

Advanced Biofuels Conference in Gothenburg, Sweden

Taking off from a "dead-end road"



Géraldine Kutas, UNICA discussed the industrial development of sugarcane fuel ethanol in Latin America.



Sandeep Poundrik, MoP&NG outlined the policy initiatives and challenges with India's new Biofuel programme. He also said that there were plans to support ten cellulosic ethanol demonstration plants.



"To change the way we travel we need to co-operate in the value-chain and create new collaborations. No one can do it themselves," said Petter Holland explaining why the company has numerous new projects.



Martina Conton, EU policy manager NGva Europe, outlined the role of biomethane in transport and introduced the concept of a carbon correction factor (CCF).



The "buzzword" for this year's Advanced Biofuels Conference (ABC) in Sweden was "take-off". Take-off for sustainable aviation fuels and for new advanced biofuel production investment – including cellulosic ethanol.

CLARIANT'S GROUNDBREAKING in Podari, Romania only days prior to the mid-September event is a case in point and quite contrary to cellulosic ethanol being a "dead end road" as concluded by a report published by Biofuelwatch also a few days prior to the event.

The pre-conference study tour to the St1 refinery in Gothenburg, which commissioned the world's first oil refinery integrated advanced ethanol plant in 2015 was another such example – a 5 million litre per annum facility that uses food industry waste as feedstock. The ethanol can be used as blend-stock on site or supplied to third parties.

First to set the record straight was Géraldine Kutas, Head of International Affairs for the Brazilian ethanol industry association UNICA. Brazil is the world's second largest ethanol producer trailing the US. The country has a 27 percent blend mandate but unlike anywhere else, 74 percent of the automobile fleet and 44 percent of the

motorcycle fleet are flexifuel vehicles (FFV). When it comes to 2nd generation ethanol, both Raizen and Gran-Bio have plants that are producing, albeit under installed nameplate capacity. Kutas presented production figures noting that both plants have yet to reach cost parity with conventional sugarcane ethanol. This means that both depend on export markets where there is a premium for fuels like cellulosic ethanol as there is no such incentive in Brazil. The other alternative is higher value markets such as chemicals.

Indian advanced biofuels

From India, Sandeep Poundrik, Joint Secretary Refineries, Ministry of Petroleum and Natural Gas (MoP&NG), spoke about the country's recently updated Biofuels programme. He explained that bioenergy development comes under the charge of different ministries and departments. Policy and R&D support for biofuels in transport sector and the utilization of wastes for biofuel generation comes under his ministry.

The first national biofuels policy was introduced in 2009 and was updated early this year setting an indicative 20 percent ethanol and 5 percent biodiesel blend targets by 2030. It's a formidable task.

For biodiesel it means installing an additional 3 billion litre per annum capacity, double the existing capacity. Collection and utilization of used cooking oil (UCO) and fats, oils and greases (FOG) from food industries and restaurants is seen as a feedstock source – India consumes 23 million tonnes of edible oil and removing UCO (aka "gutter oil") from the food chain is also a public health priority.

For ethanol, the updated policy also expanded the range of eligible feedstock for convention ethanol production to include spoiled food crops such as grains and tubers and heavy molasses from the sugar industry. The latter could provide around 1.5 billion litres of ethanol annually. However, Poundrik highlighted that the real opportunity lay with agricultural residues and waste.

– For India, advanced biofuels is the probable answer to limited availability of conventional biofuels and provides a tool for emissions reduction, waste management and income generation said Poundrik, adding that the potential exists for up to 25 – 30 billion litres of cellulosic ethanol annually.

A scheme under consideration aims to create 10 billion litres of annual cellulosic ethanol capacity by supporting 10 demonstration plants based on novel advanced biofuel technologies.



Maria Gelin (left) Swedavia and Freya Burton, LanzaTech both spoke about sustainable aviation fuels whereas Eelco Dekker, Methanol Institute and Alex Miles, Enerchem discussed methanol and DME as clean transportation fuels.



Christel Grip, Widrikssons Åkeri provided a fleet operators perspective on the challenges to becoming fossil-free and sustainable logistics company.

With 15-year off-take agreements with oil marketing companies (OMCs) already in place, the objective is to bring down the cost of production and stimulate establishment of commercial-scale biorefineries.

Oil public sector undertaking (PSU) companies (ie state owned oil firms) have already announced plans for 12 pre-commercial 2nd generation ethanol plants in 11 states across the country of which three have begun construction.

Anaerobic digestion (AD) of organic waste to produce compressed biogas (bioCNG) for transportation was another technology route being pursued. Finally, Poundrik pointed out that India too was in the running regarding biojet fuels for aviation – in August, India-headed low cost carrier Spicejet conducted a flight using a 25 percent blend of a jatropha derived fuel produced using technology developed by CSIR-Indian Institute of Petroleum (CSIR-IIP).

On the topic of aviation and carbon emissions, Maria Gelin, from the Swedish state owned airport operator

Swedavia, put the rapidly growing civil aviation sector into perspective – 2 percent of global emissions. In Sweden, aviation accounts for 5 percent and the target is for domestic flights to be fossil-free by 2030.

Using microorganisms for carbon capture and recycling (CCR) is another route that Freya Burton, Chief Sustainability and People Officer at LanzaTech spoke of. Even more sig-

nificant is the ASTM approval of ethanol to jet pathway within the Alcoholto Jet (ATJ) group that LanzaTech has achieved. This opens up an additional market for ethanol producers.

Carbon pricing on conventional fossil jet fuel would provide the financial lift for advanced biofuels like cellulosic ethanol to take off even faster.

Text & photos: Alan Sherrard
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It's a wrap for ABC 2018 - according to the organizers, Gustav Melin, Meaza Yohannes, Tomas Ekborn, Dorota Natucka Persson, Jeanette Fogelmark, Jacob Lagercranz and Nickyar Ghadirinejad, the next edition will be held 2019 in Stockholm in September.



Waiting for the fossil-free electric vehicle, Professor Övind Andersson, Lund University demonstrated with data the importance of transparency on the benefits between different powertrains through lifecycle analysis (LCA). LCA shows that EV's not automatically better than renewable fuelled internal combustion engine powertrains, both are needed.

Kraftringen initiate bio-oil extraction feasibility study

The Swedish municipal energy utility Kraftringen Energi AB together with Lund University of Technology (LTH) and Karlstad University, will evaluate the possibilities of extracting bio-oil from existing biomass cogeneration operations. The Swedish Energy Agency, together with Kraftringen, will finance the SEK 4 million (≈ EUR 385 000) project, which will be conducted at Kraftringen's Örtofta biomass-fired combined heat and power (CHP) plant. The Swedish Energy Agency contribution is SEK 2.9 million (≈ EUR 280 000).

The project seeks to answer questions about whether energy companies can become self-sufficient in biofuels and thereby replace fossil oil or imported biofuels in CHP plants or even become a

supplier of bio-oils to other industries.

– We are pleased that the Swedish Energy Agency stands behind this important project, which is in line with Kraftringen's efforts to lead the transition to a sustainable society. Our cogeneration production is already fossil fuel free today but it does not mean that we together shouldn't find new innovative ways to further reduce our environmental impact, said Stefan Hansson, Technology Manager at Kraftringen.

Scheduled to begin in November 2018, the two-year research project is unique in its kind and the hope is that the increased knowledge will form the basis for a faster conversion to a fossil-free energy industry. – In this new collaboration, we will evaluate the sustain-



Commissioned in 2014, Kraftringen's SEK 1.8 billion Örtofta biomass-fired combined heat and power (CHP) plant is one of the largest in southern Sweden. On an annual basis the plant uses 310 000 tonnes of woody biomass to supply 500 GWh of district heat to Lund, Lomma och Eslöv and 220 GWh of electricity (photo courtesy Christina Fröjd, Kraftringen).

ability of a possible future system. The possibility of using domestic wood fuel and existing facilities in a more efficient way is really exciting. It creates good conditions for the production of low-environmental

biofuels, remarked Lovisa Björns-son, Project Manager and Professor Environmental and Energy Systems at LTH.

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