Reusable plastic bags most eco-friendly option in S'pore

Next best is single-use plastic bag, instead of one made of paper or biodegradable polymers

Audrey Tan
Environment Correspondent
and Cheryl Tan

Being an eco-friendly shopper in Singapore means opting for and using a reusable plastic bag many times instead of using a cotton one, a new study has found.

Forgot the reusable plastic bag? Then the next best option would be to use a single-use plastic bag, instead of a paper one or one made of biodegradable polymers.

These findings by researchers from Nanyang Technological University (NTU) and their colleagues in Finland were published in August in the Journal Of Cleaner Production.

In the paper, the researchers noted that while plastic grocery bags are one of the most common single-use packaging products, other options have been gaining traction. These include single-use bags made of paper or biodegradable plastic, or reusable bags made of cotton or polypropylene non-woven plastic.

But how do they stack up against one another in terms of how environmentally friendly they are here?

The latest study provides the answer, with the researchers modelling the environmental impact of each type of bag based on a host of factors, such as how the bags are made, transported, distributed, collected as waste, treated and disposed of.

For example, the study took into account the quantities of natural resources used to make each type of bag, and their transoceanic shipment from where they were produced to Singapore.

The researchers found that if a reusable plastic bag made of polypropylene non-woven plastic is used at least 50 times, it is the most eco-friendly option here. This refers to the type of reusable bag commonly sold at supermarket checkout counters for about $1.

Members of the Nanyang Technological University research team include (from left) Assistant Professor Grzegorz Lisak, senior research fellow Andrei Veksha and research associate Ashiq Ahamed. The team evaluated the environmental impact of five types of bags to see how they stacked up against one another in terms of eco-friendliness. PHOTO: NTU

A single-use plastic bag, such as those usually given out for free, comes in as the second-most environmentally friendly option. But it still has 14 times the global warming potential of a reusable plastic bag used at least 50 times.

Global warming potential measures the environmental impact of various greenhouse gases, which are produced in the manufacture, use and disposal of the bags. It provides a common unit of measure.

Single-use biodegradable plastic bags are the third-most eco-friendly option in Singapore, which incinerates most of its non-recyclable waste anyway. This option has 16 times the global warming potential compared with a reusable plastic bag.

Reusable cotton woven bags come in fourth with 17 times the global warming potential, while single-use paper bags are the most environmentally damaging, with 81 times the global warming potential.

The production of cotton involves pesticide use, and long-term heavy metals discharge into water. Paper bag production involves generation of liquid waste, noted the authors.

Assistant Professor Grzegorz Lisak, director of the Residues and Resource Reclamation Centre at NTU's Nanyang Environment and Water Research Institute, who led the research, said: "Our main message is that reusable plastic bags are the best option, provided that they are reused many times – over 50 times to be precise."

Context is important, he added. This is because bags have to be transported across different distances, depending on where they come from and where the city that imports them is. Each country may also deal with waste differently.

In Singapore, which has a closed waste management system with incineration treatment, using plastic bags – both reusable and single-use types – may be the best option that is currently available, he said.

"This is provided that there is no significant leakage of waste into the environment," Prof Lisak added.

Plastic bags, if not disposed of properly, can contaminate the natural environment and end up in the ocean, where they can ensnare wildlife or be eaten by animals.

Singapore Youth for Climate Action member Alice Soewito said the findings had to be communicated carefully, so people do not misinterpret them as showing that plastic bags are eco-friendly.

"Such a message could be misleading, and it could distract from our end goal of minimising or eliminating the use of these single-use disposables," said Ms Soewito, an environment and sustainability major at Cornell University.

To nudge consumer behaviour, she suggested that reusable plastic bags be given to each household in a one-off distribution. A surcharge should also be imposed on each single-use plastic bag taken by a customer.

"The battle should never be about swopping between different materials – like paper and plastic bags for single-use items. The question we should ask ourselves is why are we still using single-use items," she said.

audreyt@sph.com.sg
tansuwen@sph.com.sg

How the bags you choose affect the climate

A new study led by researchers at Nanyang Technological University has shown the environmental impact of using different types of bags in Singapore.

MOST ECO-FRIENDLY: Reusable plastic bags
Such bags refer to those often sold at the checkout counters in supermarkets for about $1. If each bag is used at least 50 times, it is the most eco-friendly option here.

Single-use plastic bags
14 times
the global warming potential compared with reusable plastic bags, even though these bags, often given out for free at supermarkets, may be the second-most eco-friendly option here.

Single-use biodegradable plastic bags
16 times
the global warming potential compared with reusable plastic bags.

Reusable cotton woven bags
17 times
the global warming potential compared with reusable plastic bags. However, researchers say cotton bags that are reused hundreds of times would make them a superior choice over a single-use item.

LEAST ECO-FRIENDLY: Single-use paper bags
81 times
the global warming potential compared with reusable plastic bags.