Country Spotlight

The Philippine WESM

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The Start of the WESM

The Electric Power Industry Reform Act (EPIRA) took effect 26 June 2001 and provided for the formation of the Wholesale Electricity Spot Market (WESM) and the privatisation of National Power Corporation (NPC) assets. The WESM, which launched on the fifth anniversary of the EPIRA, has operated for over five years, long enough to support meaningful analysis of its performance and evolution to date.[1] In December 2010, the WESM expanded to include the Visayas region. Mindanao is currently not part of the WESM. Options for a future market for Mindanao, perhaps as part of the WESM but possibly of a localized design, are slated for development and consideration.

Successful Privatization

After a slow start[2], the overall EPIRA-driven privatization program is nearing completion, successfully having attracted a mix of domestic and international investors and providing a tangible indication of confidence in the WESM. Dispatch rights covering over 70% of the Republic's power generation assets have been privatized (through outright generation asset sales or through formation and sale of rights to be an Independent Power Purchase Administrator – IPPA), making the Philippine privatization process one of the most comprehensive and transformative in Asia.[3] Summaries of the sales of assets and IPPA rights to date are set out in Table 1 and Table 2.[4]

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1 The WESM commenced on Luzon on 26 June 2006.

2 Criticisms were initially directed at the pace of privatization and the resulting lingering concentration of ownership in PSALM/NGC (leading to alleged abuse of market power). In the past three years, however, privatization and new development have increased greatly the diversity of industry ownership.

3 Exceeding the NEM in Australia and the New Zealand power sector, two of the most advanced competitive power markets in Asia. Singapore has privatized the greatest proportion of its generation assets, but has not yet privatized its transmission and distribution business. Most transmission and distribution in the Philippines is under private sector control or ownership.

4 Note that the IPPA transaction of the Benguet Mini Hydros has yet to be concluded pending acceptance of the condition for assignment set by the IPP operator.

Table 1: Privatised Generation Assets (Asset Sales)

Power Plant	Rated Capacity (MW)	Winning Bidder	Winning Price (US$ million)	US$ M/MW
Pantabangan-Masiway	112.0	First Gen Hydropower	129.0	1.15
Magat Hydroelectric	360.0	SN Aboitiz Power	530.0	1.47
Masinloc Coal-Fired	600.0	Masinloc Power Partners Co. Ltd.	930.0	1.55
Ambuklao-Binga	175.0	SN Aboitiz Power	325.0	1.86
Tiwi-MakBan Geothermal	747.5	AP Renewables.	446.9	0.60
Bantangas (Calaca)	600.0	DMCI Holdings,.	361.7	0.60
Palinpinon-Tongonan	305.0	Green Core Geothermal	220.0	0.72
Angat Hydro Electric	218.0	Korea Water Resources Development	440.9	2.02
Total	4,320.3		3,467.5	

Source: Department of Energy

Table 2: Privatized Control and Dispatch Rights (through IPPA arrangements)

Power Plant	Contracted Capacity (MW)	Winning Bidder	Winning Price (USD MM)	USD MM/MW
Pagbilao Coal Fired	700	Therma Luzon Inc.	691	0.98
Sual Coal Fired	1,000	San Miguel Corporation	1,107	1.11
San Roque Hydro	345	San Miguel Corporation	450	1.30
Bakun-Benguet Hydros	100.75	Amlan Power Holdings	145	1.43
Illijan Combined Cycle	1,200	San Miguel Corporation	870	0.73
Total	3,345		3,263	

Source: Department of Energy

A number of stakeholders now have active positions in the WESM. Major positions are held (or were sought) by entities controlled by the Aboitiz Group, San Miguel Corporation and the Lopez Group. Other domestic firms also have entered the WESM, including DMCI (Calaca). Significant international investors include AES Corporation (Masinloc), Korea Water (Angat[5]), InterGen and EGCO (Quezon), and Sithe Global and Denham Capital (GN Power). To protect competition, the Energy Regulatory Commission (ERC) establishes market share limitations for each region and for the Philippines overall. The market share limit for Luzon is currently 30%, and is 25% for the Philippines overall. Entry into the WESM is open to any investor.

The IPPA Structure

The IPPA structure is a prominent feature of the WESM, having been created to support the privatization of dispatch rights covering the Sual, Pagbilao, San Roque, Bakun, Benquet and Ilijan power stations. Each IPPA is a virtual power asset in the WESM. A simplified version of the IPPA structure adopted for the Sual and Pagbilao power stations is depicted in Figure 1. From the perspective of the WESM, the IPPA *is* the power station. The IPPA has the responsibility of bidding the power station into the WESM. In some instances, such as for Sual and Pagbilao, fuel procurement activities are also passed to the IPPA. Meanwhile, the actual physical power station remains owned by its investors and remains covered by its corresponding power purchase agreement (PPA). The Power Sector Assets and Liabilities Management Corporation (PSALM), a government entity, is the entity that covers the obligations to meet the payment terms and conditions of the PPA.

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5 The transfer of Angat Hydroelectric Power Plant to K-Water remains pending due to a "Status Quo Ante order" issued by the Supreme Court. Issues remain to be resolved regarding the nature of "ownership" of the dam versus the ability to determine the dispatch of the hydro-facility for the purpose of generating electricity. See: "Korea's state-run water utility firm keen on 218-MW Angat hydropower plant" By Ted P. Torres (The Philippine Star) September 04, 2011 12:00 AM.

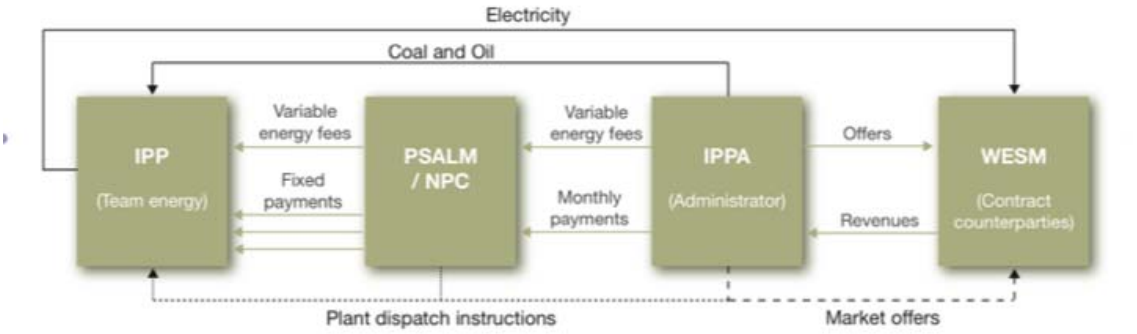

Figure 1: Schematic of the IPPA Arrangements for Sual and Pagbilao

The IPPA issues dispatch instructions and is paid the WESM-related revenues from the dispatch of the virtual power station. In exchange, the IPPA pays PSALM for the right to earn this revenue stream. Separately, PSALM pays the original PPA owner under the terms of the original PPA. If the IPPA rights are worth less than the cost of the PPA, then PSALM pays that and recovers the additional necessary revenue through a surcharge on electricity bills that must be approved by the ERC, the independent, economic regulator.[6] Considerable attention has been paid to promoting bidder interest in the IPPA arrangements, using clear legal and commercial structures and making the IPPA arrangements compatible with the WESM design and operation. Prior to tendering, the value of each IPPA arrangement is evaluated using a WESM dispatch and investment projection model constituted with the latest available technical, fuel and macro-economic data.

Though initially the structure might appear complex, it is nothing more than two interlocking "wheels". One wheel spins between the IPPA and PSALM, covering the payments and obligations established for the virtual power station that participates in the WESM. The second wheel spins between PSALM and the PPA owner, covering the obligations that are enshrined in the PPA or other associated contracts (Energy Conversion Agreements, for example) and relate to the physical power station and its financial costs. Any mismatch between the two spinning "wheels"—money flows resulting in either a deficit or surplus to PSALM—is covered by charges to consumers, as approved by the ERC. The IPPA structure

[6] One of the reasons for introducing a competitive electricity market in the first place is to reduce the risk that the cost of poor investment choices will be passed through to consumers in the future. Unlike investors who were awarded PPAs, and thereby were reasonably assured to recover the cost of their investments, investors who build capacity in the WESM must take the risk that their investments will earn less money than expected.

is consistent with mechanisms used in other markets to facilitate a transition to a competitive industry structure while honoring pre-existing commercial contracts. A society that respects the rule of law and the sanctity of contracts ultimately must deal fairly and comprehensively with contract or asset-related stranded costs (or benefits) when introducing significant changes to an industry's commercial or regulatory framework.

Additionally, if pre-existing commercial arrangements are not well documented or structured—and if legacy operational practices are relatively informal—it can take more time to implement a comprehensive industry restructuring and privatization process. For example, the support teams involved in the IPPA sales process faced a range of issues associated with each underlying power station asset and its associated legal and commercial agreements. Relevant documentation has had to be located; a variety of legal rights have needed to be confirmed or clarified; operating practices and applicable legal, physical or policy constraints were identified, confirmed or queried; and the physical attributes and capabilities of power station assets have needed to be reflected accurately in the IPPA arrangements. These activities can be thought of as helping to establish a baseline "hygiene" level for the WESM. And as evidenced by the challenges to the sale of the Angat hydro-electric assets and the sale of the IPPA for Benguet, these issues are often exceedingly complex. Sorting out commercial hygiene takes time and does not necessarily produce short-term benefits, but it is essential to the long-term robustness of a market like the WESM.

Where the WESM is Today

With the rapidly increasing complexity of forces affecting the global power generation industry, ranging from sustainability concerns, economic development needs and new generation technology options; to information technology capabilities and evolving consumer preferences and sophistication, it is difficult to imagine a developed society without the support of a dynamic and responsive energy sector.

It is important, therefore, that the WESM has achieved so much to date. Through software glitches, typhoons, network outages, fuel supply disruptions and extreme hot/dry weather, the WESM has proven robust.[7] The high degree of privatization and the recent expansion of the

[7] As detailed by various presentations over the years by the PEMC.

WESM into the Visayas signal that the Philippines is staying the course and remains committed to WESM development. Similarly, consistency of direction and an increasing focus on fine tuning the WESM rather than introducing major potential changes signal stability. Principled, consistent market development supports investor interest (and thus competition in and for) investment.

Continued Development and Evolution

Notwithstanding the WESM's many accomplishments, much still needs to be done:

1. **Ancillary Services Market.** One of the key original design features of the WESM, the competitive provision and compensation of ancillary services, still needs to be implemented. Originally discussed over five years ago, the arrangements finally have been approved pending readiness of the system operator to implement them. The intended ancillary services market arrangements have the potential to create or enhance incentives to use available capacity more efficiently, while also attracting investment in more flexible generation capacity and effective demand response over time. In past years, the WESM has been, at times, constrained by the relative inflexibility of existing generation supply—even to the point of venting steam and foregoing low-cost geothermal generation to manage system performance.

   Yet, often this inflexibility related less to the intrinsic capabilities of the existing physical generation assets than to commercial arrangements that either failed to maximize access to the physical capabilities of the installed generation assets (e.g., Sual) or over-committed otherwise flexible generation capacity (e.g., the three gas-fired CCGT plant that use gas under take-or-pay contracts from the Malampaya gas field). In 2010, the Ilijan IPPA agreement was designed to enhance the availability of flexible power generation to the WESM by reducing the gas take-or-pay burden somewhat for the IPPA.[8] With this change in place, timely introduction of the agreed-in-principle ancillary services market would help the WESM capture the value of this new flexibility while better incentivizing future developments.

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[8] The take-or-pay gas supply contracts from Malampaya, for example, reduced flexibility in the WESM by forcing more flexible gas-fired CCGT capacity to run as baseload units shifting the burden of providing flexible response to coal-fired, geothermal and periodically highly constrained hydro resources. With the formation of the Ilijan IPPA in 2010 a portion of this gas take-or-pay burden has been alleviated—absorbed by PSALM—significantly increasing the amount of lower cost flexible generation in the WESM and enhancing the value of the Ilijan IPPA during the privatization process.

2. **Governance**. WESM governance structures and processes and regulatory capacity, in general, can be enhanced to speed up the normal process of market analysis and evolution and to promote and sustain stakeholder confidence.[9] The paucity of rule changes relative to experience in other markets after similar periods of operation, and the fact that some outstanding issues, such as those related to the "Must Offer" rule and the use of Pmin, date back to the commencement of the WESM, imply processes or capabilities that have not been sufficiently resourced. Also, plans for the establishment of a formal Independent Market Operator (IMO) remain to be implemented.

   Another area where improvement is needed is to clarify and speed up the process of compensating "must run" units. A significant concern during the effort to create an IPPA arrangement for the Malaya power station was the fact that the plant operated substantially on a "must-run" basis, yet it was not clear the extent to which it would be fully compensated for doing so. Is it wise to delay compensation for units that play such important functions in the market?

3. **Financial resources.** Related to the governance-related issues noted above, the prevailing impression after five years of successful WESM operation is that good ideas abound but take a long time to be implemented. Regulatory decisions are generally well documented, but a simple inspection of the ERC website quickly reveals that the open regulatory workload is substantial, raising concerns about timeliness. Therefore, it seems fair to ask: do the market institutions (regulatory, operations and policy) have the financial and other resources they require to perform their roles most effectively? A more detailed comparison of funding for regulatory and market operations activities in the WESM relative to counterparts in other countries seems warranted in order to promote and sustain balance across the regulatory, operational and commercial stakeholders in the WESM.

4. **Market Information.** Collection, management, consistent usage and dissemination of information relevant to market performance remain uneven, but are generally improving. As yet, no annual "statement of opportunities" exists to guide investor interest in (and inform policymaker judgment of) the market, though this is intended for eventual development.[10]

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[9] A list of apparently still-open market surveillance related investigations from 2008 and 2009 when trading teams of the Power Sector Assets and Liabilities Management Corporation (PSALM) managed the majority of capacity offered into the WESM, together with a lack of clear reports as to findings, analysis and justifications, is problematic.

[10] As has been adopted successfully in Australia, New Zealand and Singapore as a vehicle for presenting views of how various economic development scenarios could affect the need for electricity industry infrastructure.

Also, the WESM does not appear, even after five years, to have established a body of market analysis, studies, consultations, working group reports, or other consultancy studies similar to what one can find when one examines the relevant websites of regulatory, market or policy stakeholders in countries with similarly sophisticated electricity markets.[11] A robust market needs support from principled, well-funded market institutions that have the ability periodically, through insightful analysis, to educate and inform stakeholders regarding market operation and performance. Those institutions must also be able to respond to evolutionary needs, stakeholder concerns and comments, disputes and disruptions in a timely manner—again, all so as to promote and sustain market confidence.

5. **Funding Sources.** One issue, probably unique to the Philippines amongst modern electricity markets in the Asia Pacific region, is the role of international funding agencies. Among other things it is difficult, if not impossible, to access the full range of studies or analyses that have been undertaken of the WESM. Relevant reports can be difficult to locate or they may be effectively disconnected from an overarching market evolution plan or process—having not necessarily been subjected to a structured market participant consultative process. The scope for improved collation of information and collaboration and cooperation across agencies and key WESM governance and operational stakeholders to design and implement a structured market development and evolution program would seem to be high. Of course, it can also be asked, why, after five years of successful operation, are international funding agencies *still* involved in the WESM at all? Considering the sophistication of an electricity market like the WESM and the relatively modest associated further costs of market evolution compared to the total amount of value at stake, it should be a concern that, five years after WESM commencement, market stakeholders do not have greater responsibility for funding the WESM's further evolution.

Yes, things happen slowly in the WESM, but they are happening. Faster evolution would be welcomed, and should be seriously pursued, but not at the expense of quality. As the wise adage goes when it comes to "cheap", "fast" or "good" you can only have two. More importantly, continued WESM development needs sufficient resources, which ultimately should come from WESM stakeholders.

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[11] The lack of coherence, and comprehensiveness, is particularly evident in the website of the DOE, as the ERC and PEMC websites seem to have increased steadily in comprehensiveness.

Future Investment in the WESM

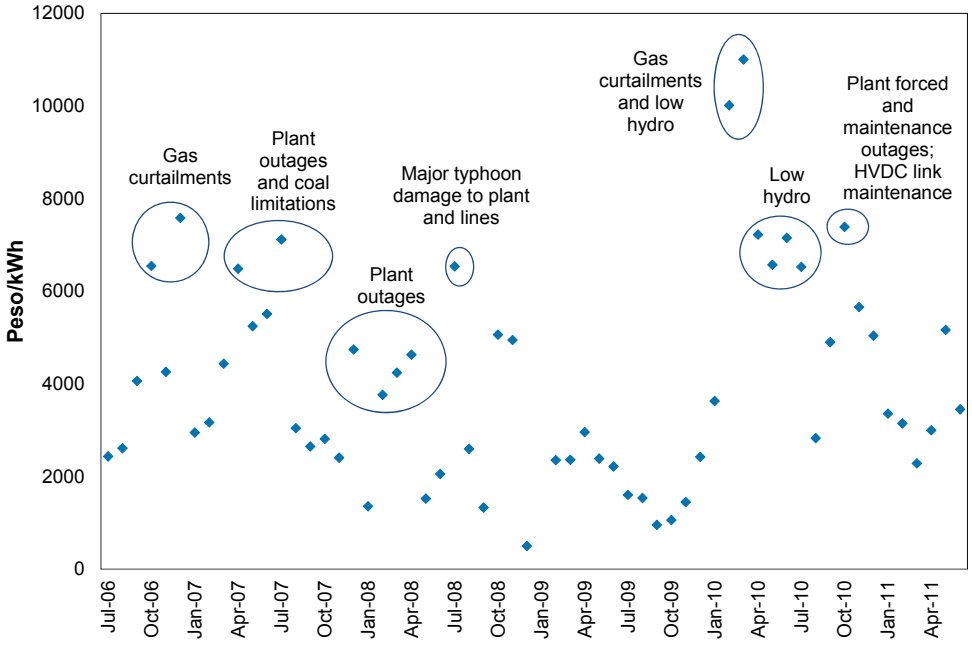
Looking ahead, the WESM will need to support timely investment of the right type and in the right place. To date, capacity additions in the WESM have been supported by long-term contracts that predate the WESM or involve improvement or enhancement to existing assets. The great ship WESM will soon be reaching some uncharted waters.

A range of different types of capacity will be needed in the WESM. New baseload capacity, possibly large (400-600 MW) coal-fired plants, will be needed to support long-term demand growth. More flexible capacity, probably in the form of traditional peaking units, reciprocating engines or enhanced storage hydro, will be needed to respond efficiently to variations in supply of hydro-generation and temperature-driven demand and to provide ancillary services. Investors must have confidence in the WESM sufficient that they make potentially multi-billion US dollar investments on a *merchant* basis. Life of asset power purchase agreements (PPAs) backed by a government-owned entity is not an intended part of the WESM design.

A distinguishing feature of the WESM (compared to other "open" markets in Asia, such as Australia, Korea, New Zealand and Singapore) has been the extent to which market prices are affected by combinations of adverse factors, including load variation, generation outages, severe hydrological variations, temperature, gas supply disruptions, fuel supply management challenges, typhoon-related disruptions and various and sundry grid-related failures. Taken together, these various factors generally increased prices in the WESM, though at times disruptions have decreased prices greatly, such as during some periods when demand was adversely affected by the Global Financial Crisis.[12]

[12] In 2009 high levels of rainfall resulted in high hydro-generation and low prices (sometimes negative) – not every disruption is price increasing. However, most are.

Figure 2: Monthly Average Nodal Prices[13]



The WESM has proven remarkably robust considering the major disruptive events it has faced. If the WESM continues to be allowed to work through future similar disruptive events without material intervention, then investors will have good reason for increasing their confidence that the WESM will support future investment. And the closer one looks at pre-WESM investment decisions and practices, the more clear it is that the WESM already has improved upon these and is helping to build a more robust and dynamic power sector.
On the other hand, ill-considered or hasty intervention can erode confidence extremely quickly. As has become all too apparent in global financial markets, confidence, once lost, is difficult and expensive to restore.

Confidence in markets and processes depends most fundamentally on understandable linkages between cause and effect. If market outcomes flow logically from observed inputs, clear market rules and robust processes, then confidence increases. If, when things go wrong, there are clear and principled mechanisms or processes by which wrongs are righted, then this too builds confidence in markets.

[13] WESM reports available from the PEMC.

During a recent WESM stakeholder conference a number of stakeholders persistently sought clarification over such things as must run declarations, ancillary services provision and departures from market dispatch schedules. Transparency of outcomes is fundamental to enhancing investor confidence. Because of the associated risk and cost of misunderstanding or misinterpretation, the highest standard of reporting and explanation should be openly provided for departures from normal market outcomes.[14]

Let's take an example from the operating history of the Malaya power station, a 36-year old, fuel-limited, oil-fired, relatively inflexible high-cost power station that is hardly ever used to generate electricity under ordinary circumstances given the other, more efficient, sources of capacity that are usually available. In early 2010, the system operator put Malaya on almost continuous must run status during a prolonged period of low hydrology that coincided with a significant maintenance outage of the Malampaya gas field (Figure 3). We analyzed the value of the Malaya power station, which was put up for an IPPA-related sale in June 2010. A significant portion of the power station's value related to assumptions regarding future must-run situations and the outcome of must run compensation decisions by the ERC.

[14] And, simply to signal the degree to which the earlier governance and funding discussion and this discussion of investment incentives are connected, keep in mind that compensation for must-run generation is subject to ERC approval, and the frequency of requirements for such arrangements to be approved directly impacts the ERC workload, and thus, the timeliness of a wide range of important market development and regulatory activities.

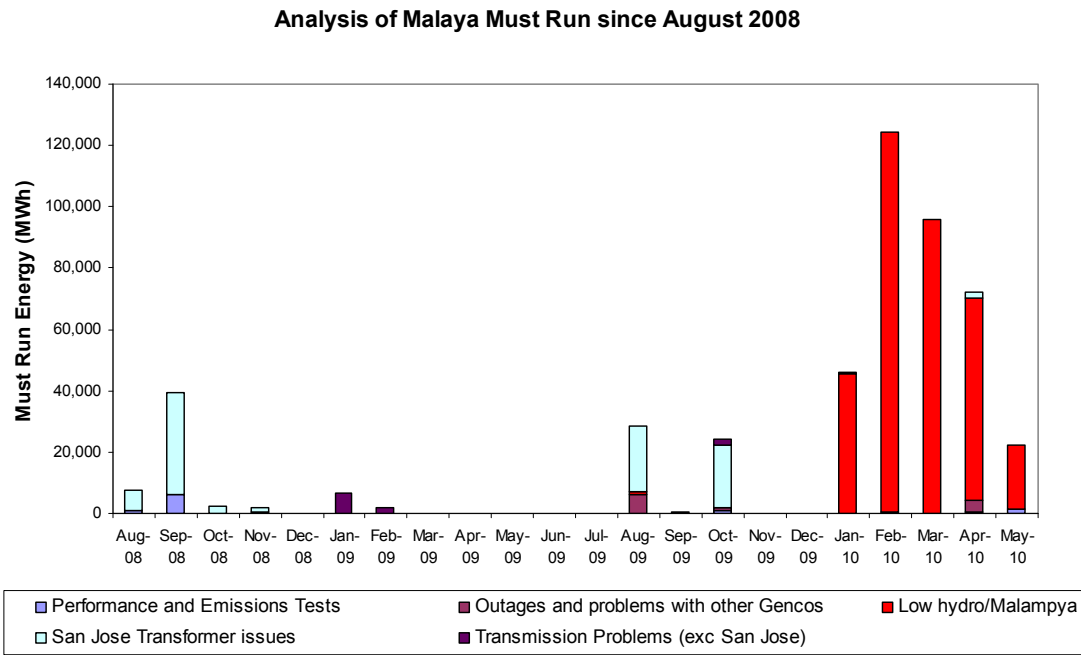
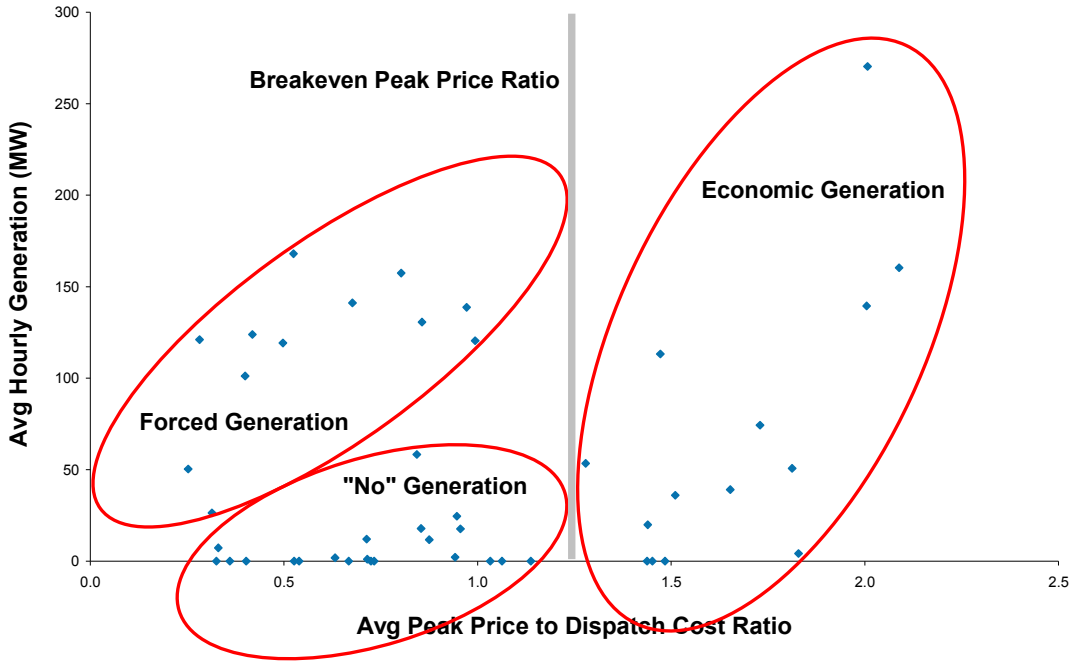


Figure 3: Malaya Power Station and Must Run Status

We identified three broad operating modes, as shown in Figure 4. The first, to the right, is when the market price is high enough relative to Malaya's dispatch cost that some amount of generation is profitable. To the left are situations in which Malaya has no incentive to run (it would be unprofitable). Of the "dots" on the left, some relate to when Malaya was not dispatched or should not have been (it is not always possible to know, except in hindsight, whether a dispatch decision will be profitable), while others relate to when Malaya was clearly instructed to run as it would not otherwise have had any incentive to run.

If the system operator wants Malaya to run to an extent different from what it would otherwise have run, such as during a period in which it would otherwise be unprofitable for it to do so, the system operator must force Malaya to do so through a must run declaration. Given the relatively few periods when Malaya can be profitably dispatched, the must run conditions and compensation arrangements would naturally form a very significant proportion of an investor's calculation of value. Malaya was not, in fact, privatized and so the investor's potential calculations were not relevant in this case. Nevertheless, the example highlights the importance to commercial investors of clarity and transparency around the application of must run declarations, ancillary services arrangements and other similarly technically oriented system operator departures from market dispatch schedules.

Figure 4: Malaya Power Station Commercial Operating Modes



Understanding the WESM Design

The period in which Malaya played such a prominent role, early 2010, was a period significantly affected by the occasional "El Nino" weather phenomenon. For the Philippines, El Nino results in unusually hot and dry weather. In 2010, El Nino unfortunately coincided with a maintenance shutdown of the Malampaya gas field. The resulting combined reduction in hydro *and* gas-fired capacity caused much higher prices and much tighter than normal reserve margins in the WESM. A shortage of contingency reserves caused the system operator to rely on must run provisions in the WESM rules to compel capacity such as the Malaya oil-fired unit discussed above to be available. Had the WESM's proposed ancillary services market been operational, it is possible that must-run declarations would *not* have been needed, as Malaya would have had an incentive in either the energy market or the ancillary services market to be available and running without being *required* by the system operator.

Fortunately, the WESM did not require involuntary load curtailments during this tough period, so it can be argued that the WESM worked as intended, though the scare was close enough to cause reflection on the question of whether the WESM was just lucky and whether

something more might be needed to ensure sufficient investment in capacity and available contingency response for future similar system stress events. One recommendation that should be clear is that the ancillary services market is needed as soon as possible. On the other hand, it is useful to consider what else might be needed (and why or why not) to support timely and sufficient investment in the right type of generation capability—generation capability with valuable flexibility, for example.

The very question of what might be done to ensure the WESM can deliver appropriate levels of reliability and adequacy incorporates the question of what levels of adequacy and reserve are desirable and whether the cost associated with achieving or delivering such levels is worth the benefits expected. Clearly, if an event or outcome is sufficiently extreme, the cost of being ready to meet it every hour and second of every day will be too high relative to the expected benefit. But where is the line? Who draws it? How much reliability is enough?

The question of how much adequacy and reliability is "enough" is a hugely important electricity market design and policy question, and one that is not particularly easily answered except through continuous review and analysis. This topic is one of the most oft-studied issues in the Australian NEM, for example. A reliability panel has long been constituted and numerous studies, analyses, models, consultative processes and parameter adjustments have been used to determine or ensure that the NEM can deliver to a reliability standard that is acceptable (currently that standard involves no more than 0.002% unserved energy in each region in each year). A challenge in the Philippines is to figure out even what reliability levels have actually been achieved on a consistent basis, given that involuntary load curtailment is all too often applied without notice or compensation in some customer segments.

When considering market design options related to the provision of reliability and adequacy of supply, the role of government can matter. It is possible for policy makers to prefer a level of reliability and adequacy that exceeds what a well-designed energy-only market like the WESM can, in fact, deliver. It is also possible for imperfections and practical realities in an otherwise good market design to make it impossible for the market to deliver what it would otherwise be theoretically capable of. And there is always the question of what benchmark to use to judge whether a market, like the WESM, is doing a sufficiently good job at improving on the past and evolving satisfactorily for the future. The perfect, after all, can be the (very

expensive and distracting) enemy of the good. And it is clearly a luxury to be able to complain of the performance of a system that, though imperfect, is nevertheless better than anything else realistically available or that had previously been achieved.

The energy-only market design that has been embraced in the WESM is arguably the most nuanced and sophisticated type of market design from the perspective of reliability and adequacy of supply. The Australian National Electricity Market (NEM), New Zealand and Singapore have similar market designs. In the USA, the Texas market uses a similar design. The UK's NETA was developed as an energy-only market, representing a major shift away from the original UK Pool, which had been an "energy+capacity" market.[15]

In theory, an energy-only market discovers the level of service customers value by allowing the market to clear (using prices). If short- and medium-term ancillary services settings are well specified, and prevailing spot market price signals are sufficiently accurate in communicating economic value of incremental supply or demand variations, then prices are theoretically able to clear the market, though the level of prices necessary to actually clear the market may be extremely high in some circumstances. Of course this means that customers or their retailers must see prices signals in order to respond in a timely manner. In reality, no energy-only market operates to such a theoretically pure standard and various safety net and support arrangements are used to promote sufficient capacity investment. A review is underway that considers such mechanisms and their potential value to the WESM.

The "energy-only" market design produces spot prices that are inherently more volatile than prices in markets that explicitly compensate generation *capacity* for being available (and hence are called *energy+capacity* markets). Both energy-only markets and energy+capacity markets are capable of supporting timely investment; they just differ in how they do so. The energy-only "market" design provides little if any assurance of compensation to generators that do not actually generate electricity.[16] An energy-only market achieves virtually all of the

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[15] Though the shift in focus to decarbonzation in the UK may force changes in the market design to better accommodate a new future investment mix driven more by policy choices than underlying economics.

[16] In fact, most competitive markets for other goods and services operate in a similar manner – a butcher collects no money unless you buy some meat. Most goods and services are paid for when they are actually sold for use. If no one buys your product, you do not get paid. That is also how an energy-only market works. There is a natural elegance to the logic of an energy-only market. So long as all stakeholders accept the basic design precepts, then an energy-only market provides a consistent framework for a dynamic power sector, supporting strong efficiency and investment incentives.

required compensation through spot market prices or through voluntary contracts between stakeholders. Such contracts help generators and retailers manage risk associate with volatile spot prices. Contracts also support investment. A retailer who wishes not to be exposed to the risk of ultra-high prices can seek comfort, for example, in a so-called option contract for which the retailer pays a fee to the generator (reducing the generator's financial risk). In exchange the generator agrees to provide power to the retailer at a price no higher than a price as agreed in the contract (reducing the retailer's risk). If the spot price goes higher than that, the retailer is protected. The generator forgoes the higher spot price but enjoys the greater certainty of having received the option fee.

In contrast, an energy+capacity market incorporates a separate payment for "capacity".[17] Through competitive pressures or regulatory restrictions, an energy+capacity market tends to have (much) lower, and (much) less volatile, *spot* market prices than would a properly designed energy-only market operating in the same context and circumstances. The lower level of *spot* market prices typically found in an energy+capacity market is then offset to varying degrees by the *capacity* payment.[18] At the end of the day, there is no free lunch. If additional reliability is desired, then it must be paid for somehow.

If the investment incentives inherent in the WESM's energy-only market design are deemed sufficient, then the main concern over time will be the possible impact of occasional high prices and high price volatility, as these can be difficult to distinguish from the inappropriate abuse of market power. For this reason, the WESM's market share limitations, as determined and enforced by the ERC are extremely important. If the market is known to be structured competitively, then market outcomes are more likely to be the result of competition and real resource scarcity pricing, rather than the result of abuse of market power. Structural, rather than conduct, limits are more important in an energy-only market, since conduct is much more difficult to interpret given the volatility of spot prices in an energy-only market.

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[17] The precise definition of "capacity" varies from implementation to implementation.

[18] In theory and in the longer run, there should not be a material difference in the cost to consumer of a well-designed and implemented energy-only market or a well-designed and implemented energy+capacity market. On the other hand, it can be challenging to make energy+capacity markets work optimally when locational signals matter and it can also be relatively more difficult to develop consistent incentives for demand- versus supply side investment. The energy-only market's Achilles heel is price volatility.

Competition regulation in energy-only markets ideally can be usefully focussed on ensuring the absence of material barriers to entry (access issues) and on maintaining a competitive industry structure through rigorous and cautious merger proposal reviews and explicit market share limitations, as well as through vigilant review of the level of implicit and explicit long-term contracting in the WESM. Long-term contracting reduces exposure to price spikes and can lead to more competitive behaviour in the spot market. At worse, long-term contracts can encapsulate the fruits of market power, but they also increase the risk to the retail counterparty of locking in a higher cost structure relative to contracting with a potential new entrant. If the competitive structure of the industry is, in fact, sufficiently competitive and entry is reasonably free and open, then an energy-only contract market provides a self-correcting platform for managing long-term market power concerns.

The WESM is soon entering a stage that will test commitment to the energy-only market design precepts. Will the WESM be allowed to operate as designed so that investors gain the confidence to invest? Key to the answer to these important questions is to ensure that government, regulatory and other market stakeholders continuously improve their understanding of the WESM and the factors that influence market outcomes, that the WESM itself is able to be improved through sound market evolution processes.

Summary

The WESM is five years into a major transition from a PPA-supported investment environment to a merchant environment in which investors build new power stations without life-of-asset contracts. To make this transition successfully, stakeholders are learning how to operate in a new market environment with a high degree of private sector involvement and investment activity. WESM development continues to proceed, albeit slowly, with important activities needed or underway to improve governance arrangements, market rules, and market information provision.

To date, growing energy consumption mainly has been met by increasing utilization of previously underutilized coal-fired generation. In addition, some of this coal-fired capacity has been (or is being) refurbished to improve availability and performance. Additionally, GN Power pushed forward with development of the Mariveles coal-fired power station slated for

operation in 2012. Such developments are creating some additional effective generating capability in the WESM. More will be needed of course.

The next great challenge will be the development of new greenfield power stations financed based on commercial arrangements developed wholly within the WESM. Such development of timely new capacity addition will be a serious test for the maturing WESM. To ensure that investment is adequate and timely, investors will need to have sufficient confidence in the WESM to be able to secure financing for new power stations without long-term PPAs. Improving the WESM is therefore a continuous and important activity, as it contributes to confidence and supports the ability of investors to develop bankable revenue and cost projections. The implementation of the long-delayed ancillary services market arrangements would be one such welcomed development. Other options include improved information management (such as the institution of a periodic Statement of Opportunities) and improved governance structures (such as implementation of the IMO) and improved transparency around market interventions (such as around must-run and other system operator-led departures from WESM market dispatch schedules) and a general speeding up and intensifying of market support, governance and evolution processes. In addition, more detailed review of the WESM's reliability standards seems warranted.

All of these activities, taken together, would strengthen the WESM as it enters a new stage of operation and development.