Response to AEMC Proposal

We read on ABC news on line that the chief executive of the AEMC, Mr Ben Bar proposes to tax solar households with PV panels 2cents/kWh to export to the Grid.

We believe this is **a retrograde step.** Instead we should be encouraging all households, who can afford to install PV panels to do so, in order that we can have pollution free electric power in our homes.

Obstacles
We shall now deal with the obstacles that have been raised. Electric generated power exceeding demand is a **technical problem** and requires a t**echnical solution**. At the wholesale level, just a few years ago electric power prices had sky-rocketed at certain times of the day because of a shortage of generated power to meet demand. However in the last year or so wholesale electric power prices have been coming down in price because of the increasing amount of renewable power coming online. South Australia is a good example. A few years ago it had the most expensive wholesale prices in Australia. Now, with almost all the fossil-fuel power stations replaced by renewable power, wholesale prices have come down to levels of most other states.

Wholesale Power
At the wholesale level, (transmission level) the way that supply of electric power meets demand at all times is to ensure we have enough capacity and storage methods to meet changes of demand. So, there is always a balance between supply and demand. It is the main function of Australian Energy Market Operator (AEMO) to ensure this happens on a half hourly basis ahead of time (presently) but in future on a 5 minute basis.

Distribution Power
At the distribution level, the network operators are responsible. We take the case of NSW in which three of us live. Our network -Endeavour Energy- looks after Wollongong and all suburbs in the Illawarra as well as other areas in the south and west of the Illawarra. Initially Endeavour (old name - Integral) was a network operator as well as a retailer. However, a few years ago the NSW Government first decided to privatise the retailing business. Before privatisation there was better coordination between distribution and retailing. With less coordination, the increasing use of PV solar in households can create problems.

Solar PV
The introduction of solar PV electric power as well as wind power ideally would require the networks to install some batteries at the substation in order to ensure there is balance in supply and demand. This is because renewable power is variable. However, the networks were built long before renewable power was introduced. Distribution lines vary in length and supply loads only. Now PV generators on the line have changed that situation.

The Problem and Solution
The nominal supply voltage to a typical household can vary between 220V AC and 250V AC. However inverters are capable of operating between 207V and 265V AC.. So at the beginning of the distribution line the voltage is closer to 250V to allow for voltage drop along the line as current is drawn. As a result at the end of the line the voltage may be down closer to 220V. However, the introduction of renewable power can cause the distribution line to rise in voltage instead because the PV inverter at the household has to exceed the line (grid) voltage in order to export power. Similarly, if the next household has PV as well, the inverter will have to increase voltage further to export power. This is what can cause the grid voltage to rise to unacceptable levels. So, the solution is to increase the load down the line to counter the exporting inverters.

Proposal
Our proposal is to encourage households that can afford it, to install some batteries on this line. These batteries are used to import power from the grid to counter the inverters that are exporting at times of excess generation. In this manner the grid voltage can be kept within specified limits. The encouragement to install a battery is free import of power at times of excess generation. The whole process can be done autonomously. If the network operator is the retailer We see no problem. The user is helping the network operator. In principle, the retailer should not object to this small loss for the sake of a reliable grid.

On the other hand, if we are all genuinely concerned about anthropogenic climate change, both State and Federal Governments should encourage their citizens to start replacing their old fossil-fuel combustion vehicles with Battery Electric Vehicles (BEVs). These new vehicles have battery capacities far in excess of what is normally installed in household batteries. At less effectiveness, fuel-cell vehicles (because they use a smaller battery) fueled by hydrogen derived from renewable energy may also be added. When this starts to happen, there should not be excess voltage on the grid line because there is going to be more imports than exports from households.

Thank you,
Yours sincerely,

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