

The promise of biomethanol

Victoria Baghdjian on the 'second generation' biofuel

Many petrochemical producers are examining renewable alternatives, many of which feed downstream into energy products, such as biodiesel, bio-MTBE and biomethanol.

Biomethanol is chemically identical to regular methanol, the only difference between the two products being the feedstock. Fossil methanol is made using natural gas while biomethanol can be made from renewable resources such as waste wood and crude glycerine, which is a residue from processing vegetable oil and animal fat.

Currently, the only producer of biomethanol is Netherlands-based BioMCN. The company owns and operates two 450,000 mt/year methanol units in Delfzijl, making it the largest "second generation" biofuel producer globally.

The company acquired two existing methanol plants in November 2006 and the pilot plant for biomethanol production was completed in March 2008. It began commercial production in summer last year.

BioMCN uses crude glycerine to produce its biomethanol. First, any impurities and water are removed and the remaining product is evaporated to form a biogas. This biogas is fed into a reformer and thereafter the production process is identical to that of conventional methanol.

"The resulting biomethanol has exactly the same specifications as regular methanol and therefore meets IMPCA methanol specifications," BioMCN communications director Eelco Dekker said. IMPCA – the International Methanol Producers and Consumers Association – is the industry body responsible for setting the standards and specifications of European methanol.

"This means that biomethanol can easily be used to produce 'green alternatives' for any and all existing methanol applications, without the need for extensive approval procedures," Dekker said.

"Biomethanol is a very versatile product that can be used as a feedstock for other biofuels and fuel additives such as bio-MTBE and bio-DME, or as biofuel in its own right, in the case of M85 gasoline – a blend composed of 85% methanol/biomethanol and 15% gasoline," he said.

"Biomethanol is highly suitable to play an important and lasting role in the transition toward sustainable transportation fuels with low CO₂ emissions. With our current

production capacity of around 200 000 mt/year, we can immediately fulfil the entire Dutch biofuel obligation which targets a minimum of 4% blended into gasoline."

While BioMCN is the only producer of biomethanol globally, it expects the market for the product to grow and this will likely pull other producers into the market.

"Although biomethanol is still a relatively new product, we are aware of at least four or five other biomethanol initiatives in Germany and Sweden," Dekker said.

"In most cases, these projects look at using different types of biomass other than crude glycerine. We think it's encouraging that other producers are also moving into biomethanol and it will allow customers to source from multiple suppliers."



Biomethanol is eligible for double biofuel credits under the EU's RED – the energy content is 'counted twice'



Biomethanol is primarily used by ether producers and oil majors to meet the biofuel obligations in their countries. While Northwest Europe does not blend methanol directly into gasoline, the petrochemical sector is a primary feedstock for the oxygenate MTBE, used to raise the Research Octane Number (RON) of road fuel.

"There is clearly an application in MTBE," said a gasoline trader at a Nordic oil major. "Biomethanol is a very attractive option for some producers. It means you can convert between bio-MTBE and using fossil methanol for regular MTBE," the trader told Platts. "Depending on what a buyer wants, they can ask for MTBE, with a portion of it to be of a bio-origin."

BioMCN sees the energy industry as a key demand outlet for biomethanol. Although several chemical companies have started to use biomethanol to produce sustainable alternatives of traditional methanol applications, for example in plastics and resins, the company expects most of the

growth in the coming years will come from fuel and energy applications.

Considered a sustainable fuel, biomethanol is eligible for double biofuel credits under the European Union's Renewable Energy Directive (RED).

In recent years, the sustainable nature of traditional "first generation" biofuels has come under pressure due to claims of adverse effects such as deforestation as well as the "food versus fuel" argument.

The emphasis in the political and public debate has shifted towards more sustainable, less contentious biofuels made from waste products – what the industry refer to as second generation biofuels.

"In order to stimulate the use of second generation biofuels, the EU has decided that the energy content of biofuels made from waste and residues shall be counted twice," Dekker said. "Regular methanol has an energy content of 16 megajoules/liter but since the energy content of biomethanol is counted twice, every liter of biomethanol made from crude glycerine effectively contributes 32 MJ/liter to the biofuel target."

The RED recognizes crude glycerine as a processing residue and as such, is considered to have zero life-cycle greenhouse gas emissions up to the process of collection.

"So, biomethanol reduces CO₂ emissions by 78% in comparison to regular methanol on the basis of a life cycle analysis."

Biomethanol is seen by octane producers in Europe as an alternative to ethanol.

Subsequently, producers will look at the cost-competitive nature of biomethanol versus ethanol when deciding to produce either bio-MTBE or ETBE.

"[Producers will] weigh up the bio credits for MTBE and ethanol, and the relative costs of ethanol and biomethanol," a Europe-based operator said.

Prices for T2 ethanol (material that does not incur an import duty in the EU) dipped to a 2010-low of Eur423/cu m (about \$550/cu m) FOB Rotterdam on April 26, according to Platts data. However, prices recovered and have reached a year high of Eur650/cu m on September 13, obliterating last year's peak of Eur555/cu m recorded on December 12, 2009.

In comparison, methanol T2 FOB Rotterdam prices have been less volatile recently, with values over the third-quarter 2010 in a range of Eur223-236.50/mt.