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A new energy cocktail for a new age of mobility

The gradual rise in fuel prices over the past five years has been driven by growing demand especially from China combined with limiting production levels tightening supply¹. Are we experiencing “peak oil” as a reality now or is this just a temporary price spike? As with climate change, this affects the economic development of all countries – developed and developing. Fuel prices in Europe are already much higher than in the United States, largely due to taxes that make up as much as half of the actual pump price.

How this is affecting the public transport sector is not yet very clear and will largely depend on whether the prices stay consistently high. Transport is 95% fossil fuel dependent across the whole sector and accounts for 60% of all fossil fuel consumption. It comes as no surprise that bus operations rely heavily on diesel: 90% of the urban bus fleet (EU27) is diesel powered², and probably will remain so in the foreseeable future.

The risks for this sector are high. Encouraging the use of diesel for personal transport, initially triggered by relatively low taxes on diesel, has been a cornerstone of European policy to reduce CO₂. The market share of diesel in Europe has grown to nearly 70%³, bringing about the peculiar present situation of a surplus of gasoline in Europe and a deficit of diesel. This demand is currently met by importing diesel from Russia and the USA and exporting gasoline from Europe (mainly to the US). However, should this balance be disrupted by the “dieselisation” of the car fleet in other parts of the world, we could find ourselves in a very vulnerable position, with diesel supply shortages combined with a higher price than gasoline. This increases our exposure to oil price volatility and supply shocks.

Where are the viable alternatives? And what reasoning should operators adopt for changing over to these alternatives – is the aim to reduce CO₂, or to reduce other local pollutants? And just how sustainable are these alternatives at the present time? Many charter signatories are showing leadership in trialing different renewable energies, and details can be found in the “Making Tomorrow Today⁴” report.

Bioenergy and biofuels are of growing public and private interest but the widespread debate on biofuels is not sending reassuring messages to operators nor is

it encouraging them to turn to this type of energy. According to UITP research on the EU bus fleet, a little more than 3% uses biofuel (biodiesel and biogas), ethanol, mixtures and fuel cells.

It does not help that biofuels obviously come from crops; and that some of these feedstocks can be used either for food or fuel. The signals sent by major agencies such as the World Bank and the FAO are also confusing. The President of the World Bank said recently in the media “While many are worried about filling their tanks, many more others are worried about filling their stomachs”. On the one hand support for agriculture globally by the World Bank has been slashed since 2000, and, on the other, pressure on food has increased, due in part to a higher standard of living for greater numbers. The unforeseen consequences of this are that the poor suffer. For example, we have witnessed the so-called “tortilla wars”, where Mexico relied heavily on cheap imported American corn rather than boosting local production. It was bad timing as the effects of this policy coincided with strong population growth in the very regions of the world that are the most vulnerable to political instability and extremes of weather.

Although yields per hectare may have in general increased (in most of the major food-producing regions), supplies have been disrupted due to extreme climate conditions, usually drought. For example, some rice farmers in Australia have had to skip a whole season due to drought. This, combined with the global increase in population, has caused as much as a 53% increase in some commodity food prices.

In addition, pressure on crops can come from other sectors such as cosmetics. In reality, only a tiny proportion of total palm oil production goes to biofuel (less than

5%) – much more is taken up for soaps and cosmetics. Most of the production comes from Malaysia and the Philippines, despite having policies and bodies in place that verify the production and restrict land-use change. Unfortunately, much of the forest in the Philippines belongs to private individuals, making it difficult for governments to enforce these laws and ensure the sustainability of production.

Much of the problem appears to stem from incentives and market distortions, encouraging farmers that are presently producing crops for food to switch to growing crops that can be used instead for fuel, often encouraged by some perverse incentive.

Farmers in the US find it more profitable to take the subsidies offered by the government to use their corn for the production of ethanol rather than food use. And it is difficult to compete when world trade agreements allow product to be shipped from Latin America to the United States, where it can benefit from a EUR200 or so subsidy with the addition of less than 5% of locally produced biofuel (the “golden” drop); and it can then be imported into Europe. It arrives after having been transported halfway across the world at a lower price than European biofuel.

It is also certainly true to say that the present first-generation biofuels (biodiesel and bioethanol) made from feedstocks such as rape seed or sugarbeet cannot be viewed as affordable or viable alternatives for transport use. In almost all cases, they are less energy efficient than fossil fuel and their full life cycle analysis often shows a CO₂ net increase rather than a reduction, as quantities of fertilisers and water are needed. Some non-food crops, such as drought-resistant jatropha, that can thrive on poor land and needs little water, show some promise in the developing world (India and Africa), but not

for Europe. But it takes about nine years for the plants to grow and make local production a viable option.

However, there is much potential for second-generation biofuels – these are the ones that either use non-food feedstocks or waste products. Both switch grass and algae seem to have quite good potential and the process for producing biodiesel from straw can be considered to be proven. Getting them into the mainstream is going to be quite another thing.

Biogas made from urban waste is a win-win situation – but this requires other non non-mobility actors to take the responsibility to produce the biogas from the waste, and requires expensive production infrastructure to be built.

The transport sector, dominated by road vehicles, is the fastest-growing generator of carbon dioxide and consumer of oil and there is no doubt that this will have to change.

Part of that is building the skills and getting the vehicles and infrastructure in place to enable that change to take place. Using biofuels today despite the questionable sus-

tainability and efficiency of them can help build this experience and is possibly a good option for many operators in the developing world, where demand is rising most strongly, and who are vulnerable to shortages of imported energy supplies.

The IEA⁵ expects world energy demand to double by 2050 and transport will play a large role in this. It is perfectly clear that the developed world must fundamentally alter its approach towards motorised mobility and that emerging markets need to avoid its past mistakes. Every lever must be pulled, from short-term disincentives for unnecessary consumption, to long-term changes in how we live, work and play. Our whole approach to the provision of mobility and the design of road vehicles and the energies they use has to change. But this cannot be done overnight.

What is not clear is which energies are the most promising for transport. Improvements in energy efficiency are certainly needed – gains can come from using new technologies and an energy saving of around 10% (in some cases more) can be achieved with better driving habits and “ecodriving” training. What is

also clear is that we will have to change from using one dominant fuel to a “cocktail” of different energies, suited to the local conditions. Biofuel plays an important role as an alternative, renewable fuel – but we should also be careful not to bio “fool” ourselves.

As such, there is much debate on whether the EU should stick to its target of 10% of European transport fuels coming from biomass by 2020.

References

- 1 International Transport Forum OECD “Oil dependence: is transport running out of affordable fuel”, Round Table 139
- 2 UITP Public Transport Statistics Report Issue 1 Latest figures in the urban bus fleet in the European Union.
- 3 International Transport Forum OECD “Oil dependence : is transport running out of affordable fuel”, Round Table 139 Executive Summary
- 4 Available via Mobi+
- 5 International Energy Agency

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Encouraging the use of biofuels in public transport

Currently, transport is facing several challenges, including congestion, local air pollution, its contribution to greenhouse gas emissions, and last but not least its overwhelming dependence on fossil fuels, and in particular crude-oil derived fuels. This dependence is even getting more critical as crude oil prices have started to rise exponentially in recent years.

Various alternatives exist, but their success largely depends on the policy support they receive, often in the form of fiscal incentives. The issue of biofuels for transport has become increasingly prevalent in the media and on political agendas, a fact reflected by the recent European Commission proposed binding target whereby at least 10% of vehicle fuel in the European Union should come from biofuels by 2020.

Costs

Even with the current high fossil fuel prices, biofuels still remain more expensive. There are various reasons. First of all, over a century’s worth of production of crude-oil based fuels – processed in very large and efficient refineries – is difficult to match with a young industry which usually works at lower scales and efficient bio-refineries are only envisaged in the longer term.

The second problem is that commodity prices for current generation biofuels (vegetable oils, cereals, sugar) have increased significantly in recent years. This is mainly due to developments in the world food markets (increased demand in Asia); moreover speculation on commodities is increasing greatly, pushing prices up. So in the end biofuel production remains more expensive than fossil fuel production, in some cas-