Paving the Way to a Circular and Sustainable Future: Transforming Plastic Waste into Eco-Roads with NEWBitumen

In Singapore, a longstanding issue is the management of plastic waste, a significant portion of which is widely deemed unrecyclable using conventional methods. However, a groundbreaking technology developed by a local start-up, Magorium, offers a solution – by transforming contaminated and unsorted plastic waste into an innovative new road construction material, NEWBitumen.

3,805 kg of NEWBitumen was produced using plastic waste collected during the pilot project

Traditionally, road surfaces are constructed from bitumen – a sticky, viscous liquid derived from crude oil, which is a finite fossil fuel. Magorium engineered a process to create a bituminous substance from various types of plastic waste, including those that are contaminated, mixed or previously deemed unrecyclable, such as food-contaminated waste. This involves a chemical process known as depolymerisation, where plastic is broken down on a molecular level and reconfigured to replicate traditional bitumen, before catalysing and stabilising the new material, NEWBitumen. Synthetic gas generated as a byproduct of NEWBitumen is utilised as a heating source, thereby reducing reliance on external energy and making the process energy efficient.

The resulting material offers a circular alternative to crude oil and addresses a key issue in Singapore's management of plastic waste, where 95% of plastic waste is unrecyclable[1], by creating a practical use for the plastic waste.

Plastic waste collection at selected CICT's properties to support pilot project of NEWBitumen

CapitaLand Integrated Commercial Trust (CICT) is committed to advancing innovative solutions to address global sustainability issues. Its sponsor, CapitaLand Investment, is funding this NEWBitumen pilot project as part of the CapitaLand Sustainability X Challenge[2] (CSXC), reflecting the groupwide focus on a circular economy and greener urban environments. CICT is supporting the project through the collection of plastic waste at selected malls which are then utilised as feedstock for the production of NEWBitumen.

[1] https://eurocham.org.sg/publication/circular-plastics-regional-impact-putting-the-economy-back-into-singapores-circular-economy/

[2] Launched in 2020, the CSXC is a global platform to advance innovation and collaboration in sustainability within the urban environment. Through the CSXC, CapitaLand aims to source for emerging solutions/technologies globally to solve sustainability challenges impacting our business and accelerate our progress to meet our sustainability targets.

The CSXC 4th Edition trophy crafted by Magorium out of NEWBitumen

The impact of this collaboration has been substantial. In 2025, a total of 5,725 kg of plastic waste was successfully collected, which included contributions from four of CICT's malls, namely Raffles City, IMM Building, Tampines Mall, and Plaza Singapura, and six of CICT's tenants at these malls.

This plastic was then reformed into NEWBitumen to pave large eco-roads spanning 3,277 m^2 across three key locations in Singapore. These include two of CapitaLand Development's showflats and a crucial driveway within the Singapore Science Park. This initiative not only provides a second life for plastic waste but also transforms everyday spaces into tangible examples of sustainable urban development, paving the way for a greener future.

3,277 m^2 of eco-roads paved at sites such as LyndenWoods and HOLLY showflats