Double Glaze Matters

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Using your own Solar Power

One of the biggest disincentives to installing solar panels is the low feed in tariff. I am lucky. I installed panels early and get paid 66 cents feed in tariff. But then my panels cost 3 times what they cost now. My aim is to minimise power usage during the day to maximize the amount of power I feed into the grid.

However if you buy panels now, you get paid only 6.2 cents per kwh. If you use the power yourself you save 35 cents/kwh. There has been a lot of talk about the Teslar power wall. It is a 10 kwh battery soon to be released in the US for $3,500. Sounds good. You can charge your battery from your solar panels during the day and use the power later.

You lose the 6.2 cents but save the 35 cents later, giving a 29 cent saving for each kwh. If you can save 10 kwh each day and use it later, you save $2.90, paying off the battery in around 3 years.

Sounds like a good deal, but there are a few catches. Firstly, you can only use around 80% of the battery. If you fully charge the battery or flatten it totally on a regular basis you will halve the battery life.

Secondly, if it is a very overcast day, you may not get the 10 kwh to charge the battery.

Thirdly, the $3,500 cost is in US dollars and does not include installation. It is not clear, but you are likely to need additional hardware to manage the charging and discharging of the battery.

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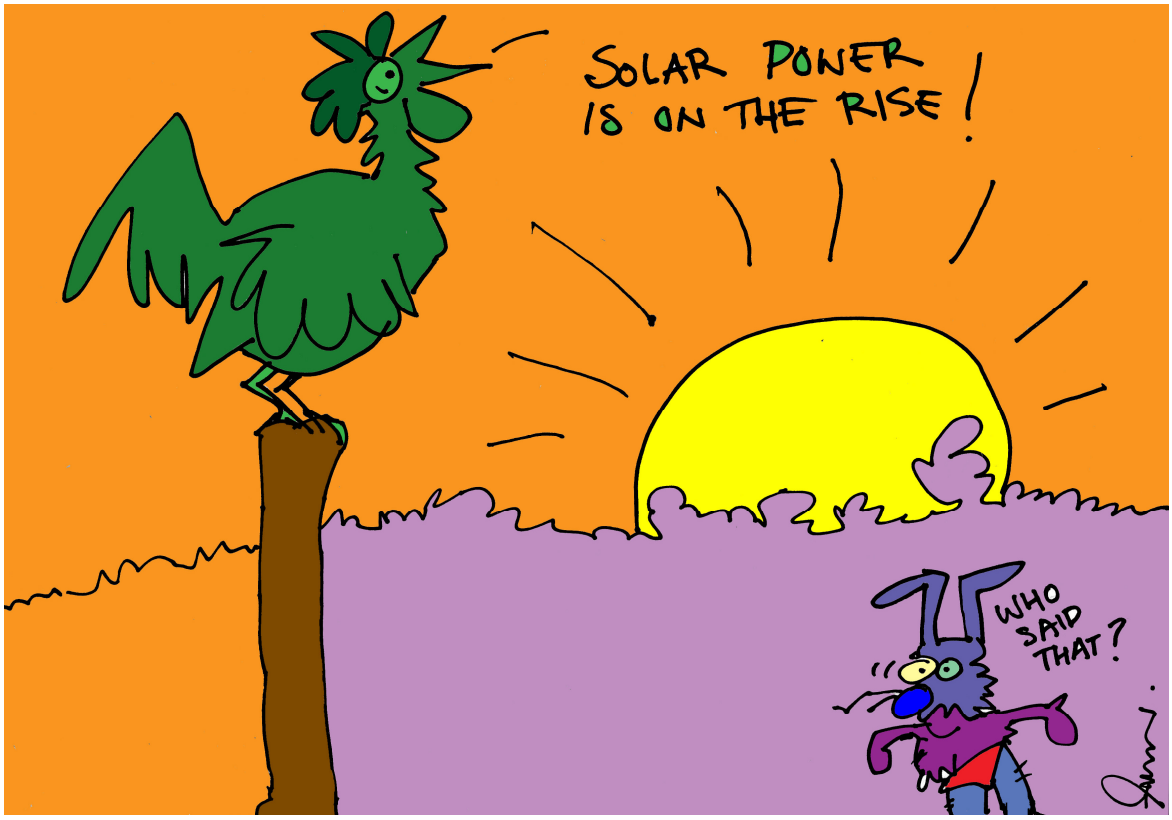


Franciscus Henri's contribution.
I like Mr Rabbit in the red speedos?

Using your own Solar Power(cont)

All of this means that the time to repay it gets close to 10 years, the expected life of the battery.

Of course the Teslar battery shows great promise. It lowers the bar on battery cost and in 10 years time will be very affordable.

It turns out there are other potential ways to "load shift". That is, use your own power costing you 6.2 cents rather then the grid power at some other time for 35 cents.

The first is a heat pump for hot water. A reverse cycle air conditioner is a heat pump. It has two coils, one in the house and one outside. It uses power to pump heat from the cold coil to the hot coil. In summer the inside coil is the cold coil, in winter it swaps and becomes the hot coil.

The beauty is that it uses 800 watts of power to pump 3,000 watts of heat, a 400% efficiency!

You can buy a heat pump for your hot water. Heating 150 litres of water each day from 15 degrees to 55 degrees requires 1.5 kwh of heat. With a heat pump, you only need .5 kwh of electricity. At 35 cents /kwh, it costs 20 cents a day. using your excess power costs 3 cents a day.

To work though you need a controller that detects when you are putting power into the grid and to tell your hot water service to work harder. Effectively say "always heat the water to 50 degrees, but if I am exporting power to the grid, heat it to 80 degrees.

Similarly the controller could talk to your electric car charger. "Always charge my car to 30%, but when exporting to the grid, charge it to 100%"

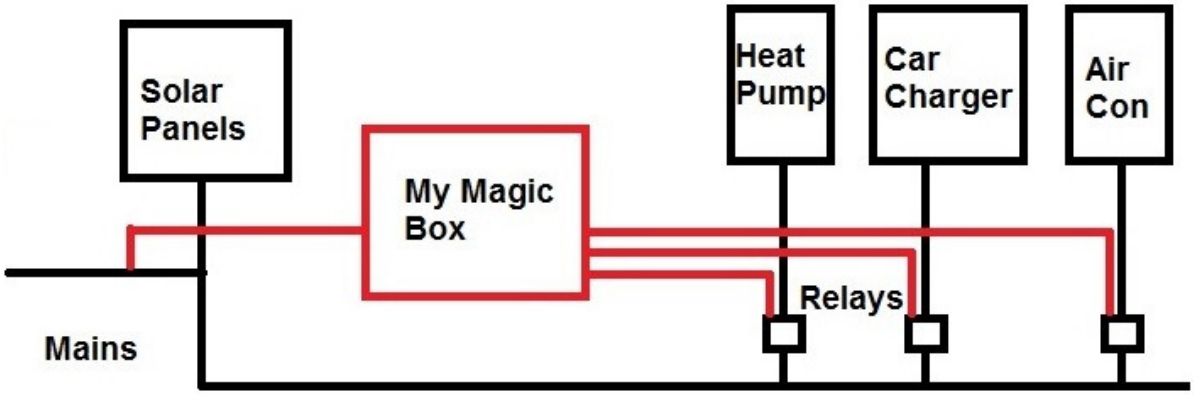
In summer it could talk to your air conditioner. "Always cool my house to 26 degrees, but when exporting to the grid, cool it to 23 degrees.

In winter it could talk to your reverse cycle air conditioner. "Always heat my house to 18 degrees, but when exporting to the grid, heat it to 20 degrees.

And I could put a 1,000 litre tank of water in the house, hook it up to my hot water service to say "in winter, when my hot water is at 75 degrees, transfer heat into my 1,000 litre tank". You can then use this water to heat the house starting at 6:00 the next day.

If you can build this control unit you can make a fortune. It is easy to detect when you are exporting to the grid. It needs to be able to activate a number of relays to turn on the hot water heater, the car charger and the air conditioner. The tricky part is the "over ride condition" . It needs to know when the hot water is below 50 degrees and turn it on anyway. Similarly it needs to know when the car is below 1/3rd full or the room temperature is above 26 degrees. All quite feasible if only these devices had a standard way of providing this information! Or if the heater etc had a relay that you activate to say "work harder"

From an environmental perspective, such "load shifting" has no value. Using the power yourself rather than selling it cheaply to someone else doesn't save power. However it will an environmental value as solar panels are used more. Eventually we reach the point, where at 2:00 pm solar generation exceeds consumption and we have to "throw away" power. Then load shifting is environmentally valuable. Also, if load shifting is easy, it encourages more solar panels.



My control box that ensures you use your power rather than feeding it back into the grid