AUSTRALIAN ENERGY MARKET COMMISSION
DRAFT REPORT

POWER OF CHOICE – GIVING CONSUMERS OPTIONS IN THE WAY THEY USE ELECTRICITY

Request for Submissions

This submission is made in response to the above draft report on the reforms proposed by the Australian Energy Market Commission.

BACKGROUND

Sustainable Sydney 2030

In developing its vision for the future, Sustainable Sydney 2030, the City of Sydney spent more than a year consulting its community and a consensus emerged on the way to make Sydney a greener, more global and connected city.

Some 90% of people wanted the City to take urgent action to tackle climate change, so the City made sustainability the overarching theme. A major objective of Sustainable Sydney 2030 is to position Sydney as one of the world's leading green cities in the race to counter climate change. To achieve this, the City has committed to reducing greenhouse gas emissions by 70% by 2030 from 2006 levels.

80% of the city's greenhouse gas emissions come from centralised power generation, primarily burning coal, which is inefficient, unnecessarily polluting, a waste of non-renewable resources and the primary cause of climate change. Key in the City's objective to tackle climate change is to supply 100% of the city's electricity from local generating systems through a combination of energy efficiency and low or zero carbon decentralised energy, principally trigeneration that can be fuelled from natural gas or renewable gases.

The emission reduction targets will be delivered through what Sustainable Sydney 2030 calls "Green Transformers". These are a combination of green infrastructure, primarily trigeneration, but also waste and recycled water infrastructure. When combined with demand reduction, trigeneration will provide 70% and renewable energy will provide 30% of the electricity needs of the city in 2030 and reduce overall greenhouse gas intensity by 63.5%. This will require at least 477MWe of trigeneration and cogeneration to be delivered by 2030. The balance of energy needs will come from waste heat from local electricity generation and the renewable electricity and gas will be sourced from within and outside the City's Local Government Area.

The City's Sustainable Sydney 2030 energy and climate change targets will be delivered by the City's Green Infrastructure Plan.

Green Infrastructure Plan

Developing the Green Infrastructure Plan and putting it into action is happening on two levels – for the city as a whole and by the City of Sydney leading the way and installing local green infrastructure projects in its own operations. The Green Infrastructure Plan comprises:

Decentralised Energy – Trigeneration Master Plan
Decentralised Energy – Renewable Energy Master Plan
Decentralised Energy - Advanced Waste Treatment Master Plan
Decentralised Water Master Plan
Automated Waste Collection Master Plan

The City's integrated approach to a city-wide energy, water and waste infrastructure, for example, enables the trigeneration, recycled water and waste collection to share the same network infrastructure routes and stations. Recycled water could be treated by zero carbon waste heat from trigeneration and renewable gases and non-potable water could be recovered from waste and used in the city's green infrastructure network.

Centralised Power Generation Efficiency and Grid Losses

More than two thirds of primary energy is lost at remote power stations in the form of waste heat, a natural by-product of thermal electricity power generation, rejected into the atmosphere with further losses in the grid supplying the city's very large and peaky electrical load due to the very large electric air conditioning load.

The poor efficiency of centralised energy has a cost that is now being felt by NSW electricity consumers with huge rises in electricity bills, primarily driven by network charges transporting the electrons from remote centralised energy power stations to end consumers.

Grid Network Charges

The Institute of Sustainable Futures, University of Technology Sydney 'Close to Home: Potential benefits of Decentralised Energy for NSW Electricity Consumers' report[1] established that over 2010-15, electricity network businesses in Australia are spending over $46 billion, more expenditure than the proposed $34 billion National Broadband Network.

In NSW, electricity networks are undertaking capital expenditure of $17.4 billion over the 5 years to 2013/14. This represents $2,400 per person and an 80% increase on the previous 5 year period. Average electricity prices in the Sydney electricity distribution network area are expected to increase by 83% during this period with the proportion of electricity bills that goes to pay network charges to rise from 40% to 60%.

The Institute of Sustainable Futures estimates that the City's plans to supply 70% of the Local Government Area's electricity needs from a 360MWe trigeneration network by 2030 could achieve savings in deferred electricity network costs and avoided costs of new power station capacity to serve the city's growing demand in the order of $1.5 billion by 2030.

[1] Institute of Sustainable Futures, University of Technology Sydney 'Close to Home: Potential Benefits of Decentralised Energy for NSW Electricity Consumers November 2010'
http://www.isf.uts.edu.au/publications/dunstanlangham2010closetohome.pdf

Electric Air Conditioning and Peak Power

A key part of the reason for surging electricity prices is the need to build electricity assets for peak power demand, primarily electric air conditioning, for 4 days of the year to meet high demand on hot days. $11 billion of network assets is built to meet demand for just 100 hours a year and as much as 25% of electricity costs result from peak demand, primarily electric air conditioning, which occurs over a period of less than 40 hours a year.

A 2kW reverse-cycle air conditioner costs $1,500 a year to operate and yet imposes costs on the electricity network of $7,000 since it adds to peak demand[2]. These network costs are not paid by the consumer operating the air conditioner but by all NSW electricity consumers whether or not they own air conditioners.

These network costs are significantly amplified by a city such as the Sydney CBD. For example, the Trigeneration Master Plan will displace 542MW of electricity peak demand, primarily electric air conditioning, which all NSW electricity consumers are currently paying for. This is equivalent to taking 271,000 - 2kW reverse-cycle air conditioners off from peak electricity demand.

Decentralised Energy and Distributed Generation

Distributed generation is generation connected to the low voltage distribution network rather than the very high voltage grid transmission network. Although decentralised energy is a form of distributed generation it is very different in its concept and design than distributed generation.

Distributed generation is typically implemented for a specific purpose, ie, diesel standby generators for standby power, renewable energy to generate an income or a saving for a particular building or project or stand-alone cogeneration or trigeneration schemes for individual buildings to achieve a particular GreenStar or NABERS rating. These systems are typically connected to the low voltage (230V or 400V) part of and anywhere on the distribution network without any consideration of load balancing, fault levels, etc, which can create significant connection and associated technical and cost issues.

In order to overcome the regulatory barriers to distributed generation these systems are normally designed not to export electricity into the network minimising the potential reduction in greenhouse gas emissions and economics of such technologies.

Decentralised energy, on the other hand, is designed to replace centralised energy, particularly for cities and other large energy load centres. This is achieved by designing the decentralised energy network for the city or part of the city as a whole to take the place of centralised energy.

Centralised energy transmits electricity from remote power stations across the transmission grid to grid supply points in the local distribution networks. Grid electricity is then distributed from various grid supply points on the high voltage distribution network. This is where decentralised energy is normally connected, typically at the 11kV or 33kV parts of the network, and simply replaces remote

[2] Australian Government 'Draft Energy White Paper – Strengthening the Foundations of Australia's Energy Future December 2011 http://ret.gov.au/energy/Documents/ewp/draft-ewp-2011/Draft-EWP.pdf

electrons with local electrons but without the grid losses plus the ability to recover and recycle the waste heat from local electricity generation for local heating and cooling which further reduces electricity consumption and peak demand. As decentralised energy is developed it gradually changes the distribution network from a passive network to an active network providing further opportunities for network cost savings and the facilitation of a smart distributed network system through the active management of local two-way electricity flows and demand management to the benefit of the distribution network and connected customers as a whole.

As island networks, the thermal reticulation networks are impervious to where the energy centre electricity connections are made so it is important to determine the best places to connect the energy centres first and then design the thermal reticulation networks accordingly. Ausgrid, the electricity distribution network operator, advised the best places and maximum capacities to connect to their distribution network to deliver the specified trigeneration network and this forms part of the Trigeneration Master Plan which the City's trigeneration project is designed to deliver.

The term decentralised energy was developed in London to differentiate between these types of systems and distributed generation. It also helps to explain the difference as it is the exact opposite of centralised energy and helps people understand the concept.

Trigeneration Master Plan

The interim Trigeneration Master Plan was completed by the Kinesis consortium in December 2010 and placed on public exhibition until 28 January 2011. The interim Master Plan covers the four energy dense zones of the city – CBD North, CDB South, Pyrmont/ Broadway and Green Square. Together, these four zones would deliver 372MWe of trigeneration which would exceed the City's 330MWe trigeneration target under Green Transformers in Sustainable Sydney 2030.

The final Trigeneration Master Plan was placed on public exhibition until 3 October 2012 and comprises the original four Low Carbon Zones plus four precinct scale trigeneration 'hotspots' outside the original Low Carbon Zones and small scale co/trigeneration for the remainder of the Local Government Area.

The 477MWe of trigeneration and cogeneration systems set out in the Trigeneration Master Plan would reduce the City of Sydney's greenhouse gas emissions by between 1.4 million and 2 million tonnes a year depending on which operational performance is selected for the mid-growth scenario. This represents a reduction in greenhouse gas emissions of between 39% and 56% for the building sector and between 24% and 32% of the overall Sustainable Sydney 2030 target.

The Trigeneration Master Plan would also reduce electricity consumption by 30% and electricity peak demand by 60% and make the renewable electricity target much easier to achieve as electricity will not be used for heating and cooling.

The Trigeneration Master Plan is the leading and the largest of the Master Plans in the Green Infrastructure Plan in which other Master Plans will follow utilising the same infrastructure routes and co-located stations, wherever possible.

The resolution of the outstanding issues, stakeholder feedback and the 2 year long procurement process for the appointment of an energy services provider to design, finance, build, operate and maintain the city wide trigeneration network also informed the Master Plan. Completion of this work has now enabled the City to publish the final Trigeneration Master Plan.

Renewable Energy Master Plan

The Renewable Energy Master Plan will set out the renewable electricity, renewable thermal energy and renewable gas resources and locations both inside and outside the LGA. A proximity principle of 250km from the city has been applied for renewables outside the city to avoid investment in remote renewables and minimise associated increases in network charges to consumers.

The Arup report shows that 55% of the 30% renewable electricity target can be delivered within the LGA and 45% from outside the LGA. In addition, 100% of the renewable gases/fuels and renewable thermal energy needed to displace natural gas for the 360MWe of trigeneration in the Trigeneration Master Plan can be sourced from feedstocks and resources within 250km of the city.

Together, this would deliver reductions in greenhouse gas emissions of 2.15 million tonnes a year which equates to a 31.5% reduction in overall greenhouse gas emissions from the 2006 base year and potentially up to 100% of the city’s local energy target (70% renewable fuelled trigeneration plus 30% renewable electricity) being met from renewable energy.

The final Renewable Energy Master Plan is currently being reviewed and will be published by the end of 2012.

Leading by Example

Leading by example is an important principle for the public sector as you cannot expect others to do what you are not prepared to do yourself. The “show by doing” principle as adopted in Woking and London demonstrates that if the public sector leads, others will follow.

The City has already reduced greenhouse gas emissions in its buildings by 18% from 2009 to 2011 by building energy efficiency retrofits and has let a further building energy and water efficiency retrofit contract to reduce emissions by a further 24%, increasing the total emission reductions to 42% by the end of 2012. The City has also let a contract to replace all City owned street lighting with LEDs over the next 3 years which will reduce emissions in City owned street lighting by 51%.

A contract has also been let for 1.25MWp of precinct scale solar photovoltaics to be installed on more than 30 of the City’s buildings over the next 2 years. The City has taken advantage of its large unshaded collective roof areas, including large roof areas such as depots where there is little on site electricity consumption but the surplus solar electricity can be exported to other City buildings utilising the local distribution network and the trigeneration service provider’s ‘CogentPower’ which retains the retail value of electricity, less distribution use of system charges. This technical and financial approach has reduced the cost of carbon abatement by 50%.

The City's four major energy and climate change projects for its own buildings and operations were all procured via output performance specifications to enable the rapid implementation of large scale reductions in greenhouse gas emissions. These 'show by doing' projects, together with the City's city-wide Trigeneration project will set the City on the path towards reducing emissions on the City's own buildings and operations by 70% by 2030.

City's Trigeneration Project

Following completion of the 2 year long procurement process Cogent Energy (owned by Origin Energy) was appointed by the City as the Energy Services Provider to design, finance, build, operate and maintain the city-wide trigeneration network. Heads of agreement were signed in April 2012 and the development agreement was executed in July 2012.

A key feature of the agreement is that the trigeneration energy centres and low carbon electricity and zero carbon thermal energy outputs will be owned and retailed by Cogent Energy and the thermal reticulation network will be owned by the City of Sydney.

The agreement also provides for the City and Cogent Energy to develop renewable gas resources to replace natural gas within the development agreement timeframe.

Stages 1 and 2 of the project comprise 63.5MWe of trigeneration across four precincts plus supply to all 230 of the City's buildings and 21,000 street lights by 2015. The City's buildings will be one of the first to be supplied with low carbon energy which is expected to be commissioned by July 2014.

This, together with the other three major energy and climate change projects, will reduce the City's greenhouse gas emissions by 51% to 69% for 15/5 hours and 24/7 hours trigeneration operation, respectively. Other emission reductions will also come from the City's vehicle fleet emissions reduction programme.

The first trigeneration precincts comprise CBD North, CBD South, Green Square and Pyrmont/Broadway plus Prince Alfred Park. Site surveys and negotiations are also under way with other building owners which will extend or create new precincts over and above the first four precincts.

Stage 3 represents the balance of the trigeneration network to be rolled out by 2030, if not before.

AEMC POWER OF CHOICE

Executive Summary

The City, in the main, supports the AEMC's key recommendations in the reform of demand side participation (DSP), particularly in relation to efficient and flexible pricing options, enabling technology (metering), facilitating consumer access to electricity consumption information and reforming the application of the current demand management and embedded generation connection incentive scheme. However, further reforms to the National Electricity Market are required over and above those reforms currently under way if Australia is to deliver a cost effective, efficient and low emissions energy system.

7. Distribution Networks and Distributed Generation

The City would support the series of reforms that would allow the owners of distributed generation (DG) units to sell the value of their demand responses to parties other than their existing retailer. The City also supports the need for government feed in tariff structures to be designed to recognise the value of DG, which will vary over the course of the day, and to encourage DG units to maximise their export during peak demand periods.

This should not just apply to the electricity that is generated or exported but also to the electricity consumption and peak demand that is avoided or displaced through the application of utilising the waste heat from local electricity generation such as cogeneration and trigeneration and renewable thermal energy systems such as solar thermal and geothermal energy systems to supply heating and cooling that would have otherwise been supplied by electricity.

Electric air conditioning, in particular, should be discouraged since this is the primary cause of expensive network upgrades for managing peak power that impacts all consumers connected to the network. Other non-electric means of providing air conditioning are available such as trigeneration and solar cooling and these should be particularly incentivised to reduce the impact on peak power demands.

7.1 Market Conditions for Uptake of Efficient DSP

The City agrees that the application of the current regulatory framework, in combination with other influences, does not incentivise network businesses to react in the way intended to pursue efficient DSP projects. This needs to be addressed.

7.2.2 Distributed Generation

Although a number of regulatory barriers to distributed generation are currently being addressed by proposed rule changes there are other more major barriers and burdens to distributed generators that still need to be addressed as set out in the City's submissions to the Prime Minister's Task Group on Energy Efficiency dated 30 April 2010[3], AER Approach to Retail Exemptions Issues Paper dated 27 July 2010[4], NSW Special Commission of Inquiry Electricity Transactions dated 16 June 2011, Productivity Commission dated 11 July 2012[5] and AER Framework and Approach Paper on Ausgrid, Endeavour Energy and Essential Energy – Regulatory Control Period Commencing 1 July 2014[6], the resolution of which would economically incentivise distributed generation to the benefit of network businesses and consumers.

[3] City of Sydney Submission to the Prime Minister's Task Force on Energy Efficiency – 30 April 2010
http://www.climatechange.gov.au/government/submissions/pm-task-group/~/media/submissions/pm-taskforce/papers/102-city-of-sydney.ashx
[4] City of Sydney Submission to the Australian Energy Regulator on Approach Retail Exemptions – 27 July 2010
www.**ar**.gov.au/.../item.phtml?...fn...%20**City**%20of%20**Sydney**
[5] City of Sydney Submission to the Productivity Commission on Potential Improvements t, Regulation of Distribution and Transmission Networks in the NEM – 11 July 2012
http://www.pc.gov.au/__data/assets/pdf_file/0007/118834/sub039-electricity.pdf
[6] City of Sydney Submission to the Australian Energy Regulator on Ausgrid, Endeavour Energy and Essential Energy – Regulatory Control Period Commencing 1 July 2014
http://www.aer.gov.au/sites/default/files/City%20of%20Sydney%20-%20Submission%20on%20Preliminary%20Framework%20and%20Approach%20-%20August%202012_1.pdf

7.3.1 Potential Return for Network Businesses Implementing DSP Projects

The City supports having a standard, consistent method for valuing the costs and benefits of DSP which will improve the transparency of the network planning process and the application of the demand management incentive scheme as well as reducing AER administration costs.

Innovation Allowance

The City supports separate provisions for a demand management innovation allowance (DMIA) to enable network businesses to access funding to experiment and trial innovative DSP schemes which they would otherwise have been unable to fund through their normal expenditure allowance providing that such innovation is not already covered by government programs. However, affected consumers should be consulted on such projects and be able to propose innovation projects to network businesses such as LED street lighting which would also reduce costs to local government consumers.

7.3.2 Network Tariff Structure Influencing Incentive to do DSP

The City supports a move towards revenue cap regulation providing this is supported by introducing more prescriptive detail prescription in the rules on how distribution network business sets their network tariffs.

7.5.5 Providing Clarity and Flexibility for DSP Related Expenditure

a) Inclusion of Market Benefits into the AER Regulatory Expenditure Reset Assessment

The City supports including the potential non-network benefits of DSP when the Australian Energy Regulator (AER) is assessing the efficiency of network expenditure.

b) Managing Volatility in DSP Expenditure

The City supports amending the National Electricity Rules (NER) so that distribution network businesses have extra flexibility in their annual tariff setting process to reflect changing DSP costs. These arrangements should be limited to actual payments to consumers under agreed rebates/rewards based DSP projects.

c) Clarifying Treatment of DSP Operating Expenditure at Regulatory Resets

The City supports introducing a new rule in the NER to provide distribution network businesses with more certainty on how DSP expenditure in a regulatory period (but which is not included in the approved allowance) will be treated in future regulatory determinations.

d) Temporary Exemption from the Service Target Performance Incentive Scheme

The City supports that the NER is changed to permit the AER to grant temporary exemption from reliability service standards for specific DSP pilots/trials.

7.4 Distributed Generation

7.4.1 Market Conditions for Uptake of Efficient DSP

Distributed generation (DG) not only has the potential to address peak demand through local electricity generation it also has the potential of reducing electricity peak demand through the utilisation of thermal energy for supplying heating and cooling either from the recycling of waste heat from local electricity generation such as cogeneration and trigeneration or from renewable thermal energy systems such as solar thermal and geothermal energy and thus reduce the reliance on large scale generation and network investment to meet peak demand.

7.4.3 Considerations

b) Ability of DNSPs to Own and Operate DG

The City supports Distribution Network Service Providers (DNSPs) being allowed to own DG assets, where the primary purpose is to provide network support. However, the AER should ensure that such DG assets are needed to provide network support and that it could not be provided by another party contracted to the DNSP. DNSPs should not be allowed to implement high carbon solutions for DNSP owned assets such as diesel generators and that the DNSP should also find a market for the waste heat generated by thermal electricity generation and connect such thermal energy to consumer loads, either directly or indirectly by consumers or third parties supplying consumers.

c) Feed-In Tariffs and Value of Export from DG Units

The City supports incentivising owners of DG to maximise the export or consumption of their energy during peak demand periods through the use of specifically designed net feed-in tariffs, side payments or time varying tariffs.

9. Energy Efficiency Measures and Policies

Energy efficiency measures and policies to reduce electricity peak demand on networks must also include the avoided or displaced electricity peak demand through the application of utilising the waste heat from local electricity such as cogeneration and trigeneration and renewable thermal energy systems such as solar thermal and geothermal energy systems to supply heating and cooling that would have otherwise been supplied by electricity.

Electric air conditioning, in particular, should be discouraged since this is the primary cause of expensive network upgrades for managing peak power that impacts on all consumers connected to the network. Other non-electric means of providing air conditioning are available such as trigeneration and solar cooling and these should be particularly incentivised to reduce the impact on peak power demands.

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11 October 2012