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Extended Producer Responsibility In Singapore's Resource Sustainability Act

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Abstract

With the introduction of the Resource Sustainability Act (RSA) on 5 August 2019, Singapore has embarked on its journey towards building a circular economy. Circularity was further emphasized and detailed in the Zero Waste Masterplan 2019 (ZWMP) launched on 30 August 2019. One of the main pillars of the Resource Sustainability Act (RSA) which was passed in Parliament on 4 September 2019, is the introduction of the Extended Producer Responsibility (EPR) scheme for electronic waste by 2021. Under the ZWMP, EPR will also be extended to packaging waste by 2025. This paper will review the consultative democratic exercise of the Year Towards Zero Waste (YTZW) that has shaped the RSA, the new e-waste EPR provisions in the RSA, as well as highlight the complexities in extending EPR to packaging waste.

1. Introduction

Singapore's meteoric rise from third world to first has seen Singapore make stratospheric advances in waste management. As Singapore's public housing programme kicked into full throttle in the 1970s, high-rise Housing & Development Board (HDB) apartment blocks became ubiquitous and subsequently the way of life for most Singaporeans. Today, about 80 percent of Singapore's resident population live in HDB apartments.[1] Increased urban density and households living in high-rise apartments led to urban waste management concerns and new waste management methods were set up to provide hygienic waste management for households. The most iconic innovation of the era was the refuse chute.[2] Initially, every apartment had a refuse chute fitted in the kitchen. In 1989, these were scrapped in favour of one central refuse chute at a lift landing shared by several apartments.[3]

At the same time, Singapore was the second country, after Japan, to incinerate its waste to reduce the volume of waste going to landfill, and to generate electricity at the same time. These waste-to-

[1] The Economist, 'Why 80% of Singaporeans live in government-built flats' (*The Economist*, 6 July 2017) <https://www.economist.com/asia/2017/07/06/why-80-of-singaporeans-live-in-government-built-flats> accessed 5 September 2019

[2] A refuse chute in a typical HDB apartment was originally designed as an integrated component of the dwelling. They were introduced as a quick and convenient way to collect refuse from multiple flats. Waste thrown into the chute fell into a bin at the bottom that was emptied daily by refuse collection workers. See Ministry of the Environment and Water Resources and National Environment Agency, *Zero Waste Masterplan Singapore* (2019) ("**ZWMP**"), 12

[3] ZWMP, 12

energy (WTE) plants were introduced to Singapore in 1973.[4] Even so, this did not stop the land mainland landfill at Lorong Halus from reaching capacity in the 1990s, thus necessitating the construction of Singapore's latest (and currently sole) landfill at Pulau Semakau in 1995, an offshore landfill site. Even this is expected to fill up by 2035 at current waste landfilling rates.[5]

Recycling has, so far, been seen as the main waste reduction policy, though its effectiveness across sectors remains varied. Recycling, in a way, is not new to Singapore. The *karang guni* (rag-and-bone men) are a traditional form of informal recycling collection. Amongst other things, the traditional cry of the *karang guni* lists the items they specialised in collecting (which they would sell to traders and recyclers): newspapers, old clothes, and broken radios and televisions.[6]

This was supplemented by the National Recycling Programme (NRP) in 2001. Each HDB block, and each landed, privately-owned household received one recycling bin, which would collect cleaned, co-mingled packaging waste, such as paper, plastic, glass, and metal. These materials would then be sorted at a central facility before being sent for recycling.[7] The bulk bins at HDB blocks are emptied at least three times a week, while the smaller streetside bins provided to landed households are emptied once a week.[8] Other community recycling efforts promoted by the Ministry of Environment and Water Resources (MEWR) include cash-for-trash collection stations and recyclables collection at community events.[9] However, in 2018, while the overall recycling rate was 60 percent, the domestic recycling rate was only 22 percent, much lower than the 74 percent recycling rate for non-domestic waste.[10] It was further reported that *karang guni* collected 20% of domestic waste but the official national recycling streams in 2016 only collected 2 percent.[11] Moreover, contamination of waste in recycling bins remains a major hindrance to recycling. It is

[4] ZWMP, 13

[5] ZWMP, 15

[6] Larry Loh, 'Singapore's karang guni men - nuisance or nostalgia?' (14 December 2019) <http://travel.cnn.com/singapore/none/singapores-karang-guni-men-nuisance-or-nostalgia-130877/> accessed 5 September 2019

[7] ZWMP, 32-34

[8] ZWMP, 33

[9] ZWMP, 33

[10] ZWMP, 32

[11] Audrey Tan, 'Parliament: National recycling effort collected 2 per cent of total domestic waste in 2016' (*Straits Times*, 28 February 2018) <https://www.straitstimes.com/singapore/environment/parliament-national-recycling-effort-collected-2-per-cent-of-total-domestic> accessed 5 September 2019

estimated that 40 percent of materials collected in the recycling bins are actually not recycled in the end due to contamination by food and liquid waste, or are themselves not recyclable.[12]

Singapore now intends to increase domestic recycling rates from 22 to 30 percent, and reduce the volume of waste sent to landfill by 30 percent. Both targets are planned to be achieved by 2030.[13]

Thus, the ZWMP and RSA have sought to introduce a new model of resource management through the EPR schemes for e-waste, and the planned EPR scheme for packaging waste. These are two of the three main waste streams that the ZWMP and RSA are aimed at. The third waste stream is food waste, which is addressed in a separate paper by the same authors.[14]

1.1 E-waste in Singapore

Singapore is home to "one of the most diverse semiconductor industries in the Asia-Pacific" and is a key player in the global electronics manufacturing market.[15] Integrated circuits ("ICs") (used in computers, and sometimes known as semiconductors) alone account for 36 percent of Singapore's exports, and Singapore regularly finds itself in the top five exports of ICs over the past decade.[16] 95 percent of rare earth elements found in these ICs are currently produced in China.[17]

Singaporeans generate 60,000 tonnes of e-waste yearly. While this is less than 1 percent of total waste generated in Singapore, this figure is expected to rise in the years to come.[18] This translates to 11 kg of e-waste (equivalent to 73 mobile phones),[19] twice the regional average in East and Southeast Asia (ESEA).[20]

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[12] ZWMP, 33

[13] ZWMP, 20

[14] Melissa Low and Eric Bea, 'Singapore's Resource Sustainability Bill: Tackling the Food-Water-Energy Nexus' (27 August 2019) 31 Energy Studies Institute Policy Brief

[15] Singapore Economic Development Board, 'Electronics' (2019) <https://www.edb.gov.sg/en/our-industries/electronics.html> accessed 5 September 2019

[16] Massachusetts Institute of Technology Observatory of Economic Complexity, 'Singapore' (2017) <https://atlas.media.mit.edu/en/profile/country/sgp/> accessed 5 September 2019

[17] United States Department of Energy, 'Critical Materials Strategy' (2011) <https://www.energy.gov/sites/prod/files/DOE_CMS2011_FINAL_Full.pdf> accessed 5 September 2019

[18] ZWMP, 36-41

[19] ZWMP, 41

[20] Shunichi Honda, Deepali Sinha Khetriwal and Ruediger Kuehr, *Regional E-waste Monitor: East and Southeast Asia* (United Nations University ViE – SCYCLE 2016)

About half is estimated to be common household information technology (IT) products and home appliances, while the rest comprises information and communications technology (ICT) equipment generated by the commercial and industrial sectors.[21]

In Singapore, e-waste is either traded-in (24 percent), donated (9 percent), removed by delivery services at the same time a new electrical/electronic product (e-product) is delivered by a retailer (35 percent), or simply collected as waste (26 percent). Only 6 percent of e-waste is recycled.[22]

The viability of the first three services (trade-in, donation collections, and delivery collections) relies on retailers, manufacturers, and other operators offering these services in the first place, as well as the availability of a second-hand market for the used e-product in the latter circumstance, or a working recycling market (which has ceased to be the case).

1.2 Packaging waste in Singapore

Packaging waste in Singapore, forming about one-third of Singapore's total waste,[23] has been the bugbear of many for almost two decades now. Despite the NRP's efforts, the relatively low recycling rates drove MEWR to refocused its efforts upstream to reduce the amount of packaging put on the market by manufacturers.

Since 2007, the Singapore Packaging Agreement (SPA), a voluntary joint initiative by the National Environment Agency (NEA), industry, and other groups calling for a reduction of packaging waste, has been in place to provide flexibility for the industry to adopt cost-effective solutions to reduce waste. Manufacturers have managed to reduce about 54,000 tonnes of packaging waste so far, saving about S$130 million in the process.[24] Elsewhere, in the food and beverage, retail and hospitality sectors, the World Wide Fund for Nature (WWF) has initiated another voluntary agreement in 2019, together with 15 companies, to reduce their plastics production and usage by 2030. Another 270 outlets phased out plastic straws as part of this agreement.

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[21] 'Written Answer to Question: Comprehensive National Plan for Managing E-Waste (Assoc Prof Randolph Tan)' (*Parliamentary Debates of Singapore: Official Report*, 15 August 2016, vol 94, sitting 22) <https://sprs.parl.gov.sg/search/sprs3topic?reportid=written-answer-2976>

[22] Samantha Boh, 'Singapore's mountain of e-waste' (*Straits Times*, 1 February 2018) <https://www.straitstimes.com/singapore/environment/singapores-mountain-of-e-waste> accessed 5 September 2019

[23] ZWMP, 44

[24] ZWMP, 46

Other developments include the rise of zero-waste grocery shops in Singapore, where customers bring their own containers for a wide variety of groceries. While the first such store, the homegrown Unpackt, was only opened in 2018,[25] at least two large international chains have joined the nascent scene in 2019.[26] Already, 14 percent of Singaporeans have indicated that they shop at such stores.[27] One of the attractions may be the economics of bulk purchasing. This allows such stores to price their products up to 10 percent cheaper than similar prepackaged products.[28] However, these stores have typically been limited to dry food and non-food products.[29] Singapore has a tropical climate, and hot and humid conditions mean that fresh produce and cooked/prepared food need to be packaged for hygiene.[30] This will likely remain so until further technological advances make it possible to do away with such packaging without inconveniencing the average shopper with the need to carry and wash reusable containers.

The rise of e-commerce also poses new questions for packaging waste. While it is likely to reduce the use of carrier bags since the products do not need to be carried from shop to home, it leads to equally wasteful packaging practices, such as oversized boxes with disposable inflated plastic pillows, or paper fillers, and "Russian-doll" packaging, where products which already come in freight-safe packaging are further packed in additional packaging to reduce damage in transit.[31] On the other hand, e-commerce also allows for new models of product delivery.

1.3 E-waste and packaging waste as a global issue

Waste, as a trade and environment issue, has recently caught the attention of lawmakers in the region. China's "National Sword" has been unsheathed, and as a result, the world's recycling

[25] ZWMP, 27

[26] Eunice Quek, 'Shop with zero waste' (*Straits Times*, 28 July 2019) <https://www.straitstimes.com/lifestyle/food/shop-with-zero-waste> accessed 5 September 2019

[27] Tessa Oh, 'Singaporeans want to go green but not sure how to use blue bins: Poll' (*Todayonline.com*, 8 August 2019) <https://www.todayonline.com/singapore/singaporeans-want-go-green-need-learn-how-recycle-properly-survey-finds>

[28] Tang See Kit, 'Packaging-free stores sprout in Singapore, but will consumers give them the green light?' (19 May 2018)

[29] Ang Hwee Min, 'Could more be done to reduce plastic packaging waste in Singapore's supermarkets?' (28 July 2019) <https://www.channelnewsasia.com/news/singapore/reduce-plastic-packaging-supermarkets-clingwrap-11756670>

[30] Ibid

[31] Alyssa Karla Mungcal, Denise Chong and Jocelyn Tan, 'War on waste: The dirty (brown) secret about e-commerce' (*Straits Times*, 19 April 2019) <https://graphics.straitstimes.com/STI/STIMEDIA/Interactives/2019/04/earth-day-online-shopping-packaging-waste-fails/index.html> accessed 5 September 2019

system has, in the words of the Financial Times, "stopped working", as China announced that it would stop accepting imports of recycled material.[32] Malaysia, Indonesia, and the Philippines have also followed suit.[33] As such, countries have realised that there is an urgent need to manage their waste within their own borders.

Additionally, China has suggested it would begin subjecting the export of rare earth elements to quotas.[34] These rare earths and metals are also frequently mined in areas of active or potential conflict. China intends to mine the contested South China Sea for minerals in the sea bed that are used to make electronics;[35] while reserves of cobalt, used to make batteries, are concentrated in the conflict-blighted Democratic Republic of Congo.[36]

Some countries have been able to turn the waste crisis into an opportunity. For example, the Tokyo Olympics 2020 has been able to manufacture all 5,000 medals, harvesting 32kg of gold, 3,500kg of silver, and 2,200kg of bronze from almost 79,000 tonnes of e-waste over a 2-year period.[37]

Loop, a delivery service which offers products from 25 companies such as Unilever and Nestle in reusable containers, is inspired by traditional milk delivery services, which dropped off fresh milk and then came back for the bottles once people consumed their supply.[38] Loop arranges for delivery from the partner companies' warehouses, and collects and washes empty containers from customers.[39] Customers simply pay a refundable container deposit, as well as delivery fees. It has already launched in Paris and New York, and will expand to London and Tokyo by 2020.[40]

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[32] Leslie Hook and John Reed, 'Why the world's recycling system stopped working' (*Financial Times*, 25 October 2018) <https://www.ft.com/content/360e2524-d71a-11e8-a854-33d6f82e62f8> accessed 5 September 2019

[33] Kate Lamb and Adam Morton, 'Indonesia sends rubbish back to Australia and says it's too contaminated to recycle' (9 July 2019) <https://www.theguardian.com/environment/2019/jul/09/indonesia-sends-rubbish-back-to-australia-and-says-its-too-contaminated-to-recycle> accessed 5 September 2019

[34] Lucy Hornby and Archie Zhang, 'China's state planner suggests using rare earths in US trade war' (29 May 2019) <https://www.ft.com/content/a0125e6a-8168-11e9-b592-5fe435b57a3b> accessed 5 September 2019

[35] Viola Zhou, 'China's deep-sea mission to mine the wealth beneath the ocean floor' (*South China Morning Post*, 6 October 2017) <https://www.scmp.com/news/china/policies-politics/article/2025456/chinas-deep-sea-mission-mine-wealth-beneath-ocean-floor> accessed 19 September 2019

36 Robin Hicks and others, 'Defusing Southeast Asia's e-waste timebomb' (Eco-Business, August 2019) <https://www.eco-business.com/news/defusing-southeast-asias-e-waste-time-bomb/> accessed 5 September 2019

37 Tokyo Organising Committee of the Olympic and Paralympic Games, 'Tokyo 2020 Medal Project: Towards an Innovative Future for All' (Tokyo Organising Committee of the Olympic and Paralympic Games, 2019) accessed 5 September 2019

[38] Ashley Carman, 'Pepsi, Nestle, and more will test reusable packaging subscription service' (*The Verge*, 28 January 2019) <https://www.theverge.com/2019/1/28/18200449/loop-reusable-packaging-subscription-service-pepsi-nestle-unilever> accessed 5 September 2019

[39] Ibid

[40] Ibid

1.4 Public Participation in the Year Towards Zero Waste 2019

The Year Towards Zero Waste (YTZW) 2019 was launched on 12 January 2019, with Minister for the Environment and Water Resources Mr Masagos Zulkifli calling on Singaporeans to "adopt a circular economy approach" by "turn[ing] trash into treasure by reusing and recycling… resources endlessly."[41] As part of the YTZW, MEWR embarked on a consultative democractic exercise, almost unprecedented in its scale. According to MEWR, more than 250 companies were consulted on measures to address Singapore's key waste streams.[42] From 7 to 31 March 2019, 1,300 respondents had taken part in an online public consultation open, followed closely by two focus group discussions on 18 and 29 April which say a total of 90 participants participating. The first session on 18 April was on "Encouraging Sustainable Consumption" across food, packaging and e-waste while the second on 29 April looked at "Building a Culture of Recycling Right". In both instances, the topics were pre-selected by MEWR for the participants.

However, these were no ordinary focus group discussions, as they were co-organized in partnership for the first time with two local civil society groups – Zero Waste SG and LepakInSG.[43] In tackling waste management in Singapore, the government appears to be serious about co-creating and implementing zero-waste initiatives with stakeholders. For the first time, MEWR also released a 17-page Zero Waste Masterplan Public Engagement Report on 4 September 2019.[44] The report details findings from the online consultation in March 2019 and key suggestions from discussions in April 2019. It notes that Zero Waste SG and LepakInSG helped frame questions for discussion and facilitated them, and that Mr Masagos Zulkifli, Minister for the Environment and Water Resources, and Dr Amy Khor, Senior Minister of State for the Environment and Water Resources, and members of the Government Parliamentary Committee (GPC) for the Environment and Water Resources, attended the sessions as observers.

Such a consultative democratic exercise heralds the revival of the concept of a "democracy of deeds", first mentioned by one of Singapore's pioneer ministers, Mr S Rajaratnam. The concept has been expanded by Prime Minister Mr Lee Hsien Loong, Deputy Prime Minister Mr Heng Swee

[41] Calvin Yang, 'Singapore needs to relook way it uses resources if it's to become a zero-waste nation: Masagos' (*Straits TImes*, 12 January 2019) <https://www.straitstimes.com/singapore/environment/singapore-needs-to-relook-way-it-uses-resources-if-its-to-become-a-zero-waste> accessed 5 September 2019

[42] Ministry of Environment and Water Resources, 'Public Consultation on Zero Waste Masterplan' (2019) <https://www.towardszerowaste.sg/consultation> accessed 5 September 2019

[43] ibid

[44] Ibid

Keat, and Speaker of Parliament, Mr Tan Chuan-Jin.[45] The concept, in short, involves citizens partnering with the government on issues and getting involved in policy-making.[46]

Public consultations on the ZWMP,[47] the Recycle Right Citizens Workgroup,[48] and a 'Towards Zero Waste Grant' have been launched as part of YTZW.[49] The ZWMP was launched in August 2019, setting out new policy directions to build the circular economy.

The Recycle Right Citizens' Workgroup aims to improve household recycling in Singapore. It supported by MEWR and the NUS Institute of Policy Studies (IPS), began its work in September 2019, and will span four full days on 21-22 September and 19-20 October 2019.[50] 48 participants were chosen from a broad spectrum of society, including "those who actively recycle, do not recycle, and those who are keen to recycle but feel that they do not have enough information to do so".[51] They will be given access to background information about household recycling in Singapore, including household recycling surveys. They will also be invited to visit a Materials Recovery Facility and meet with resource persons who can share their expertise and help with the piloting and implementation of solutions.[52] These resource persons are drawn from civil society leaders, sustainability experts, as well as waste industry professionals. The Citizens' Workgroup is expected to help the government put the ZWMP into action and allow Singaporeans to co-develop solutions with experts and MEWR to improve household recycling.

Additionally, a 'Towards Zero Waste Grant' was created to support ground-up initiatives from civic groups and companies that drive waste reduction and recycling in any of the three key waste streams – packaging waste, food waste and electrical and electronic waste (e-waste) – or encourage households to recycle more and/or recycle right.[53]

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[45] Martino Tan, 'Heng Swee Keat mentioned Rajaratnam's 'democracy of deeds' in 2 different speeches in a week' (*Mothership.sg*, 24 June 2019) <https://mothership.sg/2019/06/heng-swee-keat-democracy-of-deeds/> accessed 5 September 2019

[46] Ibid

[47] Ministry of Environment and Water Resources

[48] Ministry of Environment and Water Resources, 'Recycle Right Citizens' Workgroup' (2019) <https://www.towardszerowaste.sg/citizens_workgroup/> accessed 5 September 2019

[49] National Environment Agency, 'Towards Zero Waste Grant' (2019) <https://www.nea.gov.sg/programmes-grants/grants-and-awards/towards-zero-waste-grant> accessed 5 September 2019

[50] Navene Elangovan, 'Got ideas on recycling household rubbish? Join a new 'citizens' workgroup" (*todayonline.com*, 17 July 2019) <https://www.todayonline.com/singapore/got-ideas-recycling-household-rubbish-join-new-citizens-workgroup> accessed 5 September 2019

[51] Ministry of Environment and Water Resources, 'Recycle Right Citizens' Workgroup' (n 44)

[52] Ibid (n 44)

[53] National Environment Agency (n 45)

In a first for local governance in Singapore, Nee Soon East constituency district launched its own local Zero Waste Masterplan on 22 April 2019 (Earth Day), with targets for plastic, paper, food, and e-waste, as well as carbon emissions reduction.[54] The Member of Parliament for Nee Soon East constituency, Mr Louis Ng, has also called on the Public Service, as well as the National Day Parade committee, to adopt similar zero-waste measures.[55]

All these measures are significant, as they are a step forward in public participation in environmental issues in Singapore. The importance of this has been recognised in Principle 10 of the Rio Declaration on Environment and Development,[56] as well as the Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters.[57] This principle, as expressed in the Rio Declaration, can be subdivided into three limbs, which have also been described as "baseline democratic values" for environmental decision-making:[58]

- Access to public participation: "Environmental issues are best handled with the participation of all concerned citizens", "Each individual shall have… the opportunity to participate in decision-making processes";
- Access to information: "Each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities";
- Access to justice: "Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided."[59]

From the above, the organisation of public consultations undoubtedly meets the public participation limb of the Principle. On the other hand, the implementation of the access to information limb is still restricted. The access to various forms of information is still limited to a

[54] Cheryl Teh, 'Zero-waste masterplan launched in Nee Soon East' (*Straits Times*, 29 April 2019) <https://www.straitstimes.com/singapore/zero-waste-masterplan-launched-in-nee-soon-east> accessed 5 September 2019

[55] 'Adjournment Motion: Towards a Plastic-Lite Singapore (Mr Louis Ng Kok Kwang)' (Parliamentary Debates of Singapore: Official Report, 1 October 2018, vol 94, sitting 83) <https://sprs.parl.gov.sg/search/sprs3topic?reportid=motion-67>

[56] 'Rio Declaration on Environment and Development' (United Nations Conference on Environment and Development, 1992) <http://www.unesco.org/education/pdf/RIO_E.PDF>

[57] 'Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters' (1999) 38 ILM 517 (Aarhus Convention)

[58] Lin Heng Lye, 'Land Law and the Environment: Re-examining the Concept of Ownership and Forging New Rights and Obligations in a Changed World' (2010) 22 Singapore Academy of Law Journal 189, para 47

[59] *Supra* n 56

pre-selected group of people in the Citizens' Workgroup. While it is a sign of progress, it is submitted that the Ministry could be more proactive in releasing basic information on a regular basis.

Eventually, it is hoped that the experiences from these public consultations will result in the practice of a more open and consultative form of environmental policy-making in Singapore. This form of consultative democracy has already attracted some positive attention from other countries. It has been suggested that Singapore's experience would be of "referential value" to China's domestic environment-related decision making and the "protection of the right to information and involvement along the countries involved in the Belt and Road Initiative", over half of which are state parties to the Aarhus Convention.[60]

[60] Kangle Zhang, 'Right to Information about, and Involvement in, Environmental Decision Making along the Silk Road Economic Belt' (2017) 5(1) Chinese Journal of Comparative Law 58

2. The RSA and the EPR Framework

The RSA[61] was first read in Parliament on 5 August 2019. It, *inter alia*, imposes obligations relating to the collection and treatment of electrical and electronic waste and food waste, mandates the reporting of packaging imported into or used in Singapore, introduces and regulates producer responsibility schemes (PRS), and promotes resource sustainability.

2.1 E-Waste

Part 3 of the RSA legislates on the management of e-waste. Additionally, Part 6 legislates for the creation and regulation of PRS. The main stakeholders in this process are the producers, retailers, collectors, PRS operators, and consumers. The role of each stakeholder in this process will be looked at in turn.

[61] Resource Sustainability Bill (Bill No. 20/2019) (Singapore) <https://sso.agc.gov.sg/Bills-Supp/20-2019/Published/20190805?DocDate=20190805> ("**RSB**")

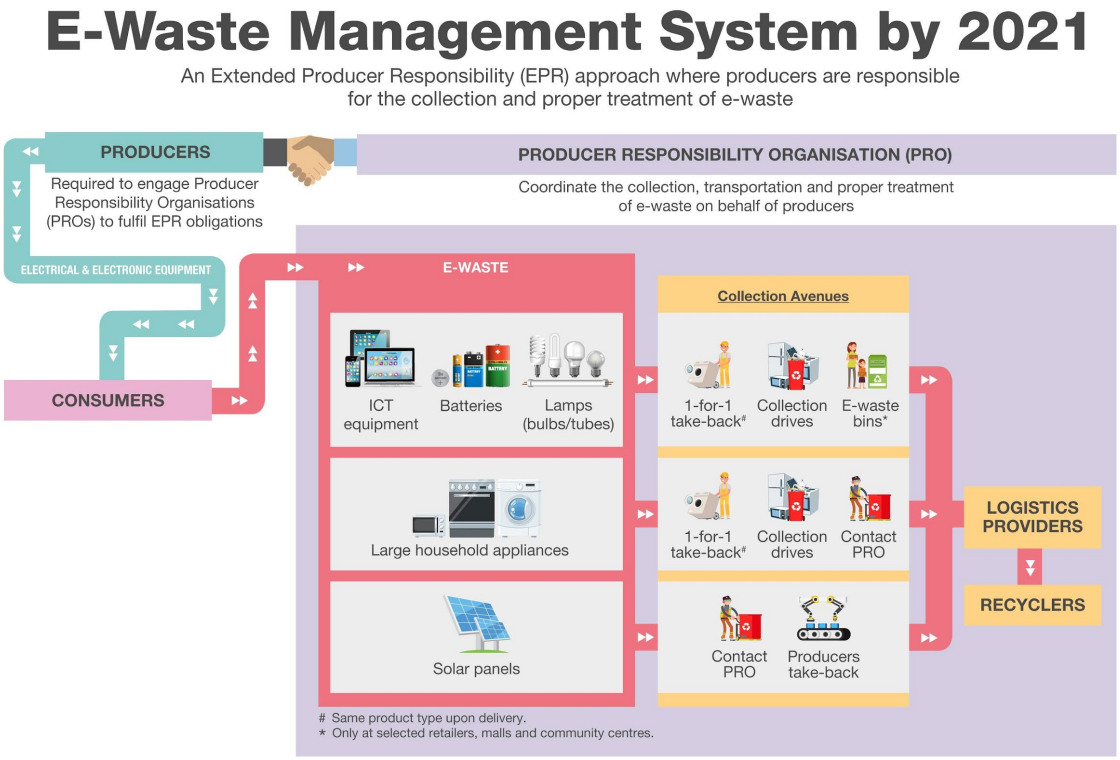

Figure 1: NEA Diagram on EPR[62]

2.1.1 What is e-waste?

In clause 7(1) of the RSA, e-waste is defined as "any regulated product that is intended for disposal and not for re-use".[63] In turn, a "regulated product" is defined in clause 6 as classes, or types, of electrical or electronic products, which are prescribed as such by the Minister.[64] The National Environment Agency (NEA) has already indicated the classes of products that will be regulated:

[62] National Environment Agency, 'NEA To Implement E-waste Management System For Singapore By 2021' (6 March 2018) <https://www.nea.gov.sg/media/news/news/index/nea-to-implement-e-waste-management-system-for-singapore-by-2021> accessed 5 September 2019

[63] RSB, cl 7(1)

[64] RSB, cls 6; 52(1)

COVERED EEE AND PRS COLLECTION TARGETS

PRODUCT CATEGORY	PRODUCT TYPE	COLLECTION TARGET
ICT EQUIPMENT	Printers / Personal computers / Laptops / Mobile phones / Tablets / Routers / Modems / Set-top boxes / Servers	20% of put-to-market (PTM) by weight
LARGE APPLIANCES	Refrigerators / Air-conditioners / Washing machines / Dryers / Televisions / Electric mobility devices, including Personal mobility devices, Power assisted bicycles and Electric mobility scooters	60% of PTM by weight
BATTERIES	Portable batteries	20% of PTM by weight
	Industrial batteries	NA
	Hybrid / electric vehicle batteries	NA
LAMPS	Bulbs and tubes	20% of PTM by weight
SOLAR PV PANELS	All types	NA

List of regulated products and collection targets[65]

This is then further subdivided into "regulated consumer products" (RCP) and "regulated non-consumer products" (RNCP). Classes and types of regulated products in the RCP category must be further prescribed by the Minister under clause 12(2);[66] those regulated products not further prescribed are thus RNCPs.[67]

For the products in the RCP category, the Minister may also further prescribe a threshold supply level for a class or type of RCP, or a collective threshold for multiple RCP classes and/or types.[68]

But what does it mean to "produce" a regulated product, RCP or otherwise?

[65] ZWMP, 43

[66] RSB, cl 12(2)

[67] RSB, cl 7(1)

[68] RSB, cl 12(2)(b)

2.1.2 Producers

The definition of "producer" in the Act is defined in clause 7(2) as someone who is in the "business of supplying the regulated product in Singapore", and must also either manufacture; engage another person to manufacture; or cause the regulated product to be manufactured in Singapore, or import the product into Singapore.[69]

However, clause 7(3) also states that "a manufacturer of a regulated product is not the producer of the regulated product if the manufacturer manufactures the regulated product for or on behalf of a Singapore-connected person."[70] This would mean that the producer would be the person or entity who is the last in line in the supply chain before delivery to the retailer or end-user.

Under clause 9, producers must register themselves with the National Environment Agency (NEA), who is required, in turn, to maintain a register of registered producers under clause 11.[71]

Clause 12 makes it mandatory for registered producers to join a licensed scheme, ie. a PRS with the necessary licence, as defined by clauses 2 and 29, if it has exceeded the threshold supply level for any class or type of RCP in Singapore.[72]

Clause 13(1) also requires all RNCP producers (registered or otherwise) to collect unwanted RNCPs (which they were the producers of) from end-users for disposal from the premises specified by the end-user. The registered producer must not impose any fee for the collection and disposal of the RNCP, including "labour" and "transport" costs.[73] Clause 13(2) further empowers NEA to direct the producer to collect the RNCP from any premises. This may not necessarily be the premises stated by the end-user in clause 13(1).[74]

Further, clause 13(6) requires RNCP producers to hand over the collected RNCP to a licensed waste collector or licensed e-waste recycler.[75]

[69] RSB, cl 7(2)

[70] RSB, cl 7(3)

[71] RSB, cls 9, 11(1)

[72] RSB, cl 12

[73] RSB, cl 13(1)

[74] RSB, cl 13(2)

[75] RSB, cl 13(6)

Finally, clause 18 requires registered producers to keep records on the weight and number of all regulated products it has supplied in Singapore. In the case of RNCP, the weight, number, and the final handling / disposal of these products must also be separately recorded.[76]

2.1.3 Retailers

For retailers, clause 14(1) stipulates that they must collect unwanted RCPs from consumers when it supplies (whether over the counter, or via delivery service - regardless of whether it is an in-house delivery service, or an outsourced delivery service) another RCP "of the same class and type".[77] Clause 14(2) further requires that this must be done at the time of delivery, or any other time agreed with the consumer. The retailer must not impose any fee for the collection and disposal of the RCP, including "labour" and "transport" costs.[78] Under clause 14(4), the retailer must then hand over the collected RCP to a PRS operator.[79]

2.1.4 Large Retailers

Clause 15 requires that large retailers, defined as retailers that occupy any premises with a floor area of 300m^2 or larger (or such other area prescribed in substitution), must offer in-store collection of RCPs of the same class or type as of those being supplied on the premises.[80] This service must be extended to RCPs purchased from other premises or retailers. Again, under clause 15(4), the retailer must then hand over the collected RCP to a PRS operator.[81]

The definition of "large retailer" by way of floor area seems to be behind the times, however:

- With the rise of e-commerce, "large retailers" may not need to supply RCPs from a large shopfront area. In fact, all a "large retailer" needs is a warehouse, and an internet connection. Under the current provisions, an large e-commerce retailer can therefore refuse to accept an RCP on the basis that it is not "of the same class and type" as the

[76] RSB, cl 18

[77] RSB, cl 14(1)

[78] RSB, cl 14(2)

[79] RSB, cl 14(4)

[80] RSB, cl 15

[81] RSB, co 15(4)

product being delivered to the consumer, whereas traditional brick-and-mortar retailers must accept any RCP "of the same class and type as of those being supplied on the premises".

- What about a chain retailer with many premises which each have a floor area of less than 300m^2? Will an aggregate approach be applicable here, or will each premise be reckoned separately?

2.1.5 Collectors

The Act establishes a new regulatory scheme for e-waste collectors as well. Clause 16(1) restricts public collection of e-waste to PRS operators, as well as other people with NEA's written approval ("approved e-waste collectors").[82] However, clause 16(3)(a) clarifies that a person who puts out a receptacle for collection of e-waste on behalf an approved e-waste collector, is not subject to this clause.[83] Licensed waste collectors are also allowed to continue to collect e-waste in the process of collecting general waste, pursuant to clause 16(3)(b)(i). They may also collect e-waste on behalf of an approved e-waste collector.[84]

2.1.6 Producer Responsibility Scheme (PRS) Operators

Clauses 28-29 requires prospective PRS operators to apply for a licence from NEA.[85] Under clause 30, NEA may regulate the following matters in a PRS:

- Fees payable by PRS members
- Requirements relating to e-waste collection operators to ensure "comprehensive and regular" collection, removal, and transport of e-waste
- Minimum collection amounts
- Public education requirements, including conducting programmes and events on waste management and resource sustainability.[86]

[82] RSB, cl 16(1)

[83] RSB, cl 16(3)(a)

[84] RSB, cl 16(3)

[85] RSB, cls 28-29

[86] RSB, cl 30

Clause 34 requires licensed PRS operators to keep records on details of the PRS collection activity, fees charged to PRS members, and the amount of e-waste sent for treatment or recycling.[87] Clause 35 further requires them to submit an audited annual report on such matters as may be prescribed relating to the operation of the PRS.[88]

It is quite likely that the PRS operators will be existing licensed e-waste recyclers, who are licensed under section 23(1) of the Environmental Public Health Act.[89] This would make commercial sense as it allows for vertical integration of the PRS, collection, and recycling functions.

2.1.7 Consumers and end-users

While detailed regulations have been drawn up for the producers, retailers, collectors, and PRS operators, little is mentioned about consumers and end-users. The only relevant part of the Act is clause 17, which makes it illegal to dispose of a RCP/RNCP other than through an approved e-waste collector, licensed waste collector, or licensed e-waste recycler.[90]

It seems that the participation of consumers and end-users in the circular economy is entirely optional. They may demand service by producers and retailers to collect their unwanted RCPs/RNCPs, but there is nothing to stop consumers and end-users from simply discarding their RCPs/RNCPs as general waste, where they will be incinerated, with all the attendant environmental issues.

It would seem that if any PRS is to be successful, it must be able to reach a critical mass of participants. This would allow the PRS to maximise economies of scale, and (for PRS operators who are also e-waste recyclers) to process sufficient RCPs/RNCPs to be able to harvest rare earths and metals on a commercial scale.

On the other hand, consumers and end-users must always go through either a producer or retailer to dispose of their e-waste. But what if the producer refuses to collect the RCP/RCNP, ceases business in Singapore, or in the case of a foreign online business, has no legal presence in Singapore? What recourse does the end-user have? Can the end-user approach a PRS operator or

[87] RSB, cl 34

[88] RSB, cl 35

[89] RSB, cl 2

[90] RSB, s 17

e-waste recycler directly for collection and disposal? (The Ministry's answer is yes.[91] But will this be at the cost of the consumer?)

2.1.8 Repairers

Repairers, in this case, can be separated out into commercial repair services, and non-profit repair organisations. The former would not be affected since they purchase their spare parts from existing sources. Whether the spare part suppliers will need to be registered as producers themselves is an open question.

The more interesting question, however, is in the case of a non-profit repair organisation which repairs RCPs as a community service. They may, in the course of their service, decide to take apart an unrepairable RCP for its components, which can be used as spare parts in repairing other RCPs. Does this make the organisation a "collector" as well? Will the organisation need written permission under clause 16 to do so?

2.2 Packaging Waste

Part 4 of the RSA establishes a mandatory packaging waste reporting scheme which is to be implemented by 2020. This builds on an existing mandatory waste reporting framework for large malls and hotels, which will also be expanded to all large industrial and commercial premises, including large convention and exhibition centres, in 2020.[92]

Clause 20 of the RSA sets out the packaging waste reporting requirements for "producers" of "regulated goods" which uses "specified packaging", and meets "prescribed threshold criteria".[93] Each of these terms will be unpacked in turn.

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[91] 'Resource Sustainability Bill: Second Reading (Dr Amy Khor Lean Suan, Senior Minister of State for Environment and Water Resources)' (*Parliamentary Debates of Singapore: Official Report*, 4 September 2019, vol 94, sitting 111) <https://sprs.parl.gov.sg/search/sprs3topic?reportid=bill-386>

[92] ZWMP, 46

[93] RSB, cls 19-20

2.2.1 "Producer" of "regulated goods"

The RSA defines a "producer" in relation to "regulated goods", which is itself an inclusive category, defined as "any goods other than goods prescribed as excluded from this definition".[94] This means that the "producer" will take reference from the product which is being packaged, rather than the producer of the packaging itself.[95] It also means that NEA will likely have a narrow list of categories of goods which it intends exempt from this provision. This is likely to be goods where hygiene is a concern, such as fresh produce and medical products.

Here, a "producer" of regulated goods also includes importers of the regulated goods,[96] as well as retailers which provide "specified packaging" to a consumer who purchases regulated goods to enable the consumer to put the regulated goods into the "specified packaging".[97] However, if the retailer is required by the producer of regulated goods to use a "specified packaging" provided by the producer, then the producer while directs the retailer to do so is the relevant producer (not the retailer).[98] The upshot is that the party which makes the decision to provide a "specified packaging" is the producer.

2.2.2 "Specified packaging"

The RSA takes an inclusive approach to defining this term as well. This is defined as "any packaging other than any type of packaging prescribed as excluded from this definition".[99] This broad definition means that it is likely that MEWR will exclude only a narrow list of categories of packaging, possibly limited to those designed to be reusable, such as reusable carrier bags.

[94] RSB, cl 19(1)

[95] RSB, cl 20(2)

[96] RSB, cl 19(2)(a)

[97] RSB, cl 19(2)(b)(iv)

[98] RSB, cl 19(2)(b)(iii)

[99] RSB, cl 19(1)

2.2.3 "Prescribed threshold criteria"

While not defined in the RSA, the ZWMP has indicated that this threshold will be producers of packaged products, and supermarkets, with an annual turnover of more than $10 million.[100] If the producer is a franchisor (ie. franchise/brand owner), then the turnover of all franchisees of the franchise are added together for the purpose of reckoning the producer's turnover.[101] The packaging used by all franchisees will also be deemed as being used by the franchisor.[102]

2.2.4 Reporting duties

Producers which produce "regulated goods", package them in "specified packaging", and meet the prescribed threshold criteria in a given year, will need to keep records on the amount of specified packaging used for regulated goods in the following year, and submit a report to NEA on these figures in the year thereafter.[103] The producer must also submit to the Agency a plan to reduce, re-use or recycle packaging in Singapore, including information on the implementation of any part of the plan.[104]

2.2.5 Possible extension of EPR to packaging waste

The ZWMP also indicates that EPR will be extended to packaging waste by 2025.[105] It highlights the various regulations used in other jurisdictions to implement EPR, including recycling rate targets, performance standards and restrictions, deposit refund systems, material taxes, advance disposal and recycling fees, and tradable credits.[106]

The RSA includes both e-waste and packaging waste in the same legislative act, but only e-waste is subject to an EPR. The authors are of the view that this is because packaging waste is far more voluminous than e-waste, so waiting for the producer to collect its own packaging waste may not be feasible. Further, considering the rise of e-commerce, a more robust regulatory model is needed

[100] ZWMP, 46

[101] RSB, cl 20(2)(a)

[102] RSB, cl 20(2)(b)

[103] RSB, cls 20(1), 23

[104] RSB, cls 21(1)-(2)

[105] ZWMP, 46

[106] ZWMP, 47

to address packaging waste. At the same time however, the e-commerce model of direct deliveries from warehouse to home provides a new opportunity. The provision of delivery logistics services can be harnessed to create a new "reverse logistics" flow. This will require the sharing of the regulatory burden across all producers and retailers of the same class of regulated goods, and will be explained in Part 4 below.

3. Recommendations

Our recommendations stem from our reading of the RSA and ZWMP and are by no means exhaustive. We hope that this working paper will be helpful in shaping and stimulating public discourse on waste management in Singapore.

E-Waste

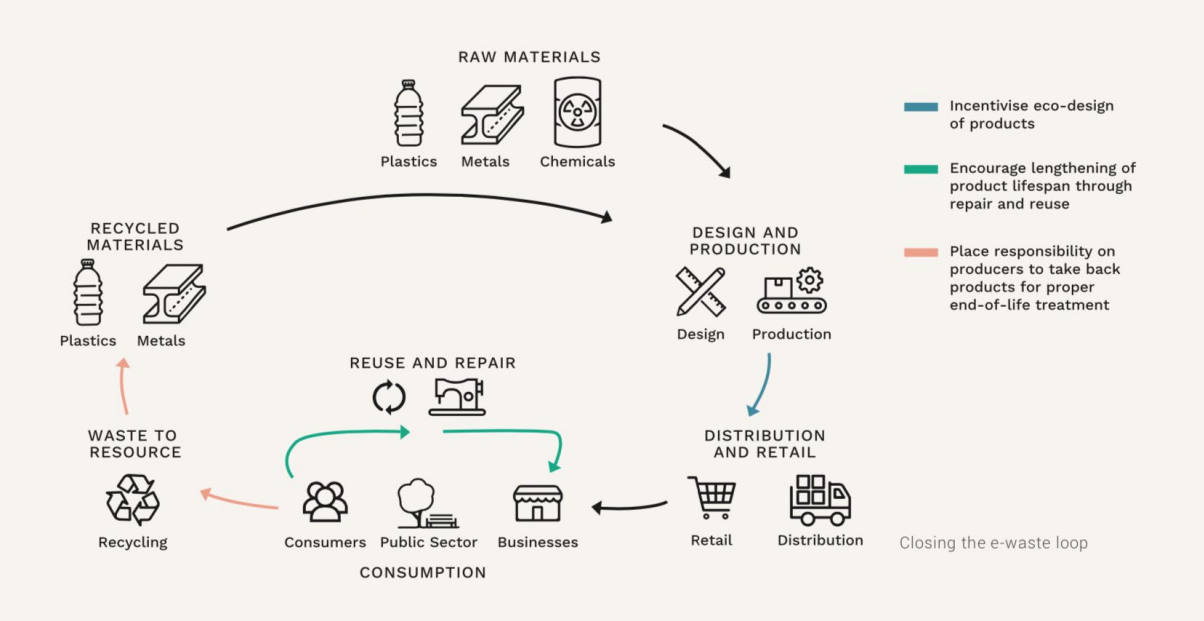
1. E-product design and labelling
2. Promoting competition in after-sales service markets and the Right to Repair
3. Closing legislative loopholes
4. Supporting Singaporeans to pioneer pathways towards zero e-waste

Packaging Waste

1. Container standardisation
2. Minimum recycled content standards for other packaging
3. Expanded role of PRS operators for packaging waste
4. Imported packaging through e-commerce

3.1 E-waste

While the EPR for e-waste is a major advance in terms of resource sustainability, more needs to be done to close the e-waste loop in order to "turn trash into treasure". The recommendations below are aimed at doing so.



Closing the e-waste loop[107]

3.1.1 E-product design and labelling

Singapore has an existing energy label scheme, but it only shows the energy consumption, and only applies to air-conditioners, fridges, dryers, televisions, and lightbulbs.[108] The energy label should be expanded to washing machines (which are already subject to the Public Utilities Board's mandatory Water Efficiency Labelling Scheme),[109] and e-products generally. The energy label should also indicate:

- the CO2 emissions from product manufacture and use;
- product lifespan;
- consumer and third-party reparability of the product; and
- cost savings from both energy efficiency and repairability.

[107] ZWMP, 44

[108] National Environment Agency, 'The Energy Label' (2019) <https://www.nea.gov.sg/our-services/climate-change-energy-efficiency/energy-efficiency/household-sector/the-energy-label> accessed 5 September 2019

[109] Public Utilities Board, 'Water Efficiency Labelling Scheme: Types of Label' (2018) accessed 5 September 2019

3.1.2 Promoting competition in after-sales service markets and the Right to Repair

The practice of e-product warranties being voided when the e-product is brought to an independent (ie. "non-authorised"/third-party) repairer should also be examined for potential anti-competitive effects. These restrictions deter e-product owners and users from using independent repairers and prevents these repairers from competing with the e-product producer or their authorised repair centres. This would then in turn allow the manufacturer and authorised repair centres to charge higher service and repair fees. The Competition and Consumer Commission Singapore (CCCS) conducted an inquiry on similar warranty terms in the automotive industry in 2017 and has found these terms to be of concern. The CCCS has since worked with car dealers to remove these terms from their warranties.[110]

In the same vein, e-product producers should be required to allow consumers and users to download diagnostic and service information and share them with third-party repairers to aid in repair. The European Union, as well as a planned Act in Australia, requires automotive industry manufacturers to share such information with any repairer; IFixIt calls for this to be extended to electronics and farm equipment.[111]

3.1.3 Closing the legislative loopholes to advance with the times

From the discussion of the Resource Sustainability Act above, the following loopholes identified should be resolved with the following amendments:

- Consumers and end-users should have the option of approaching either a PRS operator, or a licensed e-waste recycler to collect their unwanted e-products, especially where the producer has ceased operations in Singapore, or the retailer refuses to collect the unwanted e-product.
- On the other hand, consumers and end-users should not be allowed to put e-waste in general waste streams, considering the toxic emissions from incinerating e-waste. Licensed

[110] Competition and Consumer Commission of Singapore, *Market Inquiry on Car Parts in Singapore* (11 December 2017) <https://www.cccs.gov.sg/resources/publications/market-studies/market-inquiry-on-car-parts>

[111] Craig Lloyd, 'Australia's Right to Repair Proposal for Motor Vehicles Is a Good Start' (*Ifixit*, 5 March 2019) < https://www.ifixit.com/News/australias-right-to-repair-proposal-is-a-good-start-but-its-not-enough> accessed 5 September 2019

waste collectors should not be allowed to collect e-waste as part of the general waste stream knowingly.

- The definition of a "large retailer" should also be amended to take into account e-commerce retailers. Rather than a floor area approach, the size of the retailer should be based on sales receipt revenues. E-commerce retailers, both local and foreign, should also be required to partner with PRS operators or e-waste recyclers to collect and process unwanted e-products.

3.1.4 Supporting Singaporeans to pioneer pathways towards zero e-waste

Finally, the Resource Sustainability Act and the Zero Waste Masterplan presents an opportunity for clarification and strengthening of the role of the repair and second-hand communities in the circular economy.

Taking the example of the Repair Kopitiam, a volunteer initiative project of Sustainable Living Lab (SL2), which conducts electrical equipment repair pop-ups at different Community Centres from time to time, the Repair Kopitiams could become a more permanent fixture at every Community Centre. They should be granted a licence via a simplified and expedited approval process under clause 16.

Electrical and computer engineering students in Institutes of Technical Education, polytechnics and universities can be roped in (as part of a practical learning and design module) to assist in, and learn how to repair electrical and electronic equipment and in the process, learn how to design electric and electronic equipment in a more sustainable manner. Equipment beyond repair could also be collected at the Repair Kopitiams, and where safe to do so, stripped for spare parts.

Community Centres can become a focal point in the fight against e-waste — and with their ubiquity and visibility, they are good places to build public awareness and acceptance of repair and refurbished e-products. Moreover, the public becomes an active participant in the process of conserving our heritage in a reimagined form; by becoming involved, they can better understand the issues behind product management law and policy, and how these can be improved to reduce e-waste.

3.2 Packaging waste

While the current PRS model in the RSA would be an improvement above and over the current NRP, it would still rely on the presence of a market for recycled products, including packaging with recycled content. The following recommendations are aimed at creating this market through regulations, and eventually moving towards a true circular economy model with reusing placed ahead of recycling.

3.2.1 Container standardisation

For beverages and dry foods, as well as household cleaning products and toiletries, the aim should be to standardise the containers that they are packaged in. These standardised containers should have reusability and refillability as a priority. Initial container design regulations should include:

- The material which the container is made out of - including minimum recycled content standards, ratcheting up over time towards 100%;
- The colour of the container - restricted to a limited number of popular colours (possibly clear, clear green, clear brown, and white) to allow for more of the same material to be collected in bulk for recycling;
- The material which the sealing mechanism is made out of;
- The ease of separating labels and sealing mechanism from the container; and
- The ease of emptying of residues from the container after normal use when lightly rinsed with water.[112]

All compliant containers should be embossed with a common mark to identify them as compliant with the regulations. All retailers, including local e-commerce retailers, should be required to collect all compliant containers presented by the consumer, regardless of the producer of the product or container. These containers will then be sent to a PRS operator or licensed recycler, who will then be required to ensure that the collected container is either cleaned and refilled, reused, or reformed into a new container.

Even so, recycling containers will still require energy use to reform containers. To minimise energy use in this regard, the container regulations should then be further refined at a later stage to provide

[112] Adapted from Forum for Circular Plastic Packaging under the Danish Plastics Federation, 'Reuse and recycling of plastic packaging for private use' (2018) , 7-10

for standardised containers to allow them to be refilled by any producer. This would come into force when refilling technology is available at competitive levels.

3.2.2 Minimum recycled content standards for other packaging

For other forms of packaging produced in Singapore, minimum recycled content standards should be imposed, and ratchet up over time towards 100%. This will drive up demand for recycled packaging material. At the same time, a tax based on the ecological cost of producing the packaging should be imposed, with more recycled content resulting in lower tax. Factors in calculating this tax should include, as with the MEWR life cycle analysis:

- Global warming potential;
- Water requirement;
- Energy consumption; and
- Land use change.[113]

Alternatively, the producer can submit a cradle-to-cradle plan to NEA. This plan should ensure that none of the packaging material is sent to landfill through a comprehensive in-house collection and recycling process, where the producer also acts as collector, PRS operator, and recycler. The producer would be responsible for ensuring packaging material is reformed into new products for sale. These products would then receive a mark to identify them as tax-exempt.

3.2.3 Expand role of PRS operators for packaging waste

The role of the PRS operators for packaging waste should also be similarly expanded to take into account the additional resource sustainability regulations. At the very least, it should be required to monitor and verify, on behalf of NEA, its producer members' compliance with container design regulations and minimum recycled content standards for packaging. It would also collect the packaging ecological tax on behalf of NEA. When standardised containers regulations come into

[113] Ministry of Environment and Water Resources and National Environment Agency, 'Factsheet on Findings from Life-Cycle Assessment Study on Carrier Bags and Food Packaging' (2018) <https://www.nea.gov.sg/docs/default-source/media-files/news-releases-docs/cos-2018-media-factsheet-for-lca-study-findings49933c75146e42428011c7d2041a200b.pdf>

force, it would then be in charge or providing producers with the standard containers, and prepare used standard containers for refill by producers.

3.2.4 Imported packaging through e-commerce

Local and foreign e-commerce retailers should be required to enter into agreements with PRS operators in Singapore to comply with the requirements of the RSA. The e-commerce retailer would be able to certify, through the PRS operator, the type and amount of packaging material used, in compliance with Singapore's packaging regulations. Where this fails, consumers should be able to approach PRS operators or licensed recyclers to dispose of their packaging waste directly.

4. Conclusion

Overall, the RSA will give legislative effect to regulatory measures to help Singapore achieve its vision of zero waste. The RSA and ZWMP will co-exist to better regulate waste in Singapore while helping businesses reduce and recycle more. As a small island state, Singapore does not have many options and needs to constantly plan ahead, invest in research and development, find ways to scale innovative solutions to managing waste, and build the circular economy. These legislative and policy measures have been introduced in the Year Towards Zero Waste, putting into effect some of the promises made earlier this year by Minister Masagos Zulkifli, such as that of building a strong 3R (Reduce, Reuse and Recycle) culture in Singapore.[114]

A circular economy approach is a clear pathway to help Singapore overcome its resource constraints and move Singapore towards zero waste. The engagement efforts by MEWR in putting together the ZWMP this year is commendable. MEWR and NEA consulted more than 250 companies in 2018 on measures to address key waste streams in Singapore, and more than 1,300 respondents participated in an online survey in March 2019.[115] In April, MEWR co-organized two focus group discussions with non-governmental organisations Zero Waste Singapore and LepakInSG.[116] These should be seen as first steps towards more meaningful engagement on waste management in Singapore.

[114] Ministry of Environment and Water Resources, 'Public Consultation on Zero Waste Masterplan'

[115] Ibid

[116] Ibid