

CAPITALISING ON QUALITY SUSTAINABILITY REPORTING

Study of Waste Disclosures on the Food and Beverage
Sector in Singapore

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List of Abbreviations

| | |
|--------|---|
| ESG | Environmental, Social and Governance |
| F&B | Food and beverage |
| FLW | Food loss and waste |
| FLWARS | Food Loss and Waste Accounting and Reporting Standard |
| GRI | Global Reporting Initiative |
| GSSB | Global Sustainability Standards Board |
| HLPE | High Level Panel of Experts on Food Security and Nutritio |
| MSE | Ministry of Sustainability and the Environment |
| NEA | National Environmental Agency, Singapore |
| RSA | Resource Sustainability Act |
| SAS | Sustainability Accounting Standards |
| SASB | Sustainability Accounting Standards Board |
| SGX | Singapore Exchange Limited |
| WBCSD | World Business Council for Sustainable Development |

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About this Report

Solid waste management and reduction remains to be a national challenge in Singapore. Singapore's only landfill facility is expected to be fully filled by Year 2035, which makes the need to reduce waste an urgent need for the country. Furthermore, greenhouse gas emissions that are the main drivers of climate change can and need to be reduced if we focus to streamline the use of materials and energy as part of our efforts to reduce waste. Whilst the Resource Sustainability Act has been enacted to regulate priority waste streams, including food and packaging waste, we present the possibility of using the sustainability reporting process to hold companies accountable for their waste management strategies and practices.

This report analyses the prevalence and quality of waste reporting amongst food and beverage listed companies in Singapore and finds that there are gaps in the information reported, with much room for improvement. Recommendations, including a suggested framework, are proposed to close these gaps and to push for more companies to make the disclosures, so that companies provide useful information in sustainability reports for stakeholders and the latter can place pressure on companies to enhance their waste management efforts.

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Executive Summary

Singapore's waste situation has not been ideal. Limited landfill space and high greenhouse gas emissions from industrial production indicate that it is timely and important to get everyone, including companies, to act on waste management and reduction. Amongst Singapore's waste, plastic and food waste contribute very significantly to the country's total waste volume, and hence have been the focus of this report.

The Resource Sustainability Act (RSA) has been enacted for the regulation of the three priority waste streams, including food and packaging waste. Under the RSA, the National Environmental Agency is the sole agency to monitor businesses' compliance of the Act. On the other hand, companies are held accountable by several stakeholders for their sustainability reports. Hence, we argue that sustainability reports could be used as a tool to drive action and change.

It is found that there is value in pushing for the transparency of disclosures in sustainability reports as it encourages companies to justify their actions, and stakeholders are empowered with knowledge over companies to drive change. The research aim is to explore whether sustainability reports can be used as an effective tool to drive action and change on the packaging and food waste generated by companies in Singapore.

The following research objectives had been embarked upon, including having assessed the prevalence and quality of the waste information in sustainability reports of food and beverage listed companies in Singapore, identified gaps in the reported information when compared with the current governing standards, and provided recommendations to close the gaps and other shortcomings.

Research showed that there is much room for improvement on the prevalence and quality of the waste disclosures. Key findings include the discretion on materiality assessments that influence disclosure scores, high score observed for actions taken to prevent or reduce waste impact, lack of disclosures on the scope, measurement methods and processes of waste-related data, and lack of disclosures on performance

against waste-related goals and targets and monitoring measures. Insufficient disclosures make it difficult for stakeholders to hold companies accountable for their waste management practices, and hence should be improved.

Key recommendations include to introduce a framework that let companies have less flexibility to determine whether food and packaging waste is material, have performance disclosed against waste-related goals and targets *and* actions taken to prevent or reduce waste impact so that stakeholders get a holistic view of the outcome of the companies' waste management strategies, and have specific measurement methods which companies can adopt for their waste data. The assessment rubric has been recommended as a framework that can be adopted, but with minor tweaks.

Finally, implementation measures have been recommended, including who are the parties that need to support the push of the framework, having a separate party to provide assurance on compliance and strengthening the legal channels to enforce compliance. It could also be worthwhile to consider aligning the information submitted under the RSA and disclosure requirements under the recommended framework to reduce disclosure costs incurred by companies.

1 Introduction

1.1 Waste Situation in Singapore

According to the Kaza, Yao, Bhada-Tata and Van Woerden (2018) on the global solid waste management situation, the waste generation rate of Singapore is at 3.72kg/capita/day, ranking it at the highest waste per capita per day in the East Asia and Pacific Region, which includes developed countries like Australia, New Zealand, Japan and South Korea, and developing countries like China, the Philippines and Thailand. In comparison, the regional average waste is at 0.56kg/capita/day, and the global average waste generation rate is at 0.74kg/capita/day (Kaza et al., 2018).

In 2020, Singapore has generated a total of 5.88 million tonnes of waste (National Environmental Agency (NEA), 2021-a). This was a dip from previous years which hovered between 7.2 to 7.8 million tonnes of waste from 2016 to 2019 (NEA, 2020-a). The dip could be attributed to the Covid-19 pandemic in 2020, where circuit breaker measures were introduced, and restrictions were applied on non-essential economic activities to minimise transmission. Reduced demand on goods and services had impacted the volume of waste generated (NEA, 2021-a).

Nonetheless, solid waste management and reduction remains to be a national challenge. Currently, all incinerated ash and non-incinerable solid waste are transported to Singapore's only landfill facility, Semakau Landfill, to be buried (NEA, 2020-b). The landfill, however, has a limited lifespan to receive waste and is expected to be fully filled by Year 2035 (NEA, 2020-b). With Singapore's small landmass, clearly, the search for more land space to fulfil the country's landfill needs is not a sustainable solution and the Singapore government had launched the Zero Waste Masterplan in August 2019 to drive waste reduction at a national level, in an attempt to extend Semakau Landfill's lifespan (Khor, 2019; NEA, 2020-c).

The other benefit from reducing the amount of waste that gets incinerated and disposed into the landfill would be the reduction of greenhouse gas emissions, a main cause of the world's serious environmental issue, climate change (Crowley, 2000). In 2016, solid waste disposal and incineration amounted to 279.83 gigagram (Gg) CO₂

eq. (NEA, 2020-d). While this takes up a small percentage of Singapore's greenhouse gas emissions at 0.55%¹ (NEA, 2020-d), waste reduction efforts that involve the reduction in production of packaging and food at the upstream of the value chain could decrease the materials and energy used (U.S. Environmental Protection Agency, 2021), further reducing greenhouse gas emissions. Currently, energy from manufacturing industries and construction and industrial processes and product use take up 41%² of Singapore's GHG emissions for 2016 (NEA, 2020-d).

Looking at the types of waste contributing to Singapore's total waste volume, according to the NEA (2021-a), plastic and food waste are 2 of the 3 waste categories that contribute towards the highest waste volume disposed in 2020 at 832,000 tonnes and 539,000 tonnes respectively, with very low recycling rates. Both types of waste combined form 48% of the total waste disposed in Singapore in 2020 (NEA, 2021-a), making it imperative that we place emphasis to manage this waste.

While there is a lack of data available on the proportion of the plastic and food waste that is non-domestic, overall non-domestic waste generated was 70% of the total waste generated for Singapore in 2020 (NEA, 2021-a). The mean non-domestic waste disposed of from years 2000 to 2015 was at 44% of the total waste disposed of in Singapore (NEA, 2016; NEA, 2017). These statistics show that businesses contribute to a significant proportion of waste generated and disposed in Singapore.

1.2 Resource Sustainability Act

Recognising the urgency to curb waste on a large scale, the Ministry of the Environment and Water Resources (MEWR) introduced the Resource Sustainability Act (RSA) in 2019 (Ministry of Sustainability and the Environment (MSE), 2020). The Act legislates regulations over three priority waste streams, which are e-waste, food waste and packaging waste, including plastics (MSE, 2020), and mainly targets

¹ Singapore's total greenhouse gas emissions in 2016 = 50,702.71 Gg CO₂ eq. (NEA, 2020-d)

² Total emissions from manufacturing industries and construction = 18,641.02 Gg CO₂ eq.; total emissions from industrial processes and product use = 2,291.98 CO₂ eq. (NEA, 2020-d)

“persons³ who profit from the supply of products”, so as to impute cost and responsibility of the waste to them (RSA, 2019).

On packaging waste, the RSA (2019) requires producers, who use the packaging to carry on a business for the supply of goods in Singapore, and has an annual turnover of more than \$10 million, to report on the packaging imported or used, as well as to submit a plan to reduce, re-use or recycle packaging to NEA (i.e., a 3R plan). According to the Act, for each submission not complied with, the producers will face fines “not exceeding S\$5,000” on the first conviction, “not exceeding S\$10,000 or to imprisonment for a term not exceeding 3 months”, or both, on the second or subsequent conviction, and “to a further fine not exceeding S\$1,000 for every day” if “the offence continues after the second or subsequent conviction” (RSA, 2019).

On food waste, the RSA (2019) requires building managers to provide, within the premises of the prescribed building, facilities to dispose food waste separately, and that occupiers of the building to dispose food waste within these facilities, and not at any other place or with any other types of waste. The Act also requires the food waste to be treated in the building or engage a licensed waste collector to collect the food waste have it treated at a licensed waste disposal facility, unless the building is new in which the food waste must be treated in the building (RSA, 2019). Contraventions of these requirements would render the building manager and/or the occupiers liable to “a fine not exceeding S\$10,000 or to imprisonment for a term not exceeding 3 months or to both”, and “a further fine not exceeding S\$1,000 for every day” if “the offence continues after conviction” (RSA, 2019).

Thus, it is observed that the Singapore government is getting more serious in pushing for food waste and packaging waste to be managed in a sustainable manner by business owners. As the Act is relatively new and businesses need time to design and implement the required systems or infrastructure, the government has provided phased timeframes for the Act to be in force. Unlike sustainability reporting, however, where companies would need to be accountable to several stakeholders, under the

³ A person refers to an individual, a company or other body corporate, or an unincorporated body (RSA, 2019).

RSA (2019), NEA is the sole agency to be monitoring businesses' compliance of the Act.

1.3 Sustainability Reporting

Companies which are listed on the Singapore Exchange are required to present annual sustainability reports on a “comply or explain” basis from 2016 (Singapore Exchange Limited (SGX), n.d.). The aim of this requirement is to increase transparency on listed companies' Environmental, Social and Governance (ESG) practices, so as to shed light on the risks and opportunities the company is facing (SGX, n.d.), which are important information for investors and other stakeholders.

The disclosure of waste as a sustainability topic in sustainability reports have been listed within global reporting frameworks – more extensively, in the Global Reporting Initiative (GRI), and the Sustainability Accounting Standards (SAS). The waste disclosure guidelines in the GRI currently covers all types of waste generated, whilst food and/or packaging waste have been mentioned as material topics to be disclosed in the SAS for food and beverage (F&B) companies. Whether or not sustainability reports can be used as an effective tool to drive more action and change on the packaging and food waste generated from the goods supplied by listed companies, specifically F&B companies in Singapore, would be explored in this report, and if so, is there more that can be done on reporting regulations to facilitate this.

According to SGX (n.d.), the issuer of the sustainability report would need to select a suitable reporting framework to guide their reporting and disclosure, preferably a globally-recognised framework which has wider acceptance. As companies may be selecting different frameworks for their reporting, the content of their reporting may differ from company to company. Additionally, consistent with the need to cater the reporting framework to companies from different industries with different business strategies, each framework provides overarching guidelines for companies on the selection of topics or content to disclose, but the companies do need to make considerable judgement on the topics and related content being disclosed.

For example, the global reporting initiative (GRI) requires organisations to identify the economic, environmental, and/or social topics that are material. This is done through the processes established within the GRI to determine the topics that “reflect the reporting organisation’s significant economic, environmental, and social impacts; or substantively influence the assessments and decisions of stakeholders” (GRI, 2016). Stakeholder identification is also assessed by the reporting organisation.

For the Sustainability Accounting Standards, the standard has gone one step further by identifying sustainability topics which are important and relevant to be included within the standards that have been set for each industry (Sustainability Accounting Standards Board (SASB), 2017). The Sustainability Accounting Standards specify which standards are required, recommended or optional, leaving less leeway for judgement. However, the standard recognises that each company is still responsible in determining what information is material and would need to exercise judgement to disclose material information that may not be required by the standard (SASB, 2017).

As there is much discretion in the disclosures that are determined to be material for stakeholders, the quality of reporting by companies within sustainability reports, in accordance to selected reporting frameworks, and whether F&B companies do prioritise the reporting of food and packaging waste needs to be researched to understand the perceptions that companies have on the disclosures for this topic. If companies are not disclosing sufficient useful information, the sustainability reports would not be an effective means to enable companies and stakeholders to act upon the information reported.

2 Does Sustainability Reporting Increase Accountability?

On whether sustainability reporting can increase accountability of companies on their ESG practices, this remains to be a question that does not hold a definitive answer.

Amran and Ooi (2014) argues that when stakeholders are well-informed and equipped with readily available information, they can drive or pressure businesses to respond properly and responsibly. The media also plays an important role in facilitating this process (Amran and Ooi, 2014). In favour of this argument is the observation that there

is increased expectation from stakeholders on companies to take on more responsibility towards the environment. For example, an HSBC survey in 2021 showed that 80% of Singapore investors believe that sustainable, environmental, and ethical issues are important to managing their investments, despite having a gap in their actions (Choy, 2021). Singaporeans also expect businesses that produce and/or sell packaged goods to undertake responsibility to reduce the amount of unnecessary packaging which is sold (Ho, Causier and Karlsson, 2020).

In getting listed companies to provide quality waste disclosures in their sustainability reports, companies become more transparent with stakeholders about their corporate practices. On information transparency, Fox (2007) discussed that transparency can be distinguished between opaque and clear transparency. Opaque transparency refers to the spreading of information that lacks insight on institutions' decision-making process and outcome of their actions, while clear transparency refers to the provision of access to reliable information on institutional performance (Fox, 2007). According to Fox (2007), where clear transparency is provided, it is argued that it is a form of "soft accountability", as both concepts emphasize on the "fundamental right to call those in authority to justify their decisions".

In a report by Minderoo Foundation and SYSTEMIQ (M.F. and SYSTEMIQ, 2020), the lack of transparency across the plastics supply chain is evident, particularly in material flows and financial flows linked to plastics, perpetuating the plastic pollution problem. The importance of transparency is emphasized, as it helps companies and investors to make informed decisions on procurement and investments, as well as to mitigate liability risks. Governments and regulators would have the information to draft more effective policies. Consumers and civil society groups can also hold companies accountable for plastics being produced and sold (M.F. and SYSTEMIQ, 2020).

Transparency, however, has its drawbacks. One of the drawbacks on value chain transparency for environmental performance raised by Mol (2015) is the information overloads, misinformation, and disinformation. When the sustainability report discloses excessive information or information that are suspected to be false, users of the report are disempowered in that they lose sight of information that could actually

be red flags. Another drawback is that excessive disclosure requirements could be costly, leading to the withholding of information by companies instead (Mol, 2015).

A key question that Mol (2015) also raised is whether transparency actually improves environmental performance. He found that the relationship between procedural provisions for information disclosure and substantive environmental or sustainability improvements and impacts is weak, and that there were contradicting conclusions when investigating the relation between transparency and environmental performance in international value chains (Mol, 2015).

Livesey and Kearins (2002) argued that the inconsistency and non-comparability of data across companies make it difficult for reporting information to be understood and used. However, the information reported, even when it is crude, could provide a force for change when corporate environmental performance is made more publicly accessible and comparable, as seen with the U.S. Toxic Release Inventory data collection programme (Livesey and Kearins, 2002). In the case study, crude but standardised information was preferred over entirely accurate data (Karkkainen, 2001, as cited by Livesey and Kearins, 2002).

According to the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2014), the non-comparability of data in food loss and waste (FLW) also makes it difficult understand and identify the causes and extent of FLW, possible solutions, priorities to take action, and the tracking of progress to reduce FLW. Hence, improvement in the reliability, comparability and transparency of data is being called for to help push through these barriers (HLPE, 2014).

From the above findings, it is observed that whilst being transparent and providing quality disclosures for environmental performance may or may not lead to impacts or improvements in performance, there is value in pushing for transparency of information, as it encourages companies to justify their actions, and stakeholders are empowered with more knowledge over companies to drive change. Caution should be exercised in getting companies to provide excessive information, which could become counterintuitive to the information provider and user.

3 Research Aim and Objectives

This study explores whether sustainability reports can be used as an effective tool to drive more action and change on the packaging and food waste generated by companies in Singapore, to contribute to solving the environmental challenges that the country is facing. In Singapore, as only listed companies are required to issue sustainability reports, and that packaging and food waste are expected to be prominent environmental topics in food and beverage companies, the research will be performed on listed F&B companies.

The research objectives are as follows:

- 1) Assess the prevalence and quality of the food and packaging waste management information that is currently being reported in the sustainability reports of the food and beverage sector in Singapore;
- 2) Determine whether there are gaps in the reported information when compared with the current governing standards, i.e., the sustainability reporting frameworks the companies have selected to guide their reporting;
- 3) Provide recommendations to close the gaps and other shortcomings identified, with consideration of the findings from Section 2: Does Sustainability Reporting Increase Accountability.

The study also seeks to explain the importance of certain disclosures, including waste-related information, that could be useful in driving companies to better manage their waste.

4 Current Governing Standards on Waste Disclosures

When researching the listed F&B companies in Singapore, 59 out of 63 companies or 92% used the Global Reporting Initiative (GRI) as their sustainability reporting framework. A few of these companies also referred to other reporting frameworks such as the Sustainability Accounting Standards, Task Force on Climate-Related Financial Disclosures (TCFD) and the Integrated Reporting Framework to guide their reporting disclosures. 1 company which was listed both on SGX and the Stock Exchange of Hong Kong solely referred to the Environmental, Social, Governance Reporting Guide in Appendix 27 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited, while 3 companies did not specify any framework.

Given the high adoption rate on the GRI by the companies and that it has detailed guidance on waste-related disclosures, this would be one of the main standards that would be elaborated upon and have companies' disclosures compared against. Guidance in the other reporting frameworks have also been studied and considered.

4.1 Global Reporting Initiative (GRI)

GRI 306 Waste is a topic-specific standard contained within the GRI, which sets out reporting requirements and guidance on waste disclosures. GRI 306: Waste 2020 was developed after a 75-day public consultation was made and analysed by a multi-stakeholder working group (GSSB, 2020). Whilst GRI 306: Waste 2020 is only effective for reports or other materials published on or after 1 January 2022, earlier adoption is encouraged (GRI, 2020). As GRI 306: Waste 2020 has incorporated the latest public feedback and would be more relevant for current disclosure needs, it is used as a reference point in our assessment of companies' waste reporting.

As mentioned in Section 1.3: Sustainability Reporting above, companies would only follow the topic-specific disclosure requirements if they have assessed the topic to be material, through the assessment of their economic, environmental and social impacts, as well as the topic's influence on stakeholders' decision-making.

Reporting requirements that have been set out within GRI 306 are as follows:

Table 1: Reporting requirements in GRI 306: Waste 2020

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|-------------------------|--|
| <p>GRI 306-1</p> | <p>“For the organisation’s significant actual and potential waste-related impacts, a description of:</p> <p>(i) the inputs, activities, and outputs that lead or could lead to these impacts;</p> <p>(ii) whether these impacts relate to waste generated in the organisation’s own activities or to waste generated upstream or downstream in its value chain” (GRI, 2020).</p> |
| <p>GRI 306-2</p> | <p>“(a) Actions, including circularity measures, taken to prevent waste generation in the organisation’s own activities and upstream and downstream in its value chain, and to manage significant impacts from waste generated;</p> <p>(b) If the waste generated by the organisation in its own activities is managed by a third party, a description of the processes used to determine whether the third party manages the waste in line with contractual or legislative obligations;</p> <p>(c) The processes used to collect and monitor waste-related data” (GRI, 2020).</p> |
| <p>GRI 306-3</p> | <p>“(a) Total weight of waste generated in metric tons, and a breakdown of this total by composition of the waste;</p> <p>(b) Contextual information necessary to understand the data and how the data has been compiled” (GRI, 2020).</p> |
| <p>GRI 306-4</p> | <p>“(a) Total weight of waste diverted from disposal in metric tons, and a breakdown of this total by composition of the waste;</p> |

| | |
|-------------------------|--|
| | <p>(b) Total weight of hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations:</p> <p>(i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;</p> <p>(c) Total weight of non-hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations:</p> <p>(i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;</p> <p>(d) For each recovery operation listed in Disclosures 306-4-b and 306-4-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste diverted from disposal: (i) onsite; (ii) offsite;</p> <p>(e) Contextual information necessary to understand the data and how the data has been compiled” (GRI, 2020).</p> |
| <p>GRI 306-5</p> | <p>“(a) Total weight of waste directed to disposal in metric tons, and a breakdown of this total by composition of the waste;</p> <p>(b) Total weight of hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations:</p> <p>(i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;</p> <p>(c) Total weight of non-hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations:</p> |

| | |
|--|--|
| | <p>(i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;</p> <p>(d) For each disposal operation listed in Disclosures 306-5-b and 306-5-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste directed to disposal: (i) onsite; (ii) offsite;</p> <p>(e) Contextual information necessary to understand the data and how the data has been compiled” (GRI, 2020).</p> |
|--|--|

Each reporting requirement above has their rationale. The following is a compilation of the rationale for disclosures:

Table 2: Rationale for GRI 306: Waste 2020 disclosure requirements

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| GRI 306-1 | <p>In determining significant waste impacts at each stage of the organisation’s value chain, the organisation would obtain an understanding of waste generation and its causes (GRI, 2020). This would help the organisation to identify opportunities to prevent and reduce waste, or introduce circularity measures (GRI, 2020).</p> |
| GRI 306-2 | <p>In GRI 306-2, specific references were made to waste prevention and circularity actions in light of respondents’ feedback to shift the focus away from managing waste after its creation and encourage companies to consider circularity resources management (GSSB, 2020).</p> <p>The standard also requires organisations to consider waste-related impacts that could be caused by their own activities, resulting in more waste upstream or downstream in its value chain, as well as their relationships with third parties (GRI, 2020).</p> |

| | |
|------------------|---|
| GRI 306-3 | The total weight of waste provides the context for GRI 306-4 and GRI 306-5 to understand the proportion of waste recovered or disposed, while the identification of waste composition helps organisations to identify suitable waste management activities for each waste type (GRI, 2020). |
| GRI 306-4 | Organisations are required to provide quantification on how the waste is being managed. A hierarchy has deliberately been set up to differentiate more preferable practices (waste prevention and diversion) from less preferable practices (waste disposal) (GSSB, 2020). |
| GRI 306-5 | |

In addition to the above disclosures, GRI 103 provides overarching reporting requirements that applies to each material topic. Key disclosures include explanations of how the organisation manages the topic, policies, and specific actions (GRI, 2018-a). Disclosure of goals and targets, evaluation mechanisms on management’s effectiveness, as well as the results are also required (GRI, 2018-a). These disclosures were recognised as valuable when consulted with respondents to help users understand the progress organisations were making (GSSB, 2020) and the direction the latter are heading.

If the company were to have disclosed based on the older waste standard, GRI 306: Effluents and Waste 2016, it would also need to follow GRI 103, which had not changed from 2016. However, for GRI 306, companies would only have to disclose GRI 306-3(a) (without the breakdown of the total by composition), 306-4(b) to (c) and GRI 306-5(b) to (c) in Table 1, as well as how the waste disposal method has been determined (GRI, 2018-b). On hazardous waste, the weight of hazardous waste transported, imported, exported and treated, percentage of hazardous waste shipped internationally, and the standards, methodologies, and assumptions used would also need to be reported (GRI, 2018-b).

4.2 Sustainability Accounting Standards

The Sustainability Accounting Standards (SAS) are focused on guiding issuers to report financially material sustainability topics, with the aim of helping investors to make decisions concerning the company's business value (SASB, 2017). Disclosure guidance are provided by each industry. Refer to the table below for a list of the F&B industries, and food waste and/or packaging-related disclosure requirements that had been included for each industry:

Table 3: List of F&B industries and disclosure requirements in the SAS

| F&B Industry | Reference | Disclosure requirements |
|--|---|---|
| Agricultural products / Meat, poultry & dairy | - | Food waste and packaging-related disclosures not mentioned as material topics. |
| Alcoholic beverages / Non-alcoholic beverages / Processed Foods | FB-AB-410a.1. / FB-NB-410a.1. / FB-PF-410a.1. | "(1) Total weight of packaging, (2) percentage made from recycled and/or renewable materials, (3) percentage that is recyclable, reusable, and/or compostable", and may breakdown these 3 disclosures by major packaging substrate (SASB, 2018). |
| | FB-AB-410a.2. / FB-NB-410a.2. / FB-PF0410a.2. | "Discussion of strategies to reduce the environmental impact of packaging throughout its lifecycle", which may include circumstances surrounding the entity's use of recycled and renewable packaging, use of packaging that is recyclable and compostable, implementation of environmental standards, packaging-related targets, performance against the |

| | | |
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| | | targets, and use of Life Cycle Assessment analysis (SASB, 2018). |
| Food retailers & distributors | FB-FR-150a.1. | “Amount of food waste generated, percentage diverted from the waste stream”, and “the quantification methods used to calculate the amount of food waste” (SASB, 2018). |
| | FB-FR-430a.4. | “Discussion of strategies to reduce the environmental impact of packaging”, which may include design innovations, implementation of other packaging standards or performance on global protocol, strategies in relation to primary, secondary, tertiary of the entity’s private-label products and packaging of products from its vendors, as well as its use of Life Cycle Assessment analysis (SASB, 2018). |
| Restaurants | FB-RN-150a.1. | “(1) Total amount of waste, (2) percentage food waste, and (3) percentage diverted” (SASB, 2018). |
| | FB-RN-150a.2. | “(1) Total weight of packaging, (2) percentage made from recycled and/or renewable materials, (3) percentage that is recyclable, reusable, and/or compostable”, and may breakdown these 3 disclosures by major packaging substrate (SASB, 2018). |

As the aim of the disclosure guidance was to provide information that are financially material and decision-useful for making investment decisions based on the company’s financial performance and potential for value creation (SASB, 2017 and SASB, 2020), the rationale for disclosures were driven very much by this aim.

4.3 Task Force on Climate-related Financial Disclosures

The Task Force on Climate-related Financial Disclosures (TCFD, 2017) focuses on climate-related financial disclosures that would be useful to investors, lenders, and insurance underwriters to assess and price climate-related risks and opportunities. The disclosure guidance has an emphasis on financial impacts arising from climate-related risks and opportunities, such as those arising from the transition to a lower-carbon economy (TCFD, 2017).

Within the Recommendations of the TCFD (2017), there are no detailed disclosure requirements for waste. It was only briefly mentioned that organisations may consider opportunities arising from waste management that could lead to cost savings or to include metrics on climate-related risks associated with waste management.

4.4 Integrated Reporting Framework

The <IR> Framework (International Integrated Reporting Council (IIRC), 2021) aims to help financial capital providers understand how organisations create, preserve or erode value over time, and takes a principles-based approach. As such, it does not prescribe specific disclosures of individual matters, and there are no specific disclosure requirements on waste.

4.5 Environmental, Social and Governance Reporting Guide in Appendix 27 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited

The Environmental, Social and Governance (ESG) Reporting Guide in Appendix 27 of the Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited (HKEX) sets out the disclosure requirements for the environmental, social and governance aspects of companies who are listed with the HKEX. Primarily, the guide aims to get companies to communicate to investors their commitment and approach to ESG reporting and the process to identify relevant ESG areas (HKEX, 2018).

The guidance prescribed very few provisions that were specific to waste, including information on policies and compliance with relevant laws and regulations that had

significant impact on issues relating to the generation of waste, greenhouse gas emissions and discharges into water and land. Total hazardous and non-hazardous waste produced (in tonnes), and the waste intensity (where appropriate) were key performance indicators that were also required to be disclosed (HKEX, 2017-20).

5 Research Method

5.1 Scope

Sustainability reports of F&B companies that will be evaluated are companies that are listed on SGX (including secondary listings) during the study period, excluding newly listed and suspended companies. Research conducted will be limited to the latest sustainability reports of the companies.

The F&B companies identified operate in a wide range of industries, including food and/or beverage manufacturing and distribution, F&B establishment operators, food trading, F&B retail including grocery chains, meal catering, agricultural products producer, and aquacultural products producer. Some companies conduct business operations in 2 or more F&B industries. It is also observed that the companies that operate in the hospitality industries also have F&B operations that take up low, moderate and high stakes of revenues and were thus scoped in for research. For the companies operating in hospitality industries, they were scoped in if they have F&B operations that hold a revenue share of 10% or more in 2020 or 2019. 3 of these companies had their F&B revenues subsumed as part of hotel revenue, hence whilst the F&B operations revenue share was not determinable, they were also scoped in.

The companies were selected through the following method:

From the SGX Stock Screener, all the companies were extracted. SGX Stock Screener provided a sector categorization which was based on Thomson Reuters sector classification (SGX, n.d.). The sectors were screened based on sector name and sectors that were not F&B-related were removed from the filtered list. For sector names that could have companies with F&B operations, including Applied Resources, Consumer Goods Conglomerates, Cyclical Consumer Products, Cyclical Consumer

Services, Food & Beverages, Food & Drug Retailing, Holding Companies, Industrial & Commercial Services, Industrial Goods, and Retailers, each company's principal business was read from the information background, which the company submitted on SGX, to determine if the company conducts F&B operations. Out of the 690 companies on SGX Stock Screener, 63 companies with F&B operations were scoped in for this study.

5.2 Assessment Method

With reference to the disclosure guidance and requirements provided by current sustainability reporting frameworks as described in Section 4, an assessment rubric has been set out. The components of the assessment rubric were determined based on an evaluation of the rationale for disclosure, that the disclosure would reflect the economic, environmental and social impact that could be material, given the industries the companies operate in. The perspectives provided by sustainability reporting frameworks that placed emphasis on financial impacts and long-term value creation were also considered, as the information provided would also be of concern to stakeholders that make their investment decisions based on the organisations' performance in these aspects.

For each rubric, each company is assessed whether it has provided disclosures by indicating 'Yes' and 'No'. The results are compiled and analysed.

6 Assessment Rubric

The assessment rubric has been set out as follows:

Table 4: Assessment rubric

| S/n | Rubric | Source |
|-----|---|------------------|
| 1) | “For the organisation’s significant actual and potential waste-related impacts, a description of: (i) the inputs, activities, and outputs that lead or could lead to these impacts;” | GRI 306-1 |
| 2) | “(ii) whether these impacts relate to waste generated in the organisation’s own activities or to waste generated upstream or downstream in its value chain.” | GRI 306-1 |
| 3) | “(a) Actions, including circularity measures, taken to prevent waste generation in the organisation’s own activities and upstream and downstream in its value chain, and to manage significant impacts from waste generated” / “discussion of strategies to reduce the environmental impact of packaging or food waste throughout its lifecycle;” | GRI 306-2 / SASB |
| 4) | “(b) If the waste generated by the organisation in its own activities is managed by a third party, a description of the processes used to determine whether the third party manages the waste in line with contractual or legislative obligations;” | GRI 306-2 |
| 5) | “(c) The processes used to collect and monitor waste-related data” . | GRI 306-2 |

| | | |
|-----|---|---|
| 6) | Waste-related goals and targets, performance against those targets and monitoring measures to track progress. | GRI 103 / SASB / Food Loss and Waste Accounting and Reporting Standard (FLWARS) |
| 7) | Evaluation of the efficacy of waste reduction strategies | FLWARS |
| 8) | Scope of waste | FLWARS |
| 9) | “Total weight of packaging purchased by the entity, in metric tons.” | SASB |
| 10) | The “percentage of packaging, by weight, made from recycled and/or renewable materials.” | SASB |
| 11) | The “percentage of packaging, by weight, that is recyclable, reusable, and/or compostable.” | SASB |
| 12) | “(a) Total weight of waste generated in metric tons, and a breakdown of this total by composition of the waste;” | GRI 306-3 |
| 13) | “(b) Contextual information necessary to understand the data and how the data has been compiled.” | GRI 306-3 |
| 14) | “(a) Total weight of waste diverted from disposal in metric tons, and a breakdown of this total by composition of the waste;” | GRI 306-4 |
| 15) | “(b) Total weight of hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations: | GRI 306-4 |

| | | |
|-----|--|-----------|
| | (i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;” | |
| 16) | “(c) Total weight of non-hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations: (i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;” | GRI 306-4 |
| 17) | “(d) For each recovery operation listed in Disclosures 306-4-b and 306-4-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste diverted from disposal: (i) onsite; (ii) offsite;” | GRI 306-4 |
| 18) | “(e) Contextual information necessary to understand the data and how the data has been compiled.” | GRI 306-4 |
| 19) | “(a) Total weight of waste directed to disposal in metric tons, and a breakdown of this total by composition of the waste;” | GRI 306-5 |
| 20) | “(b) Total weight of hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations: (i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;” | GRI 306-5 |
| 21) | “(c) Total weight of non-hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations: | GRI 306-5 |

| | | |
|-----|---|-----------|
| | (i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;” | |
| 22) | “(d) For each disposal operation listed in Disclosures 306-5-b and 306-5-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste directed to disposal: (i) onsite; (ii) offsite;” | GRI 306-5 |
| 23) | “(e) Contextual information necessary to understand the data and how the data has been compiled.” | GRI 306-5 |
| 24) | Impact of Covid-19 on the amount of waste generated. | - |

Whilst many of the assessment rubrics were derived from sustainability reporting frameworks that had varying reporting objectives, it is intended that the analysis in this report would be focused on the reporting of information that would drive more action and change on the packaging and food waste generated by listed companies in Singapore.

For the disclosure requirements that were extracted from the GRI, it is made clear through the explanations in the Background sections (compiled in Section 4.1) that the requirements were designed to steer organisations towards finding opportunities to prevent and reduce waste-related impact, and hence were viewed to be important to be included within the assessment rubric.

For disclosure requirements relating to quantitative measurements, such as weight by different waste types and waste management activities, being transparent with the operational strategy adopted to manage waste could pressurise companies to relook at their waste management approach, so that the reporting of such information do not work against their favour. A year-on-year trend on waste volume could possibly provide indications of whether there had been improvements or deterioration on the amount of waste produced.

However, according to the Global Protocol on Packaging Sustainability 2.0 (The Consumer Goods Forum, 2011), for packaging waste, such attributes (e.g., packaging weight reduction, recycled content, and recovery rates of used packaging), are not directly related to environmental impacts, wherein the reduced attribute values may or may not lead to reduced environmental impacts. The Protocol (2011) cited the example of having combined materials to save packaging weight but reducing the recyclability of the packaging due to more difficulties in separating the combined materials.

Other disclosures would help to mitigate the adoption of contradictory measures, such as item 3 of the assessment rubric, where the organisation is required to assess and manage its environmental impacts across its value chain or the lifecycle of their product and/or packaging. Item 7 of the assessment rubric would allow organisations to make comparisons of their waste reduction strategies and choose the strategies that produce more desirable outcomes.

Under the FLWARS, it was raised that defining the scope of waste inventory is important, so that the inventory data produced is comparable. The scope of waste defined should be aligned to the organisation's goals (WBCSD, 2016). For example, a company seeking to reduce the amount of food waste being sent to the landfill would scope waste differently from a company that wants to improve food production yields. On comparability, defining the scope of waste would prompt organisations to have their waste data reported consistently across comparable periods, and where the organisation has multiple waste inventory from different entities or locations, the summary of data produced could be interpreted meaningfully.

One of the key merits in the GRI disclosures is the emphasis on circularity, which was introduced in the 2020 standards. The intention was to shift report issuers' perception of waste as a valuable source of material (GSSB, 2019) to prevent waste. This move was welcomed by stakeholders and the latter have further recommended the adjustment of the waste hierarchy, which contributed to the split between more preferable and least preferable waste management practices. As these disclosures

were designed to encourage preferred practices with a view to reduce environmental impacts, they were suitable to be included as assessment rubrics.

Another merit of the GRI was the holistic view that was encouraged to be undertaken in identifying opportunities for the prevention and reduction of waste-related impacts, where the interrelationships between activities that result in waste generation need to be examined, and should include the related activities performed by third parties in enabling the organisation to produce its goods and services.

To ensure consistent performance of these desired practices, monitoring measures need to be implemented. The implementation of targets and the reporting of performance against these targets help to direct the organisation's attention to exploring ways to improve and close gaps. Many public comments on the exposure draft for GRI 306 Waste that were received raised this as a necessary requirement, which GSSB has acknowledged and reminded of the presence and applicability of GRI 103. Therefore, this has also been included in the assessment rubric.

Finally, 2020 was a unique year, where the Covid-19 pandemic had resulted in an unprecedented impact on every industry, including the F&B industry. Social distancing measures, dining-in restrictions and remote working arrangements had severely impacted F&B operations. At the start of the pandemic, there was also fear amongst the public that the country's food security may be at stake and there was a phenomenon of panic-buying. Therefore, it would be interesting to understand how the circumstances had impacted the waste reporting scene amongst the food and beverage companies in Singapore.

7 Results and Discussion

64 companies were being identified to be operating in the food and beverage (F&B) industry, and were manually categorised into the following 8 industry groups:

- 1) Agricultural product producer
- 2) Hospitality

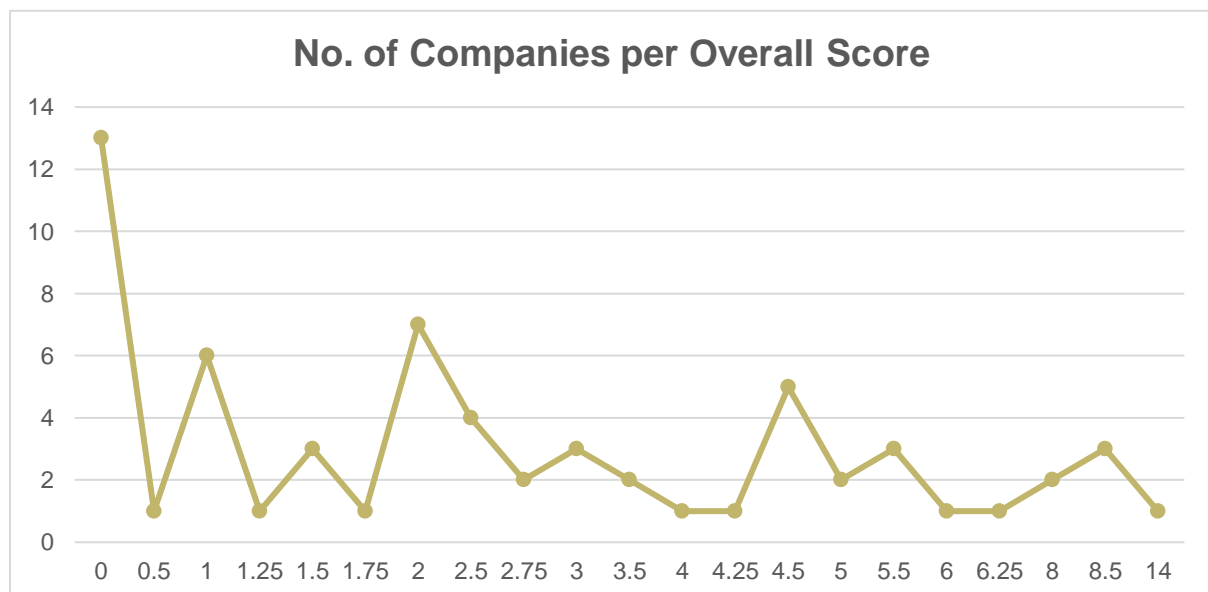
- 3) F&B establishment operator
- 4) F&B catering
- 5) F&B producer & distributor
- 6) F&B retail
- 7) F&B distributor
- 8) Aquacultural product producer

63 out of the 64 companies have had their sustainability reports published for financial year ends in 2020 and 2021, ranging from 30 June 2020 to 30 June 2021, 63% of which reported for the financial year ended 31 December 2020.

Overall Scoring

For each assessment rubric, assuming a score of 1 for 'Yes', 0.5 for partial disclosures and a score of 0 for 'No', overall scores for the 63 companies are tabulated as follows:

Figure 1: No. of companies by overall score



The highest score attained was at 14 out of 24. However, generally, it is observed that food and/or packaging waste-related disclosure score is generally low, with approximately half of the companies scoring 2.5 and below. When examined by framework, the average score is tabulated as follows:

Table 5: No. of companies and average score by sustainability framework

| Sustainability Framework | No. of Companies | Average Score |
|--|-------------------------|----------------------|
| GRI | 54 | 2.8 |
| GRI & sector specific scorecards | 1 | 0.0 |
| GRI, SASB, TCFD | 1 | 14 |
| GRI, SASB | 1 | 4.3 |
| GRI, IR approach | 1 | 4.5 |
| No specific framework mentioned | 3 | 1.3 |
| Hong Kong Main Board Listing Rule 13.91 ESG Reporting Guide, GRI | 1 | 4.5 |
| ESG Reporting Guide in Appendix 27 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited | 1 | 1.3 |
| Grand Total | 63 | 2.9 |

It could be observed that companies who actively seek to comply with multiple frameworks scored higher than companies who only complied with a single framework or no framework. In Singapore, where GRI is the most commonly adopted sustainability framework, the average score is at 2.8, whilst this could be attributed to

the lean disclosure requirements as set out by the older GRI standard (GRI 306: Effluents and Waste 2016), we may be surprised by additional disclosures that companies have also included within their sustainability reports beyond the disclosure requirements of their selected sustainability framework.

Materiality

Materiality plays a significant role in helping the report issuer to determine the topics to be reported where the report issuer has assessed the topics to be important to their stakeholders. This concept was brought up in the GRI, and also raised in the SGX Mainboard Rules Practice Note 7.6. The GRI provides a more detailed guidance on materiality. The 2 key criteria that was looked at in determining that a topic is material is its influence on stakeholders' assessments and decisions and reflective of the organisation's economic, environmental & social impacts (GRI, 2018-c).

An evaluation was performed on whether the companies' materiality assessments had an effect on the disclosure scores. Table 6 below specifies the findings:

Table 6: Average score of disclosures based on materiality assessment

| Materiality (for Stakeholders' Concern and/or Business Impact) | Average Score |
|---|----------------------|
| High / Material | 4.6 |
| Moderate / Relevant | 4.5 |
| Low | 2.8 |
| Not mentioned | 1.1 |
| Grand Total | 2.9 |

Therefore, it could be seen that companies that had assessed food and/or packaging waste to be material, of high or moderate importance, or relevant scored better than companies that assessed this topic to be low in materiality.

26 out of 63 companies, or 41%, rated waste management as being material or important to stakeholders and/or have material impact to their businesses. 8% of the 63 companies assessed waste management to be of moderate importance or relevant to stakeholders or impact to the business, whilst 6% of the 63 companies assessed waste management to be of low importance.

28 out of 63 companies, or 44%, did not mention food and/or packaging waste management as part of their materiality assessments. Amongst these companies, 13 out of 28 companies, or 46%, did not have any disclosures relating to food and/or packaging waste.

Considering the national waste statistics observed and the focus that the government is placing upon food and packaging waste through the legislation of the Resource Sustainability Act, the observation that a relatively high number of companies did not assess food and/or packaging waste to be material is surprising and may be reflective that there is a significant proportion of the companies that are side-lining waste issues.

Rubric 1) & 2) “For the organisation’s significant actual and potential waste-related impacts, a description of: (i) the inputs, activities, and outputs that lead or could lead to these impacts; (ii) whether these impacts relate to waste generated in the organisation’s own activities or to waste generated upstream or downstream in its value chain” (GRI 306-1)

41 out of 63 companies or 65% did discuss inputs, activities, or outputs that could lead to significant actual and potential waste-related impacts. It is observed that companies did not always disclose all 3 aspects (i.e. inputs, activities and outputs), which could possibly be due to the absence of significant waste-related impacts in 1 or 2 of these aspects, the assumption that an inference could be made on other aspects when 1 of these aspects is mentioned, the performance of a partial assessment by the company, or that it is not a requirement under the sustainability framework adopted. Given that

there could be justifiable reasons for not disclosing all aspects, as long as the company has discussed either aspect, it was indicated that the company had met the disclosure requirement.

The high percentage of companies making these disclosures is consistent to the percentage of companies disclosing actions taken to prevent waste generation or manage their waste impact (Rubric 3) where companies described the activities that cause significant waste-related impacts, and hence set out actions targeted to prevent or reduce the impact.

In contrast, for Rubric 2, only 3 out of the 63 companies, or 5%, explained whether the impacts relate to waste generated in the organisation's own activities or to waste generated upstream or downstream in its value chain. This disclosure requirement would be helpful for organisations to understand how materials flow through the entire value chain (GSSB, 2020), whether full responsibility could be imputed on the company to manage the waste impact, and if not, whether there are opportunities to be tapped upon to reduce or prevent waste, including circularity opportunities (GSSB, 2020). The low disclosure rate could be indicative of a lack of appreciation and understanding of why stakeholders need the information, or that it is not a disclosure requirement under the current sustainability framework selected by the companies.

Rubric 3) “(a) Actions, including circularity measures, taken to prevent waste generation in the organisation’s own activities and upstream and downstream in its value chain, and to manage significant impacts from waste generated” / “discussion of strategies to reduce the environmental impact of packaging or food waste throughout its lifecycle” (GRI 306-2 / SASB)

It is observed that a high number of companies, being 46 out of 63 companies or 73%, had made disclosures on steps taken that would help to prevent waste generation or reduce their waste impact. This number includes 12 companies that did not mention waste management as a material topic, and 4 companies that assessed waste management to be of low concern to stakeholders and have low business impact. It is also notable that several companies had elaborated extensively on the actions taken to manage significant impacts from waste generated or discussion of strategies to

reduce environmental impact from waste. This is a very high score, judging by the fact that the older GRI standard, which is adopted by most companies, did not specify this as a disclosure requirement. This shows that a large proportion of companies are acknowledging the importance of reflecting their commitment towards the environment, and their waste impact. It is also possible that companies want to portray a good image to boost their branding as responsible companies that care for the planet and society.

Rubric 4) “(b) If the waste generated by the organisation in its own activities is managed by a third party, a description of the processes used to determine whether the third party manages the waste in line with contractual or legislative obligations” (GRI 306-2)

11 out of 63 companies or 17% had mentioned that a third party was engaged to collect and handle some of the waste generated. Most of the descriptions just mentioned that the third party has been licensed, and there has been a lack of description of processes to determine whether the third party manages waste in line with contractual or legislative obligations. According to the GRI (2020), this disclosure is intended to provide insight into the level of control assumed by the company on waste that is outsourced to a third party. A lack of description of these processes could leave stakeholders wondering whether the third party did manage the waste adequately.

Rubric 5) “(c) The processes used to collect and monitor waste-related data” (GRI 306-2)

Only 1 out of the 63 companies explained the processes used to collect and monitor waste-related data. This disclosure, together with Rubric 8, being the scope of waste, as well as Rubrics 13, 18 and 23 on the disclosures of contextual information to understand the quantitative data and how the data has been compiled, are important in helping stakeholders to understand whether the waste data compiled is comparable with the data of other companies. It is also an area where companies could perhaps be wary to provide more information, as understanding the practicalities of measuring

waste data, there is bound to be limitations in the processes and methods used to collect and monitor waste-related data, and the scope that could be covered.

Even so, as mentioned earlier under Section 2: Does Sustainability Reporting Increase Accountability, crude but standardised information is preferred over entirely accurate data. Therefore, for the waste data disclosures to be useful to stakeholders, it is imperative that these areas of disclosures be enhanced, so that comparable waste data can be presented and would help companies and their stakeholders better understand how each of them fare against their industry peers, as well as across comparative periods.

Rubric 6) Waste-related goals and targets, performance against those targets and monitoring measures to track progress (GRI 103 / SASB / FLWARS)

21 out of 63 companies or 33% disclosed waste-related goals and targets. However, there has been a lack of disclosures in performance against those targets and monitoring measures to track progress. Setting goals and targets help to align stakeholders' understanding on the company's intentions and direction with respect to waste management. The goals / targets also provide a positive message of the company's commitments, but there needs to be progress and actions shown to substantiate the company's commitments. Otherwise, the goals / targets presented would not be of value to companies and their stakeholders.

Rubric 7) Evaluation of the efficacy of waste reduction strategies (FLWARS)

Only 1 out of 63 companies evaluated the efficacy of waste reduction strategies. Notwithstanding that this disclosure is designed to get companies to explore different options and be more selective in them to help the environment, it is acknowledged that this process requires time, resource and cost commitments, which could be a plausible reason for the low disclosure score. However, the evaluation may be combined with the exploration to reduce the use of materials and packaging upfront which could help companies with cost savings in procuring materials and handling the waste later in the product's manufacturing lifecycle.

Rubric 8) Scope of waste (FLWARS)

Only 3 out of 63 companies disclosed their scope of waste. Referring to the FLWARS (WBCSD, 2016), the scope of waste includes the reporting of boundary in terms of the food category, lifecycle stage, geography, and organisation. With a lack of scope reported, there is ambiguity in what is included or excluded in the waste being reported and contributes to the challenge of being able to compare waste management performance amongst different companies' reports.

Rubrics 9) to 23) Quantitative measures

Table 7: Percentage of companies that meet the disclosure requirements under Rubrics 9 to 23

| S/n | Rubric | Percentage of companies that met this requirement fully / partially (Population = 63) |
|-----|--|---|
| 9) | "Total weight of packaging purchased by the entity, in metric tons." (SASB) | 2% |
| 10) | The "percentage of packaging, by weight, made from recycled and/or renewable materials." (SASB) | 3% |
| 11) | The "percentage of packaging, by weight, that is recyclable, reusable, and/or compostable." (SASB) | 5% |
| 12) | "(a) Total weight of waste generated in metric tons, and a breakdown of this total by composition of the waste;" (GRI 306-3) | 29% |

| | | |
|-----|---|-----|
| 13) | “(b) Contextual information necessary to understand the data and how the data has been compiled.” (GRI 306-3) | 3% |
| 14) | “(a) Total weight of waste diverted from disposal in metric tons, and a breakdown of this total by composition of the waste;” (GRI 306-4) | 19% |
| 15) | “(b) Total weight of hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations: (i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;” (GRI 306-4) | 16% |
| 16) | “(c) Total weight of non-hazardous waste diverted from disposal in metric tons, and a breakdown of this total by the following recovery operations: (i) Preparation for reuse; (ii) Recycling; (iii) Other recovery operations;” (GRI 306-4) | 25% |
| 17) | “(d) For each recovery operation listed in Disclosures 306-4-b and 306-4-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste diverted from disposal: (i) onsite; (ii) offsite;” (GRI 306-4) | 3% |
| 18) | “(e) Contextual information necessary to understand the data and how the data has been compiled.” (GRI 306-4) | 0% |

| | | |
|-----|--|-----|
| 19) | “(a) Total weight of waste directed to disposal in metric tons, and a breakdown of this total by composition of the waste;” (GRI 306-5) | 10% |
| 20) | “(b) Total weight of hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations: (i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;” (GRI 306-5) | 16% |
| 21) | “(c) Total weight of non-hazardous waste directed to disposal in metric tons, and a breakdown of this total by the following disposal operations: (i) Incineration (with energy recovery); (ii) Incineration (without energy recovery); (iii) Landfilling; (iv) Other disposal operations;” (GRI 306-5) | 21% |
| 22) | “(d) For each disposal operation listed in Disclosures 306-5-b and 306-5-c, a breakdown of the total weight in metric tons of hazardous waste and of non-hazardous waste directed to disposal: (i) onsite; (ii) offsite;” (GRI 306-5) | 2% |
| 23) | “(e) Contextual information necessary to understand the data and how the data has been compiled.” (GRI 306-5) | 0% |

On the quantitative measures, the percentage of companies making these disclosures is low, even for Rubrics 12, 15, 16, 20 and 21, which are requirements under the older GRI standard. Disclosures for non-hazardous waste are observed to be more than that of hazardous waste, which could be due to the nature of food and packaging waste, where there is a higher likelihood of having non-hazardous waste as compared to hazardous waste. If there is no hazardous waste, the company may choose not to bring it up.

Weight of packaging purchased by the entity, the composition of packaging made of recycled and/or renewable materials, as well as composition of packaging that is recyclable, reusable and/or compostable have a low percentage most likely because companies that use the GRI framework do not have this disclosure requirement. However, these disclosure requirements form a reference point in understanding the volume of packaging procured and will become waste, and whether there are opportunities to improve the packaging to reduce environmental impact. Under the GRI framework, Rubric 9 is perhaps subsumed under Rubric 1, but singling Rubric 9 out places emphasis on packaging waste which is intended for industries that produce much of such waste.

The weight of waste that is diverted from disposal or directed to disposal onsite or offsite is barely mentioned. However, as the RSA (s. 27) would be requiring food waste to be segregating onsite for new buildings from 2024, this disclosure requirement will have increased relevance in time to come.

On the lack of contextual information, its importance has been explained earlier under Rubric 5 above. For the quantitative measurements, it is challenging to interpret them if there is a lack of understanding of the measurement methods used and how the data is being compiled. Just as there are different accounting methods for financial statement items such as inventory and depreciation expense that help financial statement users to better understand the basis for accounting for the financial statement items, accounting methods for quantitative measurements on waste would give stakeholders a sense of the accuracy of the data, including the estimations that have been made.

Rubric 24) Impact of Covid-19 on the amount of waste generated

10 out of 63 companies, or 16%, had disclosed the impact of Covid-19 on the amount of food and/or packaging waste generated. Only 3 companies had reported on food waste, with 2 companies reporting a decline in food waste from the reduction of business activities. 8 companies had reported on packaging waste, which had mixed experiences with waste output as summarized below:

Table 8: Summary of disclosures made by companies on the impact of Covid-19 on food and/or packaging waste generated

| Industry Group | No. of Companies | Findings Summary |
|----------------------------|------------------|---|
| F&B establishment operator | 3 | Increase in usage of plastic containers due to the increased demand from takeaway services. |
| F&B producer & distributor | 2 | Both companies reported an increase of packaging usage due to the need to create smaller packaging to meet customers' changed needs, as well as to cater to more online orders. |
| F&B retail | 1 | Increase in plastic bag usage due to a higher business volume. |
| Hospitality | 2 | Decrease in single-use plastics and slow depletion of existing stocks of small amenity bottles due to decreased business activity from temporary closure. |

There were also 6 other companies that had commented on the impact of Covid-19 on overall waste, but not specifically on the food and/or packaging waste type.

Nevertheless, this disclosure of the impact of Covid-19 is found to be scant in companies' sustainability reports. This is surprising, as packaging has played an important role in maintaining food hygiene, as well as that food deliveries would have increased significantly during the pandemic period.

8 Recommendations

The results have shown that there is still much room for improvement on the waste disclosures performed by the food and beverage listed companies in their sustainability reports. The recommendations provided below are focused on how to improve the information that is being made transparent which would encourage companies to justify their actions and empower stakeholders with the knowledge to drive change.

On materiality, it is recommended that the framework is designed such that companies are given less flexibility to determine whether food and packaging waste is material. The approach taken by SASB, where disclosure guidance was set based on information that is deemed material for each F&B industry is preferred. Where food and packaging is deemed material for a specific F&B industry, the companies in the industry would be required to provide disclosures on how their food and packaging waste is being managed, which would serve as an impetus to start measuring and tracking waste. They would have less discretion to side-line waste issues. Having standardisation in the materiality of waste information would also enable comparability of waste data for companies within the same industry, as well as across comparative time periods.

Waste disclosures across the value chain, including waste generated upstream or downstream, should be made, as it encourages companies to view the waste impacts of the entire product lifecycle and enable companies to determine opportunities to reduce, reuse or prevent waste. This includes working with their suppliers and customers to come up with solutions to mitigate waste impact.

Related to the waste disclosure across the value chain would be disclosures on the weight of packaging purchased by entities. Whilst this is information received at procurement stage, it is a good inference for the packaging that will flow eventually as waste, and hence help companies and stakeholders assess waste impact from packaging.

For the discussion of actions taken to prevent waste generation and to manage waste impacts, whilst it puts companies in a positive light, it is suggested to come hand in hand with the outcome achieved or performance against waste-related goals and targets, so that the stakeholders could appreciate the impact that these actions create. It would also be helpful to explain how the actions are aligned with the companies' waste management strategies, which in turn supports the companies' long-term goals, so that there is clarity and justification on the actions taken.

Companies should also be wary that not all actions taken are beneficial. For example, using biodegradable plastic bags in Singapore where much of the waste is incinerated would not be helpful for the environment. This is where the evaluation of the efficacy of waste reduction (or waste management) strategies would help companies with evaluating whether their actions taken would reduce their environmental impact.

Where a third party is engaged to manage the company's waste, it would be useful to explain the steps taken to make sure that the third party has managed the waste adequately, such as identifying the license that was relied upon in deciding on the third party's service engagement. This would add credibility to the companies' actions, providing assurance to stakeholders that the waste is properly managed, particularly for waste that causes serious environmental impacts.

On the processes used to collect and monitor waste-related data, and the contextual information to understand the quantitative data and how the data is compiled, it is proposed that specific methods of data collection and measurement be introduced as part of the disclosure framework used by companies, and that companies would need to specify the method of measurement used. This provides an opportunity for the compilation of data that can be meaningfully compared with other companies. It should

also help stakeholders to form an understanding of the level of estimation used for the data disclosed.

The recommendation above echoes the recommendation provided by the United Nations Environment Programme (UNEP, 2015) in the “Raising the Bar – Advancing Environmental Disclosure in Sustainability Reporting” report which calls for the need to standardise reporting, including methodologies on reporting, to improve the quality of reporting.

Another pertinent issue on data measurement would be the consideration to disclose the scope of waste. This is highly recommended, as it would help stakeholders understand the waste impact across geographical boundaries, whether the reporting covers the full lifecycle of the products, and whether the waste data is reported in a complete manner for all the companies’ products. Under-reporting of waste creates a biased view over the data, putting companies which are transparent and comprehensive with their waste reporting on an uneven playing field and hence, should be avoided.

The data measurements could also be placed alongside quantitative waste-related goals / targets to show progress. For qualitative waste-related goals / targets, these should not only show ambition, but there needs to be meaningful indicators that help stakeholders to assess whether the company is achieving its goals / targets.

On the setting of waste targets, given that Singapore plans to achieve their Zero Waste vision by adopting a circular economy approach (Ministry of Sustainability and the Environment, 2021), so that the use of Earth’s limited resources, anthropogenic impact on climate change, and the pressure to find more land for landfill could be eased, there needs to be measurable targets developed to encourage companies to implement measures to use resources in a circular manner (UNEP, 2015). The Ellen MacArthur Foundation (n.d.) has developed Circulytics, which measure a company’s entire circularity. The indicators in Circulytics can be referred upon as a starting point for the development of targets to drive monitoring and action. Where common indicators are established with standardized guidance on how the indicators should be measured, industry average could be determined and used as a reference point to

track performance of the industry with respect to their progress in achieving targets on circularity. This can be included in sustainability reports.

Lastly, in relation to disclosures on the impact of Covid-19 on the amount of waste generated, one could obtain insights from analysing the influence of business activity on the waste impact by comparing the fluctuations of the waste impact in relation to the change in business activity to understand how the companies' decisions on their product design and packaging have had an impact of waste generated.

8.1 Framework

The assessment rubric that has been set out in Section 6 (Table 4) can be used as a framework to be followed, as a starting point, by the food and beverage listed companies in Singapore, with the exception of Rubric 24. For Rubric 24, it is suggested that companies disclose business trends that have a significant impact on waste.

For Rubric 6, the recommendation to have the goals and targets explained alongside the companies' long-term strategies to address waste issues could be included as a recommended disclosure.

For Rubrics 18 and 23, specific measurement methods should be provided for report preparers to refer to and a disclosure of the measurement method used should be made.

Whilst there appears to be many items to be disclosed, it has been explained in Sections 7 and 8 on why the disclosures are important for the company to have them included within the sustainability report. Information presented needs to be concise and to the point, so that it does not appear convoluted and excessive.

8.2 Framework Implementation

It is recommended that the framework be pushed for adoption by the food and beverage listed companies, so that useful information for stakeholders could be produced within sustainability reports. This would be the joint responsibilities of the Singapore government, Singapore Exchange, as well as the food and beverage listed

companies. Investors also need to play a part in providing support for the framework. Stakeholders could then use the reports as a basis to apply pressure on companies for more impactful action on waste management. Stricter and more granular guidelines that require less judgement on the items to disclose and requiring a separate party to provide assurance on the compliance of these guidelines would also be necessary to improve the quality of the disclosures. Strengthening legal channels to enforce compliance could also be explored, as it places emphasis on the seriousness of waste matters.

Whilst disclosure costs and the costs incurred by companies to engage assurance services may deter companies from complying, there could be considerations made to align the information submitted under the RSA and disclosure requirements for sustainability reports to mitigate some of these costs. The benefits of the disclosures to stakeholders could also be emphasized in the framework to help companies understand why the disclosures will be useful for themselves and/or for the stakeholders.

Engaging companies and their stakeholders on an ongoing basis to provide feedback on the framework would be helpful in finetuning the information that would be useful for stakeholders.

The table below summarises the gaps and shortcomings identified and related recommendations.

Table 9: Summary of findings

| S/n | Gaps | Recommendations |
|-----|---|--|
| 1 | Food and/or packaging waste-related disclosure score is low (Average of 2.9 out of 24). | Steps should be taken to improve the disclosure score. The Singapore government, Singapore Exchange, as well as the food and beverage companies should be jointly responsible to push for the adoption |

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| | | <p>of a new disclosure framework that encourages food and packaging waste-related disclosures to be made. Along with the adoption, other key measures include strengthening legal channels to enforce compliance, having a separate party to provide assurance on the compliance of the framework, and reducing disclosure costs by aligning the information submitted under the RSA and for sustainability reports.</p> |
| 2 | <p>Discretion that management can exercise on the materiality assessment of food and/or packaging waste influences disclosure scores. Also, there is a relatively high number of companies did not assess food and/or packaging waste to be material.</p> | <p>Companies should be given less flexibility to determine whether food and packaging waste is material. Material waste topics should be defined for each industry within the reporting framework to be adopted.</p> |
| 3 | <p>Only 5% of the companies disclose impacts relating to waste generated across the value chain.</p> | <p>Such disclosures should be made so that companies may identify opportunities to reduce, reuse or prevent waste. A related disclosure requirement would be the weight of packaging purchased by entities, whilst measured at the procurement stage, would be good inference for the packaging that will flow eventually as waste.</p> |

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| 4 | There is a lack of description of the processes to determine whether the third party manages waste in line with contractual or legislative obligations. | Companies should consider explaining the steps taken to make sure that the third party has managed the waste adequately, so that there is more credibility in the companies' actions. |
| 5 | There is also a lack of disclosures in the processes used to collect and monitor waste-related data and the contextual information of how the data has been compiled. | Specific methods of data collection and measurement should be introduced as part of the disclosure framework and used by companies, so that data produced can be meaningfully compared with other companies and the level of estimation involved in the data could be better understood. |
| 6 | There is a lack of disclosures in the scope of waste data. | Such disclosures are highly recommended as they would help stakeholders to understand the waste impact and its boundaries better. |
| 7 | There has been a lack of disclosures in performance against targets and monitoring measures to track progress. | These disclosures should be made, along with the actions taken to prevent waste generation and manage waste impacts, so that stakeholders could appreciate the impact that these actions create. |
| 8 | Most companies do not demonstrate an evaluation of the efficacy of waste reduction strategies. | Having this included as a disclosure requirement would encourage companies to perform an evaluation to help them identify waste |

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| | | management strategies that are more beneficial to be embarked upon. |
| 9 | A low percentage of companies provide quantitative measures on food and packaging waste volume. | Such disclosures should be made as they enhance the comparability of waste information across companies. When placed along with quantitative waste-related goals or targets, they could help to show progress. |
| 10 | Waste targets that encourage the use of resources in a circular manner could be enhanced. | Indicators in Circulytics can be referred upon as a starting point for the development of such targets. Common indicators with standardised measurement guidance can be established for companies to monitor to drive action. |
| 11 | Disclosures on the impact of Covid-19 are found to be scant in companies' sustainability reports. | Such disclosures could help one obtain insights from analysing the influence of business activity on the waste impact. Whilst Covid-19 is an event unique to Years 2020 and 2021, business trends that have a significant impact on waste are recommended to be reflected, where stakeholders can make meaningful analysis. |

9 Conclusion

It has been found that there is value in pushing for the transparency of information, so that companies are encouraged to justify their actions, and stakeholders are empowered with the knowledge to push companies to drive change, in this case, for better waste management practices. The prevalence and quality of food and packaging waste management disclosures in the sustainability reports of listed companies in the food and beverage sector in Singapore has been studied and there are many improvements to be made. The discretion that companies can exercise on determining the materiality of waste disclosures, and the lack of standardized disclosure requirements and measurement methods have produced disclosures that are difficult to compare across companies and time periods. More can also be done to enhance the credibility in the eyes of stakeholders and usefulness of the disclosures for the companies and stakeholders. Recommendations that provide further ideas on how this could be done have been proposed. A framework which picks out useful disclosure requirements from different reporting frameworks and can be used as the standardized framework for the food and beverage companies have also been proposed, which intends to provide stakeholders with a more holistic view of the waste impact of companies.

It is also important that the framework be pushed for adoption. Helping companies to see the benefits of the disclosures, creating efficiencies with reported information under the RSA, and considering legal channels to penalize non-compliance, are approaches that could be taken to help companies see past the disclosure costs.

It is notable that at the time when this report is being prepared, it has just been announced at COP26 that a new International Sustainability Standards Board is formed to develop a global baseline of sustainability disclosure standards, of which developments and new findings in the harmonisation of various sustainability reporting standards would need to be continually observed.

For future work, it is suggested that similar studies can be performed across other industries to enhance the usefulness of waste disclosures for stakeholders.

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