

Biochemistry for the Circular Economy

NEXTCHEM AND LANZATECH SIGN AN AGREEMENT TO PROMOTE CIRCULAR ETHANOL PRODUCTION

NextChem's #CircularDistrict model is enhanced with a new dimension: in addition to hydrogen and methanol derived from the chemical conversion of plasmix and non-recyclable dry waste, it will now be possible to obtain ethanol, an important chemical for sustainable fuels and disinfectant production.

Rome, July 23rd 2020. NextChem and US carbon recycling company, LanzaTech sign an agreement to license the "Waste to Ethanol" process line. NextChem thereby expands its circular economy and chemical recycling technologies, adding circular ethanol technology to circular hydrogen and circular methanol production technologies (currently in the engineering phase), based on the chemical recycling of plastic and dry waste. The basic process is the chemical conversion of hydrogen and carbon contained in plasmix¹ and RDF², from which a Circular Gas is obtained to be used as a base to produce various chemical products. With LanzaTech's biological "syngas fermentation" technology, ethanol is produced by bacteria, transforming the Circular Gas at low temperature and low pressure, improving the overall sustainability profile of the process. This is an example of the bioeconomy in action, serving the circular economy and promoting decarbonization. NextChem will exclusively license this technology in Italy and, on a project basis, in some foreign markets.

Circular ethanol derived from this process can be blended with gasoline displacing fossil inputs with recycled carbon, lowering the fuel's carbon footprint. When produced from biological wastes and residues, 40% of the circular ethanol can be considered as "advanced" under the EU Renewable Energy Directive. Ethanol (which is totally imported by Italy), is another important intermediate product for the production of a series of chemical components, such as ethyl acetate, a valuable solvent for car paints, which Europe has to import, and alcohol used as a disinfectant. By making these products from waste derived ethanol, circular models of consumption are promoted.

NextChem technological integration is among the most relevant innovations in the circular economy sector, as it allows the production of products such as hydrogen, methanol, ethanol, which are chemical "building blocks", sourced from the currently non-recyclable waste, avoiding fossil sources and reducing climate-changing emissions while increasing the share of recycling.

"We are expanding our technology portfolio from a strategic perspective: our circular district model and our waste-to-chemicals technology platform are the answers both to the problem of reliance on foreign supplies of chemical products, and to the problem of recovery of currently non-recyclable waste fractions, and to the problem of decarbonization", says

¹ Non-recyclable waste from plastics separate collection

² Refuse Derived Fuel

Pierroberto Folgiero, CEO of NextChem and Maire Tecnimont. "NextChem aims to provide the market with technological solutions to completely replace traditional fossil-based chemistry with biochemistry and waste chemistry. We want to re-build coal chemistry, excluding coal entirely: an extremely ambitious goal, which today has become possible".

"We must accelerate the transition to an inclusive circular bioeconomy in harmony with our natural world," said Jennifer Holmgren, CEO of LanzaTech. "We have to realize that waste is a choice. Everything can and should be reused, just as everything is reused in nature. The Circular Economy is here to stay and NextChem's circular district model is a great example of how we can build resilience in our economy by reusing all the carbon we can!"

Maire Tecnimont S.p.A. Listed on the Milan Stock Exchange, is the head company of an industrial group, a leader in the natural resources processing industry (plant engineering in oil & gas downstream, with advanced technological and executive skills). Through its subsidiary, **NextChem** operates in the field of green chemistry; NextChem develops, designs and markets technologies for the energy transition, to produce chemical products sourced from non-fossils. NextChem roadmap goes in three directions: lower climate impact of traditional plants through industrial technologies that use renewable energy sources and CO₂ capture and recovery; the production of intermediate products and chemicals from bio-sourced raw materials; advanced recycling (Upcycling) of plastic waste and chemical recycling. Maire Tecnimont Group is present in 45 countries, has about 50 operating companies, and employs about 6,300 people, plus 3,000 professionals in its electrical and instrumentation business unit. For more information: www.mairetecnimont.com, www.nextchem.com

About LanzaTech. Carbon recycling company, LanzaTech is a global leader in gas fermentation, making sustainable fuels and chemicals via biological conversion of waste carbon emissions, including industrial off-gases; syngas generated from any biomass resource (e.g. municipal solid waste), organic industrial waste, agricultural waste); and reformed biogas. LanzaTech's expertise in fermentation scale up, reactor design, machine learning and synthetic biology has enabled the company to commercialize its recycling process and demonstrate production of over 100 different chemicals. With global investors and partners, LanzaTech has a pipeline of commercial projects around the world and is working across the supply chain to provide novel circular solutions to mitigate carbon by producing consumer goods that would otherwise come from fresh fossil resources. Founded in New Zealand, LanzaTech is based in Illinois, USA and employs more than 170 people, with locations in China, India and Europe. Further information is available at www.lanzatech.com

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