BP-DuPont biofuels fact sheet

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BP/DuPont Partnership:

- BP and DuPont have joined forces to develop, produce and market next generation biofuels to help meet increasing global demand for renewable transport fuels.
- These next generation fuels will harness DuPont's advanced biotechnology capabilities, BP's fuel market expertise and their joint process engineering know how.
- The first product of this next generation of biofuels made from renewable resources will be biobutanol.
- Using existing processing technology, we intend to market commercial volumes of biobutanol during 2007. In a second phase we anticipate using an improved conversion technology that will support broader commercialization before 2010.
- Biobutanol will be produced at a British Sugar facility. This will involve the conversion of British Sugar's bioethanol plant that is currently being constructed in Wissington in the UK to produce ~30,000 tonnes pa biobutanol.
- BP and DuPont are seeking other partnership opportunities in addition to the British Sugar relationship with other biofuel producers in other geographies, in order to extend production potential and hence the beneficial impact of biobutanol.
- BP's commitment is part of its strategy of identifying low carbon and renewable fuels for the future. It follows the company's creation in November 2005 of BP Alternative Energy, a dedicated alternative energy business (active in solar, wind, hydrogen and combined-cycle-gas-turbine (CCGT) power generation), the recent formation of a new Biofuels Business and plans to invest $500 million over the next decade in a new Energy Bioscience Institute to fund longer term research in biofuels and provide a technology pipeline for the new biofuels business.
- DuPont is committed to demonstrating how its unique scientific capability provides solutions that are sustainable, renewable and matched to real world needs to deliver products for a better, safer, healthier world.

Butanol's Advantages

- Can be easily added to conventional gasoline due to its low vapour pressure**.**
- Has an energy content closer to that of gasoline versus existing biofuels so consumers face less of a compromise on fuel economy – this is particularly important as the amount of biofuel in the fuel blend increases.
- Can be blended at higher concentrations than existing biofuels for use in standard vehicle engines. Currently biobutanol can blended up to 10%v/v in European gasoline and 11.5%v/v in US gasoline.
- Is well suited to current vehicle and engine technologies.
- Does not require automakers to compromise on performance to meet environmental regulations.
- Can be used in higher blend concentrations than existing biofuels without requiring specially adapted vehicles. There is the potential in the future to increase the maximum allowable use in gasoline up to a 16% volume.
- Is less susceptible to separation in the presence of water than existing biofuel-gasoline blends and therefore allows it to use the industry's existing distribution infrastructure without requiring modifications in blending facilities, storage tanks or retail station pumps.
- Is expected to be potentially suitable for transport in pipelines. As a result, biobutanol has the potential to be introduced into gasoline quickly and avoid the need for additional large-scale supply infrastructure.

Biobutanol has a number of synergies with ethanol.

- It is produced from the same agricultural feedstocks as ethanol (i.e. corn, wheat, sugar beet, sorghum, cassava and sugar cane).
- Existing bioethanol capacity can be cost-effectively retro-fitted to biobutanol production (minor changes in fermentation and distillation), as evidenced by the British Sugar relationship.
- There is a vapour pressure co-blend synergy with biobutanol and gasoline containing bioethanol, which facilitates ethanol blending.
- In summary, biobutanol offers biomass producers and biofuel converters the option of upgrading to a higher value bio-molecule. It is also compatible with and facilitates the introduction of bioethanol into the fuel pool.

Production

- Production technologies can utilize a variety of conventional feedstocks such as sugar cane, corn, sugar beet, wheat, cassava and sorghum, supporting global implementation.

- Production processes will also be compatible with future biofuel feedstocks such as lignocellulosics from fast growing energy crops (e.g. grasses) or agricultural byproducts (e.g. corn stalks).

Environmental Benefits:

- DuPont and BP are currently in the process of carrying out detailed calculations of biobutanol's GHG WtW/LCA emission performance. Initial indications are that, on the same feedstock basis, biobutanol can deliver emission reductions that are at least as good as ethanol on the same basis.

- Biobutanol's low vapour pressure (lower than gasoline), means that vapour pressure specifications do not need to be compromised leading to higher VOC emissions (i.e. no requirement for a vapour pressure relaxation).

Agricultural Benefits:

- Biobutanol is produced from the same agricultural feedstocks as ethanol (i.e. corn, wheat, sugar beet, sorghum, cassava and sugar cane).

- Biobutanol is good for global farmers as it provides another marketing opportunity for key agricultural products, thus enhancing value to farmers.

- By facilitating/smoothing the introduction of biofuels into gasoline, either directly as biobutanol or indirectly through biobutanol's synergy with ethanol, biobutanol will help expand the biofuels market as well as the markets for related agricultural produce, enhancing value for farmers.