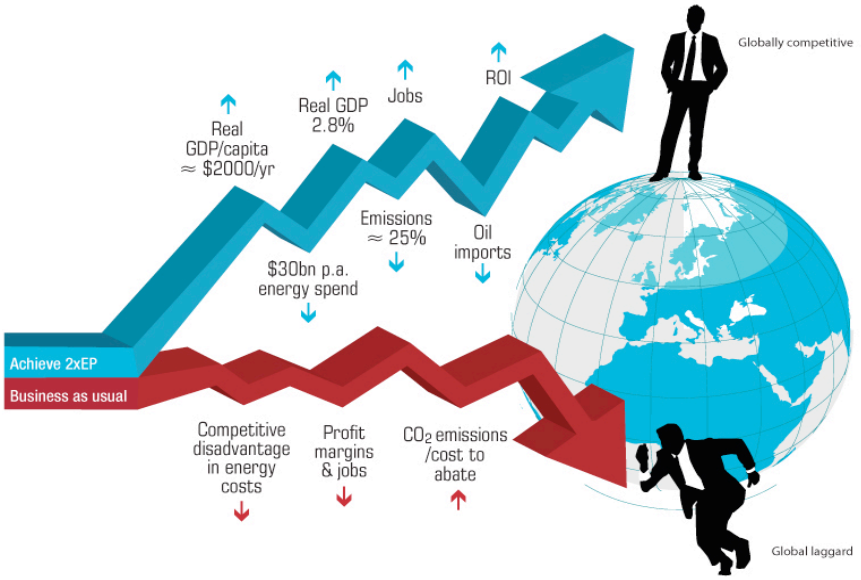
Unlocking Australia's energy productivity potential

2xEP
Doubling Australia's Energy Productivity

At $111 billion per annum, energy is a substantial and growing cost to end users – equivalent to about 8% of Australia's GDP. Sharp price increases for electricity and gas have combined with poor energy productivity to damage the competitiveness of our economy. The commodity price boom masked poor performance in multi-factor productivity, and the commodity price boom is over. Australia now faces a stark choice. We can continue as we have in the past or strive to dramatically improve energy productivity. The benefits of change are clear. Failing to change will see Australia run against the global trend, slip further in competitiveness, and risk reduced living standards.



The energy productivity imperative

Australia's economic growth is determined predominantly by productivity performance. For nearly two decades economic productivity in many sectors of the economy has been stagnant or in decline. The underlying performance of the Australian economy has been masked by the commodity price boom but since 2012 Australia's terms of trade have been declining with the drop in mining commodity prices.

In order to counter the effects of an ageing population and falling terms of trade, growth in labour productivity would need to increase to 2.7% per annum – almost double the rate of the past decade – just to maintain historical levels of growth in per capita income.[i] A focus only on labour and capital as the means to boost productivity is no longer sufficient. Businesses and governments also need to optimise energy and other inputs.

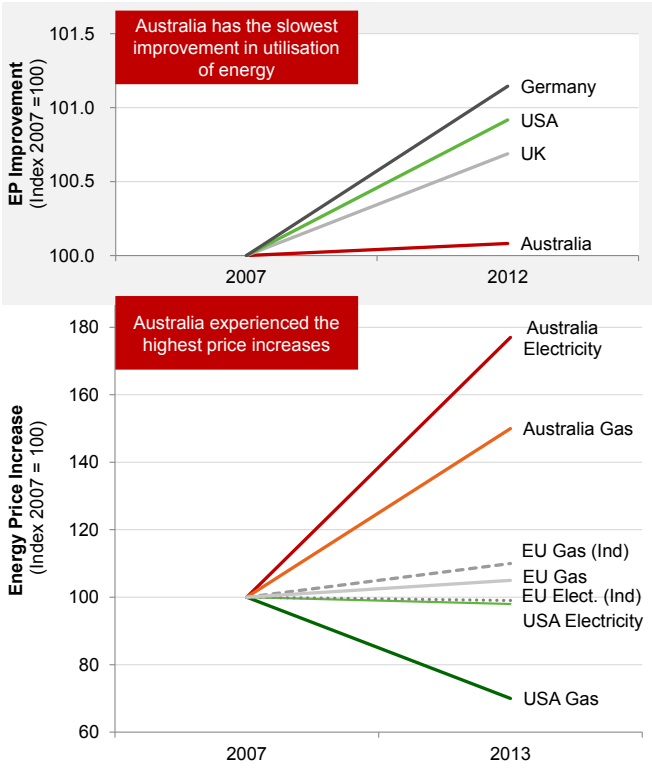
Australia has fallen behind key competitor nations in terms of our relative rate of improvement in energy productivity. This problem has been compounded by sharp increases in energy prices to result in plunging energy competitiveness

The Australian economy uses $110 billion of energy annually, and there is an opportunity to save about $30 billion/year by 2030. But, the energy productivity opportunity is far greater than direct energy cost savings. Energy productivity aims to maximise the total value created per unit of energy (GJ) consumed and per dollar of energy spend.

The 2xEP Roadmap

The Australian Alliance to Save Energy (A2SE) launched the 2xEP initiative against a backdrop of mounting evidence of the contribution energy productivity can make to Australia's growth and prosperity. The project seeks to engage intensively with stakeholders towards a well-informed, widely embraced and practical plan. The aim of this initiative is to galvanise business and government support for a voluntary target of doubling energy productivity by 2030.

Figure 1: Energy competitiveness plunges



The value proposition

The importance of energy productivity is recognised by Australia's competitors. In the USA, the Obama administration adopted a target of doubling energy productivity (2xEP) by 2030 from a 2010 base year. The EU has set an energy efficiency target of 27% improvement by 2030 compared to 1990 levels (and there is debate about increasing the target to 40%). China has also set aggressive targets to improve the energy performance of its economy. Australia is considering an energy productivity improvement target of up to 40% by 2030 (from a

2015 base year), and is currently developing a National Energy Productivity Plan.

Modelling by the 2xEP program suggests that doubling energy productivity at the economy-wide level[ii] is achievable over the 20-years from 2010 to 2030 and in an economically efficient manner. The modelling is supported by findings from more recent studies.[iii] The proposed 2xEP national target does not imply that all sectors of the economy can double their energy productivity – some sectors may be able to do more, whilst others may need to increase efforts simply to maintain current levels of energy productivity.

Energy typically constitutes between 5% and 10% of the operating cost of Australian industry, and up to 20% in some heavy industries. It is a significant cost, but one that can be managed. When margins are under pressure energy cost can have a direct bearing on the viability of a business. However, energy productivity is more than just reducing energy cost. It is about maximising the value created per unit of energy (GJ) consumed, as well as the value per dollar of energy spend.

The benefits of achieving the 2xEP target are significant in the current economic context. Compared to the business as usual forecast for Australia in 2030, the benefits of 2xEP include:

- Real GDP ↑ ≈ $59.5bn (2.8% larger)
- Real GDP per capita ↑ ≈ $2000
- Energy spend ↓ ≈ $30 billion, assuming energy prices remain constant in real terms

Lower consumption of liquid fuels will reduce demand for petroleum-based imports with positive flow through effects for Australia's energy security and balance of payments.

Furthermore, achieving a reduction of $30 billion on annual energy bills by 2030 is likely to involve new capital investment of some $100 billion with benefits for Australian businesses and workers.

Apart from the economic benefits to be gained from 2xEP, modelling shows that 2xEP will also reduce carbon emissions by 25% from the government's business as usual forecast.

Energy productivity defined

Energy ***productivity*** integrates energy efficiency, the co-benefits of energy efficiency (such as reduced maintenance costs, health benefits and the value of reduced carbon emissions), energy market dynamics (that determine the price per unit of energy), as well as the relative economic value created from energy inputs. There are two core measures of energy productivity:

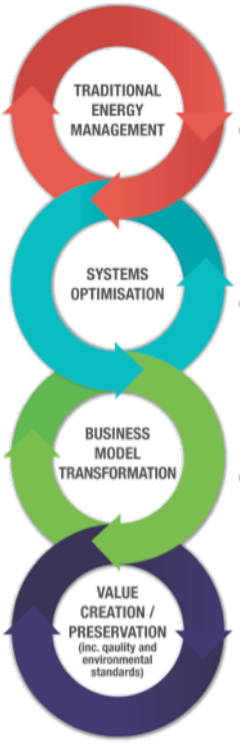
$$\frac{\text{Value of output (real} - \$)}{\text{Energy use (GJ)}} \quad \text{and} \quad \frac{\text{Value of output (\$)}}{\text{Cost of energy (\$)}}$$

Gross Domestic Product (GDP) or company revenue is typically used as the proxy for value created. It is recognised that this does not capture the qualitative aspects of economic activities. A set of shadow measures is proposed to track "qualitative dimensions" that do not translate simply to dollar values.

How do we improve energy productivity?

Opportunities to improve energy productivity are as diverse as the economy and the firms within it – ranging from traditional energy management (consumption and tariff management, energy efficiency and demand response) to innovative new business models that revitalise the relationships between capital, labour and energy. Figure 2 illustrates the four strategic areas of opportunity for energy productivity improvement.

Figure 2: Energy productivity improvement



The 2xEP program is working with businesses, associations, governments and research partners to develop an economy-wide Roadmap and a national target for energy productivity improvement. The program is also working to a level of detail with key sectors of the economy including manufacturing, mining, agriculture, transport and the built environment. The scope and potential for improvement varies between sectors. There is also potential for improvement between sectors as they interlink; manufacturing and transport for example.

We are relying on stakeholder expertise to develop and then implement a Roadmap that is effective. More information about energy productivity, the 2xEP program and particular sectors is available at 2xEP.org.au. Contact us by email at 2xEP@A2SE.org.au

Australian Alliance to Save Energy

A2SE is an independent, not-for-profit coalition of business, government and research leaders working to promote energy efficiency and decentralised energy. A2SE aims to inform, influence and advance the efficient use of energy in Australia.

References

[i] Fraser, J. (2015, February). *Australia's Policy Challenges*. Address by Secretary of the Treasury to the Committee for Economic Development of Australia. Sydney

[ii] Stadler, A., Jutsen, J., Pears, A. & Smith, M. (2014, November). *2xEP – Australia's Energy Productivity Opportunity – Framing Paper*, Sydney : A2SE

[iii] Vivid Economics (2013). *Energy Efficiency and Economic Growth: Report prepared for the Climate Institute*. London: Author; ClimateWorks (2015), *Australia's Energy Productivity Potential*, Melbourne : Author; Weiss, G. (2015). *Doubling Australia's Energy Productivity by 2030,* Sydney : Energetics