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Zero Waste and BioFuels



ZEROWASTE
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The Zero Waste New Zealand Trust views with some alarm the indication that government is to proceed with its plans to use whey and tallow for the production of biodiesel and ethanol. The Zero Waste Trust believes that the inefficient use of these valuable by-products has no part to play in a sustainable future for New Zealand. The Trust believes this is a waste of resources, and that New Zealand's energy future depends on a two-pronged approach. Firstly, we must invest heavily into reducing our energy consumption, through increased efficiencies in all areas; secondly, we must make every possible effort to promote the use of renewable energy sources.

Fundamentally, we believe that the government is viewing this energy problem from the wrong perspective. It is reacting to the perception that we must be afraid of 'peak oil' and that we should be reducing our reliance on Middle East oil, and it is reacting to the Kyoto requirement to reduce our CO2 emissions. What is needed is to switch from this reactive policy, and to adopt a positive vision for a sustainable future, based on an economic drive to maximise resource use efficiency and to minimise waste. Under this scenario, the Zero waste pathway, long term goals would be set, and measures would immediately be taken to set us going on that path.

The first area for urgent attention is the need to reduce our fuel demands by increasing efficiency. Many of the answers are right in front of our nose, starting with the adoption of a 25 year goal of reducing transport fuel use by 25% by requiring better vehicle fleet fuel efficiency. At a stroke of the pen, we could achieve 5% fuel savings within 5 years. This could start with a reduction in passenger car engine sizes. Current fuel prices are depressing the demand for large vehicles such as SUV's, and this trend could be further assisted by selectively imposing purchase taxes on vehicles, in line with their engine sizes. This could be followed by promoting hybrid vehicles, including vehicles like the Toyota Prius, and the hybrid bus, manufactured in, and exported from Timaru. Why are these buses not in more common use here in our own country? While on transportation, we also see the need to continue promoting the use of rail and sea transport, both modes being far more efficient than road transport. Biting the bullet and progressively implementing the full road taxes on heavy vehicles would also help rail and sea transport.

Energy use is not restricted to vehicle use; standards in every other energy-consuming activity also need to be changed. Improved efficiency can be obtained through much better housing and commercial building design, including such measures as increased insulation, double glazing, passive solar features and the like, all of which are well known and already in use. We know we can reduce energy consumption in new buildings by more than 40% at an additional capital cost of about 6%. While we're on it, let's mandate that every new building include at least solar water heating or solar

power, and encourage the widespread use of heat pumps for space heating as well as water heating. The availability of guaranteed loans, paid off by the savings made, would bring about a substantial increase in investment in this area, ensuring a significant reduction in energy use. Now there's a challenge to Kiwi Bank – “energy savings loans”. And we should not forget that industry also has a large part to play in reducing energy use, through more efficient lighting and heating, and through measures such as the use of highly efficient electric motors such as the Wellington Drive motor.

While we are pushing these measures for energy use efficiencies, we also need to be looking at maximising opportunities for harvesting our indigenous renewable energies, in areas such as wind power, tidal power, and solar power. These sources of renewable energy are all steadily coming into their own, with significant investment especially in wind and solar energy, even though costs are higher than the cost of using coal and gas. With continuing improvements in technologies, tidal power and solar power will soon be joining wind power as the energies of the future. A steady investment here will capture these benefits as they become more widely available.

After commenting on the drive needed to maximise the efficiency of our energy use and to make better use of natural energy sources, we now need to look at another source of energy, our waste products. We are not talking about by-products such as tallow and whey, which already have a profitable place in the market, but at the stuff that we throw away as waste. When analysing what is simply dumped into our landfills, we find that there are many energy-rich resources, including huge quantities of energy-rich plastics, which should never be there. The outstanding feature is that more than 50% of landfill contents are comprised of green wastes and kitchen food wastes. The challenge is to utilise them - to fully capture the methane they produce when they break down, instead of letting it disperse into the environment as a greenhouse gas. We need to utilise all our organic wastes, mulch them down, capture the methane that is emitted, and use it as an energy source. The same principle can be applied to other organic wastes, such as from sewage treatment plants, cowsheds, chicken houses and piggeries; there are some operations in place now that capture gases from these sources, but the practice is not commonplace, and so needs to be mandatory. We can save space in our landfills (and that space is very valuable), we can generate biogas for fuel, we can reduce methane emissions (greenhouse gases), and we can produce compost, which will fertilise food crops at the same time as it sequesters carbon into the land.

Government has set 2008 as the year when biofuels should make up 5% of our liquid fuel needs. It seems foolish that valuable agricultural by-products should be seen as wastes, suitable for an experiment into the conversion of organic products into biofuels. It is our belief that the production of biofuels should wait until there is a commercially economic process for the conversion. This may be found in a process which captures the energy within grasses and woody plant materials using bacterial fermentation to produce cellulosic ethanol. Another possibility for biofuels is from the use of algae, fed on sewage wastes and energised by the sun. Another potential source of energy is the use of hydrogen. But at present, for all these technologies, energy

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inputs for conversion far exceed energy outputs, and financially viable solutions appear to be some way off. So in the meantime, let's use the existing technologies, and generate biogas from our greenwastes.

The government's current goal is to produce sufficient biofuel substitute for a mere 3-5% of our petroleum-based liquid fuel needs. Having invested some hundreds of millions in that endeavour, the pressure will then be on to increase the use of biodiesel and ethanol, and new sources of these products will have to be found. But where could substantial new resources be found in New Zealand? If we follow the overseas lead of North America, the EU and South America, then the next readily available source of bio-energy will be our food crops. In those countries they use their sugar beet and sugar cane; they use soy and canola and palm oil; and they use corn (maize) and wheat and barley. In the temperate North American and European areas, production is heavily subsidised, as they are trying to reduce their dependency on Middle-Eastern oil. Even so, they cannot locally produce enough bio-oils, not even the 5% that is their goal, so they are heavily increasing their imports of plantation oils (palm and coconut oils) from tropical countries, where solar energy sustains plant growth at a far higher rate.

A consequence of this is that in the tropical countries such as Brazil, Indonesia and the Philippines, we are witnessing a tremendous increase in plantings of these food and oil crops. In Indonesia there are some 3 million hectares of palm oil plantations, and the government has allocated 30 million hectares of forest for conversion to oil palms over the next 5 years. Translated, that means the destruction of millions of hectares of complex tropical rainforest, and its transformation into a monoculture of palm oil trees, with attendant soil erosion, fertiliser and pesticide run-off, not to mention the displacement of indigenous peoples and endangered animal and plant species. In Brazil, huge new plantings are being made at the expense of the Amazon rainforests and their last remaining endangered wetlands.

Underlying this whole biofuels issue, is the fact that the world is potentially facing a crisis in food production, and it is appalling that we are seeing a mass movement driving and subsidising the conversion of food crops into vehicle fuels. Unfortunately, for some specific places with vast acreages and low populations, it only requires the application of a subsidy for this alternative fuel movement to take off, and it can be to the real advantage of that area. In the corn States of the Mid-west, a huge movement is occurring on the farm, with subsidised corn now being turned into ethanol, and with corn and wheat now being used directly as a fuel to replace coal in central-heating systems. While it benefits the local economy, it could be contributing to a world-wide food shortage, and it is unlikely that it will be in the USA that people will become short of food.

Ironically, if every scrap of the world's total food production was to be devoted to this purpose, we could produce enough fuel to run the world's whole transportation fleet for only 4 days each year. Clearly, this is an absolute dead-end! The solution cannot therefore lie in biomass- it can only be a small contributor to the solution.

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Alongside this, consider the alternative of simply requiring a 25% increase in vehicle fuel efficiency, introduced progressively over the next 52 years. This would not be without its costs, as it would require controls on excessively fuel-hungry vehicles, and incentives for the promotion of efficient vehicles, but it would be so much simpler, and would actually reduce the amount of liquid transport fuels consumed.

There is no simple answer, but with water shortages, an increasing world population, and increasing living standards, then clearly there is no long-term future in using food crops for conversion to biofuels. Pressure on food crops is already increasing food prices, as can be seen in the price of wheat, corn, sugar, rice. We also dump thousands of tonnes of plastics into landfill each year – these should be either re-manufactured or at least recovered for the manufacture of diesel fuel. There are technologies for these situations existing right now – implementing their use would cost a good deal less than the biodiesel and ethanol proposals put forward, and would also bring about a reduction in capital expenditure that is now required for building new landfills.

This whole problem relates to the economic future of New Zealand and its long term sustainability. It seems to Zero Waste that some of the momentum towards a sustainable future has been slipping in the last few years. The people of New Zealand are well aware that changes are necessary in terms of our relationship with the environment, but we are waiting for leadership and action from government. We will accept a challenge – we know the kinds of things that have to be done, such as building houses to face the sun and thereby maximise solar input – but we have been waiting 20 years for action. We have our trainers on, and we're ready to go. But where is the political leadership? I hope that we will be able to wake up one day soon, to be faced by a challenge from our government; we will meet that challenge, and perhaps then there will be the possibility of a truly sustainable New Zealand.

The Zero Waste Trust New Zealand

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