

RCP PAPER NO. : **EMC/RCP/40/2008/CP16**

SUBJECT : **PUBLISHING GENERATION OFFERS AND DISPATCH QUANTITIES**

FOR : **DECISION**

PREPARED BY : **POA TIONG SIAW  
SENIOR ECONOMIST**

REVIEWED BY : **PAUL POH LEE KONG  
SVP, MARKET ADMINISTRATION**

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### **Executive Summary**

Generation facility-level offers and dispatch quantities for the Singapore wholesale electricity market (SWEM) are currently not published. This paper discusses the pros and cons of doing so. Given the SWEM's high level of market concentration, we consider that, on balance, the risks associated with implementing this proposal are more well-established and pertinent compared to the potential benefits sought. Hence, EMC recommends that the RCP **not support** this proposal.

At its 40<sup>th</sup> RCP Meeting on 4 November 2008, the RCP by majority, did not support this proposal. The Panel also agreed that this decision should be reviewed when the level of market concentration has lowered. It decided to monitor the vesting contract level as a gauge of market concentration. The Panel agreed to review this proposal when the EMA next lowers the vesting contract level.

## 1. Introduction

Generation facility-level offers and dispatch quantities for the Singapore wholesale electricity market (SWEM) are currently not published. This paper discusses the pros and cons of doing so. We concede that it would be futile to attempt quantifying the benefits and costs of publishing the said information. Hence, the bulk of the analysis has been built on the following:

1. Economic theory
2. SWEM's market design principles
3. The structural nature of the SWEM
4. References<sup>1</sup> to practices in other deregulated centrally-dispatched electricity markets

## 2. Economic Theory

Economic efficiency is the primary principle underpinning the design<sup>2</sup> of SWEM. Accordingly, economic efficiency has the following three broad elements:

1. **Productive Efficiency** – Attainment of least-cost production in the short run.
2. **Allocative Efficiency** – Each resource is allocated to those that value it most in the short run.
3. **Dynamic Efficiency** – There is optimal rate of investment in the long run.

### 2.1 Information and Economic Efficiency

The case for making all relevant market information universally available rests on accepted economic theory. In economic literature, perfect and complete information is one of the defining characteristics of a perfectly competitive market. Accordingly, a perfectly competitive market has the following textbook characteristics:

1. Atomicity – a large number of small sellers and buyers so that their actions have no significant impact on others.
2. Homogeneity – goods are perfect substitutes.
3. Perfect and complete information – all firms and consumers know about others' actions, and strategies and payoffs.
4. Equal access – all firms have access to production technologies, and resources are perfectly mobile.
5. Free entry and exit.

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<sup>1</sup> Based on "Analysis of Data Release Practices in Centrally-Dispatched Electricity Markets," CRA International's Report to PJM Interconnection in July 2007.

<sup>2</sup> "Wholesale Market Design August 2000", PHB Bailey.

Instinctively, this definition of a perfectly competitive market supports the case of publishing generation offers and dispatch quantities. Generation offer information is undeniably pertinent market information that affects the outcome of the market place.

However, while the above definition describes the end-state of an ideal market place, it does not prescribe a path towards attaining it. In practice, the evolution of every market place is unique with its own starting point and inherent dynamics. Furthermore, the perfect end-state is rarely attainable in practice.

Indeed, two roles of information in markets are the subject of substantial economic literature. They are:

1. Role of information in promoting efficient outcomes; and
2. Role of information in enabling uncompetitive and hence less efficient outcomes

## 2.1 Guidance from Economic Literature

In its study for PJM, CRA International reported that there is a lack of economic literature linking information disclosure with competitiveness in electricity markets. There is, however, substantial material in general and theoretical terms. The broad conclusions from this research<sup>3</sup> are:

- Information on aggregate prices, aggregate output and overall demand levels has a “small negative effect (if any)” on social welfare;
- Information on the specific output quantities and prices of individual market participants has a “strong negative effect” on welfare; and
- Private communication regarding future plans has a “strong negative effect” on welfare.

These guidelines indicate that information on overall market conditions carry a lower risk of facilitating uncompetitive behavior than information that reveals the specific actions of an individual firm.

## 3 Degree of Competitiveness of the SWEM

Perfect information is one of the defining characteristics of a perfectly competitive market. It does not, however, necessarily follow that at any given stage, the release of information on firms’ actions will make a market more efficient. Where market concentration is high or where

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<sup>3</sup>Nistche, Rainer and von Hinten-Reed, Nils, “Competitive Impacts of Information Exchange,” Charles River Associates, June 2004, p.6.

market power is present, it is generally accepted that the release of strategic firm-specific information is a double-edged sword that can also undermine economic efficiency.

### 3.1 Structural Characteristics of the SWEM

1. The generation market is concentrated. The Herfindahl-Hirschmann Index<sup>4</sup> (HHI) is widely used as a benchmark measure of structural market power. (Used by US DOJ and FTC to measure market power. Used on 170 generation markets serving nearly 75% of US population<sup>5</sup>.)

In the SWEM, the three largest generators combine to account for about 85% of total licensed capacity (Senoko Power – 32%, Power Seraya – 28%, Tuas Power – 25%).

- a. HHI for generation in SWEM = 2,531<sup>6</sup> (6 firms) [Above 1800 considered highly concentrated<sup>7</sup>]

A highly-concentrated market makes the exercise of market power very profitable.

2. There is vertical concentration: All five participating retail licensees are affiliates of participating generation licensees.
3. Short term demand response is non-existent.

We see that going by a HHI<sup>8</sup> of 2531, the generation market is considered highly concentrated. These structural characteristics of the SWEM are borne in mind in the analyses throughout this paper.

## 4 A Marginal Cost Pricing Regime

To maximize economic efficiency, the SWEM operates a marginal cost pricing regime through the use of a uniform price auction. Subject to the effects of co-optimization and network constraints, the offer price of the marginal generator sets the (uniform) market price. In a competitive market place, this pricing regime elicits truth-telling, i.e. best induces sellers to offer their products at marginal cost. Without knowledge of competing bids, it is in the best

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<sup>4</sup> The HHI is calculated by summing the square of every firm's market share.

<sup>5</sup> "Horizontal Market Power in Restructured Electricity Markets", US Dept of Energy, March 2000.

<sup>6</sup> See Annex 1 for the derivation of HHI for SWEM.

<sup>7</sup> The U.S. Department of Justice considers a market with a result of less than 1,000 to be a competitive marketplace; a result of 1,000-1,800 to be a moderately concentrated marketplace; and a result of 1,800 or greater to be a highly concentrated marketplace. As a general rule, mergers that increase the HHI by more than 100 points in concentrated markets raise antitrust concerns.

<sup>8</sup> EMA's guidelines on evaluation of merger and acquisition proposals in the electricity industry dated Sept 2004 also uses HHI as an assessment of market concentration.

interest of a generator to offer based on its marginal cost. In doing so, the generator is assured of marginal cost recovery if it is dispatched.

Hence, the SWEM's pricing regime incentivises generators to bid close to their true marginal cost – independently of other generators – so as to secure dispatch. At first glance, the publication of competitors' offers could dilute the incentive for truth-telling provided by the marginal pricing regime, i.e. generators are likely to strategically react to the observed offering pattern and not offer based on their marginal cost.

## 5 Benefits and Risks

In this section, we consider the specific benefits sought and identify the risks for SWEM of publishing generation facility-level offer and dispatch information. The assessment in this section is guided by the considerations set out in the introduction of this paper.

### 5.1 Benefits Sought from Publishing Generation Facility-level Offer and Dispatch

#### 5.1.1 Buyer Choice (Allocative Efficiency Argument)

One argument for availability of information on the offers of sellers is that buyers require information on alternatives in order to choose. However, economic efficiency requires that buyers bid at the marginal benefit of each unit of electricity in a pool environment. Hence, knowledge of how suppliers offer is not necessary. The benefit of consumer choice is severely limited in the context of the SWEM because of the lack of demand bidding.

#### 5.1.2 Lower cost of risk management (Productive Efficiency Argument)

With knowledge of competing offers, it is natural that generators would be better able to manage the risks associated with price fluctuations in the spot market. It is conceivable that this could lead to overall lower administrative cost of risk management for generators.

#### 5.1.3 Facilitate entry/investment decisions (Dynamic Efficiency Argument)

Knowledge of competing offers can conceivably allow potential entrants to make better entry or investment decisions. However, market clearing prices (which are published) would be more relevant to potential SWEM participants because trades are settled based on clearing prices and not offered prices. It has also been argued that this information is not essential for efficiency.<sup>9</sup>

#### 5.1.4 Facilitate market monitoring

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<sup>9</sup> Peter Cramton and Jesse A. Schwartz “Collusive Bidding: Lessons from the FCC Spectrum Auctions” *Journal of Regulatory Economics*, 17, 229-252, May 2000 p25.

It has been suggested that publicly available historical offer information act as a surveillance tool for the market to collectively monitor behavior. It could lead to the dispelling of the notion of market power or the abuse of market power.

## 5.2 Potential Risks of Publishing Generation Facility-level Offer and Dispatch

With high supply-side concentration (as suggested by the HHI), publishing generation facility-level offer could undermine the incentive for generators to act independently. Collusion is encouraged simply because it is made easier. Tacit collusion is sustainable because there are only three dominant players.

In short, publishing facility-level offer information plausibly facilitates collusion in two ways:

1. It facilitates indirect communication between generators. It is well-established in economics literature that players in a concentrated market can coordinate their actions through such indirect communication.
2. It aids in the detection of deviation from a collusive agreement, thus enabling colluding parties to enforce and sustain a collusive equilibrium.

### 5.2.1 Counter-arguments from the European Federation of Energy Traders (EFET)<sup>10</sup>

EFET is a long-time proponent for publication of offer stacks and cited the following as deterrents of the abuse of market power:

- i. Prohibition of tacit collusion by law;
- ii. Financial services regulation being applied to power markets (EU), placing onerous restrictions on participants manipulating market prices and engaging in transactions without bona fide commercial purpose;
- iii. Incentive to cheat overrides incentive to collude (if there are more than five participants);
- iv. Collusion is easily identified (public scrutiny);
- v. Transparency on collusive behavior allows traders to factor collusion into their decisions and “trade around it”. (From traders’ perspective)
- vi. Not releasing information does not help to solve market power problem

In the context of SWEM, we observe that for points (i) and (ii), monitoring, surveillance and enforcement capabilities are still being developed. Also unlike some other markets, there is no ex-ante market power mitigation mechanism. Furthermore, although collusion is prohibited by law, there is no reason to institute facilitating factors. For point (iii), there are effectively only three large players in the generation market so tacit collusion can be

<sup>10</sup> “European Federation of Energy Traders’ (EFET) Position Paper: Transparency and Availability of Information in Continental European Wholesale Electricity Markets”, July 2003.

sustainable. The element of public scrutiny in point (iv) is not strong in the Singapore context because of the lack of demand participation. Consumer advocacy is also not advanced in Singapore. Hence, the threat of adverse public reaction is likely to have a very limited deterring effect on the abuse of market power. Finally, we consider points (v) and (vi) to be irrelevant.

Therefore, publishing generation offer improves the availability of information in the SWEM, but encourages more economically inefficient behavior by market participants. This counters the primary objective of re-structuring the electricity industry.

## **6. Effect of Aggregation and Delayed Release**

### **6.1 The Aggregate Offer Curve**

This section extends the discussion to whether an aggregate offer curve (as opposed to facility-level offers) has strategic content.

#### 6.1.1 In a collusive environment

In an environment where generators have market power and engage in collusion, aggregate offer curve can provide useful information. Given a fixed level of demand that is easily estimated, an aggregate offer curve would be useful in helping generators (who engage in capacity withholding) to more effectively determine how much and when to withhold to raise prices.

#### 6.1.2 In a non-collusive environment

Can a single generator exercise market power? The answer is yes. We make reference to the EMA's decision to impose vesting contracts, where it had reasoned that market power in Singapore existed in the form of a concentrated market where profit-maximizing firms acted independently to increase prices. The total vesting quantity is also subsequently set using a Cournot game model that describes non-collusive generators that have the ability to independently increase prices. Similarly, given a fixed level of demand that is easily estimated, an aggregate offer curve would be useful in helping a single dominant generator (who engage in capacity withholding) to more effectively determine how much and when to withhold to raise prices.

#### 6.1.3 Disincentive to offer close to marginal cost.

Information on offers of other generators would at least partially erode the incentive for the generator to be guided only by its true marginal cost in their offers. This is against what the marginal uniform pricing regime sets out to achieve.

#### 6.1.4 Cost versus Benefit

We are unable to describe any form of economic benefit other than the general observation and accepted notion that an efficient market is characterized by high information availability. The lack of clear benefits of publishing an aggregate offer curve is, in our opinion, in contrast with plausible potential benefits of publishing facility-level offer. An aggregate offer curve (that does not impart specific information on facility-level offer) does not deliver the benefits described in section 5.1. Hence, the potential risks of publishing aggregate offer curve overwhelm the potential benefits.

### 6.1.5 Should the Aggregate Offer Curve be published?

We consider that the aggregate offer curve should not be published because:

1. Market power exists and generators (colluding or not) that engage in withholding will be able to extract strategic information from the aggregate offer curve.
2. Publishing aggregate offer curve would at least partially erode the incentive for generators to be guided only by its true marginal cost in their offers. This distraction contravenes the objective of marginal uniform pricing.
3. There are no plausible economic benefits in publishing aggregate offer curve.
4. The potential downside risks overwhelm the uncertain economic benefits.

## **6.2 Effect of Delayed Release**

Practices in other electricity markets (covered in the following section) suggest that introducing a time lag dilutes the strategic content of offer information. Among markets that make offer information available, this lag range from one day to six months.

### 6.2.1 Analysis of 2007 Energy Offers

To have a sense of the variability of energy offers, we examined energy offer data from 2007. We accumulated offered quantities falling into price bands and compared them for two of each peak, shoulder and off-peak periods (periods: 9, 10, 21, 22, 44 and 45 totaling six periods) of every Wednesday in 2007. We further looked at the data separately in two six-month blocks.

#### 6.2.1.1 January – June 2007

Visually, the offer curves for all six periods in Jan-Jun 2007 appeared very similar.

#### 6.2.1.2 July – December 2007

Visually, the offer curves for all six periods over Jul-Dec 2007 appeared very similar.

#### 6.2.1.3 Full Year 2007

Admittedly, our visual inspection of offer curves cannot be considered scientific. However, it does lead us to believe that generation offers did not appear to vary significantly over six or twelve months. Consequently, we consider that information with up to a 12-month lag would still have strategic value. Given the current level of market concentration, publishing fully aggregated offers can provide useful information to aid collusive behavior. Bigger players can gain more information on offers of other players than smaller players by subtracting their own offers from the aggregated stack.

### 6.2.2 Impact of Structural Changes on Offer Patterns between 2003 and 2007

Between 2003 and 2007, there were three significant changes to the industry that could have an impact on offer patterns. First, the vesting contract (VC) regime was implemented on Jan 2004 covering, on average, 65% of load. Second, additional capacity was added with Keppel Merlimau Cogen beginning commercial operation in April 2007. Third, VC coverage was reduced from 65% to 55% of load in July 2007. It is therefore appropriate to compare offer curves from 2003 with those from 2007 to see if such structural changes have altered offer patterns.

We observed through visual inspection that offer patterns in 2003 were not materially different from that of 2007. There were some observable differences in offer levels that can be explained as follows:

1. Difference in the general level of offers reflected the increase in demand between 2003 and 2007;
2. More capacity was offered in Q1 2003 when the market started. Offer levels quickly “normalized” from Q2 2003 onwards.

From Q2 2003 onwards, we observed that offer patterns were visibly similar to those of 2007. This is despite the fact that significant time has lapsed and that the vesting contract regime was introduced in 2004 and more generation capacity was added in April 2007 (Keppel Merlimau Cogen).

### 6.2.3 Conclusion

In addition to the observation that offer patterns have remained relatively static between 2003 and 2007, we consider that the strategic value of delayed and/or aggregated offer information would not diminish much because:

1. Singapore’s load pattern is stable and predictable
2. Common underlying cost-driver for generation is oil price (since over 90% of generation is oil or gas-fired and gas prices are closely linked to oil prices.)
3. There are three dominant suppliers

In other electricity markets, diversified fuel sources and volatile load makes the strategic content of offer information decay more over time.

## **7. International Practice**

Internationally, electricity markets in the US, Australia and New Zealand generally adopt the practice of publishing generation offers and dispatch quantities. In these markets, market power has been a major consideration in deciding whether and how to publish generation offer. We note that in the markets that publish such information, there are often many sellers, which dilutes the potential of tacit collusion.



Energy  
Market  
Company

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The following is a table of comparison reproduced from CRA International's report<sup>11</sup>.

Degree of obfuscation	Posting Time Lag						
	At market Close	1-Day Lag	2-Day Lag	2-Week Lag	30-Day Lag	90-Day Lag	180-Day Lag
Unit-specific offers with IDs		Australia Columbia		New Zealand			
Aggregated by portfolio/zones, with IDs					ERCOT		
Price-setting offers only, with IDs			ERCOT				
Masked unit-specific offers (pseudo-IDs)						ISO-NE (proposed)	CAISO, ISO-NE, NYISO, MISO, PJM
Aggregated by zone or system	AESO		ERCOT			Nord Pool	PJM

## 7.1 Observations from International Comparison

From Singapore's perspective, the following are key take-aways from CRA International's survey of deregulated and centrally-dispatched electricity markets on data release practices:

1. Singapore is on the conservative end of the spectrum
2. Most markets that publish offer/dispatch information typically have significantly lower levels of supply-side concentration
3. Some of these more liberal markets have short-term demand side response (eg. demand bidding)
4. In general, publication policy tend to be inherited and has undergone little or no change
5. Publication policy tend not to be concluded from rigorous analysis
6. There is no empirical evidence that publication policy has enhanced market performance in terms of economic efficiency

<sup>11</sup> "Analysis of Data Release Practices in Centrally-Dispatched Electricity Markets," CRA International's Report to PJM Interconnection in July 2007.



## 8. Consultation

Two consultation notices on this subject were published on 26 December 2006 and 1 August 2007 respectively. The full submissions made by stakeholders are appended in Annex 2 of this report. The following are two summary tables containing pertinent points submitted and EMC's responses to them.

**Summary Table 1: Specific Benefits Sought**

From	Benefit Sought	EMC Response
Senoko Power	<p><b>Lower cost of risk management:</b></p> <ul style="list-style-type: none"> <li>- For Generators through being able to better understand the "prime movers" of the market.</li> <li>- For Retailers, result in cost savings.</li> <li>- For customers through being able to evaluate among retail products how to minimize price fluctuation risk.</li> </ul>	<p>Agree. But from the view of the market and when applied to disclosure of offer information, the risk is that generators would deviate from offering based on marginal cost.</p> <p>It is unclear how offer and dispatch information would lead to this.</p> <p>It is unclear how offer and dispatch information would lead to this.</p>
	<p><b>Improve efficient competition</b> through helping potential entrants assess market entry.</p>	<p>It is unclear how offer and dispatch information would lead to this. In principle, the more relevant information is market prices, which are already published.</p>
	<p><b>Enhance efficient auctioning process</b> when all participants are able to assess what moves the market. Doing so also serves as a check on market compliance as market behaviour is now subject to public scrutiny.</p>	<p>EMC differs on this point. Given only a few suppliers, the current auction model incentivises them to offer at marginal cost, which is most economically efficient. Publishing competing bids</p>



		removes that incentive because suppliers, in an attempt to maximize profits, can price their offers in reaction to prices offered in competing bids.
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**Summary Table 2: Risks and Mitigating Factors**

<b>From</b>	<b>Risks / Risk Mitigating Factors</b>	<b>EMC Response</b>
<b>PowerSeraya</b>	Large number of market participants in Australia makes market concentration and collusion less of a concern. In Singapore, there are only 6 active generators to date. Anti-competitive behavior is a concern.	EMC agrees to the extent that the incentive for generators to bid at marginal could be compromised.
	Delayed publication does not help because the collusive value of such information does not decline over time.	Given predictable and fixed demand, if the underlying cost structure of suppliers is stable, EMC agrees that time lag would not dilute the strategic content of offer information.
<b>Senoko Power</b>	Given a high reserve capacity, the extent and duration of price upswing is limited.	This is a matter of tolerance.
	In practice, generators are able to estimate the industry supply curve without detailed market data. Even so, there has been no evidence that generators have succeeded in manipulating and profiteering from the market with such knowledge.	Given the high level of concentration in generation, we should remain vigilant and refrain from instituting facilitating factor for collusion.

## 9. Conclusion

In summary, potential supply side benefits of publishing generation facility-level offer information are creditable and support this proposal. They include:

1. Lowering risk management cost;
2. Facilitating entry decisions of potential participants (although published prices seemed to be enough); and
3. Facilitating market monitoring and surveillance.

Conversely, our analysis also suggests that publishing generation facility-level offer information can be potentially detrimental to economic efficiency through:

1. Removing the mechanism that incentivizes generators to make marginal cost-based offers;
2. Enabling collusive bidding behavior that could be sustainable; and
3. Effectively creating a scenario of asymmetric information favouring suppliers due to the lack of short-term demand side response.

Given the SWEM's high level of market concentration, we consider that, on balance, the risks associated with implementing this proposal are more well-established and pertinent compared to the potential benefits sought. We are therefore unable to recommend that generation facility-level offer/dispatch information be published now. We also consider that aggregation and delay do not remove the strategic content in offer information and therefore do not recommend publishing aggregated/delayed offer information. We suggest that the subject be reviewed when the market achieves a good level of balance between supply-side concentration and demand-side participation.

## 10 Decision by RCP

At its 40<sup>th</sup> RCP Meeting on 4 November 2008, the RCP by majority did not support this proposal.

The Panel also agreed that this decision should be reviewed when the level of market concentration has lowered. It decided to monitor the vesting contract level as a gauge of market concentration. The Panel agreed to review this proposal when the EMA next lowers the vesting contract level. The Panel requested EMC to include the vesting contract level in the RCP's monitoring list for this purpose.

**ANNEX 1: HHI CALCULATION FOR GENERATION IN THE SWEM**

	<b>Total Registered Capacity as at 1 Sep 2007 (MW)</b>	<b>Market Share</b>	<b>Square of Market Share</b>
<b>Senoko Power</b>	3,300	31.8%	1011.9
<b>PowerSeraya</b>	2908	28.0%	785.8
<b>Tuas Power</b>	2,640	25.4%	647.6
<b>SembCorp Cogen</b>	785	7.6%	57.3
<b>Keppel Merlimau Cogen</b>	490	4.7%	22.3
<b>National Environment Agency</b>	251	2.4%	5.9
<b>Total</b>	10,374		<b>2530.7</b>

<= HHI

## ANNEX 2: CONSULTATION SUBMISSIONS

A consultation notice on this subject was published by EMC on 26 December 2006. The following comments were received:

From **Power Seraya:**

Publishing

Offer

PowerSeraya Ltd noted EMC's suggestion to publish historical offer information to act as a surveillance tool for the market to collectively monitor behaviour and to dispel the notion of market power or the abuse of market power. PowerSeraya is of the view that a balance between attaining transparency in the market and releasing market sensitive information into the market must be maintained at all times.

In the other markets, different approaches are adopted for the disclosure of participant offers. In PJM, offers are published 6 months in arrears, whereas for other markets such as the Philippines and the original Power Pool of the UK, offer data are not published at all. In Singapore, there are only 5 competing generation companies in the market, each of which own typically one power station albeit with a mix of CCP (Gas), Steam (HSFO) and Steam (Orimulsion) units. Of the 5 companies trading in the market, there are only 3 companies that would be called "market makers". For large markets like PJM with 400+ participants and 100+ generation sources, disclosure of offer data can be seen as to aid transparency. However, in a small market like Singapore, PowerSeraya believe that it could trigger an adverse effect that could lead to opportunities for the 3 market makers to game the market.

PowerSeraya also have concerns that the disclosure of offers could result in exposing commercially sensitive information to the world at large and we are keen to avoid the risk as much as possible. As such, PowerSeraya do not support the publishing of offers.

Dispatch Data

For the publishing of dispatch information, PowerSeraya see no benefit in the publication of individual generation unit dispatch. Plant is dispatched by the PSO in accordance with market produced schedules and this dispatch is subjected to the scrutiny of the market surveillance structure. In addition, the EMC published reports has already disclosed the type of power dispatched and how much was dispatched but this is presently provided in group according to plant type only. The benefit of disclosure of dispatch data to a more detailed level does not provide any tangible benefits to the marker as a whole. Furthermore, for other markets like NEMMCO and PJM, dispatch information are not published. As such, PowerSeraya do not support the publishing of dispatch data as it may contain confidential information that are commercially sensitive.”

A second consultation notice on this subject was published by EMC on 1 August 2007. The following comments were received:

From **Power Seraya**:

We are pleased to provide our comments as follows:

Currently EMA does not provide public access to historical bid offer and dispatch information for individual generation company. One frequently stated rationale for publication is to allow interested parties, including current and future market participants, to gain a better understanding of how the energy market operates. It will be easier to monitor the trading behaviour for these relevant stakeholders. While many other established markets might already have adopted such a feature, PowerSeraya questions the maturity of the current market conditions in the National Electricity Market of Singapore (“NEMS”) to embrace this feature.

(a) Comparison of Market Conditions Between National Electricity Market Of Singapore (“NEMS”) And In Other Developed Markets In The World

The National Electricity Market Management Company Limited (“NEMMCO”) provides a range of market data in delimited flat file format for market participants to access. Publication of historical offer and dispatch data has only a one-day delay in publication. Currently the Australian National Electricity Market (“NEM”) has 59 market participants inclusive of scheduled and non-scheduled generators\*. In the light of such large number of market participants, concerns surrounding market concentration and collusion become uncalled for.

The large number of participants in the Australia NEM is in sharp contrast to Singapore. With only 6 active generators to date in NEMS, individually reported historical information could easily be associated with respective entities, even if the generator’s identity is not disclosed. Confidential pricing strategies could also be revealed, and potentially leads to anticompetitive behaviour in the market since the outcome of participants’ actions depends on the behaviour of other participants and not simply their own decisions. Therefore, participants with knowledge of others’ offer strategies will have an interest in altering their own behaviour in response to other participants’ behaviour, or make an attempt to influence the behaviour of other participants.

\*New Zealand Electricity Commission: Consultation paper on publication of reserve offers, 30 Nov 2006,

(b) Rate of Change for Information Released

Given that the information with regards to fuel purchase prices and plant operating costs could have little changes over time in Singapore, greater competitive harm might occur with the release of historical offers and dispatch data which becomes sensitive information, even with long time delay i.e. 2 months. Since collusive value of such information do not decline over time, risks of collusion outweigh the efficiency gains of disclosing information beyond market prices and total quantities.

### Evaluating The Extent Of Benefits Brought To The Market

The above illustrations indicate how publication of certain information, for example identities and bid prices, can give rise to behaviour that undermines the efficiency of auctions. In our view, the EMC should consider publication of other more relevant data e.g. which provides more applicable information to the 1.2 million consumers in the market, instead of releasing extraneous information which could potentially lead to anticompetitive behaviour in the market and benefits only the few current or potential market participants. Such information published for the consumers' knowledge should also effect better demand-side management and improved market efficiency.

In view of the above, we do not support the proposal for the publication of historical offer and dispatch information, given that the case for collusion is highly possible in Singapore's current market conditions. It is our hope that EMC will approach with caution on this subject.

From **Senoko Power**:

#### **PUBLISHING OFFER AND DISPATCH INFORMATION**

Thank you for inviting us to provide our comments to your paper, Publishing Offer and Dispatch Information. Senoko Power is a keen advocate of market transparency and this rule change is of great interest to us for that reason.

EMC's proposal is a positive step and in our opinion, one in the right direction. Freedom of market information, in our opinion, is essential for the operation of an efficient market. As a market participant, transparent pricing information is also key to better risk management.

#### **Concerns of transparent price information**

##### **Facilitate abuse of market power.**

Some have argued that, with greater availability of market information, market profiles can be constructed to enable market participants (especially large generators) to more accurately influence market movements by timely withdrawal and injection of capacity.

We disagree with this view on two counts. Firstly, we do not believe that any single generator has the market power to influence and profit from manipulating the market. Since withdrawn capacity earns no income, one questions if generators would deliberately place themselves in the position where they are both exposed to the wholesale market as well as not earning any income. Singapore is in the enviable position of having high reserve capacity, which could be called in to replace withdrawn capacity, limiting the extent and duration of price upswing. The Singapore electricity market is also closely watched for potential market abuse.

Secondly, in practice, generators, particularly those with knowledge of and experience in the market, are able to estimate to a high degree the industry supply curve without detailed market data. To date, there has been no evidence that generators have succeeded in manipulating and profiteering from the market with such knowledge. In this case, disclosure is unlikely to make a great deal of difference in respect of the unilateral exercise of market power.

**Facilitate collusion between market participants.**

Market collusion could conceivably be facilitated as bidding patterns could be used to send market signals to other market participants.

In Senoko's view, any market participant with intent to collude will not likely be deterred by the lack of market information; conversely, it can be argued that the availability of market information is not likely to be the key catalyst for market collusion, if at all. Instead, Senoko believes that greater market transparency would allow market watchers to observe if there is any hint of market collusion.

**Benefits of disclosure**

There are several potential benefits from publicly disclosing information on offer and dispatch bids. These include lower costs of risk management, increased market transparency and the facilitation of entry decisions by new generators. These benefits would be expected to improve the operation and efficiency of a wholesale electricity market.

**Lower cost of risk management.**

The variability of prices in a wholesale electricity pool creates substantial risk for generators. While there are contractual means to manage this risk (e.g. contracts for differences), risk management itself increases the costs to the generator for doing business. The greater the ability of generators to understand the prime movers of the market, the better they can understand the risks involved and thus can better manage them.

The ability to better analyse risk also benefits retailers and customers. Customers will be in a better position to evaluate, among various retail products, how they would be able to minimise price fluctuation risks. With respect to retailers, improved risk management should lower the total costs of the retail business.

Electricity is a highly capital intensive industry and participants need appropriate information flows to enable them to understand what makes the market.

**Improve efficient competition.**

Efficient competition requires transparent price information available to all parties. This will not only aid current participants but also help potential entrants assess their entry into the market.

**Enhance efficient auctioning process.**

An efficient auction market is only possible when all participants are able to assess what moves the market. Publishing offer and dispatch data is thus essential. Doing so also serves as a check on market compliance as market behaviour is now subject to public scrutiny.

### **Examples from other markets**

Examples from other markets show that transparency is a key objective.

Australia's NEM, Texas' PUCT and the UK's BETTA chose, to various extents, to have greater market transparency despite some concerns. This both opens up participants' behaviour to public scrutiny, and enables market participants themselves to monitor the market for abnormal behaviour.

A summary of information policies adopted by other markets is attached as an appendix.

### **Recommendation**

Transparent price information enhances competitiveness and efficient market operation. Transparent price information enables market participants to manage market risks with more insight, while market surveillance is enhanced by market behaviour being subjected to greater scrutiny.

We recommend that the following information be made available:-

- a) Bid offers for energy, reserves and regulations for individual units (period by period).
- b) Dispatch offers for energy, reserves and regulations for individual units (period by period).
- c) Publish bid offers and dispatch details on a D+1 basis.
- d) Targeted audiences for full disclosure are the market participants and summary for non-market participants.

We hope that our comments will be helpful to the discussion of this topic.

### **APPENDIX**

#### **Other Markets**

##### **Australia**

The Australian National Electricity Market (NEM) is one of the few markets that follow a policy of full disclosure of market information. The National Electricity Market Management Company (NEMMCO) makes all data on bids and unit-level dispatch available on its website the following day. Data is posted by the name of the market participant. This policy was approved by the Australian Competition and Consumer Commission (ACCC) in its decision to authorize the National Electricity Code. In its decision, the ACCC outlined the balancing of objectives that was required: in particular, the ACCC had to assess whether the benefits of system security and efficiency from disclosing the

information outweigh the potential anti-competitive effects. Ultimately, while the ACCC remained concerned about the potential for anti-competitive effects, it authorized the disclosure of price and quantity data on the basis of the importance of information to the efficient operation of the market. However, the ACCC strongly urged market participants to use this information to take an active role in monitoring the market, and to raise any concerns.

### **Texas, US**

In Texas, the Public Utility Commission of Texas (PUCT) is responsible for regulation of the spot electricity market run by the Electric Reliability Council of Texas (ERCOT). As part of a strategy to deal with “hockey stick pricing” – which involves offering a small quantity of energy at a price well in excess of its marginal cost – PUCT has adopted a sunshine policy.

The expectation behind the policy is that the threat of public identification would deter unwarranted bids by generators averse to bad publicity. PUCT’s sunshine policy involves publicly disclosing the names of suppliers who have submitted high-price offers when the market clearing price spikes. Automatic disclosure is triggered whenever the market clearing price reaches \$900 or higher during an operating interval, and applies to any generator that offered a bid in excess of \$900. There is also discretionary disclosure under which PUCT has authority to disclose the names of generators who bid under \$900. An earlier sunshine policy has already had some success in ERCOT. In July 2002, PUCT began identifying all balancing energy suppliers who submitted offers priced above \$300, and posting their names on the internet. Once this policy began, the number of auction participants offering balancing energy above \$300 dropped by two-thirds.

### **United Kingdom**

Since reforms to the wholesale electricity market in 2001, wholesale electricity trading in Britain is no longer concentrated in a single wholesale electricity pool. The British Electricity Trading and Transmission Arrangements (BETTA) specify the systems and methods of sale, purchase and transmission of wholesale electricity. A principle of BETTA is that electricity should be traded bilaterally between willing buyers and sellers under negotiated prices, and traded over-the-counter and on power exchanges. There remains a wholesale electricity pool, but this is only to deal with imbalances between the quantities produced and consumed by each party and the quantities covered by bilateral contracts. The balancing mechanism allows electricity companies and traders to submit offers to sell electricity and bids to buy electricity from the system. The National Grid Company (NGC) accepts offers and bids as necessary to balance the system, and seeks to do so at least cost. Under the balancing mechanism of BETTA, certain information is made publicly available. This includes information on bids or offers made, bids or offers accepted and trading charges for each trading party or transmission company. This information is released daily.

**From Island Power:**



30 August 2007

Our Ref: C1.3.3-5158

Market Administration  
Energy Market Company  
9 Raffles Place  
#22-01 Republic Plaza  
Singapore 048619  
Email: [rulechangerequest@emcsg.com](mailto:rulechangerequest@emcsg.com)

**RE: 2<sup>nd</sup> Consultation Notice: Publishing Offer and Dispatch Information**

We refer to the above Consultation Notice which considers whether offer and dispatch information pertaining to individual Market Participants should be made publicly available. Island Power Company Pte. Ltd. ("Island Power") welcomes the opportunity to provide comments on this issue.

The Consultation Notice contains a brief summary of the arguments for and against publishing historical offer information. The principal reason to publish is that transparency of the market will be improved and therefore the market will become more efficient and effective. The principal reason to not publish is that commercially sensitive data could be published plus it could aid anti competitive behavior. We note international practice is to publish offers with a publication delay varying from one day to 6 months.

Island Power believes this is a question of striking the right balance between transparency and an effective competitive bidding process. The NEMS provides less information to market participants and the public than other markets. For example, the New Zealand Electricity Market, which NEMS is virtually identical to, publishes the following additional information:

- Supply offer curves for both energy and reserves, issued day-ahead and updated half-hourly up to real time.
- Final bids and offers with participants identified, issued 2 weeks after the trading date.
- Half hourly actual generation/dispatch by generation plant, issued shortly after real time.

Energy Market Company

Our Ref: Cl.3.3-5158

30 August 2007

We recommend publishing the following. This will provide a balanced outcome between transparency and competitive markets.

Information	Publication Delay	Publication Audience
Actual generation, by power station, by half-hour	2 day delay	Public
Final offers without generator identity	2 day delay	Market Participants

The rationale for making dispatch information publicly available is that generation is an outcome from the market and is of sufficient public interest to warrant disclosure. A delay of two days provides a window to avoid potential anti-competitive behaviour.

We support publishing final offers without generator identity to Market Participants. A delay of two days combined with not publishing the generator identify provides a margin against anti-competitive behaviour.

If further supporting information is required we suggest requesting copies of the analysis completed in the New Zealand Electricity Market. Very detailed analysis was conducted by the Market Administrator M-Co.

We recommend the market proceed immediately with Rule Changes to implement these changes. If you have any questions on this submission please do not hesitate to contact Wayne Crean on 6331 0202.

Yours sincerely



Wayne Crean  
**Director of Marketing and Trading**  
**Island Power Company Pte. Ltd.**