Recycling Europe's three million tonnes of tyre waste

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Credit: AI-generated image (disclaimer)

With up to 70 percent of used tyres ending up in landfills, there is an opportunity to find other ways of recycling this material, and in turn reduce the environmental damage. The EU-funded TyGRE project set out to find a use for Europe's tyre waste - estimated to be three million tonnes a year.

Tyres contain gases which are highly flammable. This volatility is good news for recycling because waste tyres can be used instead of coal or biomass as a fuel source or starter material for value-added by-products. The project team is investigating better ways to harness this resource by extracting the volatile gases or 'syngas' (a mixture of mainly hydrogen, carbon monoxide and dioxide, and methane).

Leading this project is the Italian national agency for new technologies, energy and sustainable economic development, ENEA, in Portici, near Naples. Sabrina Portofina, a researcher at ENEA, says such by-products are a 'must' in the recycling process. 'Solid carbon is collected after the gasification as a basis for the productions of these by-products,' she explains.

'Therefore, to increase the added value of the gasification we decided to include products such as silicon carbide - the carbon reacts with silicon oxide at high temperature to form silicon carbide,' she continues. 'Silicon carbide can be used in the manufacture of ceramic materials and in electronic applications.'

Having received EUR 3.3 million in EU-funding, the consortium consists of industrial and private partners (producer, recycler, ceramic powder final user and pyro-carbon producer).

Already significant achievements have been made since the start of the project in 2011 with the first phase of the project having been completed. A prototype plant is now under construction at the ENEA facilities in Trisaia, with the aim of processing 30 kilograms of tyre waste per hour. Operating the prototype will establish how sustainable the TyGRE recycling scheme will be and the project team will then be able to assess the energy balance of the whole process.

More information: TyGRE www.tygre.eu/cms/

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