Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria

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Introduction

The Public Transport Users Association (PTUA) welcomes the opportunity to contribute to the Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria.

The PTUA takes a strong interest in transport and sustainability issues. This Inquiry has direct relevance to two of the most pressing issues facing society:

- the likely imminent peak in global oil production; and
- the pressing need to reduce greenhouse gas emissions.

The promotion of biofuels has superficial attraction as a response to both of these pressing issues. However, full consideration of the implications of increased biofuel production demonstrates that it is at best a partial response, and at worst highly counter-productive in both regards.

The PTUA believes that this Inquiry must acknowledge the urgent need to reduce private motorised travel and enable a shift to walking, cycling and public transport. The following comments are made in this context.

1 Merits of a mandated target for alternative fuels

Based on the serious concerns outlined in this section, the PTUA does not believe there is any merit in a mandated volume-based target for alternative fuels at any level or by any date. Instead we urge the Committee to note the importance of:

- raising community awareness about peak oil; and
- improving the coverage and integration of fast, frequent public transport so that Victoria's oil dependency can be reduced.

1.1 Current human footprint

Human induced land use changes have reduced net primary production (NPP) by about 10% compared to the total potential vegetation of the planet (Haberl, Erb, Krausmann, Gaube, Bondeau, Plutzar, Gingrich, Lucht and Fischer-Kowalski 2007). On a global level, about 29% of above-ground Net Primary Production is appropriated by humans (Haberl et al), which is an extremely disproportionately high share of nature's productivity for a single species, especially considering that many ecosystems are likely to come under increasing stress due to climate change.

Across much of Victoria, human appropriation of net primary production (HANPP) comprises well in excess of half of NPP (Haberl et al 2007, Fig 1). This demonstrates that human activity is already having a serious impact upon biodiversity and habitat for non-human species. It also demonstrates that increasing HANPP, such as through biofuel production, is likely to cause serious environmental harm. Increasing biofuel production with the existing level of HANPP implies reduced food production and higher food prices.

1.2 Food for people or machines?

The surge in biofuel production in countries such as the USA is consuming growing quantities of agricultural production and flowing through into rising food prices. For example, the substantial increases in the price of Mexico's staple tortillas sparked "tortilla riots" in some poor communities (Taylor 2007). In a competition between low income food deficit countries and high income Western motorists, it is likely that agricultural production will increasingly be for the benefit of machines rather than the world's 800 million chronically undernourished people.

After decades of rising agricultural productivity, factors such as land degradation, rising biofuel production and growing populations have brought world food stocks (relative to consumption) down to their lowest levels in many years. Numerous people are now warning of serious implications for food security from rising biofuel production (Nebehay 2007). Some Australian farming groups are questioning the value of producing biofuels relative to producing for traditional export markets, which emphasises the fact that biofuel has serious opportunity costs for food security internationally (ABC 2007).

The scale of oil consumption in Australia is currently so large due to the highly inefficient way it is consumed (i.e. largely in low occupancy cars) that mandated use of biofuels would require a large quantity of agricultural production to be diverted to fuel production. The entire Australian oilseed crop would be required to produce a mere 6 per cent of Australia's current diesel consumption (Energy White Paper) while turning the entire Australian wheat crop into ethanol would only supplant 15 per cent of Australia's oil production. The World Policy Institute estimates that the amount of grain required to produce one 95 litre tank of fuel would feed one person for a year (Brown 2006).

In the short-term, the price elasticity of petrol demand is relatively inelastic. If biofuel blending was to be mandated, demand for biofuel crops would also be relatively inelastic. With dwindling stocks relative to consumption and inelastic demand, food and biofuel crop prices are likely to become highly volatile in response to fluctuations in supply. Such supply variations are likely to become commonplace as climate change brings more frequent and more severe droughts, floods and other extreme weather events.

1.3 Compatibility

Not all vehicles on Victorian roads are suited to using biofuels such as ethanol. Nearly half of vehicles on Australian roads cannot use ethanol-blend fuels, hence mandating ethanol use in petrol in Victoria could damage the engines of many vehicles (Hagan 2007). It is likely that low income motorists would be most seriously affected in this situation due to their inability to afford the latest model cars.

1.4 Health impacts

It should be noted that "alternative" fuels are not necessary "clean". Use of ethanol leads to increased emissions of acetaldehyde and formaldehyde, which is a highly toxic organic solvent, with research indicating that biofuel use could lead to an increase in respiratory-related deaths and hospitalisations (Apace Research, 1998; Shwartz 2007).

1.5 Energy profit

It is unlikely that increased use of biofuels would have any discernible impact on Victoria's energy security. The Energy Returned on Energy Invested (EROEI) from many alternative fuels is substantially lower than conventional oil which historically yielded as much as 100 units of energy for each unit expended in exploration, extraction and processing. It appears that less energy is ultimately obtained from some alternative fuels than is consumed in producing the fuel, after considering the

energy used in cultivating, fertilising, harvesting, processing and transporting the feedstocks.

In a market free of distortions, fuel production processes leading to a negative or very low energy profit (EROEI close to or less than 1) would not be financially sustainable. Mandated use of such fuels, however, would add a premium to the price offered for such products and allow such processes to be financially profitable even where they burn more energy than the create. This attempt to "pick winners" would clearly be a perverse outcome with no environmental or economic justification.

1.6 Carbon impacts

The greenhouse benefits of alternative fuels will to some extent depend upon the EROEI. Due to the relatively high EROEI of conventional oil, the bulk of carbon emissions from conventional oil consumption relate to its final combustion ("tank to wheel"). With biofuel use, the bulk of net carbon emissions relate to the cultivation, harvesting, processing and transport of the fuel ("well to tank"). If EROEI from alternative fuel production is low, emissions relating to production ("well to tank" emissions) will be comparable to emissions relating to consumption ("tank to wheel" emissions). As discussed in Section 1.5, distortions such as volume-based targets for ethanol blending could force the inclusion of biofuels with low EROEI and therefore low or negative greenhouse benefits.

Although the growth of crops for biofuels absorbs carbon dioxide which will be released upon combustion, this does not offset the emissions released during production. As a consequence the total "well-to-wheel" emissions of biofuels can be as high as conventional oil (Bowers & Dings 2007).

Significant concerns have been raised over the land use changes that could result from biofuel production, such as deforestation in Asia and South America to make way for palm oil and sugarcane production (Romanowicz 2006). Such land use changes are a major source of carbon emissions and could substantially outweigh the benefits of using renewable fuels. Even where production of crops for biofuel does not *directly* result in deforestation or loss of biodiversity, indirect impacts could be just as significant due to the displacement of other crops to new or marginal farmland in order to make way for the production of biofuel crops. Such negative impacts are likely to be particularly strong if ambitious volume-based targets are imposed.

2 A framework - not picking winners

One of the key objectives often cited in support of biofuels is a reduction in carbon emissions. As outlined above, increased production of biofuels is not inherently beneficial. A volume-based target could encourage perverse outcomes such as counterproductive land use changes, or merely partially offset an increase in the carbon intensity of transport fuel due to greater use of non-conventional oil (Bowers & Dings 2007).

Diversion of private motor vehicle journeys to walking, cycling and public transport would reduce fuel consumption and deliver significant greenhouse, health, congestion and energy security benefits (PTUA 2007). Reduced motor vehicle use and greater efficiency should be the primary focus of efforts to reduce non-renewable oil consumption and transport emissions.

Putting aside reductions in total fuel consumption from mode shift, further meaningful emissions reductions will only be achieved by reducing the ***total*** well-to-wheel carbon intensity of ***all*** transport fuels including biofuels and fuels produced from conventional and non-conventional sources. This will not be achieved by volume-based targets for biofuel blending, but through reductions in the lifecycle carbon intensity of the transport fuel end product.

Internalisation of the negative externalities of transport fuels would facilitate the development of those alternative fuels that do have commercial and environmental merit. One key means of achieving this is to price the carbon content of transport fuels by including it within the coverage of a national emissions trading scheme. Pricing the carbon content of transport fuels would provide an advantage to low-carbon alternative fuels without necessarily attempting to pick winners.

Consumer trust in alternative fuels and environmental integrity should also be safeguarded by robust certification standards that ensure biofuel production does not take place at the expense of biodiversity or food security. The EU is making some progress in this area, however there is still some way to go to ensure true social and environmental sustainability. Use of biofuels in Victoria should not be encouraged in the absence of world's best certification standards.

Although some hope is held for second generation biofuels such as cellulosic ethanol, these appear to be a long way from commercialisation. It would therefore be extremely premature to mandate targets for biofuels until the true ecological and commercial potential of such fuels is known. Furthermore, an appropriate framework that prices externalities such as carbon emissions would provide an environment for such fuels to succeed without the need for volume-based targets for biofuels.

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