

Mr Tyson Self, Manager Projects, Access
Economic Regulation Authority

Dear Sir

My name is Martin Anda and I am Principal Engineer Sustainability at ENV Australia Pty Ltd and Academic Chair of Environmental Engineering at Murdoch University.

I would like to make a public submission to the 2012-2017 Western Power's Proposed Revised Access Arrangement (AA3).

I am particularly interested in making a submission on the proposed Smart Grid arrangements. I believe these to be vital for the future sustainability of energy supply in Western Australia particularly to the residential and commercial sectors.

In my role at Murdoch University I provide education to students and supervise research projects related to energy supply and energy efficiency. In my role at ENV I manage behavioural change programs for the Water Corporation to achieve water savings in the range of 10-15% using community based social marketing techniques across tens of thousands of households across the State.

Energy efficiency, energy savings and peak load management will be an important outcome of the Smart Grid proposal by Western Power and community based social marketing is a method they are proposing to support the introduction of their Smart Metering Infrastructure (SMI) to achieve these outcomes.

I am providing only a brief submission in this email but would be happy to provide a more detailed formal submission if your submission period is still open.

In this brief email submission I would like to refer to my other role as WA board member of the *Envirodevelopment* scheme offered by the Urban Development Institute of Australia.

The commercial and residential urban development industry is partially responsible for two major challenges faced by Western Power in energy supply management. These are understood to be peak demand management and increasing renewable energy on the SWIS.

It is understood that there are three main technical constraints in implementing renewable energy on the SWIS:

1. intermittency of output from renewable energy generators;
2. fluctuation of output when renewable energy systems are generating; and
3. the overnight trough problem.

The commercial and residential urban development industry is being driven to achieve higher environmental performance from a number of angles but of interest here are two industry-based awards programs that have specific energy efficiency and renewable energy targets, namely:

- The Green Building Council of Australia (GBCA) Greenstar Communities, and
- The Urban Development Institute of Australia (UDIA) *Envirodevelopment*.

Greenstar Communities may still be several years away from full implementation in WA but *Envirodevelopment* is now a strong and attractive driver for urban developers in WA. The new *Envirodevelopment* technical standards require the following criteria to be satisfied:

- 3.1.3 Ensure there are measures aimed at specifically reducing peak load at a master planning level.
- 3.1.4 Provide efficient lighting in common areas (e.g. street lighting, public spaces), such as through utilising solar power, fluorescent, or LED fittings.
- 3.1.5 Demonstrate measures to assist with community education of energy efficiency and greenhouse gas reduction.

3.2 Reduce greenhouse gas production within the development by at least 20% more than required under current Federal, State and Local government regulatory means.

Commercial and residential urban developers can position themselves to address all of the above criteria simultaneously through the following strategies that are understood to be preferred by Western Power:

- i. Installation of smart metering infrastructure for electricity metering (in the future this may also enable gas, water and waste), on all homes, offices, commercial and community premises. This will allow real-time monitoring of energy use and enable control and feedback to residents necessary for behavioural change.
- ii. Installation of Demand Response Enabling Devices (DREDs) and/or timers on devices such as air-conditioners, pool pumps, clothes dryers, bore pumps that will enable 'load shifting', or load reduction, away from and during peak periods.
- iii. In-home displays that provide real-time feedback to customers.
- iv. Community education programs such as Living Smart workshops and over-the-phone eco-coaching using goal-setting and community based social marketing.
- v. Installation of 'low carbon' transition gas fuelled on-site power in applications such as trigeneration gas peaking plants
- vi. Installation of renewable energy technology in the form of grid-connected rooftop solar PV systems (1.5kW preferred for better load matching) or larger community scale PV systems either as interconnected rooftop systems or single stand-alone systems. It is understood that if these systems are installed facing west or northwest then the peak output will be better matched with the late afternoon peak summer demand on the SWIS arising from home air-conditioning use. PV performance for the householder may only be 13% less than direct north orientation. It may also be possible to install grid-switched PV systems with battery storage.
- vii. Installation of energy storage in the form of pumped storage (community bores pumping with surplus solar energy to elevated tanks and hydropower outlet) and batteries in electric vehicles (on-site charging stations).

Strategies 1-4 are increasingly of interest and incentivised through the *Envirodevelopment* program to achieve marketing advantage. The latter strategies 5-7 will be attractive with the availability of a 'critical peak rebate' program offered by Western Power.

In order to better meet the requirements of Western Power I am assisting several urban land developers to prepare themselves for the proposed new SG and SMI arrangements as follows:

- a) Focus on single phase smart metering infrastructure (SMI) initially
- b) Customer feedback communications can be either online portal OR in home display
- c) Portal can be linked to WP reads made every 4 hrs
- d) In home display can be linked to Zigbee home area network – this is real time enabled
- e) The latter can also be linked back to WP via network for Direct Load Control (DLC) devices
- f) Can also be linked to water, gas and PV
- g) PV data output can be net (minus grid consumption) or gross (actual PV generated) – the latter requires more development yet
- h) Demand Response Enabling Devices (DRED) (or zigbee chip enabled) air conditioners will be standard by April next year in accordance with AS4755.
- i) DREDs then cycle aircon compressors on and off as required for peak load management by means of the DLC system.
- j) Several companies already have DRED aircons entering market, eg LG, Mitsubishi
- k) Other devices eg pool pumps, clothes dryers, will have to be DRED enabled not too long after.
- l) The above SMI will then be ready for future developments such as electric vehicles plug in to the grid.

Such arrangements can then serve as a vehicle for enhanced customer engagement by utilising the SMI to deliver real time feedback in community based social marketing education programs. This enables customers to then better engage with their SMI and leads to greater effectiveness of the SG with significant energy savings, peak load reduction and load shifting as the outcome.

I see Western Power's SG and SMI proposals for AA3 as being critical to underpin the sustainable development of the urban land development industry and urban renewable projects in conjunction with community based social marketing programs to achieve enhanced customer engagement and outcomes.

I would be happy to provide more detailed information on the above initiatives if required.

Thank you.

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