

AUSTRALIA'S ENERGY SYSTEM

Strange things are afoot in Australia's energy system. For one thing, demand for electricity has been falling at about 2% each year for the last four years. And more importantly, the CO₂-emissions intensity of our domestic electricity supply is now falling fast. Having peaked in financial year 2008-09, total CO₂ emissions from our electricity sector have fallen 13% from 188 million tonnes to 163 million tonnes, at an average rate of 3.3% per year. In the financial year to end June 2013, CO₂ emissions from our electricity sector fell a staggering 7%, at twice the rate of demand reduction.

For those of us concerned with the need to urgently decarbonise our energy systems to avert potentially devastating consequences for future generations, this reduction in emissions intensity is welcome news. That Australia has the highest emission intensity, and hence greatest carbon exposure, of any developed economy makes it particularly timely. The story of this demand reduction for 'poles & wires' electricity is nuanced and has significant implications for the future of our electricity supply. And buildings are playing a key part in this quiet revolution.

The reduction in demand for 'poles & wires' electricity splits in about equal measures to shifts in our economy away from energy-intensive industry, and shifts in our domestic sector directly related to our buildings and the 'punters' who

occupy them. Our buildings are rapidly becoming significant electricity producers. With more than one million domestic rooftop systems now installed, solar PV is reshaping demand profiles for 'poles & wires' electricity. In South Australia, midday demand is down around 10%, compared to where it was just three years ago, just because of solar PV.

Our buildings are becoming more energy efficient. The great positive in the political debacle of the "pink batts" scheme is that it has been manifest in reducing energy demand, as was the intention. And, perhaps most importantly of all, our building occupants are becoming more energy-wise, with price sensitivity now impacting electricity demand in what historically has been a notoriously inelastic market. While all of the factors contribute to a decline in demand for electricity served over the 'poles & wires', there is growing awareness that we have only just begun to realise the full potential to drive energy savings through our buildings. For example, a doubling of solar PV units in SA will see midday demand fall to levels comparable to the early morning off-peak minimum. And the energy efficiency of our building stock still leaves huge room for improvement.

While the reduction in electricity demand is welcome in helping to reduce the emissions intensity, it is producing challenging issues in the way we provide electrical power services. And buildings are essential to meeting these challenges.

As our demand for electricity reduces, we are necessarily seeing a dramatic reduction in the way we utilise the 'poles & wires' distribution system. By some estimates the utilisation rate of our distribution network is now declining at about 2% each year. This is necessarily putting upward pressure on the cost of delivering 'poles & wires' electricity, and is presenting huge challenges in managing the business of electricity, as well as meeting the challenge of improving national productivity.

A particular challenge is that our expectation of peak demand for electricity is continuing to grow, while our average demand is falling. Unless we can curtail peak demand growth, the price pressures on our delivery of electrical power services will continue to surge raising some analysts to raise the spectre of an impending "death spiral" for the industry. Managing peak demand is all about what is going on in our buildings.

To alleviate peak demand growth and allow for cost effective electrical services into the future we urgently need to rethink how our buildings can contribute to more effective demand management, both as electricity producers and consumers. This report provides a welcome insight into the opportunities and challenges for Australia in how our buildings can help in the challenge of the radical decarbonisation of Australia's energy system.

Source: <http://decarboni.se/publications/zero-carbon-australia-buildings-plan/foreword>