

History has shown changes in energy sources and how energy is generated for human life or comforts (a huge consumer of energy in the western economies) causes changes and often great changes in lifestyle, agriculture 10,000 years ago and the industrial revolution 300 years ago being the greatest examples. It was the latter bringing about the current capital economic model we now live with. This economic model is based on centralised energy sources which distribute to the consumer directly or indirectly in goods and services. The period of change into the industrial revolution is also an insight to how social structures and values are changed by the threat of energy supply decline.

Up till now the progress of Homo sapiens has been enabled by the continuous flow of usable energy. There have been hiccups in that progress but now we are facing limits on just how much energy we can use with current technology. This is largely being caused by rapidly diminishing energy resources from one of the most useful forms, oil and the downside of all fossil fuels and agriculture multiplied by massive population affecting global climate. Biologists also credit early plant life bringing about a planet climate change allowing other life forms including mammals. It was doing a fair job until the last 300 years when Homo sapiens managed to reverse the process at an exponential rate.

A renewable energy system is essentially a "distributed energy generation system" that is many generation points of lower output are used. It is also likely to be system of lower "energy gain" that is it will take more human energy to operate and service.

The roof tops of most Australian cities are ready built, almost ideal structures to support PV and solar thermal collectors also small wind generators are feasible. Most homes in Australia, are, with current technology, capable of energy self-sufficiency. R&D in this area is much underfunded, yet a current system is about the same level of technology as a modern motor vehicle but with pathetic production capability with resulting high unitary costs. Further and most importantly the capital cost per watt drops the larger the installation. I have seen quite a few effective renewable energy homes in Tasmania whose owners are generally financially able to make a green statement, what is most impressive is most of the homes are purpose built with a high level of passive energy design in their construction. Much of this passive energy design can be incorporated into existing structures and an opportune time would be at the installation of active renewable energy equipment. A big job but one with potentially large outcomes.

Changing to a distributed energy generation system also changes the ownership of the energy and the owner becomes "energy empowered". Although the current practice for home generation is to sell surplus energy to the grid, it is quite foreseeable that "human ingenuity" will find a way of more productively benefitting their personal "economy" by utilizing the spare energy some other way. Such a change would be very powerful in kilo Watt terms when multiplied by millions of energy generation units. Basic human nature will direct that energy, forming new society structures, a force that will be difficult to stop.

A distributed and diversified energy source is a stronger and more flexible system and strategically less vulnerable. Reducing transmission distances means that industries would need to move to areas of high density renewable energy eg. Geothermal reducing the need for super cities with their attendant infrastructure problems, cleaner atmosphere and reduced need for transport are also added benefits.

Carbon tax has one great problem there is very little carbon free energy to buy, to be effective it needs to be draconian and otherwise it just a means of employing more administrators to operate carbon creating computers to process "money" in an obscure circular path across continents. The current proposals are totally self defeating and tend to save the big polluter, coal fired power stations. Some how an investment in clean energy generation technology has to made, most of the needed energy to produce clean energy plant and infrastructure will come from fossil fuel sources. The more adaptive we are with current infrastructure the less fossil fuel energy used. What are urgently needed are sources of clean energy to get the renewable cycle going. Sequestration of various kinds may help to alleviate the release of carbon for the transition period. Remember the original biological carbon sequestration was done with fusion energy from the Sun, it is a hard act to follow.

**In view of the urgency with climate change a feed in tariff seems the most flexible way to break the current fossil fuel energy monopoly and allow, with other measures, a transition to a new style economy. It is after all "energy for living" for each individual that is of importance not the wealth of minority of current vested interests.**

A further clause could also be added that of "energy independence" businesses and households should be allowed to disconnect from the grid and pay no standing charges. Water should also be included in this option. This because the distribution costs makes up such a high part of tariffs, in the basic meter charge and part cost, particularly charges to household and small business, in the very high unit charges. This would make locally generated energy more competitive against remotely generated energy both from fossil and renewable sources, particularly fossil fuel having such large hidden subsidies.

We seem to be locked into a mentality that the "monetary economy" is paramount. The problem with the "monetary economy" is that it is an abstract algorithm with massive social bias. Unfortunately the physical world takes no notice of "abstract algorithms" and climate change will wreak havoc on all in its path.

Australia has vast renewable energy resources which are readily exploitable, it seems stupid not to embrace the challenge to a new and very possibly better future. If we show a better lifestyle then others will follow.