that arises for the Authority in relation to the restriction of positions of market dominance in the spot market, is not so much the matter of whether the aggregated financial shareholding of a licensee, or an investor, exceeds a certain threshold, as a percentage of the total generation capacity in the defined market (the MIS). Rather, the Authority believes, it is whether or not a specific investor (or investors, if affiliated, or otherwise working in a co-ordinated manner) is able to control, or exert significant influence, over the bidding behaviour of the plant invested in. The matter of what the Authority considers constitutes a position of controlling, or significant influence, will be considered later in this paper.

In addition to “market share” restrictions covering the proportion of total production capacity that may be owned, it should also be noted that the Sector Law and generation licences presently restrict licensees (and their affiliates) in relation to their participation in other licensed activities in the sector (known as economic interest and regulated activity restrictions). These include the

ownership of the transmission business of OETC and (though arguably of lesser concern) of distribution and supply licensees.

The Authority intends to review the restriction on the ownership of distribution and supply licensees by generators or vice versa in due course, as it considers the further liberalisation measures specified in Article 29 (and defined in Article 1) of the Sector Law. They are not, therefore, assessed in detail in this paper.

Comments on this consultation paper should reach the Authority by 21 August 2019 and be addressed to:

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2 - Regulatory framework for competition for the market

The regulatory framework designed to support competition in the market already sets out certain restrictions and limitations on regulated activities, economic interest in other licensees and market share. In addition, the Authority has recently introduced new licence restrictions governing generators' bidding behaviour in the spot market.

2.1 Restrictions on Regulated Activities and Economic Interest

Restrictions on regulated activities and economic interest are set out in Articles 7 and 110(d) of the Sector Law, as follows:

Article (7)

Save for the Rural Areas Electricity Company or a special provision to the same effect in this Law it is not permissible for any Licensee to undertake more than one regulated activity or to acquire any direct or indirect economic interest in any other Licensee.

Article (110d) The Licence shall contain....

A prohibition on the Licensee, or any affiliates, other than the government and any entity wholly-owned by the government, without the prior written approval of the Authority, to own shares or have an economic interest of whatever kind in any other licensee or its affiliates.

The restraint applies to licensees rather than their constituent shareholders. In practice, the Authority has permitted a number of shareholders, both those who are internationally experienced plant developers and operators and those who are local financial investors, such as pension funds, to hold an interest in one or more generation licensees, subject to the market share restrictions described below.

2.2 Market Share Restrictions

Restrictions on the market share of licensed generators are provided for in Article 112(2)(c) of the Sector Law (as amended by Royal Decree 47/2013) as follows:

Article (112(2)(c) The Generation Licence....shall contain....

A provision to permit the imposition of restrictions on the percentage of total market share for Generation and/or Generation/Desalination whether in respect of the Licensee and its affiliates and related commercial projects.

The following extract from paragraph 1(e) of Condition 2 of the Generation and Desalination licence illustrates how such market share restrictions are presently applied.

The Licensee shall not and shall procure that any Affiliate of the Licensee shall not, on its own account (or that of the Licensee or of any Affiliate of the Licensee, as the case may be):

(e) Without the consent in writing of the Regulatory Authority, hold any economic interest, whether by the ownership of shares or otherwise in entities which, on their own account or in combination with other entities, provide more in aggregate than:
(i) twenty five per cent (25%) of the Production Capacity of production facilities which Generate electricity and deliver it into the Total System; or
(ii) twenty five per cent (25%) of the Production Capacity of production facilities which Desalinate water and form part of the Related Water Sector.

These restrictions reflect general international best practice competition considerations in relation to the risks of market dominance, where one party acquires a market share of greater than 25%. In the case of the Oman electricity generation market such dangers relate also to the risks of over concentrated ownership and possible financial instability. The restrictions apply to the percentage of shares held by a licensee and its affiliates in the Total System capacity.

Since the restructuring of the sector, the interests of customers in relation to wholesale electricity prices have largely been protected through ensuring that the Oman Power and Water Procurement Company (OPWP) secures sufficient capacity to meet all reasonably foreseen demand for electricity and that it does so in compliance with certain Economic Purchase obligations. This has been achieved through periodic competitions for the procurement of new centrally contracted capacity; so-called competition for the market. OPWP has then paid the generation licensee for the power provided on the basis of a long-term (typically 15 year) power purchase agreement (PPA).

The power procurement process and rules operated by OPWP and the Authority's own licensing arrangements have attracted specific project based entities to the market. In these projects, operating expertise is typically limited to 1-2 active shareholders, with the rest of the shareholders mainly consisting of local partners and financial investors, such as pension funds, with an inactive or much less active approach to their shareholdings.

To date, the Authority's key tasks have been:

- to ensure that the competitive process was well structured, fair, transparent and generated sufficient bids from reliable and efficient plant operators and investment partners; and
- to specify and ensure that such investors and operators are able to meet the Appropriate Person criteria (APCs).

The market share restrictions provided an additional mechanism for the Authority to use, should concerns exist that OPWP's procurement process ("competition for the market") was likely to lead to a significant risk of financial instability in the market.

Whilst these restrictions have been effective during the period of competition for the market, the Authority considers that such restraints may need to be supplemented by additional market share restrictions, following the introduction of competition in the market. This reflects the fact that, in practice, the present restraints have permitted certain investors to build up investment portfolios containing significant, though not majority, shareholdings in a number of different generation licensees. As a result the Authority needs to consider whether or not such positions are likely to represent a significant risk to the successful development of the spot market.

3. Development of and regulatory framework for competition in the market

3.1 Development of spot market

In April 2015 OPWP's consultants (NERA) published a cost-benefit study setting out the benefits of implementing an electricity (spot) market in Oman, which would operate, at least during its initial stages, alongside existing PPAs.

NERA argued that this would:

- enhance despatch efficiency;
- incentivise generators to respond to real time system needs, rather than just contractual requirements;
- provide a mechanism whereby unconventional and uncontracted capacity (including for example demand response, renewables and back-up GTs) could contribute to meeting demand;
- clarify post contract revenue opportunities for new generators and thereby lower procurement costs; and
- enhance the transparency of treatment of generation plant whose PPA was due to expire.

The Authority accepted NERA's recommendations and detailed legal and technical guidelines were then prepared, including full market rules documentation and revised generator licences. Both the market rules and the revised generator licences incorporate behavioural restraints designed to ensure the market will operate in a competitive manner and will not be characterised by abuses of market power, as summarised in section 3.3 below.

It is planned that the spot market will commence live operation from January 2021.

3.2 Market Power in the Spot Market

The Oman electricity spot market applies to the MIS only and not, at present, to the Dhofar Power System, or to power generated by the Rural Areas Electricity Company (Tanweer).

Electricity spot markets are, by their nature, volatile and dynamic. They can change dramatically over the course of just a few hours, as demand fluctuates, as plant becomes available, or unavailable, to meet the anticipated system demand and if there are limitations of transmission system capacity, either generally, or more especially during peak demand periods.

Experience internationally has shown that such factors may, especially at times of system stress, create significant opportunities for the exercise of market power, even though the market may be very competitive under most circumstances. Certain plant may, for example, be aware that they (and /or plant controlled by an affiliate) will be needed at certain times during which no, or a limited range of other plant is able to act as a substitute. This situation may provide them with market power, meaning their offered prices are effectively unconstrained by the effects of competition. In terms of competition tests, the “relevant market” for the purpose of exerting market power may be:

- very different at 5 a.m. than at 5 p.m.;
- different during summer peak periods, compared with off peak periods; and
- potentially, different at one location compared with another.

In other words, there may be both, temporal and geographic markets, or sub-markets.

Although it is a developing area, given that electricity cannot yet be cost effectively stored on a large scale and that, in practical terms, fuel substitution is restricted to a small number of very high demand customers, there is, at present, relatively little elasticity of demand in electricity markets. Customers therefore have only a limited ability to respond to short-term market price signals, whether caused by underlying economic factors, or by the exploitation/abuse of temporal and/or geographic market power.

Furthermore, the existence of temporal and geographic market power is exacerbated by the fact that whilst total demand (in the case of the Oman spot market total MIS demand) may be met by the total connected capacity on the (MIS) system, certain renewable generation, such as solar and wind plant, tend to be inflexible and are unlikely to set the spot market (system marginal) price. Indeed, for the purposes of the Oman spot market such plant are to be categorised as price takers and will not be expected to set the spot market (system marginal) price, in normal circumstances.

As a result, it is the ability of certain plant (and its shareholders) to control, or significantly influence market price (including the availability, or scarcity payments, as well as the bid prices) and, in effect, to act independently of a competitive response, combined with the inability of customers to respond to those price signals, that will provide market power in the spot market.

Comments 1: the Authority requests comments on the existence and nature of market power in the Oman spot market.

3.3 Market behaviour restraints in generator licences and market rules

On 25 December 2018 the Authority modified the licence conditions of those amongst Oman's licensed generating companies that provide power to the MIS, in order to incorporate a number of new conditions relevant to the introduction of the spot market. Amongst these was Condition (4B) / Condition (7), relating to market behaviour and the requirement to submit offers on a cost reflective basis. This provides that licensees shall not:

inhibit the proper operation of, or distort competition in, the spot market; or give false or misleading information ...including the availability or cost of operation of any part of the production facilities; or (do anything that is) intended to or is likely to result in prices or charges under the Market Rules being determined on an artificial basis or the artificial operation of the Pool (Spot market).

In addition, the provisions of the market rules require generators to submit bids on the basis of cost reflective prices, as specified in Section J and Annex J of the market rules and (as applicable) in accordance with the approved methodology for translating the terms of PPAs into spot market offers, or bids.

Although these restraints will provide the Authority with some tools to control abuses of market power that are identified, abuses of market power in electricity spot markets can in practice be very difficult to identify and take action against. It is therefore international best practice that positions of market power should be restricted through ex-ante controls, as far as possible.

Comments 2: the Authority invites comments on the need for further measures to restrict positions of dominance in the spot market. Such measures would be additional to the licence conditions and market rules requirements requiring generation licence holders to bid at cost-reflective prices and are summarised in Section 6 of this consultation document.

4 - Indicators of Market Power in the Oman Spot Market

During the early stages following implementation of the spot market most, potentially all of Oman's licensed generators will have an existing PPA contract and will continue to be compensated on the basis of their contract terms. As indicated above, for those generators providing power to the MIS, this is reinforced by a market rules requirement that generators should submit spot market bids on the basis of cost reflective prices (and their PPA terms).

Over time however (especially as the present PPAs expire) spot market prices will reflect generator cost structures, operating efficiency, declared availability and bidding behaviour. As a result, in a dynamic spot market, where demand fluctuation is significant, opportunities for the exercise and potential abuse of

market power are likely to remain, however sophisticated the regulatory requirements.

4.1 Levels of control over licensee bidding behaviour

As market power in the spot market will be exerted through a generator's bidding behaviour, including its declared availability, the Authority considers it necessary to assess who is (and who is not) likely to be able to control, or exert significant influence over a generator's bidding behaviour and to what extent they may be able to do so. This is a more complex question than the matter of what percentage of a generation license holder's shares are held by an individual shareholder (and its affiliates).

In the circumstances applicable in Oman, where most licensees are project specific companies (comprising a range of both active and less active/inactive shareholders) it is the Authority's view that the power of each shareholder to exert control or significant influence over bidding behaviour in the spot market is best identified using a range of indicators. These would usually be taken together, but may, in some circumstances be sufficient on their own.

To this end the Authority has identified the following indicators of control and significant influence;

1. **Shareholding:** a shareholding in excess of 20%, which is usually the largest single shareholding is assumed to indicate an active and strongly influential shareholder (for example one that is entitled to nominate one or more Board Directors of the licensed generating company) though it should be recognised that, in some circumstances, a strongly influential shareholding position may also exist at a lower level than 20%, dependent on the range and scale of other shareholding interests;
2. **Employment:** in some cases it has been observed that one or more senior officers of the project specific licence holding company have an historic (and potentially future) employment relationship with one or other of the leading shareholders, such as the CEO, COO, Finance Director etc;
3. **Contractual relationships:** the employment by the project specific licensed generating company of an operations and maintenance contractor that is a subsidiary or affiliate of a major shareholder.

The indicators described above are considered likely to represent key factors the Authority should take into account in assessing which shareholders are and are not able to control or significantly influence the bidding behaviour of each plant.

Comments 3: the Authority invites comments on the potential indicators significant influence, or control, over a plant's bidding behaviour.

The Authority intends to review each of the indicators identified above in assessing the potential degree of concentration and market power in the Oman spot market. For the purpose of transparency the indicator in relation to shareholding would be calculated using the criteria described below:

- A shareholding of 20%¹ or greater in a generation licensee that has price setting ability, in accordance with the Oman spot market rules (and that is providing power to the MIS) potentially on its own and certainly if accompanied by one or more of the additional primary indicators outlined above, would be assumed to constitute the ability to **exert a controlling influence** on that licensee's bidding behaviour. (100% of the capacity of that plant is therefore allocated to that shareholder in calculating the shareholder's market share);
- If more than one shareholder has an equity interest of 20% or greater in a generation licensee with price setting ability, they are assumed to share control over the plant's bidding behaviour, subject to further investigation in relation to the other indicators of control (the capacity is then allocated equally between them).
- A shareholding of lower than 20% in a licensee is assumed not to provide the shareholder with control over plant operation and bidding behaviour assuming that larger shareholders exist (0% of the capacity of that plant would therefore be allocated to that shareholder in calculating the shareholder's MIS market share);
- Plant not connected to the MIS would not be regarded as able to influence spot market prices.

It must be stressed that, in applying regulatory restraints, the Authority must carefully consider each case on its individual merits and the criteria and indicators above are therefore intended to provide guidance to individual investors and to the market, rather than constituting hard and fast rules applicable in all circumstances.

For example, if the largest shareholder has a 15% equity interest in a plant, combined with a relationship with the executive management and/or an O&M contractor it would not make sense to allocate 0% of the capacity to that shareholder.

Comments 4: the Authority invites comments on the potential criteria for allocating the capacity of the plant to the active shareholders.

¹ For the specific purpose of these calculations, the Authority has in practice applied a limit of 19.5% because one major generation company has a shareholder with 19.5% equity share and does not seem appropriate not to consider this significant position when conducting market share analysis.

4.2 Portfolio optimisation concerns

In addition to control over individual plant, it is important that the Authority's assessment of market power and potential market dominance considers whether or not significant influence or control over a considerable portfolio of plant would provide greater market power than could be exerted through control of a single plant.

It is difficult to devise a specific economic indicator to assess this, especially in a market that has not yet commenced operation. In theory however the Authority considers that there is likely to be additional market power (as well as incentive) obtained through the control of a portfolio of plant with different (marginal) cost characteristics and that would be likely to be despatched to meet different demand levels.

The Authority therefore expects to pay particular attention to this factor in determining whether or not an individual shareholder is or is not, considered likely to enjoy a dominant market position.

In addition, the Authority will also pay additional attention to situations where a generator has a portfolio of both price setting and price taking plant, whereby the value of and revenue from a price taking plant could be increased through the same shareholder's ability to control a price setting plant.

Comments 5: the Authority invites comments on the specific potential for portfolio generators to optimise portfolio value and whether or not this would provide additional market power (including, for example, through bidding levels and/or plant withdrawal) and what, if any, additional considerations the Authority should apply and actions it should take in such circumstances.

4.3 Market concentration indicators

In addition to calculating the market share of individual shareholders, the Authority has used the above criteria to assess both the overall degree of concentration in the MIS generation market (using the Herfindahl-Hirschman index, or HHI) and the resilience of that market to the withdrawal of plant owned/controlled by a specific generator/shareholder (the Residual Supply Index, or RSI). These indicators and the results of the Authority's analysis are described further below.

The Herfindahl - Hirschmann Index (HHI)

The Herfindahl - Hirschman Index (HHI) is one of the most commonly used measures of market concentration and is widely applied in research and by

regulators and competition authorities to assess the effectiveness of various markets, as well as the competitive impacts of proposed mergers that would strengthen an operator's market position.

HHI is calculated by summing the squares of the market shares of all firms in the market. This gives proportionately more weight to the market shares of larger firms and therefore reflects their relatively greater market power.

In the case of a pure monopoly situation, with one firm controlling 100% of the market, the HHI value would be 10,000. In the case of perfectly competitive market, with multiple firms with equally small market shares, the HHI value would approach zero.

There are a number of different levels of market concentration that cause concern for regulators and competition authorities but perhaps the most commonly applied threshold values² and those previously referenced by the Authority in its 2009 Annual Report are:

- Unconcentrated market (HHI below 1000)
- Moderately concentrated market (HHI between 1000 and 1800)
- Highly concentrated market (HHI above 1800)

The results of the Authority's HHI calculations for the Oman MIS generation market, using the control indicators outlined above, for 2019 and 2021 (at the time the spot market is expected to go live) are shown in Appendix 1 to this paper.

Comments 6: the Authority invites comments on the matter of whether or not HHI is a useful indicator of market concentration in the Oman spot market and what other indicators might apply.

Residual Supply index

The RSI calculation methodology is designed to take account of the variable nature of electricity markets e.g. between peak and off-peak hours and was developed by the California Independent System Operator (CAISO).

The RSI for a particular generator measures the total supply capacity in the market, minus the percentage remaining available to the market (the residual capacity) after subtracting the particular generators owned/controlled capacity. Thus:

² See The U.S. Department of Justice Horizontal Merger Guidelines

RSI for particular generator (P) = (Total Supply capacity – Supply capacity controlled by particular generator (P)) / Total Demand

Fundamentally, the RSI illustrates to what extent a particular generator is 'pivotal' to the clearing of the market. A supplier is defined as pivotal if total market demand exceeds the available capacity under the offer control of other market participants; that is, when the RSI < 1. When RSI > 1, suppliers other than the particular generator (P) have enough capacity to meet market demand, and company P should have a reduced ability to exercise market power in a manner not restrained by the effects of competition.

It is important to note that the RSI only measures Generator P's potential market power. That is, the RSI analysis does not illustrate whether a firm has an incentive to exercise market power. Also, the RSI calculation does not indicate whether or not market power has actually been exercised.

The results of the Authority's RSI calculations for the Oman MIS generation market, using the control indicators outlined above, are shown in Appendix 2 to this paper.

Comments 7: the Authority invites comments on the matter of whether or not RSI is a useful indicator of market concentration in the Oman spot market and what other indicators might apply.

5 - Results of the Authority's market power analysis

In accordance with Section 4 of this paper, the Authority's analysis of market power issues related to the introduction of the Oman electricity spot market is divided into three separate parts:

1. the indication of the extent to which the market is, or is not, deemed to be concentrated, both now and in the near future;
2. the extent to which each individual plant is pivotal to the system; and
3. whether or not individual shareholders are likely to be able to exert market power and benefit from positions of market dominance.

5.1 HHI

The Authority's calculations of HHI in 2019 and 2021, on the basis of the Section 4 indicators and criteria in relation to control and significant influence over bidding behaviour in the spot market are set out in Tables 1 & 2 of Appendix 1, attached.³

In both 2019 and in 2021 the HHI score is greater than 1,800, indicative of a highly concentrated market, in which the regulator must consider whether or not measures should be taken to reduce market concentration and whether or not additional investments should be permitted that would further increase market concentration.

It may be noted that although the level of market concentration reduces between 2019 and 2021 it does not fall below the level at which the market is regarded as highly concentrated, despite the addition of a further 1,574MW of generation capacity during that period. This represents approximately a 19% increase in market size.

5.2 RSI

The Authority's calculations of RSI in 2021, for selected large shareholders and individual generation plants, on the basis of the Section 4 indicators and criteria in relation to control and significant influence over bidding behaviour in the spot market, are set out in Figure 1 in Appendix 2, attached.

As it is the largest shareholder in the Oman electricity market (based on the calculation methodology outlined in this paper) Appendix 2 illustrates the Residual Supply Index calculations for Engie. In order to provide a clear illustration, the calculation has been performed for both Engie's total capacity and for a combination of plant forming part of Engie's overall portfolio. In

³ Market shares used in calculations have been updated to reflect the shareholdings notified to the Authority at the end of 2018. These will be updated again before the Authority decides whether or not to proceed with the potential measures outlined in the consultation document.

addition, RSI calculations have been performed for Ibri and Sohar III (assumed to be jointly controlled by Acwa Power and Mitsui) which are among the largest single power plants in Oman.

In the illustration the capacity and peak demand shown are forecasts for the year 2021⁴. The daily peak demand forecast has been calculated by scaling the forecast electricity peak demand in 2021 by the average daily peak load in 2017 - 2018.

As can be seen, there is significant variation on electricity demand throughout the year and it is easy to see that it is during the summer period when the selected plant(s) would be pivotal to the system, i.e. the RSI <1.

According to the results, capacity controlled by Engie would be pivotal to the system 48% of the time. Ibri and Sohar III combined would be pivotal 40% of the time. A combination of Sohar II, Barka III & Rusail would be pivotal 7% of the time. However, no single plant on its own is pivotal to the system, suggesting that particular attention should be paid to those investors likely to be able to control a portfolio of generating plant.

5.3 Existence of positions of market dominance

The Authority has also calculated the market share of selected individual investors in 2021, on the basis of the Section 4 indicators and criteria in relation to control and significant influence over bidding behaviour in the spot market.

Those calculations indicate that one large shareholder is likely to have control or to be able to exert significant influence over almost 30% of the total price setting capacity in the spot market and is therefore likely to enjoy a position of market dominance. As that single shareholder is also likely to enjoy control over the bidding behaviour of a portfolio of several separately licensed, project specific, generating companies, it may also enjoy additional benefits.

One other shareholder is likely to have a control based market share of greater than 20% and might be likely to exceed the 25% threshold if permitted to acquire a significant or controlling interest over a further large plant in the future.

⁴ MIS Contracted capacity and Peak demand in 2021, Expected case, OPWP 7-Year Statement 2018 - 2024

6. Conclusions, next steps and summary of consultation questions

Dependent on the comments received and any further analysis the Authority may need to carry out, the Authority considers that it needs to take the following steps in order to progress this initiative:

1. to update the information it holds in relation to investments in and control of licensed generators and to enhance this information to enable it to assess the indicators of control in relation to each licensed generator;
2. to decide whether or not to introduce additional measures to restrict the further development or acquisition of positions of market dominance, in addition to the market share restrictions set out in generator licenses; and
3. to consider whether further measures are necessary to reduce or constrain such market dominance as may have been obtained during the existence of the presently applied market share restraints and the form such restraints might take (for example licence modifications and enhancements to reporting obligations relating to the indicators of control in accordance with the Appropriate Persons Criteria.

Having noted the above, in relation to step 2 and subject to the views of respondents to this consultation paper, the Authority wishes to state that it does not believe it is justified, at this stage, to introduce regulatory rules that effectively unwind approvals it has already given in relation to the acquisition of shareholdings, where positions that may be regarded as dominant in the context of the spot market have reasonably been acquired through activities that were fully compliant with the market share restrictions applicable at the time. This will however depend upon continued compliance with licence conditions, including those relating to bidding behaviour.

In summary, the Authority now invites comments from interested stakeholders in relation to the issues identified in this consultation paper, including the following:

- 1. the existence and nature of market power in the Oman spot market;*
- 2. the potential indicators of market power in the Oman spot market and their relationship to a shareholder's ability to exert significant influence, or control, over a plant's bidding behaviour;*
- 3. the criteria for allocating the capacity of each plant to the active shareholders;*
- 4. the specific potential for portfolio generators to optimize portfolio value and whether or not this would provide additional market power (including, for example, through bidding levels and/or plant withdrawal) and what, if*

any, additional considerations the Authority should apply and actions it should take in such circumstances;

- 5. whether or not HHI and RSI are useful indicators of market concentration in the Omani spot market and what other indicators might be applied;*
- 6. the steps outlined in 1-3 above; and*
- 7. the question of whether or not restraints should be applied in relation to shareholdings that provide a dominant market position but that were legitimately acquired under the existing market share restraints.*

Comments on the above matters should reach the Authority by 21 August 2019, to the address indicated in Section 1 of this document. Comments received after that date may not be taken into account.

Appendix 1 – HHI and market share calculations

Illustration of overall market concentration and market shares in 2019 and 2021, for select shareholders only.

Shareholder	Economic interest in number of plants	Current approach			Proposed new approach		
		Total MIS market share per equity interest %	Share of total MIS market capacity MW	HHI calculated per equity interest	Total MIS market share per controlling interest %†	Share of total MIS market capacity MW	HHI calculated per controlling interest
ACWA Power	2	8.3%	678	69	10.9%	896	120
Chubu Electric Power Sur B.V.	1	4.8%	394	23	12.4%	1,012	153
EHC	2	8.6%	704	74	8.6%	704	74
Engie	6	15.7%	1,283	245	34.4%	2,813	1,180
Khaled Juffali Energy & Utilities Co.	1	1.7%	143	3	3.2%	264	10
Marubeni	1	8.0%	657	64	12.4%	1,012	153
MENA Sohar 1SPV LTD	1	1.5%	119	2	3.6%	299	13
Mitsui	1	6.1%	499	37	6.1%	499	37
Mubadala Development Company	2	5.2%	427	27	8.4%	691	71
Sum*		100%	8,187	851	100%	8,187	1,811

Shareholder	Economic interest in number of plants	Current approach			Proposed new approach		
		Total MIS market share per equity interest %	Share of total MIS market capacity MW	HHI calculated per equity interest	Total MIS market share per controlling interest %†	Share of total MIS market capacity MW	HHI calculated per controlling interest
ACWA Power	3	17.4%	1,703	304	20.9%	2,037	436
Chubu Electric Power Sur B.V.	1	4.0%	394	16	10.3%	1,009	107
Engie	6	13.1%	1,283	173	28.8%	2,813	830
Khaled Juffali Energy & Utilities Co.	1	1.5%	143	2	2.7%	264	7
Marubeni	1	6.7%	656	45	10.3%	1,009	107
MENA Sohar 1SPV LTD	1	1.2%	119	1	3.1%	299	9
Mitsui	2	16.8%	1,643	283	16.8%	1,640	282
Mubadala Development Company	2	4.4%	427	19	7.1%	691	50
Sum*		100%	9,761	1,062	100%	9,761	1,829

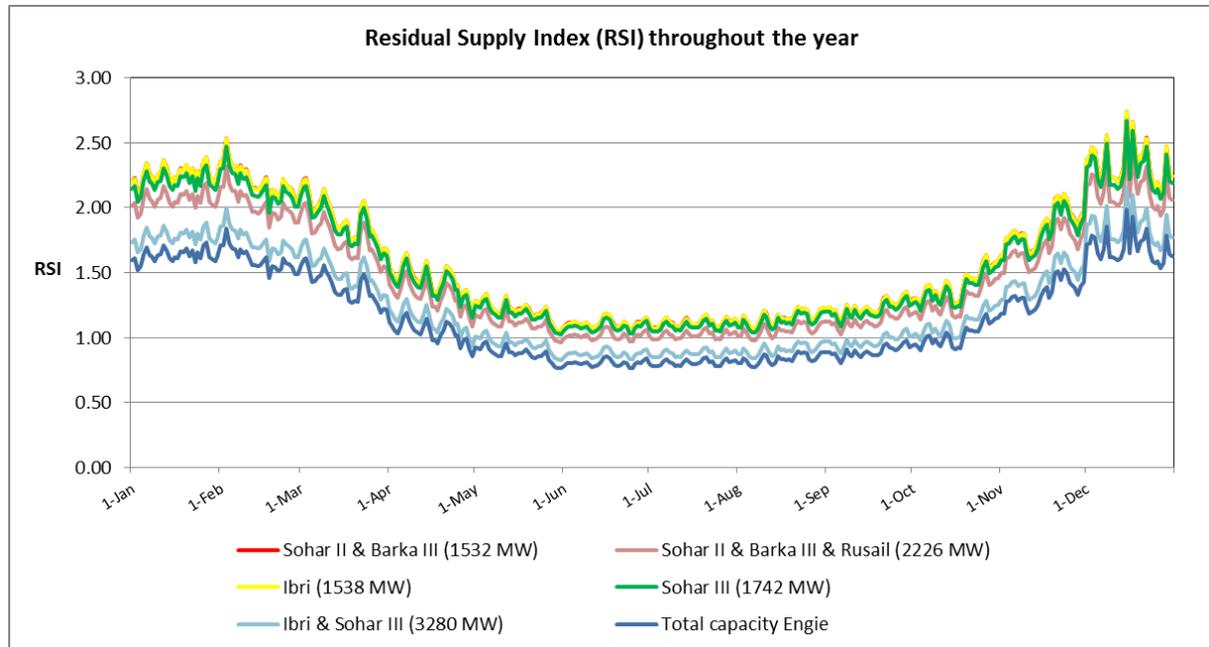
Source: Licensee submissions, OPWP 7–Year Statement 2018 - 2024 and the Authority's calculations.

*The tables illustrate only a select number of shareholders. However, the sums calculated reflect the total of all shareholders, including those not shown individually in the above tables.

†100% control over the plant's capacity is assumed if equity interest >20%. If more than one shareholder has an equity interest of >20%, the plant's capacity and market share is allocated equally between them.

Appendix 2 – RSI calculations

Figure 1



Source: Licensee and OETC submissions, OPWP 7 – Year Statement 2018 - 2024 and the Authority's calculations.

Figure 1 illustrates the daily RSI for selected plant.

As can be seen there is significant variation in electricity demand throughout the year and it is clear that during the summer period certain plant is pivotal to the system, i.e. the RSI <1.

The Authority's analysis indicates that:

- Plants likely to be controlled by Engie would be pivotal to the system 48% of the time;
- Ibri and Sohar III combined (assumed to be jointly controlled by Acwa Power and Mitsui) would be pivotal 40% of the time;
- a combination of Sohar II & Barka III & Rusail IV would be pivotal 7% of the time; and
- no single plant on its own is pivotal to the system.

Appendix 3 – Annual Information Return

The Authority currently requires licensed generators to provide, on an annual basis, certain information in relation to shareholdings and other related matters and to update these as and when relevant changes occur (“Provision of Information to the Authority” – letter)

Subject to comments received in relation to this consultation paper and as indicated in section 6.1 of this consultation paper the Authority intends to modify this return, as illustrated in the attached draft letter, in order to better inform its assessment of control and influence in the spot market, in accordance with the indicators and criteria listed in Section 4 of this consultation paper.