

Solar update

Richard Elliott attended the Solar 2013 conference in May. Here is what he discovered ...

NEWSON THE SOLAR FRONT. Over a million homes in Australia now have solar power. Renewables (so that includes wind and a tiny amount of hydro and others) is now providing over 10% of annual electricity production. Somedays in South Australia 35% of the power has come from renewables — chiefly wind. The average size of domestic solar installations has gone from 1.5kWp a year ago to 3.6kWp in the last year.

In most states the utilities and miners have lobbied to kill off all rebates, incentives and feed in tariffs. In most areas you will be paid 6-8 cents for each kilowatt hour (kWh) fed into the grid. This is about a quarter of what you pay to buy one kWh. Among the fossil minded it was thought (perhaps hoped) that this would kill off solar. To their great surprise it hasn't. What has happened is that solar power can now be created at comparable cost to coal fired — which wasn't meant to happen for years. Of course the models for calculating a return on investment are different, but in both cases you have a capital cost but solar then has negligible running costs.

The response to the reduction of feed

in tariff to 'wholesale' is that home owners are now installing systems where the panels are orientated east and west (whereas with more generous feed in tariffs they would face north to maximise total production and revenue). This means that especially in summer, people are generating and consuming their own power in the morning and evening peak demand periods, rather than buying power.

It wasn't many years ago that the annual peak demand shifted from cold winter days to high summer with the plague of air conditioners. Many made necessary by appallingly architecture and buildings quite unsuited to our environment. Nobody ever died from heat exhaustion in a house in Australia in the 1950s. People had shade and eaves — and black roofs hadn't been invented. Because west facing solar will peak at close to the time of the air conditioning peak demand it is likely that we'll shift back to winter peaking again.

The other game changer now is the move to home energy storage. Pundits thought that this change was years away from being economical. But largely due to the rapid battery devel-

opments for electric vehicles, particularly scooters in China, it's now here.

There are caveats. Solar might not be suitable if you are wholly reliant on electricity for winter space heating, or have huge electrically heated hot water consumption for example.

If it is suitable, home-owners can install a reasonably sized solar power system. This may require good east and west exposure. After sunrise this is used to start recharging the battery and meet the morning load spike. Later in the day when the battery is fully charged, excess power is then fed into the grid even if you are not paid much. Once the sun sets the house uses power preferentially from the battery rather than buying from the grid. If the battery can't cope, power is taken from the grid.

The batteries used are all Lithium Iron Phosphate, often called LiPO, as currently used in most electric vehicles. These are quite small and housed in a fridge-sized cabinet in the case of ZenPower, or in a box not much larger than the solar inverter in the case of SunSink from Aust. Solar Systems.

In the case of SinSink the batteries are leased and replaced by the Company as a high voltage pack. They use four packs of forty, ten-ampere/hour cells which are securely locked away in a steel box. They get good battery life by running an advanced 'active battery management' system where all cells are effectively charged individually. If one cell is weaker than its mates, it alone gets extra charge. The cells last a long time because they are well managed. With the price of these batteries falling so quickly the company plans to replace batteries at five-yearly intervals, whether they need replacing or not.

Sungevity is a new player in Australia offering different financial models where they will install solar PV on a lease arrangement and the system is paid for by the home-owner's electricity account savings. They offer a couple of different models and had a recent promotion through Get-Up.

What's not going so well.

There have been many failures of the rooftop mounted solar isolators — mostly due to water ingress. There were many people who predicted this would happen and apparently it caused much discussion at the Standards Association meetings. All states now have the requirement and at the conference vendors offered replacement roof top isolators with aluminium or stainless steel weather

proof covers which should last a bit longer — many have failed within a few years.

Some 'Tier 3' (a politically correct way of saying very cheap) inverter manufacturers have mercifully left the market after selling unreliable products. Rising electricity costs have helped encourage consumers to replace failed inverters. This was more of a problem at the bottom end of the market. There have also been reports of some panels delaminating within a couple of years. Unfortunately none of the approval tests assesses their longevity.

The grid feed with storage systems are catching on.

Until recently many owners didn't understand why their solar systems stopped working when the grid failed. With storage this doesn't have to be the case. It's also partly because people enjoy the autonomy of a really reliable supply. Many systems have gone into areas recently affected by bush fires where residents didn't realise their pumps wouldn't work once the power was cut off.

Some people have found they couldn't even open their garage door manually. Others feel vulnerable to unknown future electricity costs while others are angered that despite reducing consumption they feel rorted by constantly increasing 'service availability charges'.

In some cases these charges exceed those for consumption. Apparently 10% of NSW consumers changed retailers last year. During the changeovers (called 'churn' in the industry) many consumers found their previous off peak hot water put onto the standard tariff.

In discussions none of the electricity retailers came out 'smelling of roses' although some were rated much better than others. Another driver has been the refusal by Energex to connect more solar grid feed systems to their network in some areas, particularly in Queensland.

Some utilities have 'switched on' engineers who realise that changes to their previous unchallenged monopolies are happening right now and they will need to embrace the changes to survive in the future. Others with more emu like management are just waiting for it all to go away.

It is interesting that some utility planners still believe in an ever increasing electricity market, refusing to believe that national consumption has

declined every year for the last four years.

It's not just the domestic market either. Many large buildings, hotels and hospitals etc have installed CHP systems. These are large engines usually running on natural gas which produce Combined Heat and Power. If you have a use for the waste heat and were previously using electricity to produce the heat, the recent price rises make it financially viable.

The benefit in this investment comes from a number of areas. They can negotiate a deal to buy gas at a fixed or agreed price for some years in the future. If they are on a peak demand tariff they can reduce their peak demand so pay less for all the electricity they buy from the grid and they are better protected against grid fail-

ures. It is a way of reducing business risk.

You may have heard that Google invested a billion dollars in renewable power in the last few months. Berkshire (Warren Buffet's Co) invested three times this much.

At the conference Christine Milne explained how, with some difficulty, The Greens had obtained the amount the Aust Govt subsidises mining each year — over three billion dollars! Much of this through fuel tax rebates. One of the other speakers claimed that in three years time, half the cars sold will be electric — unclear whether this meant wholly electric or also includes hybrids. I was pleased to see some Toyota Prius taxis in Melbourne.

[The author has no financial interests in coal mines.]



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