Investing in coal or renewable energy?

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James Hansen, is the director of NASA's Goddard Institute for Space Studies in New York. He was the first scientist to warn the US Congress of the dangers of climate change, and is now considered one of the leading scientific authorities on climate change. He is quite clear about the dangers of coal. His advice: coal-fired power stations are death factories -close them. The reason he gives is that coal is the single greatest threat to civilisation and all life on our planet.

The amount of carbon dioxide in the air has already risen to a dangerous level. The pre-industrial carbon dioxide amount was 280 parts per million (ppm). Humans, by burning coal, oil and gas, have increased this to 392 ppm; it continues to grow by about 2 ppm per year.

Hansen states that the greatest danger hanging over our children and grandchildren is initiation of changes that will be irreversible on any time scale that humans can imagine. If coastal ice shelves buttressing the west Antarctic ice sheet continue to disintegrate, the sheet could disgorge into the ocean, raising sea levels by several metres in a century. Such rates of sea level change have occurred many times in Earth's history in response to global warming rates no higher than those of the past 30 years. Almost half of the world's great cities are located on coastlines.

If we burn all fossil fuels, we will destroy the planet we know. Carbon dioxide would increase to 500 ppm or more. We would set the planet on a course to the ice-free state, with sea level 75 metres higher. Climatic disasters would occur continually. But if we cut off the largest source of carbon dioxide - coal - it will be practical to bring carbon dioxide back to 350 ppm, lower still if we improve agricultural and forestry practices, increasing carbon storage in trees and soil.

According to Hansen, coal is not only the largest fossil fuel reservoir of carbon dioxide, it is the dirtiest fuel. Coal is polluting the world's oceans and streams with mercury, arsenic and other dangerous chemicals. The dirtiest trick that governments play on their citizens is the pretence that they are working on "clean coal" or that they will build power plants that are "capture-ready" in case technology is ever developed to capture all pollutants.

In New Zealand, a United Nations review has found a large credibility gap between New Zealand's target for reducing greenhouse gas emissions by 2020 and the measures in place to achieve it. "It could find no plan for two-thirds or more of what is required to meet the target," said the Sustainability Council's executive director, Simon Terry. The UN review voices 'great concern' about whether New Zealand will put measures in place in time to do so.

According to Jeanette Fitzsimons, New Zealand’s position will be even worse if Solid Energy’s plans are developed. She states that New Zealand is heading in the opposite direction of what is needed. In addition to oil and gas exploration there are well-advanced plans to use more than 3 billion tonnes of economically recoverable lignite from three fields in Southland. These plans are big, and New Zealanders are hardly aware of them.

The state-owned coal company Solid Energy has developed plans to use the lignite for fertiliser and diesel. The company wants to build a pilot plant in 2011 to make

briquettes, taking the water out of lignite so it burns cleaner and hotter (but with no less carbon emissions) for Fonterra's milk-processing plants and for export. The pilot plant will produce "only" 100,000 tonnes a year of briquettes. The full-scale plant would be many times larger. Solid Energy intends to build a plant to convert coal to crude oil and/or diesel. They claim it could produce all New Zealand's diesel this way. Depending on the technology used, it is likely to double the carbon emissions of every litre of diesel compared with petroleum-sourced fuel. They also want to use coal for urea, a nitrogen fertiliser.

Fitzsimons says that Solid Energy state all the emissions will be "offset". But increasing the amount of biological carbon that cycles between atmosphere and plants can't compensate for putting more fossil carbon into the system, even if our ETS scheme pretends it can.

It is sometimes said that New Zealand need not worry about our emissions because we are such a small player. The three countries most responsible, per capita, for filling the air with carbon dioxide from fossil fuels are the UK, the US and Germany, in that order. Yet we have participated in many international and regional wars on the grounds that even if we are small, we are part of an international community and everyone should play a part. On a more selfish level, if we do not play our part, we will find it increasingly difficult to have access to key markets such as the EU and Asia.

Professor Ralph Sims is a New Zealander with an international reputation in the renewable energy field, being Professor of Sustainable Energy, Massey University, and the Director, Centre for Energy Research, having returned from Paris after working with the International Energy Agency. He states that for medium to large electricity, geothermal is a safe bet. More wind is coming on stream too. Small hydro sites are numerous, but ideally need low-head turbines for run-of-river. Some good micro turbine systems are in place. Visit the New Zealand-based renewable energy store and consultancy, Ecoinnovation, for examples.

Ocean energy is still at the R&D stage so it is high risk. Solar thermal at domestic level and biomass heat for industrial and commercial building sectors must surely expand (using the good resources from forest residues mostly). Wastes to energy (biogas, landfill gas, MSW incineration) are all possible.

Biofuels are tricky. In Sims view, advanced fuels from ligno-cellulose are still a long way off. Food crops (such as Solid Energy using oilseed rape for biodiesel) are not really viable even at $100+/barrel oil. The trouble is opportunity cost for the land. Electric vehicles are bound to come (but probably imported) though the Yike Bike is a good concept.

One key option might be supporting community-owned heat and power schemes – rather than the SOEs moving in and developing a site. Great options here are just starting to gain momentum. Other option could be novel mobility systems, so no need for everyone to own a car.

In summary, the science on climate change is clear. Our investments in coal. oil and gas have contributed to a world that will be 4^{o}C+ warmer with dire consequences for future generations. We need to invest in renewable energy, and away from coal.
In New Zealand and Australia and Australia there are a number of options. However, as with the several of the underlying technologies, these are not without specific investment risks.
According to Mark Bytheway from SIRIS in Melbourne, investors can choose direct

investment or managed investment funds. There are relatively limited direct renewable energy investment opportunities in New Zealand and Australia; there are approximately 20 “single purpose” renewable energy companies – those that only produce renewable energy. However, recent listings of coals seam methane and geothermal companies has expanded this. The risk to investors here is not just “picking the (winning) technology” but also these companies are developing and thus small in market capitalisation. They often reflect companies with management and governance “challenges”. Alternatively several of the larger energy companies offer some exposure, through their respective renewable energy assets eg Contact Energy, AGL and Origin.

For managed investment funds, there are several clean tech funds investing in local/regional renewable energy companies and/or directly into projects (eg Viridis, Arkx). Again, the challenge for these funds is the size of the investible pool of renewable energy companies and the investment quality of many of these companies.

For investors inclined towards international investments, there is a much deeper choice of both direct investments and managed funds, reflecting much larger renewable energy markets, often underwritten by much more supportive regulatory and pricing structures.

References

Mark Bytheway, personal communication.

Brian Fallow. UN Finds NZ Credibility Gap on Emissions. NZ Herald April 19 2011.

Jeanette Fitzsimons. Keep coal in the hole, or green efforts will remain futile. NZ Herald, Nov 2 2010.

James Hansen http://www.guardian.co.uk/commentisfree/2009/feb/15/james-hansen-power-plants-coal

Oxford Climate Conference http://www.eci.ox.ac.uk/4degrees/media.php

Ralph Sims, personal communication.