The potential of renewables

Speaker: Philip New
Title: vice president, BP Biofuels
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My focus is on energy for transport. I hope to be able to explain why an energy company like BP believes that renewables – specifically Biofuels – have an important role to play in any future energy mix, and how Biofuels can play that role well.

Liquid hydrocarbons are an exceptionally useful and efficient means of storing and moving energy, particularly for highly atomised and, by definition, mobile – applications like transport; an application which has responded through the development of the internal combustion engine. The combination of liquid fuels and increasingly efficient petrol and diesel engines will be very difficult, and very expensive, to displace. This is why over 60% of oil production is used in transport, and still today over 90% of transport energy is oil derived. This is why substitutes for transport energy have to be viable substitutes for oil, and this is why transport energy, as opposed to electricity, is absolutely a global market, and therefore any view of the UK has to be put into that context – as a relatively small – and declining – demand centre.

The bad news is that the IEA believe that the number of cars on the roads of the world will double by 2030. The good news is that we don't believe this leads to a doubling of oil demand – increasingly fuel efficient vehicles, including hybrids, will lead to a decline in demand in OECD economies, and mitigate demand growth in Asia and south America. In aggregate, we anticipate that demand will increase from 85mbpd to 105mbpd in that time.

And while non OPEC conventional supplies will decline, OPEC volumes, particularly from Iraq and NGLs, combined with non conventional reserves such as tar sands, will expand. But, by dint initially of regulatory push, and latterly simply because they will be economically competitive and technologically compatible substitutes, Biofuels will play an increasing role in the mix – at least 9% of the total, predominantly in the Americas and Europe, where Biofuels will command at least a 20% share. This implies a trebling of current capacity.

Done well, we don't think there are any resource constraints that make this an unachievable goal. The world has ample land. According to the WWF, excluding all agricultural crop land, protected and unprotected areas of forest and biodiversity, and areas not suited for rain fed agriculture, there are still 893mha of land available globally for additional agricultural use. In the US alone, there are 59m ha of abandoned agricultural land. According to the IEA, expanding Biofuels to meet 27% of demand will require 100m ha. Today, Biofuels production takes up 30m ha.

We believe that if Biofuels are to meet this challenge they need to fulfil 4 criteria – they need to be able to compete with oil, without subsidy. That means production costs in the range of $60-80 boe. They need to be scalable. Putting the English wine surplus into one's Aston Martin, or waste oil from the local chippy into the VW camper van, is admirable, but won't trouble OPEC. They need to be sustainable – using resources efficiently, contributing positively to local communities and sustaining biodiversity. And they need to be at least 50% better on CO2 performance, well to wheels, than oil.

Taken in aggregate these are tough hurdles. Biofuels' performance against these criteria is a function of the feedstocks they are made from. It explains why US corn ethanol supply is topped out, and why growth of Biofuels made from vegetable oil is likely to be constrained. Today ethanol made from sugar cane in Brazil is showing that it can meet these goals comfortably, is already a material industry, and has massive scope for expansion. By 2020 biofuels made from cellulosic sugars extracted from

agricultural wastes and energy crops, will also be able to meet these hurdles. The potential for crop yield and conversion efficiency improvements is significant, as we have only started to seriously apply biotech to energy applications in the past 5 or so years. There are other innovative process and feedstock technologies – from the thermo-chemical conversion of forest residues to the use of photosynthetic and heterotrophic algae – that may provide future options post 2020.

And where are we today? The economic crisis and regulatory inconstancy have combined to bring expansion of supply to a grinding halt. Even in Brazil there will be only 3 mills opening this year, and none next year. In Europe, once the Vivergo plant is opened in Hull there is no new capacity to follow. We are facing a period of undersupply. The “hot money” has moved out.

But on the other hand the industry is consolidating, with players capable of providing the balance sheets, the project management and engineering capabilities, the market knowledge and the technology now entering in force. The technology is coming through – we are already building the first commercial scale cellulosic feedstock farm in Florida, and will be breaking ground on the industrial facility in the next 6-9 months. A global commodity is starting to emerge.

In summary, we are getting to grips with the challenges. A sustainable, scalable, competitive, global industry is starting to emerge can complement – indeed catalyse- the expansion of the worlds agricultural capacity, and make a material contribution to the challenge of meeting our primary energy needs in the coming decades. There is a real path forward for Biofuels.