

# Final

## National Generators Forum Submission to the Productivity Commission *Inquiry into Energy Efficiency*

### Introduction

The National Generators Forum (NGF) represents electricity producers in the National Electricity Market (NEM). NGF membership consists of both privately owned and publicly owned electricity generation businesses competing in the NEM. The National Electricity Code, ACCC, NEMMCO and state-based requirements govern operations in the NEM.

NGF members support competitively priced electricity supply, delivered through a competitive electricity market, as fundamental to economic and social well-being. The NGF and its members support the efficient generation of electricity and the responsible, efficient and effective use of electricity by consumers. The NGF endorses the Productivity Commission's definition of energy efficiency as '*maintaining or increasing the level of useful output or outcome delivered, while reducing energy consumption*'.

The NGF acknowledges the high standard and focussed nature of the Productivity Commission's Issues Paper. Consistent with the terms of reference for the Inquiry, the Issues Paper makes it clear in several places that the inquiry is not into climate change policies and that the inquiry will concentrate on examining constraints on '*energy efficiency improvements which are cost-effective for individual producers and consumers*'. Although such focus may limit the Inquiry's scope and opportunity to more fully explore 'public good' and 'externality' issues of improved energy efficiency, which are also discussed well in the Issues Paper, the focus is consistent with the acknowledged discipline placed on private and public capital in a market-based economy.

The NGF notes the terms of reference dealing with:

- Energy market reform to facilitate improved demand and supply management, with more cost-reflective price signals in the markets, particularly at peak times, and
- Introducing a national energy efficiency target, including, but not limited to, the establishment of an annual requirement for major users of stationary energy to generate, or otherwise acquire, a target level of efficiency related to energy savings.

This NGF submission is limited to input related to electricity generation as an energy or fuel conversion industry and it does not deal with demand side efficiency unless directly supply related.

## Some NGF energy efficiency issues

It is widely acknowledged that energy intensive energy suppliers (namely primary energy conversion to electricity) and energy intensive energy users are normally efficient in the use of energy (whether primary or secondary) because energy or fuel makes up a very large component of operating costs and energy savings translate directly to bottom-line benefits. However, two key points do need to be made:

- Because of the capital intensive nature of electricity supply (and of energy intensive industry generally) plant efficiency is optimised by the cost structure of the plant at the time of design and installation (or major refurbishment) and by the cost of fuel in order to operate profitably in the competitive electricity market, and,
- The design and operating nature of the NEM may cause generation plant to operate from time to time at less than optimal efficiency, particularly for older plant and plant subject to wide variations in market-determined generation needs.

The NGF believes that the Australian Greenhouse Office's Generation Efficiency Standards (GES) measure offers a worthy case study into the efficiency issues related to fuel conversion as it neatly provides some commentary on the rational economic objectives of the Inquiry while addressing some 'externality' issues, mainly greenhouse gas abatement. At the same time, implementation of the GES measure satisfies social needs by maintaining competitively priced electricity for consumers and by providing continued employment for a skilled workforce.

The GES measure has the following key market-focussed energy efficiency attributes:

- **Voluntary but legally binding** – the measure is essentially voluntary but once agreed to by business it is legally binding. Government is comforted by the fact that greenhouse gas emissions are being reduced according to a defined objective and generators are comforted by the fact that costs to be incurred are commercially sensible, taking into account the perceived value of the external benefit.
- **Objective and quantifiable** – the legally binding agreements detail implementation of agreed strategic plans and action plans that move generation to world best practice for new plant, plant refurbishment and existing plant based on defined energy efficiency - capacity bands that take account of Australia's commercial realities. Fuel and greenhouse gas savings are quantified and independently verified.
- **Operationally sensible** – the measure takes into account the potentially wide range of plant operating conditions required to meet NEM requirements.
- **Economically viable** – generators incur potential costs consistent with their business objectives, including their cost of capital and payback

hurdles, while pushing the cost 'envelope' in order to further reduce their greenhouse gas emissions.

- **Primary fuel neutral** – the measure does not discriminate against fuel types and classes of fuel thereby making participation in the measure equally attractive to all fossil fuel generators, maximising participation whilst maintaining market competition.
- **Continuous energy efficiency improvement** – the measure drives a cycle of continuous efficiency improvement by requiring generators to continue to improve efficiency, even when they are within the agreed efficiency band. Plant refurbishment and new plant are required to meet higher levels of efficiency, consistent with technology improvements and economic opportunity.
- **Transparent** – participating generators are required to report annually to the Australian Greenhouse Office and to provide annually a public report.
- **Addressing externality while maintaining competitiveness** – the purpose of the measure is to abate the emission of greenhouse gases within a cost structure that maintains dispatch order merit and value to the business.

To summarise, the GES measure is consistent with the Productivity Commission's objective of advancing opportunities that improve energy efficiency and are cost-effective to individual producers.

Apart from the GES measure, NGF wishes the following points to be noted with respect to electrical energy efficiency:

- **Cost-reflective consumer pricing** – The NGF and its members support the need for cost reflective price signals for electricity consumers as the most appropriate way to provide a better balance between demand and the true cost of supply.

However, it is unrealistic to assume that this will better drive energy efficiency as electricity use is notoriously unresponsive to price signals.

There is little global evidence that more cost-reflective time-of-use pricing will lead to more energy efficient outcomes. Responding to price signals, requiring at least a ten-fold price differential between lowest and highest prices, will lead to some load shifting where this is practicable (i.e. having real loads to shift) but there is little evidence that it will lead to higher energy efficiency. In general, US evidence suggests that consumers may curtail some load where possible but this type of voluntary (or involuntary) conservation should not be confused with energy efficiency or efficiency improvements.

It is also unrealistic to assume that all consumer classes, and in particular residential consumers, can be fully exposed to the full price fluctuations in the NEM. More measured, cost-reflective tariffs are likely

to offer more practical opportunities to smooth out the price differences between low off-peak prices and peak prices, while providing incentives for off-peak uptake.

**National energy efficiency target and requirements on major energy users** – The NGF and its members do not support the implementation of national energy efficiency targets as a policy option to boost energy efficiency for energy intensive energy suppliers and energy intensive users because mandated measures of this kind are unlikely to be cost-effective for individual producers. As stated previously, electricity generators optimise their conversion efficiency consistent with capital and operating costs in meeting their competitive market requirements. Generation businesses employ highly skilled professionals to constantly optimise plant efficiency consistent with business needs.

Given the focus of the Inquiry into ‘energy efficiency improvements which are cost-effective for individual producers and consumers’ electricity generators support energy efficiency measures that are ‘stimulatory’ rather than ‘regulatory’. The GES measure detailed above is a useful example of this. Mandating levels of energy efficiency for electricity generation is likely to be economically inefficient and potentially costly for a highly technical energy industry already operating in a highly competitive market.

- **Network constraints** – constraints on transmission and distribution networks can reduce supply efficiency by restricting centrally dispatched efficient generation and through line losses. Network constraints can lead to failure to meet consumer demand even when sufficient generation is available. Network driven demand response measures may alleviate network constraints by reducing or shifting load but, in general, such measures do not improve energy efficiency *per se*.
- **Distributed generation** – well-located and firm capacity distributed generation can improve supply efficiency through potentially more efficient generation, principally generation with a combined power and heat mode, and through reduced network losses. However, poorly located distributed generation can worsen overall supply and network efficiency and significantly increase network costs and costs of ancillary services, while non-firm supply capacity may not be available when most needed.
- **Renewable energy** – the generation of electricity from renewable energy sources may, or may not, be energy efficient, although current government measures such as the Mandated Renewable Energy Targets and state-based measures are designed to value efficient generation. Renewables-based electricity generation has potential climate change advantages in either being zero greenhouse gas emitting or being greenhouse neutral, but neither necessarily equate to being energy efficient (for instance, the combustion of biomass can be

very inefficient in generation terms).

- **Benefits of electricity use** – however electricity is produced, electricity provides for a staggering array of energy services, including a large range of essential energy services. In the main, electricity use is extremely efficient in that nearly all of the electrical energy in most cases is converted to deliver the required energy service (whether or not the energy service is needed is a separate issue determined by consumers). Further, electricity is the cleanest energy source and non-polluting at the point of use, a key benefit for already polluted urban environments. The environmental and social benefits of seamlessly delivering vast amounts of energy in the form of electricity when needed into large urban centers and sparse rural areas should not be understated or undervalued.