ENERGY UPDATE
JULY 2012

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Matt Zema, MD and CEO

UPDATE FROM THE CEO

This month began with the introduction of the carbon price and as expected it will take some time before we can analyse the full effects it will have on the wholesale electricity and gas markets.

On 1 July 2012 the price increase was in line with expectations at approximately $20 MWh.

It will be some weeks or possibly months before we can see a longer term market response to the carbon price. AEMO will be monitoring the market and will provide industry with an assessment once the clearer picture emerges.

AEMO's Statement of Corporate Intent for 2012-13 acknowledges the changing environment we are all now operating within. AEMO's role continues to meet the challenges of maintaining competitive energy prices, pricing carbon emissions, delivering appropriate investment information for the energy sector while ensuring reliable and secure energy markets.

Our focus in 2012-13 will be on improving our performance as an organisation and delivering value to the market and ultimately the broader community. AEMO's business model is the effective management of markets, effective management of grids and delivering value for our stakeholders.

GROUND-BREAKING REPORT SHOWS BIG CHANGES IN ELECTRICITY DEMAND

AEMO's recently released National Electricity Forecasting Report (NEFR) forecasts a significant reduction in electricity supplied from the NEM across eastern and south eastern Australia that is likely to result in the deferral of new electricity generation and transmission network investment for years.

The inaugural report shows lower industrial energy consumption, significant uptake of rooftop solar photovoltaic (PV) systems and consumer response to rising electricity prices and uptake of energy efficiency measures are behind a 2.4 per cent drop in actual annual energy for 2011-12.

As shown in the graph on page 2, across the NEM, annual energy for 2011-12 was 5.7 per cent lower than estimated in the 2011 ESOO under a medium economic growth scenario.

The NEFR provides independent and consistent electricity forecasts for each region of the NEM to capture the substantial economic and behavioural changes taking place in the energy supply sector and to provide valuable information for future investment decisions.

"Structural change in the Australian economy is having disparate impacts across the eastern and south eastern states, particularly in the wake of the global financial crisis.

We have not seen electricity use drop this much since the NEM commenced," said AEMO Managing Director and Chief Executive Officer Matt Zema.

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AEMO's Statement of Corporate Intent outlines five areas of focus – **engaging with stakeholders** including a survey of your views later this year; **empowering employees** by having the right people for the right jobs; continued development of **efficient markets**; building the AEMO brand by **applying commercial discipline and targets**; and **delivering value** and reporting **productivity** to our stakeholders.

In recent months, AEMO has undergone an organisational restructure to align our resources with the services we deliver to Australia's energy sector.

In line with AEMO's Statement of Corporate Intent 2012-2013, there is a renewed focus in 2012 on providing the market with robust and transparent information. The recent release of AEMO's ground-breaking National Electricity Forecasting Report is one example. The report itself, input reports and supporting data are all available via our website for industry to freely access and use this key information anytime.

You will also see a difference in the way we are producing our reports this year, with timely information being published as it becomes available rather than in one consolidated report at a given point in time. Last month, AEMO published several reports which will provide input into the South Australian Advisory Function and the Gas Statement of Opportunities (GSOO). Mid August both the South Australian Energy Report (SAER) and Electricity Statement of Opportunities (ESOO) will be published – earlier than in previous years.

Work is also underway on 100 per cent renewable scenarios for 2030 and 2050. The outputs of this modelling will no doubt be of broader interest to investors in the clean energy space.

Another area AEMO has been tasked to explore is the market design for a new Queensland gas supply trading hub at Wallumbilla in consultation with the Gas Supply Industry Reference Group and the Gas Supply Hub Jurisdictional Working Group.

The development of a national gas supply hub trading market has the potential to enhance market transparency and efficiency.

The Standing Council on Energy and Resources (SCER) has asked AEMO to report back by 19 October 2012 so that SCER ministers can consider the proposed design at their December meeting.

(Ground-breaking report shows big changes in electricity demand continued from Page 1)

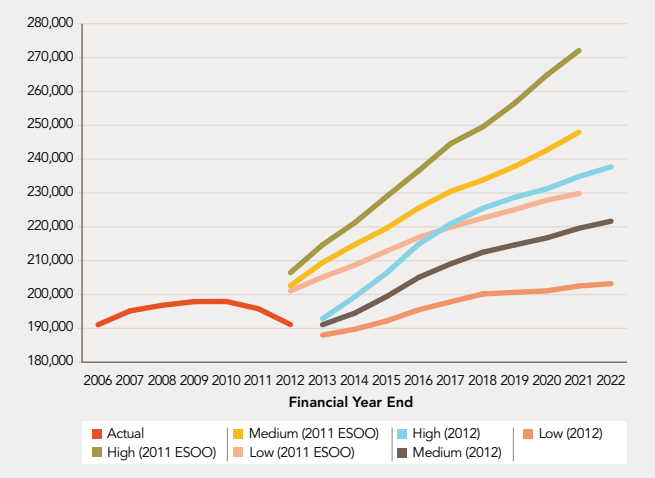
"Investment signals for new large scale electricity infrastructure are muted when compared to a year ago," Matt said.

The 2012 ESOO to be released in August will show a significant revision of Low Reserve Condition (LRC) triggers for generation investment. Most LRCs will be pushed out by at least four years.

AEMO will be using the NEFR as a basis for further collaboration with our stakeholders to maintain the quality and value of this work.

To view the full report click here.

Graph 1. NEFR2012 v ESOO2011 Annual Energy (GWh)



Graph 2. Revised annual energy growth rates (Medium growth scenario)

CHANGING OF THE GUARD – AEMO BOARD WELCOMES NEW DIRECTOR

The appointment of the new non-executive director to the AEMO Board to replace Ms Karen Moses has been finalised with the appointment of Mr Stephen Orr, effective 1 July 2012. Mr Orr has extensive senior management experience in the energy industry including detailed knowledge of the wholesale spot and financial markets and a working understanding of gas markets.

AEMO Chairman, Dr Tom Parry, and Managing Director and CEO, Matt Zema, thank Ms Moses for her exceptional contribution to the AEMO Board and wish her all the best for the future.

THE SOLAR STORY

The impact of consumer behaviour on demand – and particularly the significance of rooftop photovoltaic (PV) installations – features strongly in the NEFR. This is particularly the case in South Australia which has a high average sunlight intensity compared to other states in the NEM.

In 2011-12, rooftop PV systems are estimated to have generated 0.9 per cent of annual energy, which is forecast to grow to 1.3 per cent in 2012-13.

By 2021-22, energy generated by rooftop PV is expected to increase to 7,558 GWh or 3.4 per cent of annual energy under a 'moderate uptake' scenario.

South Australia has the highest penetration of rooftop PV of all the NEM states. At the end of February 2012 the estimated total installed rooftop PV capacity in South Australia was 267 MW.

In 2011-12 – and in comparison to NEM-wide figures – rooftop PV systems in South Australia are estimated to have generated 306 GWh or 2.4 per cent of estimated annual energy. By 2021-22, this is forecast to increase to be 900 GWh or 6.4 per cent of annual energy in South Australia.

Robust estimates relating to rooftop PV installations require consistent, detailed and national data. To achieve this, AEMO is seeking increased collaboration with industry and has set up a new six-monthly process to gather the required information. To find out more see AEMO's Solar Rooftop PV Information Paper – an input into the main forecasting report.

CARBON PRICE – MARKET YET TO SETTLE

AEMO's initial analysis of the impact of the carbon price on the National Electricity Market (NEM), following its introduction on 1 July 2012 indicated wholesale electricity price rises of around $20 per MWh.

While the $20 per MWh price rise is in line with expectations, it will be some time before AEMO is able to assess the full impact of the price on the wholesale electricity market. For example, on 2 July 2012, unrelated events including a drop in wind generation, the momentary loss of the Basslink interconnector and some generator outages caused price volatility for a brief period.

In gas markets, the carbon price appeared to have no discernible impact on prices. A higher than normal price on 7 July 2012 for the Victorian gas market was attributed to more expensive gas being sourced to make up for the line pack shortfall as a result of limitations on the Southwest Pipeline.

Given the range of external variables that can affect wholesale electricity prices alongside the carbon price introduction, it is likely to be some weeks – or perhaps even months – before a longer-term market response to the carbon price emerges.

In the meantime, AEMO will continue to monitor the market, and once a more accurate evaluation is able to be made we will provide industry with an assessment.

QUEENSLAND GAS SUPPLY HUB A STEP CLOSER

A Queensland gas supply trading hub is a step closer with the Standing Council on Energy and Resources (SCER) endorsing AEMO's recommendation for the hub to be developed in stages at Wallumbilla, 600km west of Brisbane.

The council has asked AEMO to develop the detailed design for the new hub in consultation with the Gas Supply Hub Industry Reference Group and the Gas Supply Hub Jurisdictional Working Group. AEMO will report back by 19 October 2012 so that SCER ministers can consider the proposed design at their December meeting.

SCER believes the development of a national gas supply hub trading market has the potential to enhance market transparency and efficiency.

"This is important as the gas industry faces a period of rapid growth, particularly in Queensland, a state which is experiencing substantial developments in liquefied natural gas processing," said AEMO's Group Manager Business Strategy, Peter Geers.

Peter said Wallumbilla was a natural place for a successful trading hub.

"There are already a lot of pipelines in the area, and it will provide a conduit for coal seam gas (CSG) bound for Gladstone.

"It is vital we get the framework right to foster continued development of reliable, efficient and competitive natural gas markets," Peter said.

The report to SCER will include functional specifications on market design, an outline of IT, legal and legislative requirements and a detailed costing for implementation of the hub. AEMO has drawn together a multidisciplinary team of operational and IT professionals to achieve the best result for the market. For more information contact Peter Geers.

LNG EXPORT POTENTIAL

The Eastern and South Eastern Australia: Projects of Gas Demand for LNG Export report shows that growing potential for Australian LNG export will lead to six to 10 trains being built in Queensland over the next 20 years to support the Asian Pacific market which currently accounts for nearly 60 per cent of world LNG demand.

The report compiled by consultants Core Energy is part of a suite of information which provides input into the Gas Statement of Opportunities (GSOO) to be published later this year.

Ninety-nine per cent of Australian LNG export currently goes to the Asian region, and has a compound annual growth rate of 2.8 per cent under the Asian LNG demand reference scenario.

Over the next 20 years, contracted supply to the Asian LNG market is trending down, while uncontracted demand and unfulfilled demand are trending up. The compound annual growth rate of unfulfilled LNG demand in the Asian market is 8.6 per cent, growing from 28 megatons in 2012 to 146 megatons in 2032, providing competitive opportunities for eastern and south eastern Australian LNG projects.

Eastern and south eastern Australian LNG projects have a number of advantages over other competing suppliers, including their vicinity to the Asian market and resultant lower shipping costs, low sovereign risk and the advanced progress of several projects, particularly for the time horizon up to 2017.

The reserves required to meet demand from the number of trains projected over the next 20 years range from 33,000 petajoules to 53,000 petajoules. The analysis conducted by Core Energy also shows that growth is not likely to continue after 2021 due to competition from possible LNG development in other areas of the world.

The Gas Statement of Opportunities webpage also contains recent gas reserve updates in line with AEMO's commitment to publishing timely information for industry.

To view this report and other recent gas reports see: http://www.aemo.com.au/en/Gas/Planning/Gas-Statement-of-Opportunities.

SOUTH AUSTRALIA IN FOCUS

New South Australian advisory reports compiled by AEMO for the South Australian Government and being released gradually throughout 2012, will now replace the former South Australian Supply and Demand Outlook (SASDO), which was issued as a single annual report in 2011 for the last time.

The reports provide an updated, accessible and timely suite of papers containing more streamlined and consistent information. For South Australia, the changes will allow for accurate historical data to be used in analysis for each year rather than including estimated data for current years, as has been used in the previous SASDO releases.

On 29 June 2012, four new reports were publicly released, comprising demand forecasts, generation information, an update on the Heywood Regulatory Investment Test – Transmission (RIT-T) and existing and proposed generation maps for South Australia.

See the reports at http://www.aemo.com.au/en/Electricity/Planning/South-Australian-Advisory-Functions.

100% RENEWABLE ENERGY MODELLING UNDERWAY

The Department of Climate Change and Energy Efficiency (DCCEE) has tasked AEMO to model 100 per cent renewable energy scenarios for two end dates – 2030 and 2050.

The modelling will include the type of generation plant, storage and transmission networks needed to achieve the 100 per cent target, cost estimates in today's dollars and an indication of the impact on customer energy prices.

AEMO will look at around 40 renewable resource regions and analyse a number of technologies that could contribute to meeting the 100 per cent renewable target such as onshore and offshore wind and energy generated by wave, geothermal, biomass and solar technologies.

Energy storage such as pumped hydro, compressed air, batteries, bioenergy and molten salt technologies will also be included in the modelling.

GROWTH DESPITE ECONOMIC DOWNTURN

The Victorian Annual Planning Report (VAPR) recently released by AEMO shows that although growth in Victoria's annual electricity use has slowed largely due to a downturn in manufacturing and changing consumer behaviour, localised investment is still needed to support growing pockets of the state.

The VAPR was released on 22 June 2012 and provides market investor information on gas and electricity transmission network planning over a three to 10-year outlook period. The 2012 report includes line augmentations and infrastructure upgrades to support growth in these areas.

One proposal is an upgrade of the Heywood interconnector between Victoria and South Australia to support increased transfer of wind energy from South Australia.

These proposals are considered through the Regulatory Investment Test – Transmission (RIT – T) process which is intended to promote efficient transmission investment and ensure consistency, transparency and predictability in transmission investment decision making.

Options for upgrading existing electricity transmission lines and hubs known as terminal stations are at various stages of consideration and consultation.

For example several options are under consideration to address electrical load growth from the Cranbourne and Rowville Terminal stations to support electricity supply to Casey and Cardinia Shires in south east Melbourne which incorporate the suburbs of Cranbourne, Pakenham and Officer.

Ringwood Terminal Station is also likely to be upgraded to support suburban growth in Ringwood and Box Hill.

Parts of regional Victoria are also bucking the trend of slowing growth in electricity use. The Bendigo and Ballarat areas have experienced growth in recent years and some existing transmission lines will be upgraded to accommodate the additional electrical load needed to supply these cities and their surrounding districts.

To read the full report, go to: http://www.aemo.com.au/en/Electricity/Planning/Victorian-Annual-Planning-Report

TASMANIA AND THE ACT ADOPT NATIONAL ENERGY CUSTOMER FRAMEWORK

The National Energy Customer Framework (NECF) has come into operation in Tasmania and the Australian Capital Territory on 1 July 2012 – importantly for AEMO, the introduction of the NECF also signals the commencement of new Retailer of Last Resort (RoLR) processes.

Although its introduction has been delayed in other states, in Tasmania and the ACT, the NECF is designed to streamline the regulation of energy – both electricity and natural gas – distribution and retail regulation functions in a national framework, and develop an efficient national retail energy market that incorporates appropriate customer protection.

This framework includes provision for the involvement of the Australian Energy Regulator (AER) in overseeing the appointment of Retailers of Last Resort (RoLRs) and declaration of a RoLR event.

The RoLR scheme aims to ensure customers maintain continuity of supply if their electricity or gas retailer goes out of business or is suspended from trading in the electricity or gas markets, by implementing immediate arrangements to transfer them to another retailer.

The RoLR processes define what market participants and AEMO are required to follow in order to effectively manage market transactions and communicate customer and site information should a RoLR event be invoked.

In the lead-up to the NECF introduction, earlier this year the AEMO and Australian Energy Regulator Boards, supported by AEMO's Electricity Retail Market Development, Gas Retail Market Development, and Metering and Settlements teams, participated in a joint Retailer of Last Resort (RoLR) exercise in early May at AEMO's Melbourne office to identify and test the extent of interactions required by both AEMO and AER Boards from an operational perspective.

SYSTEM SECURE FOLLOWING FLOODING AND EARTHQUAKE

The Latrobe Valley's electricity network withstood a battering recently with wild winter weather causing flooding in early June followed by an earthquake with a magnitude of 5.4 later that month.

A coordinated response between industry and AEMO, and healthy power reserves saw the lights stay on despite flood waters pouring into the Yallourn open cut mine on 6 June, cutting coal supplies to generation plant.

The earthquake struck on 19 June, with the epicentre near Moe in west Gippsland, about 120 kilometres south-east of Melbourne. The shake resulted in a loss of 2000 MW of generation primarily at Loy Yang and Yallourn power stations.

At the time AEMO Energy Update went to press, three units were back in service at Yallourn.

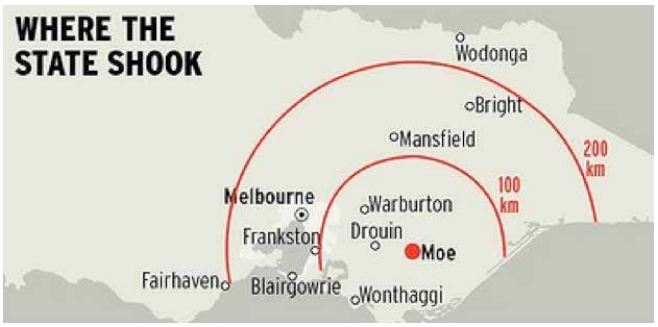
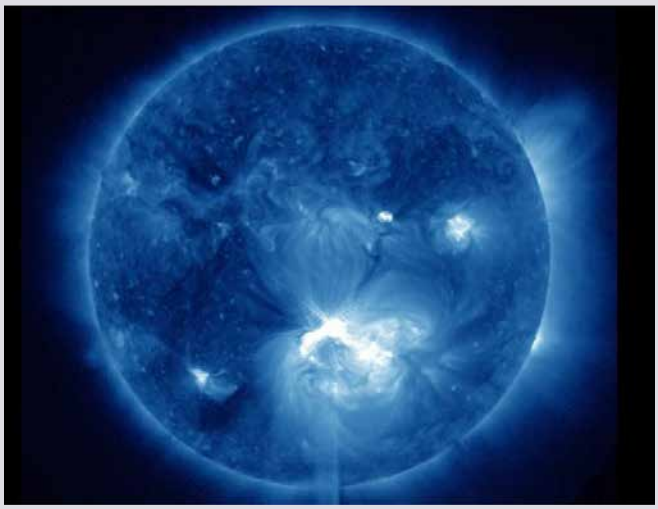


Image courtesy of The Age



SOLAR FLARES BEING MONITORED

A large solar flare in mid-July has highlighted the importance of monitoring the impact of space storms on the NEM transmission network.

As previously reported in AEMO Energy Update, it was thought solar flares only affected infrastructure in the northern hemisphere but recent studies in New Zealand and South Africa raised the possibility that Australian power infrastructure may be affected by storms on the surface of the sun.

Group Manager Real Time Operations Mark Miller said minor solar storms aren't likely to have an effect on Australia's power infrastructure but large Coronal Mass Ejections (CMEs) have the potential to cause damage.

"Coronal Mass Ejections cause geomagnetic storms on earth, which can cause geomagnetically induced current (GIC) on transmission lines. These DC currents create harmonics on the AC network and over-heating on transformers or reactors. This can lead to transformer and reactor failures and disruption to the network," Mark said.

In recent months AEMO and the Power System Security Work Group (PSSWG), which consists of representatives from Transmission Network Service Providers (TNSPs) together with the Bureau of Meteorology, IPS Radio and Space Services, have been assessing the potential impact of solar storms which tend to peak every 11 years, with the next level of heightened activity occurring over 2012-13.

Fortunately the recent solar flare did not impact the power system.

AEMO has been working with TNSPs to assess the potential effects of solar storms by installing monitoring equipment on the transmission network. Data is already being collected through the SCADA system in South Australia via Electranet and Queensland via Powerlink. Over the next few months data will become available from other TNSPs.

AEMO also receives warning emails from IPS Radio and Space Services if there is a possibility of a solar flare occurring in the coming days. These warnings are like a weather forecast for solar activity.

The damage caused by solar flares is not to be underestimated. A period of solar storm activity in March 1989 saw virtually the entire Canadian province of Quebec plunged into darkness. In total 21,500 MW of load and generation was lost and it took more than nine hours to fully restore supply.

> "The monitoring and mitigation measures we are implementing or considering are prudent and the cost is relatively small when compared to the damage that could be caused by solar storms," Mark said.

For more information about solar storm monitoring see:

ACE spacecraft – the red trace in the top box is the north-south magnetic field – if it goes below -20nT for an hour, a significant storm will probably result.

http://www.swpc.noaa.gov/ace/MAG_SWEPAM_24h.html

Magnetic storm index – http://www.ips.gov.au/Geophysical/1/2/4

TELL US WHAT YOU THINK

AEMO Energy Update welcomes your feedback.

If you have suggestions and comments or wish to change your contact details, please email media@aemo.com.au

AEMO EDUCATION

AEMO's education program is open to employees of registered market participant organisations, regulators, jurisdictions, consumer advocates and AEMO-accredited metering service providers.

Programs for the next few months are listed below.
For more detail, visit AEMO's website.

ELECTRICITY		
Overview of the NEM	ADELAIDE *(Full – wait list only)*	9 – 10 August 2012
	HOBART	13 – 14 September 2012
	SYDNEY	18 – 19 October 2012
Network and FCAS Constraints in the NEM	BRISBANE	25 – 26 October 2012
GAS		
Overview of the Declared Wholesale Gas Market (DWGM) in Victoria	MELBOURNE	5 October 2012

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