NETHERLANDS

World's largest bio-methanol plant on the horizon

BioMCN, a European bio-methanol producer, has begun construction on a new bio-methanol plant in Delfzijl, Netherlands. The plant will be the largest bio-methanol plant in the world, having a production capacity of 200,000 t/a.

The plant will be based on a new technology developed by BioMCN that is capable of purifying crude glycerine and then converting it into bio-syngas. The bio-syngas can then be used to generate power, or can be converted into bio-methanol which can be used as a biofuel, or a feedstock to make other biofuels or bioproducts such as formaldehyde or acetic acid.

BioMCN began successfully producing bio-methanol using their glycerine conversion technology in March 2008 at a 20,000 t/a pilot plant in Delfzijl. With the technology proving successful, BioMCN are now moving to complete the commercial-scale 200,000 t/a bio-methanol plant by the end of 2009.

In October 2008, BioMCN were awarded the European Responsible Care Award for the technology, which has been praised for its potential to reduce GHG emissions by over 70%, and to avoid some of the negative impacts that are commonly associated with some other types of biofuels, such as land use competition. "By converting glycerine into methanol, the energy value can be maintained for transportation fuels, thus improving potential for CO_2 emission reductions," Eelco Dekker, Chief Marketing Officer at BioMCN told delegates at the CMAI World Methanol Conference in Lisbon, December 2008.

The GHG reduction potential means that when used as a biofuel or biofuel feedstock, BioMCN's bio-methanol can be used to help meet EU biofuels targets (5.75% biofuel replacement by 2010, and 10% replacement by 2020). Bio-methanol fuel blends, M60 and M85, have been shown to emit less CO_2 and have a lower energy consumption (MJ/100km) than petrol and E85 when tested with a 2.0 litre FFV engine.

Lotus Engineering recently developed an Exige Tr0-Fuel sports car, capable of running on a mixture of gasoline, ethanol and methanol, and in August 2008 BioMCN demonstrated running the vehicle on their bio-methanol. The bio-methanol may also be used to produce other biofuels such as bioMTBE, or bioDME (a diesel-fuel alternative). In the last few years there have been a range of initiatives in Europe demonstrating DME-powered commercial vehicles, such as Volvo's bioDME project.

Capturing the full energy potential of the glycerine not only helps reduce GHG emissions but also allows the development of integrated biodiesel refineries, where waste glycerine from biodiesel production is converted into syngas which can then be used as a substitute for natural gas to generate power, or fed back into the esterfication process after being converted to bio-methanol.

With biodiesel set to play a large role in meeting EU biofuels targets, the availability of glycerine is likely to increase in the near future. In 2007 the EU produced up to 5.5 million tonnes of glycerine, almost 2 million tonnes more than what was produced in 2005, and over 5 million tonnes more than what was produced in 2000.

As Europe's infrastructure gears up for an increased use of biodiesel and other fuels like bioDME, technologies that are capable of converting crude glycerine from biodiesel production into bio-methanol show commercial promise.

BioMCN is so confident that there will be demand for bio-methanol and glycerine conversion technologies in the future that they are planning 3 additional 200,000 t/a glycerine-to-bio-syngas plants; one to completed by 2010, and two more coming online by 2011.

UNITED STATES

Plasma technology converts glycerol to syngas

Florida Syngas, a US-based energy company, claim to have developed a new technology that is capable of converting glycerol, a by-product from biodiesel manufacturing, into a synthesis gas.

Using a patented "electric discharge plasma arc reactor" technology called *GlidArc*™, Florida Syngas claim they are able to produce a hydrogen-rich, high BTU syngas with 90% efficiency. "Electric discharge plasma differs from the more common "plasma torch", in that plasma torch technology use tremendous amounts of energy to operate (both high voltage and high amperage), whereas electric discharge reactor technology uses far less energy (only requiring high voltage with very low amperage)" Lawrence Bell, vice president of marketing at Florida Syngas told *Nitrogen+Syngas*.

Bell said the technology works by first vapourising glycerol using heat generated by the plasma. The vapourised glycerol is then fed into a plasma chamber where it is subjected to a low amperage, high voltage spark. The shape of the plasma chamber and the catalyst are key to making the technology work, but Bell wasn't going to give away any secrets. Though he did mention that once started, the process is self-sustaining, and the initial tests have shown no deterioration of their catalyst.

Glycerol is a by-product of the transesterification process used to produce biodiesel. In the US biodiesel production has doubled each year since 2003, with approximately 362.42 million gallons of biodiesel produced in 2007, generating about 36.24 million gallons of glycerol. With such large amounts of glycerol by-product being produced, the industry has sought commercially viable uses for glycerol.

Florida Syngas claim that the syngas produced using their new technology is ideal for microturbines used to generate electricity, and can help biodiesel operations achieve energy independence and reduce carbon emissions. They also claim that their technology can be used to make methanol, and may be used to provide biodiesel refiners with up to 50% of their methanol needs.

According to Bell, a number of companies have expressed an interest in Florida Syngas' technology and have committed to being involved with beta testing projects, with a complete system expected to be completed within six months. Ingersoll Rand has agreed to integrate the technol-