SCB Overview

- **Its all about money**: Perspective on who made money in road biofuels and how that provides lessons for bio-jet markets.
- **Market style**: Explain the differences between the road biofuel and the bio-jet market structure.
- **Viability**: What will make a bio-jet market viable?
- **Progress to date**: A synopsis of the flows seen in the bio-jet market.
It’s all about the Money

“The single most important decision in evaluating a business is pricing power,” Warren Buffett 2011

If one competes for agricultural land, one is a price taker on biofuel inputs/feedstocks.

Biofuels prices are set by the fossil fuel equivalent plus government actions.
It’s all about the Money

“The single most important decision in evaluating a business is pricing power,” Warren Buffett 2011

Capital costs not taken into account, merely gross margins on the spot market.
Are biofuels a profitable business and if so for who?
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First generation biofuel production is an industrial process with low IP and little differentiation.

The profitability of an industrial process depends on supply demand balance.

Without IP there can be no long term expectation of profitable biofuel production.

In some biofuel markets government have a tight control over pricing, demand and supply and consequently profitability, e.g. France, Portugal and Brazil in biodiesel.
Are biofuels a profitable business and if so for who?

Biofuels provide greater security of demand, significant at lower prices. In all cases, agricultural suppliers have generally sucked back any value in the chain.

Alternative fuel feedstock suppliers; UCO, tallow (white or yellow grease), even Jatropha have managed to capture the bulk of any value in the chain.
Are biofuels a profitable business and if so for who?

Unclear consumers regard biofuels as a premium product. Poor handling of the food-fuel and land-use-change debates by the biofuel producers organisations the main reason. Producer organisations too busy securing government handouts.
Are biofuels a profitable business and if so for who?

The prime driver of trading volumes and profitability in biofuels is government action.

Ever increasing layers of regulation provide trading opportunities to exploit unintended & intended consequences. This often undermines the biofuels industry.

A good understanding of government action is vital to optimise trading in biofuels.

Market opportunity exists for fund managers to mix the trading of biofuels as a commodity with trading the equities of the sector.
Biofuels trading opportunities

- Thorough analysis of government regulations
- Investigation of both equities and commodities
- Trading decisions
- Portfolio Management

Equities

Commodities
Market style: How will (first generation) road biofuels markets differ from a possible bio-jet market?

<table>
<thead>
<tr>
<th>Key attribute for profitability of production</th>
<th>Road Biofuels</th>
<th>Bio-Jet fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price taker for inputs</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Price taker for outputs</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Influence of Govt Action</td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td>Competitor differences</td>
<td>Little difference for which customers will pay</td>
<td>Little difference for which customers will pay</td>
</tr>
<tr>
<td>Internal cost control</td>
<td>Asymmetric profile, unlikely to benefit, can hurt</td>
<td>Asymmetric profile, unlikely to benefit, can hurt</td>
</tr>
</tbody>
</table>
Market style: How will first generation bio-jet markets differ from road biofuels markets?

- **Key influencer for production is Government Action:** Road biofuels are mandated by government in the three main markets; US, Brazil and Europe. No such mandates exists in bio-jet markets and they are unlikely. Bringing aviation into the carbon credit world, will set a bid max-price on bio-jet fuel: Fossil Jet fuel + CO2 emission cost. Too low currently to develop a market.
Market style: How will first generation bio-jet markets differ from road biofuels markets?

- **Government involvement**: Current road biofuels markets are not connected to the price of emissions.

<table>
<thead>
<tr>
<th>UK RTFO Data 2008-2010</th>
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<tbody>
<tr>
<td>2.9bn liters of biofuel used in the UK</td>
<td></td>
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<tr>
<td>GHG saving 51% ex ILUC</td>
<td></td>
</tr>
<tr>
<td>3.6m MT of CO2 saved</td>
<td></td>
</tr>
<tr>
<td>Actual cost to UK, ex farming benefits</td>
<td>$694,600,388</td>
</tr>
<tr>
<td>Biodiesel Premium to Gasoil per MT energy adjusted</td>
<td>$307.50</td>
</tr>
<tr>
<td>Ethanol Premium to Gasoline per MT energy adjusted</td>
<td>$204.00</td>
</tr>
<tr>
<td>Average Price of Dec 10 EU Carbon 2008-2010</td>
<td>17.61 EUR</td>
</tr>
<tr>
<td>Offset theoretical cost:</td>
<td>$89,876,509</td>
</tr>
</tbody>
</table>
Viability: How will a bio-jet market become viable?

• **First generation bio-jet fuels are unlikely to be viable.** Agricultural prices are too high relative to fossil fuel and the support offered from government can not fill the gap. It is extremely unlikely a majority consumers will indicate a preference for higher priced air travel because of bio-jet fuel.

• If agricultural prices fall relative to fossil fuel to the extent that discretionary blending of first generation biofuel occurs the bio-jet fuel markets will have an advantage over road biofuels markets; the value of the CO2 emission. However, it is probable that such a move down would be slow and is unlikely.

• **Second generation bio-jet fuels likely viable.** If one can produce biofuel from a permanently cheap input of which you can control the supply, you will look to scale to supply all liquid fuel markets, transport and power. The likes of jatropha and camelina are unlikely to apply as they compete for agricultural land.
Progress: What progress has been made on the development of a bio-jet market?

- Negligible: Market prices simply not aligned for bio-jet fuel at the moment.

**Spread Bean oil - Gasoil in USD per MT**

Source: Data CBOT/CME; Methodology SCB