NTU Develops Tech to Turn Plastic Trash into Fuel

Alita Sharon, OpenGov, April 7, 2022

Scientists from Nanyang Technological University, Singapore (NTU Singapore) have developed a new method for plastic waste to be converted into hydrogen based on pyrolysis, a high-temperature chemical process.

Unlike PET plastic bottles which can be recycled easily, plastic litter containing contaminated food packaging, styrofoam and plastic bags, is challenging to recycle and is currently incinerated or buried in landfills, leading to both water and ground pollution.

Using the new method, NTU scientists are now able to convert plastic litter into two main products, hydrogen and a form of solid carbon known as carbon nanotubes – a high-value material used in biomedical and industrial applications. Hydrogen is useful for generating electricity and powering fuel cells like those found in electric vehicles, with clean water as its only by-product.

Developing such hydrogen technologies is part of Singapore's plan to explore hydrogen technologies in its push to diversify energy sources, as it could replace fossil fuels such as natural gas while lowering the carbon footprint of the nation.

This waste-to-hydrogen research project used marine litter collected from local waters in collaboration with the Ocean Purpose Project, a non-governmental organisation and social enterprise. Together with industrial partner Bluefield Renewable Energy, the joint project demonstrates the potential for all non-recyclable plastics to be upcycled into fuels and high-value materials.