Carbon Pricing – Will it benefit Renewable Energy?

Summary position: BZE's recommendation on a carbon price is that calling for a high price, above $25/tonne, will inevitably lead to a large switch to gas-fired power, with minimal benefits to renewable energy. The focus should be on making the case for a carbon-pricing-plus framework that elevates 'direct incentives' such as Feed-in-Tariffs in the debate. A $10-20/tonne price will have a low impact on consumer electricity prices, leaving open the option for further direct renewable policy.

In the wake of Prime Minister Gillard and the Multi-Party Climate Change Committee's announcement of a carbon price architecture, there has been much speculation about the nature of the carbon pricing and what the starting price should be. There have been many calls from those in the climate change debate for 'a rising price on carbon which is high enough to stimulate renewable energy'.

This is a flawed strategy. Due to the nature of technology and the electricity market, we would require in excess of $70/tonne even for wind power, the lowest cost renewable, to compete in the electricity market without requiring Renewable Energy Certificates from the LRET. For baseload technologies such as concentrating solar thermal (CST), the game changer we need to replace coal and gas, you would need in excess of $200/tonne for initial plants.

A carbon price, even a high one, will not get any more renewable energy built than would otherwise occur due to the Large-scale Renewable Energy Target (which will mostly be met by wind).

Detailed modelling by the Australian Energy Market Operator of a carbon price trajectory of $50/tonne increasing to $93/tonne in 2030, normally associated with Garnaut's target of 25% emission reductions below 2000 levels, actually shows that all that would occur in the electricity sector is a very large switch to gas-fired generation – at least 14,000MW of combined-cycle gas turbines by 2030, with another 7,500MW of so-called 'clean coal CCS', which in reality would likely be gas as well if the technology fails to eventuate. A high carbon price scenario will bring a total of at least 21,500MW of gas or nearly the equivalent of Australia's current entire baseload generation capacity. Much of this in addition to conventional coal fired power generators that would continue to operate regardless of the $50/tonne rising to $93 price (see graph).

Figure 3-4 Total NEM generated energy by technology–FC-H (TWh)

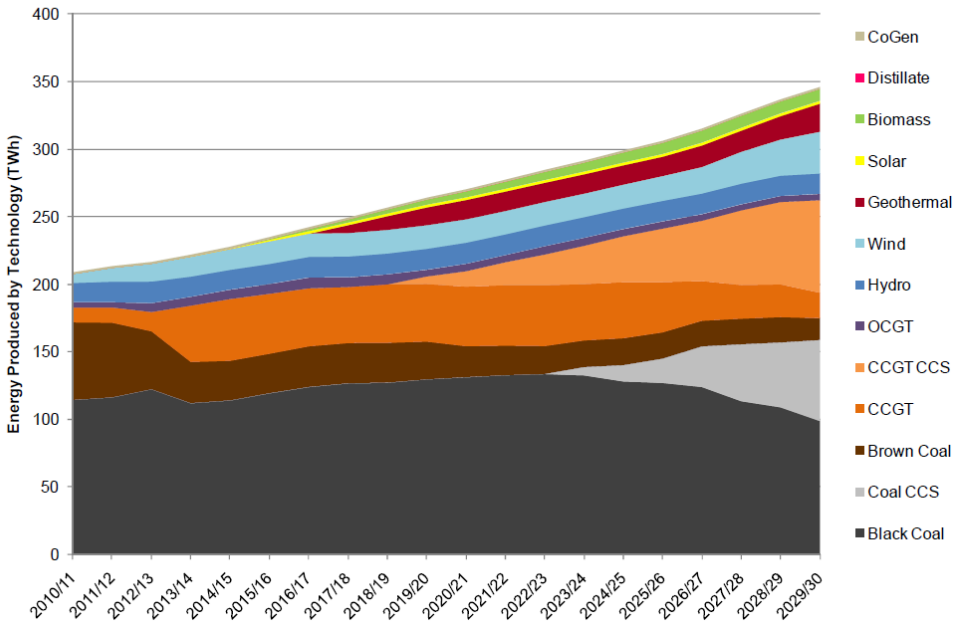

Figure 1: Modelled electricity generation under a $50 --> $93/tonne carbon price. Source: AEMO NTNDP, p50 (http://www.aemo.com.au/planning/0410-0066.pdf)

Other high carbon price scenarios also suggest that almost 20,000MW of new gas-fired generation would be likely under varying economic scenarios, representing from 25-50% of Australia's electricity generation. Extra investment in wind power beyond the LRET would only occur after 15-20 years, as the carbon price gets towards $90/tonne.

The effect of this carbon-price only approach is 20 years without building any wind power, if you don't have a mechanism such as a RET or a Feed-in-Tariff.

The carbon price will raise electricity prices while doing little to support renewable energy investment. The impact on electricity prices would be in the order of roughly $1/tonne = $1/MWh, due to coal still being a large player in the electricity market. This means that a $90/tonne carbon price will lead to an $80-90/MWh increase in electricity prices. This is like taking today's retail price of 20c/kWh up to 29c/kWh, not including other increases that are likely to occur due to transmission and distribution upgrades. While this will stimulate energy efficiency, and still leave Australia with comparable electricity prices to most other developed economies in the world (that's right, the Europeans get by perfectly fine with electricity much more expensive than ours), it will do very little to put us on track to a 100% renewable future.

BZE modelling, soon to be released, shows that putting in place a national Feed-In-Tariff for renewable energy, could get vastly more renewable energy built for a comparable or lower cost to consumers than such a high carbon price. Even taking into account more conservative projections on the cost of solar thermal than used in the *Zero Carbon Australia Stationary Energy Plan*, which represents what could occur with a decisive and fast rollout of 100% renewable infrastructure, we could reach penetrations of 60-70% of electricity coming from solar thermal power, with the cost to consumers being comparable ($80-90/MWh) to a high carbon price.

A low carbon price of $10-20/tonne is somewhat useful, as it will still create a disincentive to build new coal-fired power stations, and will ensure that coal is more likely to be displaced by renewable than gas. However, a carbon price which is greater than $25/tonne will ensure a mass rollout of gas-fired power stations, while renewables are left out in the cold.

There is an idea of using some of the revenue from a carbon tax to directly invest in renewable energy. However this strategy has several issues:

- It is likely that only a small fraction of the carbon tax revenue would actually be used for renewables. Most of the money will likely be used to compensate households and businesses – not a bad outcome in itself, but not very useful for the construction of renewable energy power plants. Even if 25% of the total revenue is used, it would only be able fund a small rollout of an initially high-cost technology like solar thermal – in the order of a few hundred MW per year.
- If the management of a direct renewable grant funding model is by a government that is beholden to vested interests and fossil fuel industry lobbyists, which seems to be the case with the Government's current Solar Flagships program, it will likely be ineffective. A deliberately non-transparent 'expert' selection process has ended up choosing some of the worst possible solar thermal projects (such as inefficient linear Fresnel mirrors hybridised with a coal plant). The actual release of money is continually dependent upon the vagaries of the government, as the recent debacle with the attempt to cut Solar Flagships funding to pay for the Queensland flood reconstruction has shown.

Government grant funding for mass rollouts as yet has not been shown to be a particularly effective policy for driving renewable energy deployment elsewhere in the world, though has done some good to date in terms of innovation and initial commercialisation. The US Federal Grants program announced as part of the GFC bailout package will hopefully show a successful program can be achieved by a government with the will to build a serious renewable future.

- While you have a low-to-medium carbon price ramping up to a higher price over time, it will still stimulate large investments in gas-fired generation in the larger market.
- As renewables are relatively high cost today, and will only reduce in cost in later years, using carbon tax revenue will only lead to a small amount of capacity being built in early years of the program.

In summary we have two options:

(1) A carbon price above $25/tonne, which even if it rises sharply, will mainly stimulate a mass rollout of fossil gas power, including expansion of the damaging and dangerous QLD and NSW coal seam gas industries and associated leaks of methane to atmosphere. The impact on consumer electricity prices will be enough to damage the prospects of any further energy-related climate policy. Using revenue from the tax to fund renewables will not be enough to prevent the gas switch, and will only be able to fund a small renewable build until after at least 10 years when the tax revenue increases and renewables are cheaper. Backing measures that result in a gas power boom is contrary to the wishes of those who support action on climate change and renewable energy.

(2) A low carbon price of $10-20/tonne, which will not significantly impact consumer electricity prices, and leaves open the option of a national Feed-In-Tariff tiered to meet the different stages in the cost reduction curve that each renewable technology is at. A tiered FiT will guarantee the build of the different types of renewable energy required for an eventual 100% renewable energy grid from Day 1, you do not have to wait 10 years for the carbon price to rise. The impact on consumer electricity prices will be similar to a high carbon price (therefore having desired behavioural impacts), but will not create any extra incentive to build and waste our resources on new gas-fired power stations and associated infrastructure.

BZE's recommendation on a carbon price is that calling for a high price will inevitably lead to a large switch to gas, with minimal benefits to renewable energy. The focus should be on making the case for a carbon-pricing plus framework that elevates 'direct incentives' such as Feed-in-Tariffs in the debate. A carbon price alone is only a complementary measure. The carbon price 'debate' has already been won, the next step is to call for policies that work, as opposed to policies that delay. While a switch to gas will reduce the emissions intensity of Australia's energy in the short-term, it does not put us on a path that will eventually lead to a 100% renewable future, it represents a costly diversion that will create a new generation of stranded fossil fuel assets and vested interests against further climate action for the next 30 years.