

as judged by your Piers

The power of trees

I am about to do something very dangerous: make a prediction. As Mark Twain said, "prediction is difficult, especially about the future".

You may recall that, in this column back in May 2005, I predicted that oil prices would soon rise to "about US\$100 per barrel". At the time, leading economists were arguing that the existing price (about \$50) was clearly unsustainable. They said that Market Forces would ensure that conservation, substitution and increased production would bring the price down to a more reasonable \$25. I took the line that Market Forces don't appear in my list of the physical forces of the universe, and that geology always trumps economics.

Please note that I am not setting myself up as some sort of mystic seer. For example, I failed to anticipate the recent sudden price surge for foodstuffs, even though it is a logical consequence of the oil price. In fact, in 1995 I bought a part-share in a dairy farm - and planted it out in pines! Anyway, back to my prediction...

I anticipate that - quite soon - the issue of Global Warming will assume lesser importance in media reporting. Why so? It will not be because the theory has been rubbished, and indeed evidence will soon allow sceptics nowhere to hide. The reason will be partly because the public have finally become bored with it - they will accept it as a problem, but won't want to dwell there. Mostly it will be because everyone will be shrieking, "you want me to reduce my emissions? I would love to be able to increase my emissions, but I can't get the petrol! And even if I could, I couldn't afford to pay for it!"

If New Zealand meekly stands in the OPEC queue and holds out its plate, it may not get served anything. Oil exporters might - for strategic reasons - prefer to keep the oil for themselves or sell it to their more important customers. On the other hand, if New Zealand strikes oil in its own waters, our own domestic supply might be assured - but only at international prices. New Zealand being the semi-egalitarian country it is, I imagine that rationing to domestic consumers will be partly on a quota system and partly on the ability to pay. Either way, the hunt will be all on for alternative fuels.

Our Prime Minister has announced a goal of converting a large proportion of New Zealand's vehicle fleet to electricity by 2040. Easier said than done, particularly when it comes to bulldozers, heavy trucks, or jet aircraft, but transport currently accounts for 86% of our oil usage so it's a most worthwhile goal. Even if you are a total Greenhouse sceptic, you must concede the advantages of independence from the world's oil-exporting horror spots.

The Government have also announced a Biofuel Sales Obligation so that by 2012 biofuels must constitute 3.4% of all petrol and diesel sold. But biofuels have received a

very bad press lately. There are riots in four continents as a result of food price rises - partly attributable to demand for biofuel. On the other hand, there are fewer opponents of so-called second-generation biofuels - ie fuel from waste or wood. Two and a half kilograms of dry wood can theoretically replace one litre of petrol.

Scion has taken the bit between their teeth and has (correctly) calculated that New Zealand could meet its entire requirements from trees planted on marginal land. There is absolutely no need to displace food production! But they may have blown it by concentrating on bio-ethanol, made by the fermentation of sugars. In my layman's opinion, as an ethanol-feedstock wood cannot possibly compete with arable crops like fodder beet, sugar beet or even turnips. The cellulose and hemi-cellulose have first to be broken down into the starch and sugars that are present in those species. Most tellingly, lignin (up to 30% of wood by weight) is very unresponsive to chemical or biological influences.

The University of Canterbury, on the other hand, has decided that gasification is the way to go. When you have converted wood to carbon monoxide and hydrogen by the old Producer Gas/Water Gas technique, you can use the Fischer-Tropsch process to make liquid hydrocarbons. The only problem is that you cannot gasify the wood until you have driven off most of the water - so wood cannot possibly compete with peat or lignite as a feedstock unless environmental incentives are factored in.

A third possibility is to use "fast pyrolysis". Ernslaw One, I understand, has already imported a small operational plant. The products of this exciting process are a combustible gas, a crude bio-oil and a biochar. Each of these has its uses. The bio-oil can be refined into bio-diesel, and the biochar has the potential to make even a steady-state forest carbon-negative - by locking up atmospheric carbon in agricultural soils for thousands of years. It seems almost too good to be true: biochar can reduce nitrate pollution of groundwater and improve agricultural productivity as well as having the potential to actually restore the world's greenhouse gas balances.

And finally, you can even dissolve trees in water provided you can generate enough pressure. Or so I'm told. Liquid trees can then be easily turned into fuels or plastics. The mind boggles, but these are interesting times and we can expect strange things to happen.



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