

Conversion of crop wastes and carbonaceous biomass to ethanol and/or power,

Enclosed is an overview of a INEOS Bio system which is recognised as the world's first commercial plant to convert cellulosic biomass into renewable fuel and power. We have been following this development with the inventor for a decade and now have agreements to be able to introduce this technology into Australia. We see crop or plantation wastes, paper waste and municipal waste as potential feed-stocks for this technology. Plant is best located near potable water and near sources of densified crop wastes to minimise transport costs. We believe several well located plants could end up producing 50% of Australian liquid transport fuel needs. Apart from being able to produce low cost renewable fuel (ie E85) and or power, this is a system that can protect our transport industry which is fast running out of local refinery capacity that could cause instability during global crises.

Such a business could work in with wheat growers to also produce aviation fuel from camelina seed which can be grown as a second crop with wheat using the same planting and harvesting equipment. Qantas has already found competition difficulties from middle east airlines who have access to lower cost aviation fuel.(fuel is 25% cost of running aircraft) A local industry that could quickly support Australian agriculture and airlines should be something worthy of early investigation.

It is also worth mentioning that much of value added food in European supermarkets is flown in daily from Kenya. Also a certain amount of fresh produce out of NZ is flown to Asia. There should be similar opportunities to supply Asian and middle eastern markets if we can lower cost of aviation fuel.

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INEOS Bio Produces Cellulosic Ethanol at Commercial Scale

INEOS Bio Produces Cellulosic Ethanol At Commercial Scale

First facility in the world using new advanced bioenergy technology to convert waste to renewable fuel and electricity

Vero Beach, Fla. – July 31, 2013 – INEOS Bio today announced that its Indian River BioEnergy Center (Center) is now producing cellulosic ethanol at commercial scale. First ethanol shipments will be released in August. This is the first commercial-scale production in the world using INEOS Bio's breakthrough gasification and fermentation technology for conversion of biomass waste into bioethanol and renewable power.

"We are delighted with the progress made by our team at Vero Beach", said Peter Williams, CEO of INEOS Bio and Chairman of INEOS New Planet BioEnergy. "They have successfully addressed the challenges of moving a new technology to large production scale for the very first time. Consequently, we are now pleased to announce that we are producing commercial quantities of bioethanol from vegetative and wood waste, and at the same time exporting power to the local community – a world first. We expect to spend the remainder of 2013 putting the plant through its paces, and demonstrating full nameplate capacity."

Dr. Williams added, "All that we have seen so far validates the technical and economic viability of the technology. We remain convinced that the ability to divert waste materials from communities by converting them into competitively priced renewable fuel and power offers an excellent value proposition. It helps solve waste disposal issues, contributes to the supply of affordable and renewable fuel and energy, creates attractive jobs, and provides a sustainable source of value for the community. We look forward to taking the next steps in building a global business based on the broad deployment of this advanced technology."

The BioEnergy Center is a joint venture project between INEOS Bio and New Planet Energy. The facility has already converted several types of waste biomass material into bioethanol, including vegetative and yard waste, and citrus, oak, pine, and pallet wood waste. It will have an annual output of eight million gallons (24kta) of cellulosic ethanol and six megawatts (gross) of renewable power. The Center is also permitted to utilize municipal solid waste (MSW), quantities of which will be used for bioethanol production at the Center during 2014.

The biofuels produced in Florida will anchor the new production of cellulosic ethanol under the U.S. Renewable Fuels Standard (RFS). INEOS Bio is working with other companies and cities globally to use this technology as a new direction for waste disposal and the production of advanced biofuels and renewable power.

The Center cost more than \$130 million and created more than 400 direct construction, engineering and manufacturing jobs during its development. The project sourced more than 90% of the equipment from U.S. manufacturers, creating or retaining jobs in more than 10 states. The Center has 65 full-time employees and provides \$4 million annually in payroll to the local community.

The Center will serve as a reference plant for future INEOS Bio facilities and for companies and cities interested in licensing the technology for similar facilities. As a major licensor of chemical process technology in the world, INEOS will leverage its extensive expertise to bring this technology forward as an exciting new alternative for sustainable waste disposal.

For more information on licensing the INEOS Bio technology, contact Mark Dietzen or Markus Hesse at bioinfo@ineos.com also at <http://www.ineosbio.com>.



INEOS Bio started production of commercial-scale ethanol at its first facility near Vero Beach, Florida. The Indian River BioEnergy Center is producing commercial quantities of transportation fuel from vegetative and wood waste, and at the same time exporting renewable power to the local community.

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INEOS Bio, Syngas Fermentation of carbonaceous feedstock to ethanol (overview)

The syngas fermentation process converts any carbonaceous raw material (biomass, MSW, coal, tires, plastic, shale oil, etc.) into synthesis gas which is fermented with proprietary bacteria into a single product, ethanol, with a by product of waste heat and power. In general, liquid fuel is more valuable than electricity; hence the general design produces more ethanol; although the design can be varied for local economies. The usual design produces about 80 gallons of ethanol per dry, ash-free ton of biomass feedstock (wheat straw, wood) and about double this amount for coal, tires, plastic, etc. The process produces all the steam and power required to produce ethanol and could export about 2.5 kwh per gallon of ethanol. Many high energy usage process plants have significant synergies, including the use of the excess heat and power from the ethanol plant.

The attached Sketch of a Florida installation converting green waste into ethanol will be to our knowledge the first commercial plant in the world using this technology. The two stage gasifier used for MSW or vegetative waste does not require any pre-sorting of metal, glass which comes out in the ash. The space required for this 300 TPD installation is a little less than one hectare..

Major feed-stocks for ethanol will come from agricultural wastes such as straws, grasses, woody biomass from coppiced trees (eg Mallee Eucalypts). To provide estimates of yield and plant ops costs for wastes, it will be necessary to provide an NDA to INEOS Bio through below personnel for technology involved. A combination of local and overseas groups can construct plant, it may be possible to integrate an operation to handle several wastes from different organizations

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