



ENGINEERS  
AUSTRALIA

# Energy Position Statement

2016

## Australia needs a domestic energy policy

Australia has an abundance of natural energy resources which have underpinned national prosperity over the past 50 years. Energy is an essential input for all Australian industries with transport, electricity supply, manufacturing and mining the largest users.

Australian energy policies often mix trade and domestic energy consumption policies together. The two are inextricably linked because Australia is a net importer of transport fuels such as oil and refined petroleum products, and a net exporter of other energy fuels such as coal, natural gas and uranium. Australian exports of fossil fuels such as coal and gas make contributions to global energy supply and global emissions.

This policy statement is primarily directed at domestic energy consumption policies. Energy policy should be comprehensive and cover all sources of energy use in Australia. Too often, discussion of energy consumption focuses on electricity use to the exclusion of other sectors. This policy statement covers all sources of energy used in Australia.

The 2015 United Nations Climate Change Conference in Paris (Paris COP21) reaffirmed the objective to restrict global warming to less than 2 degrees above the pre-industrial global average temperature. Future Australian energy policy will be constrained by the Paris COP21 agreement through Australia's commitment to an emission target of 26 to 28 per cent reductions on 2005 levels by 2030, which is just around the corner.

This target will be exceedingly difficult to achieve unless all aspects of energy use play their parts. If Australia is to meet this target, and remain globally competitive, it will need to transition to a new energy paradigm. Australian engineers will be crucial to the shift to this new paradigm as they have the critical skills that can prosper in a future economy with reduced emissions.

## Energy productivity

The Australian government has signalled energy productivity as a major focus of Australia's energy policy through the release of the Australian National Energy





Productivity Plan (NEPP). Through this plan the nation will manage and embrace changes in the energy industry, as well as help meet emission reduction targets.

Energy productivity is measured as GDP per energy unit used. Energy productivity improvement is the combined outcome of restructuring towards lower energy consuming industries and energy efficiency.

The NEPP sets a notional target of 40 per cent improvement in energy productivity between 2015 and 2030 and over half of the 40 per cent target could be achieved simply through continuation of current trends and within existing funding programs. These arrangements rely excessively on current trends in industry restructuring. Engineers Australia views this passive approach as insufficient to meet Australia's future energy challenges and its emissions reduction ambitions.

#### **Recommendations:**

- That the Australian government reconsiders its NEPP to build on current industry restructuring trends, focusing on lower energy using industries and promoting an aggressive approach to energy efficiency.

#### **Energy efficiency**

Energy efficiency improvement is achieving the same production and/or consumption outcome using less energy. Research by the International Energy Agency (IEA) shows that energy efficiency improvements not only save on the cost of energy used

but could achieve large emission reductions over the next 20 years. Energy efficiency is a form of direct action that achieves results in most policy environments. Energy efficiency is the key to a dynamic energy productivity policy.

Energy efficiency improves energy productivity by reducing the amount of energy required for powering homes, businesses, vehicles and industries, which in turn reduces the amount of energy needed. Because energy efficiency improvements can be achieved in almost all uses of energy across all sectors of the economy, Engineers Australia believes that Australia needs an energy efficiency target to account for changes achieved and to guide progress along the lines proposed by the Prime Minister's Task Group on Energy Efficiency in 2010. Setting a target to achieve energy efficiency improvements of 30 per cent by 2030 would be a major and cost effective step towards Australia achieving its emissions reduction target and containing the cost of restructuring energy use in Australia towards lower or zero emissions.

There is split jurisdictional responsibility for energy efficiency improvements and this has been a key factor in why progress has been exceptionally slow. Important improvements have been made, including improvements to the efficiency of electrical appliances, phasing out incandescent lighting in favour of other forms of efficient lighting, and improvements to the energy efficiency of buildings. However, much of the improvement has not been led by political

leadership, but by consumers and other energy users who have made energy use choices in their own interests.

There is substantial potential to build on this foundation through fundamental reform to energy efficiency governance arrangements and the extension of energy efficiency programs to all sectors of the economy. Engineers Australia believes that an energy efficiency target should spear-head such reform. Energy efficiency improvements require some changes to government policies to eliminate barriers to the adoption of new approaches. These barriers include split incentives, information failures, lenders favouring existing approaches while assigning higher risks to new approaches, early adopter disadvantages as well as barriers to the commercialisation of new prototypes.

Energy efficiency is an integral aspect of engineering and Australia's engineering profession is well placed to contribute to the implementation of an energy efficiency target quickly and effectively.

#### **Recommendations:**

- That the Australian government adopt an energy efficiency target of 30 per cent by 2030 as the means to drive progress under its NEPP, improving Australia's overall energy productivity program.
- That the Australian government lead reform of energy efficiency governance arrangements to ensure a broad



base of energy efficiency improvements across all jurisdictions and encompassing all sectors of the economy with a national energy improvement target the focus of new arrangements.

### Transport energy

The transport sector is the largest energy user and a significant greenhouse emitter in Australia and has yet to be targeted by formal energy efficiency policy. There are two important facets to transport energy use.

The first is transport energy security. Australia has become increasingly dependent on imported fuels. This is because demand continues to rise and Australia's supply of crude oil that is suitable for domestic refineries has rapidly depleted while aging refineries have been retired. As a result, Australia's transport fuel security is far more exposed than ever and this has been compounded by our persistent failure to comply with the IEA requirement on emergency oil stocks.

The second is energy conservation, and thereby emissions reduction through improved efficiency in the use of existing fuels, more efficient vehicles, and through the adoption of alternative fuels changing the transport modal mix. Just as consumers have moved ahead of policy makers in other areas of energy use, many Australian motorists have chosen more fuel efficient cars leading to some improvements in these areas.

Australia has no energy efficiency (nor emissions reduction) policies for transport. Meanwhile mandatory fuel efficiency or emissions standards for light vehicles are in place for approximately 80 per cent of the global light vehicle market, including the USA, the EU, China, Japan and India. Australia has considered the implementation of new measures to address fuel efficiency, but has to date favoured a 'business as usual' approach. Engineers Australia believes this approach is inadequate to achieve meaningful change.

Motor vehicle technology is changing with more hybrid-fuelled and electric vehicles becoming available, and new hydrogen fuel cell vehicles emerging. Many countries actively encourage adoption of alternative fuel vehicles, but similar policies have not been considered in Australia.

Conventionally fuelled vehicles have improved efficiency potential, but there are limits to progress and it is prudent for government policies to embrace a diversity of potential solutions.

Australia will need to make an overall transformational change in the transport sector, optimising effective freight, transport and energy strategies, leveraging on economies of scale. Broader changes to existing transport models are required; primarily a shift from road to rail for long haul freight, and from cars to public transport for urban transportation.

Transport infrastructure projects should ensure that all major projects achieve a net economic, social and

environmental outcome within a sustainable framework for the future. This will need to include appropriate price signals to internalise externalities. These issues have been discussed in Australia for some time but there has been a dearth of action and overall progress has been slow.

### Recommendations:

- That all levels of government reduce our exposure to imported transport fuels through an integrated approach to transport energy efficiency and transport modal change.
- That the Australian government introduce policies and programs leading to an energy efficient and low emissions transportation system, including mandatory fuel efficiency standards for all vehicles, active encouragement and promotion of alternative fuelled vehicles and more efficient combinations of transport options.
- That these changes be implemented within the framework of a comprehensive energy efficiency target as recommended above.
- That the Australian government uses its financial leverage to direct infrastructure planning and investment towards active integration of more efficient transport modal mixes, particularly in urban transport areas and between urban and regional centres.



## Electricity generation

Access to reliable electricity supplies is crucial for Australia's continued industrial and commercial prosperity, and to the standard of living enjoyed by Australians. At present, the dominant fuel for electricity generation is coal, supported by gas. However, electricity generation has become characterised by stagnant demand and aging plants and technology.

Within a decade, many plants will reach the end of their commercial lives. The question then will no longer be whether these plants need replacing, but how fast and with what technology this can be achieved without disruption to electricity supplies. These problems must be formally recognised in government policy because new investment is unavoidable if Australia expects to meet its Paris climate change obligations, and because the work force for current electricity generation and associated regional employment should not be ignored.

Engineers Australia believes that governments should adopt a market based approach complemented by structural transition programs to initiate necessary changes. This package should adjust institutional arrangements to facilitate change, should incorporate removal of direct and indirect subsidies to fossil fuels, and should include pricing that reflects externality costs within a triple bottom line framework. Temporary assistance governed by transparent sunset arrangements may be necessary to overcome barriers to

the commercialisation of new zero or low emission technologies and to overcome barriers faced by early adopters.

The full portfolio of new electricity generation options should be considered including solar PV, solar thermal plants, wind, thermal, hydro, geothermal, bio-mass, waste gas and ocean wave energy. Other options include storage of electricity, micro-grids and demand management. These technologies have been demonstrated to be economic depending on locational considerations. Engineers Australia notes in particular that the rapid uptake of solar PV and the emergence of mass deployment of battery storage have proceeded at a pace that has surprised most experts and policy makers.

Further research and development into how renewable generation and energy storage are best deployed is also essential. In the near future, there may be options to transition from almost complete reliance on centralised electricity generation to a more shared system with distributed electricity generation. Investment that has occurred in transmission and distribution will have enhanced value in these arrangements.

### Recommendations:

- That all levels of government proactively develop plans to restructure electricity generation in Australia, recognising that aging existing plants must be replaced, that Australia has committed to ambitious emissions reductions and that the communities associated

with the present generation of plants will need structural assistance in the form of transitional plans well before plants cease to operate.

- That all levels of government adopt a market based framework for this restructure complemented by the removal of direct and indirect subsidies for fossil fuels, and temporary assistance with sunset provisions to overcome barriers to commercialise new zero or low emissions technologies.
- That all levels of government consider the full portfolio of electricity generation options choosing the most suitable based on the locations to be serviced and including the possibility of mixed centralised and distributed electricity generation.