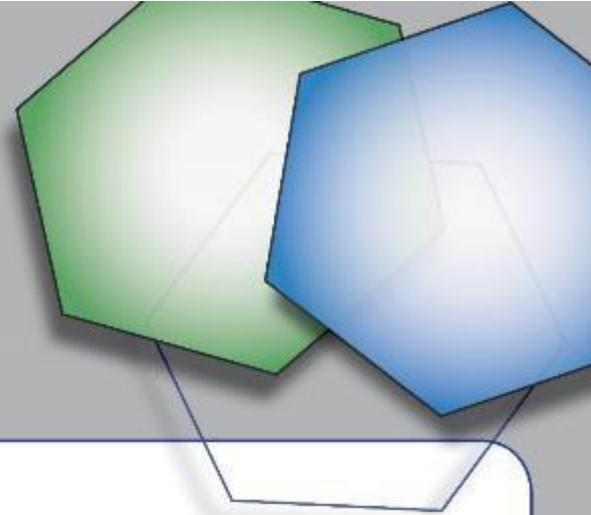


**Energy Policy Institute  
of Australia**



**Public Policy Paper**

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## **THE ECONOMIC IMPACT OF HIGH ENERGY PRICES IN AUSTRALIA**

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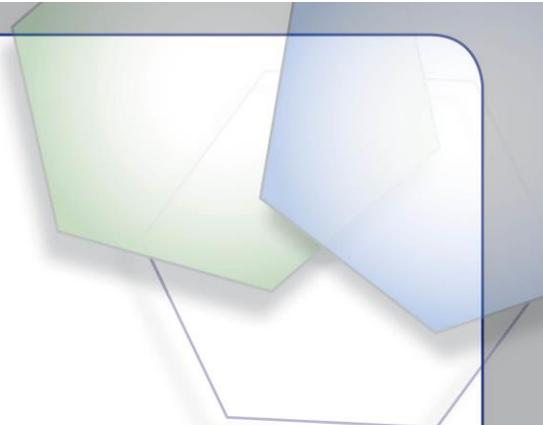
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## Executive Summary

Australian industry and our community have enjoyed the benefits of relatively low electricity and gas prices for many decades, without suffering any significant price shocks. Competition policy reform brought significant benefits to the energy sector in terms of productivity gains. This relative energy price stability underpinned the international competitiveness of many of our industries, trading off other higher costs (labour, \$A, etc.) whilst striving to be productive and efficient. This also materially underpinned the affordability of energy for all consumers in our community through access to relatively low priced energy in households, competitively priced goods and jobs in local industries.

This has now changed as electricity and gas prices escalate rapidly, driven by market factors to some degree but more by energy policy decisions – in the absence of a cogent overall energy policy framework in Australia. The three tiers of Government have all contributed to price escalation without anticipating the impacts that would follow from their cumulative effects.

In this new era of relatively higher energy prices in Australia, we are witnessing the rapid restructuring of the more energy-intensive or energy cost-exposed businesses, driving many to move production abroad. Many cannot manage multiple changes in costs and have lost the edge that low-cost energy gave them to remain competitive. It is also driving the restructuring of investments in key parts of the energy supply sector in a way that is not largely reflective of an open, competitive market sector.

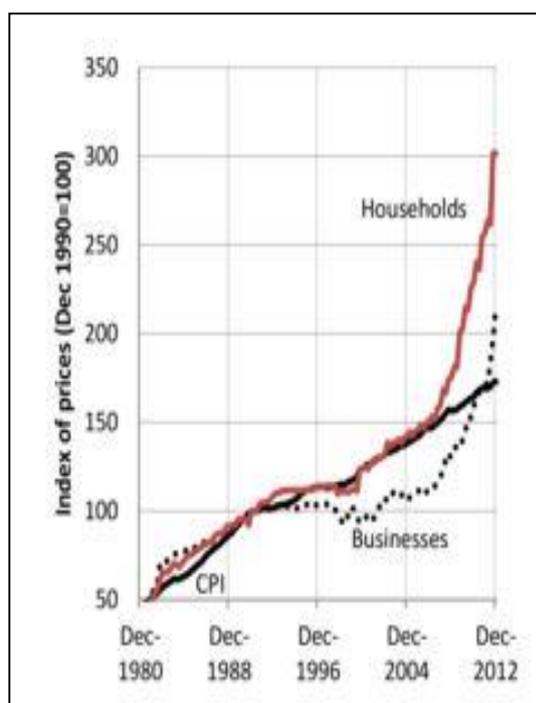
Unhappily, it is also increasing the cost of living burden on all Australians, propelling many on low or fixed incomes into energy poverty – which may eventually result in a restructuring of welfare benefits and the way people accommodate themselves.

Whilst it is recognised that Australia needs to remain internationally competitive and that the allocation of resources needs to be market-driven, even if this entails losing key industries such as packaged food, metals, etc., this is somewhat hollow rhetoric when policy decisions have been a major driver of energy price rises resulting in a reduction in competitiveness.

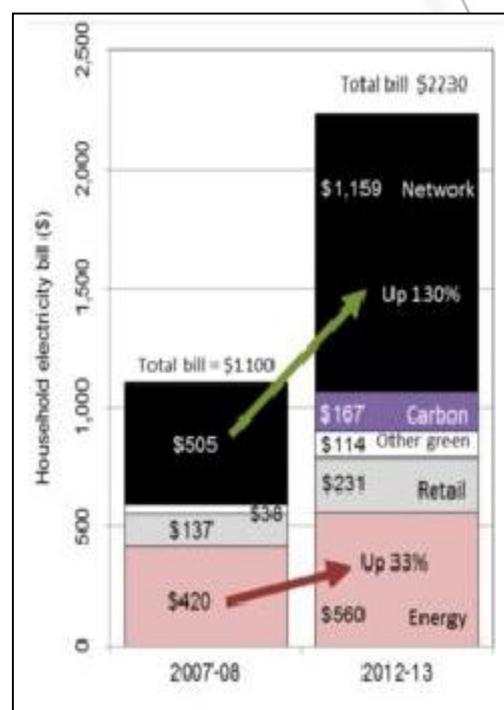
It has also left our energy supply industry in free-fall domestically as demand declines. Electricity demand has proven to be elastic. This was not anticipated by the supply industry historically although forecasts of this effect go back to 2008 when major price increases were first anticipated. Worse, this impact is still not well understood or calibrated; the forecasting of energy demand in Australia lacks credibility and a robust methodology - to the detriment of sound investment decisions.

## Electricity and gas prices on the rise

Over the 6 years between 2007 and 2013 Australian electricity and gas prices have gone through an extraordinary escalation, both rising more than 100% in some states. Furthermore, gas prices are continuing to rise.



Electricity price index, December 1980 to December 2012 Electricity Network Regulatory Frameworks, Inquiry Report, Vol 1, Productivity Commission



NSW Household electricity bill increase from 2007-08 to 2012-13. Electricity Network Regulatory Frameworks, Inquiry Report, Vol 1, Productivity Commission

## The causes of high energy prices

High energy prices have largely been attributable to policy and regulatory interventions of one type or another but particularly to the economic regulation of networks in some key states and the application of a myriad of greenhouse gas mitigation measures.

In 2007-2008, it became apparent that electricity prices could escalate based on the likely regulatory outcomes from the network pricing reviews for NSW distribution entities. It had been foreshadowed since 2004 that network pricing reform would be required to manage the impacts of air conditioning load at peaks. The 2009-2014 NSW network revenue determinations were the first under the new Australian Energy Regulator and coincided with:

- a very uncertain future for economic growth due to the global financial crisis (GFC),
- claims for major upgrades of ageing assets, driving historically high capital investment in the networks, and
- a move to prescribe (through jurisdictional regulation) much higher levels of reliability ( $n-2$ ) in some areas.

High capital expenditure rates for the networks were consequently approved, initially in NSW and followed shortly after in Queensland, which set off a major electricity price ratchet in those States.

The investment and regulatory challenge at the time was to forecast the effect on demand for power of a major escalation of network prices in subdued economic conditions. The forecasting techniques of old would prove very unreliable (and remain so, requiring urgently needed change).

## The end of “inelastic” of electricity demand

The traditional wisdom in the energy industry was that electricity use was relatively “inelastic” – it would not be influenced by price substantially – it was an “essential” service – the consumption growth graph always pointed up – even when the consumption trend was down.

Some challenged the traditional wisdom, arguing that energy was indeed elastic and that the industry would see a *decline in demand* (not just flat load growth), that prices would continue to be driven up (due to large fixed costs and lower system load factors) and that the industry would enter a “*death spiral*” effect until some base usage was reached.<sup>1</sup> This trend had been seen in the gas industry prior to the introduction of natural gas in the early 1980’s - when the old “*Towns Gas*” produced from oil and coal escalated in price rapidly with the growth of underlying costs – but it was novel in the electricity industry.

The subsequent *regulated* electricity price shock (as it was not driven by wholesale energy costs or retail margins – although there was also a high greenhouse gas mitigation policy component as outlined below) demonstrated that demand for energy was elastic – just as for any other good and in line with economic theory. This came as a shock for people working in the electricity industry as many had *never* seen a decline in demand in their entire working lives – it was new territory and demand forecasting failure was widespread.

At the same time, other policy interventions also contributed to *accelerating* these effects – for example the heavily subsidised and policy mandated take-up of solar technologies. This reduced the revenues but not the costs of networks as they still had to meet the demand at peak times. The early 2014 heat wave provided an example, where peak demand reached close to historical highs in affected states even though overall consumption had been falling.

The plethora of greenhouse gas emission reduction schemes and multiple other policy interventions, at all levels of government, have also added directly to delivered costs through various imposts.

The lack of growth in consumption and declining overall demand inevitably drove price increases – because this was the only way to pay for the major investments in the networks. Had there been strong growth at the time, the price increases would have been mitigated.

## Gas demand also falling

This story is being repeated in the gas industry, albeit driven by different factors. The market prices for gas are escalating on the east coast in response to a huge demand for indigenous gas for LNG production and export, driving up the value of new gas and hoovering up existing low cost of production gas. Some new price/demand balance will eventually emerge on the east coast domestically reflective of costs of production (as we are now seeing in Western Australia) as the price bubble drives both demand and supply responses.

But once again policy issues are limiting the ability to bring on new production in some sectors and the network impacts are yet to materialise. As outlined, investment in network assets comes from either growth in demand or from increases in prices (or a combination of both) and high prices are already driving down demand for gas.

The impact on gas use for power generation due to the combined effects of reducing electricity demand and escalating gas prices is becoming stark – several gas generators have shut down or significantly curtailed production and resold their gas contracts (profitably) in 2013 and early 2014. The flow-on to industrial and domestic use is set to go the same way as electricity demand – down.

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<sup>1</sup> *Energy Industry Supply and Demand - Responses to the Carbon Economy*: Snow, April 2009, Australian Institute of Energy Conference, Sydney;  
*The Energy Market Death Spiral – Rethinking Customer Hardship*, Simshauser and Nelson, June 2012, AGL Applied Economic and Policy Research Working Paper No 31.

## Customer responses to high energy prices

Customers have responded as could have been expected – they have reduced their demand through *conservation*, through *substitution*, through *investment in more efficient products* and through simply *stopping their use*. The latter for businesses has involved relocation of energy price-sensitive production interstate or offshore, or just closing down production as it became uncompetitive. This was (and continues to be) economic theory being played out in real time.

These economic impacts appear to have come somewhat as a surprise to the energy industry and to policymakers, even though they align with well-accepted economic theory. There was a view that somehow electricity demand in particular was relatively immune from rising prices.

The realisation of the gravity of these economic impacts has caused the energy supply sector to become a major consideration of macroeconomic policy – no longer merely an issue of microeconomic reform. Fundamental structural change is now occurring in the Australian economy as it migrates to a high energy cost base.

## The impact on manufacturing industry

The impacts were also highly predictable and are still playing out in the economy in terms of generational industrial restructuring – recent high profile cases such as packaged food and car manufacture for example have a significant energy component.

Again, industrial restructuring is not a new phenomenon in Australia as during the late 1980s and early 1990s we saw the rapid decline of the textiles, clothing and footwear industry, or “rag trade”, once tariff protection was removed. There was a rapid restructure in terms of lost jobs in the sector (>100,000<sup>2</sup>) and a shutdown of plants that had been operating for many decades. But it also lowered the anticipated cost of these items in Australia from imported equivalents and what remains of the industry has itself restructured into the value-adding components that can be competitive (for example, design).

One of the key competitive advantages Australian industry has enjoyed has been low energy prices. Electricity from coal was and remains very competitive by world standards. Until very recently, gas was also competitive. Low energy prices compensated for a high cost of labour and a high Australian dollar; although manufactured items were subject to international competition, the more energy-intensive industries still had an edge.

It may be tempting to be dismissive of “inefficient smoke stack” industrial plants but most modern primary and secondary manufacturing is technically efficient and has made best use of low energy prices and other local advantages.

High energy costs also impact on industries that are not recognised readily as energy-intensive. The energy costs for materials (no matter how materials are sourced) are an input component to many other industries. A good example is housing (bricks, glass, tiles, steel, concrete, etc.) but the whole economy is in a similar dilemma – the cost escalations are unavoidable in many cases because they are embedded. The competitive advantage of energy was not just enjoyed by industry but added to the affordability for consumers of a wide range of products.

## The impact on food processing and packaging

It is not just traditional industries like metals, bricks, glass, wallboard, etc. that are now affected by high energy prices. The packaged and processed food sector is also heavily affected and is now going through the same restructuring as the rag trade, with consequences for food growers.

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<sup>2</sup> “*Refashioning the Rag Trade: Internationalising Australia’s Textiles, Clothing and Footwear Industries*”  
Michael Webber and Sally Weller, UNSW Press, 2001

The energy content and cost is significant if food has to be processed and put into containers (glass, steel, plastic), or frozen or has to be cooked and then packaged – which is much of what is found on supermarket shelves. The packaged food industry is also more easily replicated than heavy manufacturing in other countries. As well, brands are increasingly concentrated within global firm ownership. Often it is simply a case of a global firm shifting production to marginal capacity that already exists in offshore jurisdictions. This trend has already started and is likely to accelerate as gas prices continue to rise.

### The impact on power generation in the Asian region

In Malaysia, for example, there is a return from gas to coal-fired power generation due to the high LNG price impact. This is becoming a trend in South East Asian manufacturing countries as they seek to remain competitive with China and other BRIC countries. China itself continues to build coal-fired power generation each year equivalent to Australia's total coal generation capacity. The financing benchmark used for coal prices for the new South East Asian power stations is often the cost of coal ex-Newcastle – free from any taxes and policy imposts that might apply in Australia. The irony of this is remarkable with coal being exported to support competitive manufacturing.

### The impact on the Australian energy industry

There are substitution affects that can rapidly distort or restructure investments, and perceived regulatory and policy driven risks can materially add to the costs of investments. For example the concept of using gas to fuel base load (and even mid merit) power stations has gone from being a robust proposition to being placed on the shelf for possibly the next decade at least (some modelling indicates much longer) in just a space of *two years* – again through revisions to actual demand impacts from prices and the impact of the RET to date.

Renewable power station developments, despite policies for their implementation and major subsidisation, have also largely now stalled and some coal plants could be mothballed or run intermittently. High gas prices may also see an escalation in the use of residential air conditioners for the winter heating months.

These are just some examples of how the interactions of market forces and various levels of policy intervention can drive unintended (and often illogical) consequences.

### The impact on the cost of living

The rapid escalation of energy prices is also leading to an equally rapid and worrying growth in residential "*energy poverty*" – defined as consumers who will have to apply more than 10% of their income to pay their energy bills. This burden will eventually also fall on the public purse and is set to be compounded by the rise in gas prices in the populous southern states (NSW, Victoria and SA).

There is a need to much better understand the underlying drivers and trends in energy use in Australia which can only be derived from a far more granular approach to forecasting than has been adopted to date and the development of well calibrated economic models. This will assist both policy development and investment analysis considerably.

## Conclusion

Energy is a significant input cost to many Australian industries and is accounting for a growing proportion of residential disposable income for low-income households.

The consequences of rising energy prices are predictable and are now playing out in what may become a classic case study in economics in the years to come: demand destruction; loss of competitiveness of Australian industry that relies on reasonably priced energy driving offshoring of production; and rising energy poverty in the residential sector.

The offsets are intended to be greater national income from international sales of energy and the associated economic benefits from being able to source goods from more cost-competitive countries.

There is rigour and logic to these arguments, but many of the domestic market consequences come from policy decisions, not from efficient resource allocation, so the full impacts of what may seem reasonable policy decisions at the time are now coming to light and will become more transparent over the next 3 to 5 years – and will be unpalatable.

The question then is – do we have the trade-offs right – are the impacts of the policy decisions worth the pain of the restructuring? Do we even understand the consequences?

It is interesting that strong economic argument is put forward for the development of energy export industries but that the same rigour and logic is largely lacking for domestic energy policy decisions. A more holistic approach is required, with rigour, and this needs to be redressed urgently.

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## Author

*After graduation as a Chemical Engineer Jim Snow spent 12 years in the natural gas industry (AGL) holding several senior executive positions.*

*He has since then held senior executive positions with Energy Developments Ltd running their Development and Construction Group, was CEO of Hunter Electricity, CEO of Consulting for Energetics Pty Ltd and was a founding Vice President in Australia of the Boston based consulting firm Charles River Associates which evolved to become Oakley Greenwood in Australia.*

*Jim has worked across the energy and water industry. This has included water and energy pricing and economic regulation, demand side management, greenhouse gas mitigation and emission trading, extensive and complex modelling and price/volume forecasting work as well as building generation plants, gas pipelines and electricity grid systems, CNG and LNG facilities, managing energy retail operations and has consulted widely to the demand side, particularly energy intensive industry.*

*Jim has also undertaken large assignments internationally including spending more than two years restructuring the entire electricity industry of the Kingdom of Saudi Arabia and is currently advising on the restructure of the Malaysian industry and associated incentives based regulation of the key monopoly assets of the country.*