

# Managing Packaging Waste in the ASEAN Region

November 2018

## FROM LINEAR TO CIRCULAR PACKAGING VALUE CHAINS

**Packaging is an indispensable part of retail, logistics and the consumer goods industry.** It contains, protects, preserves and transports products from producers to consumers. Common packaging materials include plastic, paper and board, metals, glass and wood. During the last decades, the packaging industry has evolved significantly in terms of innovation, material use and complexity of design. This trend continues in the rapidly growing economies of the Association of Southeast Asian Nations (ASEAN) where the amount of packaging has been increasing together with the rising demand for products and services.

**At the same time, there is growing global concern with regard to the post-consumer management of packaging.** Packaging waste constitutes a significant fraction of municipal solid waste (MSW) in the ASEAN region. Plastic seems to have become an essential part of everyday lives. Increased consumption has contributed to waste management challenges in cities and rural areas, and both human settlements and ecosystems are increasingly overwhelmed with plastic pollution. Unmanaged plastic waste pollutes the air and land through

open burning and open dumping. It blocks drainage systems, increasing the risk of flooding and providing breeding grounds for mosquitos carrying malaria and other infectious diseases. Where regular waste collection is not available, citizens often dispose of their waste along canals, leading to plastic waste leakage into rivers and the ocean. Joint efforts by policy makers and all stakeholders along the packaging value chain are therefore required.

### 1) Packaging production and consumption in the ASEAN region

**The consumption of single-use packaging has dramatically increased in ASEAN member states due to economic growth, rapid urbanisation and changing consumption and production patterns.** In 2017, the combined population of the ASEAN region was 642 million people, with an annual population growth of 1.3%.<sup>1</sup> The combined gross domestic product (GDP) of the ASEAN member states totalled approximately 2.77 trillion US\$, accounting for about 6.2% of global GDP. Growth is set to continue in ASEAN, fuelled by significant increases in private consumption and infrastructure initiatives.<sup>2</sup>

Published by:

Accompanying these trends, the region has developed a growing “takeaway food culture”, ‘e-commerce activities’ and ‘sachet economy’. Consumption preferences are shifting from traditional fresh food to packaged food, while at the same time, shopping on digital platforms (e-commerce) increases. Furthermore, small portions of products such as shampoo or instant coffee

are sold in sachets for convenience and to serve the large population groups with lower purchasing power. The packaging market has increased between 2014 and 2018 by an estimated 7.06% in Indonesia, 5.57% in Thailand, 4.2% in Singapore, 3.61% in Malaysia and 3.31% in the Philippines.<sup>3</sup> Packaging production in ASEAN is not only for domestic consumption but also for export markets.

## PACKAGING WASTE RELATED TO GROWING E-COMMERCE IN ASEAN

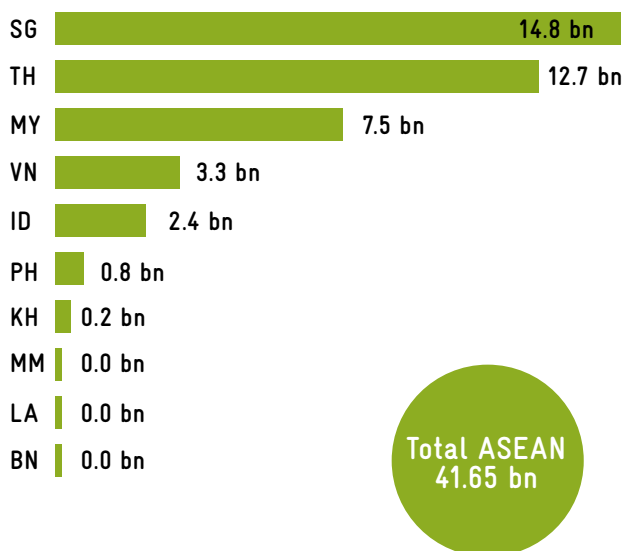
Singapore (60%), Malaysia (52%) and Thailand (51%) are among the world’s top online markets with the highest penetration rates for online shopping. ASEAN’s e-commerce sector is forecasted to grow by 32% to almost 90 billion US\$ by 2025.<sup>4</sup> A typical e-commerce parcel may use up to seven types of packaging materials: paper waybills, envelopes, cardboard, plastic bags, woven bags, tape and buffer materials like bubble wrap, and Styrofoam. Among these materials, cardboard represents the largest fraction of packaging waste stemming from e-commerce activities.

## Plastic production and consumption

**The ASEAN region accounts for about 20% of global plastic production.** Plastics and plastic-derived products represent a significant trade sector of ASEAN, with 41.65 billion US\$ in exports and 49.28 billion US\$ in imports.<sup>5</sup> Plastic resins for production are predominantly

imported from China, Japan, the Republic of Korea and Saudi Arabia.<sup>6</sup> China is the regional leader in plastics production, accounting for another 20% of global plastics production. Plastics production worldwide has seen astonishing increases since its invention: in 2015 around 407 million tonnes were produced, compared to just 2 million tonnes in 1950.<sup>7</sup>

### Flow Export 2017



### Flow Import 2017

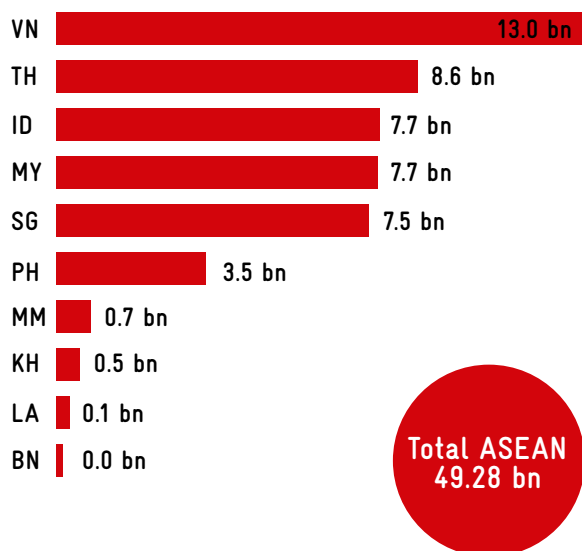


Figure 1: ASEAN export and import trade flows of 39 plastics and plastic articles in billion US\$ (ASEAN Stats 2018)<sup>8</sup>

**Growth in plastic production and consumption is strongest in ASEAN-6 (Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam).**

- » *Viet Nam*: The plastic industry grew on average by 16-18% from 2010 to 2015. Packaging accounts for about 37.4% of plastic production in the country.<sup>9</sup> Plastics consumption in Viet Nam has increased sharply from 33 kg per capita in 2010 to 41 kg per capita in 2015.<sup>10</sup>
- » *Indonesia*: The annual plastic consumption has risen to 17 kg per capita,<sup>11</sup> with food packaging accounting for 70% of it. Indonesia imports more than 40% of its plastics from Malaysia, Thailand, Singapore, Europe and the US.
- » *Malaysia*: Malaysia's plastic consumption is about 35 kg per capita and year,<sup>12</sup> of which around 45% serve for packaging. The country counts over 1,500 production companies, exporting to other ASEAN countries as well as to China and Europe.<sup>13</sup>
- » *Thailand*: Its plastic production industry has grown rapidly with over 5,000 companies operating in the country. Its annual plastic consumption is 40 kg per capita, one of the highest in the ASEAN region.<sup>14</sup> Packaging accounts for 48% of Thailand's plastic consumption.<sup>15</sup>

- » *The Philippines*: Its plastic industries are expected to grow with a compound annual growth rate (CAGR)<sup>16</sup> of 6.11% during 2018-2023.<sup>17</sup> The packaging sector uses around 48% of the total plastic production. The annual plastic consumption is about 8 kg per capita.<sup>18</sup> The country exported packaging worth 163.2 million PhP (3 million US\$) in 2011.<sup>19</sup>

**Flexible plastic packaging (sachets, pouches, bags and films) is one of the largest packaging markets in the ASEAN region.** It is forecasted to grow with a CAGR of 5.7% for the period of 2016-2024, from 4.32 billion US\$ in 2015 to 6.71 billion US\$ by the end of 2024. Indonesia and Thailand have the biggest markets, while the market is also growing in the Philippines, Viet Nam and Myanmar.<sup>21</sup>

**Rigid plastic packaging such as PET bottles is also increasing.** PET packaging is used by beverage industries to pack carbonated soft drinks, water, ready-to-drink tea and juice as well as packaged food, household cleaning products and pharmaceuticals. Asia Pacific has the largest market demand for global PET packaging (31%), followed by North America (23%) and Western Europe (19%).<sup>22</sup> The global PET packaging market was worth 48.1 billion US\$ in 2014, amounting to almost 16 million tonnes. Worldwide demand for PET packaging is expected to increase by an annual average of 4.6% over the next five years, amounting to 19.9 million tonnes worth 60 billion US\$ by 2019.<sup>23</sup>

## MARKET TRENDS FOR PACKAGING OTHER THAN PLASTICS IN THE ASEAN REGION

**Cardboard packaging.** There is a growing manufacturing base for cardboard packaging in ASEAN, mainly for healthcare items, tobacco products, household care, and electrical goods. The booming online retail market (e-commerce) further increases the demand, through e.g. online grocery shopping and added secondary packaging for handling and shipping. The demand for corrugated cardboard in 2021 is expected to increase by 22.1% in Indonesia, 19.6% in Thailand, 12.7% in Malaysia, 10.1% in the Philippines, and 1.6% in Singapore compared to 2016.<sup>24</sup>

**Metal packaging.** Metal packaging is growing mainly due to an increase in consumer preference for processed and packaged food and beverage products as well as personal hygiene and cleaning products. Beverages still represent the largest share with 65% of the global metal packaging market.<sup>25</sup> In Thailand, there are 45 metal packaging companies. A total of 579,511 tonnes of metal packaging was used in 2013 for seafood (45%), fruit and vegetable cans (25%) and other packaging (30%).<sup>26</sup>

**Glass Packaging.** Glass packaging is forecast to have the lowest growth rate by 2020 compared to other packaging, amounting to 63.87 billion US\$ in the global market.<sup>27</sup> It is often associated with luxury goods such as alcoholic beverages, wine, champagne and perfumes. The healthcare industry is one of the leading users in the global glass packaging market.<sup>28</sup>

**Wooden Packaging.** Wood is usually used as industrial packaging and for secondary or tertiary packaging such as pallets and light wooden packaging. Such packaging materials are often for bulk transport and less likely to reach end-consumers. Increased consumption of wooden packaging is therefore associated with corresponding growth in manufacturing activities.

## Stakeholders in packaging value chains

**Packaging value chains involve a wide array of stakeholders.** In the ASEAN region, packaging value chains still follow a linear model of “take, make and dispose” rather than a circular economy of “reduce, reuse, and recycle”. Packaging value chains consist of the following steps:

- » *Resource extraction:* material manufacturers use various materials for different packaging e.g. oil for plastics, wood for paper and cardboard, and aluminium for beverage cans. Resource extraction and transport causes greenhouse gas emissions and environmental impacts on ecosystems.
- » *Design and production of packaging:* packaging designers and manufacturers can choose input materials, use recycled materials and increase the recyclability of packaging. The material composition, form, size and weight of packaging influences the degree of resource efficiency.
- » *Retail & consumption:* Consumer goods companies are key players. They procure packaging and sell their packaged products to retailers. Supermarkets, market stands and other merchants sell products to consumers, who dispose of the packaging waste.
- » *Waste collection, sorting and recycling:* In the absence of extended producer responsibility (EPR) mechanisms in the ASEAN region, post-consumer packaging waste management is usually the responsibility of local governments and waste operators (public/private/ NGO, formal/informal).

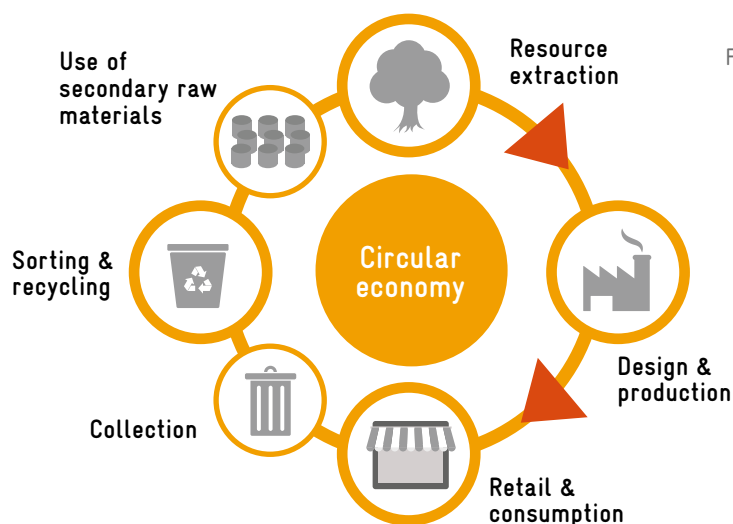


Figure 2: Transforming packaging value chains from a linear to a circular economy

## 2) Packaging waste generation and management in the ASEAN region

**Most packaging waste is part of municipal solid waste, reliable data on waste flows is often lacking.**<sup>29</sup>

Unlike European countries, which are mandated by the EU Packaging Directive to segregate and maintain statistics on packaging waste generation and treatment,<sup>30</sup> ASEAN countries do not monitor total volumes and types of packaging waste generation and flows. In addition, there are no separate statistics on the packaging fraction in MSW.

**The average municipal solid waste generation in ASEAN is 1.15 kilogrammes per capita and day.** It consists of about 52% organic waste, 14% plastics, 9% paper, 4% metals and 3% glass (Figure 3), however this varies between countries and rural or urban settlements. Packaging waste is becoming a prominent component of MSW in ASEAN member states.

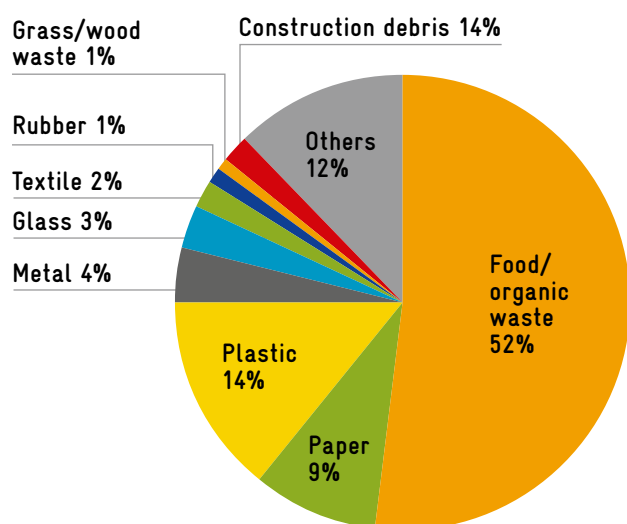


Figure 3: MSW composition in ASEAN (in %); Data extracted from UNCRD Regional 3R Forum; UNEP, AIT, ISWA, 2017<sup>31</sup>

TABLE 1: MSW Situation in ASEAN Member States \*Diversion includes recycling, composting, energy recovery, etc. (not landfilling and other disposal) \*\* In Singapore, share of total waste generated

| COUNTRY            | GDP (% of overall ASEAN GDP), 2016 <sup>32</sup> | Population (% of ASEAN pop. of 639 million), 2016 <sup>33</sup> | Annual MSW generation                | Per Capita MSW generation (kg/capita/day) | MSW collection coverage (%) | Share of plastic, paper, metal and glass in MSW (%) | Waste Management status (in %)   |
|--------------------|--------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|-------------------------------------------|-----------------------------|-----------------------------------------------------|----------------------------------|
| Brunei Darus-salam | 11.40 billion US\$ (0.45%)                       | 0.42 million (0.07%)                                            | 0.21 million t (2014) <sup>34</sup>  | 1.4                                       | 50-70%                      | 41%                                                 | Diversion*: 30%<br>Disposal: 70% |
| Cambodia           | 20.02 billion US\$ (0.78%)                       | 15.76 million (2.47%)                                           | 1.08 million t (2014) <sup>35</sup>  | 0.20 <sup>36</sup>                        | 80%                         | 21%                                                 |                                  |
| Indonesia          | 932.26 billion US\$ (36.49%)                     | 261.12 million (40.89%)                                         | 65.03 million t (2016) <sup>37</sup> | 0.76                                      | 45-50%                      | 29%                                                 | Diversion: 14%<br>Disposal: 86%  |
| Lao PDR            | 15.90 billion US\$ (0.62%)                       | 6.76 million (1.06%)                                            | 0.07 million t (2014) <sup>38</sup>  | 0.69                                      | 40-70%                      | 20%                                                 | Diversion: 9 %<br>Disposal: 91%  |
| Malaysia           | 296.97 billion US\$ (11.60%)                     | 31.19 million (4.88%)                                           | 13.70 million t (2017) <sup>39</sup> | 1.17                                      | 70%                         | 36%                                                 | Diversion (recycling): 21%       |
| Myanmar            | 67.43 billion US\$ (2.64%)                       | 52.89 million (8.28%)                                           | 2.04 million t (2012) <sup>40</sup>  | 0.44                                      | 50%                         | 13%                                                 | Diversion: 8%<br>Disposal: 92%   |
| Philippines        | 304.90 billion US\$ (11.94%)                     | 103.32 million (16.18%)                                         | 14.60 million t (2016) <sup>41</sup> | 0.51                                      | 40-85%                      | 26%                                                 | Diversion: 47%<br>Disposal: 53%  |
| Singapore          | 296.97 billion US\$ (11.62%)                     | 5.61 million (0.88%)                                            | 1.61 million t                       | 0.81                                      | 100%                        | 46%**                                               | Diversion: 97%<br>Disposal: 3%   |
| Thailand           | 406.84 billion US\$ (15.93%)                     | 68.86 million (10.78%)                                          | 27.37 million t (2017) <sup>42</sup> | 1.13 (2017)                               | 58%                         | 31%                                                 | Diversion: 31%<br>Disposal: 69%  |
| Viet Nam           | 202.62 billion US\$ (7.93%)                      | 92.70 million (14.52%)                                          | 19 (in 2015) <sup>43</sup>           | 1.2                                       | 40-85%                      | 24%                                                 | Diversion: 44%<br>Disposal: 56%  |

**Plastic packaging accounts for the largest fraction of packaging waste.** Single-use packaging such as carrier bags, bottles and food packaging as well as other single-use plastic items such as straws, cups, plates and cutlery have grown exponentially over the last decades. Despite various regulatory, economic and voluntary measures to reduce plastic bags, consumers continue to use them frequently. Plastic sachets, a multi-layered packaging made of a thin film of plastic and aluminium, have also become widespread. Because of their lightweight and multi-layer nature, sachets often skip recycling and make their way into landfills, drainage systems or waterways.

**Parts of post-consumer packaging waste in MSW are recycled.** Some high value materials like PET bottles, glass bottles and metals (tin and aluminium) tend to be collected and recycled through formal and/or informal channels to a certain extent. Recycling either takes place domestically or recyclables are exported to other countries. Before China's prohibition on the import of recyclable items including plastic waste, ASEAN member states also exported recyclable waste to China. Low value items such as single-use plastic cups, straws, grocery bags and sachets tend to remain uncollected and often are landfilled, burned or disposed along waterways.

**According to estimates, four ASEAN countries (Indonesia, the Philippines, Thailand, Viet Nam) and China contribute to about half of the world's marine plastic litter generation.** In these five countries, around 2.5 to 6.7 million tonnes of plastic waste entered from coastal areas into the ocean in 2010, compared to a global leakage of 4.8 to 12.7 million tonnes in the same year.<sup>44</sup> Once in the ocean, only parts of plastic waste float at the surface or are washed onto beaches. Significant amounts of plastics sink towards the seafloor and disintegrate over time into ever-smaller plastic particles.<sup>45</sup> Such micro-plastics (< 5 millimetres) spread throughout the food chain and are also found in several seafood and fish species used for consumption.<sup>46</sup> Understanding its eco-toxicological and human health effects still requires further research. Sea animals such as turtles, seagulls and whales ingest also larger plastics, affecting their digestion. Around 817 species are affected by marine litter worldwide, including effects by entanglement in abandoned, lost or otherwise discarded fishing gear.<sup>47</sup> Marine resources provide significant livelihood support for 70% of the ASEAN population who dwell in coastal zones.

**Single-use packaging and products represent a significant fraction of beach litter.** As documented by coastal clean-up events, the Top 10 items collected in the ASEAN region include: food wrappers, cigarette butts, plastic beverage bottles, plastic bottle caps, plastic grocery bags, other plastic bags, straws and stirrers, plastic flakes, plastic lids, and foam take away containers.<sup>48</sup> Besides its environmental effects, such beach litter can also be detrimental for tourism industries. Approaches counting the number of litter items found within a given area of beaches, coastlines, rivers or the ocean surface or within a specific set of animals are however limited in scope. A complementary approach for assessing marine plastic litter generation within a city or a Province consists in estimating plastic waste flows based on key data such as the population number, plastic waste generation per capita, collection coverage and efficiency rates and several other factors (see case study of Sidoarjo Regency, Indonesia).

#### CASE STUDY: ESTIMATED PLASTIC WASTE FLOWS IN SIDOARJO REGENCY, INDONESIA

Located in Eastern Java at the sea south of Surabaya, Sidoarjo Regency counts about 2.4 million inhabitants. It participates in the "Emission Reduction in Cities – Solid Waste Management" project between the Indonesian Government and KfW Development Bank. In 2017, GIZ has tested a methodological approach to estimate plastic waste flows and marine litter generation in Sidoarjo Regency for a global "Marine Litter Prevention" study.<sup>50</sup> Based on the population number, MSW generation of 0.65 kg per capita, a plastics share of 9% as well as a special factor for taking into account plastics in hygienic waste, the study estimated total plastic waste production at 56,073 tonnes in 2017. Based on several other factors, the study calculated that around 31,390 tonnes of plastic waste remained uncollected. Parts of the uncollected waste as well as additional leakage from formal and informal waste management led to about 9,066 tonnes of plastic waste entering waterways. Using additional factors to estimate retention of plastics in waterways, the study calculates a total marine plastic litter generation of 7,616 tonnes in 2017. It corresponds to 3.17 kg of marine plastic litter per capita, equivalent to 106 plastic bottles (with a weight of 30g per bottle). Through two different 5 years' scenarios, the amount could drop to 7,342 tonnes (2.82 kg per capita) or 5,816 tonnes (2.23 kg per capita) by 2022, including forecasted population growth.



Waste accumulation in canal, Sidoarjo, Indonesia

### 3) Policy landscape for managing MSW and packaging waste

**In ASEAN Member States, there are few specific policies or legal frameworks addressing packaging waste management.** Legal and policy frameworks on municipal solid waste mention certain types of packaging waste, especially plastic waste (Table 2). Some

ASEAN Member States implement or plan to implement regulatory and economic measures such as plastic bag bans and plastic taxes to curb plastic use. Private companies also implement voluntary campaigns to encourage consumers to reduce their plastic consumption and opt for alternatives to plastic bags. However, in such cases the ecological footprints of alternative packaging need to also be considered.

**Recent international declarations envisage a world-wide reduction of plastic waste leakage into oceans.**

The United Nations' Sustainable Development Goal 12 on sustainable consumption and production and Goal 14 on marine conservation call for enhancing waste management and reducing marine litter. Several governments and other stakeholders made voluntary commitments during the UN Ocean Conference in June 2017 in New York, USA. In July 2017, the Group of 20 (G20) adopted in Germany a G20 Action Plan on Marine Litter. The UN Environment Assembly adopted in December 2017 a third resolution on 'Marine litter and microplastics'.<sup>51</sup> All ASEAN countries, except for Cambodia, have also legally signed the UN Convention on the Law of the Sea, according to which states have the obligation to take measures for marine conservation, including reducing

land-based pollution. Regional dialogue on marine litter prevention has been taking place in the framework of ASEAN, the East Asia Summit, Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and the Asia-Pacific Economic Cooperation (APEC).

**Some ASEAN Member States have come forward to tackle marine plastic leakage with strategies and action plans.** Indonesia launched the 'National Action Plan on Marine Debris (2017-2025)', which calls for efforts to reduce 70% of its plastic debris from a 2017 baseline by the end of 2025. In Viet Nam, the Prime Minister's Decision No. 06/2018/QĐ-TTg of 2018 seeks to reduce marine pollution. Thailand has drafted a Plastic Debris Management Plan (2017-2021), which targets to increase plastic waste recycling to at least 60%.

TABLE 2: Frameworks for MSW and plastic waste management

| Country                  | Policy framework for municipal solid waste (MSW) management                                                                                                                                                                                                                                                                                                                                                         | Policy framework for packaging/ plastic/marine litter <sup>52</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brunei Darussalam</b> | <ul style="list-style-type: none"> <li>No specific policy or legal framework</li> <li>Supports the 3R concept</li> </ul>                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Restricts the use of plastic bags from Friday to Sunday and intends to ban plastic bags in supermarkets by 2019.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Cambodia</b>          | <ul style="list-style-type: none"> <li>Law on Environmental protection and Natural Resources Management 1196</li> <li>Sub-Decree on Urban Solid Waste Management No. 113 (2015)</li> <li>Sub-Decree on SWM (1999)</li> <li>Inter-Ministerial Declaration of Ministry of Interior and Ministry of Environment on Waste and Solid Waste Management in Provinces/ Municipalities of Cambodia, No. 80 (2003)</li> </ul> | <ul style="list-style-type: none"> <li>Sub-Decree No. 168 GNKR.BK on the Management of Plastic Bags of October 2017.<sup>53</sup> According to Art. 14, plastic carrier bags shall be prohibited for importation, local production, distribution and use unless its thickness is from 0.03 millimetres with a base width from 25 centimetres.</li> <li>Supermarkets charge KHR 400 (0.10 US\$) per plastic bag.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Indonesia</b>         | <ul style="list-style-type: none"> <li>Environmental Protection and Management Act No. 32 (EPMA 32/2009)</li> <li>Law No. 18/2008 on MSW management,</li> <li>Regulation No. 81/2012 on 3Rs and EPR</li> <li>President Regulation No. 97/2017 on Policy and National Strategy on MSW</li> <li>Presidential Regulation No. 97/2017 Solid Waste Management National Policy and Strategy (2017-2025)</li> </ul>        | <ul style="list-style-type: none"> <li>The National Action Plan on Marine Debris (2017-2025) calls for efforts to reduce 70% of marine plastic debris (from 2017 baseline) by the end of 2025.</li> <li>Plastic bag tax (200 rupiah/bag, 0.01 US\$) for a trial period of 3 months in 2016 at retailers in 23 cities.</li> <li>Ban on plastic bags in Banjarmasin city since 2016, resulting in a reduction of 80%. The city of Bandung introduced a similar ban on the use of Styrofoam. Bogor city issued in July 2018 a plastic bag ban.</li> <li>New initiative "Ngaji Sampah" ("Sermons on Waste") with Indonesia's two largest Islamic organizations, Nahdlatul Ulama (NU) and Muhammadiyah to reduce plastic usage and switch to reusable bags</li> <li>The Ministry of Industry considers increasing bio-based plastic consumption to 5% of total national plastic consumption. The current use of bioplastic in the country is less than 0.001% (around 3,000 t/year)</li> </ul> |
| <b>Lao PDR</b>           | <ul style="list-style-type: none"> <li>Environment Protection Law 1999</li> <li>No comprehensive policies for MSW management</li> <li>Waste management is included in the National Environmental Strategy 2020</li> </ul>                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Encourages the use of recyclable bags in cafes and markets.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Malaysia    | <ul style="list-style-type: none"> <li>Environmental Quality Act 1974</li> <li>Solid Waste and Public Cleansing Management Act 2007</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Imposes plastic tax</li> <li>Ban on plastic bags and polystyrene containers in Selangor and Federal Territories<sup>54</sup></li> <li>"Unforgettable bag" scheme of Tesco: Consumers bring bar coded bags and receive a cash rebate of 0.20 ringgit (0.05 US\$) per bag<sup>55</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Myanmar     | <ul style="list-style-type: none"> <li>National Environmental Policy of 1994</li> <li>National Waste Management Strategy for Myanmar (in technical support with UNEP)</li> </ul>                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Mandalay city banned the use of plastic bags in 2009, Yangon in April 2011</li> <li>'No plastic bag day' of City Mart since 2013 (every last Monday and Tuesday of the month). Customers bring their own bag, purchase a reusable bag, or pay 100 Kyat (0.07 US\$) per single-use plastic bag.<sup>56</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Philippines | <ul style="list-style-type: none"> <li>Ecological Solid Waste Management Act of 2000 (RA 9003)</li> <li>Presidential Decree No. 856 (Code of Sanitation of the Philippines)</li> <li>Resolution adopting the National Framework Plan of the Informal Sector in Solid Waste Management, 2010</li> <li>Resolution adopting Prototype City/ Municipal Ordinance Regulating the Establishment and Operation of Junk Shops &amp; Provide Corresponding Penalties, 2010</li> </ul>                                           | <ul style="list-style-type: none"> <li>Department of Environment and Natural Resources (DENR) urged the public to avoid disposable plastic products.</li> <li>Local Government Units practice and propose plastic use reduction measures by passing Ordinances, e.g. Ordinance No. SP-2140 on Plastic Bag Reduction in Quezon City (since 2012)</li> <li>Proposed bills on single-use plastics: Senate Bill No. 1866 – Plastic Straw and Stirrer Ban of 2018; Plastic Bags Regulation Act and Senate Bill No. 2759 – Total Plastic Ban Act of 2011; Philippine National Standards (PNS) 2097:2014 on Plastics Shopping Bags, PNS 2092:2011 on biodegradable plastics</li> <li>Government offices in Dipolog City and Cebu City avoid single-use plastic items in their premises</li> <li>Some public markets and supermarkets participate in the "Bring Your Own Bag" (BYOB) campaign to encourage consumers to bring reusable bags</li> </ul>                                                                                                                                                                                                                                                  |
| Singapore   | <ul style="list-style-type: none"> <li>Environmental Public Health Act</li> <li>Environmental Public Health (General Waste Collection) Regulations</li> <li>Sustainable Singapore Blueprint</li> <li>Environmental Public Health (General Waste Disposal Facility) Regulations</li> <li>Environmental Public Health (General Waste Disposal Facility – Exemption) regulations</li> <li>Environmental Public Health (Public Cleansing) Regulations</li> <li>Code of Practice on Environmental Health (COPEH)</li> </ul> | <ul style="list-style-type: none"> <li>Disallowed the use of disposables for dining-in at new hawker centres.</li> <li>Singapore Packaging Agreement (SPA) of 2007 for reducing packaging waste<sup>57</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Thailand    | <ul style="list-style-type: none"> <li>The Environment and Conservation of National Environmental Quality Act B.E. 2535 (1992 AD)</li> <li>The Act on the Maintenance of the Cleanliness and Orderliness of the Country Public Sanitary and Order Act B.E. 2535 (1992) and B.E. 2560 (updated in 2017) Chapter III/1</li> <li>Public Health Act, B.E. 2535, Chapter III</li> <li>The National Master Plan on Waste Management 2016–2021 promotes 3R,</li> <li>Thailand Zero Waste 2016–2017 Action Plan</li> </ul>     | <ul style="list-style-type: none"> <li>"Say No to Plastic Bag" campaign in 11,000 mini-marts and convenience stores</li> <li>MONRE made a MoU with 16 business organisations to not distribute plastic bags to their customers on the 15<sup>th</sup> and 30<sup>th</sup> of each month</li> <li>Campaigns to axe plastic cap seals of drinking water bottles (effective from 1 April 2018)</li> <li>Prohibition of plastic bags and Styrofoam containers in national parks (announced by the Department of National Parks, Wildlife and Plant Conservation, Thailand on 8 June 2018)</li> <li>The Department of Medical Services, Ministry of Public Health announced to phase out the usage of plastic bags in its 30 hospitals from 1 October 2018 (to reduce usage of 9 million bags per year)</li> <li>The Sustainable University Network (SUN) campaign with 27 universities to reduce single-use plastic on all campuses by 80–90 % over the year 2018</li> <li>"Public-Private Partnership for Sustainable Plastic and Waste Management" initiative, launched in June 2018 and led by the Plastic Industry Club, aims to halve the amount of ocean waste of Thailand by 2027</li> </ul> |

TABLE 2: Frameworks for MSW and plastic waste management

| Country  | Policy framework for municipal solid waste (MSW) management                                                                                                                                                                                                                                                                              | Policy framework for packaging/ plastic/marine litter <sup>52</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Viet Nam | <ul style="list-style-type: none"> <li>• Law on Environmental Protection (Amended in 2014)</li> <li>• The National Strategy on Integrated Solid Waste Management until 2025, vision to 2050 (Decision No. 2149/QĐ- TTg)</li> <li>• Decree No. 38/2015/ND-CP on solid waste management and scraps- effective from 15 June 2016</li> </ul> | <ul style="list-style-type: none"> <li>• Government imposes an environment tax on plastic bags, which is VND 40,000 (US\$ 1.76) per kilogram.</li> <li>• Par. 4, Art 3 of the Environmental Protection Tax Law (Decree No. 67/2011/ND-CP), imposes a tax on plastic bags (30,000-50,000 VND/kg; 1.3-2.1 US\$).</li> <li>• Circular No. 07/2012/BTNMT details regulation on eco-friendly plastic bags.</li> <li>• Decision No. 582/QĐ-TTg in 2013 on enhancing the control of environmental pollution due to the use of non-biodegradable plastic bags by 2020</li> <li>• Temporary restrictions on the import of plastic scraps and stop of issuing new licenses for scarp import activities (since July 2018) Large businesses and enterprises in Viet Nam have introduced alternative bags for shoppers</li> </ul> |

### Extended Producer Responsibility (EPR) in ASEAN

**Extended Producer Responsibility (EPR) is an environmental policy approach to involve the private sector along the whole value chain in the management of packaging waste.**<sup>58</sup> Consumer goods companies putting packaged products on the market remain responsible for the packaging throughout the whole lifecycle, also for the associated waste management. It involves financial contributions for the collection and treatment of the post-consumer packaging waste in the EPR system. EPR has been successfully applied for packaging waste management in the European Union. The concept is however relatively new in the ASEAN region and often limited to some waste categories such as end-of-life vehicles and waste from electrical and electronic equipment.

**Some ASEAN countries attempt to include EPR principles in the packaging waste sector.** For instance, Indonesia has included the EPR concept in its Waste Law 18/2008. Article 15 of the Law states: ‘The producer is obliged to manage the packaging of their products, which are unable or difficult to be decomposed.’ In practice however, EPR has not been applied. The ‘Packaging and Recycling Alliance for Indonesia Sustainable Environment (PRAISE)’, a group of private companies, is advocating for an ‘Extended Stakeholder Responsibility’ concept,<sup>59</sup> which it perceives as a more balanced approach of shared responsibilities among producers, local governments and consumers.

**In the ASEAN region, private companies are currently taking voluntary approaches to managing their packing waste as part of their Corporate Social Responsibility activities.** PRAISE in Indonesia is engaged in recycling as well as public education and awareness raising activities. Similarly, the Philippine Alliance for Recycling and Materials Sustainability (PARMS), a multi-sectoral coalition composed of top consumer goods companies, plans to build a 25 million Php (460,000 US\$) recycling facility for plastic sachets in Metro Manila.<sup>60</sup>

**Singapore is a step ahead in encouraging producers to adopt cost-effective solutions to reduce packaging waste through the Singapore Packaging Agreement (SPA).** Launched in 2007, SPA is a joint voluntary initiative by the government, industry and NGOs to reduce packaging waste. The National Environment Agency (NEA) requires SPA signatories to record their packaging waste data and adopt cost-effective solutions to reduce their packaging waste. 229 signatories (as of July 2018) are reported to have cumulatively reduced close to 46,000 tonnes of packaging waste and saved over Singaporean \$100 million (73 million US\$) since 2007.<sup>61</sup> Though producers are brought into the process of managing packaging waste, SPA is still a voluntary agreement.

**In ASEAN countries, packaging waste is often a fraction of municipal solid waste and local governments have the sole responsibility for its management.** However, EPR can become a model for shared responsibilities for packaging waste management as some experience exists with the concept, e.g. in electronics, household hazardous waste and end-of-life vehicles. An all-stakeholder negotiation is required for ensuring everybody's interests are included for breaking through the EPR impasse in the packaging sector.

## Outlook

**In the ASEAN context of rapidly increasing packaging consumption, moving from the linear model of 'take, make and dispose' to a circular economy of 'reduce, reuse and recycle' (3R) becomes an urgent endeavour by all stakeholders in packaging value chains.** Human resources, institutional arrangements as well as financial and motivational incentives are required to enhance packaging waste management. Political will and leadership are crucial to promote and support legislations and policies for effective and efficient practices across the entire packaging value chains. It includes promoting stakeholder participation, integrating the informal sector and providing the right atmosphere for investing in recycling through public private partnerships. It is also critical to develop substantial databases on packaging waste to enable evidence-based policy formulation and decision making in the region.

**Existing voluntary measures by the private sector could be enhanced by adopting EPR policies and providing space for the private sector to elaborate implementation strategies, supervised by public agencies.** Similarly, consumers are also important stakeholders in packaging value chains. Promoting sustainable consumption practices to reduce single-use packaging and to increase waste segregation for recycling is therefore essential. Behaviour influencing measures such as public education and awareness raising as well as regulatory and economic measures are potential approaches for this.

**Adopting an integrated approach to reducing packaging waste and improving waste management would provide environmental as well as socio-economic benefits.** Waste minimization and resource recovery contribute to preserving limited virgin resources, avoiding greenhouse gas emissions, protecting water quality and conserving ecosystems. Circular economy in packaging value chains can also create jobs and improve working conditions. Coordinated action by policy makers, consumer goods companies, retailers, citizens and other stakeholders are required for transforming linear packaging value chains into circular ones.

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This Circular Economy Briefing was prepared as a background document for the Regional Workshop "Managing Packaging Waste – Preventing Marine Litter", taking place from 30th October to 1st November 2018 in Bali, Indonesia. The workshop is organized by the Association of Southeast Asian Nations (ASEAN), the Indonesian Ministry for Marine Affairs and Fisheries (MMAF), the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Royal Norwegian Embassy in Jakarta. The Country Profile was prepared by the Asian Institute of Technology (AIT) and GIZ's Advisory project "Concepts for sustainable solid waste management and circular economy". It is part of a Circular Economy Briefing Series.

The GIZ Advisory project "Concepts for sustainable waste management and circular economy" develops guidance papers, conferences, trainings and policy advice on resource efficient and climate friendly waste management in cities of low- and middle-income countries. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), it advises on marine litter prevention, the sustainable management of waste of electrical and electronic equipment and climate change mitigation in the waste sector through circular economy approaches.

**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

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Bonn and Eschborn

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**Design/layout etc.:**  
Jeanette Geppert, pixelundpunkt kommunikation, Frankfurt am Main

**Photo credits/sources:**  
Page 1 GIZ/Sandra Fuhr, Viet Nam; Page 6 GIZ/Joachim Stretz

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On behalf of  
German Federal Ministry for Economic Cooperation and Development (BMZ)  
Division 412 Water, Urban Development, Mobility  
Bonn

GIZ is responsible for the content of this publication.

Bonn, November 2018

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