Catalysing global bioeconomy post-Paris Agreement

Green conversion

October marked a pivotal month for climate action, with nearly 90 nations supporting the Paris Agreement and allowing it to officially enter into force on 4 November, 2016. In a historical first, countries from around the globe convened with a significant portion of them agreeing to curb greenhouse gas (GHG) emissions and limit temperature increase to 1.5°C above pre-industrial levels. In an effort to prevent the most catastrophic consequences of climate change, this agreement represents a critical moment for the energy industry as nations accelerate the transition to a new cleaner, more efficient energy paradigm.

To meet the goals outlined in the Paris Agreement, governments and industries alike are exploring a portfolio of energy strategies to rein in emissions. Bioenergy is expected to play an integral role in the phase-out of fossil fuels. Already, bioenergy capacity has doubled in the last 15 years in the EU and is expected to grow by another 30% by 2020. Transparency Market Research projects the global biofuels market to reach $246.52 billion (€222.28bn) by 2024. Climate change mitigation and localised energy security are key drivers for global biofuels market growth.

Despite an increase in bioenergy over the years, the industry has faced a scaling problem. Incumbent biomass conversion technologies have largely been cost-prohibitive and, thus, not adopted in mass-market applications. While earlier conversion approaches were important stepping-stones towards mainstream success, these technologies relied on acids or enzymes to convert biomass into sugars. These multi-day processing methods proved largely capital-intensive and, as a result, prohibitive. Acids require high alloy reactors or expensive recovery systems, and enzymes demand extensive pretreatment and large volume sterile systems. Other processes have added solvents to try and improve the use of enzymes or acids, but have simply traded one high cost for another.

The new method

In contrast to these technologies, Renmatix was established to forge a new path in which plants economically obsolete petroleum. The Plantrose process is the first conversion technology to compete with fossil fuels on price. Using supercritical water – water at elevated temperatures and pressures – Renmatix economically deconstructs biomass into useful, cellulosic sugars, lignin polymers, and other fractions. While it also has a favourable footprint over competing technologies, it uses no significant consumables, includes rapid reactions in small reactors, and can process any number of feedstocks, reinforcing its position as a globally relevant and scalable solution. In turn, profitable conversion technologies can serve significant bioenergy market demand and begin to provide large-scale, meaningful volumes as an alternative to incumbent petroleum-derived fuels and chemicals.

Though the innovation is technical in origin, Plantrose generates an economically compelling impact on the evolving ecosystem for this burgeoning global bioeconomy. Access to these low-cost sugars creates a compounding domino effect up and down the supply chain, enabling the broad scale-up of biochemical, cellulosic ethanol, and advanced biofuels markets worldwide. Cellulosic sugar is an enabling feedstock for petroleum alternatives used in the global biochemical and biofuels markets. By utilising the Plantrose process, key players, like BASF and Total, are diverging from an era of relying solely on oil-based chemistry to one reinvented as sugar-based via modern technology. The economic breakthrough encompassed by this new process means a lower cost starting point for bioenergy, enabling it to cost-effectively compete with conventional petroleum alternatives.

With global energy demand projected to grow by 56% by 2040, according to the US Energy Information Administration, there is a need for solutions that can be tailored to meet the needs of diverse markets. Because Plantrose technology is feedstock agnostic, there are multiple feedstocks that can be utilised, including woody biomass, agri-residues, municipal solid waste, and others. As more countries move towards a new energy paradigm, Plantrose can supplant traditional energy generation methods and further displace non-renewable energy sources as scaling hinges on its economic viability and a flexible conversion platform.

Renmatix bioflex conversion unit

Open the gates

To drive further development in the sector, Bill Gates alongside French energy giant Total - recently invested $14 million in Renmatix. The investment, which will go towards commercialising Plantrose, will help drive towards the first wave of Plantrose-enabled biorefineries in diverse global markets like Canada, India, Malaysia, the US, and elsewhere. This most recent investment gives further commercial momentum to the sector as the biomarket continues to scale.

While government mandates were essential in initially spurring bioenergy, the industry is entering an era where biofuel and biochemical production is competitive with petro-based approaches. This breakthrough in cost will truly accelerate the growth of the global bioeconomy, and help nations achieve their GHG reduction goals ratified under the Paris Agreement. ●

For more information:
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