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News

Innovation and Industry

Renewable energies

Bio-based chemistry



The viability of Anellotech's **Bio-TCat™** technology has now been proven by achieving commercially-targeted yields in its TCat-8<sup>®</sup> pilot unit in Silsbee, Texas during six months of continuous process operations.

Process yields of 22-24% by weight of liquid products from loblolly pine feedstock were demonstrated. Supplemental carbon monoxide (CO) output provides potential for an additional 3-5% yield by weight of cellulosic ethanol via third-party technologies or production of renewable electricity.

The Bio-TCat™ reactor produces a liquid product containing over 98% C6+ aromatic chemicals directly from the MinFree™-pretreated feedstock. After mild hydro-treating and purification, AnelloMate™ products – the family of liquid products made through Bio-TCat™ – meet all specifications for sale as chemicals or fuel blendstocks.

Anellotech is now planning the construction of its first commercial plant and is engaging in partnership and funding discussions with existing and new strategic partners. Engineering work is expected to

begin this summer and once funding is secured, the next phase of construction will begin in the second half of 2020. The first plant will be capable of processing 500 bone dry tonnes/day of loblolly pine wood into 40,000 tonnes/year (860 BPSD) of products including benzene, toluene, xylenes, and C9+ aromatics to use as fuels or for making bio-based plastics for packaging and consumer products. 30,000 tonnes of carbon monoxide (CO) and other by-product gases will also be produced, for use in generating renewable electricity or used for chemical feedstock.

*« We are delighted with these results, as they validate the economic potential of the Bio-TCat™ process and give us confidence that even small, initial scales of production are viable »,* said David Sudolsky, President and CEO of Anellotech. *« The goal of being cost-competitive with fossil resource technologies is a reality and we look forward to on-going process improvements ».*

Anellotech and its partner **Axens** are looking forward to licensing much larger plants following this first commercialization. These would be five-times bigger, producing 200-250,000 tonnes/year (4,000-5,000 BPSD) of aromatics and 150,000 tonnes of CO. This rapidly expands the availability of bio-aromatics for chemicals and fuels, providing cost-competitive solutions needed by refiners and brand owners looking to make a difference in their carbon footprints.

*« We are very excited about the prospects of deploying the Bio-TCat™ technology commercially under license in the coming years. We expect to bring non-food, renewable solutions to the fuels and chemicals markets for products that meet sustainability goals and provide attractive returns under competitive market conditions,»* affirmed Pierre Beccat, Executive Vice-President Technology Development and Innovation at Axens.

For more information on Bio-TCat™ technology, visit [Anellotech's website](#).

### **About Anellotech**

Anellotech ([www.anellotech.com](http://www.anellotech.com)) is a sustainable technology company focused on commercializing innovative production of cost-competitive renewable chemicals and fuels from non-food biomass. Founded in 2008, Anellotech has raised over US\$80 million in cash and in-kind contributions to date. Its patented Bio-TCat™ technology is an efficient thermal catalytic process for converting biomass into BTX aromatics (a mixture of benzene, toluene and xylene) which are chemically identical to petroleum-based counterparts. High-purity BTX is used to make commodity polymers such as polyester (polyethylene terephthalate or "PET"), polystyrenes, polycarbonates, nylons and polyurethanes which are used to manufacture a variety of plastic consumer goods such as beverage bottles, food packaging, clothing, footwear, carpeting, automotive and electronic components. Bio-TCat™ technology can also produce renewable AnelloMate™ fuel blendstocks which can be used to lower the GHG emissions of producing gasoline, jet fuel, diesel, and low-sulfur marine fuels. The Bio-TCat™ process is being demonstrated with loblolly pine feedstocks at Anellotech's TCat-8® pilot plant in Silsbee, Texas which is currently producing aromatics from loblolly pine and generating data to be used for scale-up and commercial plant design by Anellotech and its engineering and licensing partners IFPEN and Axens.

### **About Axens**

*Axens ([www.axens.net](http://www.axens.net)) is a major international process licensing and engineering firm that provides a broad range of process and catalytic solutions to the oil refining, petrochemical, and natural gas industries including novel technologies for renewable biomass conversion. They are ideally positioned to cover the entire engineering value chain for Bio-TCat technology including design and licensing packages, feasibility studies, unit start-up, and technical service. Axens success is based on highly trained human resources, modern production facilities and an extended global network of engineers and technicians for manufacturing, technical, and commercial support services.*

### **About IFPEN**

*IFP Energies nouvelles (IFPEN) is the French public research entity and a major research and training player in the fields of energy, transportation, and the environment. From research to industry, technological innovation is central to all its activities, structured around three strategic priorities: sustainable mobility, new energies and responsible production and use of oil and gas resources. IFPEN collaborates with Anellotech to leverage its expertise in fluid bed catalytic reactor technology, refining, and petrochemicals processing. In addition to extensive activities at its R&D center in Solaize, France, IFPEN provides technical experts to work on-site at Anellotech's Texas location to help operate the TCat-8 development unit.*

*> [Our expertise: Bio-based chemistry](#)*

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