Rooftop solar reshapes energy market in South Australia.
Reneweconomy Feb 2013- Giles Parlinson.

Rooftop solar continues to have a dramatic impact on the energy market in South Australia – the Australian state with the highest penetration of rooftop solar.

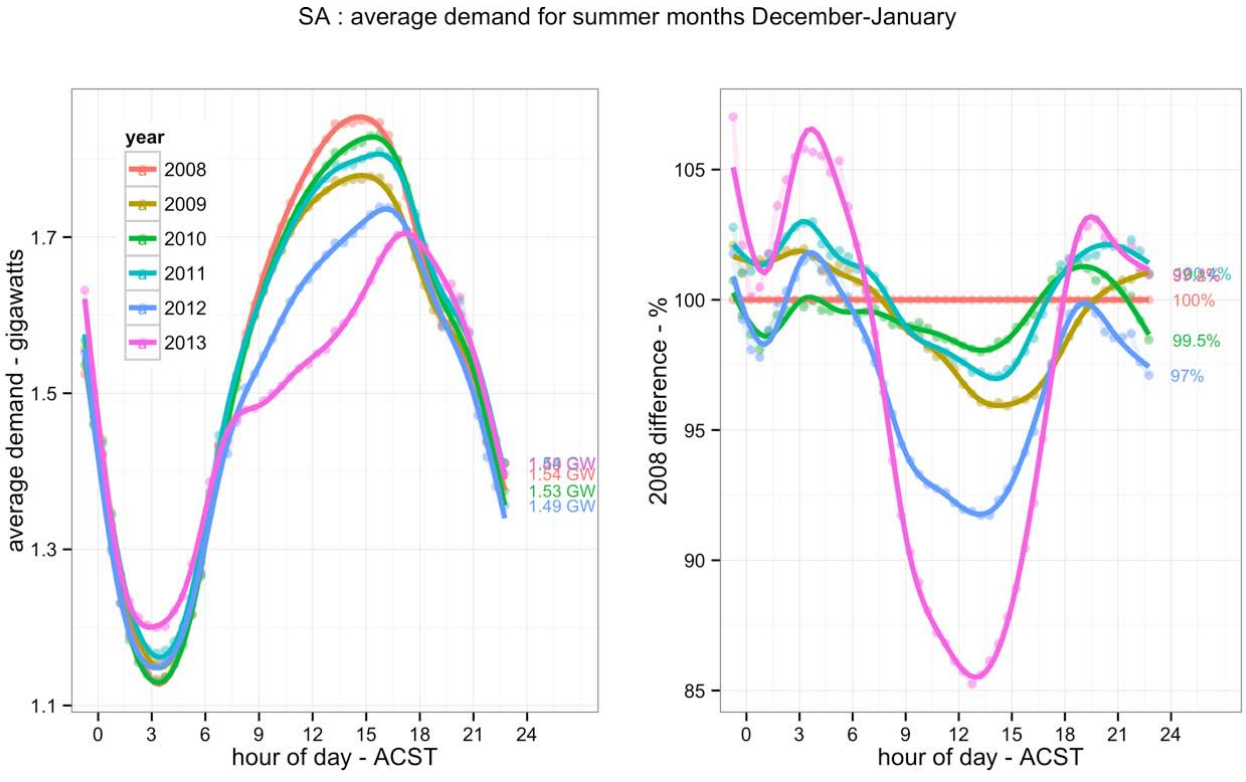
As these graphs provided by Melbourne Energy Institute's Mike Sandiford illustrate, the proliferation of solar PV is not just having an impact on overall demand in the state, it is also shaving and reshaping the peak demand curves.

The impact of solar PV in South Australia was recognised by a special study by the Australian Energy Market Operator last August. As reported then, South Australia had some 267MW of rooftop solar as at June 30, representing one in five households. AEMO said rooftop solar was accounting for 2.4 per cent of overall demand, and more than one-third of the PV systems were operating at the time of peak demand at any one time.

These graphs deliver a further illustration of their impact, as they illustrate what happened in the latest months of December and January, traditionally the period of hottest temperatures and highest demand.

Those immediately below show the average demand curves in South Australia over the last five years. The pink line shows 2012/13. As Sandiford points out, midday demand in SA this summer is down 15 per cent on where it was five years ago, even though night-time demand is up, confirming the impact of solar PV.

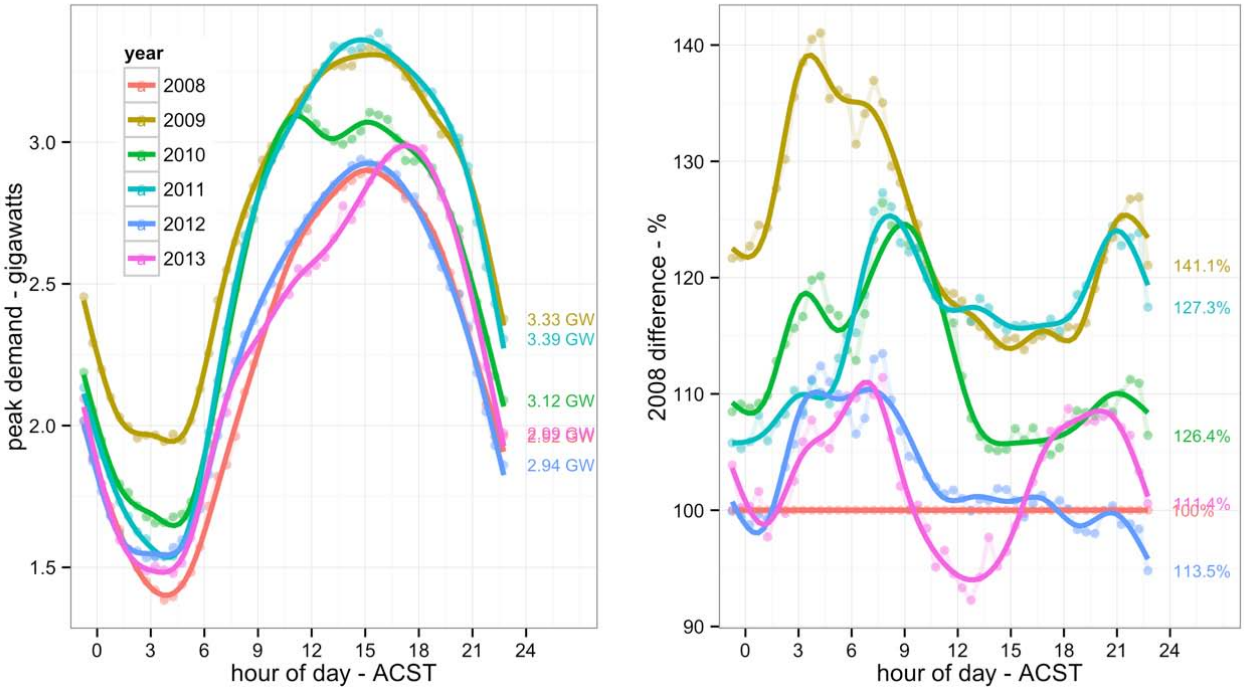
"Overall, total demand is down about 3 per cent over the same interval," Sandiford says. "I am betting all the pundits would have been expecting it to rise more than 10 per cent over interval." This accords with the AEMO estimates.



The following graphs below show the peak demand for the summer months. As AEMO noted last year, the peak demand times in the state are usually around 3pm and 4pm. The pink line shows that solar PV has been able to reduce those peaks, to the extent that the peak has now shifted to a smaller peak around 5pm, reducing the need for costly infrastructure and expensive gas peakers.

This is despite the increasing use of air conditioning, which is reflected on the graph on the right, showing that overall demand has increased around 5pm to 6pm compared to previous years.

SA : peak demand for summer months December-January



As Sandiford notes from these latest graphs: The profile is becoming both more skewed to peak in the very late afternoon, but topping out at lower levels than one might have expected from non daylight hour demand." He estimates that solar PV has shaved between 5 and 10 per cent off the peaks in South Australia.

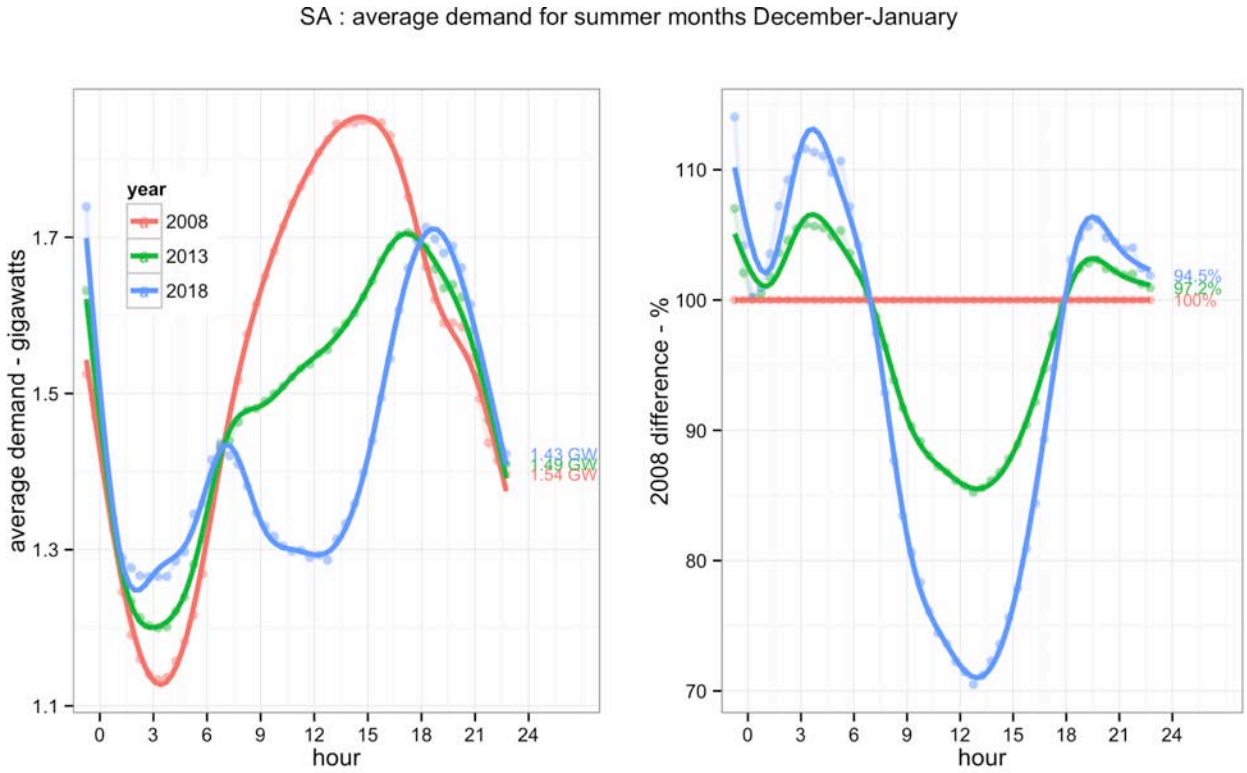
There are now smaller peaks in the morning and the evening, which might suit gas-fired generators, but not coal generators. In any case, the shift has probably removed the need for around 150MW of peaking power plant. As UBS noted last week, the **impending surge in battery storage** will reduce the morning and evening peaks.

As Sandiford has noted previously, and as UBS concluded in the case of Europe, the proliferation of solar PV is having a dramatic impact on the economics of existing generators. In fact, it is causing a revolution in the energy market – and this is without the impact of wind, which in South Australia has already exceeded 20 per cent of supply.

In South Australia, the state's only two coal-fired generators have been put in mothballs, with the Playford plant closed indefinitely, and the Northern plant opening only during the

months of highest demand. These latest graphs may question whether that was worthwhile.

But what will happen in the future? Sandiford has extrapolated the deployment of solar PV in the last five years and assumed that would continue over the next five. The results are amazing – the blue line is the key, it basically turns the midday peak into an off-peak period, taking a massive chunk in revenue from the generators who rely on spikes in demand and the accompanying pricing spikes to break even.



Given this impact, one would wonder what that does to the plan by utilities to introduce time-of-use pricing to encourage a shift in demand from the peaks to other times of the day. It would seem that the peak has already been shifted.