



Unwaste

TRENDSPOTTING ALERT



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Perspectives

The e-waste challenge

The increased production and consumption of electronics, their programmed obsolescence, the high cost or limited possibility for repair, along with the lack of adequate extended producer responsibility measures have created a massive increase in e-waste generation globally in recent years.

As reported in the *Global E-waste Monitor 2020*, the e-waste generated globally increased by 17.4 per cent between 2014 and 2019. E-waste generation is expected to continue increasing by an average of 2 Mt annually, reaching an estimated 74.7 Mt in 2030. Due to the general lack of processing capacity and high costs related to dismantling or disposal, e-waste is typically shipped overseas.

According to the *Global Transboundary E-waste Flows Monitor 2022*, an estimated **65% (equivalent to 3.3 Mt) of the global transboundary movement of used electrical and electronic equipment (EEE) and e-waste is uncontrolled**. In the European Union alone, an estimated 2–17 kt of e-waste was seized in 2019 as illegally traded. But the actual annual volume of the illegal flow is likely much larger. In Asia, 1,814 kt (more than 62%) of imported e-waste was undocumented, among 2,889 kt of total imports in 2019.

From an economic perspective, illegal e-waste management and shipment prevent the completion of a circular economy in the EEE sector. In a circular economy, consumer electronic products are used for as long as possible, then professionally remanufactured for reuse, refurbished or repaired. The valuable components are separated and recycled, thus restraining pressure on primary resources and limiting pollution related to their extraction and processing.

Illegal transboundary movements of e-waste represent a global concern due to the negative impacts on human health and the environment when such waste ends up in countries with limited or no capacity for managing them in an environmentally sound way.

Illicit transboundary movements operate through different forms, including transporting waste on the black market, mixing different types of waste, declaring hazardous waste as non-hazardous or classifying waste as second-hand goods.



E-waste situation in ASEAN countries ^[1]

All ASEAN countries have ratified the Basel Convention, and three (Brunei Darussalam, Indonesia and Malaysia) have ratified the Ban Amendment. In the 2019 (latest) assessment conducted by UNITAR SCYCLE, only four countries in the ASEAN region (Cambodia, Malaysia, Singapore and Thailand) have legislation or a specific policy on e-waste. Indonesia regulated e-waste in 2020 under Government Regulation No. 27 regarding Specific Waste Management and categorizes it as hazardous waste.

Hazardous e-waste in the ASEAN region: Imports and exports under the Basel Convention PIC procedure

UNITAR's SCYCLE data in the following table show Indonesia as the main exporter of hazardous e-waste in the ASEAN region. It is interesting to see that Viet Nam is the third-ranking hazardous e-waste exporter in the region (at nearly 32 kt), despite its low e-waste generation rate (ranking fifth, with 257 kt equal to 2.7 kg per capita) and its low level of printed circuit board waste exports (less than 25%) [2]. Singapore reported almost 5.5 kt of imported e-waste for environmental sound treatment, and this may relate to the presence of [recycling companies](#) in the country.



Hazardous e-waste imported and exported under the Basel Convention PIC procedure

Country	E-waste exports - Basel declared (kt)	E-waste imports - Basel declared (kt)
Indonesia	283.4	-
Thailand	46.6	2.4
Philippines	24.9	-
Malaysia	4.8	2.5
Viet Nam	31.7	-
Singapore	8.0	5.5

Note: The table summarizes the amount of hazardous e-waste, such as printed circuit board waste, mercury-containing e-waste, lithium batteries and mixed electronic scraps, that was imported and exported in 2019 under the PIC procedure of the Basel Convention. The selection of A+B+Y codes are based on the SCYCLE methodology developed for its regional monitors and on available data provided by countries through the Basel Convention reporting system.

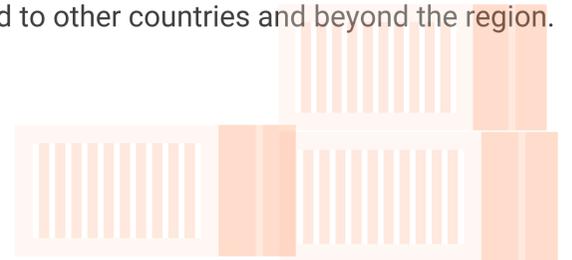
Source: UNITAR SCYCLE dataset, based on Basel Convention national reporting, 2019.

Uncontrolled e-waste flows in the ASEAN region: imports and exports for reuse

Within the uncontrolled movement of e-waste, [3] the ASEAN region imports approximately 1,000 kt [4] of used-EEE and e-waste for reuse. In addition, the region is estimated to be exporting 149–597 kt of e-waste for reuse. The data confirm that the ASEAN region is mainly an importer of used EEE and e-waste rather than an exporter, with the reported level of imports for reuse almost double the total exports.

While ASEAN countries export their printed circuit boards to East Asia, they receive uncontrolled flows of used EEE (close to end of life) and e-waste from East Asia even though they do not have the capacity to treat the waste in an environmentally sound manner. These imports “[place a significant burden on the environment and may lead to the losses of valuable resources](#)”.

Southeast Asia (Singapore in particular) is an emerging hub for re-exporting, but it difficult to determine the amount of e-waste staying in each country and in the region or how much is redirected to other countries and beyond the region.



E-waste flows from Europe to the ASEAN region

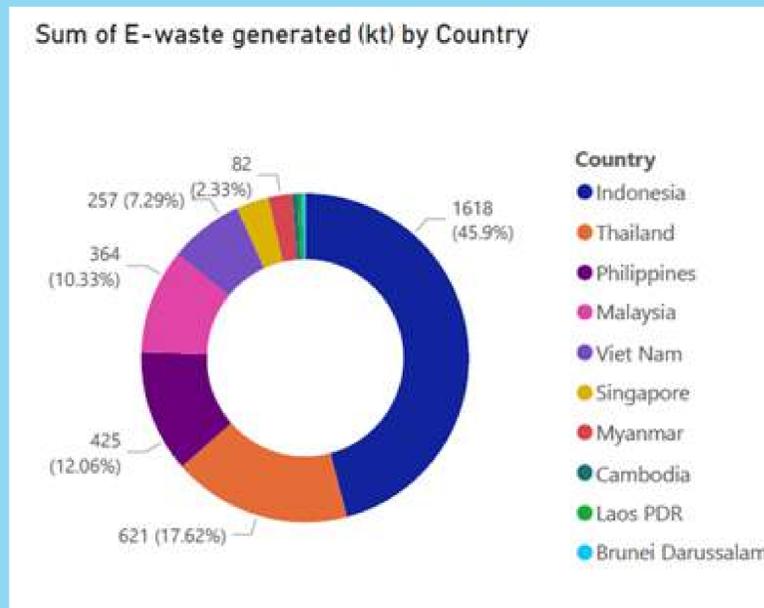
Western Europe is the main region in Europe exporting used-EEE and e-waste for reuse to the ASEAN region [5] (at 111.3 kt), followed by Southern Europe (at 85.7 kt). All the European Union countries, excluding Cyprus, export e-waste to the ASEAN region. Asia has the highest level of intraregional trade, followed by Europe, which represents the second region exporting to the Asian continent.

European e-waste flow into ASEAN

Exporting region - Europe to ASEAN	Quantity (kt)
Western Europe	111.3
Southern Europe	85.7
Eastern Europe	11.5
Northern Europe	24.9

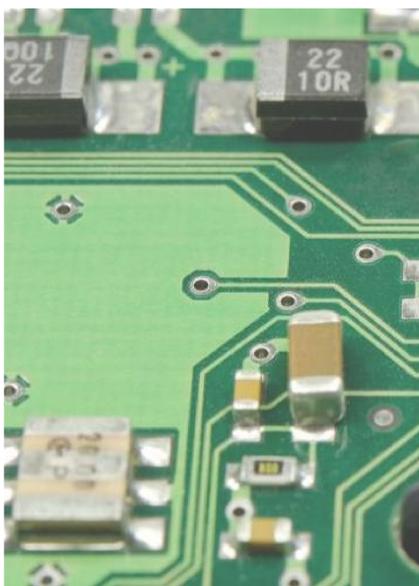
Source: UNITAR SCYCLE dataset, 2019.

The following graphs provides an overview of the e-waste situation in ASEAN countries, based on 2019 figures for the amount of e-waste generated at the national level and highlights that there is almost no documentation on e-waste to be collected and/or recycled at the national level.



Source: UNITAR SCYCLE dataset

In 2019, Indonesia, Thailand, Malaysia and Viet Nam generated more than 80% of the total e-waste in the ASEAN region (2,860 kt of 3,524.7 kt). Indonesia has a significant presence in that flow: the country generates almost half of the total e-waste in the region (45%). The Philippines ranked third at the ASEAN level, contributing about 12% to the overall regional e-waste that is generated. Unfortunately, no data is available on the amount of e-waste documented to be recycled or collected at the national level. And no data have been reported to date to the United Nations Statistics Division. The lack of data, however, can be interpreted as the heavy involvement of the informal sector in the collecting, dismantling and, most likely, extraction of valuable materials of e-waste in the region. This is confirmed, at least partially, by the level of printed circuit board waste exports for recycling in the region. Printed circuit boards are one of the most valuable components of e-waste, with the other parts typically discarded.



Percentage estimates for printed circuit board exports from ASEAN countries mainly to Eastern Asia for recycling purposes, 2019

>75%	50-75%	25-50%	<25%
Indonesia	Singapore	Malaysia Philippines Thailand	Viet Nam Myanmar Cambodia Lao PDR Brunei Darussalam

Source: UNITAR SCYCLE dataset

Indonesia and Singapore are the two biggest exporters of printed circuit board waste in the ASEAN region. They both export more than 50–75% of the overall printed circuit board waste embedded in the e-waste that is generated at the national level. Malaysia, the Philippines and Thailand export up to 50% of their total printed circuit board waste.

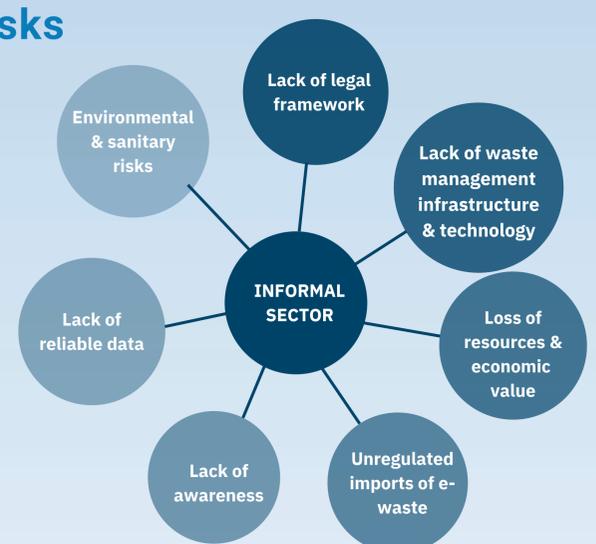
In general, the ASEAN region mainly exports printed circuit boards to Eastern Asia, where the presence of EEE manufacturers also entails the capacity to treat high-valuable components, including printed circuit boards. A portion of the exports is also directed, albeit to a lesser extent, to Western Europe or North America, where the leading recycling companies with specific treatment capacities are located.

The low environmentally sound collection rates of printed circuit boards suggest that informal cherry-picking of high-value components occurs during e-waste management, leaving the hazardous components unmanaged separately or taken care of by the informal sector.

Formal and informal sector: Opportunities and risks

E-waste management in South-eastern Asia is largely based on informal sector activities, including retail, repair, collection and dismantling.

The domination of the informal sector comes with several issues (see the figure at right). On the other hand, the informal sector provides an efficient and extensive network for e-waste collection, recovery and recycling. It is thus essential to link the informal sector to formal processing channels. This can be done by developing a policy framework through a participatory and consultative process and support, by developing informal sector capacities and skills to enhance livelihoods and social welfare security and by using public-private partnership mechanisms.



Challenges of the informal waste recycling

Source: Elaboration by UNITAR SCYCLE, Handbook for E-waste Management

Integrating the informal sector into formal e-waste recycling activities: Insight from Malaysia



Interview with Dr Saman Ilankoon, Senior Lecturer in Chemical Engineering, School of Engineering, Monash University Malaysia campus

Dr Saman Ilankoon is an expert in the field of waste management and spoke with *Unwaste* on the role of the informal sector in Malaysia. The following are excerpts from that interview.

The Ministry of Environment and Water in Malaysia announced that starting on January 2021, every last Saturday of the month is e-waste collection day. [6]

Some household e-waste items still need to be discarded properly. People tend to drop e-waste at road sites, with food waste and in front of their homes and shops [right]. This provides a business opportunity for informal waste collectors to operate, typically using a modified motorbike or bicycle to collect discarded waste materials.



Discarded and broken fluorescent lamps at road sites, Kuala Lumpur © Saman Ilankoon, January 2022



Informal e-waste recycling activities in Kuala Lumpur © Saman Ilankoon, December 2021

Informal e-waste dismantling activities by artisanal e-waste recyclers are also present. They are mainly limited to easily recoverable items, such as copper from electric cables and transformers [see picture]. The resulting selling price is lower than the copper trading price by licensed businesses: cheaper costs are a driver for these informal operations.

Many informal recycling operations also target copper and precious metals, such as gold and silver. The waste generated during the metal recovery operations is [usually] left behind. Informal dismantling and recycling activities may thus create significant environmental issues and occupational health and safety risks. In my view, it would be preferable to register informal waste collectors under local government bodies, considering their efficient waste collecting services to a circular economy.

For further reading, see the paper [“Circular economy and household e-waste management in India: Integration of formal and informal sectors”](#), co-authored by Dr Ilankoon.

CASE STUDY - Thailand

In 2018, the Natural Resources and Environmental Crime Suppression Division of the Royal Thai Police received notification of a factory (see below) in Chachoengsao Province in illegal possession of e-waste, such as computers, mobile phones and electronic parts, amounting to around 1,062 mts, with an estimated value of 2 million euros.

Findings: The investigation revealed the factory’s beneficial ownership belonged to be a non-Thai entity and that a Thai nominee was operating the factor. The illegal e-waste products were auctioned at the Bangkok Port for the purpose of melting and casting for resale. The confiscated waste encompassed items on the Government’s Hazardous Substances list, which require a permit from the Department of Industrial Works.

Regulations and punishment: A court ruling in 2021 imposed a fine of 50,000 Thai baht (around USD 1314) on the two defendants for violating the Hazardous Substances Act B.E. 2535 and the Criminal Code. All of the e-waste was impounded for disposal by the Department of Industrial Works, with all costs to be covered by both defendants.

Conclusions and suggestions: The penalty was minimal compared to the value of the imported waste. This penalty level should be revised to increase its severity and to reflect the significance in identifying the original owner. The lengthy investigation and prosecution process could be improved by increasing interagency cooperation and by building up the capacities of national officers on illegal waste management.



NEWS UPDATES

Unwaste study tour in Europe, 3–5 October 2022



In one of Italy's busiest ports (Genoa), customs officials from Southeast Asia and Italian Customs jointly inspected containers of metal waste that had been illegally arranged to be shipped to Thailand – an example of a larger trend of waste trafficking. Indonesia, Malaysia, Thailand and Viet Nam, where the Asian officials travelled from, are major destinations for trafficked waste coming from different parts of the world.

Italian Customs officials used the containers to explain methods being deployed for detecting illegal shipments.

The port stop may have been the more visual moment, but the three-day series of meetings and exchanges that took the Southeast Asian officials to Brussels and then Genoa set the scene for stronger cooperation between the European Union and ASEAN countries to address waste trafficking.

Expanding cooperation between the two regions is a goal of the Unwaste project and part of UNODC's objective to combat waste trafficking and support a circular economy.

More about the study tour [here](#).

E-waste Day 2022: Recycle it all, no matter how small! 14 October 2022



The 2022 [International E-Waste Day](#) (#ewasteday) focused on small electrical devices (such as cell phones, electric toothbrushes, toasters and cameras), for which global production reaches 22 million tonnes per year but which is the least collected category of e-waste. [7] Among the featured initiatives, UNITAR launched the first self-paced online [e-waste training course](#) available to anyone.

Increased penalty for offences in Malaysia, including illegal disposal of scheduled waste

The Environmental Quality (Amendment) Bill 2022 was passed by the Dewan Rakyat (House of Representatives) of the Malaysian Parliament on 5 October 2022. The maximum fine imposed has been increased to 10 million Malaysian ringgit (around US\$2.1 million), much higher than the current 500,000 ringgit (about US\$105,000), for offences that include pollution and dealing with scheduled wastes without approval. Most significantly, mandatory imprisonment and fines have been introduced for specific offences. The Bill has been tabled at the Dewan Negara (Senate) of the Malaysian Parliament for final approval of the Yang di-Pertuan Agong before becoming law.

PUBLICATIONS AND MEDIA

The following publications and news items relate to waste in Southeast Asia. They are drawn from desk research and information sent by stakeholders involved in the Unwaste project.

Interpol 2022: [Strategic Report – The Nexus Between Organized Crime and Pollution Crime](#) (2022)

EUROPOL: [Environmental Crime in the Age of Climate Change: Threat Assessment 2022](#) (2022)

McKinsey: [Addressing the Challenges of Plastic Waste: Circularity and Leakage](#) (2022)

Unwaste webinar series: "Monitoring Transboundary Movements of E-waste in Southeast Asia", [recording](#) and [presentation](#).

Journal of Cleaner Production: ["Evolution of global plastic waste trade flows from 2000 to 2020, and its predicted trade sinks in 2030"](#) (2022)

Thailand Business News: ["Thailand to ban plastic scrap imports by 2025"](#) (2022)

Vietnam Briefing: ["Vietnam's circular economy: Decision 687 development plan ratified"](#) (2022)

NOTES



[1] The analysis presented in this paragraph is based on the SCYCLE internal dataset on e-waste data for 2019, which includes data from both the Global E-waste Monitor 2020 and the Global Transboundary E-waste Flows Monitor 2022. For additional information on the methodology, see [Forti et al., 2020, Annex 2](#) and [Baldé et al., 2022, Chapter 2](#).

[2] According to national experts consulted on this matter, the large amount of exported hazardous e-waste might have included the e-waste that is generated at foreign owned electronic manufacturers in Vietnam but exported back to the foreign country for treatment. In addition, as Vietnam is also an e-waste importer, some of the imported e-waste might be untreated and be exported again to a third country. This could also cause a high number of exported hazardous e-waste.

[3] This includes used EEE and e-waste, for which treatment at the destination is unknown and is most likely reused and resold in local markets.

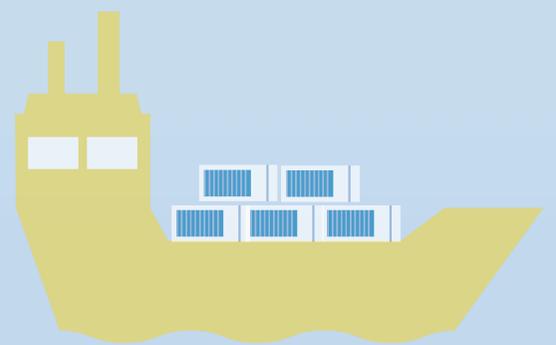
[4] Calculations made by the Sustainable Cycles Programme (SCYCLE) on its own e-waste flows dataset.



[5] For consistency, we refer to the ASEAN region, but in this specific paragraph, the ASEAN region includes the 10 ASEAN countries plus Timor-Leste. This is because the SCYCLE datasets group data at the regional level, where Southeast Asia corresponds to ASEAN countries plus Timor-Leste (11 countries in total).

[6] Following the launch of e-waste collection day, the Department of Environment collected 2,283.7 tons of e-waste as of November 2021.

[7] In the European Union, where collection rates are the higher, only 15% of small e-waste is collected, compared to 48.5% for overall e-waste collection. See European Union, *Study on Options for Return Schemes of Mobile Phones, Tablets and Other Small Electrical and Electronic Equipment in the EU* (2022), although not available online.



About the *Unwaste* project

***Unwaste* project aims to fight trafficking in waste between the EU and Southeast Asia by promoting cooperation and partnerships, in support of ongoing efforts towards a circular economy transition, in line with the relevant policy frameworks.**

More information [here](#).

Click [here](#) to read the *Unwaste* Trendspotting Alert No.1