

Public Managers and Plastic Bags: Designing and Implementing Effective Policies to Reduce Plastic Bag Use

Introduction

Karen Lim sat at a table in the corner of the Queen's Road Food Centre in Singapore, nursing a cup of iced tea as she wrote in her notebook. She was grateful for this midday time to herself after a gruelling morning of back-to-back meetings. Lim, a director at the Ministry of Environment and Water Resources (MEWR), had a lot to think about: she was brainstorming for a presentation that her team would soon deliver to senior management at the MEWR as part of the ministry's preparations for its Budget 2019 speech. She had been tasked with focusing on Singapore's waste management strategy, particularly the reduction of plastic bag use in the country.

Plastic bags were ubiquitous in Singapore's retail stores, hawker centres, and grocery stores, and public conversation about Singapore's plastic bag use and what actions could or should be taken to reduce it had increased in recent years. Singaporeans used twice and thrice the number of plastic bags per day on average than did Malaysians and Australians respectively.¹ Lim herself frequently enjoyed the convenience of plastic bags: she remembered picking up a carton of milk, a loaf of wholemeal bread, some eggs, and a box of cereal at the Cold Storage supermarket in Bukit Timah just the previous day, and how the cashier had placed the milk into one plastic bag, the cereal into another plastic bag, and the eggs and wholemeal bread into a third plastic bag.

This was a familiar scene in supermarkets in Singapore and many other places around the world. Plastic bags had become tremendously widespread, with several estimates suggesting that humans used trillions of them every year, and for good reason: plastic bags were cheap to make, waterproof, easy to store, and could hold items that were many times their weight. They came into being in the 1960s after an employee at the Swedish company Celloplast invented and patented a "bag with handle of weldable plastic material".²

As she rushed to return home to check on her elderly father, Lim had only briefly registered that she had been given a large number of bags before she picked them up and walked briskly to her car. In any case, she reasoned to herself, she could use the

¹ Derrick A. Paulo and Peh Yuxin, "The monstrous scale of plastic bag wastage in Singapore," *Channel NewsAsia*, April 5, 2018, <https://www.channelnewsasia.com/news/cnainsider/monstrous-scale-plastic-bag-wastage-singapore-charge-recycle-10100010>.

² Sten Gustaf Thulin, Bag with handle of weldable plastic material, United States Patent 3,180,557 filed July 10, 1962, and issued April 27, 1965.

bags to hold other items, line the dustbins in her house, wrap food, pick up her dog's faeces, and a host of other things. But though Lim was not alone in viewing plastic bags as useful household tools, she was also aware that plastic bags had become a prominent symbol of environmental degradation. Made of low-density polyethylene, which did not decompose in its natural form, they could spend hundreds of years in landfills. They wreaked damage outside of landfills as well, floating in the ocean and killing marine animals by smothering them or ending up in their food, and creating unsightly litter on land. In the early 2000s, after finding plastic bags to have been responsible for clogging drains after heavy flooding, Bangladesh became a pioneer in enacting a ban on thin plastic bags.

"Plastic bags are a brilliant product but they are a victim of their own success," founder and then-CEO of reusablebags.com Vincent Cobb said.³ "They've been perceived of as free when they have a real cost to the environment and to consumers." As the idea that plastic bags caused serious environmental harm gained momentum in the public consciousness, several nations began taking steps to reduce their use of plastic bags. The various measures put in place focused mostly on taxes or bans, and received mixed results and reactions from stakeholders. Lim had to consider what Singapore could feasibly do to improve the country's plastic bag situation, and how her team could make a convincing case for specific actions.

Plastic Bag Reduction Initiatives Across the Globe

Hong Kong

In 2009, Hong Kong's Environmental Protection Department (EPD) implemented a scheme that required 3,000 of country's retail outlets, including supermarkets, pharmacies, and convenience stories, to charge customers HK\$0.50 (about S\$0.09 at the time of writing) for every plastic bag they used. The scheme aimed to reduce plastic waste in landfills. Eight billion plastic bags found their way to Hong Kong's landfills each year, according to a 2005 EPD survey. The EPD expanded the levy to cover over 100,000 of Hong Kong's retail outlets in 2015.

Under the scheme, retailers had to collect a minimum HK\$0.50 fee, which they could keep, from customers for each plastic bag the retailers provided. There were a few categories of plastic bags to which the fee did not apply: those used for packaging, like the plastic "bag" that typically encased multi-packs of toilet rolls, and those used to ensure food hygiene, such as egg boxes or airtight packaging for frozen food, for example. Retailers who failed to charge consumers the appropriate amount for their plastic bag use could be subject to a HK\$2,000 fine, with more serious offenders facing prosecution and fines of up to HK\$200,000. The public could report non-compliant retailers to the EPD via a hotline, email, fax, or post.

The first retailer convicted under the scheme after its broader implementation in 2015 was Cheung Hing Grocery, which received a HK\$5,000 fine after a cashier provided EPD officers with a free plastic bag when they bought goods from the store during an

³ Elisabeth Rosenthal, ``By 'bagging it,' Ireland rids itself of a plastic nuisance," *The New York Times*, January 31, 2008, <http://www.nytimes.com/2008/01/31/world/europe/31iht-bags.4.9650382.html>.

inspection. Cheung Hing grocery had received fixed penalty notices months before for the same offence as well as for providing customers with a HK\$0.50 discount on their purchases to cancel out the plastic bag charge. A Cheung Hing Grocery employee told the *South China Morning Post* that business had been tougher following the law's implementation because locals "care about every cent they spend."⁴

About a year and a half after the levy's implementation, EPD officers had issued a HK\$2,000 fine to 302 retailers. Many continued to flout the plastic bag rule, according to the non-government organisation Greeners Action. After posing as shoppers at 100 local retailers, staff found that one third of the retailers were providing customers with free plastic bags two years after the levy. Hawker stalls made up over half of the retailers ignoring the plastic bag levy.⁵

"I don't need a bag. It's against the law," said an undercover Greeners Action member rejecting a bag from a shopkeeper. In a response caught on video, the shopkeeper replied: "It doesn't matter."⁶

Greeners Action had conducted a similar undercover study the year before—one year after the levy's broader implementation—and found that over half of the retailers inspected were flouting the plastic bag law.⁷ 93 percent of street vendors involved in the investigation gave out free plastic bags.

One street vendor told the *South China Morning Post* soon after the levy came into force that she felt "compelled to give in" to customers who wanted to receive their usual free plastic bags from her stall, and that some of them would not appreciate a plastic bag charge. She told the newspaper "I really don't know what to do and I'm so scared I'll be fined."⁸ Other customers said they were confused by the levy and wanted clearer instructions from the government about it. "I will often take my own bags when I go out to shop, but some grannies may not know about the levy and would get angry when they are charged for a bag," Chu Suk-Ping told the *South China Morning Post*.⁹ Many retailers displayed signs or provided leaflets explaining the policy.

⁴ Shirley Zhao and Eddie Lee, ``Hong Kong grocer fined HK\$5,000 for violating plastic bag levy," *South China Morning Post*, December 1, 2016, <http://www.scmp.com/news/hong-kong/health-environment/article/2050864/hong-kong-grocer-fined-hk5000-violating-plastic>.

⁵ Hana Davis, ``One in three local retailers defying Hong Kong's plastic bag law, according to green group who posed as undercover shoppers," *South China Morning Post*, August 14, 2017, <http://www.scmp.com/news/hong-kong/health-environment/article/2106765/hong-kong-green-group-claims-one-three-local>.

⁶ Ibid.

⁷ Ernest Kao, ``Half of Hong Kong retailers flout plastic bag levy in investigation by green group," *South China Morning Post*, July 14, 2016, <http://www.scmp.com/news/hong-kong/health-environment/article/1989528/half-hong-kong-retailers-flout-plastic-bag-levy>.

⁸ Shirley Zhao, ``Plastic bag levy confuses Hong Kong shoppers as full scheme comes into force," *South China Morning Post*, April 1, 2015, <http://www.scmp.com/news/hong-kong/article/1753454/plastic-bag-levy-confuses-hong-kong-shoppers-full-scheme-comes-force>.

⁹ Ibid.

Ireland

Ireland was among the first countries to establish a plastic bag tax. The Irish government began taxing consumers €0.15 for each plastic bag they took at retail outlets in 2002. Twelve years later, plastic bag usage per capita had fallen to four percent of what it was before the levy's implementation.¹⁰ Money from the tax went to a fund used for waste management research and development, environmental awareness campaigns, and other projects. At the time of writing, consumers paid €0.22 per plastic bag. Revenues from the plastic bag tax amounted to "over 30 times the costs of collection".¹¹

The change in social norms surrounding plastic bags took place virtually overnight. The plastic bag tax received mixed reviews in its first few days, with one person telling the national broadcaster *Raidió Teilifís Éireann* on the day the tax came into effect that the levy was "robbery". Another said it was a good idea. But within a year of the plastic bag levy's implementation, "nearly everyone" was using reusable bags, according to a *New York Times* article. "Plastic bags became socially unacceptable—on par with wearing a fur coat or not cleaning up after your dog," Elisabeth Rosenthal wrote.¹² Friends of the Irish Environment in County Cork Director Tony Lowes called the plastic bag tax an "extraordinary success", telling the National Geographic that most people in Ireland carried reusable bags.¹³

The possibility of a plastic bag tax started gaining momentum in 1999, when then-Minister for the Environment and Local Government Noel Dempsey commissioned a consultation study on plastic bags that proposed a three to ten pence tax on each plastic bag. In the preceding years, Ireland had experienced considerable plastic bag litter, particularly in the countryside. Dempsey, who wanted to convey a clear message to consumers, eventually proposed that the levy should be €0.15.¹⁴ This seemed a high levy in comparison with what the average consumer appeared to be willing to pay—a 1999 survey conducted by Drury Research for the Department of the Environment and Local Government found that only eight percent of Irish consumers were willing to pay €0.076, which was half of the levy's eventual value. Over a third said they were not willing to pay for plastic bags at all.¹⁵

Getting the public on board with the tax involved extensive consultation with the various stakeholders to whom the levy was relevant. Retailers were worried that the lack of bags might lead to more shoplifting, that hygiene might be compromised if certain goods could not be separated from others, and that consumers might accuse them of using the levy for profit. As such, the government did not tax plastic bags

¹⁰ "Plastic Bags," Department of Communications, Climate Action & Environment, accessed March 20, 2018, <https://www.dccae.gov.ie/en-ie/environment/topics/waste/litter/plastic-bags/Pages/default.aspx>.

¹¹ Frank Convery, Simon McDonnell, and Susana Ferreira, "The most popular tax in Europe? Lessons from the Irish plastic bags levy," *Environmental and Resource Economics* 38, no. 2 (2007): 6.

¹² Rosenthal, "Ireland rids itself of a plastic nuisance."

¹³ John Roach, "Are Plastic Grocery Bags Sacking the Environment?," *National Geographic News*, September 2, 2003, https://news.nationalgeographic.com/news/2003/09/0902_030902_plasticbags.html.

¹⁴ Convery, McDonnell, and Ferreira, "Lessons from the Irish plastic bags levy," 5.

¹⁵ Ibid, 3.

below a certain size used for food safety purposes, and the Department of the Environment, Heritage and Local Government conducted a campaign to publicise the rationale behind and reduce public opposition to the plastic bag tax.¹⁶ It may also have helped that the administrative hurdles involved in collecting and reporting the plastic bag tax were relatively few, as most markets could integrate the collection process with the value added tax (VAT) collection system in their cash registers—a luxury that might not be as available in other countries, Rosenthal wrote in *The New York Times*. Further, not needing to buy plastic bags saved costs for retailers. Feargal Quinn, who founded the supermarket chain Superquinn, said he had initially opposed the tax but had quickly become one of its biggest supporters because of its environmental benefits and the costs it saved.¹⁷

Other stakeholders were also crucial.

"Support from the Minister for Finance, the Revenue Commissioners and the Local Authorities was necessary for the collection, administration and enforcement of the levy. The Minister's personal commitment seems to have been the strongest factor in getting the principle of a plastic bag levy introduced in practice. The acceptance by the Revenue Commissioners of a hypothecated fund was also central to increasing consumer acceptance of the levy (advertising and information campaigns explicitly stated that all revenues would be used for explicitly environmental purposes)."¹⁸

A survey conducted about a year after the tax became official suggested that consumers mostly took a positive or neutral view of the plastic bag tax.¹⁹ Ninety percent of those surveyed said that they felt positively about the effect of the levy on the environment, and the majority reported a positive or neutral impact of the levy on their checkout experience, convenience, and expense. "Many report feeling guilty when they forget to bring their own long life bag and have to pay the levy!" Convery and colleagues wrote. "We are not aware of another tax that induces such an enthusiasm and affection from those who are liable to pay it." Support from consumers made enforcement of the plastic bag tax relatively easy, as they helped report retail outlets that were not complying with the law.

Denmark

Plastic bags were pricey in Denmark, with each kilogram of plastic bags costing 22 DKK (about S\$4.78 at the time of writing). This meant each consumer was paying around 2.00 DKK to 3.50 DKK (about S\$0.43 to S\$0.76) per bag.²⁰ But the high tax seemed to work: in 2014, *Reuters* reported that the average person in Denmark used only four single-use bags a year, which was the European Union's lowest rate of plastic bag

¹⁶ Ibid, 6.

¹⁷ Rosenthal, "Ireland rids itself of a plastic nuisance."

¹⁸ Convery, McDonnell, and Ferreira, "Lessons from the Irish plastic bags levy," 6.

¹⁹ Ibid, 9.

²⁰ The Danish Ecological Council, "Fact sheet: Tax on plastic bags," accessed March 30, 2018, www.ecocouncil.dk/documents/temasider/1776-150812-tax-on-plastic-bags.

use.²¹ The effect of the tax was particularly pronounced in supermarkets, while other types of retailers such as clothing shops bore the tax and did not charge customers for plastic bags.

Denmark began charging consumers for plastic bags in 1994. The tax was increased from its initial level of 20 DKK per kg to 22 DKK per kg in 1998, and had not increased since.²² The Danish and Irish taxes differed in that the former imposed a levy based on weight while the latter taxed by the bag. A weight-based levy was appropriate for encouraging lower plastic use in manufacturing, while the latter was effective for reducing litter.²³

In 2017, the Danish island of Samsø announced an island-wide ban on plastic bags in shops. Samsø's residents proposed the idea, as plastic bags comprised a lot of the island's waste material. Cotton bags would replace plastic bags, though the Danish Society for Nature Conservation had expressed reservations about the environmental sustainability of cotton bags.²⁴ Samsø, an island with 4,000 residents, had been a green powerhouse for a number of years, having cut its carbon emissions so drastically that its residents reported a carbon footprint of -12 tonnes per person per year (the average Danish carbon footprint was 6.6 tonnes at around the same time).²⁵²⁶

Kenya

At the time of writing, Kenya had what was often called the world's toughest stance on plastic bags. On August 28, 2017, the Kenyan government imposed a law that authorized the arrest and charging of anyone "found selling, producing or using the banned plastic materials".²⁷ The culprits could then have to pay a \$19,417 to \$38,834 fine or go to jail for a maximum of four years.

Kenya had been suffering from the effects of excessive plastic bag consumption for some years. The very thin and easily torn plastic bags that were prevalent in Nairobi were often not reusable and were thus frequently littered. In 2017, the veterinarian Mbuthi Kinyanjui said that staff in Nairobi's slaughterhouses were now having to remove plastic bags from cows' stomachs—a rare occurrence a decade ago, but one that they now experienced nearly every day.²⁸

²¹ Reuters Staff, "EU seeks to cut plastic bag use by 80 percent by 2017," *Reuters*, April 17, 2014, <https://www.reuters.com/article/us-eu-plastic-bags/eu-seeks-to-cut-plastic-bag-use-by-80-percent-by-2017-idUSBREA3F1DL20140416>.

²² "Fact sheet: Tax on plastic bags."

²³ Convery, McDonnell, and Ferreira, "Lessons from the Irish plastic bags levy," 5.

²⁴ "Denmark's 'sustainable island' to scrap plastic bags," *The Local Denmark*, December 11, 2017, <https://www.thelocal.dk/20171211/denmarks-sustainable-island-to-scrap-plastic-bags>.

²⁵ Dyan Lewis, "Energy positive: how Denmark's Samsø island switched to zero carbon," *The Guardian*, February 23, 2017, <https://www.theguardian.com/sustainable-business/2017/feb/24/energy-positive-how-denmarks-sams-island-switched-to-zero-carbon>.

²⁶ Global Carbon Atlas, accessed June 19, 2018, <http://www.globalcarbonatlas.org/en/CO2-emissions>.

²⁷ Victor Kiprop, "Finally, Kenya effects ban on plastic bags," *The East African*, September 7, 2017, <http://www.theeastfrican.co.ke/business/Kenya-effects-ban-on-plastic-bags-/2560-4086512-10oy0x4/index.html>.

²⁸ Katharine Houreld and John Ndiso, "Kenya imposes world's toughest law against plastic bags," *Reuters*, August 28, 2017, <https://www.reuters.com/article/us-kenya-plastic/kenya-imposes-worlds-toughest-law-against-plastic-bags-idUSKCN1B80NW>.

A 2006 study conducted in Nairobi suggested that plastic bags were popular with consumers in the city for a variety of reasons: convenience, hygiene, and cultural norms.²⁹ Consumers as well as manufacturers and suppliers viewed plastic bag management as the responsibility of the Nairobi City Council (NCC). Awareness of the environmental damage that plastic bags could wreak was low, with half of the surveyed consumers having little to no understanding of it. Meanwhile, while manufacturers and suppliers were better acquainted with the environmental effects of plastic bags, the markedly lower cost of plastic bag production relative to paper bag production made plastic bags an attractive business in which to partake. The authors noted that manufacturers viewed plastic bag production as a contributor to poverty alleviation, as plastic bags helped remove the need for more expensive bags among lower-income groups.

Any person carrying a plastic bag could find themselves at the mercy of the new law, but policymakers were focusing on manufacturers and suppliers first and allowing the public some time to get used to the ban. At the time of writing, a person carrying a plastic bag would receive a warning and have their plastic bag taken away by authorities. A *BBC* reporter noted in an August 28, 2017 article that the public appeared to be easing into a life without plastic bags, with supermarket customers buying fabric bags or using their backpacks to carry their shopping.

At the time of writing, however, plastic bags were still finding their way into Kenya via fishermen, who smuggled bags into the country from neighbouring countries Uganda and Tanzania.³⁰ Traders then used the plastic bags as they had previously done in markets and shops. Some also bought plastic bags from shops, with shopkeepers selling only to customers they knew to avoid arrest.³¹ Violators argued that the goods they sold were unsuitable for being carried in non-plastic bags, or that plastic bags made their goods too expensive.

"I cannot pack my vegetables in manilla bags. It cannot work because I wash the vegetables," Grace Mutuku, a grocery store operator in Komarock on the east of Nairobi said on Wednesday.

"A small bag of sliced vegetables goes for 0.2 dollars. This is what customers are used to. I tried to use the khaki bags but it did not work because of the water in the vegetables," she recounted.³²

Some were concerned about the possible casualties of the ban. Kenya was one of Africa's key plastic bag exporters, and Kenya Association of Manufacturers spokesman Samuel Matonda estimated that 60,000 workers might lose their jobs in the wake of

²⁹ Jeremia Njeru, "The urban political ecology of plastic bag waste problem in Nairobi, Kenya," *Geoforum* 37 (2006): 1051.

³⁰ Robert Omollo, "Fishermen smuggle in plastic bags, Mama Mbogas ignore ban," *The Star*, March 10, 2018, https://www.the-star.co.ke/news/2018/03/10/fishermen-smuggle-in-plastic-bags-mama-mbogas-ignore-ban_c1727426.

³¹ "Feature: Kenyan small traders cling to plastic bags despite ban," *Xinhua*, March 1, 2018, http://www.xinhuanet.com/english/2018-03/01/c_137006730.htm.

³² Ibid.

the ban.³³ Meanwhile, National Environment Management Authority director general Geoffrey Wahungu argued that the ban would in fact provide employment to women and young people, who could sell carrier bags made out of non-plastic materials. At the time of writing, the authorities had conducted several raids and ordered the closure of shops or markets that were heavy violators of the plastic bag ban.

What About Singapore?

Lim, having finished her tea, looked over her notes again. She wanted to ensure she could articulate a clear stance on the plastic bag issue in advance of the meeting she would have with her team in an hour. She thought about how Singapore had approached the plastic bag issue in recent months.

During a March 2018 debate on the Ministry of the Environment and Water Resources (MEWR) budget, Senior Minister of State for the Environment and Water Resources Amy Khor noted that Singapore did not intend to ban or tax single-use plastic bags. Singapore would instead focus on addressing the broader issue of “the excessive consumption of all types of disposables”, she said.³⁴ Such disposables included plastic bags as well as single-use food containers, Khor explained, citing examples such as a food delivery company’s pilot of a system in which customers could elect not to have disposable cutlery included with their orders. In 2021, the National Environment Agency (NEA) would begin requiring businesses to declare the type and amount of packaging their products would include, as well as their plans for reducing packaging waste.

Khor mentioned that an NEA-commissioned study had suggested that the use of biodegradable bags or paper bags might not necessarily be less damaging to the environment than were plastic bags. The study found that every type of disposable bag imposed “different environmental impacts, whether it be carbon emissions, heavy water usage or significant land clearance,” she said.³⁵ “This is particularly so as we incinerate our waste and do not directly landfill.” Singapore’s hot and wet climate also meant that plastic bags were a necessary household staple for bagging waste, as unbagged waste or even bagged waste that was left unattended for long periods of time attracted pests. Singaporean households generally had to dispose of their food waste every day.

There had been several calls for and moves towards the implementation of a plastic bag levy prior to the March 2018 MEWR budget speech. In September 2017, four large Singaporean supermarket chains—Dairy Farm Group, FairPrice, Sheng Siong, and Prime Supermarket—started discussing a possible agreement on a plastic bag levy at their stores. A *The Straits Times* opinion piece questioned whether private firms such as the supermarkets would “know enough to weigh the societal costs and benefits

³³ Katharine Houreld and John Ndiso, “Kenya imposes world’s toughest law against plastic bags.”

³⁴ Amy Khor, “Speech by Dr Amy Khor, Senior Minister of State for the Environment and Water Resources, at the MEWR COS 2018 debate on 6 March 2018,” (speech, Singapore, March 6, 2018), Ministry of the Environment and Water Resources, <https://www.mewr.gov.sg/news/speech-by-dr-ammy-khor--senior-minister-of-state-for-the-environment-and-water-resources--at-the-mewr-cos-2018-debate-on-6-march-2018>.

³⁵ Ibid.

associated with plastic bags", adding that supermarkets could also try to make a profit from the levy.³⁶ The piece further suggested that prompts at checkout counters asking consumers if they had brought reusable bags could be effective, in addition to a surcharge. "Behavioural economics seem to suggest that a surcharge will be more effective since people tend to overweigh losses over gains—people are loss averse," the piece argued. *The Straits Times* environment correspondent Audrey Tan wrote that a mandatory charge for plastic bags would likely work better than relying on supermarkets to impose a charge on customers, as the retail industry already faced competition from online shopping and might not, understandably, want to discourage customers from shopping in stores. Tan also suggested that the NEA should implement a plastic bag tax, noting that the year 2011 saw the use of three billion plastic bags by Singaporeans, that no one had yet studied how many of those bags were reused, that the seven percent plastic recycling rate in Singapore was low, and that the incineration of plastic bags produced ash that would then go to Singapore's one landfill.³⁷ Over three quarters of more than 4,700 respondents in an online survey conducted by *The Straits Times* were pro-plastic bag levy.

Opponents of a plastic bag tax argued that a levy would affect lower-income groups and could cause a pest and disease problem if people carelessly threw unwrapped waste down rubbish chutes. National University of Singapore Business School Distinguished Professor Ivan Png urged greater consideration of how a plastic bag charge might affect cleaners and cleaning contractors, whose jobs would become more unpleasant if people started to throw unbagged food waste down rubbish chutes, or use newspapers to wrap their food waste. Singapore could then run the risk of becoming more reliant on foreign workers, he wrote.³⁸ Tan noted, however, that Singaporean shops tended to give out plastic bags very freely, and that many households found themselves with an excess of plastic bags.³⁹

Some retailers who implemented their own charges for plastic bags reported reduced demand for plastic bags at their outlets. For example, the lifestyle brand Miniso saw plastic bag use decrease by 75 percent after it began charging customers 10 cents per plastic bag, while the apparel brand Bossini found that four fifths of its customers refused a bag when presented with a 10 cent charge.⁴⁰ In January 2018, Pamela Low Jia Hui suggested the possibility of non-supermarket retailers charging for plastic bags, while supermarkets continued to distribute plastic bags for free.⁴¹

³⁶ Euston Quah and Zach Lee, "Designing a solution to plastic bag waste that fits," *The Straits Times*, November 11, 2017, <http://www.straitstimes.com/opinion/designing-a-solution-to-plastic-bag-waste-that-fits>.

³⁷ Audrey Tan, "3 billion plastic bags a year? Cut use with mandatory tax," *The Straits Times*, October 5, 2017, <http://www.straitstimes.com/opinion/3-billion-plastic-bags-a-year-cut-use-with-mandatory-tax>.

³⁸ Ivan Png, "Charging for plastic bags may have unintended costs," *The Straits Times*, October 6, 2017, <http://www.straitstimes.com/opinion/charging-for-plastic-bags-may-have-unintended-costs>.

³⁹ Audrey Tan, "Price of curbing plastic bag use," *The Straits Times*, September 27, 2017, <http://www.straitstimes.com/singapore/environment/price-of-curbing-plastic-bag-use>.

⁴⁰ Samantha Boh, "Less demand when customers have to pay for plastic bags," *The Straits Times*, September 24, 2017, <http://www.straitstimes.com/singapore/environment/less-demand-when-customers-have-to-pay-for-plastic-bags>.

⁴¹ Pamela Low Jia Hui, "Keep supermarket plastic bags free, charge for others," *The Straits Times*, January 14, 2018, <http://www.straitstimes.com/forum/letters-on-the-web/keep-supermarket-plastic-bags-free-charge-for-others>.

Lim had several questions she needed to address in her upcoming presentation and the policy follow-up that might result from it:

1. Given the successes and failures of plastic bag levies and bans in other countries, how should Singapore proceed with reducing plastic bag usage going forward, given its political, economic, and cultural context?
2. Who are the key players in policy pertaining to plastic bags, and who are the most likely adversaries and supporters of plastic bag levies or bans? How could the key players, adversaries, and supporters be most effectively engaged?
3. Given that there exists some public support for plastic bag reduction measures, why hasn't there been a move towards a ban or levy? Was there something Lim and her team were overlooking?