

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste

This Singapore start-up hopes to make roads with plastic waste



FILE PHOTO: A plastic bottle washed up by the sea is seen at the Ao Phrao Beach, on the island of Ko Samet, Thailand June 10, 2018. REUTERS/Jorge Silva/File Photo

A local start-up is hoping to pave the way for roads made with plastic waste as a solution to the world's growing plastic pollution crisis.

Magorium, founded in mid-2019, breaks down shopping bags, bottles and other plastic trash into a material that can partially replace the tar-like, oil-based bitumen in the mixture used to build regular roads.

Its product was recently used to lay roads on sites on private-owned land – a factory site in Tuas and a condominium in Marymount.

These will serve as test beds for the start-up keen to make its work more widely used.

“We’ve done many tests but there are certain climate conditions that cannot be replicated in the lab” said Magorium’s chief executive officer Oh Chu Xian.

“These will give us the kind of comprehensive results that we need.”

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste



A road being laid with Magorium's product at a factory site in Tuas. (Photo: Magorium)

A GROWING PLASTIC PROBLEM

Plastic pollution has become one of the most urgent environmental issues as the rapid production and consumption of single-use plastic overwhelm the world's ability to manage it.

Apart from being an immense polluter of the land and oceans, plastic also exacerbates climate change.

A 2019 report by the Centre for International Environmental Law said the global production and incineration of plastic would add more than 850 million metric tons of greenhouse gases to the atmosphere.

In Singapore, about 930,000 tonnes of plastic waste was generated last year. Of which, only 37,000 tonnes, or 4 per cent, was recycled, according to figures from the National Environment Agency (NEA).

The COVID-19 pandemic has threatened to further make worse the problem of plastic pollution amid surging demand for food packaging and even bubble wrap for online shopping.

"The problem has become more pronounced," said Ms Oh, pointing to a local study that showed an increase in disposable containers and cutlery usage during the "circuit breaker" here.

The study published in June found that an extra 1,334 tonnes of plastic waste was generated from takeaway and delivery meals during the two-month period which banned dine-ins at eating places and shuttered schools and most workplaces.

"Given that COVID-19 isn't going to go away, habits could be formed even among people who don't use to do these because they would have enjoyed the convenience of online shopping or food deliveries," the 27-year-old added.

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste

"This will add to the use of plastic and result in more waste."

And when it comes to recycling, the issue is two-pronged, said Magorium's chief financial officer Adriel Ng, 25.

"It's always said that there's plastic waste because people do not or don't know how to recycle. But it's not just that – people can recycle as much as we want but without a market for recyclables, you will still be sending very clean and sorted plastic to the incinerators and landfills."

And even that may be a solution running short on time. For Singapore, its sole landfill on Semakau could be filled up by 2035, a decade earlier than planned.

"So we feel there's been an overemphasis on the consumer aspect," added Mr Ng. "But after that, what happens? What's next?"



Earlier this month, the start-up's product was also used for road laying at a condominium in Marymount. (Photo: Magorium)

ROAD TO GREENER SINGAPORE?

Currently, Magorium's technology – under development for nearly four years after Ms Oh was inspired by a stint at a road construction company that researched on environmentally-friendly construction materials – can recycle at least six types of plastic.

The start-up claims that this is a larger range compared to others that own similar expertise.

For instance, one of the first companies to commercialise such plastic-waste-to-road technology is MacRebur from the United Kingdom which typically uses four types of plastic, said Mr Ng.

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste

For Magorium, the discarded plastic it gets from local waste collectors can include anything from sweet wrappers, shopping bags, beverage bottles to food containers.

But it does “not use plastic indiscriminately,” stressed Ms Oh, citing polyvinyl chloride (PVC) as an example that it avoids due to the release of toxic, chlorine-based chemicals.

Its technology breaks down plastic waste into three forms – powder, shreds or pellets – before adding them to bitumen.

The reprocessed plastic-bitumen mix is then poured over stones and pebbles to derive asphalt, which is used to lay roads.

Ms Oh said apart from repurposing discarded plastic that would otherwise contaminate the environment, its solution also reduces the usage of bitumen - by 10 to 20 per cent - that is derived from crude oil.

Apart from that, adding plastic in the mix improves the durability of the roads by up to three years.

“Plastic has many qualities like water-proof and flexibility. So when you add it to the roads, you transfer some of these qualities and help them to be a bit more lasting,” she added.

ONGOING PLANS

For its work thus far, Magorium has snagged at least three awards from local and regional start-up competitions this year.

Most recently, it clinched the top prize at Waste 20/20, a waste technology competition organised by StartupX in partnership with Enterprise Singapore and The Incubation Network.

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste



Magorium's chief executive officer Oh Chu Xian and chief financial officer Adriel Ng are final-year students at the Singapore Management University. (Photo: Tang See Kit)

These wins have been “validation” and a big confidence booster for the start-up’s two representatives who are final-year students at the Singapore Management University.

“We didn’t expect to win but I think it shows we are doing the right thing,” said Ms Oh.

Plans ahead include continuing its research to add more plastic types to its repertoire.

It is also working with NEA and national water agency PUB on test customisations, with microplastic pollution being one area of testing, Mr Ng told CNA.

When contacted, NEA and PUB said they were approached by Magorium in 2019 for advice on the standards related to the use of plastic waste in road construction materials.

Test protocols on the use of incineration bottom ash (IBA) as non-structural concrete, and road base or sub-base material, were shared as a guide with the start-up, the joint reply said.

PUB also advised the start-up to conduct tests to check if surface runoffs from its new material could pose water quality concerns.

“As the test protocols were for the specific use of IBA as non-structural concrete and road base (or) sub-base material whereas Magorium’s proposal is for the use of plastic waste as road material, its potential risk to the environment needs to be assessed separately,” the agencies told CNA.

“Appropriate risk assessment also needs to be conducted to ensure the surface runoff from the new material does not adversely impact water quality in the water catchment.”

Publication: CNA Online

Date: 7 December 2020

Headline: This Singapore start-up hopes to make roads with plastic waste

Ms Oh hopes that the start-up's technology can pave the way for greener roads in Singapore over the next year. While the pandemic has delayed some of its plans, sustainability issues remain top on the priority list for world governments and investors.

"While COVID-19 really stopped and delayed a lot of things, especially for the construction sector, it also kind of showed that there's no better time than now to solve the plastic waste problem," she said.

"We hope we can be a part of that solution."

Source: CNA/sk