UNODC
United Nations Office on Drugs and Crime

Turning the Tide

A Look Into the European Union-to-Southeast Asia Waste Trafficking Wave

Unwaste

Tackling waste trafficking to support a circular economy

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FOREWORD

In today's globalized world, waste and how it is managed has become a major challenge to the concept of economic sustainability and sustainable development. The proliferation of waste, driven by unsustainable production practices and evolving demand for consumer goods, poses significant health, environmental, social and economic challenges worldwide. Illegal trade in waste exacerbates these issues, leading to ecosystem degradation, health hazards and economic disparities, especially in destination countries. It also undermines good governance and the rule of law by fuelling corruption and generating profits for organized crime groups, feeding into wider illicit economies and ecosystems in the countries concerned.

Southeast Asia has been particularly affected, as its strong integration and connectivity to the global economy put the region at the centre of a shifting waste trade between economic centres in Europe and Asia. At the same time, the region has a history of organized crime groups exploiting its socio-economic diversity and differences in legislative and regulatory approaches, making it a target for waste trafficking. The proceeds in turn flow into the region's network of illicit economies, feeding corruption and undermining the rule of law, and hindering Governments' efforts to promote more sustainable policies.

Waste is a valuable commodity, and trade enables the import, export and reuse of different materials to make new products; this is the circular economy at work. But waste trafficking exploits the legal trade, with illegal transactions hidden behind seemingly legitimate business operators. The mapping exercise on waste trafficking presented in this report series shows how criminal actors have exploited regulatory loopholes and environmental vulnerabilities for financial gain. This interplay between crime and waste trafficking not only underscores the resilience of the criminal actors involved, but also emphasizes the urgent need for comprehensive strategies to tackle the environmental and societal consequences of such illegal activities.

These interconnected challenges require a holistic approach that addresses the crimes that jeopardize the legal trade in waste and the world's transition to a circular economy. This *Unwaste* report series delves into the intricate relationships between the waste trade, waste trafficking, corruption, organized crime and the use of online platforms for the illegal trade, hoping to shine a light on a little understood phenomenon which nonetheless severely affects people and communities in Southeast Asia. Furthermore, the report offers insights and recommendations to navigate this complex landscape towards a healthier, safer and more prosperous future.

Masood Karimipour

UNODC Regional Representative for Southeast Asia and the Pacific

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ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
ASEM	Asia-Europe Meeting
CIF	cost, insurance and freight
COMTRADE	Commodity Trade Statistics Database
EEE	electrical and electronic equipment
ENFORCE	Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic
EU	European Union
HS code	Harmonized Commodity Description and Coding System
IMPEL	Implementation and Enforcement of Environmental Law
OECD	Organisation for Economic Co-operation and Development
OLAF	Office européen de lutte antifraude / European Anti-Fraud Office
PVC	polyvinyl chloride
SCYCLE	Sustainable Cycles Programme
SDG	Sustainable Development Goal
SEAJust	Southeast Asia Justice Network
SEPA	Scottish Environment Protection Agency
SIRIM	Standards and Industrial Research Institute of Malaysia
SWEAP	Shipment of Waste Enforcement Actions Project
TEU	twenty-foot equivalent unit
UN	United Nations
UNCAC	United Nations Convention Against Corruption
UNEP	United Nations Environment Programme
UNITAR	United Nations Institute for Training and Research
UNODC	United Nations Office on Drugs and Crime
UNTOC	United Nations Convention Against Transnational Organized Crime
WCO	World Customs Organization
WEEE	waste electrical and electronic equipment

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DISCLAIMER

INTRODUCTION

Waste trafficking is widely seen as a high-profit, low-risk crime. Often hidden behind legitimate transactions, it poses a threat not only to the legal trade in waste, but also to the global transition to a circular economy. Criminal actors involved in waste trafficking are known to use legitimate business structures to disguise illegal waste shipments, or exploit loopholes in regulation and enforcement to avoid detection. The complexity of global supply chains and inadequate monitoring mechanisms contribute to the ability of illegal waste traders to operate, and hamper efforts to combat waste trafficking. It is a large-scale problem: the European Commission estimates that illegal waste shipments within the European Union, and between third countries and the European Union, represent around 15%–30% of the total European Union waste trade and generate €9.5 billion in annual revenues for the illegal waste market in the European Union alone.

Turning the Tide: A Look Into the European Union to Southeast Asia Waste Trafficking Wave is the cornerstone publication in a series produced through the *Unwaste* project to take an in-depth look at the many facets of waste trafficking. This first report examines the movement of waste – both legal and illegal – between the European Union and the Association of Southeast Asian Nations (ASEAN) region from a global perspective, uncovering emerging patterns and their characteristics while highlighting the considerable progress made by countries in Southeast Asia to tackle waste trafficking and facilitate legal trade. The second report in the series comprises a review and gap analysis of legal frameworks to address waste trafficking in the ASEAN region, conducted by the United Nations Environment Programme (UNEP). The third report highlights how waste crime is often cyber-enabled. Finally, the fourth report points to the role of corruption in facilitating waste trafficking and examines related financial crimes such as money laundering. Each report concludes with a detailed list of recommendations to combat waste trafficking.

The current linear economic model, based on the "take-make-consume-dispose" pattern, relies on the use of large quantities of materials and energy. In recent decades, this pattern has led to the generation of massive amounts of waste worldwide – and there is no decrease in sight. According to the World Bank, global waste will increase by 70% from current levels, to 3.4 billion tonnes per year by 2050, driven by rapid urbanization, population growth and consumption habits.[1] The international waste trade has become a thriving global business. As the cost of waste treatment and disposal in high-income countries rose sharply in the 1980s, sending waste to lower and middle-income countries was seen as a cost-effective solution. Some of these countries were embracing the industrial revolution and had a flourishing secondary materials industry. However, the influx of waste has brought with it a host of problems, as many of the recipient countries were not equipped to handle the shipments. In addition, transnational organized criminal groups took advantage of loopholes in environmental regulations and gaps in law enforcement capacity to move waste illegally across borders. As a result, hazardous, highly contaminated and non-recyclable waste was shipped to countries that lacked capacity to manage it; this waste ended up in illegal landfills or dumpsites or was burnt in the open, causing significant health, environmental and economic impacts in the receiving countries.

Since then, measures have been taken at the global level to combat waste trafficking. **The Basel Convention** on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is the main multilateral agreement regulating hazardous waste shipments. The Convention was opened for signature in 1989 and entered into force

in 1992.[2] A total of 191 countries have ratified the Convention and are Parties to it.[3] The Basel Convention aims to prevent the harmful effects of improper waste management and transboundary movements of hazardous and other wastes. It enforces a Prior Informed Consent procedure, requiring prior written consent from importing and transit Parties. The Convention criminalizes the "illegal traffic in hazardous wastes or other wastes" and requires Parties to enact laws against it; it also requires parties to minimize waste generation and ensure environmentally sound waste management.[4]

A turning point in the global waste trade in recent years was the 2018 **China ban**,[5] a series of measures taken by China to combat the influx of unwanted waste into the country. As China's recycling industry began to flourish in the 1980s, the country began to receive a huge amount of waste from abroad to meet its domestic industrial demand.[6] However, contaminated solid waste, hidden among recyclable raw materials accumulated, posing an alarming environmental threat and prompting China in the 1990s to begin enacting legislation on the matter. In 2013, China launched Operation Green Fence to better control waste imports and ensure strict inspections of waste shipments.[7] In July 2017, China announced an import ban on 24 types of waste by the end of the year to prevent pollution and improve the national recycling rate.[8] At the same time, the country launched Operation National Sword, a campaign to crack down on the illegal smuggling of foreign waste.[9]

The initial (2018) ban included slag, household plastic waste, textile waste and unsorted paper waste. Further import bans were then imposed on 16 types of waste to take effect by the end of 2018, including industrial plastic waste, some types of metal scrap (cables, wires and motors) and end-of-life vessels; a ban on another 16 types of waste including stainless steel, wood and titanium scrap came into force at the end of 2019.[10] In 2020, China relaxed import restrictions on certain categories of waste such as high-grade copper, aluminium and brass scrap.[11] This adjustment signalled China's shift towards increased recycling practices to address a shortage of raw materials by allowing the import of select, high-quality scrap metals. By contrast, in 2021, China imposed blanket ban on all imports of solid waste. [12]

The 2018 and subsequent bans triggered a major **shift in global waste flows**, towards Southeast Asia in particular, with Indonesia, Malaysia, Thailand and Viet Nam becoming the main regional recipients of both legal and illegal waste. In response, these four countries have been proactive in enacting stringent requirements and regulations to control the influx of waste streams, including partial and complete bans on the import of certain types of waste, in order to protect the environment and the well-being of local populations. Despite bans and restrictions on waste trade in the region, problematic waste continues to reach these and other Southeast Asian countries. [13] Challenges faced by the waste-sending and receiving countries include a lack of traceability of imported waste, insufficient enforcement capacity and lack of adequate sanctions for illegal waste trade activities.

The illegal trade in waste generates substantial profits, estimated at billions of dollars annually. The complexity of the waste trade supply chain, its high-profit potential and limited dedicated enforcement capacity create an environment that is ripe for illegal activity. Global concerns over the **connection between organized crime, corruption and money laundering and waste trafficking** have increased, including in the ASEAN region. Waste trafficking is carried out by a variety of actors, including bad actors in legitimate waste management companies and organized criminal groups.[14] These groups use sophisticated methods such as money laundering to disguise the proceeds of their criminal activities, making it difficult for

authorities to trace the illicit funds back to their source. There is also evidence showing that the waste sector is highly vulnerable to corruption, as criminals see opportunities to bribe officials to issue permits, falsify documents, overlook violations and obstruct inspections. Waste trafficking is also facilitated by the use of the various layers of the internet – surface, deep or dark – and social media or e-commerce platforms.

The **commitment of the international community** to prevent and combat waste crime is reflected in the growing number of major international enforcement operations against waste trafficking. These include the World Customs Organization's Operation Demeter, the European Anti-Fraud Office's (OLAF)'s Operation NOXIA, the Shipment of Waste Enforcement Actions Project (SWEAP) and other initiatives aimed at disrupting the illegal trade in waste. Additionally, the European Union is currently updating its waste shipment regulations to reduce problematic exports and enhance enforcement.

Multilateral cooperation on the matter, such as the UNODC's *Unwaste* project, plays a key role in combating waste trafficking between the European Union and Southeast Asia. For example, *Unwaste* promotes enhanced European Union–ASEAN partnerships to support the move towards a circular economy, in line with the relevant policy frameworks.

The **circular economy model** promotes reuse, recycling, energy efficiency and reduced resource use. To sustain this model – and avoid the need to mine new (raw) materials, industries rely on a consistent supply of recycled materials, access to which is ensured by global supply chains dependent on the legal trade in waste and scrap. Properly managed trade in waste and scrap also safeguards against illegal disposal, preventing environmental pollution. Within a circular economy, therefore, the legal trade in waste reduces the extraction of new materials, encourages responsible waste management and fosters economic opportunities, job creation and the development of eco-friendly technologies.[15] It also contributes to UN Sustainable Development Goals (SDGs) 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), 11 (Make cities and human settlements inclusive, safe, resilient and sustainable), 12 (Ensure sustainable consumption and production patterns), 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) and 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).[16]

While the exact scale of waste crime is difficult to estimate,[17,18] it is regarded as one of the most significant crimes affecting the environment,[19] impacting human health and well-being, ecosystem integrity and economic development, and undermining the achievement of the SDGs and the transition to a circular economy. **Tackling the illegal trade in waste** requires a comprehensive and coordinated approach at various levels. It is therefore essential to map waste flows, to better understand the modus operandi of waste trafficking networks and to inform policy and enforcement responses to waste crime and trafficking.

Governments must adopt a holistic approach and identify vulnerabilities throughout the waste trade supply chain. This includes developing effective policies, taking decisive enforcement action and building up institutional capacities. The increasing involvement of organized criminal groups in waste trafficking requires a strong criminal justice response. The United Nations Convention Against Transnational Organized Crime (UNTOC) should be used as a tool in the fight against waste trafficking through its provisions for the prosecution of organized criminal groups, including waste traffickers. International cooperation is also

essential and requires initiatives such as regular dialogue, joint task forces, intelligence sharing and the establishment of communication networks for joint investigations and the exchange of best practices.

EXECUTIVE SUMMARY

Turning the Tide: A Look Into the European Union-to-Southeast Asia Waste Trafficking Wave is the cornerstone publication in a series produced through the *Unwaste* project to take an in-depth look at the many facets of waste trafficking. It examines the movement of waste – both legal and illegal – between European Union countries and countries within the sphere of the Association of Southeast Asian Nations (ASEAN). It takes a global perspective, uncovering emerging patterns and their characteristics while highlighting the considerable progress made by countries in Southeast Asia to tackle waste trafficking and to thus facilitate the legal trade of waste.

The series of publications encompasses four reports. Following *Turning the Tide*, the second report, produced by the United Nations Environment Programme, reviews the legal frameworks to address waste trafficking in the ASEAN region and draws attention to the gaps. (This report has also been condensed into a chapter within *Turning the Tide*.) The third report highlights how waste crime is often cyber-enabled. The fourth report explains the role of corruption in facilitating waste trafficking and examines related financial crimes, such as money laundering. As with Turning the Tide, each report concludes with detailed recommendations to combat waste trafficking.

This first report (*Turning the Tide*) is divided into two parts. Following a general overview of the waste flows in Part 1 (Chapters One through Three), which looks at regional relations between the countries of the European Union and ASEAN, Part 2 (Chapters Four and Five) focuses on the main waste importers in the ASEAN region: Indonesia, Malaysia, Thailand and Viet Nam. These four ASEAN Member States are also the focus countries of the *Unwaste* project, which is a joint initiative of the United Nations Office on Drugs and Crime (UNODC) in cooperation with the United Nations Environment Programme (UNEP), with funding from the European Union.

Chapter One describes the trends related to legal waste imports into the ASEAN region from European Union countries between 2017 and 2021 and what they represent from a global perspective. The analysis covers 10 types of non-hazardous waste streams (primarily plastic waste, paper and paperboard waste and the different types of metal waste) as well as a separate analysis of e-waste in 2022, based on open-source data. The chapter investigates the importation of hazardous waste reported by the four countries covered by the *Unwaste* project (Indonesia, Malaysia, Thailand and Viet Nam) to the Basel Convention Secretariat under the Prior Informed Consent procedure.

Chapter Two is a summary of the second report in this series of publications. It captures the highlights of the review and gap analysis of the waste trafficking-related legal frameworks in all 10 ASEAN countries.

Chapter Three builds on the first chapter's analysis of the legal waste flow from Europe to ASEAN countries with a mapping of the illegal waste flows, which follow the same routes as the legal trade. It provides a broad sketch of the context in which criminal activities in the waste sector take place. As well as possible due to the limited data availability and thus the knowledge gaps, this chapter defines what is known about the illegal waste trade characteristics. It offers a global overview of the illegal, hazardous and other waste flows, based on country reports to the Basel Convention Secretariat. It discusses enforcement operations, such as Operation Demeter (World Customs Organization), Operation NOXIA (European Anti-Fraud Office) and the IMPEL Shipment of Waste Enforcement Actions Project (IMPEL SWEAP). It includes data on waste flows from three main European Union ports – Antwerp (Belgium), Rotterdam (the Netherlands) and Genoa (Italy).

Chapter Four presents the *Unwaste* project analysis of waste trade data and data on illegal shipments, summarizing what has been done in the four focus countries – Indonesia, Malaysia, Thailand and Viet Nam – to tackle illegal waste shipments across their borders.

Finally, **Chapter Five** features the perspectives of national experts in Indonesia, Malaysia, Thailand and Viet Nam on how their countries are tackling waste trafficking. This chapter summarizes the challenges in tackling waste trafficking at the national and regional levels.

Findings, by chapter

Chapter One: From Bins Across Borders – A Peek Into the Global Legal Trade in Waste, With a Focus on Exports From the European Union to ASEAN Countries

Types of waste traded: Ferrous metal, copper, precious metal, aluminium, paper and plastic emerged as the most common types of waste traded globally between 2017 and 2022, with ferrous metal representing more than half of the global imports. Although plastic waste may not be the primary type of waste traded, its adverse effects on human health and the environment necessitate focused attention. Despite the potential for recycling certain types of plastics, less than 10% of the 8 billion tonnes of plastic waste generated globally before 2017 was recycled, 12% was incinerated and the rest was put in landfills or lost in the environment. Between 2017 and 2022, global imports of plastic waste (under Harmonized System, or HS, code 3915) amounted to nearly 43 million tonnes, valued at more than $21 billion. Following China's ban on many waste imports that took effect in 2018, global imports initially halved from the 2017 levels, but there has been a gradual increase since 2020.

Leading exporters and importers: The European Union is the primary exporter of waste globally, followed by the United States and Japan. Along with some European Union countries, countries in Southeast Asia and Türkiye are the major importers of waste globally.

Trends in the ASEAN region: ASEAN countries collectively imported more than 100 million tonnes of metal, paper and plastic waste, valued at nearly $50 billion, between 2017 and 2021. Waste imports to ASEAN countries experienced steady growth between 2017 and 2021, with notable increases in 2018 and 2021. Import patterns were influenced by China's ban and restrictions from 2018 onwards, leading to fluctuations in imports of plastic, paper and metal waste. Between 2017 and 2021, ASEAN countries imported 17% of the global trade in plastic waste and 20% of the global trade in wastepaper.

Waste trade players in the ASEAN region: Viet Nam, Indonesia, Thailand and Malaysia (in descending order) accounted for 96.6% of waste imports into the ASEAN region between 2017 and 2021. Singapore emerged as a main importer by value in 2019, underscoring its role in the regional waste trade. The European Union, the United States and Japan are the main waste trade partners with ASEAN countries.

Chapter Two: Legal Frameworks to Address Waste Trafficking in the ASEAN Region – A Review and Gap Analysis

Status of ratifications: All ASEAN Member States have ratified the Basel Convention, the Rotterdam Convention and the Stockholm Convention, and enacted national laws on implementation of each Convention's provisions, to varying degrees and relevancy. Four ASEAN Member States have ratified the Basel Convention Ban Amendment, which prohibits European Union Member States, OECD countries and Liechtenstein from exporting hazardous waste to all other countries for final disposal or recycling.

All ASEAN Member States have ratified the United Nations Convention Against Transnational Organized Crime, the United Nations Convention Against Corruption and the ASEAN Treaty on Mutual Legal Assistance on Criminal Matters and have taken measures to put their provisions into effect, including passing national laws to criminalize transnational organized crime, creating law enforcement and judicial cooperation mechanisms and providing training and capacity-building for law enforcement officials.

Legislation in place: Many ASEAN Member States have established anti-corruption agencies, passed national legislation to criminalize corruption and provide a framework for cooperation for extradition and mutual legal assistance requests. All ASEAN Member States have enacted laws and regulations to combat money laundering, including anti-money laundering laws and asset forfeiture laws.

Penalties: Although the nature and scope of waste crime laws vary among the ASEAN Member States, most of them have a legal framework that includes penalties, such as fines and imprisonment, as well as administrative sanctions. However, the degree of criminal penalties for waste crime offences differs across the ASEAN Member States; most of them are not effective, proportional or dissuasive. Loopholes and other weaknesses in national legislative frameworks are common.

Chapter Three: The Illegal Waste Trade – Mapping Flows From the European Union to Southeast Asia

Turning the Tide is the first report of its kind in terms of presenting data on waste trafficking of illegal shipments destined for Southeast Asia, mainly between 2017 and 2021. The data on illegal flows cover illegal, hazardous and other wastes and are based on an Implementation and Compliance Committee of the Basel Convention report to the Basel Convention Secretariat for 2018–2019, along with data provided by the various enforcement operations: Operation Demeter (World Customs Organization), Operation NOXIA (OLAF), and IMPEL Shipment of Waste Enforcement Actions Project (IMPEL SWEAP). Additionally, data on waste shipments from three main European ports (Antwerp, Belgium; Rotterdam, the Netherlands; and Genoa, Italy) were collected and analysed. Although the available data are not exhaustive, the information on the illegal trade offers a valuable overview of waste trafficking patterns, portraying them as products of transnational organized crime due to their cross-border nature. These patterns involve multiple actors and are recognized as a "serious" offence in some legislation.

Origins and destinations: Waste trafficking from high-income to low- and middle-income countries persists as a significant phenomenon, despite the control measures at major European ports of origin and the legislative and enforcement measures in destination countries. Southeast Asia remains a major destination for illegal waste shipments. Europe, North America and other countries within Asia are consistently identified as the primary regions of origin for illegal waste shipments destined for Southeast Asia.

Types of waste trafficked: Plastic, e-waste, metal and paper were the predominant types of waste shipped illegally between 2017 and 2021, while end-of-life vehicles, textiles and rubber were also found among the illegal waste shipped to Southeast Asia.

Modus operandi: Common patterns were evident across various enforcement operations and the European Union port data: False declarations to circumvent notification or the Basel Convention's required Prior Informed Consent procedures were prominent, both in reports from destination countries and in European Union ports, where waste is often falsely declared as Basel Annex IX (or green

listed in the European Union). Common issues among the European Union data were incorrect notifications and missing or incomplete European Union Waste Shipment Regulation Annex VII documents.

Reporting waste trafficking cases at the global level: Although the Basel Convention mandates parties to report illegal cases, the reporting rate remains at less than 50%, with reports predominantly originating from Europe. The number of cases reported to the Basel Convention however was large: there were 914 reported closed cases of illegal traffic for 2018, and 1,098 cases for 2019 globally, but only a few of these cases resulted in legal consequences. Instances of imprisonment and probation were scarce, and the fines reported were relatively modest.

Three of the four focus countries – Indonesia, Malaysia and Thailand – were reported as "country of import" for cases of illegal trafficking in 2018 and 2019. Due to gaps in enforcement responses to crimes that affect the environment, waste trafficking often falls under administrative and civil law rather than criminal law. Publicly available cases of successful criminal prosecution are rare.

Chapter Four: Data from Four Focus Countries in the ASEAN Region

Indonesia

Waste trade: The volume of waste imported by Indonesia fluctuated between 2017 and 2021, marked by a significant increase in 2018 followed by a drop in 2020.

Types of waste legally traded: Paper, metal and plastic were the most imported waste types.

Exporting countries: The 27 Member States of the European Union collectively are the primary exporters of waste to Indonesia, with paper and plastic waste the main types of waste. Trade partners by country for waste include (in descending order) the United States, Australia, the United Kingdom, Italy, Singapore, China and Japan.

Illegal traffic: The main types of waste illegally shipped to Indonesia included plastic, medical waste and equipment, paper and paperboard waste, metal waste and other materials, such as sludge oil and used fabric. These illegal shipments originate primarily from Asia (China, Japan, Republic of Korea, Malaysia Singapore and Thailand), North America (Canada and the United States), Australia and New Zealand. European countries, including Spain, Belgium, France, the Netherlands, Germany, Slovenia and Italy, were also identified as countries of origin for illegal shipments in 10% of reported cases.

Modus operandi: Missing licenses or permits, smuggling, lack of valid documentation, incorrect notification and mixing household and hazardous waste were the primary tactics for the illegal shipments.

Regulatory and enforcement response: In 2019, the Government of Indonesia imposed stricter regulations on non-hazardous waste imports, including homogeneity requirements and proof of exporter registration, restricting waste entry to 15 designated ports. Subsequent amendments in 2020 refined technical rules for manufacturers, required importers to obtain import approval and set a 2% impurity limit for plastic and paper waste. A 2021 omnibus regulation encompasses import provisions for all goods, with amendments specifying technical aspects and import violations subject to administrative sanctions. Indonesia established a National Task Force in 2020 that includes many agencies mandated to address waste imports that breach the national standards.

Three prosecuted cases from Indonesia are presented in this chapter, one of them reflecting a penalty of more than seven years'

imprisonment, which is the most severe punishment in Indonesia to date for a case of waste trafficking.

Malaysia

Waste trade: The waste imports for 10 selected HS codes increased gradually between 2017 and 2021 in Malaysia, from 1.84 tonnes to 4.88 tonnes. Malaysia ranked fourth among plastic waste importers globally between 2018 and 2022, with a total volume of nearly 3 million tonnes.

Types of waste legally traded: The largest volume of waste imported by Malaysia between 2017 and 2021 was ferrous waste (at 6.4 million tonnes), followed by paper and paperboard (at 4.02 million tonnes).

Exporting countries: The United States, Japan and Australia were the top exporting countries of waste to Malaysia between 2017 and 2021. The 27 Member States of the European Union collectively exported 1.8 million tonnes of waste to Malaysia, making them the third-largest exporter of waste to the country, after the United States and Japan. The primary types of waste exported from Europe to Malaysia were plastic (44%), paper (34%) and ferrous waste (12%).

Illegal traffic: Detections of illegal shipments of hazardous waste by Malaysian authorities increased between 2015 and 2017. The peak was reached in 2019 with 399 containers detected (112 cases), 95 of which were repatriated, disposed of or re-exported. In 2020 and 2021, the years of the COVID-19 pandemic, detection of illegal shipments dropped. While in 2021, the number of containers detected (151) was lower than the previous years, the total number of cases was much larger than in 2020 (59). The types of non-hazardous waste illegally imported into the country included plastic waste, metal scrap, wastepaper, steel scrap, aluminium scrap and e-waste.

Modus operandi: Authorities reported false declarations and no import permits (or general non-compliance with import regulations) as the primary tactics used to import illegal waste. Illegal imports occurred via sea routes. There was no public information available on the countries of origin of the illegal shipments.

Regulatory and enforcement response: The Government implemented stringent measures: imposing a temporary halt on plastic waste imports in October 2018, tightening permit requirements, reinforcing container controls and establishing a dedicated national task force to combat the illegal plastic waste imports and unlicensed recycling operations in 2019. The Malaysian authorities have identified and closed 139 illegal or uncompliant plastic recycling operations nationwide since the beginning of 2019, as part of enforcement efforts to combat the illegal importation and dumping of waste in the country. Joint inspection efforts were carried out to detect unrecyclable or contaminated imported plastic waste. Malaysian media reported that a total of 254 containers and 5,512 tonnes of plastic waste shipped illegally were returned to the countries of origin as of December 2020.

In 2022, Malaysia issued Guidelines on Importation of Plastic Under HS Code 3915 and guidelines for the importation and inspection of metal scrap and paper waste, specifying requirements for scrap metal importation and paper waste inspection. A two-year moratorium on issuing paper manufacturing licenses was implemented in March 2022. The transboundary movement of e-waste now requires prior approval from the Director General of the Department of Environment.

Thailand

Waste trade: Over the five-year period (2017–2021), Thailand imported 18.77 million tonnes of waste, with a value of $7.13 billion.

Types of waste legally traded: Thailand's waste imports increased by almost 43% in 2021 from 2017. After the China ban of 2018, Thailand experienced a significant increase in the importation of plastic waste, with growth reaching 262% between 2017 and 2018. However, imports stabilized at the pre-China ban levels from 2019 onwards. Thailand imported mainly paper waste (8.9 million tonnes), ferrous waste and scraps (7.5 million tonnes), and plastic waste (1.2 million tonnes) from 2017 to 2021.

Exporting countries: The United States was the main exporter of waste to Thailand, at nearly 30% of all Thai imports. The 27 Member States of the European Union collectively accounted for the second-biggest exporter of waste to Thailand for the 2017-2021 period at 2.2 million tonnes and representing 12% of all imports (mostly paper waste). Thailand imported hazardous waste under the Prior Informed Consent procedure, mainly e-waste, in 2017; this was followed by a steep decline in 2019 due to e-waste import restrictions announced by the Government.

Illegal traffic: Thai Customs made 276 arrests between 2013 and 2023 related to e-waste, with charges linked to two types of offences: smuggling and tax evasion.[20] For the same period, Thai Customs made 240 arrests [21] linked to nearly 10,000 tonnes of plastic waste, with the same types of offences: smuggling and tax evasion. The seizure and arrest record were aggregated by both types of trade – importation and exportation, but the data were only available in a combined figure. The top illegally exporting countries to Thailand by weight and by cases between 2020 and 2022 were Japan in terms of quantity and China in terms of number of cases. Most of the illegal waste exports originated within the Asian region. The United States was the second-largest exporter of illegal waste in terms of weight and fourth by the number of cases.

Modus operandi: The primary tactic employed was false declaration, most often used to smuggle household or mixed waste (forbidden for importing into Thailand) through deep-sea containers. The ports of landing were Laem Chabang and Bangkok Port.

Regulatory and enforcement response: Thailand has taken significant regulatory actions in response to the surge in illegal waste imports since 2018. Subcommittees were established under the National Environmental Board, comprising ministries and agencies, to address the issue. Measures were issued to regulate plastic and e-waste imports, in alignment with the country's Roadmap on Plastic Waste Management 2018–2030. Starting in July 2018, the Government stopped issuing import permits for plastic and e-waste. In 2019, the Government prohibited municipal waste imports. Thailand implemented a ban on 428 types of e-waste in September 2020, with plans to enact a plastic scrap import ban as of January 2025 that will apply to recycling factories in Customs-free zones, which are currently the only ones allowed to import plastic waste. During a two-year grace period (2023–2024), the importation of plastic scrap is permitted only for established factories and under specified conditions.

Viet Nam

Waste trade: From 2017 to 2021, Viet Nam imported more than 44 million tonnes of metal, paper and plastic waste, valued at more than $13 billion.

Types of waste legally traded: Viet Nam increased its waste import volume by 50% between 2017 and 2020 and ranked first in the ASEAN region in terms of waste imports overall. Viet Nam is the top metal and e-waste importer within the ASEAN region.

Exporting countries: Japan, the United States, Australia, Hong Kong (China), and the European

Union are (in descending order) the top exporters of waste to Viet Nam. Combined, the 27 Member States of the European Union ranked fifth, with more than 2.6 million tonnes of exported waste.

Illegal traffic: The most frequently trafficked waste categories were mixed, plastic scrap, metal scrap and medical waste. The illegal shipments originated from a variety of locations, mainly from North America (Canada and United States); Australia and New Zealand, but also from Europe (Belgium, France, Germany, Greece, Italy, the Netherlands, Slovenia, Spain, and the United Kingdom).

Modus operandi: Authorities reported various tactics used, including falsification or alteration of documentation, false declaration of goods to avoid inspection, fraudulent or incorrect notifications, smuggling by declaring the intention of re-exporting but illegally retaining the waste within the country, absence of required licenses or permits and concealment tactics to evade visual Customs inspection. Foreign traders frequently collaborated with Vietnamese companies, employing sophisticated methods to import illegal waste and scrap into Viet Nam. Because only a small percentage of goods undergo inspection, criminal actors exploit Customs management and regulation loopholes to carry out their illegal activities.

Viet Nam particularly struggled with the issue of abandoned containers. In 2018, the number of backlogged containers, most of them abandoned, was at its peak, numbering 10,124 containers. By the end of October 2021 and despite the re-exportation, enforced take-back procedures or destruction of containers, there was still a backlog of 2,893 containers of imported scrap.

Regulatory and enforcement response: Viet Nam makes a distinction between waste and scrap. Scrap imported for production must meet national technical standards and is defined as recovered material used as raw material. In contrast, waste imports are strictly prohibited and encompass any discharged matter from various activities. An interagency cooperation mechanism involving seven ministries and provincial committees is mandated to regulate and control imports and share information. The many existing laws and regulations related to waste and scrap outline permitted waste imports by HS codes, list the import restrictions that refer to 13 types of scrap and specify other conditions required for the importation of scrap. The country plans to ban plastic scrap imports by 2025 and has enacted decrees to regulate single-use plastics. In 2018, the Government banned the importing and exporting of used electronic goods. Currently, 179 establishments are authorized to import scrap for production use, with regulations prohibiting sales to other companies. There is a proposal to impose a deposit fee to control waste imports.

The identified instances of illegal waste accounted for nearly 17% of the total illegal shipments brought forward for **prosecution** during the five years between 2017 and 2021. Some cases did not result in successful prosecutions, and some were resolved by administrative measures. Viet Nam reported the largest number of waste-related criminal prosecutions among the four *Unwaste* project countries, with 11 cases, but only few convictions resulting in imprisonment.

Chapter Five: Breaking the Cycle – Challenges in Tackling the Waste Trade in the Four ASEAN Focus Countries

The four focus countries – Indonesia, Malaysia, Thailand and Viet Nam – have adopted measures (such as licensing, permits and quota systems) along with waste reduction road maps and demonstrated sustained efforts to tackle illegal waste

imports. Such policies are crucial for sustainable waste management, reducing the reliance on imports and supporting domestic recycling industries, including within the informal sector. Efforts are being made to ensure that the recycling capacity can support both imported and domestic waste. However, the limited recycling capacity and dependence on imported waste due to its lower costs and superior quality increases the risk of waste being trafficked, improperly processed or disposed of in these countries.

The countries of destination still face many challenges related to waste trafficking, and illegal shipments are still being received in the region. Difficulties with the take-back or repatriation procedures persists, along with other issues, such as unclaimed or abandoned containers, challenges in tracing back containers to the country of origin and gaps in implementation and enforcement of regulations.

The exploitation of Customs loopholes indicates that the vulnerabilities in the regulatory frameworks and enforcement capacity in both the origin and destination countries need immediate attention. Effective prevention of illegal waste shipments relies on collaboration between exporting and importing countries, particularly the need for international cooperation. The challenges of mislabelling, concealment and false declarations underscore the need for stricter inspection and enforcement.

The involvement of intermediaries complicates the tracing of waste origins, making it essential for law enforcement agencies to focus on these entities and close the regulatory and enforcement loopholes in the waste trade network. Analysing the misuse of transshipments as a tactic to facilitate waste trafficking and obscure the tracks to the country of origin sheds light on the tactics employed by traffickers, which thus emphasizes the importance of monitoring transit points and enforcing regulations in these areas.

The lack of detailed information on exporting companies is a major obstacle in identifying the actors involved and mitigating the of risks of trafficking, as it complicates or makes impossible the background checks, legal proceedings and repatriation, often leaving the responsible businesses untraceable. Addressing these data-related challenges is vital for enhancing collaboration between countries, improving policy frameworks and ensuring effective law enforcement.

Centralized data are crucial for establishing trends and tailoring anti-trafficking policies. Insufficient data-sharing hampers the law enforcement efforts and hinders the tracking of waste shipments, thus impeding prompt responses to illegal activities. And inadequate data prevent authorities from understanding the routes and tactics used by traffickers. Close monitoring of the types of waste will be needed in the coming years to close the regulatory, implementation and enforcement loopholes.

Discrepancies in waste definitions for non-hazardous waste across countries also urgently need to be addressed. Some examples are the differrent definitions of waste (versus scrap) made by some the ASEAN countries, the end of waste criteria or green listed waste in the European Union.

At the national levels, streamlining the communication channels and data-sharing mechanisms is essential for the swift exchange of information and coordinated responses between relevant actors at national and international levels. Streamlining initiatives between ministries, aligning the handling of cases and expanding the role of task forces to include prevention and criminal law enforcement support are necessary. Involving investigating and prosecuting authorities from the beginning of investigations is vital for effective prosecution and deterrence. There is considerable need for mutual understanding of regulations, efficient data-sharing and expedited

mutual legal assistance requests to effectively combat illegal waste trafficking.

Policy implications and best practices

While the implications for responses mentioned below are grounded in data, research, and expert consultations pertaining to the primary waste trafficking destinations in the ASEAN region, they are also applicable in a global context, particularly for regions facing influxes of illegal shipments of waste.

Strengthening national legal frameworks

A strong legislative framework criminalizing waste trafficking is needed to combat waste crime effectively. ASEAN Member States should classify waste trafficking as a "serious crime" in their national legislation. This would enable governments to apply the stringent provisions of the United Nations Convention Against Transnational Organized Crime and thus to counter such activities with more efficacy and stricter criminal penalties and fines. In addition, States should adopt a comprehensive legal framework committing them to implement the Basel Convention. As effective implementation of the Convention is a critical factor in combatting waste trafficking, States should establish a structured process to systematically monitor the importation of waste and to document its return to the country of origin. As a further step, States should fully transpose the Convention into national law, seeking technical assistance or guidance from the Basel Convention Secretariat where necessary. States that have not ratified the Basel Convention Ban Amendment should be encouraged to do so. And national legal frameworks should also incorporate environmental due diligence standards that address potential criminality and environmental harm within the waste industry. Additionally, is essential to harmonize data, definitions and the categorization of relevant commodities among different agencies and countries (including among ASEAN Member States)

Increasing enforcement and cooperation at the national level

ASEAN Member States should strengthen interagency cooperation at their respective national level. This can be done by facilitating information-sharing between law enforcement and environmental agencies, aligning law enforcement and prosecution procedures and introducing stronger penalties to deter waste trafficking. A national plan for emergencies should contain specific measures on waste trade and management, based on lessons learned from the COVID-19 pandemic (which led to a surge in clinical waste flows).

Optimizing international cooperation

International cooperation should commence by enhancing enforcement and cooperation within the European Union, ensuring adherence to international and national regulations in the destination countries. Successful initiatives such as the IMPEL SWEAP project, Operation Demeter and Operation NOXIA should be expanded and connected with initiatives and platforms in the ASEAN region. Additionally, strengthening cooperation between ASEAN countries through an action plan facilitated by existing regional platforms is crucial. A partnership between ASEAN and the European Union, aimed at preventing waste trafficking – and focusing on circular economy policies, knowledge sharing, and trade dynamics analysis – would benefit both regions and foster a sense of shared responsibility and progress.

Strengthening communication channels is essential to enable direct contact between the authorities in the countries of origin, transit and destination. This will provide regulatory

updates and verify the authorization and status of exporting or importing companies in a timely manner. Along with the recommended database, coordinating and harmonizing data collection and processing would also help refine targeting strategies to prevent waste trafficking and support the implementation of circular economy policies and strategies in the ASEAN region.

Various international organizations have raised the need to address the issue of abandoned containers. Resolving this issue would involve importing, transit and exporting countries and would require solutions for better traceability to the country of origin, enforcement and repatriation mechanisms along with standard operating procedures for when such containers are detected.

International cooperation is also needed for the successful prosecution of waste crime, such as cross-border criminal investigations and information-sharing. This requires interfaces, platforms, and institutional arrangements for cooperation that can accommodate multiple investigative and enforcement authorities.

Building expertise and capacity

Capacity development should include developing a comprehensive toolkit and delivery strategy to support agencies in detecting, investigating and prosecuting waste crimes. Forensic testing techniques should also be used to distinguish criminal waste components and provide robust evidence. Governments can count on international organizations such as UNODC for support and expertise in combatting waste trafficking. Specialized organizations should also raise awareness on organized crime trends in connection to waste trafficking.

Improving data collection, harmonization and sharing

Data are crucial in shaping policy decisions and bolstering law enforcement efforts. They provide the necessary insights for authorities to comprehend waste flows, transit points and the outcomes of illegal shipments. Strengthening collaborative data-sharing between importing and exporting countries on waste origin, destination, transit points, and the methods employed to enable waste trafficking is imperative. Establishing a comprehensive database accessible to all authorities involved in waste trafficking is a crucial step towards this goal, allowing the collection of information on seizures, penalties, investigations, prosecutions, and convictions related to waste trafficking offences.

Data-collection methods should be improved at the national, regional and global levels. The timely sharing of data with relevant international bodies and the mapping of illegal waste flows will provide a more holistic understanding of the global waste trafficking landscape. This, in turn, will improve the accuracy of risk and trend analyses, which can then be integrated into strategies to address high-risk areas. In addition, risk profiling can be adapted and supported through the use of data analytics and technology.

METHODOLOGY

This section provides an overview of the methods adopted to map the waste flows to Southeast Asia. Our approach integrated open-source data, qualitative analysis, a review of the legal and policy frameworks, information gathered from governments in Southeast Asia and three European Union ports and insights from enforcement operations. Although data available were limited, the aim was to collect existing information and data to explore the waste trafficking trends and modus operandi of criminal networks by combining the diverse data sources. This chapter outlines the steps taken to collect, analyse and interpret the datasets and to ensure the robustness and validity of our findings.

Gathering qualitative data

The *Unwaste* project [22] facilitated 10 national consultations or working groups [23] in Indonesia,[24] Malaysia,[25] Thailand[26] and Viet Nam[27] to identify or engage with interagency cooperation mechanisms, building on existing mechanisms. The consultations gathered experts from regulatory agencies, criminal justice institutions, law enforcement agencies and academia. The diversity of experts consulted was reflected in the variety of challenges reported at the national and regional levels, ranging from cooperation and access to data to enforcement and technical and regulatory challenges. These consultations generated valuable inputs and insights on the responses and challenges related to the illicit waste trade in each country. Additionally, the *Unwaste* project team conducted consultations with waste trade officials at the regional and global levels.

Quantitative open-source data

To analyse the legal waste streams of non-hazardous waste, data from the United Nations Comtrade database [28] was used, based on four-digit Harmonized Commodity Description and Coding System codes associated with the types of waste analysed. The Harmonized System or HS, was developed by the World Customs Organization (WCO) and is an internationally recognized product classification system used by over 200 countries and economies. It consists of more than 5,000 commodity groups. Over 98% of international trade merchandise is classified using the HS.[29] UN Comtrade data was extracted for 10 types of waste: plastic waste, paper and paperboard waste and eight types of metal waste for the 2017–2021 period and for 2022 when data were available.

Data on e-waste HS code 8549, which was added to the Harmonized System in 2022, is included in the Table 1. A separate analysis was done for this HS code, although only partial data were available when data for this publication were extracted from UN Comtrade (see Table 1 for the HS codes). The waste streams were selected by the *Unwaste* project, based on consultations with relevant stakeholders in the ASEAN region. They were considered most relevant for the analysis based on several factors, including the amount of waste the ASEAN countries received.

The data presented and analysed were based on reports by the ASEAN countries. Mirror data are not presented in this publication.[31] The open-source data were missing for some years for some countries (where possible, it is indicated in the relevant section or in the endnotes).

In UN Comtrade , import values are documented as cif (cost, insurance and freight), while exports are recorded as fob (free on board). This difference can often range from 10% to 20%. For quantities, net weight data were used; and for imports, the cif values were used. Numbers were rounded to the closest unit.

For all data, the weight is presented in the

Table 1 – Non-hazardous waste streams analysed

HS codes	Description
3915	Waste, parings and scrap of plastics
4707	Waste and scrap of paper and paperboard
7112	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap containing precious metal compounds, of a kind uses principally for the recovery of precious metal
***7112**	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap containing precious metal compounds, of a kind uses principally for the recovery of precious metal **other than goods of heading 85.49.** (The seventh amendment to the Harmonized System took effect on 1 January 2022. This amendment encompasses HS code 8549, pertaining to electrical and electronic waste and scrap.[30])
7204	Ferrous waste and scrap; remelting scrap ingots of iron or steel
7404	Copper; waste and scrap
7503	Nickel; waste and scrap
7602	Aluminium; waste and scrap
7802	Lead; waste and scrap
7902	Zinc; waste and scrap
8002	Tin; waste and scrap
8549	Electrical and electronic waste and scrap

metric system – in tonnes and the values are in US dollars. To enhance visualization, some quantities and values in the report figures were expressed in millions or in thousands.

In the UN Comtrade data, "Other Asia, n.e.s." refers mainly to data from the Taiwan Province of China.[32] Due to limited data availability, data for ASEAN countries are only presented for 2017–2021.

The HS codes for plastic waste do not correspond directly to the Basel Convention codes for waste. Some plastic waste might be traded under different HS codes instead of HS 3915. For example, suppose an assessment is done using the six-digit HS code at the HS 3915 heading level. In that case, no distinction can be made between the various types of polymers and their classification under the Basel Convention as hazardous, non-hazardous, mixed or as other plastic waste streams requiring special consideration.

The data extracted for waste streams are declared under the relevant HS codes related to waste and do not include the European Union "end of waste" data, whereby specific waste ceases to be waste and becomes a product or a secondary raw material. [33] For the open-source data, the raw data and detailed data tables are available and can be provided upon request.

Data and analysis for e-waste flows for 2019 were provided by the United Nations Institute for Training and Research's Sustainable Cycles (SCYCLE) Programme.

For analysis of the hazardous waste covered by the Basel Convention, data were extracted by the UNITAR–SCYCLE Programme team from Basel Convention-related national reports to the Secretariat. The types of waste reported were clustered and classified into six categories for an easier analysis:

- E-waste and waste electrical and electronic equipment, or WEEE
- Hazardous metal waste
- Hazardous plastic waste
- Mercury waste, including waste contaminated by mercury

- "Various waste types", including diverse types of waste that cannot be included in the above categories, such as ash, dust, sludge, catalyst, waste oils and water, and waste contaminated by certain chemicals.

Legal review

Chapter Two captures highlights of the resulting report from the "Legal frameworks to address waste trafficking in the ASEAN region – a review and gap analysis". Readers are encouraged to refer to the full report of the same title, which is a separate publication in the *Unwaste* report series. The legal assessment and gap analysis were undertaken through a literature and legislation review, as well as interviews and focus group discussions with government officials and experts in Indonesia, Malaysia, Thailand and Viet Nam, along with a regional consultation event attended by government focal points from ASEAN Member States.

Illegal cases

Data and review on illegal cases was provided through:

- Basel Convention national reports and interviews with the focal point for the Basel Convention Secretariat
- Data on World Customs Organization's Operation Demeter: Data from 2018 to 2022 were provided by the World Customs Organization and the Regional Intelligence Liaison Office for Asia and Pacific, compiled and comparative analysis was done for the past five operations
- IMPEL Shipment of Waste Enforcement Actions Project (IMPEL SWEAP) provided available data and analysis
- Operation NOXIA data were provided by the European Anti-Fraud Office

To gather additional information on the illegal trafficking of waste relevant to the four *Unwaste* project focus countries (Indonesia, Malaysia, Thailand and Viet Nam), the UNODC and UNITAR SCYCLE Programme teams developed a qualitative questionnaire. The questionnaire was divided into seven sections:

- Illegal import of waste
- Illegal export of waste
- Crime trends
- International cooperation
- Repatriation
- Prosecution
- Waste management

The questionnaire was distributed by UNODC national programme officers to the relevant authorities in each of the four countries. Because the questionnaire covered different aspects of the illegal waste trade, including inspection, repatriation and prosecution, the national programme officers consulted multiple authorities. The UNODC team conducted group and bilateral consultations with relevant government agencies, as required. Consultations with government experts also occurred during a UNODC and United Nations Environmental Programme joint regional meeting in Bangkok in June 2023. Subsequent discussions on data were also conducted at the country level after the joint regional meeting.

All four countries provided a certain level of information through the different national departments in charge. The information collected, however, was not suitable for statistical analysis as the information provided varied in terms of topics covered, and quantitative data provided was limited. For this reason, the information is summarized and cases provided by countries are combined with the additional information provided by the authorities to present a profile of each country.

Additional insights provided by the four countries during a study tour organized by the UNODC *Unwaste* project that took place in Brussels, on 3–4 October 2022, were added to this section.

European authorities were also involved in the data-gathering process to complement the analysis with relevant port-related information from Belgium, Italy and the Netherlands. The data from the three ports may overlap with other data provided by the IMPEL SWEAP project if the port in question is part of the project. However, the IMPEL SWEAP data indicate controls while the data provided by the three ports indicate illegal cases.

PART 1: THE STATE OF WASTE FLOWS, WITH A FOCUS ON EUROPEAN UNION AND ASEAN COUNTRIES

Chapter One: From Bins Across Borders – A Peek Into the Global Legal Trade in Waste, With a Focus on Exports From the European Union to ASEAN Countries

This chapter starts with a broad overview of the global waste trade, examining the legal transactions. It then looks at the global waste flows directed to ASEAN countries to understand the extent of the regional waste trade, then zooms into the exports from the European Union to the ASEAN region. The main objective is to understand the trends related to exports to ASEAN countries and between the European Union and ASEAN region and to highlight the most relevant waste flows and their characteristics. This analysis can then be compared with the trends and illegal trade flows that Chapters Three and Four draw attention to. The analysis here covers ten types of non-hazardous waste streams (plastic waste, paper and paperboard waste and different types of metal waste). A separate analysis was conducted specifically for e-waste for the year 2022, using the available open-source data.

In addition, the chapter investigates the imports of hazardous waste reported by the four countries covered by the *Unwaste* project (Indonesia, Malaysia, Thailand and Viet Nam) to the Basel Convention Secretariat under the Prior Informed Consent procedure.

Key takeaways

- This chapter looks at the legal trade, based on UN Comtrade data (see the methodology chapter).
- Globally, the top types of waste traded between 2017 and 2022 in terms of value were ferrous metal, copper, precious metal, aluminium, paper and plastic. In terms of quantity, ferrous metal accounts for more than half of the global trade, followed (in order) by paper, aluminium, plastic and copper. The waste of precious metals ranks low in the ranking by quantity but high (third) by value.
- Although plastic does not rank as one of the main types of waste traded, the impacts of poorly managed plastic waste on human health and the environment are very serious. Of the 8 billion tonnes of plastic waste generated worldwide prior to 2017, less than 10% was recycled, 12% was incinerated and the rest was put in landfills or lost in the environment.
- The European Union is the main exporter of waste globally, with more than 40% of trade in terms of quantity and value. The other two major waste exporters are the United States and Japan.
- Along with some European Union countries, countries in Southeast Asia and Türkiye are major importers of waste globally.
- Waste imports to ASEAN increased steadily from 2017 to 2021, with important increases observed in 2018 and 2021.
- The different bans and restrictions put in place by China from 2018 onwards seem to influence waste imports to ASEAN. After a sharp increase in 2018, imports of plastic waste and scrap have decreased due to restrictions in Southeast Asia, while paper and metal waste imports have increased gradually, with a noticeable increase for paper waste and some types of non-ferrous metal waste in 2020–2021.
- Viet Nam, Thailand, Malaysia and Indonesia imported 96.6% of the total quantity of waste that flowed into ASEAN region between 2017 and 2021, while Singapore

ranked first among all ASEAN countries for imports by value in 2019 and third for the 2017 and 2021 period.

- Between 2017 and 2021, the 10 ASEAN countries imported more than 100 million tonnes of metal, paper and plastic waste, valued at nearly $50 billion.
- ASEAN countries imported 17% of plastic waste and 20% of the total quantity of paper waste imported globally. The European Union countries combined represent more than 20% of ASEAN countries paper waste imports, second after the United States, and followed by Japan and the United Kingdom.

Industries rely on a consistent supply of recycled materials, and the legal trade in waste and scrap sustains global supply chains by ensuring access to crucial raw materials. The properly managed trade in waste and scraps also safeguards against illegal disposal and environmental pollution. The legal trade reduces the extraction of new materials, encourages responsible waste management and fosters opportunities within a circular economic model, job creation and the development of ecofriendly technologies. [34] It also contributes towards achieving Sustainable Development Goals 9, 11, 12, 14 and 15.[35]

1.1. Global trade in waste

Globally, the top types of waste traded between 2017 and 2022 in terms of value were ferrous metal, copper, precious metal, aluminium, paper and plastic (Figure 1). In terms of quantity, ferrous metal accounts for more than half of the global trade, followed (in order) by paper, aluminium, plastic and copper (Figure 2). Precious metal waste ranks low by quantity but high by value (third in the ranking).

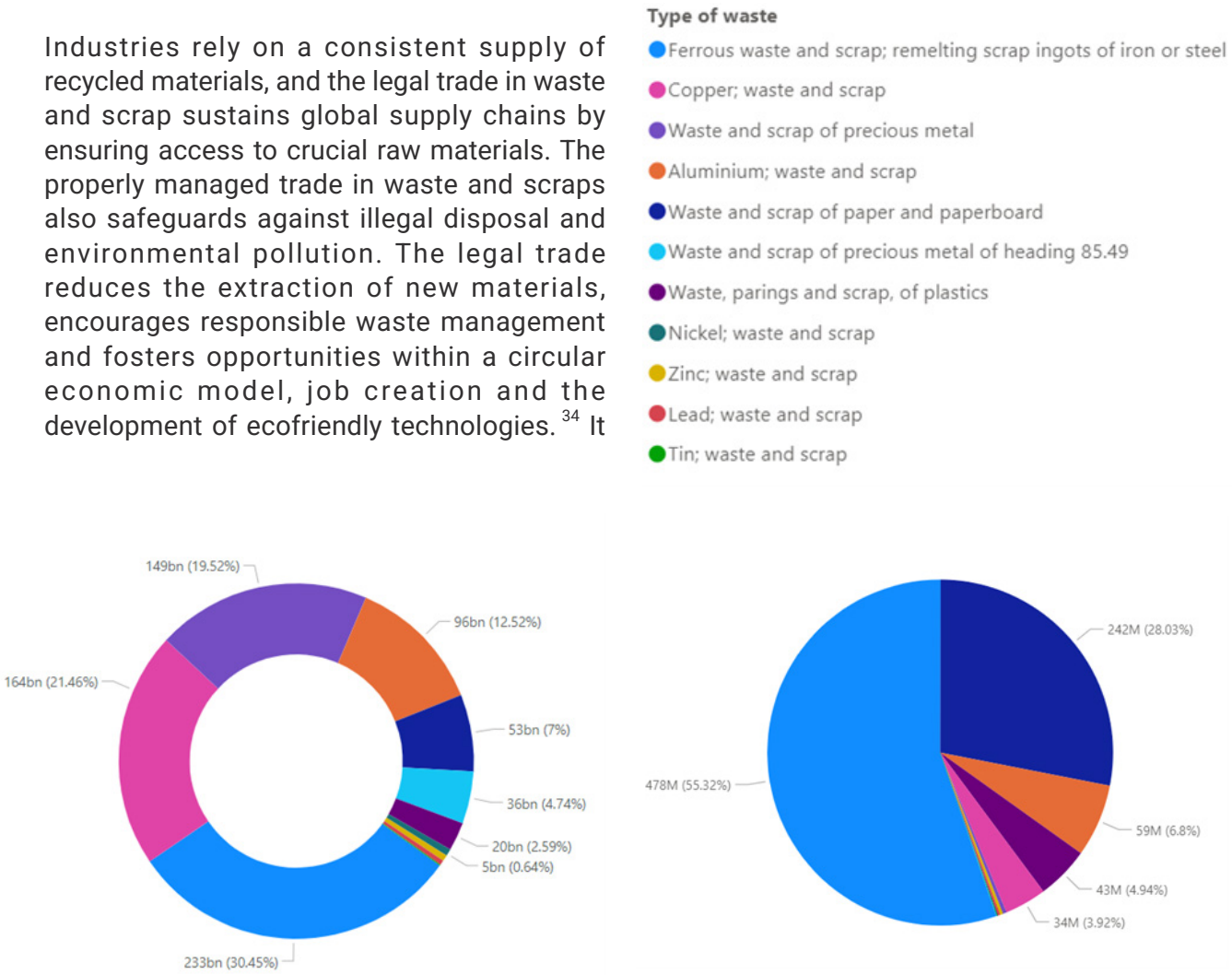


Figure 1 – Global waste imports, by value, 2017–2022 (billion US$) (Source: UN Comtrade data, accessed September 2023)

Figure 2 – Global waste imports, by quantity, 2017–2022 (million tonnes) (Source: UN Comtrade data, accessed September 2023)

Main importers

Between 2017 and 2022, the leading importers (by quantity) of the 10 types of waste analysed for this chapter were Türkiye, China, India, Germany and Viet Nam. Indonesia, Malaysia and Thailand also ranked among the major importers globally (Figure 3). However, when the 2017 data are excluded from the calculation in order to see the impact of the 2018 China ban, China ranks fourth (after Germany) and India takes second place (after Türkiye). While China imported 25% of the global waste in 2017, their share of global waste imports plummeted to 3% in 2022.

Main exporters

For the 10 types of waste combined, Figure 4 shows the 20 main exporters between 2017 and 2022 by quantity (in tonnes). Although the United States is the main exporter, when the exports from all European Union Member States are combined, the European Union is the main waste exporter globally for all types of waste combined, both in terms of quantity and value, with more than 40% of the global exports.

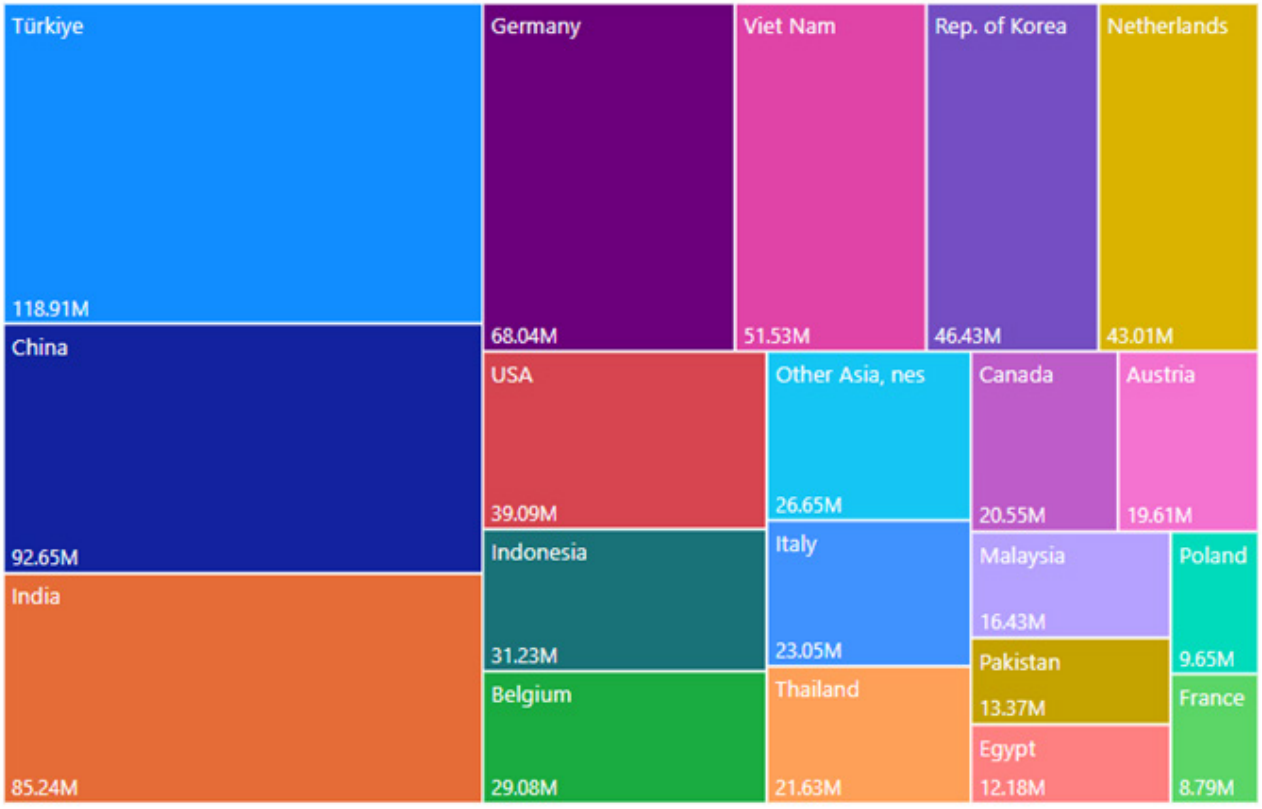


Figure 3 – Main waste importers for 10 types of waste combined, by quantity, 2017–2022 (million tonnes) (Source: UN Comtrade, accessed January 2024)

Figure 4 – Main waste exporters for 10 types of waste and scrap combined, by quantity, 2017–2022, in (tonnes) (Source: UN Comtrade, accessed January 2024)

Plastic waste and scrap

Even though plastic waste represented only 5% of the global waste imports and ranked fourth in terms of traded waste type over the five years, it is now considered one of the most problematic types of waste.

Plastic pollution is a global issue with severe environmental, health, social and economic consequences. Plastic pollution degrades ecosystems and reduces their ability to adapt to climate change; it impacts livelihoods, food production systems and the health and well-being of millions of living beings. Inadequate plastic waste management results in plastic waste entering the land, freshwater and ocean ecosystems. Microplastics, resulting from the breakdown of larger pieces of plastic, infiltrate the food chain and the air we breathe. Plastic production involves the utilization of chemical additives, several of which are categorized as hazardous under the Stockholm Convention. Many of these additives have been demonstrated to pose risks to both human health and the environment.[36] Ultimately, plastics are derived from fossil fuels and contribute to 3.4% of global greenhouse gas emissions.[37]

Global plastics production doubled from 2000 to 2019, reaching 460 million tonnes, while global plastic waste generation more than doubled during the same period, reaching 353 million tonnes in 2019. Sometimes, plastic waste is shipped thousands of kilometers for recycling, but evidence shows that part of it is burned or dumped in the open. While plastic can in theory be recycled, of the 8 billion tonnes of plastic waste generated worldwide prior to 2017, less than 10% was recycled, 12% was incinerated and the rest was put in landfills or lost in the environment.[38] Additionally, plastics can only be recycled two or three times, as after every recycling the strength of the material is reduced due to thermal degradation.[39]

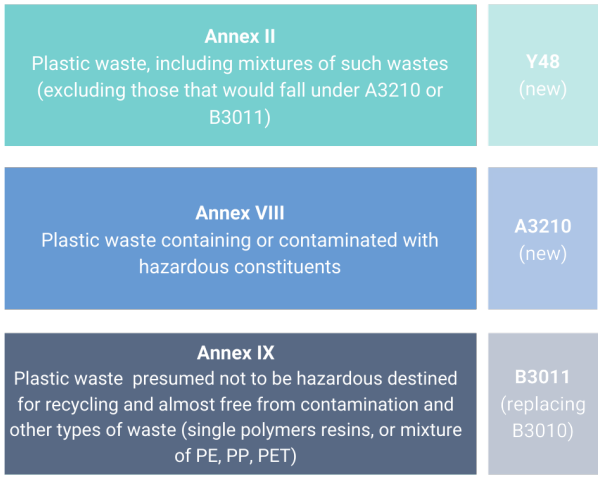
Many global initiatives are in place to tackle the plastic waste issue, such as the Plastic Waste Amendments (see Box 1 and also the legislative review in Chapter 2), the Intergovernmental Negotiating Committee on Plastic Pollution, along with multiple projects at the global level to tackle plastic pollution.[40]

Box 1 – Basel Convention Plastic Waste Amendments [41]

Decision BC- 14/12
Plastic waste Amendments
Effective 1 January 2021

The Plastic Waste Amendments entered into force in 2021 and, with the insertion of a new entry – A3210 and Y46 – it clarifies the scope of plastic waste presumed to be hazardous and therefore subject to the Prior Informed Consent procedure.

Note: PE = polyethylene; PET = polyethylene terephthalate
Elaboration UNITAR (Sources: the Secretariat of the Basel Convention)



The Basel Convention Secretariat collaborates with the World Customs Organization to incorporate identification of Basel Convention-regulated wastes into the Harmonized System. Assigning specific HS codes to Basel Convention-regulated waste facilitates the enforcement of the Prior Informed Consent procedure. Per decision BC-14/9, the Basel Convention Conference of the Parties tasked the Secretariat with proposing amendments to the HS to identify 10 types of waste. Progress updates on this and previous decisions are provided in reports to the Open-ended Working Group and the Conference of the Parties.[42] As a result, there is a draft proposal on amendments to the Harmonized Commodity Description and Coding System regarding plastic waste that contains 11 categories under the HS heading 3915. [43]

Through the course of six years (2017–2022), nearly 43 million tonnes of plastic waste were imported worldwide under HS 3915,[44] with a total value exceeding $21 billion. The largest global plastic waste import quantity and value was recorded in 2017 with almost 13 million tonnes traded, amounting to $6.12 billion. In 2018, however, following the China ban, the quantity and value of plastic waste imports reduced by almost 50%, and continued to fall from 2019 and to 2020, to then increase in the two subsequent years (Figure 5). While there is no comprehensive data showing how the plastic waste was managed after this reduction, three significant trends were noticed regarding plastic waste: increase of illegal disposal, landfills and burning of waste in the exporting countries; illegal shipments in new regions of destination (such as Southeast Asia); and an increase in both accidental and deliberated waste fires predominantly in the export countries (Europe) but also among importing countries.[45]

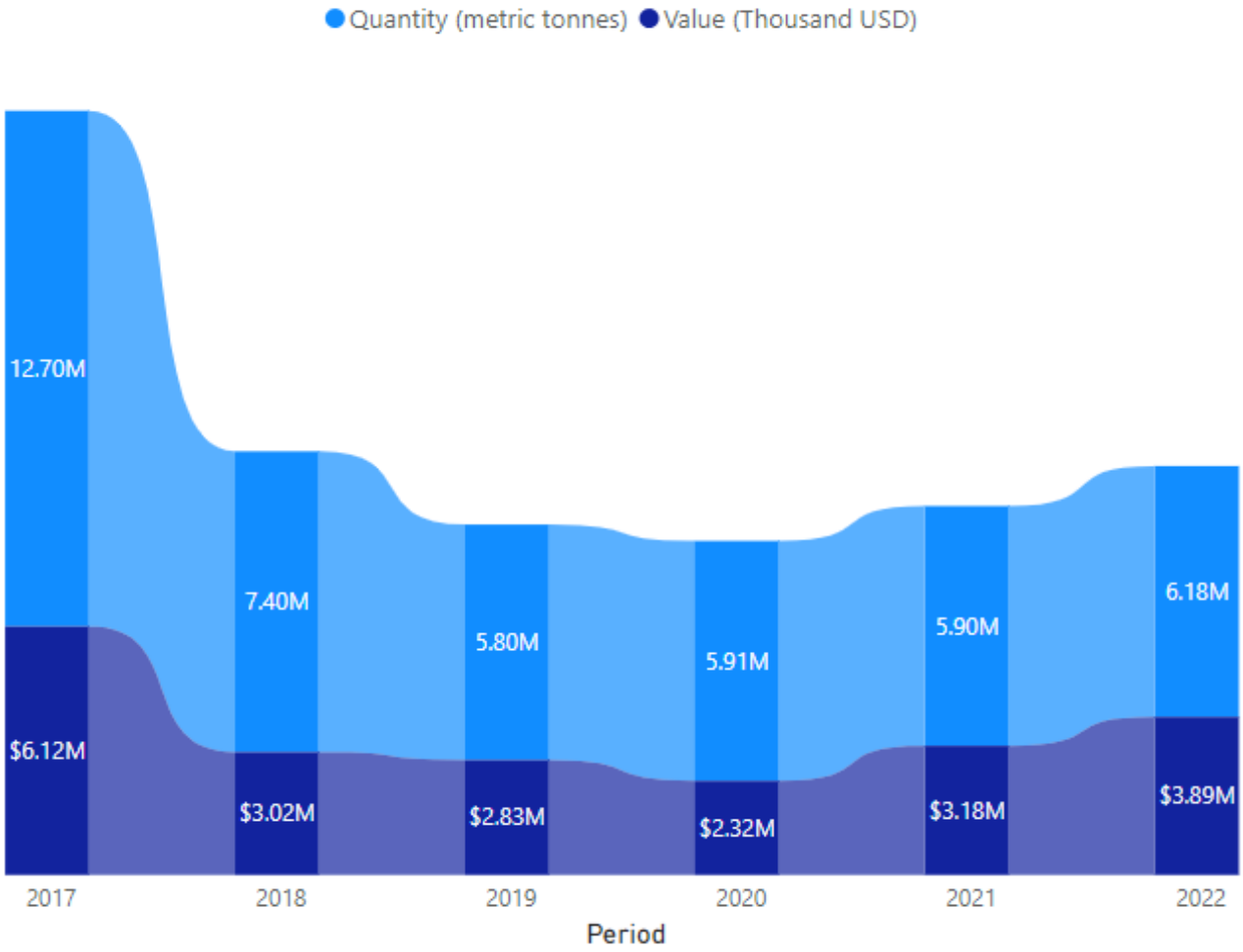


Figure 5 – Plastic import HS 3915, 2017–2022, by quantity (tonnes) and import value (thousand US$) (Source: UN Comtrade, accessed January 2024)

The main importers and exporters of plastic waste in terms of quantity and value for 2017–2022 are shown in Table 2.

Table 2 – Main importers and exporters of plastic waste and scrap 2017–2022

Importer 2017–2022			Exporter 2017–2022		
Country	**Quantity (million tonnes)**	**Value (billion US$)**	**Country**	**Quantity (million tonnes)**	**Value (billion US$)**
1. China	5.88	3.30	1. Japan	5.35	2.14
2. Netherlands	3.95	1.48	2. Germany	4.18	2.29
3. Hong Kong, China	3.53	1.26	3. United States	3.37	2.18
4. Malaysia	2.99	0.92	4. Netherlands	2.71	1.26
5. Türkiye	2.80	0.93	5. Hong Kong, China	2.46	0.79
Second ASEAN country: 9. Viet Nam	1.63	0.88	*Top ASEAN country:* 10. Thailand	0.94	0.57

Between 2017 and 2022, China ranked first as an importer of plastic waste. After China's waste import ban policy (effective 1 January 2018), plastic imports to China substantially decreased, from 5.8 million tonnes in 2017 to 51,414 tonnes in 2018 (a 99% decrease) and 310 tonnes in 2020 (a nearly 100% decrease). No waste import volumes were reported in 2021 and 2022 to UN Comtrade. With China's diminishing role as an importer of plastic waste since 2018, ASEAN countries such as Malaysia, Viet Nam, Thailand and Indonesia have become more prominent destinations. In 2018, China ranked twenty-eighth among plastic waste importers globally in terms of quantity, with Malaysia the lead importer and Hong Kong (China), the Netherlands and Thailand the next three top importers (in descending order). Two other ASEAN countries ranked high globally in 2018 in terms of imported quantities: Indonesia (ninth) and Viet Nam (thirteenth). According to UN Comtrade 2022 data, the Netherlands, Türkiye and Germany were (in descending order) the three top importers by quantity, followed by Malaysia and Viet Nam (Figure 6), with Indonesia and Thailand ranking eleventh and thirteenth, respectively, globally.

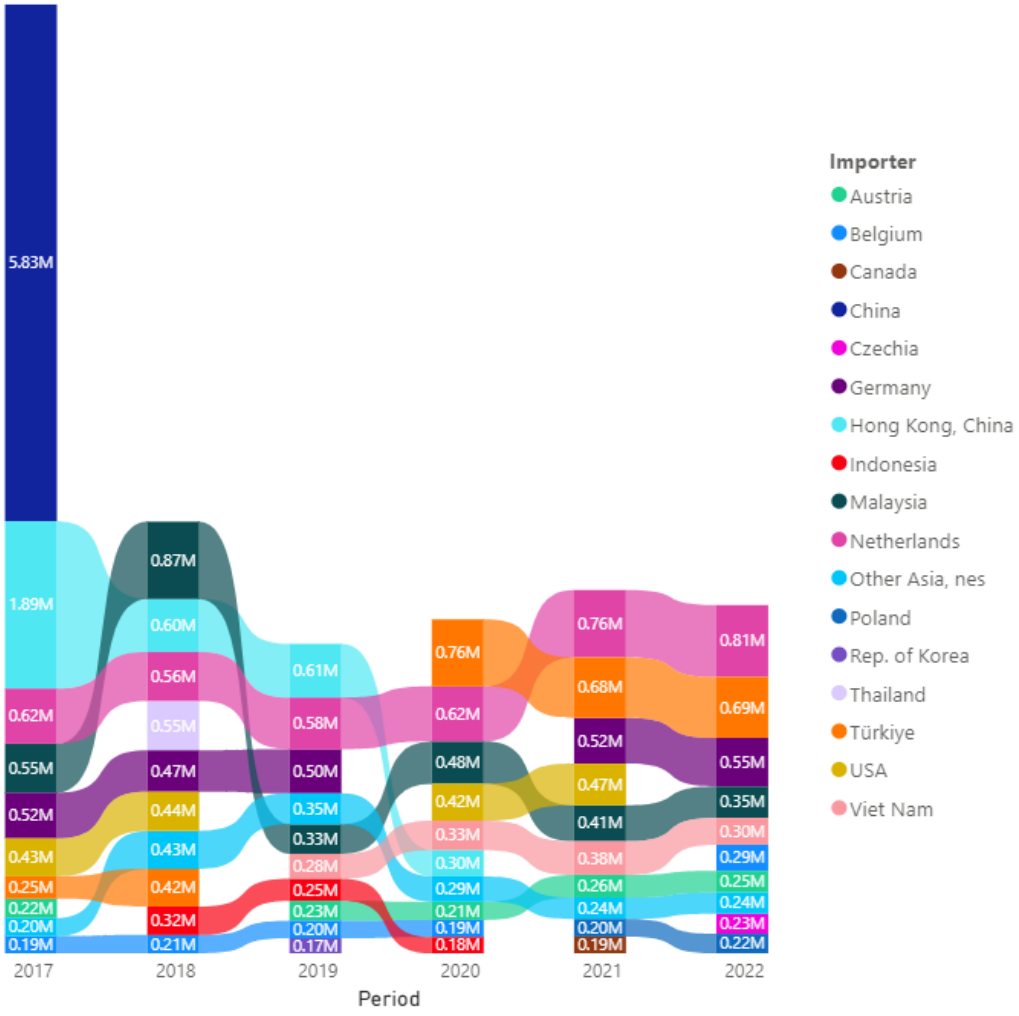


Figure 6 – Top 10 importers of plastic waste and scrap by year (2017–2022), in tonnes (Source: UN Comtrade, accessed January 2024)

Between 2017 and 2022, Japan, Germany, United States, Netherlands and Hong Kong (China) were the main plastic waste exporters globally. However, The European Union countries combined are the top exporters of plastic waste. Before the China ban in 2018, about half of the plastic waste collected in the European Union was sent abroad, of which more than 85% was exported to China.[46] In 2019, the European Union exported 1.5 million tonnes of plastic waste, mostly to Türkiye and Asian countries, such as Malaysia, Indonesia, Viet Nam, India and (still) China.[47] For the 2017–2022 period (all years aggregated), the European Union countries combined exported nearly half of the total quantity of plastic waste recorded globally.[48]

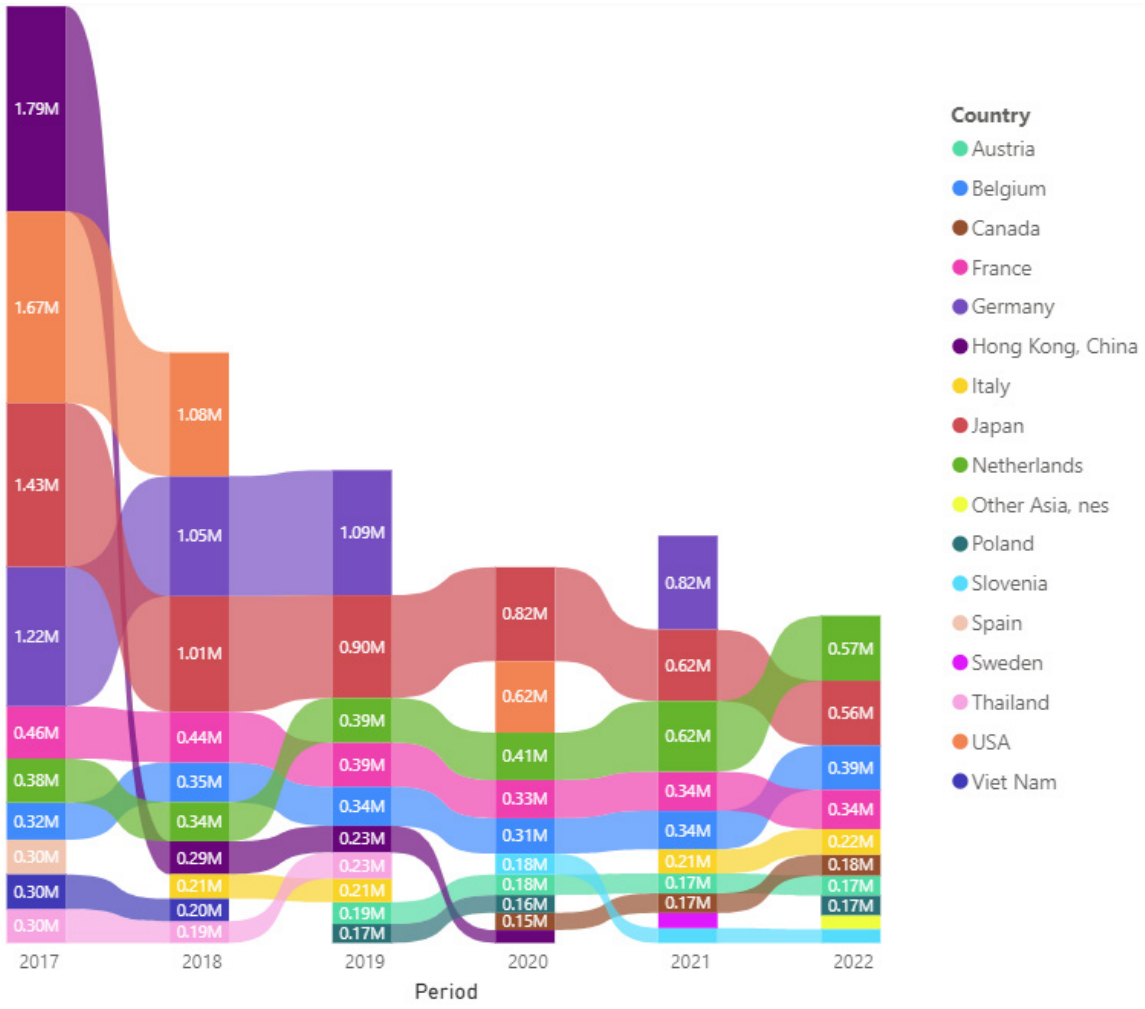


Figure 7 – Main plastic waste exporters, by quantity, in 2017–2022 (million tonnes) (Source: UN Comtrade, accessed January 2024)

Table 3 explains the breakdown by type of plastic waste currently available within UN Comtrade, classified by the six-digit HS codes. The classification below provides only a partial overview of the types of plastic waste traded. However, it allows for a baseline before the Basel Convention-regulated wastes are integrated into the current Harmonized System.

The most traded types of plastic between 2017 and 2022 in terms of quantity was the HS 3915-90 (other polymers), followed by HS 3915-10 (ethylene), with styrene and PVC representing 5% and 4%, respectively (Figure 8).

Table 3 – Types of plastic waste classified by the six-digit HS codes

HS code	Description	Notes
391510	Ethylene polymers; waste, parings and scrap	
391520	Styrene polymers; waste, parings and scrap	
391530	Vinyl chloride polymers; waste, parings and scrap	PVC is included in the Basel Convention's Plastic Waste Amendments, effective as of 1 January 2021, and requires compliance with the Prior Informed Consent procedure.[49]
391590	Plastics n.e.c. in heading no. 3915; waste, parings and scrap	Consists of plastics of other polymers than the ones listed above.[50]

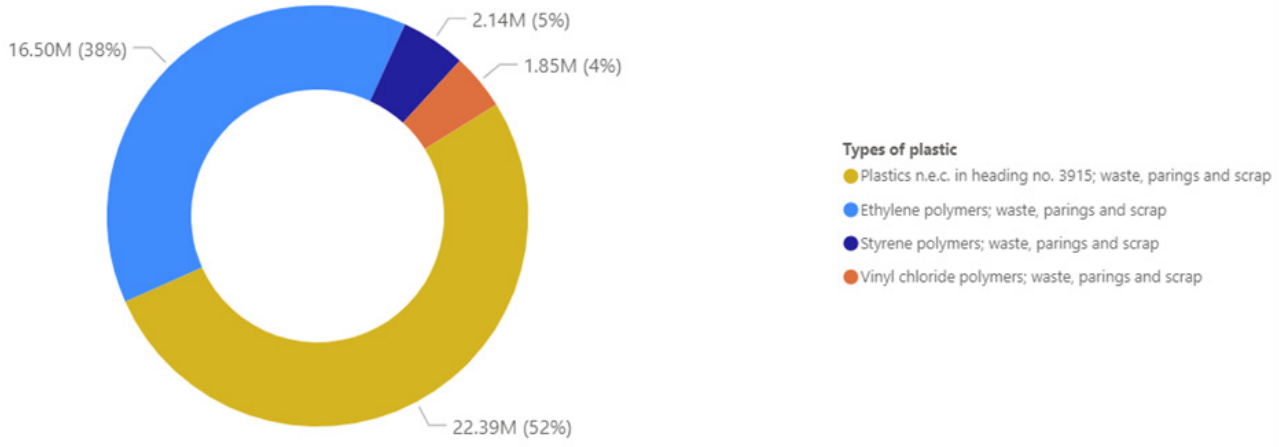


Figure 8 – Export share of four types of plastics (six-digit HS codes), by quantity, 2017–2022 (million tonnes) (Source: UN Comtrade, accessed in January 2024)

Metal waste and scrap

Metals are the most traded type of waste and highly sought-after raw materials worldwide due to how indispensable they are to the supply chains of modern manufacturing production.[51,52] The most traded types of metal waste are ferrous metal, copper, precious metals and aluminium. These metals are valuable resources that can be recovered and reused, reducing the reliance on virgin raw materials and minimizing the environmental impact associated with metal extraction. Moreover, recycling metal waste reduces energy consumption when compared to the production of metals from ores. The efficient handling of metal waste not only conserves natural resources but also helps in mitigating environmental pollution and minimizing the carbon footprint associated with metal production.[53] Metal waste can generally be recycled indefinitely without losing its qualities.[54]

Traditionally, the European Union and the United States dominated the metal market. But China's economic growth has made it today's largest trader of metal raw materials.[55,56] The metal and metal waste markets experienced considerable price fluctuations between 2017 and 2022 due to supply and demand dynamics, energy prices, trade restrictions and changes in industrial activity. During the COVID-19 outbreak, for instance, the strict containment measures and economic slowdown, especially in China, decreased metal demand and prices in 2020.

Ferrous metal waste and scrap

The main importers and exporters of ferrous metal waste and scrap, in terms of quantity and value for the period 2017–2022, are shown in Table 4.

For the given period, Türkiye was by far the main importer of ferrous metal waste for each year (except for 2018, when data on quantity is missing for this country), with more than 20% of the quantity imported globally. The ASEAN countries combined represent 12% of the global imports (at more than 59 million tonnes), with Viet Nam ranking fourth (nearly 33 million tonnes) and Indonesia fourteenth (11 million tonnes). Thailand ranked fifteenth, with around 7.5 million tonnes and Malaysia was eighteenth, with nearly 7 million tonnes.

Table 4 – Main importers and exporters of ferrous metal waste and scrap between 2017 and 2022 (Source: UN Comtrade, accessed January 2024)

Importer 2017–2022			Exporter 2017–2022		
Country	**Quantity (million tonnes)**	**Value (billion US$)**	**Country**	**Quantity (million tonnes)**	**Value (billion US$)**
1. Türkiye	108.06	45.95	1. United States	102.13	36.03
2. India	37.84	22.31	2. Germany	51.48	25.05
3. Republic of Korea	32.90	14.04	3. Japan	39.93	17.97
4. Viet Nam	32.63	11.26	4. Netherlands	37.82	19.23
5. United States	28.42	11.26	5. Canada	28.28	10.81
Second ASEAN country: 14. Indonesia	11.08	4.21	*Top ASEAN country:* 35. Singapore	2.10	2.58

The European Union countries combined were the top ferrous metal exporters, with more than 40% of global exports. The ASEAN region was not a major exporter of ferrous metal waste in the analysed time frame. The main ASEAN exporter of ferrous metal waste was Singapore,ranking thirty-fifth, with approximately 2 million tonnes between 2017 and 2022, followed closely by the Philippines (at 1.9 million tonnes), Malaysia (1.8 million tonnes) and Thailand (1.7 million tonnes).

Non-ferrous metal waste and scrap

Aluminium, copper and lead are the top three types of non-ferrous metal waste exported (and imported) globally between 2017 and 2022, with aluminium representing more than half (57%) of the global trade. The trade of copper was more than a third (34%) and the other types of non-ferrous waste were between 1% and 3% each.

The main importers and exporters in terms of quantity and value for 2017 and 2022 are shown in Table 6.

Table 5 – Non-ferrous metals included in this section

HS codes	Description
7112	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap containing precious metal compounds, of a kind uses principally for the recovery of precious metal
7112	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap containing precious metal compounds, of a kind uses principally for the recovery of precious metal **other than goods of heading 85.49.** (The seventh amendment to the Harmonized System took effect on 1 January 2022. This amendment encompasses HS code 8549, pertaining to electrical and electronic waste and scrap[57].
7404	Copper; waste and scrap
7503	Nickel; waste and scrap
7602	Aluminium; waste and scrap
7802	Lead; waste and scrap
7902	Zinc; waste and scrap
8002	Tin; waste and scrap

Table 6 – Main importers and exporters of non-ferrous metal waste between 2017 and 2022 (Source: UN Comtrade, accessed January 2024)

Importer 2017–2022			Exporter 2017–2022		
Country	**Quantity (million tonnes)**	**Value (billion US$)**	**Country**	**Quantity (million tonnes)**	**Value (billion US$)**
1. China	20.67	71.07	1. United States	13.46	80.30
2. India	10.76	24.44	2. Germany	9.82	36.04
3. Germany	9.97	64.50	3. France	4.70	14.33
4. Republic of Korea	7.75	27.59	4. Netherlands	4.46	11.48
5. United States	4.43	29.72	5. Canada	4.09	18.52
Top ASEAN country:			*Top ASEAN country:*		
7. Malaysia	4.15	7.21	18. Thailand	1.38	6.76

The major exporters through the 2017–2022 period are OECD countries, predominantly the United States and European Union countries. European Union countries combined are the main global exporter, representing almost half of the non-ferrous metal waste exports globally.

China was the main importer for the given period and for each year in the period. While its imports decreased steadily from 2017 to 2020, they bounced back in 2021 and 2022. India was the second- largest importer for the given period but also for most of the years. In terms of ASEAN countries, Malaysia wasis the seventh global importer throughout the period, while Thailand was in the top 20, Indonesia ranked twenty-fifth, and Viet Nam ranked thirty-third. While the quantities of non-ferrous metal scrap have been relatively steady since 2017, the value of imports increased by 72%, from $60 billion in 2017 to $103 billion in 2022. Different factors, such as shipping costs, may have contributed to the increase; but it also shows that the market value of this waste is much higher on the global market.

Paper waste

The global production of paper and paperboard has remained stable since 2010, averaging around 400 million tonnes each year, with a 4% increase between 2020 and 2021, to approximately 417.3 million tonnes.[58] In 2021, nearly half of all produced paper – 203 million tonnes – originated from recycled or recovered paper.[59] With many countries increasing their recycling rate targets, this proportion may increase further in the future. However, paper waste can only be recycled up to eight times, and some paper waste cannot be recycled at all, so an input of virgin fibre will always be necessary to produce new paper products.[60]

China implemented its prohibition of unsorted wastepaper imports (HS 4707900090) in 2018 as part of the China ban, followed by a total ban of all solid waste imports in 2021 that included all types of scrap paper.[61,62] This caused a shift of the flows of wastepaper to other parts of the world, such as to ASEAN countries.

Between 2020 and 2021, the value of exports of recovered paper grew by 53.7%, from $6.67 billion to $10.2 billion.[63] The main importers and exporters of paper waste and scrap in terms of quantity and value for the period 2017–2022 are shown in Table 7.

Table 7 – Main importers and exporters of paper waste between 2017 and 2022

Importer 2017–2022			Exporter 2017–2022		
Country	**Quantity (million tonnes)**	**Value (billion US$)**	**Country**	**Quantity (million tonnes)**	**Value (billion US$)**
1. China	61.11	13.59	1. United States	99.47	18.11
2. India	36.02	8.06	2. Japan	18.04	3.34
3. Germany	28.90	5.48	3. Netherlands	15.06	2.92
4. Indonesia	18.07	3.62	4. Canada	11.16	1.52
5. Netherlands	17.34	2.63	5. Germany	10.60	2.10
Second ASEAN country: 6. Viet Nam	16.85	3.21	*Top ASEAN country:* 17. Singapore	1.60	0.64

The position of China as the main global importer of paper waste between 2017 and 2022 is based on high imports in 2017, although they gradually declined until 2020. A steep drop from 2020 to 2021, from almost 7 million tonnes to half a million tonnes, was probably due to the complete ban on solid waste imports declared from 2021 onwards. In the ASEAN region, Indonesia was the biggest importer for paper waste, followed by Viet Nam, Thailand and Malaysia. Of other ASEAN countries, Lao People's Democratic Republic was among the notable importers.

The United States, Japan and numerous countries were among the top global exporters. The United States has been responsible for around half of the world exports each year since 2017.

E-waste

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*,[64] the e-waste generated globally increased by 17.4% between 2014 and 2019. E-waste generation is expected to continue increasing by an average of 2 million tonnes annually, reaching an estimated 74.7 million tonnes in 2030. Due to the general lack of processing capacity and high costs related to dismantling or disposal, some countries are shipping their e-waste overseas.[65]

According to the *Global Transboundary E-waste Flows Monitor 2022*,[66] an estimated 65% of the global transboundary movement of used electrical and electronic equipment (EEE) and e-waste is uncontrolled. In the European Union alone, an estimated 2,000–17,000 tonnes of e-waste were seized in 2019. But the actual annual volume of the illegal flow is likely much larger. According to UNITAR SCYCLE Programme estimates, in Asia, 180,000 tonnes (more than 62%) of imported e-waste were undocumented among the 290,000 tonnes of total imports in 2019.[67]

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. [68]

Since 2022, a new HS code (8549 – Electrical and electronic waste and scrap) was assigned to e-waste, and some countries declared imports and exports of such waste. Although only partial data are available so far (93 countries are covered in the 2022 data and data are monthly available in United States dollar value), and although it is not possible to distinguish the hazardous from non-hazardous e-waste according to the new HS code, this can increase transparency in the trade of e-waste globally. Moreover, following the Basel E-waste Amendments, all transboundary e-waste will be subject to the Prior Informed Consent

Box 2 – Basel Convention E-waste Amendments

The E-waste Amendments,[69] which were adopted in 2022 and will enter into force in January 2025, extend the Basel Convention's Prior Informed Consent procedure to all types of e-waste, both hazardous and non-hazardous.

procedure as of January 2025, regardless of its hazardousness. Table 8 presents key data.

Table 8 – Main importers and exporters of e-waste, 2022 (Source: UN Comtrade, accessed January 2024)

Importer 2022		Exporter 2022	
Country	**Value (billion US$)**	**Country**	**Value (billion US$)**
1. Japan	0.756	1. United States	0.698
2. Republic of Korea	0.520	2. Netherlands	0.178
3. Viet Nam	0.494	3. France	0.111
4. India	0.246	4. Germany	0.097
5. Germany	0.193	5. Canada	0.050
Second ASEAN country: 19. Indonesia	0.014	*Top ASEAN country:* 8. Viet Nam	0.042

Box 3 – Imports and exports of hazardous waste under the Basel Convention's Prior Informed Consent procedure

According to the Basel Convention report Waste Without Frontiers II (2018)[70] between 2007 and 2015, the volume of reported transboundary movements increased from 9.3 million tonnes to 14.4 million tonnes globally. This increase was mainly driven by the increased transboundary movements of household waste. The flow of hazardous waste was stable over this period.[71]

For the 2007–2015 data, most transboundary movements of hazardous wastes took place to and from a limited number of countries. The top 10 importing States received 80% of all imports, and the top 10 exporting States represented 75% of all exports. The countries within the top 10 were nearly the same as in 2004–2006. Recovery operations represented 75% of the disposal operations that hazardous waste will undergo in the State of import. Recycling and reuse operations represented around 60% of the disposal operations and incineration (both recovery and final disposal operations) around 20%. Half of the exports of hazardous wastes for recovery purposes took place from low-income countries. And 95% of transboundary movements remained within the same region. Only a limited amount was exported between regions, keeping in mind that data from OECD countries are more readily available.[72]

1.2. Analysis of ASEAN countries

Total waste and scrap imports to ASEAN from the rest of the world

For the five years between 2017 and 2021 combined, the 10 ASEAN countries imported almost 110 million tonnes of waste of metal, paper and plastic, valued at over $50 billion.

When the China waste import ban took full effect on 1 January 2018, ASEAN countries experienced a rising level of waste and scraps imports (for all types of waste combined), from 16.7 million tonnes in 2017 to almost 20 million tonnes in 2018, amounting to an approximately 20% increase. Waste imports in the ASEAN region continued to grow in the following years, reaching 26.5 million tonnes in 2021, which was an increase

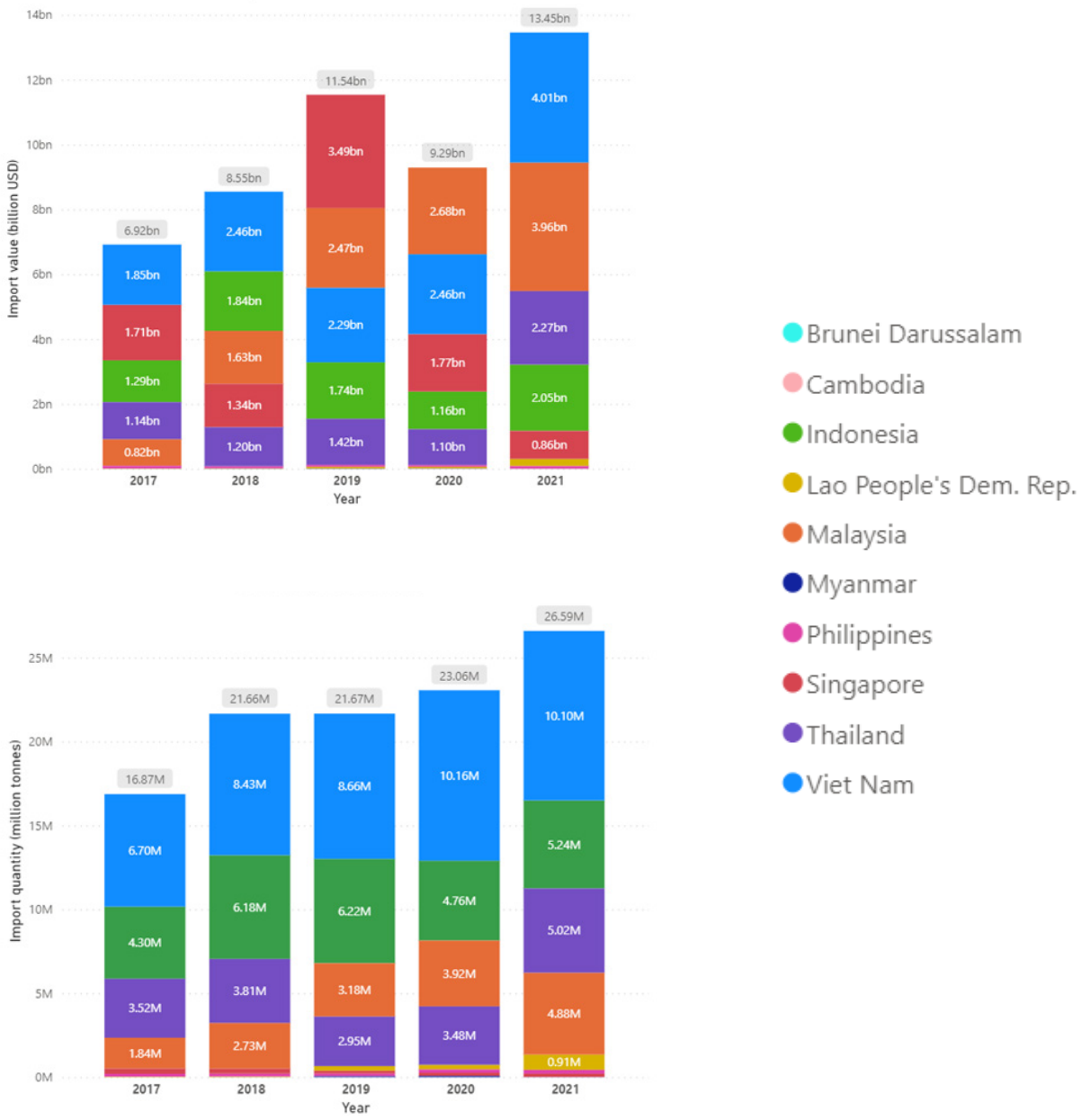


Figure 9 – Imports of waste and scrap by 10 ASEAN countries (10 HS codes combined), by quantity and value, 2017–2021 (million tonnes and billion US$) (Source: UN Comtrade, accessed September 2023)

of nearly 58% from 2017. Viet Nam, Indonesia, Thailand and Malaysia were the leading importers, all of which experienced an increase in import volumes following the 2018 China ban. The steady increase continued in Viet Nam and Malaysia, with respective increases of approximately 3.4 million tonnes and 3.04 million tonnes in 2021 compared to 2017. Indonesia reported a 1.46 million tonnes decrease in imports in 2020 comparing to previous year, a fluctuation that may correlate with the impacts of the COVID-19 pandemic or with the implementation of national policy to restrict the importation of waste and scrap (see Chapter 4 for more information on measures taken by individual countries in Southeast Asia).

Similar to the trend in import volume, the value of waste and scrap imports by the ASEAN countries increased steadily after 2017, except in 2020, when the value decreased to $9.3 billion; it subsequently rose to $13,5 billion in 2021.

Main waste importers in the ASEAN region

In terms of the waste import value, Viet Nam, Thailand, Indonesia and Malaysia remained the primary waste and scrap importers in the region, along with Singapore. Despite the limited quantity of waste imported by Singapore, it ranked third in ASEAN in terms of import value for the five-year period of 2017–2021, ranking first in 2019, at almost $3.5 billion.

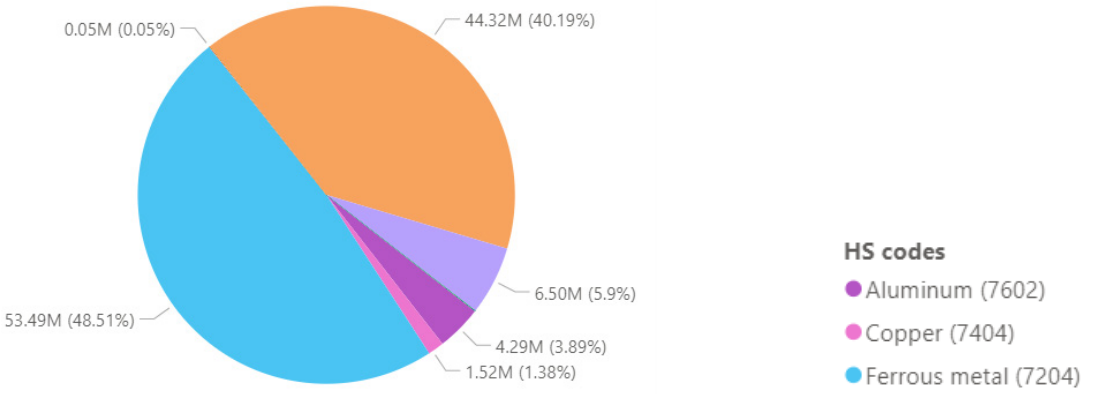


Figure 10 – Main types of waste imported into ASEAN region, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

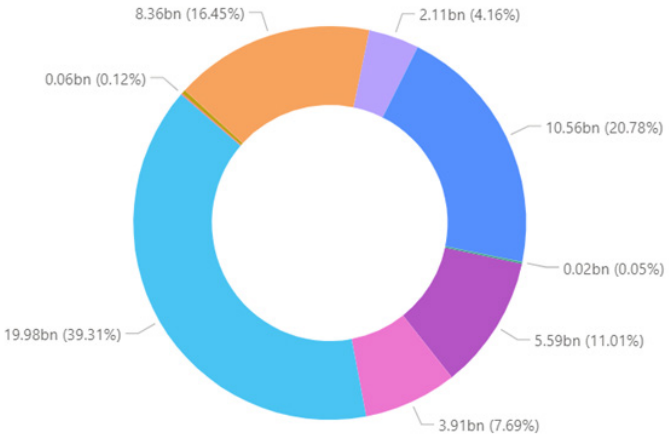


Figure 11 – Main types of waste imported into ASEAN region, by value, 2017–2021 (billion US$) (Source: UN Comtrade, accessed September 2023)

Viet Nam, Thailand, Malaysia and Indonesia imported 96.6% of the total quantity of waste that flowed into the region between 2017 and 2021. The remaining 3.4% of the imported waste was shared among the six other ASEAN Member States. Viet Nam was the top destination, receiving more than 40% of the total imported waste and scrap, followed by Indonesia (at 24.3%), Thailand (at 17.1%) and Malaysia (at 15.1%).

The primary waste exporters to the ASEAN countries from 2017 to 2021 included the United States, Japan, Australia, the United Kingdom and Hong Kong (China). Additionally, Italy, the Netherlands, France, Spain, Germany, Belgium and Greece were among the top 25 exporters. Collectively, these European countries would rank as the third-largest exporter to ASEAN in both quantity and value.

Main types of waste imported in the ASEAN region

The main imported types of waste by quantity (Figure 10) were ferrous waste (48.5%), paper waste (40.2%), plastic waste (5.9%) and aluminium waste (3.9%).

In terms of import value (Figure 11), the main types of waste were ferrous waste and scrap (HS code 7204), precious metal waste and scrap (HS 7112), paper waste and scrap (HS code 4707), aluminium waste and scrap (HS code 7602), copper waste and scrap (HS code 7404) and plastic waste (HS code 3915).

Plastic waste and scrap

Between 2017 and 2021, the 10 ASEAN countries imported nearly 6.5 million tonnes of plastic waste, valued at over $2 billion (Table 9). After more than doubling from 2017 to 2018, from 1 million to 2 million tonnes, the imports decreased in 2019 to 1.1 million tonnes, close to pre-China ban values. They have stayed relatively stable since.

Malaysia, Viet Nam, Thailand and Indonesia imported more than 95% of the total plastic waste in the ASEAN region in the given period (Table 10). Malaysia was the main plastic waste importer in the ASEAN region in terms of quantity, with more than 40% of the total ASEAN imports, follow by Viet Nam (20%), Thailand (18%) and Indonesia (16%). Although Malaysia ranked first every year, it has gradually decreased its imports since 2019 to quantities that were smaller than prior to the China ban. Although Thailand and Indonesia decreased imported plastic waste quantities after the 2018 peak, Viet Nam gradually increased its imports and doubled them, from 149,000 tonnes in 2017 to almost 380,000 tonnes in 2021.

Concerning plastic exporters to the ASEAN region between 2017 and 2021, the European Union countries combined ranked first, at 22% and more than 1.4 million tonnes, followed by the United States, with 1.2 million tonnes and Japan, at 1.1 million tonnes.[73]

Table 9 – Proportion of ASEAN region's plastic waste imports among global imports, 2017–2021 (Source: UN Comtrade, accessed September 2023)

	Tonnes	US$
Plastic imports in ASEAN countries	6,479,406	2,107,954,489
Plastic imports globally	37,707,502	17,468,143,367
Proportion	17%	12%

Table 10 – Plastic imports in ASEAN countries, by aggregated values, 2017–2021 (tonnes and US$) (Source: UN Comtrade, accessed September 2023)

ASEAN country	Sum of net weight (tonnes)	Sum of primary value (US$)
Malaysia	2,638,914	744,656,572
Viet Nam	1,328,431	676,389,676
Thailand	1,153,415	207,869,224
Indonesia	1,045,295	374,069,529
Lao PDR	196,333	49,597,293
Philippines	55,643	30,961,726
Myanmar	30,203	9,845,662
Singapore	28,661	12,528,273
Cambodia	1,481	704,146
Brunei Darussalam	1,029	1,332,387
Total	**6,479,406**	**2,107,954,489**

Metal waste and scrap

Between 2017 and 2021, almost 59.2 million tons of metal waste (for eight selected HS codes)[74] were imported into the ASEAN region. The quantities of metal waste imports increased steadily during the whole period.

Ferrous metal scrap was the most imported waste stream into ASEAN countries between 2017 and 2021, followed by non-ferrous metals (aluminium and copper waste). These three types of metal waste accounted for more than 99% of all metal waste imports in those five years.

Ferrous metal scrap trade fluctuated over the five years, from 9.5 million tonnes in 2017 to a peak of 11.2 million tonnes in 2018 and then slightly falling back to 11 million tonnes in 2021. The waste aluminium trade consistently increased, from 388,000 tonnes in 2017 to 1.5 million tons in 2021, while the copper waste trade increased from 66,000 to 407,000 tonnes from 2017 to 2019, then remained steady, at an average of 370,000 tonnes imported in 2020-2021.

For all categories of metal scrap combined, the primary exporters to ASEAN were Japan, the United States, Australia, Hong Kong (China) and Singapore. The main importing country of metal waste in the ASEAN region between 2017 and 2021 (Table 11) was Viet Nam (at 28.8 million tonnes, which was nearly 50% of the total amount imported into the region), followed by Indonesia at 18%. Like Viet Nam, Malaysia and Thailand had seen a significant and consistent increase throughout the five-year period.

Table 11 – Imports of metal waste in four ASEAN countries 2017–2021 (tonnes) (Source: UN Comtrade, accessed September 2023)

Period	Thailand	Malaysia	Indonesia	Viet Nam	Total
2017	1,863,780	1,028,221	1,978,211	4,753,933	9,624,146
2018	1,863,145	1,523,956	2,668,189	5,811,596	11,866,887
2019	1,166,485	2,280,709	2,792,132	5,596,573	11,835,890
2020	1,723,441	2,373,835	1,579,261	6,343,925	12,020,462
2021	2,056,541	2,685,596	1,636,852	6,326,388	12,705,378
Total	**8,673,393**	**9,892,318**	**10,654,645**	**28,832,416**	**58,052,771**

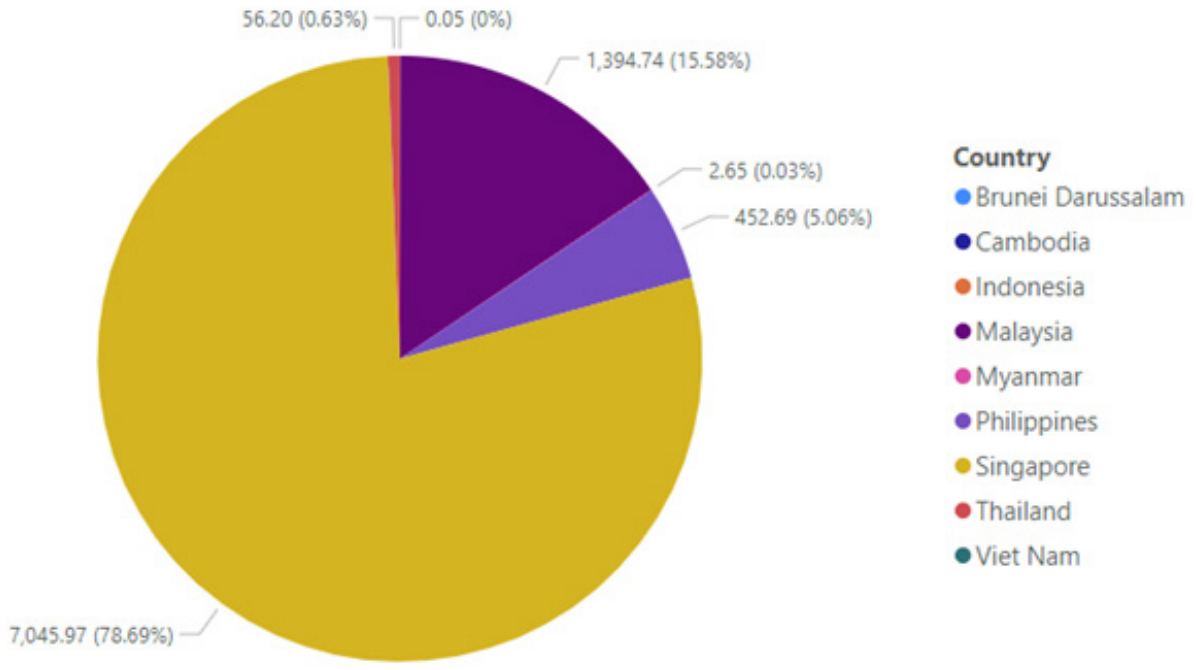


Figure 12 – Import of precious metal scrap (HS 7112) in ASEAN countries, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

While Viet Nam was the main importer of waste ferrous metal (28.5 million tonnes) between 2017 and 2021, Malaysia was the main importer of aluminium and copper waste in that period. In the ASEAN region, Singapore is by far the main importer of precious metals scrap, with more than 7,000 tonnes, representing 78% of all countries, followed by Malaysia (1,400 tonnes, or 16%) and the Philippines (452 tonnes, or 5%). Singapore is indeed an important manufacturer of goods that require precious metals, especially electronic goods,[75] which may explain the large import of precious metals scrap.

Paper waste

Between 2017 and 2021, the ASEAN countries imported more than 44 million tonnes of paper waste, valued at more than $8.3 billion and representing 20% of the global imports (Table 12). The quantity of paper waste imports more than doubled in the ASEAN region during this period, raising from 6 million tonnes in 2017 to nearly 12.5 million tonnes in 2021. The value also almost tripled from $1.2 billion to $3.2 billion.

Over the five-year period, Indonesia was the main importer of paper waste in the ASEAN region in terms of quantity, ranking fourth globally and followed closely by Viet Nam and Thailand (sixth and seventh position globally) (Table 13). Lao PDR was also in the top 20 globally in 2021 and fifth in the ASEAN region for the whole period. The quantity of paper waste imports more than doubled during this period. All countries consistently increased their imports during the five-year period, with the Lao People's Democratic Republic having the sharpest increase, from 49 tonnes in 2017 to almost 1 million tonnes in 2021. Malaysia also increased its imports almost sevenfold after 2017, reaching nearly 1.8 million tonnes in 2021.

The United States (at 13.6 million tonnes), Japan (a almost 5 million tonnes) and the United Kingdom (at almost 5 million tonnes) were the top three exporters of paper waste to ASEAN countries. The European Union countries combined exported more than 9 million tonnes, a figure ranking second after the United States

Table 12 - Paper waste imported into ASEAN countries, 2017–2021 (tonnes and US$) (UN Comtrade, accessed in September 2023)

	Tonnes	US$
Paper imports into ASEAN region	44,214,309	$8,334,198,339
Paper imports globally	**219,431,007**	**$49,770,327,540**
%	**20%**	**17%**

Table 13 – Total imports of paper waste into ASEAN countries, by five-year quantity and value, 2021 (tonnes and US$) (Source: UN Comtrade, accessed September 2023)

ASEAN country	Sum of net weight (tonnes)	Sum of primary value (US$)
Indonesia	15,011,571	2,801,509,139
Viet Nam	13,890,192	2,449,694,237
Thailand	8,948,134	1,725,238,852
Malaysia	4,024,861	846,892,686
Lao PDR	1,233,605	272,903,709
Philippines	671,758	160,986,530
Singapore	302,970	64,501,925
Myanmar	129,693	11,443,315
Cambodia	885	126,713
Brunei Darussalam	636	901,234
Total	**44,214,309**	**$8,334,198,339**

and representing 20% of the quantity imported by ASEAN countries.

E-waste

In 2022, the first year of the HS code dedicated to e-waste, six of the 10 ASEAN countries declared import and export quantities and values of e-waste to UN Comtrade. Viet Nam was the largest trader, with transactions of imports totalling almost $500 million, followed distantly by Indonesia, Thailand, and Singapore, with much smaller trade values (from $22 million to $26 million for both import and export).

Thailand had prohibited the importation of 428 types of e-waste under HS code 84 and HS code 85 in 2020.[76] Effective 1 January 2024, the country revised its commodity codes under HS 8549 to include a national statistics code added at the end of the four- or six-digit HS codes for identifying hazardous waste covered by the Basel Convention (Code 899). This is as the importation of some e-waste types under this HS code are still allowed.[77] Similarly, the importation of e-waste into Indonesia is prohibited because it is categorized as hazardous waste.[78] However, not all the commodities under HS 8549 are considered hazardous and thus are not included in the regulation, which allows the importation of some types of e-waste.

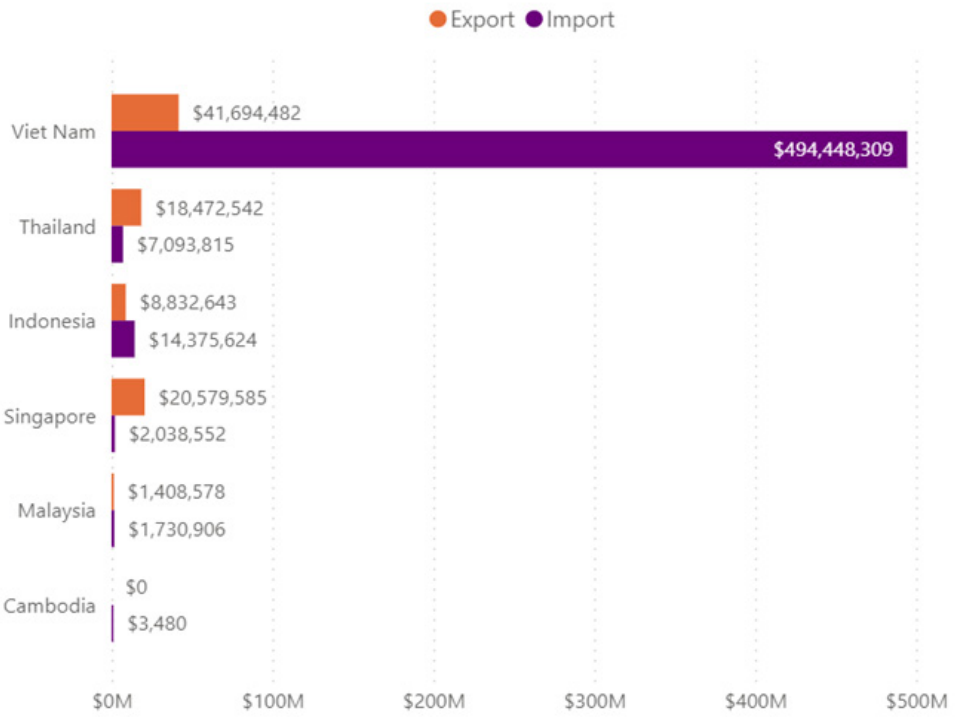


Figure 13 – Main e-waste importers in ASEAN region, by value, 2022 (US$) (Source: UN Comtrade, accessed January 2024)

Figure 14 shows the main exporters of e-waste to ASEAN countries in 2022. The presence of Thailand, Singapore, Malaysia and Viet Nam on the list shows the intraregional trade, which totals nearly $91 million and represents 18% of the total exports.

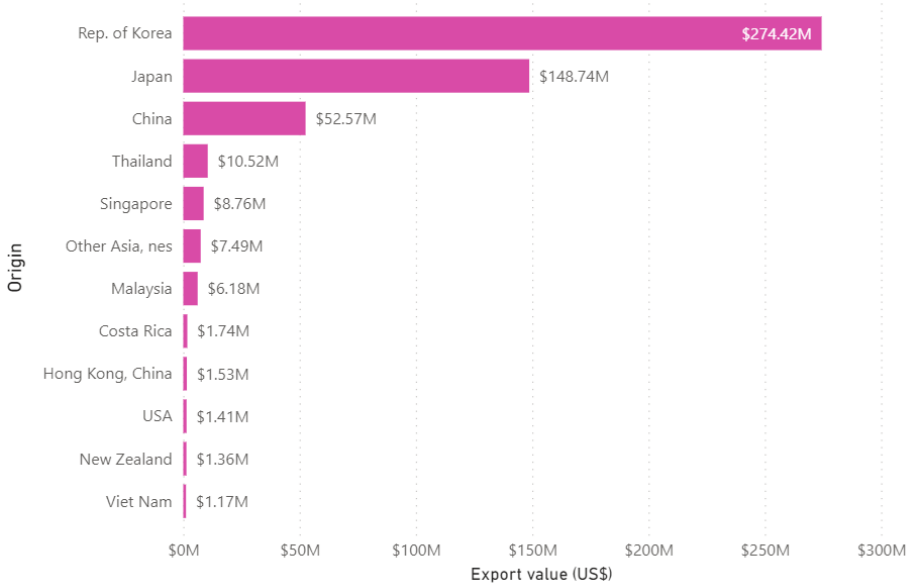


Figure 14 – Main exporters of e-waste to the ASEAN region, by value, 2022 (US$) (Source: UN Comtrade, accessed January 2024)

Hazardous waste

The analysis of hazardous waste is based on national reports to the Basel Convention and was limited to the four focus countries targeted by the *Unwaste* project – Indonesia, Malaysia, Thailand and Viet Nam. Additional data from other ASEAN countries are available in their national reports on the website of the Basel Convention. Of the four countries, only Malaysia and Thailand reported imports of hazardous waste, Thailand mostly in 2017 and Malaysia between 2018 and 2020 (Figure 15). Thailand mainly imported WEEE, but imports decreased sharply in 2018, when the country started announcing e-waste bans and restrictions.

A total of 94.5% of this waste was imported from East Asian and Southeast Asian countries. The remaining 5.5% were shared between Oceania (2.5%), Western Europe (1.8%) and South Asia (1.2%).

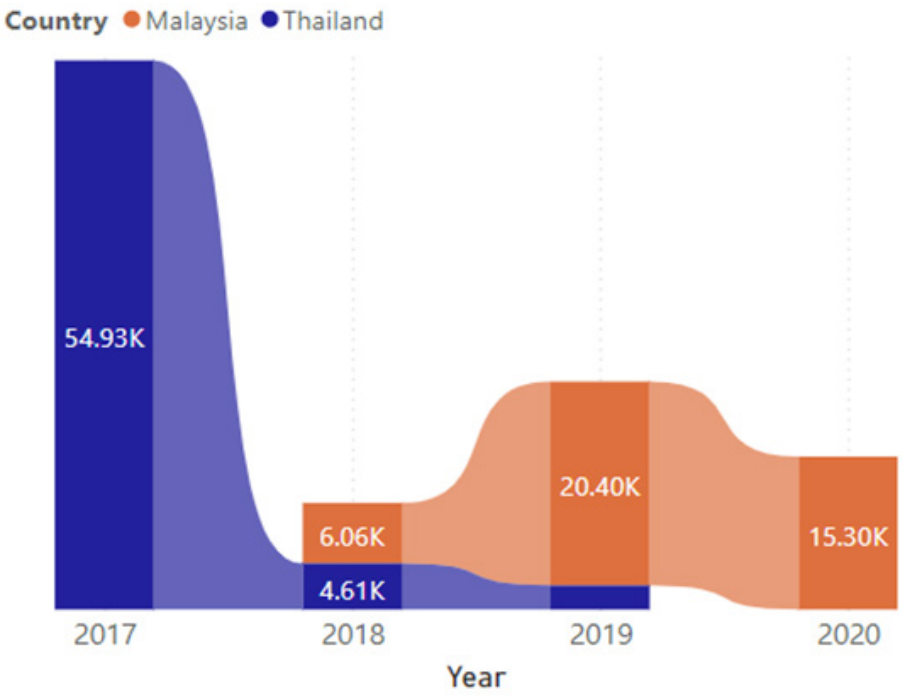


Figure 15 – Hazardous waste imported into Malaysia and Thailand, 2017–2020 (thousand tonnes) (Source: Basel Convention national reports)

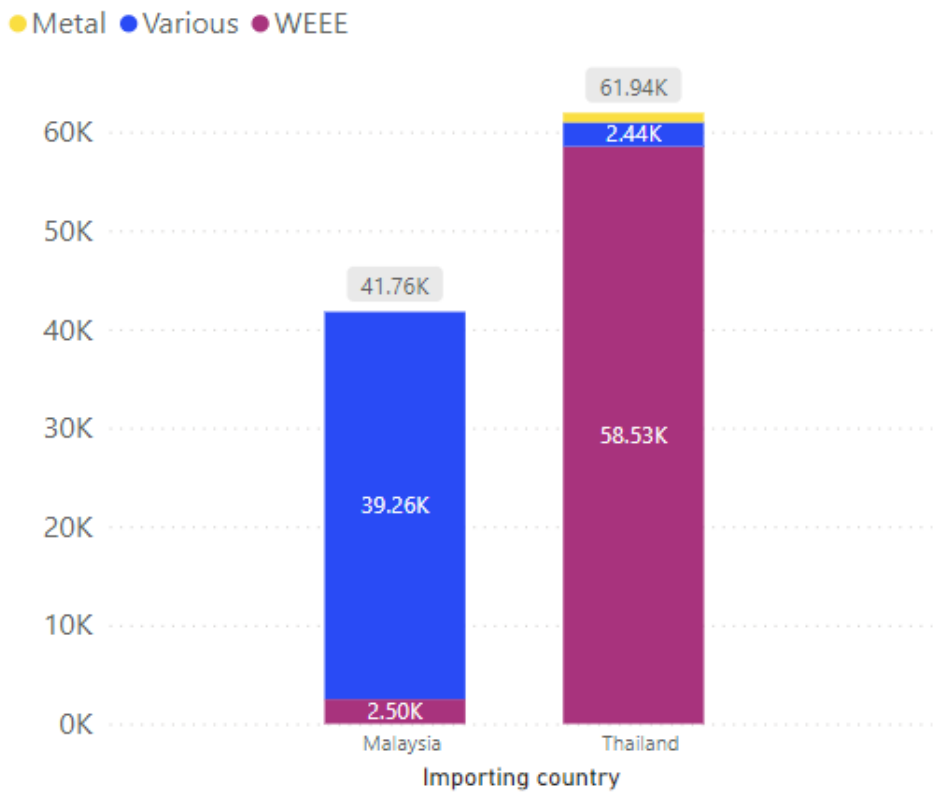


Figure 16 – Types of hazardous waste imported into Malaysia and Thailand, by quantity, 2017–2021 (thousand tonnes) (Source: Basel Convention national reports, accessed April 2023)

1.3. Waste and scrap imports from the European Union to ASEAN countries

Import quantities from the current European Union Member States (EU27) to ASEAN countries substantially increased, from 1.25 million tonnes in 2017 to a peak of 3.16 million tonnes in 2019 (an increase of 153%, or 2.5 times). Import values peaked at $1.5 billion in 2021 (Figure 17).

During the 2017–2019 period and while still a member of the European Union, the United Kingdom exported nearly 4 million tonnes of waste to ASEAN countries, with a value exceeding $1 billion. Subsequently, United Kingdom exports to the region continued to rise, reaching more than 2 million tonnes in 2021, valued at $734 million.[79]

The main types of waste imports into the ASEAN region from the current European Union Member States from 2017 to 2021 (Figure 18) consisted of paper waste (HS 4707), plastic waste (HS 3915), ferrous waste (HS 7204), aluminium waste (HS 7602) and copper waste (HS 7404). Paper waste accounted for 76% of the ASEAN region's overall waste imports from the European Union, with the largest amount of paper waste imported in 2019 (2.44 million tonnes). Plastic waste (HS 3915) imported to the ASEAN region peaked in 2018, amounting to 370,000 tonnes and slightly decreased to an average of 300,000 tonnes in the past years.

Indonesia received the most waste from the European Union over the course of five years (2017–2021), accounting for 5.21 million tonnes,

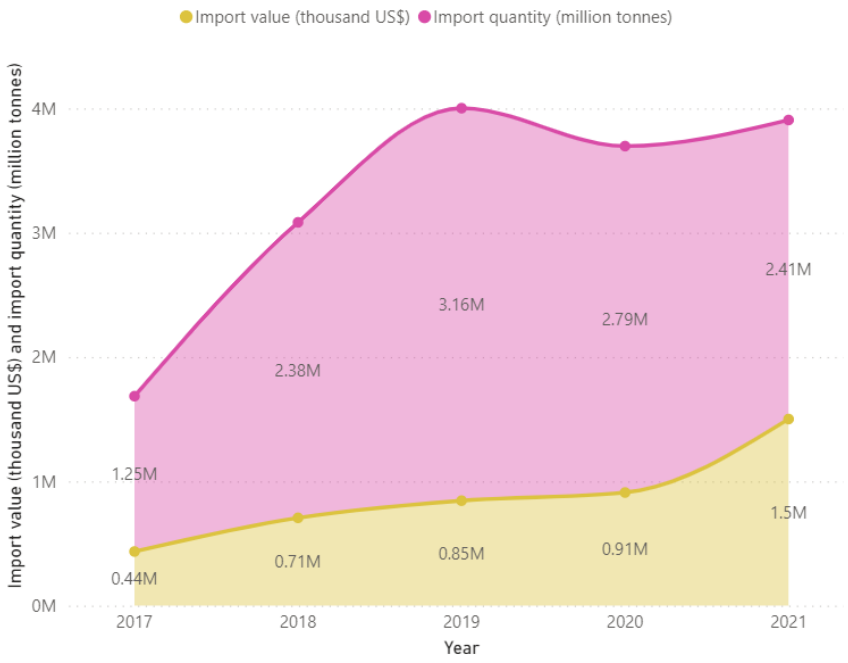


Figure 17 – Waste and scrap imports from the European Union to ASEAN countries, by value and quantity, 2017–2021 (million US$ and million tonnes) (Source: UN Comtrade, accessed September 2023)

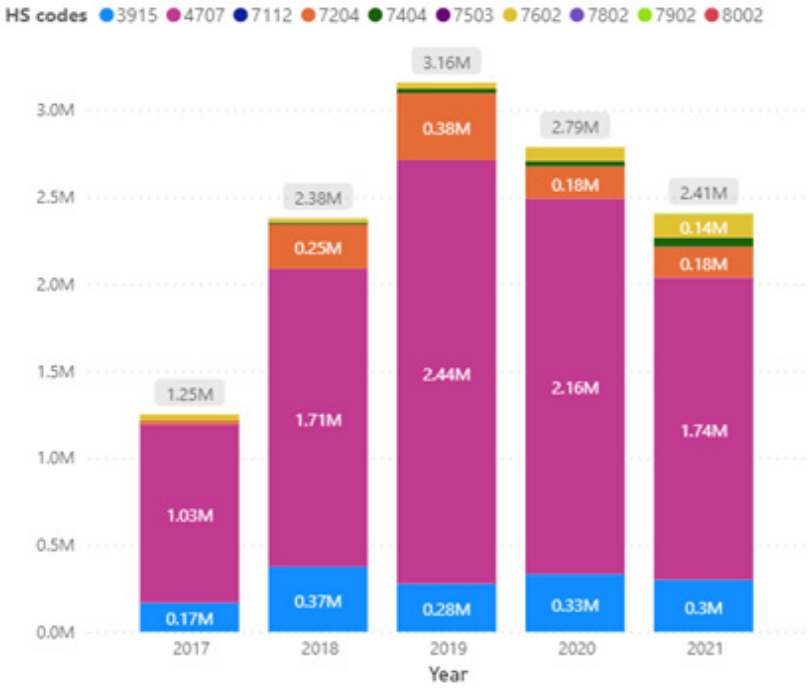


Figure 18 – Main waste types imported from the European Union to the ASEAN region, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

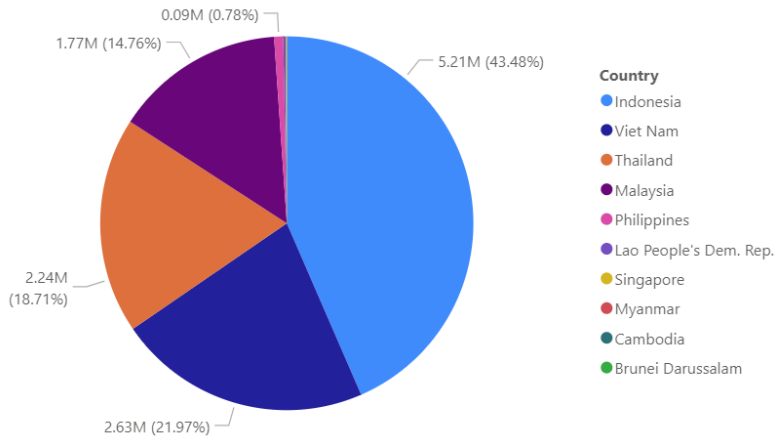


Figure 19 – Top importing ASEAN countries, by 10 waste HS codes combined, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2024)

or 43% of the total amount of waste exported by the European Union to ASEAN countries (with the waste originating mainly from Italy, the Netherlands and France). Second was Viet Nam (receiving 2.63 million tonnes (22%), mainly from the Netherlands, Italy and Spain) and third was Thailand (receiving 2.24 million tonnes (19%) of waste, mainly from Italy, the Netherlands and France) (Figure 19). Another major recipient of waste from the European Union was Malaysia (receiving 1.77 million tonnes of waste, mainly from Germany, the Netherlands and Spain).

Although Singapore ranked 7th in terms of imported quantities, it stands as the 2nd largest importer by value, closely following Indonesia, with imports exceeding $1 billion and consisting almost exclusively of waste and scrap of precious metals (HS Code 7112), predominantly from France and Italy.

Figure 20 shows the top seven exporters from European Union countries to ASEAN countries from 2017 to 2021. Italy ranked the highest, with a cumulative 3.12 million tonnes of waste exported, followed by the Netherlands, which exported 2.49 million tonnes of waste.

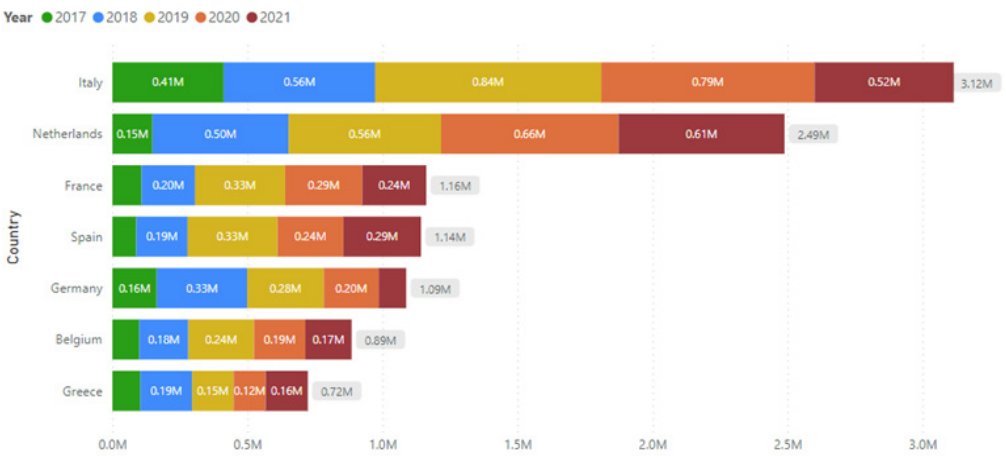


Figure 20 – Top waste exporters from the European Union to ASEAN countries, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

Malaysia stood out as the primary ASEAN importer of plastics from the European Union, with European Union exporters to ASEAN including Germany, the Netherlands, Belgium and Spain (Table 14). Meanwhile, the United Kingdom exported 350,000 tonnes of plastic to ASEAN countries during the same period.

Table 14 – ASEAN's leading plastic waste importers from the EU27 and the top EU27 exporters to ASEAN countries, 2017–2021 (Source: UN Comtrade, accessed January 2024)

Importing country	Net weight (tonnes)	Cif value
Malaysia	774,816	$226,637,643
Indonesia	439,089	$154,634,965
Viet Nam	133,928	$59,370,468
Thailand	70,918	$11,654,061
Exporting EU country		
Germany	447,417	$127,309,025
Netherlands	336,225	$134,463,285
Belgium	227,645	$77,076,854
Spain	144,846	$42,219,616

Table 15 – ASEAN's leading metal waste importers from the EU27 and the top EU27 exporters to the ASEAN countries, 2017–2021 (Source: UN Comtrade, accessed January 2024)

Importing country	Net weight (tonnes)	Cif value
Viet Nam	412,599	$208,640,415
Indonesia	405,623	$211,425,505
Malaysia	383,071	$533,464,795
Thailand	243,892	$316,447,848
Singapore	5,848	$1,091,964,026
Exporting EU country		
Netherlands	422,671	$259,919,781
Poland	274,397	$105,495,968
Germany	185,287	$364,983,859
Belgium	122,509	$149,191,112
Spain	120,591	$108,037,503

Viet Nam was the leading importer of metal waste, followed closely by Indonesia, while Singapore leads in terms of value of the waste imported(Table 15). The top European Union exporters were the Netherlands, Poland and Germany. The United Kingdom exported more than 2 million tonnes of metal waste to ASEAN countries during the same period.

Indonesia is the top paper importer in the ASEAN, with Italy, Netherlands and France being the top European Union exporters. The United Kingdom sent almost 5 million tonnes of paper to ASEAN during the same period.

Table 16 – ASEAN's leading paper waste importers from the EU27 and the top EU27 exporters to ASEAN countries, 2017–2021 (Source: UN Comtrade, accessed January 2024)

Importing country	Net weight (tonnes)	Cif value
Indonesia	4,362,174	$770,770,834
Viet Nam	2,084,135	$337,248,744
Thailand	1,925,543	$319,506,799
Malaysia	609,617	$126,002,897
Exporting EU country		
Italy	3,039,427	$516,056,877
Netherlands	1,729,759	$300,794,183
France	1,001,998	$167,035,256
Spain	877,021	$161,386,724
Greece	708,253	$131,322,347

E-waste exports from Europe to ASEAN countries

The 2022 data show exports from the European Union to the ASEAN region totalling $2 million and representing 0.4% of the total value of exports to the region.[80] However, according to 2019 data from the UNITAR's SCYCLE Programme, Western Europe was the main region in Europe exporting used EEE and e-waste for reuse to the ASEAN region[81] (at 111,300 tonnes), followed by Southern Europe (at 85,700 tonnes). All the European Union countries, with the exception of Cyprus, exported e-waste to the ASEAN region. Asia had the highest level of intraregional trade, followed by Europe, which represented the second region exporting to Asia.[82]

Chapter Two: Legal Frameworks to Address Waste Trafficking in the ASEAN Region – A Review and Gap Analysis

Demonstrating the region's recognition of the need to tackle waste crime, all ASEAN Member States have enacted national laws and regulations that target the issue. UNEP, through the *Unwaste* project and with the support of UNODC, conducted a review and gap analysis of the waste-trafficking-related legal framework in all 10 ASEAN member countries. This chapter captures key highlights of the resulting report from that review. Readers are encouraged to refer to the full report of the same title, which is a separate publication in the *Unwaste* report series.

Key takeaways

- All ASEAN Member States have ratified the Basel, Rotterdam and Stockholm Conventions and enacted national laws on implementation of each Convention's provisions, to varying degrees and relevancy.
- Four ASEAN Member States have ratified the Basel Convention Ban Amendment that prohibits European Union Member States, OECD countries and Liechtenstein from exporting hazardous waste to all other countries for final disposal or recycling.
- All ASEAN Member States have ratified the UNTOC, the UNCAC and the ASEAN Treaty on Mutual Legal Assistance on Criminal Matters and have taken measures to put their provisions into effect, including passing national laws to criminalize transnational organized crime, creating law enforcement and judicial cooperation mechanisms and providing training and capacity-building for law enforcement officials.
- Many ASEAN Member States have established anti-corruption agencies, passed national legislation to criminalize corruption and provided a framework for cooperation for extradition and mutual legal assistance requests.
- All ASEAN Member States have enacted laws and regulations to combat money laundering, including anti-money laundering laws and asset forfeiture laws.
- While the nature and scope of waste crime laws vary among ASEAN Member States, most Member States have a legal framework in place that includes penalties, such as fines and imprisonment, as well as administrative sanctions. However, the degree of criminal penalties for waste crime offences differs across the ASEAN Member States.
- Most criminal penalties across the region are not effective, proportional or dissuasive. Loopholes and other weaknesses in the national legislative framework are common.

As the other chapters of this report point out, several Member States of ASEAN have become major destinations for waste from high-income countries. Much of the inflow to the region arose after China's waste import ban, which became effective at the start of 2018. A substantial increase in waste imports has been recorded in Indonesia, Malaysia, Thailand and Viet Nam. In response, the ASEAN Member States have actively sought to comply with the international legal framework relevant to combating waste crime. Challenges remain, such as loopholes and other weaknesses in the national legislative frameworks, that need to be addressed through legal and policy reform. This review conducted by UNEP, through the *Unwaste* project and with the support of UNODC, took stock of the legal framework in each country and evaluated them against the desired outcomes to draw recommendations. The resulting report, of which the full version is a separate publication in the *Unwaste* report series, is thus intended to become a practical tool for governments and stakeholders to enhance their legislative frameworks aimed at combating waste trafficking.

2.1. Government responses to China's import ban

As explained in subsequent chapters, China's ban on the importation of 24 types of solid waste in 2018 has had considerable influence on waste trafficking in the ASEAN region. Several countries have become primary destinations for this waste. As the illegal trafficking of waste elevated into a significant issue following the China ban, Southeast Asian countries moved more proactively to protect their waste management systems with policy measures and interventions, such as stricter import regulations.

Malaysia, Thailand and Viet Nam, for instance, introduced restrictions on plastic waste imports. Malaysia temporarily halted imports in 2018 through a three-month freeze on import permits for plastic waste.[83] In addition to a cessation on the issuance of new import permits for plastic waste in 2018, Thailand banned e-waste imports in 2020 and recently declared a ban on all plastic waste imports as of 2025.[84] Viet Nam introduced significant measures early on after the China import ban, including the announcement in April 2019 of its intention to fully prohibit the importation of plastic scrap by the end of 2025.[85]

Indonesia introduced stricter regulations limiting the conditions and types of waste that can be imported. The Government created an interagency task force comprising different ministries and law enforcement agencies to oversee and regulate the importation of non-hazardous waste. These moves echo similar approaches by other Southeast Asian countries in adopting stricter regulations and interventions.

2.2. Regional overview of legal frameworks on waste trade

ASEAN as an organization has taken a strong position on the transboundary movement of waste. In 2017, ASEAN issued a Joint Declaration on Hazardous Chemicals and Wastes Management that calls upon Member States to strengthen their cooperation and coordination towards the establishment of environmentally sound systems for managing hazardous chemicals and waste. This was followed by the ASEAN Foreign Ministers' Statement on Illegal Transboundary Movement of Hazardous Waste and Other Wastes in Southeast Asia in 2019, which emphasized that all States should take necessary measures to address hazardous and chemical waste and enhance cooperation in preventing illegal transboundary movements.

As Table 17 articulates, these instruments are further complemented by ASEAN policies on marine debris and the circular economy.

Table 17 – Policy development relating to the waste trade in ASEAN

ASEAN Charter (2007)	• The ASEAN Charter serves as a guiding document for ASEAN Member States in promoting regional cooperation and integration, including in areas related to the environment. • One of the principles outlined in the ASEAN Charter is the promotion of sustainable development and environmental protection.
ASEAN Socio-Cultural Community Blueprint 2025 and Strategic Plan (2015)	• The blueprint and strategic plan serve as a guideline for ASEAN Member States to achieve a common vision and goals in education, health, environment, culture and social welfare. • They provide guidance for country-specific plans of action for promoting ASEAN cooperation on the environment until 2025, with strategic priorities regarding chemicals and waste management.
ASEAN Joint Declaration on Hazardous Chemicals and Wastes Management (2017)	• The Declaration calls upon ASEAN Member States to strengthen their cooperation and coordination towards the establishment of environmentally sound systems for the management of hazardous chemicals and wastes. • It also calls upon ASEAN Member States to establish networks to improve the supervision of trade in hazardous chemicals and waste and to enhance information exchange to prevent the illegal waste traffic. • It encourages ASEAN Member States to ratify the Basel Convention Ban Amendment and accelerate its implementation.
Protocol on the Legal Framework to implement the ASEAN Single Window (2017)	• The Protocol seeks to enhance ASEAN trade efficiency and competitiveness by enabling the electronic exchange of trade-related documents through an ASEAN Single Window initiative. • The ASEAN Single Window is a step towards the goal of an ASEAN Economic Community by significantly expediting cargo shipments and promoting ASEAN economic integration.
ASEAN Foreign Ministers' Statement on Illegal Transboundary Movement of Hazardous Waste and Other Wastes in Southeast Asia (2019)	• The Statement expresses serious concern about the growing threat and adverse effects to human health and the environment posed by the increased transboundary movement of illegal waste. • It emphasizes that all States must impose necessary measures to ensure the environmentally sound management of hazardous waste and chemical waste. • It enhances cooperation with other jurisdictions, including through the exchange of relevant information and capacity-building. • It reiterates readiness to work with the international community to enhance cooperation in preventing the illegal transboundary movement of waste.
Bangkok Declaration on Combating Marine Debris in the ASEAN Region (2019)	• The Declaration calls on States to strengthen their national and collaborative actions to prevent and reduce marine debris, particularly from land-based activities.
ASEAN Framework of Action on Marine Debris (2019)	• The Framework comprises four priority areas towards reducing marine litter: policy support and planning; research, innovation and capacity-building; public awareness, education and outreach; and private sector engagement.
ASEAN Regional Action Plan for Combating Marine Debris (2021–2025) (2021)	• The Regional Action Plan calls for 14 actions to implement the Bangkok Declaration and Framework by enhancing coordination at the regional and international levels for achieving sustainable management of coastal and marine environments and responding to marine plastic pollution.
ASEAN Framework on Circular Economy (2021)	• The Framework calls on ASEAN Member States and stakeholders to adopt the circular economy approach in achieving sustainable economic development objectives. • It aims to guide ASEAN towards achieving its long-term goals of a resilient economy, resource efficiency and sustainable and inclusive growth across the region.

2.3. Overview of national legal frameworks

As Table 18 indicates, all ASEAN Member States have acceded to the Basel Convention. Yet, due to implementation concerns, most of them have not ratified the Basel Convention Ban Amendment, which prohibits European Union Member States, OECD countries and Liechtenstein from exporting hazardous waste to other countries for final disposal or recycling. Only four countries have ratified the Ban Amendment: Brunei Darussalam, Indonesia, Malaysia and, as of 2023, Thailand. Management and trade of plastics and e-waste, which are the subject of the more recent amendments to the Basel Convention, still pose considerable challenges for ASEAN Member

Table 18 – Status of ASEAN Member States on multilateral environmental agreements related to chemicals, waste and mercury management, and trade. Note: Year specified refers to date or ratification or acceptance.

	Types of waste covered	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Basel Convention	Hazardous waste	Accession: 16 December 2002 Entry into force: 16 March 2003	Accession: 2 March 2001 Entry into force: 31 May 2001	Ratification: 12 July 1993 Entry into force: 12 July 1993	Accession: 21 September 2010 Entry into force: 20 December 2010	Accession: 8 October 1993 Entry into force: 6 January 1994	Acceptance: 6 January 2015 Entry into force: 6 April 2015	Ratification: 21October 1993 Entry into force: 19 January 1994	Accession: 2 January 1996 Entry into force: 1 April 1996	Ratification: 24 November 1997 Entry into force: 22 February 1998	Accession: 13 March 1995 Entry into force: 11 June 1995
Basel Convention 1995 Ban Amendment	Hazardous waste	2002		2005		2001				2023	
Basel Convention 2019 Plastic Waste Amendments	Plastic waste										
Basel Convention 2022 E-waste Amendments	Waste electrical and electronic equipment										
Rotterdam Convention	Pesticides and industrial chemicals		2013	Ratification: 8 May 2013 Entry into force: 8 May 2013	2010	2004		2005	2005	2004	2007
Stockholm Convention	Persistent organic pollutants		2006	Ratification: 11 June 2009 Entry into force: 11 June 2009	2016	2002 (signed only)	2004	2005	2005	2005	2002
Minamata Convention on Mercury	Mercury emissions and releases		Ratification: 8 April 2021 Entry into force: 7 July 2021	Ratification: 22 September 2017 Entry into force: 21 December 2017	Accession: 21 September 2017 Entry into force: 20 December 2017	Signed: 24 September 2014		Ratification: 8 July 2020 Entry into force: 6 October 2020	Ratification: 22 September 2017 Entry into force: 21 December 2017	Accession: 22 June 2017 Entry into force: 20 September 2017	Approval: 23 June 2017 Entry into force: 21 September 2017

States due to incomplete regulations and limited management capacity, although several countries have developed strong regulations.[86]

Most ASEAN Member States have ratified the Rotterdam Convention regarding pesticides and industrial chemicals, and most have incorporated its regulations into their national legislation. Nevertheless, difficulties persist in effectively executing the Prior Informed Consent procedure and enforcing compliance. Similarly, despite most ASEAN Member States having ratified the Stockholm Convention on persistent organic pollutants and the Minamata Convention on mercury, challenges that need to be addressed include ensuring the proper disposal of waste that contains persistent organic pollutants and ensuring the safe management of mercury waste. Although ASEAN Member States have ratified and implemented the Basel, Rotterdam, Stockholm and Minamata Conventions to varying degrees, challenges remain in effectively implementing their provisions, such as the need to strengthen or develop the regulatory framework and institutional capacity for implementation, and promoting regional cooperation.

To implement the Basel, Rotterdam, Stockholm and Minamata Conventions, ASEAN Member States have had to create national laws that regulate the import, export, production and use of hazardous waste and chemicals. For the Basel Convention, these laws must include provisions for classifying, prohibiting and punishing violations related to the transboundary movement of hazardous waste as well as implementing the Prior Informed Consent procedure and promoting environmentally sound management of hazardous waste. The Rotterdam Convention also requires provisions for the Prior Informed Consent procedure and for regulations on hazardous chemical transport, while the Stockholm Convention's implementing rules cover monitoring, reporting and disposing of persistent organic pollutants. Regulations for mercury based on the Minamata Convention must provide a framework for mercury importation, exportation, use, emission reduction and waste management. As indicated in Table 19, all ASEAN Member States have enacted, albeit to varying degrees, national laws to implement these Conventions.

Some other countries have enacted laws and regulations that are relevant and seek to implement the Basel Convention's Plastic Waste Amendments and E-waste Amendments. Some countries still rely on older regulations but are in the process of updating them. Challenges persist in effectively implementing and enforcing these laws, and there is a need for greater efforts to support national law reform while enhancing institutional capacity for waste-related issues.

The United Nations Convention Against Transnational Organized Crime (UNTOC) is a global treaty with the aim of combating transnational organized crime by promoting international cooperation among States, while the United Nations Convention Against Corruption (UNCAC) seeks to prevent corruption through both preventive and punitive measures. The UNCAC covers the cross-border nature of corruption with provisions for international cooperation and enhancing transparency and accountability. Regionally, the ASEAN Treaty on Mutual Legal Assistance on Criminal Matters aims to promote mutual legal assistance among ASEAN Member States in criminal matters. Although these agreements are not specifically designed to combat waste crime, they are highly relevant to address illegal activities related to hazardous waste and chemicals, such as waste trafficking across borders and corruption in the waste management sector. These agreements are also crucial in promoting regional cooperation in criminal matters, enhancing the rule of law and strengthening judicial and law enforcement in the context of waste crime.

Table 19– National legislative frameworks implementing multilateral environmental agreements related to chemicals, mercury and waste management and trade

	Implementing legislation: Basel, Rotterdam, Stockholm and Minamata Conventions	Relating to plastics trade	Relating to e-waste trade
Brunei Darussalam	Hazardous Waste Order (Control of Export, Import and Transit), 2013	No regulations	Hazardous Waste (Control of Export, Import and Transit) Order, 2013
Cambodia	Law on Environmental Protection and Natural Resources Management, 1996	Sub-Decree No. 36 on Solid Waste Management (dated 27 April 1999) Sub-Decree No. 17 on the Enforcement of the List of Prohibited and Restricted Goods	Sub-Decree No.16 on Electrical and Electronic Equipment Waste Management (dated 1 February 2016) Sub-Decree No. 17 on the Enforcement of the List of Prohibited and Restricted Goods
Indonesia	Environmental Protection and Management Law No. 32/2009 Waste Management Law No. 18/2008 Job Creation Law No. 2/2022	Ministry of Trade Regulation No. 20/2021 on the Import Policy and Procedure Control and Minister of Trade Regulation No. 25/2022	Minister of Trade Regulation No. 53/2021 Amending Minister of Trade Regulation No. 118/2018 Concerning Importation of Used Capital Goods (16 July 2021)
Lao PDR	Environmental Protection Law, 2012	Ministerial Instruction on Plastic Waste Processing Factory (No. 0682/MOIC)	Decision on Pollution Control (No. 1687/ MONRE, 2021)
Malaysia	Environmental Quality Act, 1974	Customs Order 2023 Solid Waste and Public Cleansing Management Act 2007 (Act 672) and Guidelines on the Importation of Solid Waste Plastic Code HS 3915	Guidelines for the Transboundary Movement of Used Electrical and Electronic Equipment in Malaysia
Myanmar	Environmental Conservation Law, 2012	Notification 22/2019 by the Ministry of Commerce (Import Negative List)	Ministry of Commerce Notification 36/2020
Philippines	Toxic Substances and Hazardous and Nuclear Wastes Control Act, 1990 (RA 6969) Ecological Solid Waste Management Act, 2000 (RA 9003)	Department of Environment and Natural Resources Administrative Order 2013–22: Revised Procedures and Standards for the Management of Hazardous Wastes	Department of Environment and Natural Resources Administrative Order 2013–22: Revised Procedures and Standards for the Management of Hazardous Wastes/Waste Electrical and Electronic Equipment (WEEE)/E-waste or Used/Second-hand Electrical and Electronic Equipment (UEEE)
Singapore	Hazardous Waste (Control of Export, Import and Transit) Act	Hazardous Waste (Control of Export, Import and Transit) Act	Import and export of e-wastes and used electronic equipment
Thailand	Hazardous Substance Act, B.E. 2535 (1992) Enhancement and Conservation of the National Environmental Quality Act, B.E. 2535 (1992)	Notification of Ministry of Commerce Regarding an Import of Goods Into the Kingdom of Thailand (No. 112), B.E. 2539 (1996) – under revision	Notification of the Department of Industrial Works on the Criteria for the Approval of the Import of Used Electrical and Electronic Equipment Into the Kingdom of Thailand (September 2007)
Viet Nam	Law on Environmental Protection, 2020	Law on Environmental Protection (72/2020/QH14)	Decree No.69/2018/ND-CP on Guidelines for the Law on Foreign Trade Management (May 2018)

As illustrated in Table 20, all ASEAN Member States have ratified the UNTOC, the UNCAC and the ASEAN Treaty on Mutual Legal Assistance on Criminal Matters and have taken measures to put their provisions into effect, including passing national laws to criminalize transnational organized crime, creating law enforcement and judicial cooperation mechanisms and providing training and capacity-building for law enforcement officials.[87]

Thus, many ASEAN Member States have established anti-corruption agencies[88], passed national legislation to criminalize corruption and provided a framework for cooperation in such areas as extradition and mutual legal assistance. In relation to waste crime and trafficking, cross-border cooperation and tackling corruption and money laundering remain issues that need further strengthening. This includes sharing compatible procedures among ASEAN Member States and ensuring effective cooperation and communication among prosecution and law enforcement agencies.

The enactment of national laws on money laundering is important for ASEAN Member States because the region has been identified as at high risk for money laundering and illicit financial flows, including for waste trafficking.[89] In response to the challenges of money flows for illegal activity, all ASEAN Member States have enacted a range of laws and regulations to combat money laundering, including anti-money laundering laws and asset forfeiture laws. As Table 21 shows, all countries in the region have also enacted a range of laws and regulations to combat corruption. Despite these efforts, challenges persist in ensuring the effective use and enforcement of these laws, especially as applied to environmental laws, such as waste management.

In the context of waste crime, mutual legal assistance can be utilized to promote cooperation among countries in prosecuting waste offences. All 10 ASEAN Member States have enacted national laws on mutual legal assistance, in line with the ASEAN Mutual Legal Assistance Treaty. The full and effective implementation of these national frameworks

Table 20 – Status of ASEAN Member States with other international agreements that are relevant for addressing waste crimeTable 20 – Status of ASEAN Member States with other international agreements that are relevant for addressing waste crime

	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Convention Against Transnational Organized Crime (UNTOC)	Accession: 25 March 2008	Ratification: 12 December 2005	Ratification: 20 April 2009	Accession: 26 September 2003	Ratification: 24 September 2004	Accession: 30 March 2004	Ratification: 28 May 2002	Ratification: 28 August 2007	Ratification: 17 October 2003	Ratification: 8 June 2012
UN Convention Against Corruption (UNCAC)	Ratification: 2 December 2008	Accession: 5 September 2007	Ratification: 19 September 2006	Ratification: 25 September 2009	Ratification: 24 September 2008	Ratification: 20 December 2012	Ratification: 8 November 2006	Ratification: 6 November 2009	Ratification: 1 March 2011	Ratification: 19 August 2009
ASEAN Treaty on Mutual Legal Assistance in Criminal Matters	Signed: 29 November 2004	Signed: 29 November 2004	Signed: 29 November 2004	Signed: 29 November 2004	Signed: 29 November 2004	Signed: 17 January 2006	Signed: 29 November 2004	Signed: 29 November 2004	Signed: 17 January 2006	Signed: 29 November 2004

is essential in promoting regional cooperation in combating transnational crime. There is still a need for a system that facilitates enhanced mutual legal assistance among the Member States of ASEAN, which would involve sharing information and evidence, extraditing suspects and providing legal aid. Establishing clear communication channels and assigning competent authorities are vital to manage requests to expedite the mutual legal assistance process.

2.4. Regional overview of the waste crime legal framework

Many ASEAN Member States face a significant problem with waste crime, which has prompted the introduction of laws and regulations concerning waste management and disposal. Specific provisions under national laws target a range of illegal activities associated with waste, including its disposal, transport and management. While the nature and scope of waste crime laws vary among Member States, most countries have a legal framework in place that includes penalties, such as fines and imprisonment, as well as administrative sanctions that include license and permit revocation. The key to tackling waste crime is to have effective, proportionate and dissuasive criminal penalties, which may include imprisonment and fines, that exceed any economic gains made by waste crime actors who fail to follow waste management regulations and that also reflect the harm and damage caused by their actions.[90]

Table 21 – National legislative frameworks implementing other international agreements that are relevant for addressing waste crime

	UNTOC, Corruption Convention	**ASEAN Mutual Legal Assistance on Criminal Matters**
Brunei Darussalam	Anti-Money Laundering Act (CAP. 209) Prevention of Corruption Act (CAP. 131)	Mutual Assistance in Criminal Matters Order 2005
Cambodia	Law on Anti-Money Laundering and Combating financing of Terrorism, 2020, Article 38 Anti-corruption Law, 2010	Law on Mutual Legal Assistance in Criminal Matters, 2020
Indonesia	Act. No. 8/2010 on Prevention and Eradication of Money Laundering Law No. 31/1999 on the Corruption Eradication and its amendment (Law No. 20/2001)	Law on Mutual Legal Assistance in Criminal Matters Law No. 1/2006
Lao PDR	Law on Anti-Money Laundering and Counter-Financing of Terrorism, 2014, Article 66	Law on Criminal Procedure No. 79/NA 2012 Part XIV
Malaysia	Anti-Money Laundering and Anti-Terrorism Financing Act 2001, as amended 2019, Section 4	Mutual Assistance in Criminal Matters Act 2002 (Act 621)
Myanmar	Anti-Money Laundering Law 11/2014, Section 43	Mutual Assistance in Criminal Matters Law No. 4/2004 Mutual Assistance in Criminal Matters Rules, 2014
Philippines	Anti-Money Laundering Act, RA No. 9160, as amended 2012 Section 14	
Singapore	Corruption, Drug Trafficking and Other Serious Crimes (Confiscation of Benefits) Act, Chapter 65A 1992 revised in 2000 Section 47	Mutual Assistance in Criminal Matters Act Chapter 190A, 2001 Revised Edition
Thailand	Anti-Money Laundering Act B.E. 2542 (1999) as amended B.E. 2558 (2015), Sections 60–61	Act on Mutual Assistance in Criminal Matters, B.E. 2559 (2016)
Viet Nam	Law on Prevention and fighting against money laundering No. 07/2012/QH13, Article 35	Law on Legal Assistance Law No. 08/2007 Chapter III

As explained in Table 22, the degree of criminal penalties for waste crime offences differs across the ASEAN Member States.

Some countries have strict penalties, with maximum prison terms ranging from 5 to 20 years. For instance, waste crime can result in imprisonment for up to 15 years in Indonesia. Conversely, Brunei Darussalam and Singapore have a maximum prison sentence of two years, while other ASEAN Member States have even less severe penalties, with maximum prison terms ranging from one to three years. Despite the imperative to deter waste crime actors from gaining any financial benefit, most criminal penalties are not effective, proportional or dissuasive. There are further challenges in the successful implementation of the laws due to a lack of resources and training. Additionally, enforcement efforts can be undermined by corruption and political pressure, especially in cases involving influential individuals.

Many ASEAN Member States impose fines in addition to imprisonment as penalty for waste crime offences. These fines can help deter potential offenders and generate revenue for governments. However, as Table 23 shows, the severity of fines for waste crime offences varies across the ASEAN Member States, with some governments imposing far higher fines than others. For instance, Indonesia imposes fines of more than US$1 million for illegal waste import and Singapore imposes fines of more than US$200,000, while Cambodia and the Philippines impose fines of less than US$20,000. Some ASEAN Member States have less severe fines, such as the Lao People's Democratic Republic, with maximum fines ranging from the equivalent of a few hundred dollars to a few thousand dollars. In some countries, it is ambiguous whether these penalties apply only to individuals or also to body corporates. Although "persons" generally encompass natural and legal persons, this is not clearly defined. Brunei Darussalam, the Philippines and Singapore provide different penalties for corporations and individuals. This ambiguity may need to be addressed in the reforms of waste laws and criminal penalties.

Table 22 – Regional overview of criminal penalties: Imprisonment

	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Prohibition of import	0–2 years	1 month–5 years	3–15 years	6 months–3 years	0–5 years	0–5 years	1 month–6 years	0–2 years	0–10 years	0–10 years
Prohibition of export	0–2 years	1 month–5 years			0–5 years	0–5 years	1 month–6 years	0–2 years	0–10 years	
Prohibition in course of transit	0–2 years		3–5 years	6 months–3 years	0–5 years	0–5 years	1 month–6 years	0–2 years	0–5 years	0–10 years
Fraud or false statements			4–6 years		0–7 years		1 month–3 years	0–1 year	0–2 years	
Permissible business			1–3 years			0–3 years				
Violating waste control measures				3–5 years						
Failure to comply with order		1 month–5 years		1–5 years				0–3 months		

Table 23 – Regional overview of criminal penalties: Fines

	Brunei Darussalam		Cambodia		Indonesia		Lao PDR		Malaysia		Myanmar		Philippines		Singapore		Thailand		Viet Nam	
	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I
Prohibition of import	0–25,215	0–75,071		240–11,983	272,050–1,020,189	272,050–1,020,189		286–2,855		0–112,031		(47–945)		1,807–5,420	0–225,215	0–75,071		0–29,383	42,586–298,103	8,517–212,931
Prohibition of export	0–225,215	0–75,071		240–11,983						0–112,031				1,807–5,420	0–225,215	0–75,071		0–29,383		
Prohibition in course of transit	0–225,215	0–75,071		240–11,983	272,050–1,020,189	272,050–1,020,189				0–112,031		(47–945)			0–225,215	0–75,071		0–29,383	42,586–298,103	8,517–21,2931
Fraud or false statements		0–7,507								0–224,061						0–7,507		0–14,691		
Permissible business	–				68012–204,038	68012–204,038					47–945									
Violating waste control measures								2855–28,555					9,035	11–72						43–852
Failure to comply with order			240–7,190					343–5711								0–7,507		0–8,815		

Note: US dollars conversion rate in May 2023; C= corporation and I=individual

Chapter Three: The Illegal Waste Trade – Mapping Flows From the European Union to Southeast Asia

Building on the analysis of legal waste flows from Europe to the ASEAN region described in Chapter 1, this chapter presents the results of research and mapping efforts of illegal waste flows that follow the same routes. It aims to provide a broad understanding of the context in which criminal activities in the waste sector take place, and to better define the main characteristics of the illegal aspects of the waste trade and available data. However, there are still many knowledge gaps in this area due to the general lack of data: the data on waste shipment inspections, for example, represents only a portion of the full waste trade.

The chapter will start by presenting a global overview of illegal hazardous and other waste flows based on reports of the Basel Convention Secretariat. Sections two to four follow the results of major international enforcement operations on tackling waste trafficking, namely Operation Demeter, as coordinated by the World Customs Organization; Operation NOXIA, as coordinated by OLAF; and the Shipment of Waste Enforcement Actions Project (SWEAP), as coordinated by the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL). Section five presents data on waste flows departing from three main European Union ports, Antwerp (Belgium), Rotterdam (the Netherlands) and Genoa (Italy).

Key takeaways

- Although the available data are not exhaustive, the shared information offers a valuable overview of waste trafficking patterns, portraying it as transnational organized crime due to its cross-border nature, involving multiple actors, and recognized as a “serious” offence in some legislations. However, due to gaps in legal responses to crimes that affect the environment, waste trafficking often falls under administrative and civil law rather than criminal law.
- Although the Basel Convention mandates parties to report illegal cases, the reporting rate remains below 50%, with reports predominantly originating from Europe. Notably, while there were high numbers of illegal cases reported to the Basel Convention in 2018 and 2019, only a few resulted in legal consequences. Instances of imprisonment and probation were scarce, and the fines reported were relatively modest.
- Waste trafficking from high- to low- and middle-income countries persists as a significant phenomenon, despite legislative and enforcement measures implemented in destination countries and control measures at major European Union ports of origin.
- Southeast Asia remains a major destination for illegal waste shipments, as indicated by data from the European Union’s SWEAP project, the World Custom Organization’s Demeter Operation, Operation NOXIA and information shared by some Southeast Asian countries. Europe, North America and East Asia are consistently identified as the primary regions of origin for illicit waste shipments destined for Southeast Asia.
- Similar modus operandi are evident across various enforcement operations, European Union port data, and information from Southeast Asian countries. False declarations to circumvent notification or Basel Convention’s Prior Informed Consent procedures are prominent, both in reports from destination countries and in European Union ports, where waste is often falsely declared as green-listed. Common issues include missing licenses and incorrect notifications.

3.1. Reporting of illegal cases under the Basel Convention: Mechanisms and challenges

As reported in Chapter 2, the Basel Convention promotes transparency in the international waste trade and is essential for tracking the movement of hazardous wastes globally, including cases of illegal trafficking (for the definition of hazardous waste see Basel Convention Article 1 (a) and (b), as well as Annex I, and Annex VIII for a list of entries of hazardous waste, and Annex III of the for a list of these hazardous characteristics which include wastes that are explosive, flammable, poisonous, infectious, corrosive, toxic, ecotoxic, etc). Parties to the Basel Convention are required to submit an annual national report to the Secretariat, providing details on competent authorities and focal points.[92] They are also expected to report on the measures they have implemented, agreements to trade with non-Parties, and information on the quantities of hazardous and other waste exported and imported. They must report on disposals that do not proceed as planned and cases of illegal trafficking as defined in article 9. This latter reporting requirement was introduced in 2016 under Table 9 of the national reporting format.[93] Table 9 only includes reported cases of illegal traffic that have been closed in the reporting year, even though their detection may have happened in the year before or earlier. It is important to note that in this regard, the term "closed" means that either the court has taken a final decision on a fine or imprisonment sentence, or that an administrative fine has been issued.

In the national reports, Parties are invited to provide information on these cases of illegal trafficking. This is done in Table 9 of the national report. Analysis of the national reports showed, first, that not all Parties submit these reports; second, that submission is often late; and, third, that the reports are not always complete (see Figure 21). These limitations should be considered when analysing and interpretating the data from the national reports, as they impact the completeness of the data and the results of the analysis.

The types of inconsistencies in the Table 9 reporting of waste types subject to illegal traffic limits the development of comprehensive statistics.

Box 4 – Basel Convention legal provisions[94]

The Basel Convention considers illegal traffic in hazardous and other wastes to be criminal. The Convention requires Parties to introduce appropriate legislative measures to prevent and punish illegal traffic and to collaborate in this endeavour (article 9, paragraph 5). It also requires Parties to take appropriate measures to implement and enforce the provisions of the Convention (article 4 paragraph 4).

Under article 9.1. of the Basel Convention, illegal traffic is defined as a transboundary movement of hazardous wastes:

- without notification pursuant to the provisions of the Convention to all States concerned; or
- without the consent of a State concerned; or
- through consent obtained by falsification, misrepresentation or fraud; or
- that does not conform in a material way with the documents; or
- that results in deliberate disposal (e.g.:dumping) of hazardous wastes in contravention of the Convention and of general principles of international law.

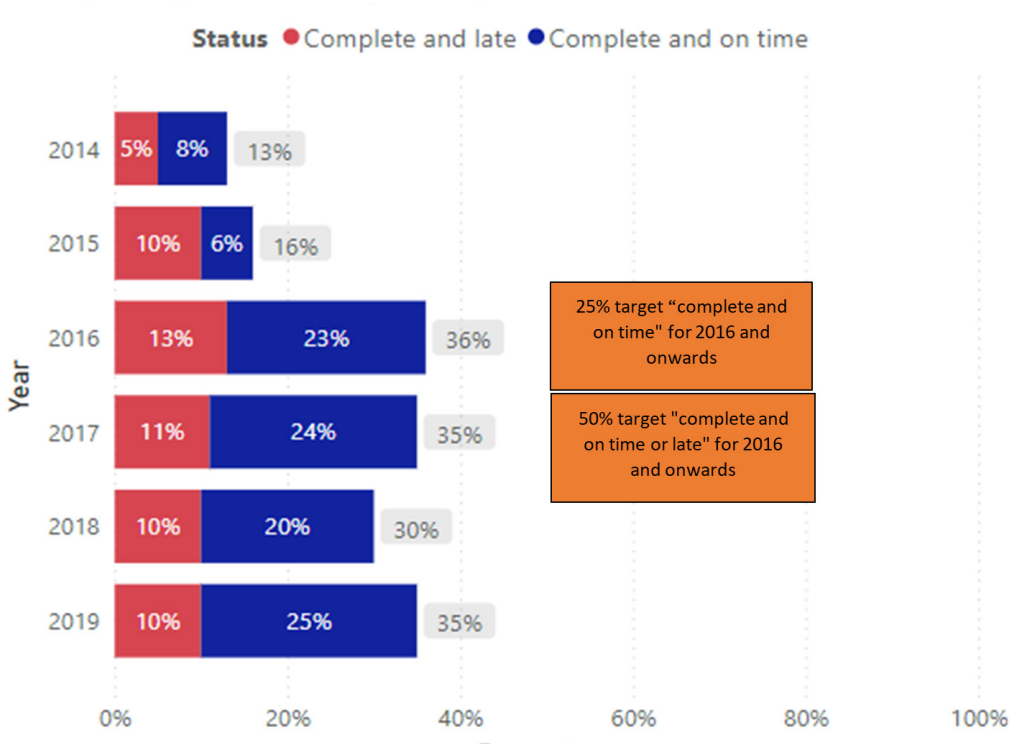


Figure 21 – Reporting rates for complete and on time or late reports 2014–2019 (Source: BRS Secretariat)

Illegal cases reported for 2018–2019

The Implementation and Compliance Committee of the Basel Convention was mandated by the fifteenth meeting of the Conference of the Parties to the Basel Convention to perform an assessment of the extent of illegal traffic, based on the information provided in Table 9 of the national reports submitted for the years 2018 and 2019. [95]

This exercise showed that the majority of the Parties reported having had no illegal shipment cases closed in the calendar year. Half of the Parties reporting on closed cases of illegal traffic were countries from the Western Europe and Other Governments (WEOG) region, almost one third were from the Eastern Europe region, and finally, some reports were from the Group of Latin America and the Caribbean (GRULAC) and from the Asia and Pacific region. There were no reports with information on Table 9 from the African region.

In total, there were 914 reported closed cases of illegal traffic for 2018, and 1,098 cases for 2019. The majority of closed cases of illegal shipments were reported by seven Parties. Among those seven Parties, most (five) were from the Western Europe and other governments region (Belgium, France, Germany, Sweden and the United Kingdom, one was from the Eastern European group region (Poland) and one from the Asia and Pacific region (China).

Three out of the four focus countries – Indonesia, Malaysia and Thailand – were reported as "country of import" for cases of illegal trafficking in 2018 and 2019.[96] No details however were provided on the types of waste involved in the cases of illegal trafficking.

As a result of this imbalanced and incomplete reporting between the regions and the diverse information on waste codes, the conclusions of the report are not comprehensive and cannot

present a reliable picture of global trends in waste trafficking of waste covered by the Basel Convention. European Union Member States, for example, may report illegal shipments according to the European Union regulation,[97] which use a slightly different definition of illegal traffic than the Basel Convention. This makes it challenging to assess whether all reports of illegal shipments constitute illegal traffic pursuant to article 9[98] of the Basel Convention.

Reported cases of illegal traffic and involved waste streams

Of the reported cases of illegal trafficking, the two main waste streams were electrical and electronic equipment and their parts (in 2018: 311 of the 914 reported cases; in 2019: 313 of the 1,098 cases) and end-of-life vehicles and their parts (in 2018: 124 of the 914 reported cases; in 2019: 113 of the 1,098 cases). Further significant waste streams involved mixed waste, comprising electrical and electronic waste and end-of-life vehicles (in 2018: 30 of the 914 reported cases; in 2019: 37 of the 1,098 cases), and plastic waste (in 2018: 77 cases; in 2019: 137 cases). Other types of waste contained lead-acid batteries, other batteries, used toner cartridges, construction waste and municipal waste.

Some Parties reported illegal shipments of wastes listed in Annex IX to the Basel Convention (such as tyres, paper, metals), which are principally not covered by the Convention and its provisions on illegal traffic. However, as it was not possible to determine whether the waste shipments reported with Annex IX waste codes fell within the scope of the Basel Convention or not, they were included in the report (indicated for 135 of the 914 reported cases for 2018, and for 117 of the 1,098 cases for 2019).

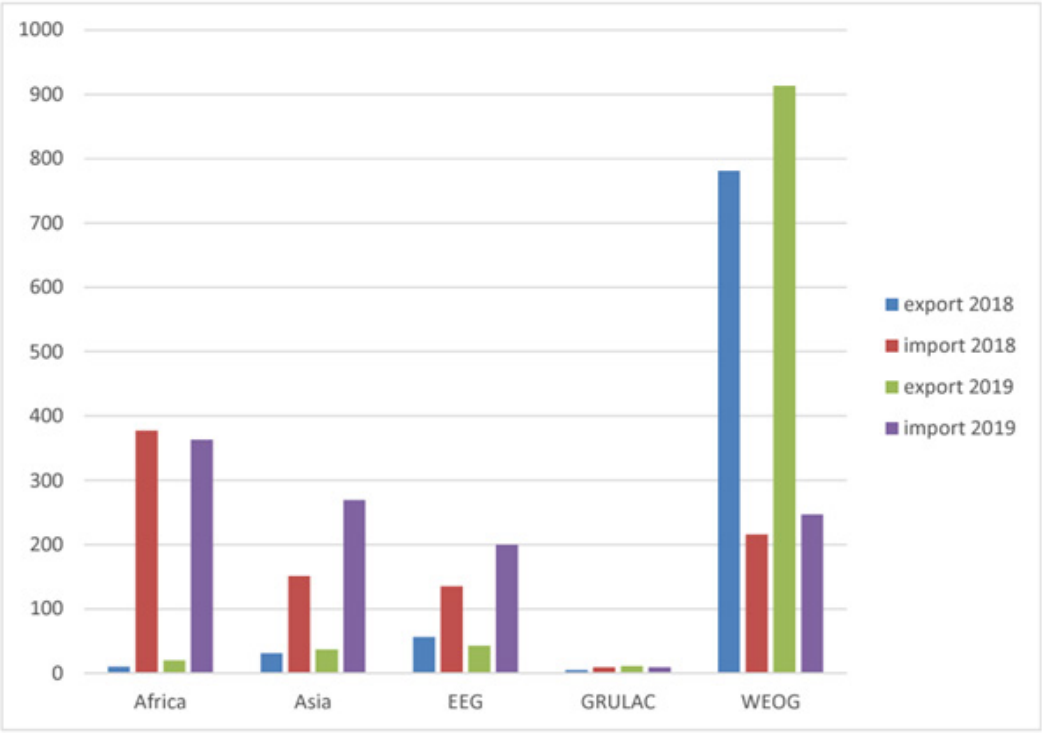


Figure 22 – Reported cases of illegal traffic under Table 9 of the Basel Convention for 2018 and 2019, by importing and exporting regions (Source: BRS Secretariat)
Note: EEG=Eastern European group GRULAC= group of Latin America and Caribbean countries; WEOG= Western Europe and other governments.

Take-back cases, criminal and administrative penalties

The majority of the cases of illegal trafficking cases were resolved either by sending the waste back to exporting Parties through the take-back procedure, or by not allowing the shipment to leave the country of export. Only a few cases of illegal traffic led to punishment. There were few reported incidences of imprisonment and probation, and the reported fines were rather modest.[99]

Comprehensive and timely Basel national reports are essential to better understand the reasons and dynamics behind illegal traffic and to enable valid statistics and assessments. At the moment, as the available data are incomplete, it is challenging to develop meaningful statistics about the types of waste covered by the Basel Convention that are subject to illegal traffic. This includes information on modus operandi, origins, destinations and the follow-up of those cases related to waste as covered by the Basel Convention.

3.2. Operation Demeter

Operation Demeter started in 2009 as a joint global Customs initiative targeting the illegal cross-border shipment of hazardous and other waste from Europe in route to countries in the Asia-Pacific region and Africa. The operation focused on monitoring and controlling cross-border movements of environmentally sensitive commodities within the scope of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. From 2019, the scope of the operation expanded to include the movement of Ozone Depleting Substances as regulated by the Montreal Protocol. [100]

This section focuses on the findings of Operation Demeter in relation to waste since 2018 (Operation Demeter IV),[101] when China revised its import policy and regulations on the import of various types of solid waste, with an additional overview of seizure data on waste originating from the European Union and destined for ASEAN. Although information on specific participants is not public, a large number of Customs administrations take part every year, namely 75 in 2018, 83 in 2019, 73 in 2020, 87 in 2021 and 90 in 2022.[102]

Seizures

One of the key parameters of Operation Demeter is the number of seizures performed by the participating Customs administrations and the national implementing partners. The number of seizures is shown in the table 24. For the given period, the largest quantity seized was in 2018, but the largest number of seizures occurred in 2019 (albeit very close in number to the previous year's seizures). The two subsequent years saw a decrease in the number of seizures, with mitigating factors including the COVID-19 pandemic, followed by a slight increase in 2022. As Table 24 explains in more detail, the very large quantities seized in 2018 were due to a shipment of mineral slag.

Waste streams involved

Based on seizure data provided by the World Customs Organization and the Regional Intelligence Liaison Offices Asia and the Pacific, the following waste streams were seized between 2018 and 2022:

- Mineral slag
- Plastic waste
- E-waste
- Waste rubber
- Municipal waste
- Textile waste
- Paper waste
- Waste batteries
- Metal waste
- Waste vehicle parts
- Ceramic waste
- Chemical waste
- Mixed waste
- Unsorted
- Wood waste
- Glass waste
- Rubble

Table 24 – Number of total and waste seizures during Operation Demeter, 2018–2022 (Source: WCO)

Year	Number of waste seizures	Quantity (waste)	Pieces
2018[103]	199	326,133 tonnes	54,782 pieces
2019[104]	201	4,584 tonnes	59,983 pieces
2020[105]	119	99,000 tonnes	78,000 pieces
2021[106]	112	3,851 tonnes	6,108 pieces
2022[107]	126	3,647 tonnes	8,662 pieces

Figure 23 shows the amounts of seized waste per waste stream in tonnes for the past years (where data were available).[108]

Taking into account the 2018–2022 reporting period, the following observations about specific waste types can be made[109] (noting that breakdown by type of is not available for 2019):

- Plastic and metal waste were key streams of seized waste compared to other types throughout the analysed period. A high of 9,816 tonnes of plastic waste were seized in 2018, while 90,872 tonnes of metal waste were seized in 2019. However, both waste types witnessed a big drop off in quantity seized after 2020.
- E-waste seizure cases tripled in 2019 compared with 2018. In 2022, E-waste accounted for the lagest number of pieces seized (3,960 pieces) out of all types of

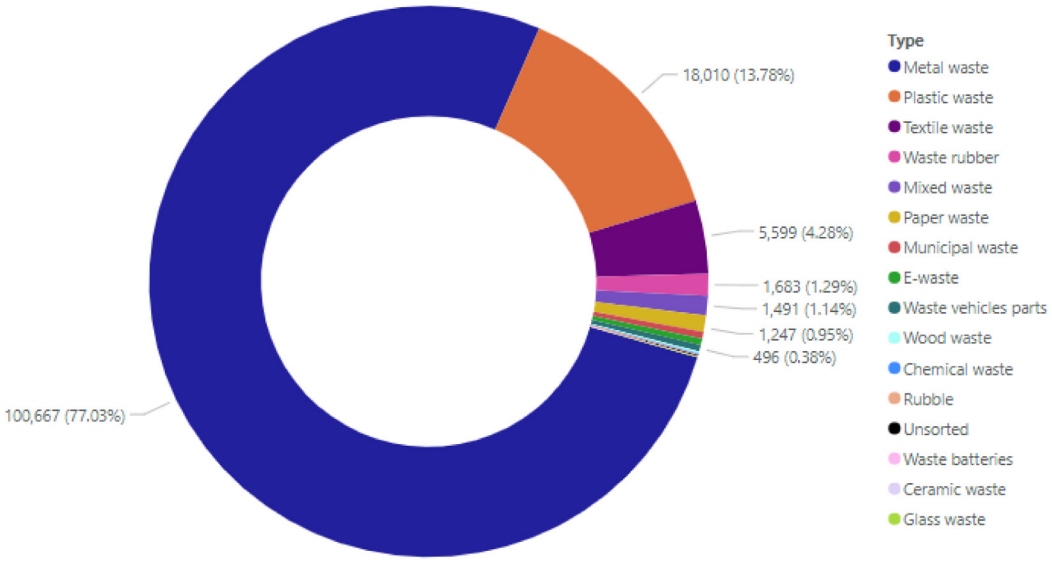


Figure 23 – Overview of waste streams in seizures, 2018, and 2020–2022 (tonnes) (Source: WCO data)
Note: Seizures in 2018 involved cases of mineral slag totalling 283,671 tonnes. It was omitted from this figure for easier visualization of other waste streams.

waste, in addition to a large quantity (226 tonnes) seized.

- Both mixed waste and paper waste became more prominent from 2021 onwards, with 908 tonnes of mixed waste seized in 2021 and 704 tonnes of paper waste in 2022.
- In 2018, 5,372 tonnes of textile waste were seized, subsequently diminishing significantly, both in quantity seized and relating to other waste types.
- Mineral slag was by far the largest quantity of waste seized over the 2018–2022 period due to one major seizure in 2018, which, involved a shipment of smelting slag (approximately 180,000 tonnes) from Spain, intercepted by China Customs.[110]
- Waste rubber had significant seizures in several years, with a high of 1,033 tonnes in 2018.
- The largest seized quantity of waste vehicle parts was recorded in 2021 (at 439 tonnes).

The World Customs Organization expects the transboundary illegal movements of waste are expected to remain high due to because of the decreasing cost of shipping sea cargo.

Modus operandi

Operation Demeter revealed several modus operandi and smuggling schemes consistent through the past five operations, broadly categorized into the following types:

- Misdeclaration
- Misdescription and mislabelling
- Avoiding Customs controls
- Abuse of export licences
- Concealment

Destination and departure routes

Demeter VII showed a pattern of intertwined routes (Europe to Asia, Europe to Europe and Asia to Asia). In 2021, Europe was the most frequent departure location with 73 cases, accounting for 60% of all cases. The number of cases destined for Asia accounted for 46% of all cases (55 cases), while 29% (35 cases) were destined for Europe, and 22% (26 cases) were destined for Africa. Vehicle parts and machines came mainly from Europe, and plastic waste came from Europe and Asia.

Image 1 – Seizures of 77 tonnes of metal waste in Canada, destined for Thailand, 2021 (Source: WCO)

Illegal exports destined for ASEAN countries

A dive into the data specific to ASEAN countries revealed that it was mostly in line with global waste trade trends, with the largest quantities seized in 2018 (see Figure 25). The European Union was a major origin among all other regions (Figure 24), while metal, e-waste and plastic were the main types of waste seized (Figure 26). Data from 2020 were not available for the analysis.

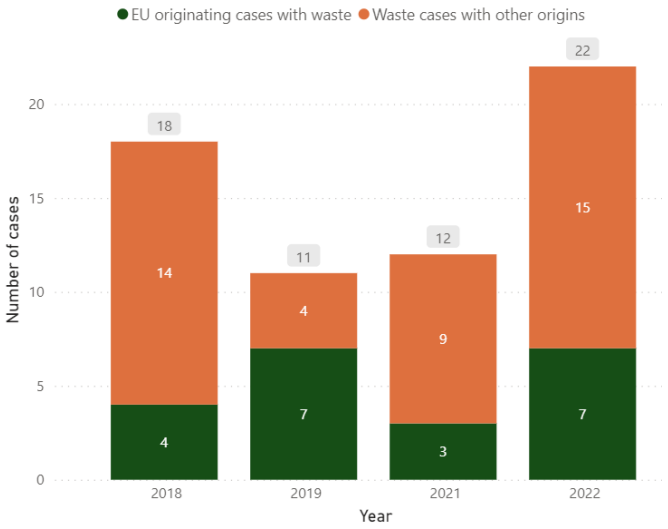


Figure 24 – Number of cases of illegal waste destined for ASEAN countries seized during Operation Demeter, 2018, 2019, 2021, and 2022 (Source: WCO data)

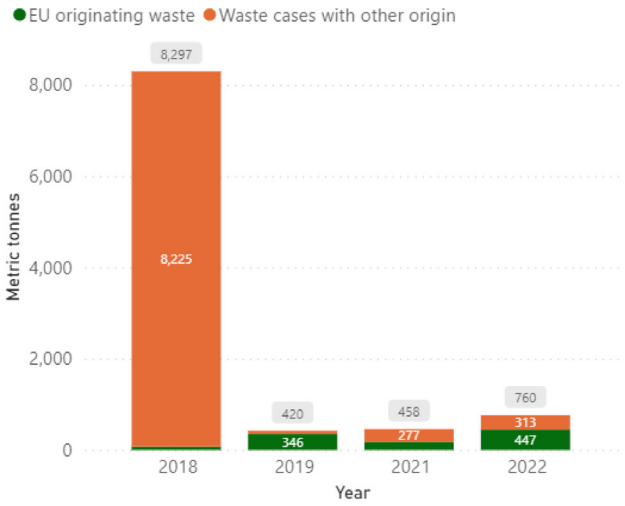


Figure 25 – Overview of waste destined for ASEAN countries seized during Operation Demeter, 2018, 2019, 2021, and 2022 (tonnes) (Source: WCO data)

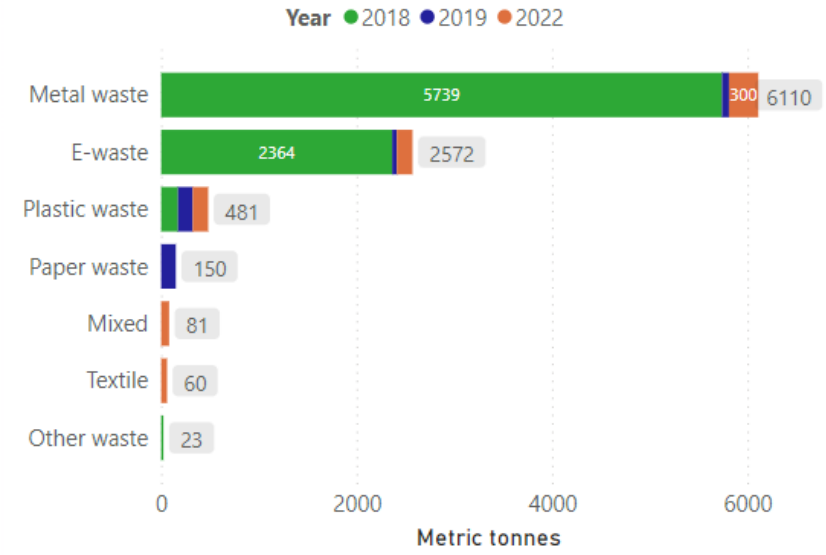


Figure 26 – Detected waste streams destined for ASEAN Member States detected during Operation Demeter, 2018, 2019 and 2022, where disaggregated data by waste category is available (tonnes) (Source: WCO data)

Table 25 gives further details on these figures, noting the quantity and type of waste, and the number of exports originating in the European Union. It is important to note that one reason for the high number of seizures by European Union countries is the high participation of European Union Member States in Operation Demeter.

Table 25 – Overview of illegal exports destinated to ASEAN countries, 2018–2022 (Source: WCO)

Year	Number of illegal exports	Quantity of waste (tonnes)	Types of waste (tonnes)	Exports originating from the European Union	Remarks or changes
2018	18	8, 298	• Plastic waste (172) • Steel scrap (5,739) • E-waste (2,364) • Other waste (23)	4 illegal shipments 22% of the total number of EU cases which were destined for ASEAN countries 73 tonnes waste (49 tonnes of plastic waste and 23 tonnes of other waste).	Globally, metal waste and e-waste were the largest quantities EU seizures were mainly plastic waste
2019	11	420	• Plastic waste (152) • Metal waste (71) • E-waste (48) • Paper waste (150)	7 illegal shipments 127 tonnes of plastic waste 45 tonnes of metal waste. 24 tonnes of e-waste. 150 tonnes of paper waste. The EU accounted for 63% of the cases destined for ASEAN countries and 82% of the total quantity of waste destined for this region.	Globally: steep decrease in metal waste and e-waste; paper as new waste steam trafficked. The decrease in e-waste can be explained by bans put in place by some countries in the region. Important increase in waste from the EU, which was the main origin of plastic waste; majority of e-waste and all paper waste.
2020	NA	NA	NA	NA	Major destinations of plastic waste expanded to Southeast Asia and South Asia, such as Malaysia, Thailand, Viet Nam, India and Sri Lanka.
2021	12	458	NA	3 illegal shipments originated from the EU, representing 25% of all the cases related to ASEAN countries and involving 181 tonnes of waste, representing 40% of the waste destined for ASEAN countries.	
2022	22	760	• Plastic waste (158) • E-waste (160) • Metal waste (300) • Textile waste (60) • Mixed waste (81) • End-of-life vehicles –2 cases and 1,863 pieces *(not in tonnes)*	7 shipments that were destined for ASEAN countries (mainly Indonesia, Malaysia and Thailand) originated from the EU (30%), which involved 447 tonnes of waste, representing 59% of the total quantity destined for ASEAN countries.	There was an increase in the number of cases and quantities, which may be due to the lifting of COVID-related restrictions. In addition to plastic, e-waste and metal observed in the previous years, there are cases of textiles and end-of-life vehicles.

Image 2 – Lao Customs intercepted a shipment of 31 tonnes of e-waste declared as plastic waste imported for recycling during Operation Demeter VIII in 2022 (Source: WCO)

3.3. Analysis of IMPEL SWEAP data on inspections at the European Union level from 2017 to 2020

Shipment of Waste Enforcement Actions Project

The Shipment of Waste Enforcement Actions Project (SWEAP) is co-ordinated by the European Commission LIFE fund and co-ordinated by the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL). The project ran between September 2018 and June 2023. Its overall purpose was to support the circular economy by disrupting the illegal waste trade at the European Union level by:

- Increasing the skill sets among inspectors and law enforcement agencies
- Intensifying collaboration nationally and internationally
- Developing innovative tools and techniques
- Creating a European Union-wide inspection data set
- Providing intelligence products

The project succeeded previous IMPEL projects that targeted illegal shipments of waste from 2003 onwards, and accordingly, the project team therefore has a large data set on illegal shipments from, to and within Europe. This analysis covers a part of the predecessor of the SWEAP project and the data available as part of the SWEAP project at point of writing.

The majority of illegal waste shipments recorded under SWEAP concerned intra-European movements. Between 2017 and 2021, these shipments amounted to 49% of the total number of violations. The next highest destination region was Asia, with 22% of total violations. Many violations with an end destination within Europe may ultimately be bound for countries outside the continent, including ASEAN countries, but it is often not possible to determine this at the time of recording the inspection.

The SWEAP data represent a partial picture of the number of violations and inspections from European inspectorates. The reasons behind this vary. Some countries' reporting cycles mean that data is supplied within a year of the recording, whereas other countries such as the United Kingdom use the App developed under the project to record all their physical waste shipment inspections, and these data are therefore "live". In other countries (Switzerland), it is Customs administrations that record data on transfrontier shipment of waste inspections at the border, and only "violation" information is sent to the project team. Institutional issues and changes in personnel could mean that there are large variations in the number of inspections from year to year. Detection rates are highly dependent on the type of inspections undertaken and whether intelligence is available to competent authorities and their national counterparts.

Data vocabulary has also changed over the last ten years, with the terms used to record inspections becoming more prescriptive. For instance, rather than simply recording the "outcome" of an inspection, there is now a differentiation made between "what will happen to the waste" and the probable "enforcement outcome", and what the waste was described as and what the inspecting officer classifies it as. The number of fields now captured has increased since the introduction of the App in 2021, and they can now provide a common (and thereby comparable) data set across Europe. The data collected post-2021 is now much "richer" than that collected previously.

Out of a total of 81,162 inspections carried out between 2017 and 2021, 5,766 violations were found. The countries for which the project has inspection data between 2017 and 2021 were: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and the United Kingdom.

Illegal shipments from Europe to ASEAN countries

It is not possible to provide the total number of inspections for shipments destined for ASEAN countries, because the final destination is not always known at the time of inspection, or some authorities may not record the field when an inspection is done but no irregularities are found. To have confidence in the data, only inspections where violations have been recorded are included in the analysis below.

Looking at the ASEAN countries specifically, 225 violations were recorded between 2017 and 2021, representing 3.9% of the 5,766 total recorded violations for all locations. The detection of 41% of illegal shipments of plastics to all destinations between 2017 and 2021 were based on intelligence .

Detailed data are available for the 2018–2021 period. Most of the illegal shipments intercepted during this period were destined for Malaysia, which may indicate that it is the "top" targeted destination of the ASEAN countries for illegal shipments from Europe. No illegal shipments have been found with Cambodia, Lao People's Democratic Republic or Myanmar as an end destination (Figure 27). However, European authorities will be targeting shipments destinated to these countries as part of their risk assessments and profiling.[111]

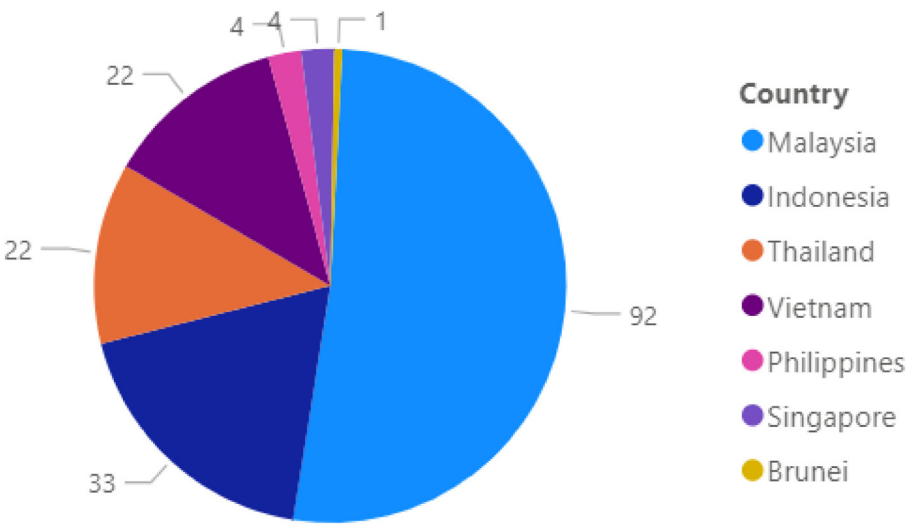


Figure 27 – Number of illegal shipments destined for ASEAN countries detected between 2018 and 2021 (Source: IMPEL SWEAP data, May 2023)

Figure 28 shows the breakdown by destination country and the waste types involved.

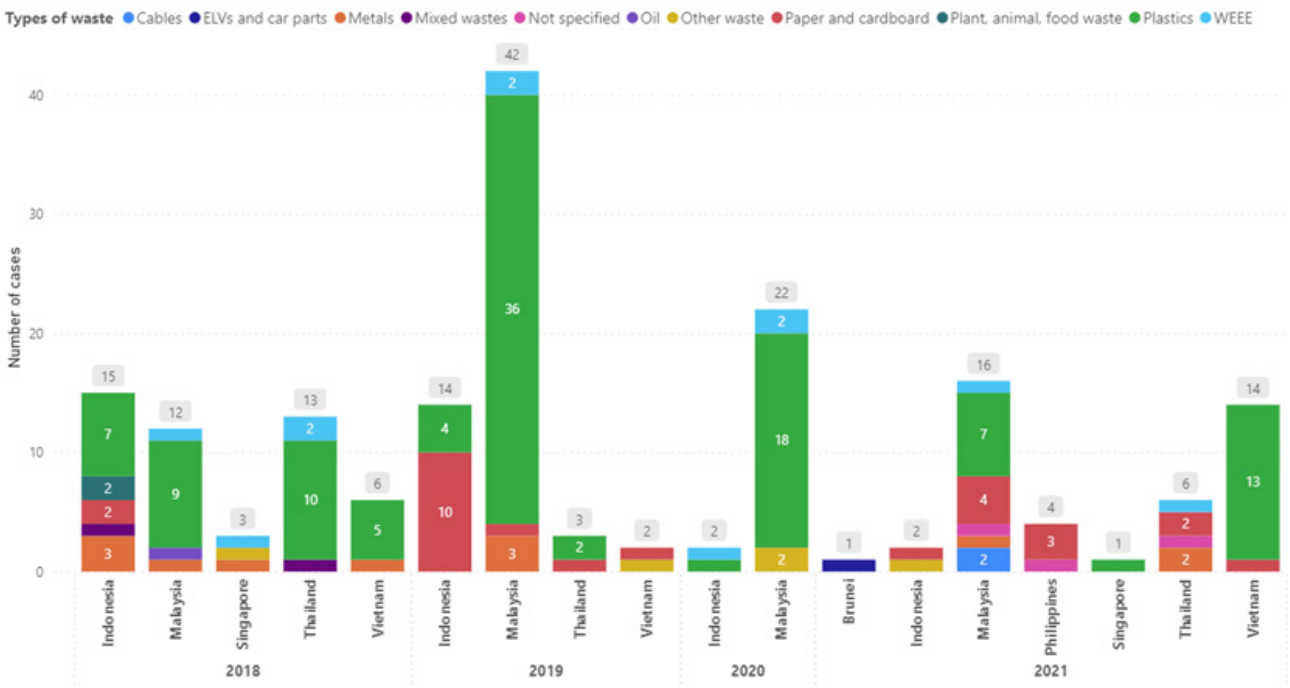


Figure 28 – Number of detected illegal waste shipments from Europe to ASEAN countries, by year and type of waste, 2018–2021 (Source: IMPEL, accessed May 2023)

The largest number of cases detected (61) was in 2019, with plastic exports to Malaysia representing the most significant waste stream. The number of detected illegal shipments dropped in 2020 to 24.[112] This was highly likely due to the initial lockdowns in Europe, where some competent authorities were unable to inspect, relying instead on Customs officers in some cases to conduct inspections. However, plastics remained the main waste stream, with the largest number of detected cases. In 2021, 65 illegal shipments were found to be destined for ASEAN countries. The types of waste found to be in violation were more diverse, but again plastics to Malaysia remained the most problematic.

The majority of illegal shipments of plastics destined for Malaysia were identified as a result of intelligence, highlighting that European competent authorities were actively targeting these shipments.

Additional partial data available for 2022 (not included in the previous figures) show that the total number of detected illegal shipments destined for ASEAN countries decreased to 44, with six countries identified as destinations. Attempted illegal shipments of waste plastics to Malaysia and Viet Nam were the highest, at 16 and 14 respectively. These data sets may not be statistically relevant but they do indicate that illegal shipments of plastics represented an increasing issue for Viet Nam.

Types of violation

Figure 29 illustrates the recorded violations between 2017 and 2021.

The types of violation seen in the 2017–2021 data show that only 4% were related to the "Basel Ban" amendment that entered into force in December 2019 and prohibits the shipment of hazardous wastes to non-OECD countries. In comparison, more recent data on 2022–23 inspections (not included in the figure above) shows that 28% of illegal shipments related to the Basel Ban.

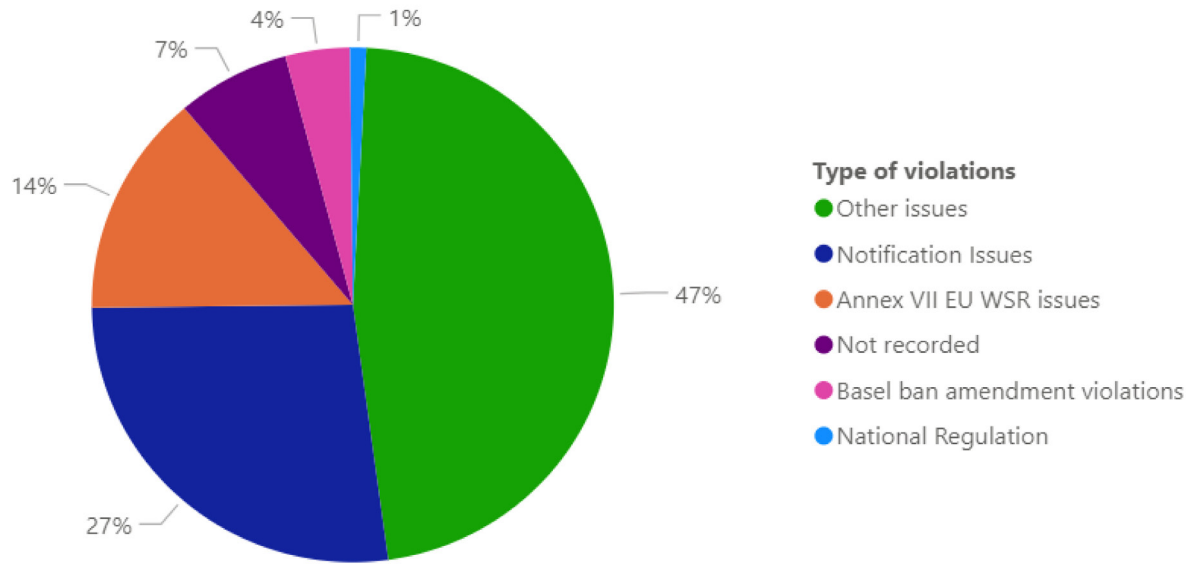


Figure 29 – Violations recorded by type, 2017 to 2021 (Source: IMPEL, accessed in May 2023)

Deviating from the usual violation data, "other issues" is the largest category for this period, at 47%. The shipments in the "other issues" category include those where contracts could not be obtained or where import permits or the receiving site permits could not be verified. It could also include shipments which were highly contaminated and which were stopped by the authority concerned, but which could equally have been recorded against the "Basel Ban" category.

Violations relating to "Annex VII issues"[113] primarily relate to shipments lacking the correct form (the "Annex VII") for the export of non-hazardous waste leaving Europe, or submitting an incomplete form. "Notification issues" may relate to the Prior Informed Consent procedure not being followed as required, the information on the form being incorrect or consent being obtained falsely. The "not recorded" category includes shipments which the inspecting officer deemed to be illegal at the time of inspection, but it may not have been clear to them what type of infraction to record, because, for example, the destination was unknown at the time.

Box 5 – Scottish Environment Protection Agency (SEPA) analysis on ports of transit

As a SWEAP Project member, the Scottish Environment Protection Agency (SEPA) tracks shipments of non-hazardous wastes, of which it must be legally informed by the person arranging the shipment, under the United Kingdom's Transfrontier Shipment of Waste 2007 Regulations, as amended. This is to ensure compliance with article 18 of the Waste Shipment Regulations 1013/06, retained into UK law by the International Waste Shipments (Amendment) (EU Exit) Regulations 2019. The SEPA analysis goes more in-depth than the SWEAP analysis, as it performs daily analysis using the information provided to the SEPA on the export of non-hazardous waste and container numbers and verifying and cross-checking the port of destination of the containers.

In this way, SEPA is doing all it can to ensure that the waste shipped reaches its intended destination, without being re-routed to another receiving facility or sold to an unscrupulous importer. Alongside these checks, SEPA officers also undertake port and site inspections to verify the quality of the waste exported. Administrative checks are carried out using various types of documentation, and verification with competent authorities of destination. Any non-compliance is followed up with the carriers and exporters involved. The data from this tracking exercise shows the common routes taken to destination countries and the ports used.

The first ports of transit are located in Europe. Rotterdam (the Netherlands) appears to be the main port of transit, followed by Antwerp (Belgium) and Le Havre (France) (153 checks correspond to "no information available"). The second ports of transit are located in Southeast Asia and Taiwan, Province of China. Singapore is the main secondary port (274 checks), followed by Tanjung Pelepas (Malaysia), Kaohsiung (Taiwan, Province of China) and Port Klang (Malaysia). The main third transit ports are in Hong Kong, followed by Singapore and Jebel Ali (United Arab Emirates).

According to the SEPA monitoring exercise, the main ports of final destination and discharge are located in Southeast Asia countries India and China. These are: Port Klang (Malaysia), Vung Tau (Viet Nam), Mundra Port (India), Ho Chi Minh City (Viet Nam), Da Nang (Viet Nam) and Ningbo (China).

This type tracking exercise is of key importance, as it highlights the different stops of the shipments of non-hazardous waste on the Europe–Southeast Asia routes, which could lead to different types of infringements of shipment procedures and, ultimately, to illegal practices of trade and final discharge.

3.4. Operation NOXIA, an Asia–Europe Meeting (ASEM) Joint Customs Operation led by OLAF

Operation NOXIA was a 2023 ASEM[114] Joint Customs Operation led by OLAF aimed at placing shipments under surveillance to detect sensitive, prohibited or dangerous goods – including waste shipments sent from Europe to Asia. OLAF coordinated the operation from the planning phase to the analysis of results, provided a safe communication IT environment for information sharing, analysed intelligence and brought together the responsible liaison officers to cooperate during the operation.

The operation focused on deep sea containers carrying pesticides, cigarettes and waste. Direct shipments as well as indirect shipments were part of the operation. The operational phase started on 24 April 2023 and ended on 12 May 2023. The countries that participated in Operation NOXIA were: 24 European Union Member States, the United Kingdom, Australia, Bangladesh, Cambodia, China, India, Indonesia, Lao People's Democratic Republic, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Singapore, Thailand and Viet Nam.

As detailed in Figure 30, a total of 1,223 tonnes of illegal waste were detained and seized as direct results of the operation targeting dangerous goods. All of the detected waste cases that originated in the European Union were destined for Asian countries, with two of the ASEAN countries ranking very high as targeted destinations. Paper, plastic, e-waste, metal and textile waste were the main types of waste seized. In 83% of the cases, the illegal shipment was detected at the European Union border. Key factors in successful detections were risk analysis and targeting during the pre-operational phase, as well as shared tools such as risk indicators, intelligence and exchange of information in real time.

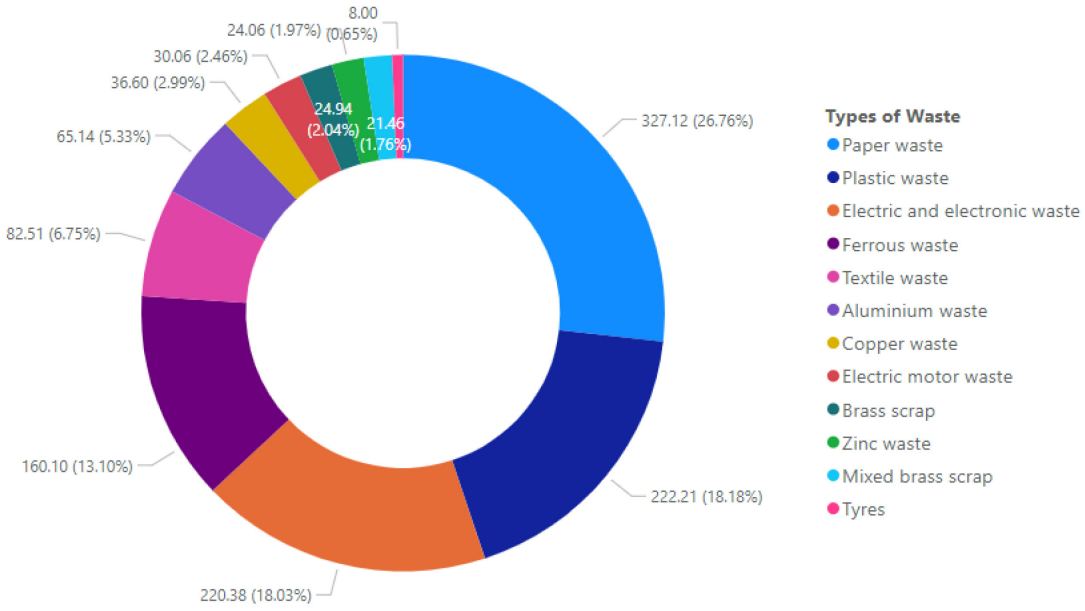


Figure 30 – Details of illegal waste shipments seized from Operation NOXIA, by quantity and types of waste destined for Asia, 2023 (tonnes)

3.5. European Union Customs perspectives

According to Eurostat, since 2020 the top five ports for containers in the European Union in terms of gross weight of goods are the ports of Rotterdam (the Netherlands), Antwerp (Belgium), Hamburg (Germany), Algeciras and Valencia (Spain). In 2022, the highest quantity transported in the containers was at the port of Antwerp (109 million tonnes), followed by Rotterdam (approximately 107 million tonnes). [115]

To complement the information from the Basel Convention Implementation and Compliance Committee's report, the data provided by the World Customs Organization for Operation Demeter, the SWEAP project and Operation NOXIA on inspections at European Union level, additional data and case studies provided by three of the main hubs in Europe – the ports of Rotterdam (the Netherlands), Antwerp (Belgium) and Genoa (Italy) – were analysed.[116]

The next sections provide an overview of the number of waste shipments detected by Customs authorities in the three European Union hubs. The overview also includes qualitative information on modus operandi derived from specific case studies of various waste stream exports.

Box 6 – The European Union (EU) Waste Shipment Regulation (WSR) and Waste Framework Directive (WFD)

The European Union Waste Shipment Regulation implements within the European Union the obligations outlined in the Basel Convention. It is primarily governed by Regulation No 1013/2006[117] of the European Parliament and of the Council of 14 June 2006 on shipments of waste. This regulation aims to control and monitor the shipment of waste within, into and out of the European Union, and shipments between European Union Member States. It sets out procedures, requirements and controls for the transboundary movement of waste to ensure environmentally sound management and prevent waste trafficking.

The regulation contains lists of waste that must follow different procedures. Annex IV lists "amber" waste, which subject to the Basel Convention's Prior Informed Consent procedure, while Annex III lists "green" waste, which is non-hazardous and does not have to follow the Prior Informed Consent procedure but requires specific information accompanying shipments of waste (Annex VII documents).[118] The green-listed waste shipments have to follow the destination country's requirements for exports to non-OECD countries.[119]The regulation includes provisions prohibiting mixing different types of waste and outlines the take-back procedure, among other aspects.

In addition to the Waste Shipment Regulation, the European Union Waste Framework Directive is an important regulation within the European Union that sets out the basic concepts and definitions related to waste management.[120] It provides a framework for waste management in the European Union and aims to prevent waste generation, promote recycling and other forms of recovery, and ensure the proper disposal of waste. The Waste Framework Directive separately lists waste disposal (Annex I) and waste recovery operations (Annex II). The export of waste from the European Union to third countries for disposal is forbidden except for European Free Trade Association countries that are also parties in the Basel Convention and do not prohibit such imports.[121]

Port of Rotterdam, the Netherlands

From 2017 to 2021, overall container traffic in the port of Rotterdam totalled 72.6 million twenty-foot equivalent unit (TEU),[122] while the overall number of waste shipment controls totalled 21,108. Each control could involve one or more containers that were part of the same shipment. There has been a consistent increase every year in container traffic and the number of waste inspections (from 3,341 inspections in 2017 to 5,072 in 2021). However, the detection of illegal cases fluctuated without following the container traffic or inspection trends (see Table 26).

Table 26 – Port of Rotterdam: TEU traffic, waste inspections and number of illegal cases, 2017–2021 (Source: Netherlands Customs)

Year	TEU total traffic	Waste inspections	Illegal cases related to waste	% of illegal cases of total waste inspections
2021	15,300,000	5,072	80	1.6
2020	14,350,000	4,065	123	3
2019	14,820,000	4,698	81	1.7
2018	14,500,000	3,859	52	1.3
2017	13,700,000	3,414	126	3.7
Total	**72,670,000**	**21,108**	**462**	

Types and quantities of waste illegally exported

Information on illegal waste cases detected and reported by Customs authorities in the port of Rotterdam is summarized in Figure 31 and depicts the main type of waste and quantities for the year 2021.

As reported by the Customs authorities in the framework of the *Unwaste* project, out of the 80 cases in 2021, half of them were related to European Union Waste Shipment Regulations requirements for an Annex VII information to accompany the shipment. In 40 cases, the information required by Annex VII[124] was either missing, incomplete or falsely completed. Twenty cases related to export bans in place in the origin countries, in 19 cases the Prior Informed Consent notification to relevant authorities in destination

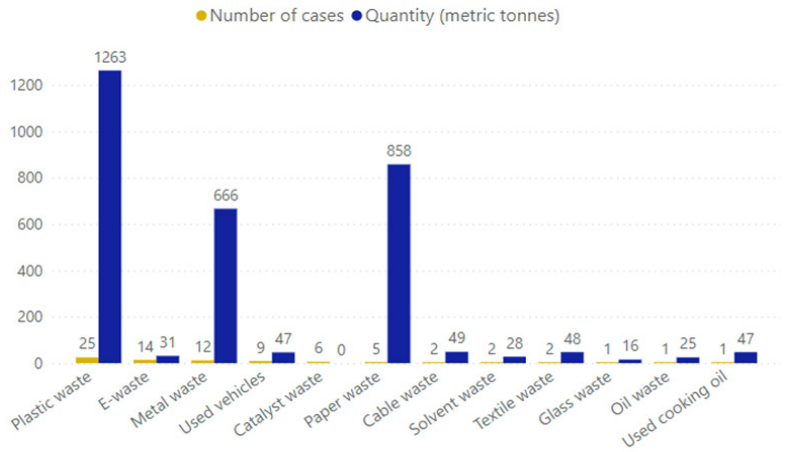


Figure 31 – Type of waste, number of cases and quantities (tonnes) detected in the Port of Rotterdam, the Netherlands, 2021 (Source: Netherlands Customs)[123]

country was missing and one case related to a treatment facility that lacked the license to treat the waste in question (see Figure 32). Information on cases prosecuted or on criminal proceedings was not available.

In terms of modus operandi, two main methods were identified by the Dutch authorities:

1. Contaminated waste shipped as clean (green-listed) waste[125]
2. Waste declared to Customs as non-waste (electrical appliances)

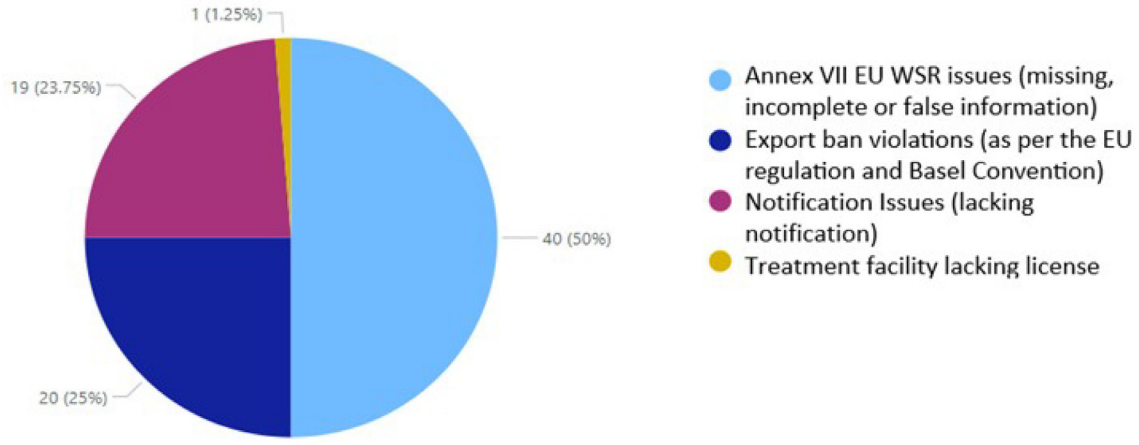


Figure 32 – Types of infringements detected in the port of Rotterdam, 2021 (Source: Netherlands Customs data)

Box 7 – Case study: Shipment of paper waste from the Netherlands to Thailand

Dutch Customs inspected multiple containers declared as paper waste en route from the Netherlands to Thailand. Several containers contained many bales of contaminated paper and wet paper showing signs of fungal growth. The bales were deliberately concealed or placed at the back of the container. The measuring and sampling team of the Human Environment and Transport Inspectorate of the Netherlands extracted a sample of 12 bales from each container and sorted through them. They discovered that all bales contained less than 98% clean dry paper, with contamination levels reaching up to 10%. This does not comply with the Basel code B3020 and the Dutch policy rule, which stipulates a threshold of maximum 2% contamination and that paper should be dry (with paper moisture content not exceeding 12%). The export was prohibited.

Image 3 – Paper waste (partly burned, partly waste with fungus)

Port of Antwerp, Belgium

Under Belgian control procedures, an inspection is required to determine whether a shipment contains illegal waste or not. If an illegal shipment of waste is detected during inspection, the shipment is stopped at port. If the consignor can provide the necessary evidence that the shipment complies with the relevant regulations, the shipment is no longer considered an illegal export and will be allowed to progress.

Belgian Customs at the port of Antwerp reported overall container traffic between 2017 to 2021 of approximately 57 million TEU, with 13,700 inspections carried out during this period.[126] While container traffic slightly increased every year, waste inspections decreased after 2019. However, the number of detected illegal cases mostly increased after 2018, possibly due to an improvement of the risk profiles used by Customs to target shipments of interest, resulting in a higher detection rate (see Table 27 for details).

Table 27 – Reported overall container traffic between 2017 and 2021 at the Port of Antwerp (Source: Belgian Customs)

Year	TEU total traffic	Waste inspections	Illegal cases	% of illegal cases of total waste inspections	Reports compiled and passed on to the public prosecutor's office
2021	12,020,000	1694	273	16.1	34
2020	12,031,469	2130	297	13.9	46
2019	11,860,204	3840	233	6	35
2018	11,100,408	2923	216	7.3	21
2017	10,450,900	3122	228	7.3	38
Total	**57,462,981**	**13,709**	**1,247**		**174**

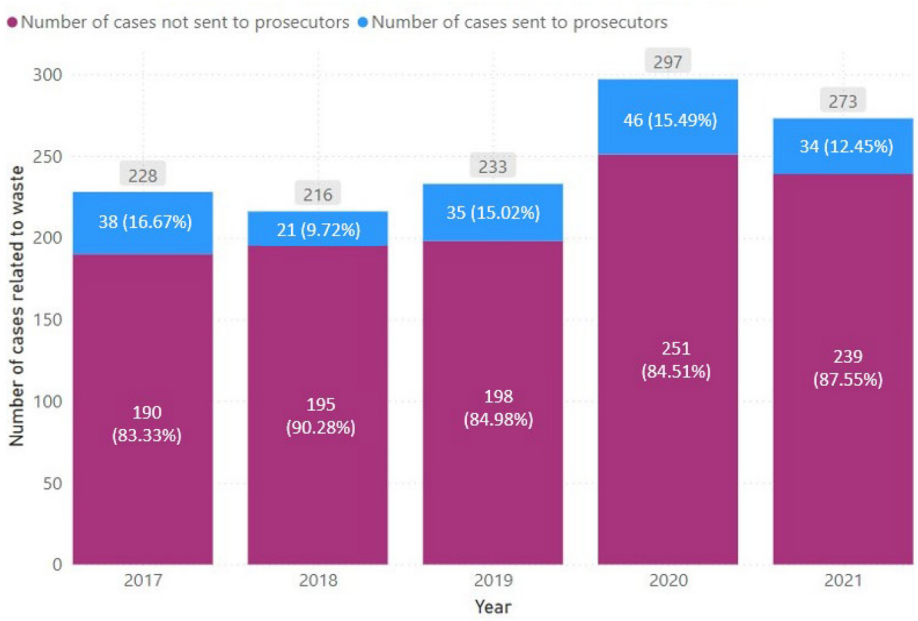


Figure 33 – Violations related to waste versus overall cases sent to the prosecutor's office 2017–2021 (%) (Source: Belgian Authorities, data provided for *Unwaste* survey)

Box 8 – Shipment of paper waste from Belgium to Malaysia

In May 2021, a shipment was selected for further inspection at the port of Antwerp. The selection was at random.

The exporter had declared the following information: shipment of six containers, commodity HS code 47071000 paper scrap, destination Malaysia, value €13,924 and a net weight of 139 tonnes. The declaration indicated a "Green-Listed Waste" shipment containing non-hazardous waste for recovery. According to the EU WSR, green-listed waste can be imported or exported for recovery without prior written notification or consent from the competent authorities but has to be accompanied by Annex VII documents.[127]

Inspectors requested the accompanying commercial documents, such as invoices and Annex VII documents. The Annex VII documents included the description "Waste paper", indicating that this waste type falls under the Basel Convention Annex IX, Basel code B3020 for paper waste (and therefore not requiring the Prior Informed Consent procedure). The documents declared the intended waste treatment operation at the destination as "recovery", using the code R3, which means recycling or reclamation of organic substances that are not used as solvents (including composting and other biological transformation processes). This information was also provided to the environmental inspectorate and Customs.

Upon physical inspection, Customs and the environmental inspectorate noticed that the cargo consisted of a mixture of paper waste and cut pieces of plastic foil. As mixed waste is not green-listed, this shipment should have been subject to the Prior Informed Consent procedure under the Basel Convention. In addition, the information declared in the accompanying documents was false. Under article 2, paragraph 35 of the European Union's Waste Shipment Regulation 1013/2006, this shipment had to be considered illegal. As a result, the export was prohibited and all six containers were returned to the waste generator.

In 2021, the number of violations related to waste represented 16.1% of all controls, the highest in five years (the lowest at 6% was in 2019). This is likely due to improved inspection of waste-related activities or better targeting and selection methods.

Overall, the number of cases passed on to the prosecutor's office is in the range of 9%–16% of the total number of waste-related cases detected by authorities at the port of Antwerp. The largest number of cases sent for prosecution in a single year (46), were discovered in 2020 (see Figure 33).

Types and quantities of waste illegally exported

The main type of waste targeted and detected in the port of Antwerp was plastic waste. Infringements were also observed for paper waste and metal waste, but to a lesser extent. Detailed figures on quantities were not available.

In terms of modus operandi, in Belgium, authorities also reported false declarations – for example, exports of plastic waste which, instead of being declared under the correct coding HS 3915 (plastic waste and scrap), were declared under different headings of Chapter 39 of the Harmonized System.

Port of Genoa, Italy

From 2017 to 2021, overall container traffic in the port of Genoa amounted to 13.3 million TEU, while the number of routine controls was over 62,000, of which more than 3,000 were based on specific risk analysis (no specific breakdown is available for controls related to waste). In 2021, there was an increase in TEU numbers and an increase in the number of containers inspected, as a result of risk analysis compared to 2020 (Table 28). Italian Customs are constantly adjusting the risk profiling criteria based on the modus operandi encountered in detected cases and also based on cases shared by other Customs administrations they are collaborating with. This resulted in more targeted controls.

Table 28 shows the number of total (criminal) cases submitted to judicial authorities for all detections combined. Waste represented, depending on the year, almost or over half of the total cases submitted to judicial authorities. These waste-related cases peaked in 2020 and then decreased in 2021 to 2017 levels. Some of the judicial cases, however, were related to detections from the previous year.[128]

Year	Total TEU	Routine checks	Number of containers inspected as a result of risk analysis	Number of total criminal cases in the port of Genoa	Number of criminal cases related to waste in the port of Genoa
2017	2,662,187	12,895	497	175	85
2018	2,674,404	13,231	624	131	63
2019	2,669,917	15,893	735	156	72
2020	2,498,850	11,861	584	167	107
2021	2,781,112	8,294	658	176	86

Table 28 – Overall container inspected and reported illegal cases in the port of Genoa, 2017–2021 (Port of Genoa, 2023)

National data for Italy indicate a large number of illegal waste shipments reported to Italian judicial authorities: 388 cases in 2017, 294 in 2018, 373 in 2019, 543 in 2020 and 549 cases in 2021. A significant portion of these cases (16%–22%) originated from the port of Genoa, where case numbers also followed the trend observed at national level (see Figure 34).

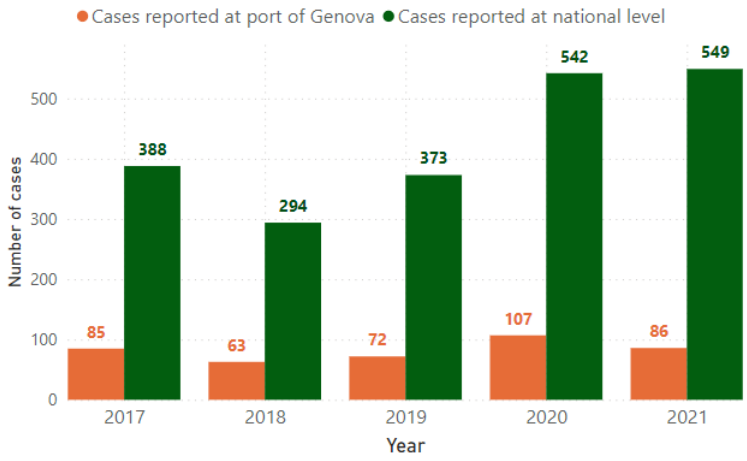


Figure 34 – Waste-related cases submitted to judicial authorities at national level versus illegal shipment cases submitted by the Port of Genoa Customs (Source: Italian Customs)

Types and quantities of waste illegally exported

The information shared by the Italian Customs authorities on shipments directed to Africa and Asia is compared for the years 2017–2021 (Figure 35). The two continents are reported as the two main destinations of illegal waste shipments from Italy.

The data on illegal waste exports to Asia and Africa show that plastic is the main waste

category exported to Asia, peaking at 960 tonnes in 2020 and falling by 75% in 2021 to nearly 241 tonnes, while there were no detected illegal exports of plastic waste destined for Africa from the Port of Genoa based on the provided data. The waste types illegally exported to Asia were mainly e-waste and plastic waste, and some batteries and other waste. While detected illegal exports to Africa rose between 2018 to 2021, illegal exports to Asia spiked in 2020, but fell in 2021. This decrease was due to a drop in illegal exports of plastic waste (or detection thereof), while the volume of e-waste and other waste illegally shipped to Asia increased. There are several possible reasons for these changes: an actual reduction in illegal waste exports, a change in targeting and selection methods, or changes in waste route (country or port of export to country of destination).

The Italian authorities also highlighted the different types of violation and modus operandi used by criminal organizations involved in waste trafficking, depending on the targeted continent. For shipments directed to Africa, criminals tended to use fake declarations when the goods declared fell under Customs item "990500 – furnishing", which does not include waste. By contrast, shipments directed to Asia tended to be organized by apparently legal entities working in the waste treatment sector. To appear compliant with the Waste Shipment Regulations, they falsely declared the cargo to contain green-listed waste, when in fact it contained hazardous waste or a category of waste whose import was banned by the receiving countries. In addition, they often reported receiving companies that were not existent.

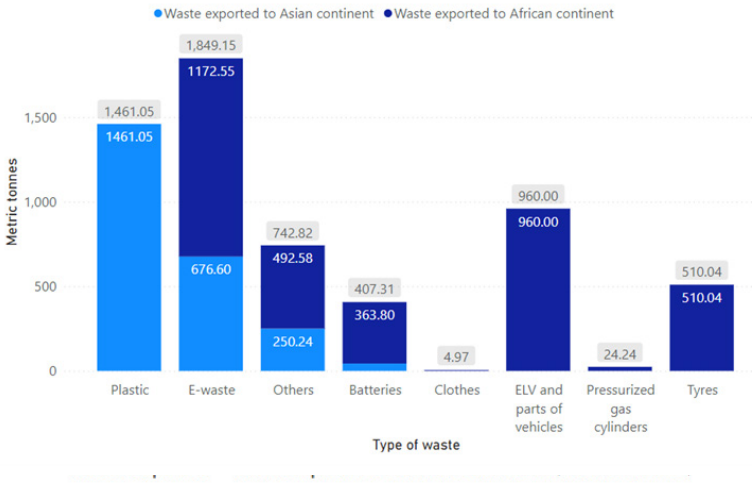


Figure 35 – Illegal waste shipments detected destined to Africa and Asia, 2017–2021 (tonnes) (Source: Genoa Customs, 2023)

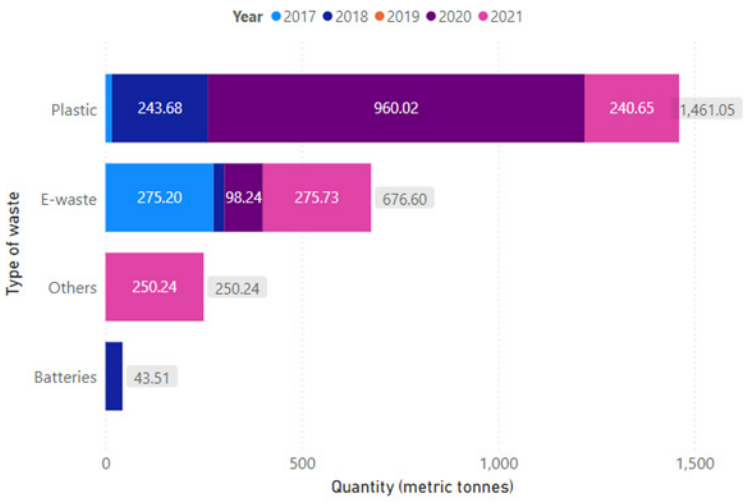


Figure 36 – Illegal waste shipments from the Port of Genoa to Asia, by type of waste, 2017–2021 (tonnes) (Source: Genoa Customs)

Box 9 – Case study: Shipment of non-ferrous metal scrap/e-waste from Italy to Thailand

During the *Unwaste* Study tour of October 2022, Customs representatives from Indonesia, Malaysia and Thailand visited the port of Genoa. Italian Customs shared their experience of an illegal shipment of 26.5 tonnes of waste that was declared officially as nonferrous metal scrap (B1010 under the Basel Convention and European Union List of Wastes code 19 12 03) and that was destined for Thailand.

Upon opening the containers, the Genoa Customs authorities detected, among the metal scrap, e-waste and contaminated metal, items that were prohibited for import to Thailand. The shipment was halted, and the Italian authorities involved the Thai Customs to investigate the receiving company.

This connection between Italy and Thailand was facilitated by the *Unwaste* project. This case study highlighted the importance of bilateral and international cooperation when dealing with illegal cross-border activities. The exchange of information among the involved authorities can help to prevent illegal shipments or even help to uncover criminal actors and networks behind the uncontrolled transboundary movements.

Image 4 – Evidence of e-waste hidden in the container of declared non-ferrous metal scrap (Source: ADM, Port of Genoa)

The European Union is updating its waste shipment regulation to reduce problematic exports, enforce circular economy principles and improve enforcement. The proposed regulation covers intra-EU shipments, imports and exports to third countries and waste transit through the EU. Notably, it maintains the ban for Member States to export waste for disposal to third countries or hazardous waste for recovery to non-OECD countries. Facilities in destination countries outside of the EU will have to pass audits and prove adequate waste management practices. The new regulation will also tighten rules for plastic waste exports, with bans on non-hazardous plastic waste to non-OECD countries. In contrast, exports to OECD countries will require Prion Informed Consent notification and strict monitoring. The new regulation will require the European Union Member states to establish penalties for breaches and ensure effective enforcement through national and international cooperation mechanisms, including a new waste shipment enforcement group.

PART 2: ASEAN COUNTRY CASE STUDIES

Chapter Four: Data From Four Focus Countries in the ASEAN Region

Following the general overview of the waste trade in Part 1 of this report, looking at regional relations between the European Union and ASEAN, Part 2 places a focus on country examples within ASEAN region. The *Unwaste* project team analysed waste trade data and policy reforms. The four focus countries are Indonesia, Malaysia, Thailand and Viet Nam. For each country, this chapter looks at:

- Data on the legal trade in waste, both in terms of imports and exports, as reported by the four focus countries to the Basel Convention Secretariat under the Prior Informed Consent procedure.
- Data on the illegal trade in waste, both in terms of imports and exports, including evidence of resulting prosecutions.
- The emergence of new legislation and policy geared to combatting illegal waste trafficking, particularly in the wake of the ban on waste imports by China.

The analysis of the legal waste trade involves global trade data sets that are publicly available. Data on the illegal waste trade and policy developments were shared by the national authorities of the focus countries.

Key takeaways

Indonesia

- The volume of waste imported by Indonesia from 2017 to 2021 fluctuated, with a sharp increase in 2018 and significant drop in 2020.
- Paper, metal and plastic were the most imported waste types.
- The EU27 combined are the largest exporter of waste to Indonesia, exporting mainly paper but also plastic waste. Trade partners for waste by country include the United States, Australia, the United Kingdom, Italy, Singapore, China and Japan.
- The main types of waste illegally shipped to Indonesia included plastic, medical waste and equipment, paper and paperboard waste, metal waste and other materials, such as sludge oil and used fabric.
- The illegal shipments originate primarily from Asia (Japan, Republic of Korea, China, Singapore, Thailand and Malaysia), North America (United States and Canada), Australia and New Zealand. European countries, including Spain, Belgium, France, the Netherlands, Germany, Slovenia and Italy, were also identified as countries of origin for illegal shipments in 10% of reported cases.
- Missing licenses or permits, smuggling, lack of valid documentation, incorrect notification and mixing household and hazardous waste were the primary tactics for the illegal shipments.
- Three prosecuted cases from Indonesia are presented, one of them reflecting an imprisonment penalty of more than seven years, which has been the most severe punishment in Indonesia for a case of waste trafficking.

Malaysia

- The waste imports for 10 selected HS codes increased by 165% between 2017 and 2021.
- The highest volume of waste imported by Malaysia between 2017 and 2021 was ferrous waste (6.4 million tonnes), followed by paper and paperboard (4.02 million tonnes).
- Malaysia ranked fourth as the main plastic waste importers globally between 2018 and 2022, recording the total volume of over 2.6 million tonnes.
- The United States, Japan and Australia were the top exporters of waste to Malaysia

between 2017 and 2021.

- The EU27 countries collectively exported 1.8 million tonnes of waste to Malaysia, making them the third-largest exporter of waste to the country. The primary types of waste exported from Europe were plastic (44%), paper (34%) and ferrous waste (12%).
- Detections of illegal shipments of hazardous waste by Malaysian authorities increased between 2015 and 2017. The peak was reached in 2019 with 399 containers detected (112 cases), 95 of which were repatriated, disposed of or re-exported. In 2020 and 2021, the years of the COVID-19 pandemic, the detection of illegal shipments dropped. However, in 2021, the number of containers detected (151) was lower than the previous years, but the total number of cases was much larger than in 2020 (59).
- The types of non-hazardous waste illegally imported into the country included plastic waste, metal scrap, wastepaper, steel scrap, aluminium scrap and e-waste.
- Authorities reported false declarations and no import permits (or general non-compliance with import regulations) as the primary tactics used to import illegal waste. Illegal imports occurred via sea routes.

Thailand

- Over the five-year period (2017-2021), Thailand imported 18.77 million tonnes of waste, valued at $7.13 billion.
- Of the 10 selected HS codes, Thailand imported mainly paper waste (8.948 million tonnes), ferrous waste and scrap (7.513 million tonnes), and plastic waste (1.153 million tonnes) from 2017 to 2021.
- Between 2017 and 2021, Thailand imported waste mainly from the United States, Japan, Australia, the United Kingdom and China. The EU27 as a combination of countries is the second biggest exporter of waste to Thailand (10 HS codes combined), with 2.2 million tonnes representing 12% of all imports (mostly paper waste). After the China ban, Thailand experienced a significant increase in the importation of plastic waste, with growth reaching 262% between 2017 and 2018.
- For the five years combined, the United States was the main exporter of waste to Thailand, totaling 5.3 million tonnes and almost 30% of all Thai imports. The EU27, as a combination of countries, is the second biggest exporter of waste to Thailand (10 HS codes combined), with 2.2 million tonnes representing 12% of all imports (mostly paper waste).
- From 2013 to 2023, Thai Customs registered 276 arrests related to e-waste with two types of offences: smuggling and tax evasion. The corresponding import value as declared on the invoice was 21.25 million baht (approximately €570,000).
- Regarding plastic waste (HS code 3915), from 2013 to 2023 Thai Customs registered 240 arrests with two types of offences: smuggling and tax evasion. The corresponding weight was 9,343 tonnes and the corresponding import value as declared on the invoice was 76.10 million baht (approximately €2.05 million).
- Thailand received hazardous waste mostly from Asian countries from 2017 to 2021, including 49,000 tonnes from China, 5,300 tonnes from Singapore and smaller-sized imports from Myanmar, Pakistan, Republic of Korea, Sri Lanka, Philippines and Indonesia.
- From 2020 to 2022, the main form of offences registered by authorities in Thailand are related to smuggling of household waste, packed into containers and transported into Thailand through the two major ports, Laem Chabang Port in Chonburi province and Klong Toey Port (or Bangkok port), using false declarations.

Viet Nam

- From 2017 to 2021, Viet Nam imported more than 44 million tonnes of metal, paper

and plastic scrap, valued at more than $13 billion.

- Viet Nam increased its scrap import volume by 50% between 2017 and 2020 and ranked first in the ASEAN region in terms of waste imports overall. Viet Nam was the top metal and e-waste importer within the ASEAN region.
- Japan, the United States, Australia, Hong Kong (China) and European Union were (in descending order) the top exporters of waste to Viet Nam. The 27 countries of the European Union combined ranked fifth, with more than 2.6 million tonnes of exported waste. In 2018, the number of illegal containers, most of them abandoned, was at its highest, at 10,124 containers. By the end of October 2021 and despite the re-exportation, enforced take-back procedures or destruction of containers, there was still a backlog of 2,893 containers of imported scrap.
- The most frequently trafficked waste categories were mixed, plastic scrap, metal scrap and medical waste. The illegal shipments originated from a variety of locations, mainly from North America (United States and Canada); Australia and New Zealand but also from Europe (Spain, Belgium, United Kingdom, Greece, France, Germany, the Netherlands, Slovenia and Italy).
- Authorities reported various Modus operandi used, including falsification or alteration of documentation, false declaration of goods to avoid inspection, fraudulent or incorrect notifications, smuggling by declaring the intention of re-exporting but illegally retaining the waste within the country, absence of required licenses or permits and concealment tactics to evade visual Customs inspection. Foreign traders frequently collaborated with Vietnamese companies, employing sophisticated methods to import illegal waste and scrap into Viet Nam. Because only a small percentage of goods undergo inspection, criminal actors exploit Customs management and regulations loopholes to carry out their illegal activities.

4.1. Indonesia

The legal trade of waste

Total imports from the world

Figure 37 shows the import quantity and import valuWe of 10 types of waste and scrap combined to Indonesia over the five years between 2017 to 2021. Overall, the volume of waste and scrap that was imported by Indonesia experienced a fluctuating trend – reflected also by its import value. In line with the other ASEAN countries, there was a significant increase in imports between 2017 and 2018, from 4.3 million tonnes to 6.18 million tonnes. A drop between 2019 and 2020 has two possible attributes. First, the major impact of the COVID-19 pandemic on global trade and second new regulations introduced in the end of 2019 by the Government of Indonesia to tighten import procedures as a response to the overflow of waste into the country. After 2020, imports started to climb again, reaching 5.24 million tonnes in 2021, with the highest import value at $2 million.

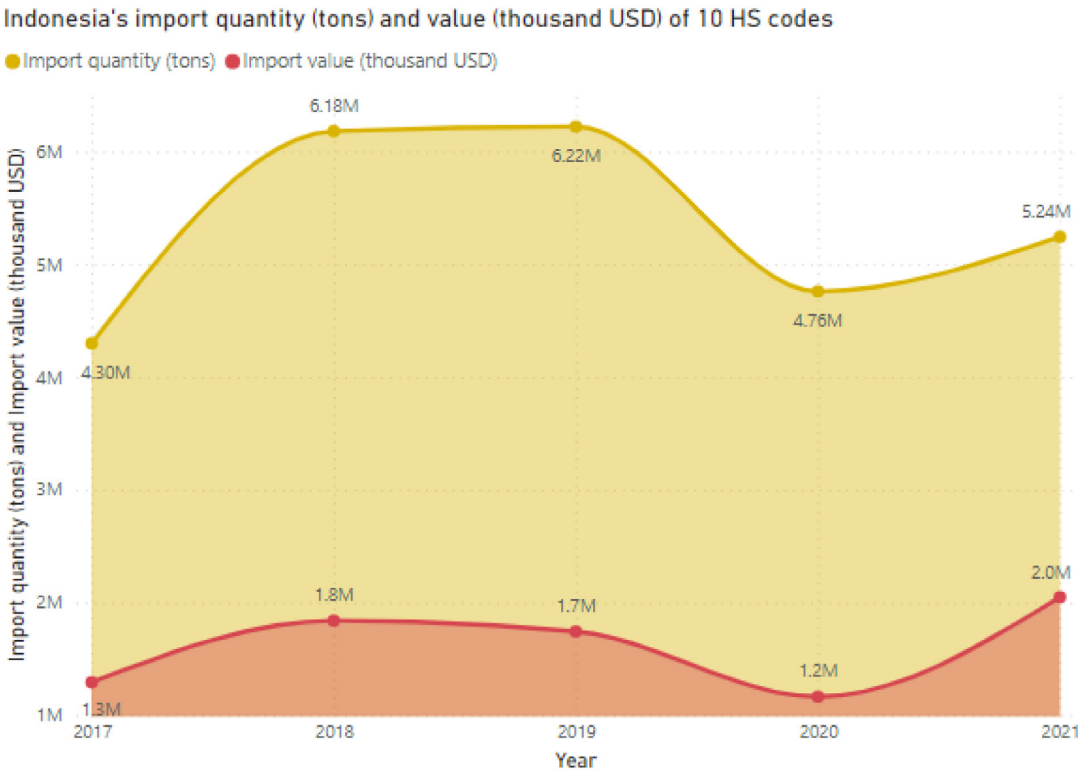


Figure 37 – Waste imports (10 HS codes) into Indonesia, by value and quantity, 2017–2021 (million US$ and million tonnes) (Source: UN Comtrade, accessed September 2023)

Main types of waste imported into Indonesia

Between 2017 and 2021, paper and ferrous metal dominated waste and scrap imports to Indonesia (Figures 38 and 39). Paper board and scrap (HS 4707) was the largest waste type over the period, weighing about 15 million tonnes in total and with a combined value of $2.8 million. Ferrous waste (HS 7204) was the second-largest in terms of quantity, at nearly 10 million tonnes, but with the highest total import value, at $3.59 million. The other primary waste commodities imported into Indonesia were plastic (HS 3915), aluminium (HS 7602) and copper (HS 7404).

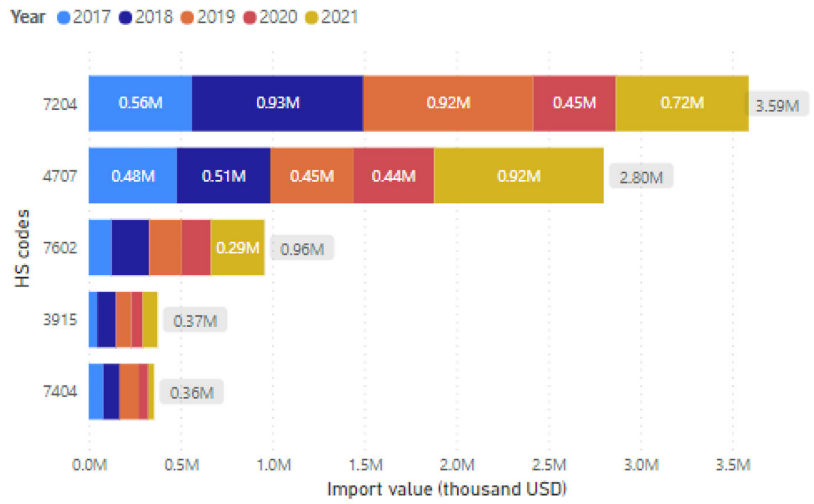


Figure 38 – Main types of waste imports (10 HS codes) into Indonesia, by value, 2017–2021 (million US$) (Source: UN Comtrade, accessed September 2023)

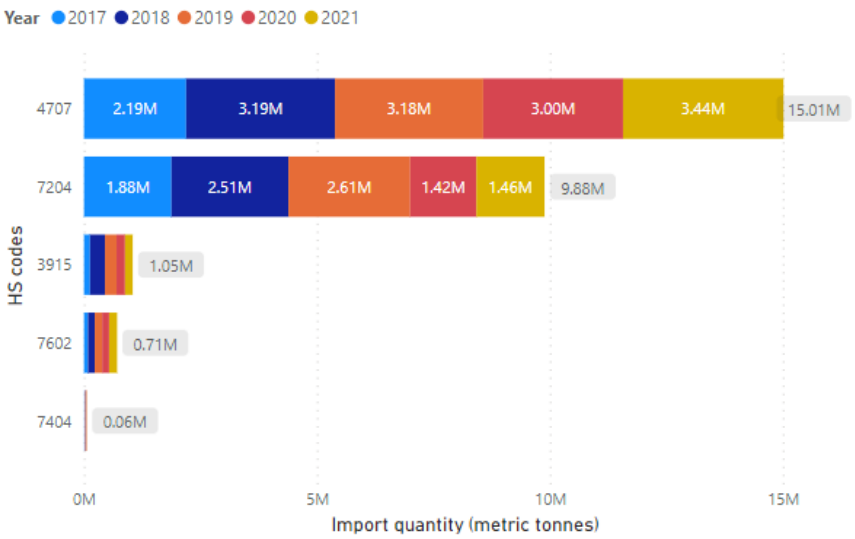


Figure 39 – Main types of waste imports (10 HS codes) into Indonesia, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

Top waste exporters to Indonesia

The United States was the top exporter to Indonesia as of 2018, when China's ban took effect. The year before, China had been the number one waste exporter to Indonesia in terms of quantity. The United States increased its export volume to Indonesia threefold from 2017 to 2018, to 1.58 million tonnes, and remained Indonesia's top waste exporter until 2020, despite the major decline in waste import in that year. Indonesia's neighbour, Australia, came second with a total of 3.63 million tonnes of exports over the five years, with a third of that volume being recorded in 2021 alone (at 1.03 million tonnes). From the European region, the United Kingdom and Italy were Indonesia's main partners, at 2.85 million tonnes and 1.89 million tonnes of waste and scrap exported (Figure 40).

The EU27 collectively exported 5.2 million tonnes of waste to Indonesia with a total value of $1.1 billion, making it the largest exporter of waste to Indonesia. The primary types of waste exported by the European Union to Indonesia were paper (84%), plastic (8%) and ferrous waste (7%).

Exports and imports of hazardous waste

Between 2017 and 2021, Indonesia exported 6.65 million tonnes of hazardous waste under the Basel Convention's Prior Informed Consent procedure, with most of it (78.4%) classified as "various waste". The other types of waste were metal waste (10.47%), e-waste (8.3%) and mercury (3%). Indonesia's export volume of hazardous waste increased dramatically in 2019, mainly due to exports of electric arc furnace dust,[129] which accounted for nearly 74% of all exports. But it decreased in the next year due to a sharp decrease in metal waste and electric arc furnace dust, along with a 44% decrease in spent bleaching earth (solid waste from the palm oil industry)[130] exports. When the national regulation was amended in 2020, spent bleaching earth was excluded from the hazardous waste list and

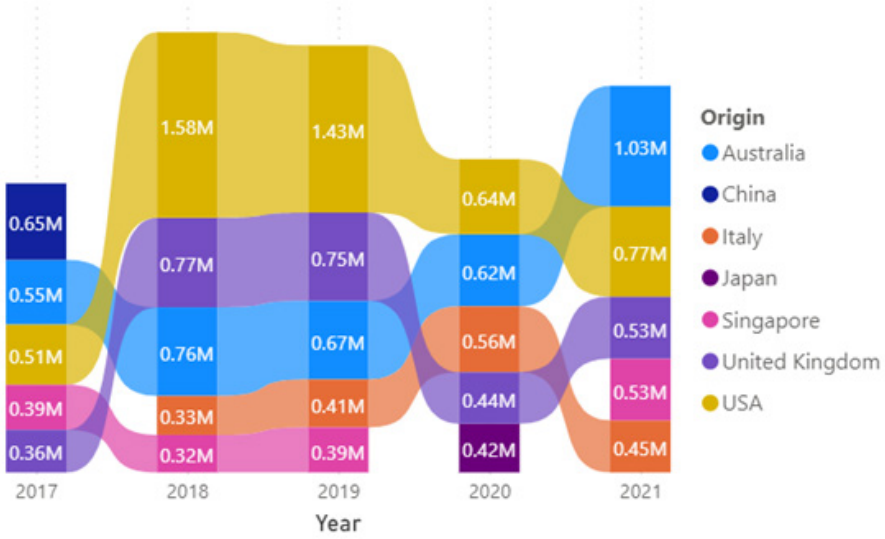


Figure 40 – Top exporting countries of waste (10 HS codes) to Indonesia, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

allowed to be used and processed domestically. Indonesia's exports of hazardous waste continued to decrease in 2021 due to a drastic drop in e-waste exports and no exporting of mercury and electric arc furnace dust as part of the "various" category declared. In terms of imports of hazardous waste, it is prohibited by Indonesian law and deemed a criminal offence.

Illegal traffic

Illegal waste shipments to Indonesia

As Indonesia banned hazardous waste imports in 1999, most of the illegal imports referred to in this section are of waste declared as non-hazardous by exporters. Through the survey submitted by the *Unwaste* project team, Indonesian authorities reported 54 cases of illegal waste imports between 2017 and 2021. Each case can involve one or more containers. One case, for example, involved a company that imported 1,078 containers.

- **Main waste types:** plastic waste; medical waste and medical equipment; paper and paperboard waste; metal waste; other (sludge oil, used fabric etc.); hazardous waste. [131]
- **Main exporting region and countries:** mainly Asia (China, Japan, Republic of Korea, Malaysia Singapore, Thailand,); North America (Canada and United States); Australia and New Zealand and, to a minor extent (fewer than 10% of reported cases), Europe (Belgium, France, Germany, Italy, the Netherlands, Slovenia and Spain).
- The **main declared modus operandi** includes missing licenses or permits, smuggling, lack of valid documentation, incorrect notification, and mixing of household and hazardous waste.

Of the 54 reported shipments of illegal waste, between 2019 and 2020, 16 shipments were returned to sender and seven were re-exported, although there was no mention of the new receiving countries. In addition, the Indonesian Directorate General of Solid Waste, Hazardous Waste, and Hazardous Substance Management reported that 1,078 containers of illegal waste (which were among the 54 shipments) from a single company were destroyed in 2020. The waste in the containers had been shipped to Indonesia without a Surveyor Report document, meaning that it did not undergo the pre-shipment inspection required for non-hazardous waste imports. The waste, based on the joint inspection carried out by the Ministry of Environment and Forestry and Customs, consisted of plastic and paper scrap, some of which was contaminated with hazardous waste and/or mixed with household waste, items which are banned from import to Indonesia.

The following boxes describe four cases of illegal waste trafficking, including the prosecution and sentencing measures undertaken by the Indonesian authorities.

Box 10 – Examples of prosecutions for illegal waste imports in Indonesia

Case 1: Smuggling of medical waste

In January 2021, the Dumai Customs Office, Riau Province, Indonesia, thwarted the smuggling of medical waste.[132] The illegal waste, allegedly from Malaysia, was transported by four trucks through the Rokan Hilir route in Riau. Enforcement officers initially received a tip-off about the attempts to smuggle medical waste, which ranged from used medical rubber gloves to used plastic face shields. The medical waste was carried by several trucks, which were also caught transporting various types of medicines without Customs clearance.

The case unfolded after Dumai Customs received information about a ship unloading imported goods to trucks in an informal port. After following up, officers detected and further monitored the two suspected trucks, which led to two more suspected trucks. Customs authorities then inspected the trucks and seized the illegal load.

Administrative and criminal procedure

Dumai Customs handed over the medicine to the National Agency of Drug and Food Control and the clinical waste to the environment investigator of the Ministry of Environment and Forestry for administrative and criminal enforcement. At the time of publication, no public information was available on the penalties imposed in this case.

Case 2: International cooperation and investigation leading to criminal conviction

In 2021, a joint investigation was conducted by the DG Law Enforcement Investigator of the Ministry of Environment and Forestry and the Batam special Port Authority Investigator into the unlicensed transportation of waste into Indonesian territory by a 48-year-old suspect named CP. [133]

CP was named as a suspect because he was the captain of the involved ship, the Belize-flagged SB Cramoil Equity[133], a vessel owned by Singapore Company Cramoil Pte Ltd., entering and carrying hazardous and toxic material waste into Indonesian waters without permission for three consecutive days. The SB Cramoil Equity ship carried 20 intermediate bulk containers[135] tanks with a capacity of 1,000 litres, containing liquid hazardous waste. The vessel departed from the Port of Singapore sailing towards the high seas.

Laboratory tests conducted by the Indonesian authorities showed the liquid to be in the form of oil and grease, which is categorized as hazardous under Indonesian law. In addition, carrying waste without permission to enter Indonesian territory is prohibited and is a criminal offence under the 2009 Law No. 32 on Environmental Protection and Management (article 106). [136]

Criminal procedure

If found guilty of such an offence, suspects are subject to imprisonment for 5 (minimum) to 15 (maximum) years and face a fine of at least 5 billion rupiah ($323,000) and not exceeding 15 billion rupiah ($970,000). The suspect also violated the Shipping Law by transporting hazardous waste without ship specification, which is subject to 2 years (maximum) imprisonment and a 300 million rupiah ($19,400) fine. After a one-year investigation and trial, the suspect was sentenced to 7 years and 8 months in prison and the maximum fine of 15 billion rupiah ($970,000).[137] This sentence was the most severe punishment so far for an illegal waste trafficking case.

International cooperation
The handling of this case was a follow-up to the cooperation with the international Operation 30 Days at Sea 3.0 to deal with crimes at sea. The operation was carried out jointly between ministries and agencies in several countries.

Case 3: Accused acquitted in a case involving plastic waste (nitrile gloves)

In August 2022, the director of a rubber glove company located in Central Java was released by the Sukoharjo District Court Judge Panel after a five-month detention.

The man was originally accused of bringing illegal waste (nitrile rubber gloves) into the territory of Indonesia, based on article 105 in conjunction with article 69 section (1) of Law Number 32 of 2009 concerning Environmental Protection and Management. In accordance with article 116 section (1) point b in conjunction with article 117 of the same law, criminal sanctions may be imposed on both the company (legal person) and the director, with imprisonment of a maximum of 7 years and a fine of 4 billion rupiah ($259,000).

After a trial lasting nearly a year, the accused was acquitted.[138]

Crime trends: Waste categories, routes, modus operandi

The national authorities reported that many of illegal waste found entering Indonesia are plastic waste and hazardous waste. Contaminated plastics arrive in Indonesia by container ships while hazardous waste was found also to be transported by other types of cargo ships or even smaller vessels. The highest-risk entry point is the western part of Indonesia (north Sumatra, the Malacca Strait). The Malacca Strait is one of the busiest international shipping passages in the world, as it connects the Indian Ocean and the Pacific Ocean. This strait is known to be one of the main routes for smuggling and trafficking due to its high volume of traffic and geographic characteristics that provide many hideouts and entry points, making it easy for smugglers to avoid detection.[139]

The above-mentioned cased of used medical rubber gloves, which entered the country via Dumai (a city in Riau Province, Sumatra) is an example. The gloves were unloaded from a ship to a truck in an unofficial port in Dumai. The trucks were later stopped by Indonesian Customs and the gloves were seized. A similar route was used to transport hazardous waste such as oil sludge, liquid alkaline cleaner waste and copper slag, which was carried by ships that were intercepted along the Malacca Strait.

Illegal waste imports are also carried out through companies holding a “bonded zone facilities” permit. A bonded zone is defined as a Bonded Storage Place to store imported goods and/or goods originating from other places in the Indonesian Customs area, to be processed or combined before being exported or imported for use.[140] The modus operandi is to facilitate the entry of hazardous or contaminated waste with a Customs declaration declaring it as non-hazardous waste.[141]

Take-back procedure and repatriation

Because the Prior Informed Consent procedure

is not required for the importation of non-hazardous waste, attempts to implement take-back procedures for waste shipments that are declared as non-hazardous but violate import rules and requirements (missing license and/or permit, misdeclaration or contaminated waste) are often unsuccessful. When an illegal waste shipment is detected by the authority, the representative of the exporting country is contacted to arrange for the waste to be shipped back to sender. However, in some cases repatriation efforts are unsuccessful, as the exporters were intermediaries or entities that were not registered in the country where the waste had originated or departed from. The absence of the Prior Informed Consent procedure makes it harder to take effective measures against illegal waste, such as repatriation.

In this scenario, the Indonesian authorities would hold the exporter accountable for the illegal shipment, with the main objective of removing it from Indonesia. In some cases, the exporter would look for another buyer in countries where the waste in question would meet the national requirements, rather than sending it back to the country of origin.

Indonesia has also experienced the refusal of the country of origin to take back the illegal waste. Indonesia Customs reported up to 20 such cases in the past five years. One reason for the refusals was that the countries of origin require a court decision declaring the waste illegal and ordering its repatriation. However, some cases could not be taken to court due to untraceable exporters and/or importers. And for those cases that were taken to court, prosecution was time-consuming and costly (see Chapter 5), which meant that this option was not made a priority in the past years.

Another challenge is communication with the country of origin. For Parties to the Basel Convention, communication is easier, as it involves reaching out to its competent authorities. Meanwhile, for non-Party countries, contacts are typically established with representatives of the respective countries in Indonesia. However, issues such as changing personnel and contacts have occurred in the past, impeding repatriation efforts.

Illegal waste exports

Indonesian authorities reported 18 cases of illegal waste exports from 2018 to 2022.

- The main waste types included: metal, e-waste, plastic and other waste. Quantities were expressed in different units of measurement, such as bags, containers, packages, rolls etc., so unfortunately it was not possible to provide an overall quantification. Shipments varied in size, from 80 packages of e-waste to two full containers of “other waste”.
- Modus operandi were mainly incorrect notifications and missing licenses or permits. The main destination countries reported were Japan, Malaysia, Panama, Singapore, China and Indonesia itself. This may be related to illegal internal trade detected by Customs authorities.

International cooperation

No specific cooperation is in place between Indonesia and the European Union, apart from the procedures that are part of the Basel Convention. The communication platform established under the Basel Convention allows for prompt communication of notification procedures via email among the Parties.

Indonesia Customs participated in multiple editions of World Customs Organization's Operation Demeter.

Overview of national responses since China's waste import ban

The National Task Force on Import of Non-Hazardous Waste as Raw Material for Industries was established in 2020. It is a coordination and communications platform for agencies relevant to waste trade and waste trafficking, such as the Ministry of Trade, the Ministry of Environment and Forestry, the Ministry of Industry, the Ministry of Foreign Affairs, Customs, and the National Police. The role of the Task Force includes discussing and recommending resolutions to address waste imports that violate national standards.[142]

In 2019, the Government regulated the import of non-hazardous waste by adding more rules and restrictions,[143] such as adding homogeneity as an importing requirement, requiring proof of exporter registration[144] for companies to obtain an Import Approval for waste and limiting the entry for waste shipment to 15 designated ports.

In 2020, the Government twice amended the regulation on the importation of non-hazardous waste to clarify technical rules on the mechanism and the prerequisites for manufacturer importers to obtain an Import Approval. In 2020, the Government established an interagency task force and issued a Joint Ministerial Decree[145] to limit the rate of impurities in imported waste to 2% for plastic and paper.

In 2021, the Government issued an omnibus regulation[146] that covers the import provisions and import requirements for all types of goods, including non-hazardous waste as raw material for industry. The regulation was later amended [147] to detail some technical aspects, including the types of import violation that can be subject to administrative sanction. However, a new regulation on general import procedures takes effect on 11 March 2024.[148] This new regulation has amended import-related procedures such as supervision from post-border to border, but it does not amend any provisions or requirements specifically related to the import of waste.

Indonesia ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal in 1993. As a commitment to the Convention and reflected from the past illegal hazardous waste cases, a government regulation that completely bans the importation of hazardous waste was issued in 1999.[149] The country then ratified the Basel Ban Amendment in 2005.[150]

4.2. Malaysia

The legal trade of waste

Malaysia imports waste from other countries due to its low recycling rate of domestic waste and the demand for materials in its recycling sector.[151,152] Many recycling facilities were established after China's waste import ban, and there has been a rising number of companies and industries obtaining licenses for scheduled waste recovery. The licenses granted increased from 52 in 2003 to 276 in 2018[153] and are now at 433.[154]

Total imports from the world

Figure 41 shows the import quantity and import value of 10 selected types of waste determined by their respective HS codes, from 2017 to 2021. For the five years and 10 HS codes combined, Malaysia imported over 16 million tonnes of waste valued at more than $11.5 billion. The waste imports increased gradually from 1.84 million tonnes and an import value of $820 million in 2017, to 4.88 million tonnes and $3.96 billion in 2021.

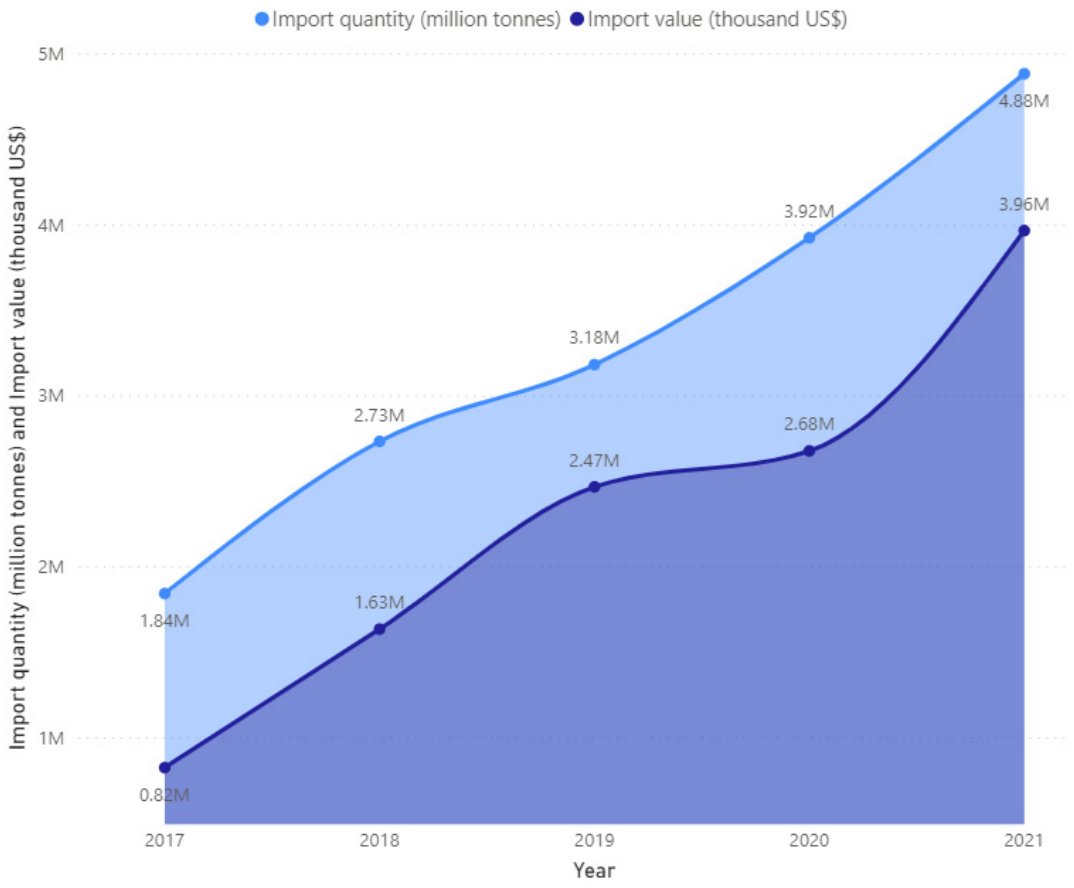


Figure 41 – Waste imports into Malaysia (10 HS codes), by value and quantity, 2017–2021 (million US$ and million tonnes) (Source: UN Comtrade, accessed September 2023)

Main types of waste imported in Malaysia

Following China's ban in 2018, Malaysia emerged as the world's top importer of plastic waste in 2018. According to UN Comtrade data, Malaysia imported nearly 3 million tonnes of plastic scrap between 2017 and 2022, with more than 872,000 tonnes of the total plastic waste imported in 2018 alone.

Among 10 selected HS codes, Malaysia recorded the highest volume of imports for ferrous waste (HS Code 7204) over the 2017–2021 period, importing a total of 6.4 million tonnes, valued at nearly $4 billion. Between 2017 and 2021, paper waste (HS Code 4707) imports to Malaysia increased nearly sevenfold in quantity, from 263,124 tonnes to 1.8 million tonnes. By 2021, Malaysia became the third-largest recipient of metal waste (all types combined) in ASEAN by quantity, importing a total of 9.89 million tonnes between 2017 and 2021 but was the top metal importer in terms of value, at almost $10 billion. Malaysia stands out as the primary destination in Southeast Asia for both aluminium and copper waste imports (Figures 42 and 43).

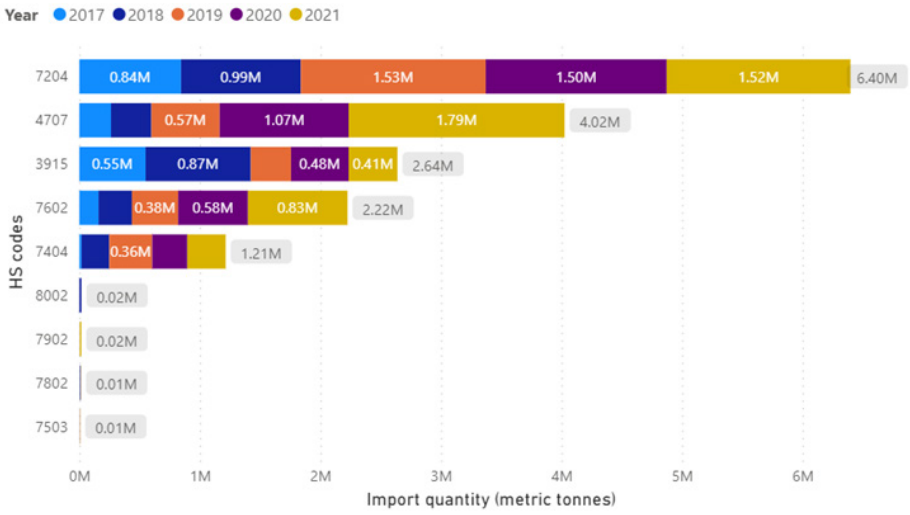


Figure 42 – Main types of waste imports into Malaysia, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

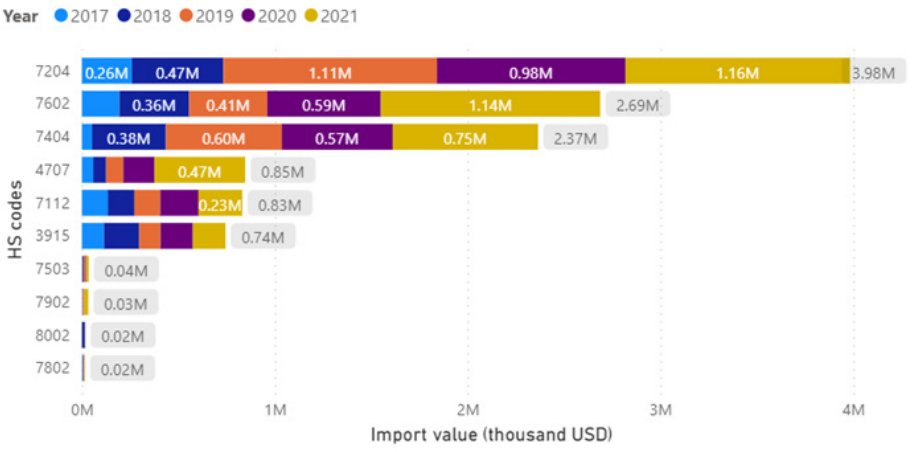


Figure 43 – Main types of waste imports into Malaysia, by value, 2017–2021 (million US$) (Source: UN Comtrade, accessed September 2023)

Top waste exporters to Malaysia

The top five exporting countries to Malaysia for 10 selected HS codes were the United States, Japan, the United Kingdom, Australia and Singapore. The United States exported 5.92 million tonnes of waste over the five-year period, with increasing quantities each year (Figure 44).

The EU27 collectively exported 1.8 million tonnes of waste to Malaysia, with a total value of $886 million, making it the third-largest exporter of waste to Malaysia. The primary types of waste exported by the European Union to Malaysia were plastic (44%), paper (34%) and ferrous waste (12%).

Trade in Basel Convention-covered waste to and from Malaysia

Malaysia reported more than 41,000 tonnes of imported hazardous waste between 2017 and 2020. As of April 2023, no imports were reported after 2020 under the Basel Convention's Prior Informed Consent procedure. Malaysia only received hazardous waste from other Southeast Asian countries (primarily from Singapore, at more than 30,000 tonnes, and from Indonesia, at less than 10,000 tonnes). This waste was mostly calcium hydroxide sludge (calcium hydroxide or hydrated lime, which is used to treat sewage water, as a stabilizer in road construction, and in other manufacturing applications, such as in the plastics industry), classified under "various wastes", with some small quantities of e-waste (2,500 tonnes of cables and wires) imported in 2019 from Singapore.

Exports under the Basel Convention were relatively low, with an increase in 2020, when Malaysia exported 162,000 tonnes of coal tar to China. During the whole period of 2017–2020, small quantities of e-waste exported were mostly destined to OECD countries.

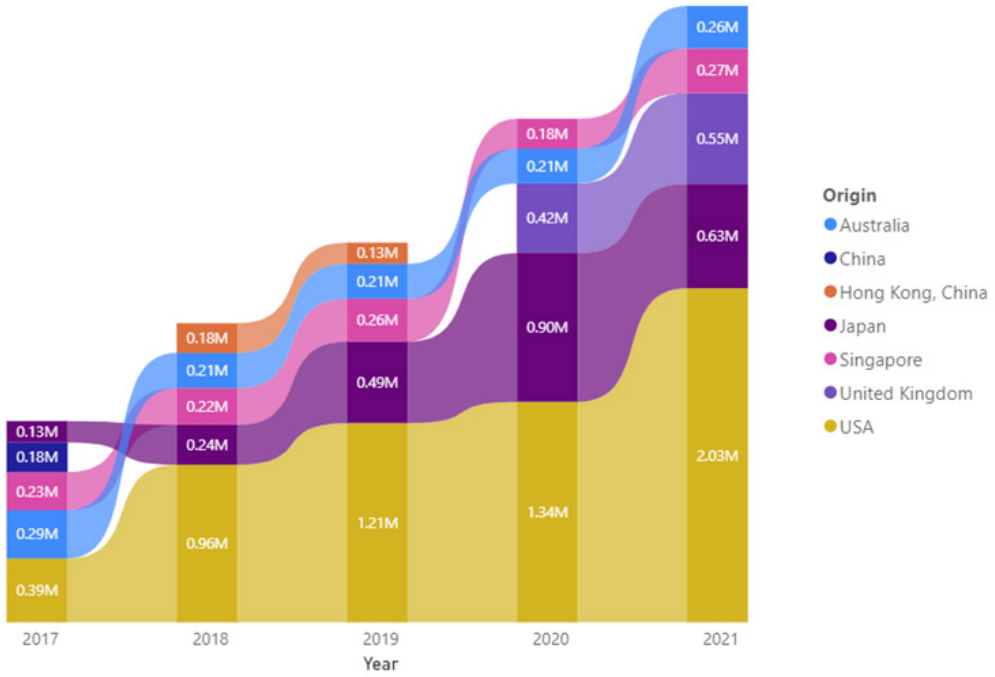


Figure 44 – Top exporting countries of waste (10 HS codes) to Malaysia, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

Illegal traffic

Illegal waste shipments to Malaysia

Information on illegal waste imports was provided by the authorities of Malaysia through the *Unwaste* project questionnaire. Figure 45 shows 274 illegal cases reported for a total number of 873 containers of hazardous waste illegally shipped to Malaysia from 2015 to 2021.

The number of illegal containers increased between 2015 and 2017. The peak was reached in 2019 with 399 containers detected (112 cases), 95 of which were repatriated, disposed of or re-exported. In 2020 and 2021, the years of the COVID-19 pandemic, the number of containers and cases dropped. However, it is interesting to note that in 2021, while the number of containers (151) was lower than the previous years, the total number of cases reported was much higher than in 2020 (59), which indicates fewer containers for each case.

Malaysian authorities reported that in addition of hazardous waste, different other waste types were illegally imported into the country, including plastic waste, metal scrap, wastepaper, steel scrap, aluminium scrap and e-waste.

Crime trends: waste categories and modus operandi

The modus operandi employed in illegal waste imports reported by the authorities included false declarations and no import permits (or general non-compliance with import regulations). Illegal imports occur via sea routes.

No information is available with regard to the possible involvement of organized crime groups or networks.

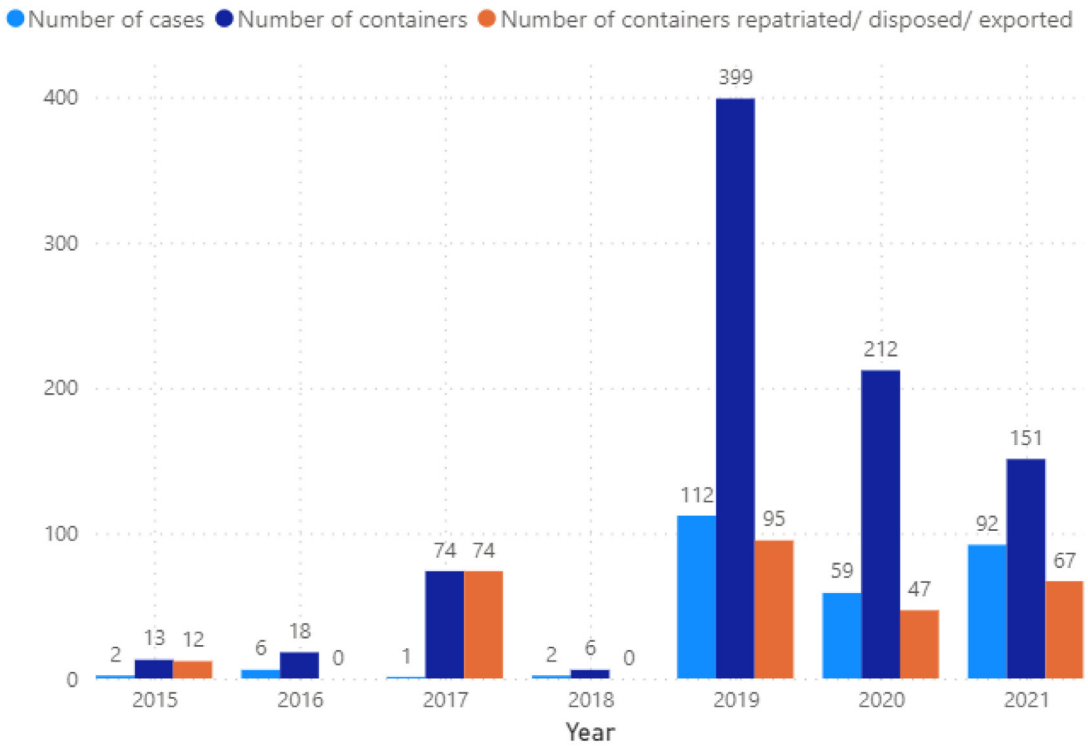


Figure 45 – Illegal shipments of hazardous waste into Malaysia, 2015–2021 (Source: Malaysian authorities through *Unwaste* survey)

Take-back procedure

As a Party to the Basel Convention, the Malaysian Government establised a policy to send back any illegal shipments to the respective countries of origin. Figure 46 shows the number of containers of hazardous waste repatriated, disposed of or re-exported between 2015 and 2021, based on data provided by the national authorities.

Prosecution

No cases of illegal traffic were prosecuted between November 2017 to November 2022. However, there is a civil case pending, in which the plaintiff claims that the imported plastics were not illegal and that therefore the detention of the waste was illegal.

Illegal waste exports

No specific information was provided through the questionnaires with regard to the illegal export of waste from Malaysia to other countries in the region or worldwide. One case of illegal exported medical waste from Malaysia involved used rubber gloves and used plastic face shields which were discovered on trucks by authorities in Indonesia. Under Malaysian law, such medical waste should have been incinerated and disposed of in secured landfills domestically, and not exported.

International cooperation

Currently, no specific cooperation is in place between Malaysia and the European Union apart from the procedures that are part of the Basel Convention. The communication platform established in the framework of the Basel Convention allows for prompt communication of notification procedures via email among the Parties. Additionally, Malaysia is one of the participating members of World Customs Organization's Operation Demeter, which is aimed at intercepting illegal shipments of hazardous waste.

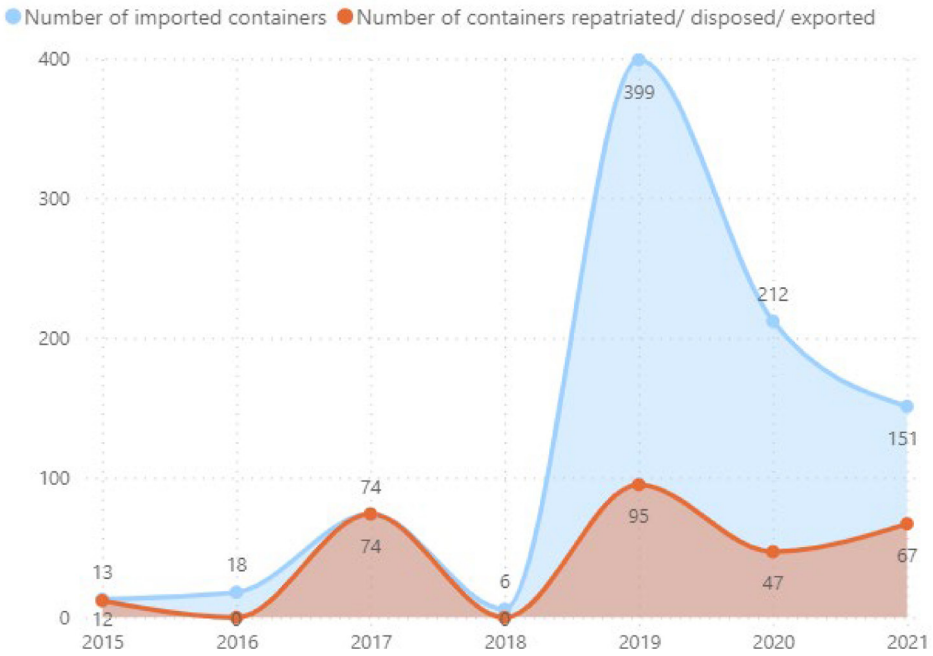


Figure 46 – Number of containers repatriated, disposed of and re-exported, 2015–2021 (Source: Malaysian government sources, 2023)

Malaysia is also part of the Southeast Asia Justice Network (SEAJust),[155] which is an informal operational platform established in 2020 with the purpose of enhancing cooperation with other regional networks in relation to mutual legal assistance in criminal matters. It also promotes the sharing of best practices and experiences with the Central Authorities of other regions. At the time of the survey, there was no reported Mutual Legal Assistance request related to cases of waste trafficking.

Overview of national responses since China's waste import ban

There has been an increase in plastic waste, metal scrap (especially non-ferrous) and paper waste importation since the China Ban. Besides legal shipments, containers of low quality, contaminated and mostly non-recyclable plastic began to pile up at Malaysian ports. In response, the Malaysian Government issued a temporary halt on plastic waste imports in October 2018, tightening requirements for issuing permits and clamping down on illegal recycling facilities. In December 2019, Malaysia ratified the Basel Convention Ban Amendment.[156]

The Malaysian authorities have identified and closed 139 illegal or uncompliant plastic recycling operations nationwide since the beginning of 2019, as part of the enforcement operations aimed to combat the illegal importation and dumping of waste in the country.[157] The Government tightened its requirements for issuing permits, reinforced controls of containers and set up a dedicated national task force in April 2019 to combat illegal plastic waste imports and clamp down on recycling facilities operating without a valid license and employing harmful disposal methods. Enforcement officers from the National Solid Waste Management Department worked closely with the Department of Environment and Customs to streamline enforcement procedures at ports nationwide to detect illegal shipments of plastic waste. Joint inspection efforts were carried out to detect unrecyclable or contaminated imported plastic waste. Malaysia media reported that a total of 254 containers and 5,512 tonnes of plastic waste shipped illegally were returned to the countries of origin as of December 2020.[158]

The National Solid Waste Management Department, under the purview of the Ministry of Housing and Local Government, controls plastic waste imports and issues the Approved Permit, governed by the Solid Waste and Public Cleansing Management Act 2007 (Act 672) and Customs (Prohibition of Import) Order 2017. In 2022, the Ministry issued Guidelines on Importation of Plastic Under HS 3915.[159]

Additionally, the Ministry of Investment, Trade and Industry issued Guidelines for the Importation and Inspection of Metal Scrap and Paper Waste, which came into force in January 2022.[160] The guidelines specify the requirements for the importation and exportation of three types of scrap metal: ferrous, copper and aluminium. Wastepaper and metal scrap intended to be imported into Malaysia for manufacturing purposes only is subject to an inspection process and issuance of the Certificate of Approval by SIRIM[161] , to ensure that imported metal scrap and wastepaper are of high quality and free from hazardous waste. The Ministry also announced implementation of a two-year moratorium, effective 15 March 2022, for the paper manufacturing license issuance.[162]

The transboundary movement of e-waste requires prior written approval from the Director General of the Department of Environment, as mandated under section 34B(1)(b) and (c) of the Environmental Quality Act 1974. The transboundary movement of e-waste must be evaluated to determine whether the waste is suitable for direct reuse, repair or refurbishment and is tested for its functionality. It must have the appropriate documents and declaration of the testing results prior to any transboundary movement. The Department of Environment issued the Guideline for Transboundary Movement of Used Electrical and Electronic Equipment.[163]

4.3. Thailand

The legal trade of waste

From 2017 to 2021 Thailand imported almost 19 million tonnes of waste, valued at more than $7 billion. In 2017, Thailand's imports of 10 selected types of waste amounted to 3.52 million tonnes, equivalent to $1,141 million. The import quantity and value fluctuated before reaching a peak of 5 million tonnes and $2.3 billion in 2021 (Figure 47).

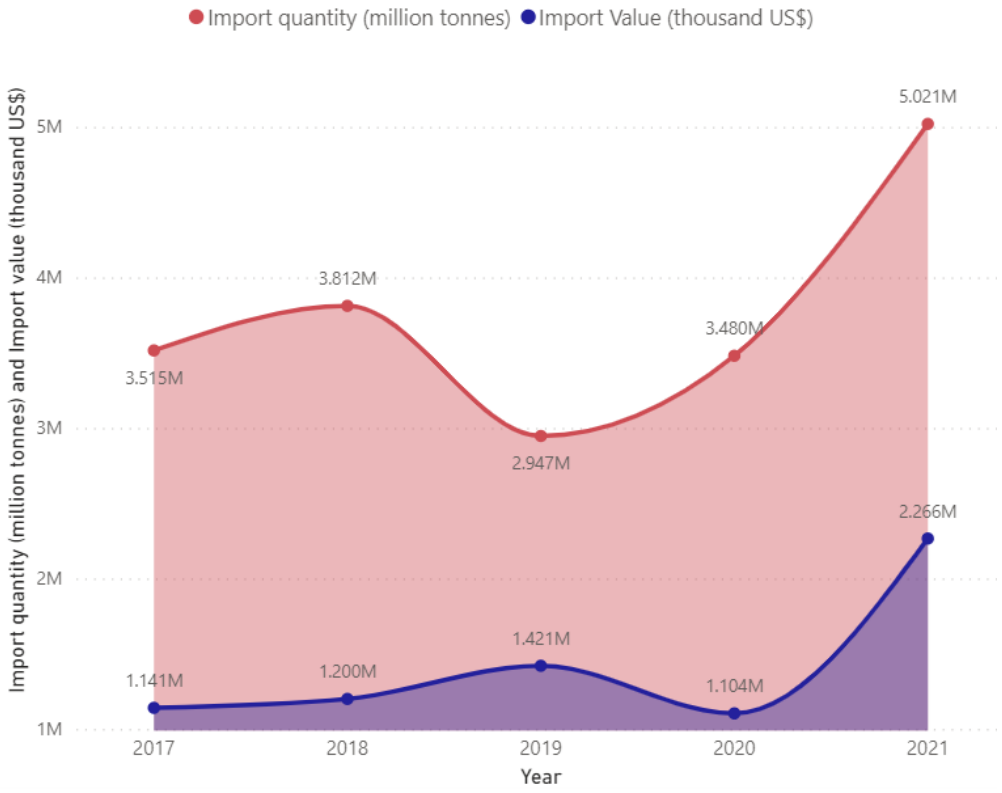


Figure 47 – Waste imports into Thailand (10 HS codes), by value and quantity, 2017–2021 (US$ and tonnes) (Source: UN Comtrade, accessed September 2023)

Main types of waste imported into Thailand

The data indicate that between 2017 and 2021, Thailand mainly imported paper and paperboard waste (HS 4707), amounting to 8.9 million tonnes, with a peak of 2.8 million tonnes in 2021. Ferrous waste (HS 7204) ranked second on the list, at 7.5 million tonnes, After the China ban, Thailand saw a significant increase in the importation of plastic waste, with growth reaching 262% between 2017 and 2018. However, imports stabilized at pre-China ban levels from 2019 onwards (Figures 48 and 49). It is also noteworthy that in 2019, Thailand's import value of precious metal waste and scraps (HS 7112) accounted for $569 million, or approximately 91% of the country's precious metal scrap imports over the five years.

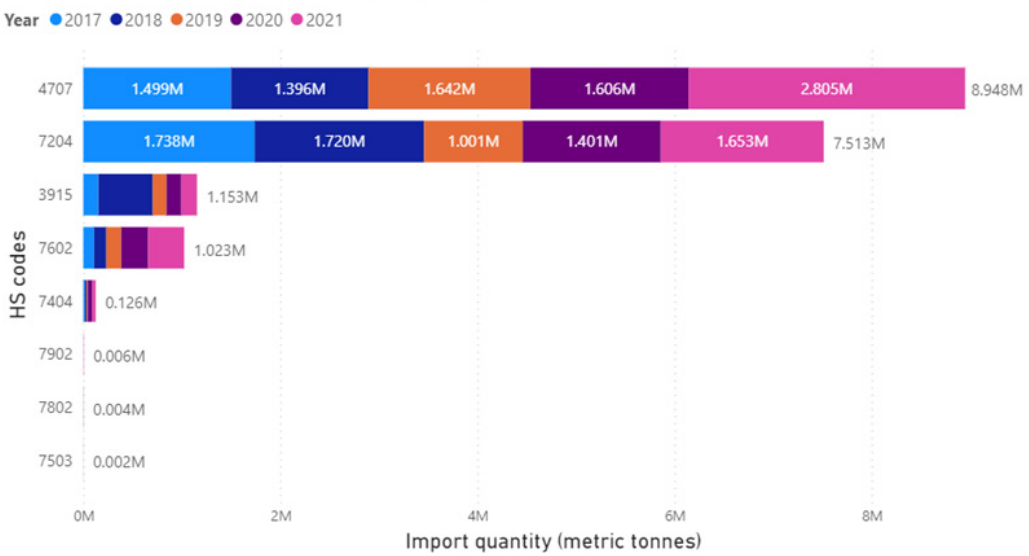


Figure 48 – Main types of waste imports into Thailand, by quantity, 2017–2021 (million tonnes) (Source: UN Comtrade, accessed September 2023)

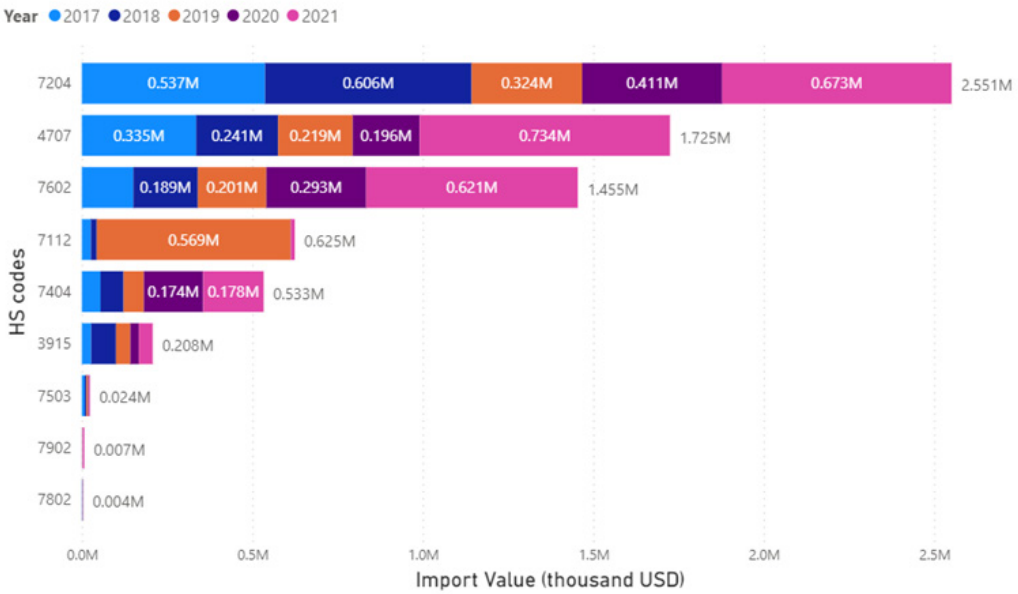


Figure 49 – Main types of waste imports into Thailand, by value, 2017–2020 (US$) (Source: UN Comtrade, accessed September 2023)

Main exporters to Thailand

For the five years combined, the United States was the main exporter of waste to Thailand, totalling 5.3 million tonnes and almost 30% of all Thai imports (Figure 50). The EU27 are the second biggest exporter of waste to Thailand (10 HS codes combined), with 2.2 million tonnes representing 12% of all imports (mostly paper waste).

The United States, Japan, Australia, United Kingdom and Italy were the top exporters, accounting for 65.6% of the total paper waste imports (HS code 4707), while the EU27 represents more than 20%. In terms of plastic waste (HS code 3915), the top five exporting countries and territories were Japan, the United States, Hong Kong (China), China and Australia, accountable for 81.2% of the overall import quantity throughout the five years. For ferrous metal scrap (HS 7204), the United States, Australia, Japan, Panama and Myanmar exported 52.7% of the overall quantity. Cambodia was the main exporter to aluminium to Thailand.

Trade in Basel Convention-covered waste to and from Thailand

Thailand received hazardous waste mostly from Asian countries from 2017 to 2021, including 49,000 tonnes from China, 5,300 tonnes from Singapore, and smaller imports from Myanmar, Pakistan, Republic of Korea, Sri Lanka, Philippines and Indonesia. From other regions, the United Kingdom and Australia were large exporters (2,000 and 1,800 tonnes, respectively). The country imported mostly e-waste or WEEE, especially in 2017. In 2018, the Thai Government imposed a national resolution, signaling the phasing down of plastic scrap imports over two years, and an e-waste ban effective in 2020. This led to a substantial decline of e-waste imports between 2019 and 2020.

The majority of the country's hazardous waste exports consisted mainly of electric arc furnace dust and mill scaling arising from the manufacture of iron and steel, e-waste and metal. The exported amount of e-waste peaked in 2019, at 14,375 tonnes, increasing by 88% from 2017

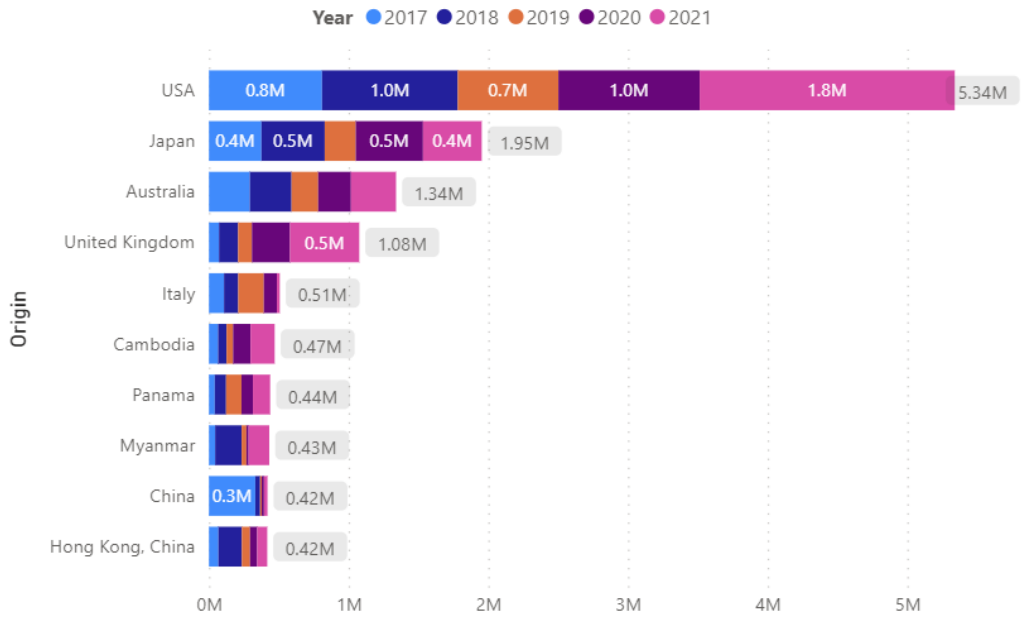


Figure 50 – Top exporting countries of waste (10 HS codes) to Thailand, 2017–2021 (tonnes) (Source: UN Comtrade, accessed September 2023)

before dropping entirely to zero in 2020. There was also a drastic increase in chemical and metal compounds, at 29,100 tonnes in 2019. In 2020, however, there are no data available. The overall exports in 2021 spiked by 241% from 2019 due to an unprecedented shift to exporting mill scaling arising from the manufacture of iron and steel (141,315 tonnes), with no previous record of this type of export.

Illegal traffic

Illegal waste shipments to Thailand

The Prevention and Suppression Division of Thai Customs provided statistics on the seizures and number of arrests between 2013 and 2023[164] related to infringements concerning two main waste streams, e-waste[165] and plastic waste.

From 2013 to 2023, Thai Customs registered 276 arrests related to e-waste with two types of offences: smuggling and tax evasion.[166] The corresponding import value as declared on the invoice[167] was 21.25 million baht (approximately €570,000). [168]

Regarding plastic waste (HS code 3915),[169] from 2013 to 2023 Thai Customs registered 240 arrests[170] with two types of offences: smuggling and tax evasion. The corresponding weight was 9,343 tonnes[171] and the corresponding import value as declared on the invoice was 76.10 million baht (approximately €2.05 million). This seizure and arrest record was aggregated from both types of trade (importation and exportation), although further breakdown is unavailable. Following China's ban on solid waste imports, Thailand received, for the recorded period, its highest number of illegal plastic waste shipments in 2018 (77 cases), before a gradual drop due to national measures. The measures included halting the issuance of import licenses for plastic scrap and developing Thailand's Roadmap on Plastic Waste Management (2018–2030). The number of e-waste cases prior to 2020 remained relatively high before a distinct drop in 2021 and the following years due to the Ministry of Commerce's importation ban notification, prohibiting 428 types of electronic waste in 2020.

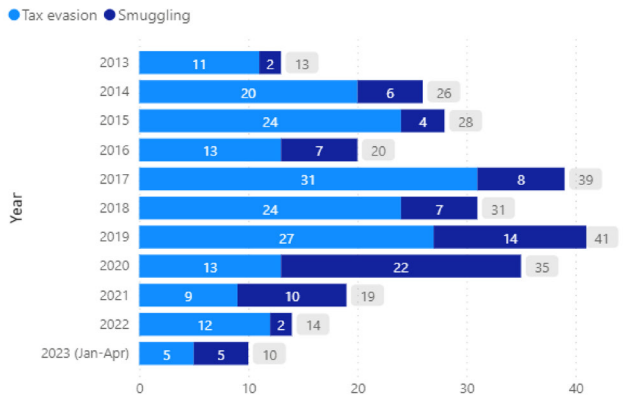


Figure 51 – Number of e-waste cases found, by year and types of offence

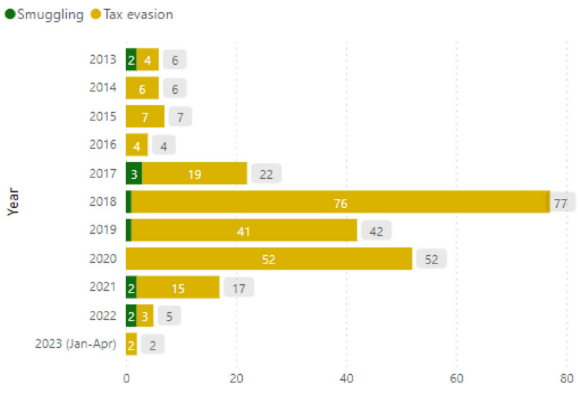


Figure 52 – Number of plastic waste cases found, by year and types of offence

Box 11 – Incorrectly declared containers from the United States identified at Thai port

Thanks to the cooperation between different governmental units in Thailand and the Natural Resources and Environmental Crime Suppression Division of the Royal Thai Police, 14 containers or 294 tonnes of waste from the United States were detected with falsely declared incoming goods. The shipment was declared as paper waste, however the waste identified was a combination of several materials mixed with paper waste, such as plastics, foams, clothing scraps and ropes. As a result, Laem Chabang Customs Department has taken legal action under the Customs Act 2017 and fined the importer 384,507 baht (€10,186.38). The exporting company received a 20% fine of the shipment value. As for the goods, they were returned to the port of origin or departure. The Ministry of Foreign Affairs was notified of the case.

Image 5 – Case study of illegal waste importation in Thailand (Source: *Unwaste* Study Tour October 2022)

Crime trends: waste categories, routes and modus operandi

The top 5 illegally exporting countries to Thailand by weight and by cases between 2020 and 2022 are reported in Figure 53: Japan was the top exporter of waste in terms of quantity, while China was the top exporter in terms of number of cases. Most of the illegal waste exports come from the Asian region. The United States was the second largest exporter of illegal waste in terms of weight, and fourth for the number of cases. The European Union was not listed among the top five exporters.

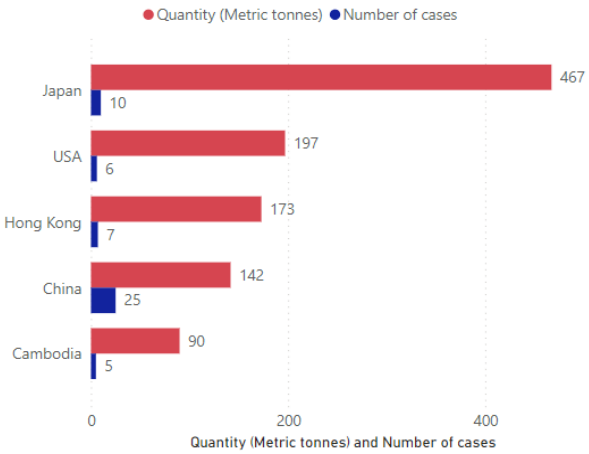


Figure 53 – Top 5 exporting countries to Thailand with illegal cases by number of cases and weight, 2020–2022

From 2020 to 2022, the main form of offences registered by authorities in Thailand are related to smuggling of household waste, packed into containers, and transported into Thailand through the two major ports, Laem Chabang Port in Chonburi province and Klong Toey Port (or Bangkok port), using false declarations that indicate that the products can be imported as controlled goods. After a thorough X-ray examination, goods inside the containers were identified in various cases as paper, plastic, plastic scrap and household waste. In high profile cases, containers were sent back to origin countries and administrative fines not exceeding B500,000 ($14,305) were imposed on exporting companies for false declarations. However, returned containers are often not monitored as they are considered no longer under the Thai government's jurisdiction, resulting in difficulty in tracking the next destination.

International cooperation

Thailand's Customs Intelligence Centre (CIC) has participated in the latest editions of World Customs Organization's Operation Demeter. This initiative facilitated the circulation of illegal waste shipment reports, risk indicators for control of suspicious shipments, commonly used routes in criminal activities and successful seizures of illegal containers.

Thailand is also member of SEAJust,[172] a UNODC-supported judicial cooperation network that serves as an informal platform facilitating direct contact and communication between central authorities for mutual legal assistance in criminal matters.

Overview of national responses since China's waste import ban

Triggered by the influx of illegal waste since 2018, various subcommittees under the National Environmental Board were established, comprising the Ministry of Industry, the Ministry of Interior, the Ministry of Public Health, the Royal Thai Police and other allied agencies. The subcommittees have issued measures to regulate plastics and e-waste imports in parallel with the country's Roadmap on Plastic Waste Management 2018–2030.

In July 2018, the Government started to phase out the importation of plastic waste and e-waste by halting the issuance of new import permits for plastic waste.[173,174] That same year, the Subcommittee for Integrative and Systematic Management of E-waste and Plastic Imports announced its intent to ban foreign plastic waste imports, with a two-year grace period for existing licenses to expire.[175]
In 2019, the Department of Foreign Trade within the Ministry of Commerce prohibited municipal waste (HS code 3825.10) goods from importation and from transiting through Thailand. In early 2020, a new Subcommittee on Plastic and E-Waste Management, headed by the Minister of Natural Resources and Environment, was established to advise on and monitor the plastic and electronic waste situation in Thailand.[176]

Effective as of 15 September 2020, Thailand banned 428 types of e-waste.[177] The plastic scrap ban, initially intended to be in place for 2020, was postponed for five years. However, a Cabinet resolution from February 2023 declared that the plastic ban will enter into force on 1 January 2025.[178] This also affects the 14 recycling factories currently authorized to operate in the Customs-free zone area. During the two-year grace period (2023–2024), plastic scrap can only be imported on the condition of being cleaned, segregated, unavailable or insufficient in the country and that they are to be used directly as raw material. Importing factories must have been established before January 2022.

Thailand ratified the Basel Ban Amendment in June 2023.

Box 12 – Shipment of mixed metals from Belgium to Thailand

This case involved a shipment of mixed metals from Belgium to Thailand. The shipment was declared as 107 tonnes of aluminium waste and scrap (commodity code begins with HS 7602) valued at €247,681, with a value per tonne of €2,307. The shipments were identified for further inspection and more information was requested from the declarant, who submitted an Annex VII form declaring the shipment as Basel Convention code B1010 (Annex IX) consisting of mixed metals. The inspection showed that the shipment contained mixed metal waste, mainly consisting of pieces of cable (Basel Convention code B1115) mixed with printed circuit boards (Basel Convention code GC010) and rubber waste (Basel Convention code B3040). However, the export of this waste from Belgium to Thailand can only be carried out with "a prior written notification and consent" and the declarant only provided an Annex VII. This shipment was considered illegal according to the EUWSR 1013/2006. All five containers were returned to the waste generator.

Image 6 – Shipment of mixed metals from Belgium to Thailand

4.4. Viet Nam

As early as 2005, the Viet Nam Law on Environmental Protection made a distinction between waste and scrap. This differentiation has been consistently maintained in subsequent laws issued in 2014 and 2020.

- Scrap imported as raw material for production must satisfy the national technical standards. Scrap means any material recovered, classified and selected from materials or products left over from production, business operations, service provision or consumption to be used as raw material for another production process.[179]
- Imports of waste are forbidden. Waste means any matter in a solid, liquid or gaseous form or other form that is discharged from production, business operations, service provision or living activities or from other activities.[180]

The terminology in the next section was adapted to reflect these definitions.

The legal trade of scrap

Viet Nam is the top scrap importer in ASEAN. From 2017 to 2021 Viet Nam imported more than 44 million tonnes of metal, paper and plastic scrap, valued at more than $13 billion (Figure 54). Viet Nam increased its scrap import volume by 50% from 2017 to 2020 and has remained stable since.

Viet Nam was among the countries importing the largest amounts of plastic scrap in recent years, ranking fifth in 2020 with 6.1% and sixth in 2021 with 6.4% of the total global imports.[181]

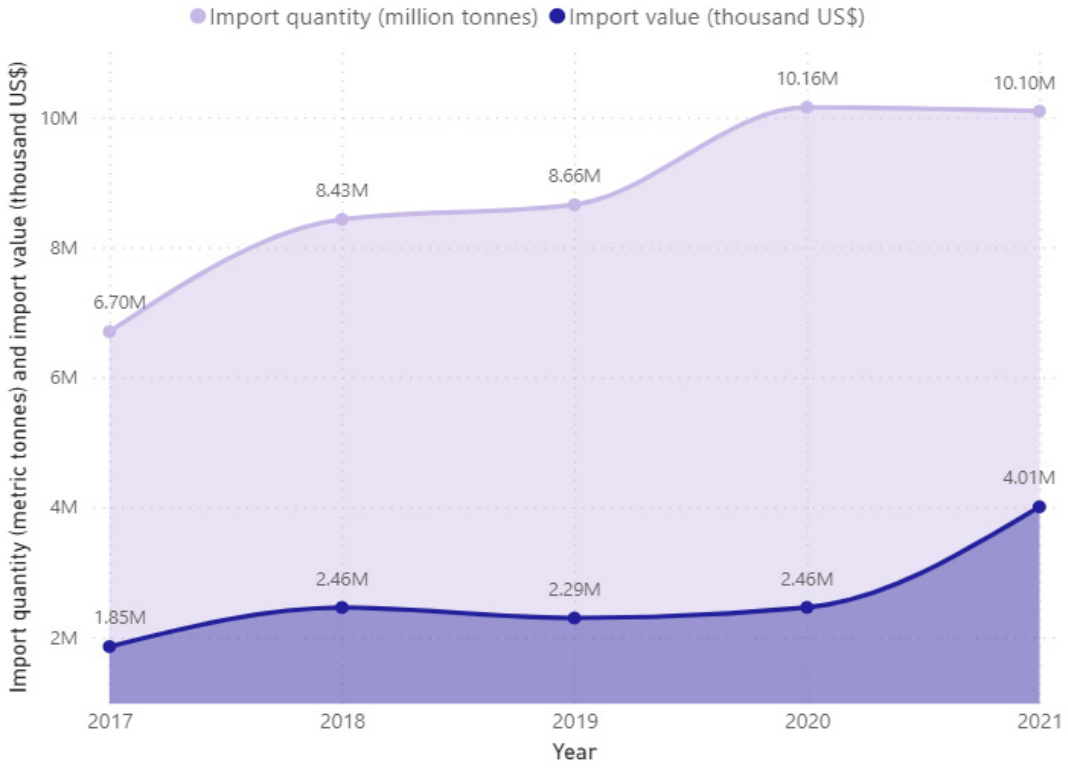


Figure 54 – Waste imports into Viet Nam (10 HS codes), by value and quantity, 2017–2020 (US$ and million tonnes) (Source: UN Comtrade, accessed September 2023)

Main types of scrap imported into Viet Nam

Ferrous metal scrap (HS 7204) was the most imported type of waste in Viet Nam, followed by paper (HS 4707) and plastics (HS 3915). The other types of scrap, including aluminium scrap (HS7602) and copper scrap (HS 7404) were commonly imported but in small quantities (Figures 55 and 56).

Between 2017 and 2021, annual plastic scrap imports into Viet Nam grew by 153%, with the largest increase from 2018 to 2019, at 46%. For paper scrap, there was a consistent rise in import values, from $341 million in 2017 to $843 million in 2021 (Figure 55). In the ASEAN region, Viet Nam emerged as the primary destination for metal scrap imports from 2017 to 2021, with a total of 28.8 million tonnes imported and accounting for nearly half of all metal waste imports in the region.

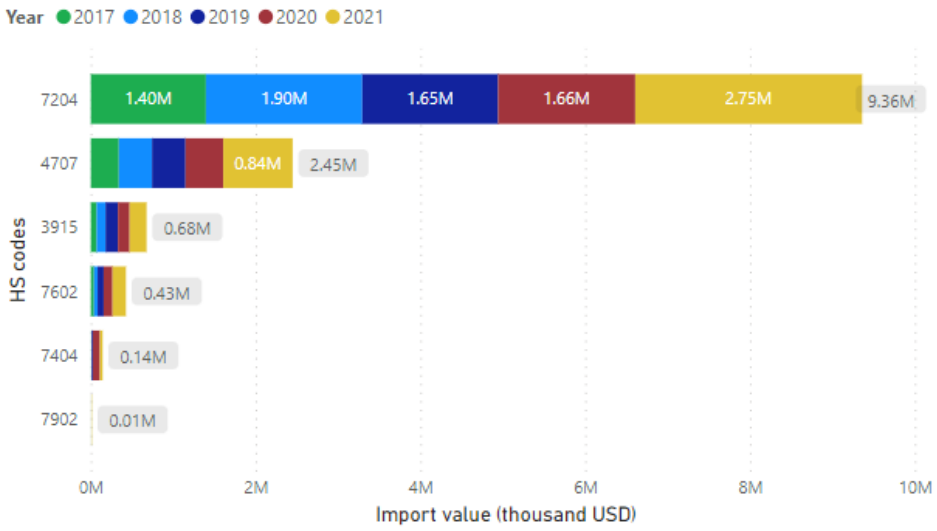


Figure 55 – Main types of scrap imports into Viet Nam, by value, 2017–2020 (US$) (Source: UN Comtrade, accessed September 2023)

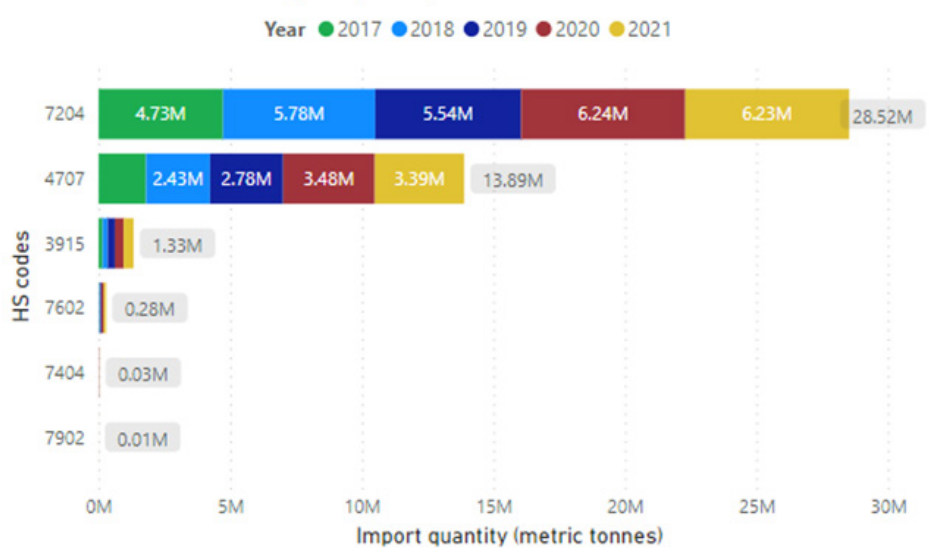


Figure 56 – Main types of scrap imports into Viet Nam, by quantity, 2017–2020 (million tonnes) (Source: UN Comtrade, accessed September 2023)

Main exporters to Viet Nam

For the 2017–2021 period Japan, the United States, Australia, Hong Kong (China) and the United Kingdom were the biggest exporting countries in terms of quantity (Figure 57). The EU27 countries combined ranked fifth, with more than 2.6 million tonnes. In the past five years, Viet Nam received 133,928 tonnes of plastic waste from the European Union and 16,563 tonnes from the United Kingdom.

Trade in Basel Convention-covered waste in Viet Nam

In 2023, there was only one notified case of import under the Basel Convention, concerning PVC plastic shipments from Japan to Viet Nam.

The country experienced a substantial drop in exports of waste under the Basel Convention in 2018, followed by a considerable increase in 2019. The officially permitted export volume reported by the Ministry of Natural Resources and Environment was only 3,958 tonnes in 2019,[182] which is significantly less than the volume recorded in the Basel Convention database. This may be due to a gap in information and reporting in the management of hazardous waste in the country.

Illegal traffic

Illegal waste shipments to Viet Nam

For the period 2018–2021, the Environment Police Department (Ministry of Public Security) reported cases of illegal waste imports in Viet Nam of iron and steel, paper, plastic and other wastes by ports of destination. The detailed breakdown by type of infringement or year was not provided, and the type of waste was only available for plastics for Ho Chi Minh City port. Key findings for the three main ports of Viet Nam include:

- **Ho Chi Minh City port:**
  - 673 containers did not meet the import standard and had to be re-exported to other countries or destroyed; re-exportation or take-back procedure (when possible) occurred for 418 of these containers of

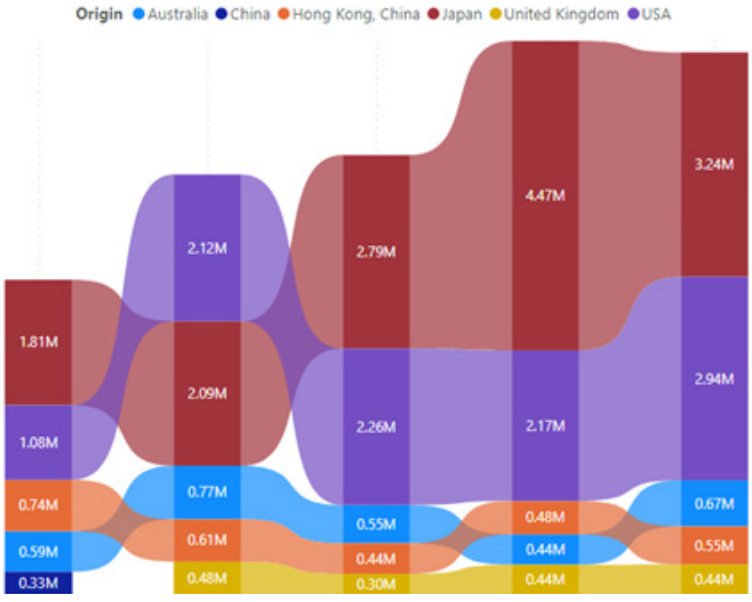


Figure 57 – Top exporting countries of waste (10 HS codes) to Viet Nam, 2017–2020 (tonnes) (Source: UN Comtrade, accessed September 2023)

plastic waste. Among the 673 containers, 488 violated Customs law and could not be cleared by the Customs authority, the rest of the containers failed to comply with other domestic import regulations (non-specified).

- **Hai Phong:**
  - 979 containers of illegal waste in total, including
    - 560 containers that did not meet the import standards
    - 34 containers of waste that were not classified and inspected
- **Vung Tau:**
  - 185 containers did not meet the import standard including
    - 84 containers that were subsequently re-exported
    - 101 containers that were destroyed due to non-compliance with national standards

As presented by the Vietnamese delegation during the 2022 *Unwaste* study tour to Belgium, many other containers with illegal waste were found abandoned in Vietnamese seaports. In 2018, the number of backlogged containers, most of them abandoned, was at its highest (10,124 containers), located mainly in the ports of Hai Phong, Ho Chi Minh City and in Ba Ria Province, Vung Tau Port. By the end of October 2021, after re-exportation, take-back procedure or destruction of part of containers, there was still a backlog of 2,893 containers of imported scrap, with 979 containers in Hai Phong Port and 1,630 containers in Ho Chi Minh City Port.

Crime trends: waste categories, routes and modus operandi

The project questionnaire completed by authorities shows that the most frequently trafficked waste categories are mixed waste (used rubber gloves from the food processing industry, oil mixed with paper or metal etc.), other waste (used tyres), plastic waste, metal waste and medical waste (with medical gloves varyingly classified as plastic, mixed or medical waste). Additionally, during the *Unwaste* 2022 study tour in Brussels, Vietnamese authorities showed delegates the different types of illegal waste imports detected in the country.[183]

Different modus operandi reported by the authorities include false or modified documentation, false declaration of goods (declaring goods as exempt from inspection), fraud or incorrect notification. Other means include smuggling (such as where waste is imported with the aim of re-exporting it, but which ends up remaining in the country illegally), missing licenses or permits and concealment (disguised and arrangement of goods in containers to evade visual inspection by Customs). In many cases, foreign traders have worked with Vietnamese companies to import illegal waste and scrap into Viet Nam using "sophisticated tricks". They also take advantage of loopholes in Customs management and regulations, under which only 5%–10% of goods are inspected.

The waste was reported to have come mainly from North America (the United States and Canada); Australia and New Zealand; Europe (Spain, Belgium, the United Kingdom, Greece, France, Germany, the Netherlands, Slovenia, Italy); Latin America (Puerto Rico). In one case, Viet Nam was not the final destination for a shipment of mixed waste, which was intended for re-export to Cambodia. According to the *Unwaste* survey, a case involved an organized crime group that trafficked waste from Lao People's Democratic Republic to Viet Nam.

Prosecution

During the *Unwaste* study tour, the Vietnamese authorities reported that between 2017 and 2021, Customs authorities detected a total of 265 illegal shipment cases that were submitted for prosecution, of which 44 concerned waste. This implies that identified instances of illegal waste account for nearly 17% of the total illegal shipments that were brought forward for prosecution during

Image 7 – Illegal e-waste imports received by Viet Nam

Image 8– Illegal paper waste imports received by Viet Nam

Image 9 – Illegal solid scrap (spare parts, aluminum, copper, tyres) imports received by Viet Nam

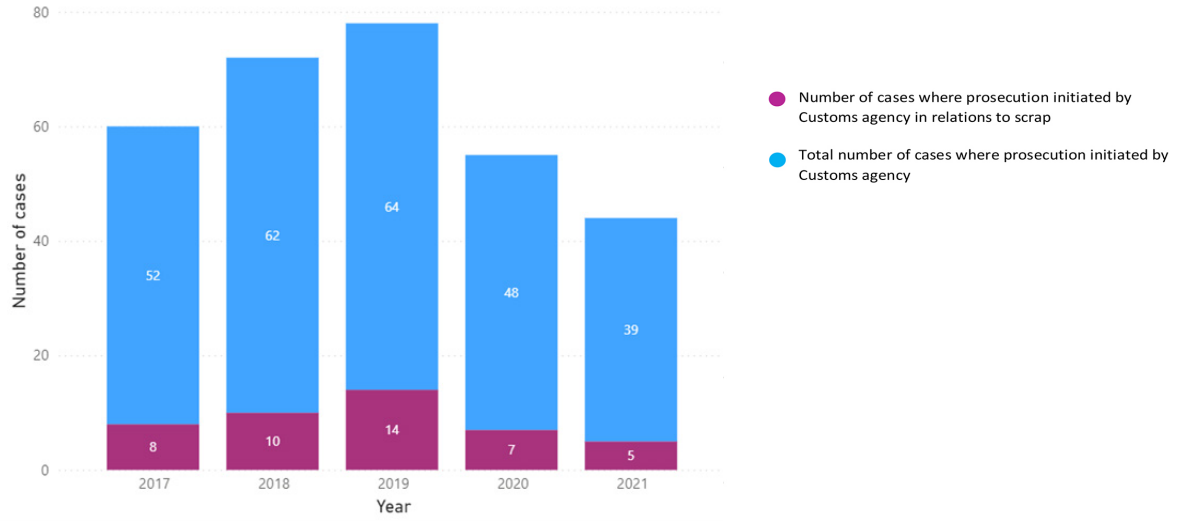


Figure 58 – Number of cases where prosecution was sent to the People Procuracy by Customs in relation to scrap (Source: General Department of Viet Nam Customs – Synthesis from reports on Customs Control during 2017–2021)

the five years. It is crucial to highlight that not every case resulted in a successful prosecution. Also, certain cases may have been resolved through administrative measures.

The Supreme Procuracy of Viet Nam, which is in charge of prosecutions, reported in the survey on seven illegal waste import cases that had been prosecuted between 2018 and 2022. The sentencing results were reported for two of the cases, which involved:

- Medical waste (three containers of used rubber gloves), resulting in eight jail sentences for the offenders.
- Illegal imports from a Vietnamese company located in the city of Bến Tre of almost 46,000 tonnes of plastic scrap and over 11,000 tonnes of metal scrap. The imports originated from 249 companies in 31 countries, and the three offenders were sentenced to 10, 7 and 4 years in jail respectively.
- Smuggling of used aluminium, metal, paper and oil from Cambodia (case suspended).
- Import of forbidden items (over 12 tonnes of used rubber gloves) from Singapore.
- Import of medical waste (used gloves) from the Lao People's Democratic Republic.
- smuggling of used tyres originating from the United States and intended for re-export to Cambodia.
- Smuggling of the equivalent of 2,871 containers of plastic waste.

In 2022 the Supreme Procuracy Department 3[184] received four cases related to the illegal import of plastic scrap[185] from the Department of Anti-Smuggling Investigation of the General Department of Viet Nam Customs.

International cooperation

As other countries, Viet Nam is member of SEAJust,[186] a UNODC-supported judicial cooperation network that serves as an informal platform to facilitate direct contact and communication between central authorities for mutual legal assistance in criminal matters.

Viet Nam Customs have been continuing their participation under World Customs Organization's Operation Demeter.[187]

Overview of national responses since China's waste import ban

Based on the Interdepartmental Coordination in the Management of Imported Scrap Activities, [188] the Ministry of Natural Resources and Environment and related agencies from six other ministries (the Ministry of Finance, the Ministry of Transport, the Ministry of Public Security, the Ministry of Defence, the Ministry of Industry and Trade, the Ministry of Foreign Affairs, the Ministry of Science and Technology and the provincial committees) share information; issue regulations relating to the management of scrap and waste imports; supervise and control waste imports; and deal with violations and prevention.

Consultations under the *Unwaste* project have led to various recommendations to improve the coordination mechanism and to further integrate intraregional and international cooperation in waste trafficking and scrap management and improve the legal framework for Viet Nam.

In 2020, the Prime Minister issued Decision No. 28/2020 approving the list of waste permitted for import as materials for production. The allowed materials are broken down by eight-digit HS codes and include six types of iron and steel scrap, five types of plastic scrap, three types of paper scrap, one type of glass scrap, six types of non-ferrous metal scrap and one type of blast furnace slag scrap. The list was updated in June 2023.[189]

Prohibitions and restrictions

Since 2020, the number of types of scrap allowed for importing has been reduced.[190] The list now excludes 13 types of scrap, such as gypsum (HS code 2520.10.00), chemical elements used in electronics (HS code 3818.00.00) and non-rigid foam scrap and waste from two types of plastic waste and some types of polystyrene (HS code 3915.20.10). However, polystyrene, butadiene styrene, impact polystyrene and expanded polystyrene (under HS code 3915 20 90) are on the list of permitted imports.

As of 31 December 2021, the list of types of scrap permitted for importation as raw production materials was reduced to include only 21 types, omitting unsorted paper waste (HS code 4707.90.00) and blast furnace slag (HS code 2618.00.00).[191] Most recently, Viet Nam further reduced its list of scrap permitted, with this reduction being enforced as of June 2023. [192]

Viet Nam will completely ban the importation of plastic scrap by the end of 2025 (according to the Law on Environmental Protection 2020). A new decree[193] was enacted to further tighten the regulations surrounding the production and importation of certain types of plastic waste, specifically single-use plastic and products generating microplastics.[194]

In line with its efforts to manage foreign trade, the Government issued a decree in 2018 that lists the types of used electronic goods banned from both export and import,[195] and a circular was released that details the list of used information technology products prohibited from import, along with the relevant HS codes.[196]

Authorized establishments for waste imports

As of June 2022, 179 establishments were permitted to import scrap for use as raw production materials – they were granted a certificate of eligibility for importing scrap. To enforce the differentiation between waste and scrap made by Viet Nam and to regulate the associated waste imports, a 2018 directive [197] was implemented that restricts the issuance of new licenses for the importation of paper, plastic, metal and other waste. Consequently, companies are now only permitted to use scrap for the purpose of producing commercial goods – the importation of scrap for selling to other companies is prohibited.

The Ministry of Natural Resources and Environment proposed a regulation in January 2022[198] that would impose a deposit fee on importers requesting to bring waste into Viet Nam. The deposit is meant to be used to control waste imports and cover any costs involved while also following the 2020 Law on Environment Protection.[199]

Chapter Five: Breaking the Cycle – Challenges in Tackling the Waste Trade in the Four ASEAN Focus Countries

In Southeast Asia, waste trafficking presents numerous challenges in addition to hindering the transition to a circular economy and undermining efforts to manage waste sustainably. The *Unwaste* project asked national experts in four focus countries – Indonesia, Malaysia, Thailand and Viet Nam – for their perspective on how their countries are tackling waste trafficking. An analysis of the illegal waste trade, and the various responses by national authorities particularly in light of China's waste import ban, was provided in the previous chapter. This chapter summarizes focus country perspectives on the challenges in tackling waste trafficking at the national and regional levels.

Key takeaways

- Effective prevention of illegal waste shipments relies on collaboration between exporting, transit and importing countries, particularly the need for international cooperation. The challenges of mislabelling, concealment and false declarations underscore the need for stricter inspection and enforcement.
- The exploitation of Customs loopholes indicates that the vulnerabilities in regulatory frameworks in both origin and destination countries need immediate attention.
- Understanding the misuse of transshipments (transit) sheds light on the tactics employed by traffickers, emphasizing the importance of monitoring transit points and enforcing regulations in these areas.
- The involvement of intermediaries complicates the tracing of waste origins, making it essential for law enforcement agencies to focus on these entities and close such loopholes in the waste trade network.
- Thorough implementation and enforcement of legislation are essential to prevent and combat waste trafficking. Although the four countries have adapted their laws and several cases have been detected by enforcement authorities, the national experts acknowledged there are challenges that still need to be addressed.
- Centralized data are crucial for establishing trends and tailoring anti-trafficking policies. Insufficient data-sharing hampers law enforcement efforts and hinders the tracking of waste shipments, thus impeding prompt responses to illegal activities. And inadequate data prevent authorities from understanding the routes and modus operandi used by traffickers.
- The lack of detailed information on exporting companies complicates background checks, legal proceedings and repatriation, often leaving the responsible businesses untraceable. Addressing these data-related challenges is vital for enhancing collaboration between countries, improving policy frameworks and ensuring effective law enforcement.
- Discrepancies in interpretations of waste definitions and classification of shipments across countries also urgently need to be addressed. Some examples are the different definitions of waste (versus scrap) made by some the ASEAN countries or the *end of waste criteria* or green listed waste in the European Union.
- Close monitoring of the types of waste will be needed in the coming years to close the regulatory, implementation and enforcement loopholes.
- At the national level, streamlining communication channels and data-sharing mechanisms are essential for the swift exchange of information and coordinated responses. Streamlining initiatives between ministries, aligning the handling of cases and expanding the role of task forces to include prevention and criminal law enforcement support are necessary.
- Involving investigative and prosecuting

authorities from the beginning of investigations is vital for effective prosecution and deterrence.
- There is considerable need for mutual understanding of regulations, efficient data-sharing and expedited Mutual Legal Assistance requests to effectively combat illegal waste trafficking.
- Despite the efforts deployed by Indonesia, Malaysia, Thailand and Viet Nam in the past few years, waste trafficking persists. The following sections highlight the challenges reported in terms of enforcement, capacity, implementation of international regulations, data and information sharing and cooperation.

5.1. Enforcement

Effective enforcement of waste management regulations is a shared responsibility between exporting and importing countries. The national experts in the four *Unwaste* project countries echoed one another when noting that even though regulations are in place, verifications at the exporting stage seem inadequate and often do not comply with the applicable regulations in their country. Similarly, waste separation at source does not always follow the required standards, with mixed and contaminated waste still being shipped to some of the four countries despite the strict regulatory framework banning such importations.

Mislabelling, concealment and false declarations are major challenges for law enforcement authorities in all four countries. For example, in Indonesia, there have been reported cases of waste shipments being misdeclared as second-hand products. In Viet Nam, traffickers take advantage of the loopholes in the management of Customs clearance by misdeclaring goods so they will be exempted from inspection. For instance, the countries have received shipments of non-recyclable single-use plastic waste that was labelled as recyclable plastic. Because these countries do not have the recycling technologies for some types of plastic to process it, some of the shipments were redirected to countries where such shipments were not restricted.

Transshipment is also an area of concern. In general, transshipment is used when there is no direct route between an origin country and a destination country. In the case of waste, transshipment is sometimes used to enable waste trafficking and, in such cases, involves an initial export to countries with weaker regulations or enforcement mechanisms. When the waste is re-exported or rerouted in the transshipment hubs, some of it is relabelled, the waste designation is modified, or the country of destination is changed.

Additionally, when intermediaries are used to facilitate the movement of waste, it is more challenging for law enforcement in receiving countries to trace the origin of shipments, especially when the companies are unauthorized or do not exist. With such complex schemes, the identification and prosecution of companies or individuals involved is challenging and the take-back procedures cannot be put in place. Intermediaries are also used when a company has already been flagged for its illegal activities and thus makes use of other entities for its waste trade transactions. For example, Malaysian law enforcement officials reported that companies that were “red listed” or flagged after bringing illegal waste into the country were using intermediaries to ship waste containers to avoid triggering an alert in the Customs or enforcement system and thus avoid an inspection.

5.2. Capacity and expertise

Waste identification expertise

Determining the type of waste that is being trafficked requires different sets of knowledge, ranging from administrative and legal to technical expertise. The experts in all four

countries cited the limited expertise of front-line officers to identify types of waste as a major issue, especially in cases that require more than a visual inspection.

In Thailand, for instance, there is no uniform system or adequate tools (such as specialized labs) to support the identification of the different types of waste. Front-line officers must send samples of waste to the Department of Industrial Works for analysis, which is an ad hoc and time-consuming process. Additionally, the relevant authorities are not always aware of the technical issues and cannot distinguish between legal and illegal waste, especially in misdeclaration cases.

In Viet Nam, authorities lack investigative capacity and are often unaware of the appropriate documents required to assess if shipments are illegal. Vietnamese Customs officers face challenges when inspecting shipments because they must rely on other agencies for support, which leads to prolonged investigation times. The formal support request for prosecuting illicit shipments is essential, but the delays in contacting and receiving assistance from relevant ministries hamper timely interventions.

In Indonesia, Customs authorities reported challenges in distinguishing between hazardous and non-hazardous waste. They must consult with the Ministry of Environment and Forestry to examine and identify any waste, which also delays the investigation.

Recycling capacity

The lack of recycling capacity for certain types of waste was cited as a challenge. In particular, the Vietnamese experts reported being overloaded[200] and not being able to treat the waste imported into the country in addition to the domestic waste. In recent years, Viet Nam has ranked as the fourth-largest country releasing plastic waste into the sea, although a major portion of that waste likely originated from imported plastic waste.

In Indonesia, insufficient waste collection and segregation has led to limited domestic raw materials for the recycling industry, prompting a need for waste imports. In 2019, the Government launched the National Road Map for Waste Reduction,[201] aiming to cut national waste generation by 30% by 2030. It includes recycling measures to be adhered to by producers. This initiative is expected to boost the domestic supply of recyclable waste and gradually reduce the need for waste imports.

In Malaysia, although the overall recycling rate has been rising, the locally generated plastic waste is less recycled than other types of waste, such as paper, and the recycling rate for plastic remains at less than 50% of the total recycling rate each year.[202] Although the industry has the capacity to process locally generated plastic waste, the plastic-recycling industry depends on imported plastic scrap due to its low cost and superior quality. Local materials are often of poor quality and heavily contaminated. To address the increased influx of plastic scrap imports, authorities have implemented stricter approval processes for issuing and renewing manufacturing licenses and have offered tax incentives to recycling companies. [203]

Thai recycling companies have asked for recyclable-grade plastics that they say are unavailable domestically, making plastic scrap imports necessary. This situation indicates that the waste collection sector in Thailand struggles to meet the recycling industry's standard. For example Thailand imported 158,646 tonnes of plastic scrap (HS 3915) in 2021, while the country generated 2,760,000 tonnes of such scrap that year, of which only 524,400 tonnes were recycled.[204] Also, only 10% (40,000 tonnes) of e-waste was collected, while the remaining 390,000 tonnes were handled by the informal sector in 2022. [205] In order to managesustainably the recycling of waste

generated in the country, imports of plastic waste and e-waste into Thailand are limited or have been phased out, leaving the recycling plants the capacity able to manage the waste generated domestically.

5.3. Basel Convention-related challenges

Prior Informed Consent procedure

Many issues raised by the national experts relate to the application of the Basel Convention's trade control regime. The Prior Informed Consent procedure is a process that requires an exporting country to obtain the informed consent of the importing and transit (if applicable) countries before shipping certain types of waste across national borders.[206] National experts in Thailand, for example, pointed out the failure to apply the Prior Informed Consent procedure by some exporting countries.

Similarly, in some cases, the national regulations in the destination countries are not known or applied by exporters in the countries of origin. For example, the authorities in Malaysia reported that there have been cases of plastic waste exported without an Approved Permit, and importers only applied for the permit once the containers had arrived in the country. By circumventing the Prior Informed Consent procedureor procedures put in place by destination countries, exporting companies prevent importing countries from accessing information that they need to control and screen the importation.

Take-back procedure

The take-back procedure as outlined in article 9, paragraph 2 of the Basel Convention,[207,208] refers to the process of returning hazardous and other waste that is deemed to have been illegally trafficked across international borders due to actions by the exporter or generator. In such cases, the responsible exporter or generator is obligated to take back the waste and return it to the State of export. If this is not feasible, alternative disposal methods must be employed in accordance with the provisions of the Convention.

Enforcement of the take-back procedure is key to ensure that the exporters are held accountable for the illegal shipments.

Some of the experts reported difficulty in identifying the competent authorities in the origin country to initiate the take-back procedure process. Experts in all four countries reported that in multiple instances the origin countries had refused to take back the waste. While the reasons for refusal were not provided in detail, it was highlighted that it is a recurring issue.

Box 13 – Guidance on the implementation of the Basel Convention provisions dealing with illegal traffic

The Basel Convention published a Guidance on the Implementation of the Basel Convention provisions dealing with illegal traffic (paragraphs 2, 3 and 4 of article 9), that includes a recommended process for the take-back procedure. The section on taking back (section 4.1) explains the process and provides detailed steps and forms necessary for countries to initiate and manage the take-back process for illegally trafficked wastes. It emphasizes the importance of timely action, evidence collection and international cooperation to ensure that the responsible parties bear the costs associated with the take-back operation. While the decision to take back the waste belongs to countries, the Basel Convention Secretariat can provide support to countries by providing guidance regarding the procedure.

To ensure waste shipments are taken back, Viet Nam started enforcing an environmental protection deposit mechanism established in 2022, which imposes a deposit fee on importers requesting to bring waste into the country. Viet Nam requires shipping companies to return non-compliant imported waste within 30 days (extendable by another 30 days).[209] But the General Customs Department lacks the legal power to penalize non-compliance of shipping companies or expedite court-mandated waste returns. To influence compliance, the Department assesses reliability based on past issues thus impacting subsequent shipments.

The experts in all four countries agreed that repatriation is not often a solution because it is highly dependent on origin countries' willingness to take back a shipment and on their capacities to find a specialized facility to process the repatriated waste. As the next section elaborates, the take-back procedure is lengthy and adds to the financial burden of importing countries, which must cover the cost of demurrage while courts deliberate.

Storage, destruction and repatriation capacity

Although all four countries are taking active steps to initiate take-back procedures for illegally trafficked waste, the cost of storage, demurrage, destruction and/or repatriation of unclaimed containers adds an additional burden.

In Indonesia, the cost of demurrage for the containers while waiting for a court decision for repatriation is often higher than the value of the waste itself. This situation complicates the Government's effort to hold the importers accountable for the repatriation cost because the importers are already financially drained by the demurrage cost. In some cases, the Indonesian authorities have had to destroy the shipment. But the destruction of illegal waste shipments, in addition to being costly and causing an additional financial burden to the national authority, can have a greater negative impact on the environment and the health of communities, depending on how the destruction is carried out. Considering this challenge, the idea of applying an import deposit in advance emerged as one possible solution to the repatriation cost in the future.

Similarly in Malaysia, the costs involved and limited space for storing containers until the waste is taken back by the origin country is a major challenge, accentuated by the delayed response from the exporting country to the take-back requests, which is a lengthy process because it requires gathering evidence and negotiating with the authorities of the exporting country. This is particularly problematic when containers are left unclaimed in a port, thus causing congestion and affecting operations for port operators.

In Viet Nam, the national experts reported they had 2,893 backlogged unclaimed containers at ports in October 2021 (down from 10,124 in 2018).[210] The storage costs, they said, are often coupled with the testing costs required to determine if shipments are legal or hazardous. Additionally, shipping companies are facing difficulties in covering the costs associated with returning the waste to the origin countries.

5.4. Regulatory, policy and legal challenges

The regulatory framework in each of the four countries is analysed in Chapter 2, with recent development highlighted in Chapter 4. This section spotlights challenges that the national experts emphasized regarding the regulatory and policy frameworks.

Across the four countries, the main challenge reported is the lack of regulation and enforcement for some categories of waste, in particular, the waste that is not covered by the

Basel Convention (for example, the European Union's Waste Shipment Regulation green-listed waste)[211] and the lack of uniformity between ASEAN countries' regulations. Traffickers exploit these legal loopholes by taking advantage of a weaker legal framework and diverting waste shipments to that country.

In Thailand, for instance, certain types of waste do not need notification, and therefore importers do not need to apply for a license. This is a major loophole that allows the smuggling of waste into the country. Smugglers also use the lax legal definition of "used goods" to import unwanted waste. In Viet Nam, where the distinction between waste and scrap differs from what is used in other countries, traffickers exploit this loophole to import illegal waste mixed with scrap.[212] This loophole results in difficulties to identify whether the waste shipment is suitable for industrial use or if it is just unrecyclable waste.

At the national level, policies to regulate the storage and handling of shipments stuck in-country while awaiting a judicial decision to trigger the repatriation procedure are not sufficient, according to the experts. As explained in the previous section, the often-high cost of storage is borne by the receiving country, which adds an additional burden to the already-strained capacities. In Viet Nam, for instance, when a shipment arrives in a port, there is a notification system to relevant authorities but no robust verification mechanism of incoming waste shipments. Similarly, if waste shipments are stuck in Thailand pending a prolonged judicial decision, there is no regulation to cover waste shipment management.

Another regulatory challenge relates to import permits. National experts in Viet Nam pointed out that the quantity of waste that some companies can export should be limited. They noted that currently the threshold is too high, and importers lack the capacity to process the imported waste in addition to the domestic waste. Therefore, a quota for an import permit is needed to meet national environment standards. Although the Vietnamese legal framework does not clarify which type of companies are permitted to import and transport scrap, a list of permitted scrap importers is publicly available on the Department for Environmental Pollution Control's website,[213] with their address and the permit expiration date but without mention of their quota or the type of waste they can import.

Challenges related to import permits were also experienced by Indonesia in the past, especially when dealing with the repatriation of illegal waste. The problem stemmed from untraceable exporters, which caused delays and complications in the process. To tackle this issue, Indonesia introduced a preventive measure: Waste exporters are now required to provide a copy of their company register. This document is then used by waste importers in Indonesia to apply for import permits.

Malaysia has observed a surge of investment in recycling and importation of waste since 2018. To manage the increase, the Ministry of Housing and Local Government imposed a temporary import ban for plastic waste and strengthened importation criteria for all types of waste before the issuance of importation approval. For example, to cope with the influx of paper waste importation in Malaysia, the Guidelines for Importation and Inspection of Waste Paper was implemented, effective 10 January 2022, and the Government announced a two-year moratorium for paper waste manufacturing licenses.[214]

5.5. Data

The main challenge reported across the four countries is the overall lack of timely data-sharing on waste flows.[215] The experts in Thailand cited a data gap between the moment that a waste shipment leaves the origin country and when it reaches a port in Thailand. Also, after the waste passes the Customs

procedures, data on the final destination inside the country is often missing, and it is difficult to track the next location once the shipment has entered the country. The Malaysian experts also mentioned the lack of visibility on waste flows, especially regarding transshipments, which prevents authorities from understanding the current and often changing modus operandi of waste traffickers and thus affects the timely adaptation of their response to illegal shipments.

As in other regions, data on waste shipments and seizures in the four countries are often not centralized but scattered across multiple agencies, which poses difficulties to understand the extent of the issue and to tailor policies that address the issue. As for investigators and prosecutors, scattered data across relevant authorities impedes their capacity to build and escalate waste trafficking cases.

Another challenge is the poor representation of the informal sector in the formal waste management structures, which impedes the collection of accurate data on recycling rates. Due to this lack of data, it is challenging to understand how much waste is being recycled and processed. In Indonesia, most of the recycling capacity is occupied by the informal sector, making access to comprehensive data challenging because the published data do not accurately reflect the actual recycling rate. Most informal groups are represented by registered associations that could help them develop structured data reporting systems. Similarly, the lack of comprehensive data on waste imports has an impact on the accuracy of recycling rates.

Sometimes, publicly sharing unrefined information can be a threat to successful investigation and evidence collection. When data are made public (for instance, through media channels), it can pose challenges to ongoing investigations. When sensitive information related to waste trafficking becomes publicly available, it can inadvertently alert the perpetrators, compromise operational strategies or hinder the collection of crucial evidence. On the other hand, in Malaysia, researchers who rely on official databases find it challenging to access recent information on official websites because certain information is not accessible by the public, thus hindering their ability to do timely and comprehensive analysis on an issue.

Another issue reported in Indonesia and Malaysia is the lack of information on exporting business entities and the private waste sector in the origin countries. When a request for exportation is received, little information about private companies is available for enforcement authorities in importing countries to conduct background checks before accepting a shipment. The lack of information poses issues for competent agencies to properly assess if a company is qualified to export waste and also to stop issuing licenses to companies running illegal activities. Because exporting countries are also suffering from this lack of data on the exporting companies' activities, they can be reluctant to take responsibility for waste shipments. When cases reach the prosecution phase, little data are available regarding the exporting companies, some of which have gone out of business. Ultimately, the lack of data on exporting companies makes it challenging for repatriation because the businesses are not traceable.

5.6. Categorization and most challenging types of waste

Categorization and lack of uniformity in the definition of waste

The Basel Convention sets a list of types of wastes and covers toxic, poisonous, explosive, corrosive, flammable, ecotoxic and infectious waste. The list of waste types can be further expanded by parties in their national

legislation.[216] In addition to the trafficking of waste listed in the Basel Convention Annexes, the countries are also facing cases of trafficking related to other types of waste not covered by the Convention, such as paper and textiles. However, household waste (which can include mixed paper and textiles) is part of Annex II of the Basel Convention and is subject to the PIC procedure.

Due to the increasing inflows of waste, the national experts reported challenges in categorizing the types of waste received by importing countries. Indeed, the discrepancies in the definition of waste across countries present difficulties when it comes to allowing shipments to be exported and under which conditions. Different interpretations of the definition of certain types of waste lead to a misalignment of the way each country declares its HS codes, which traffickers then exploit. As previously noted, the way waste and scrap[217] are distinguished is a major challenge in Viet Nam. In Thailand, the national experts reported that the lack of consistent definitions and a waste identification system are challenges because it is difficult to distinguish between legal and illegal waste shipments.

Most challenging types of waste and upcoming challenges

During the different interagency consultations in the four countries, the experts discussed what they considered to be the most challenging types of waste.[218] The issues varied across the four countries, but a recurring issue highlighted by many of the experts was plastic waste. Single-use plastics, which have little-to-no recycling value, were cited as a pressing issue despite steps being taken at the global level (see Chapter 1) to reduce plastic pollution. More generally, the importation of low-quality recyclable waste has been cited as problematic because importing recycling companies tend to discard these materials in landfills, which further contributes to environmental pollution.

Even though e-waste is covered through the Basel Convention and even though the Prior Informed Consent procedure will be required as of 1 January 2025 for both hazardous and non-hazardous e-waste, it remains a concern across the four countries. This is true also for used lead acid or lithium-ion batteries and contaminated waste. End-of-life solar panels, which are piling up in exporting countries, were mentioned as an emerging issue and a cause for concern for the future by national experts in Malaysia and Thailand. In Indonesia, hazardous waste, non-homogenous waste and used electronic products were cited as the most challenging. Another category of concern in all four countries is the waste declared as “used goods”.

Similarly, while the recycling of paper and cardboard is important to achieve the circular economy targets, and recycled paper is heavily traded, contaminated paper remains a challenge. The importation of unsorted and contaminated paper waste exacerbates the issue because it strains waste management systems. In Thailand, paper waste imports are not banned and can be imported on the condition that they are not contaminated nor mixed with other types of waste; therefore, they are less likely to be closely monitored. There are documented cases of household waste, which is prohibited from importation, being declared as paper to circumvent the verification procedure.

5.7. Cooperation

National cooperation

There are many great cooperation initiatives in the four countries, and an impressive amount of work has been done to tackle the influx of unwanted waste in the region. Challenges remain, however, which the national experts acknowledged and continue to work at tackling. As reported in both Thailand and Viet Nam, the lack of interagency communication and data-

sharing are important challenges that affect cooperation at the national level. As noted, data related to waste trafficking are typically scattered among different agencies, which creates difficulties when trying to obtain a comprehensive understanding of the issue and coordinate actions effectively. The lack of streamlined communication channels and data-sharing mechanisms hamper the timely exchange of information and impedes the ability to take swift and coordinated action against waste traffickers. Although cooperation exists at the policy level in Thailand, there is limited prioritization on waste trafficking issues from high-level authorities. Also, there is little engagement between law enforcement authorities and environmental agencies on one side and prosecutors on the other side. It is even less so at the beginning of the consultation process that takes place between authorities when illegal cases are detected. Subcommittees exist at the national level, but they often focus on policymaking.

In Indonesia, despite the great initiative of the interagency approach to supervising the importation of waste, the role of the task force has remained limited, with a focus mainly on cases of imports that violate administrative regulations. However, with the emerging cases of waste trafficking, it is deemed essential to expand the role of the task force to include cooperation in prevention, policymaking and supporting the criminal law enforcement of waste trafficking.

In Malaysia, with governance spread among ministries regarding waste trade and waste management, it is crucial to streamline initiatives between the ministries as well as between the federal agencies and states. For example, while the Ministry of Investment, Trade and Industry governs the issuance of approval on waste trade for manufacturing purposes, the Ministry of Housing and Local Government has responsibility for solid waste management. Tackling illegal waste requires cooperation between law enforcement and prosecution and for agencies involved to better align the handling of cases.

Multi-agency cooperation is also essential when it comes to prosecution. In Thailand, prosecutors require data to initiate investigations, but cases often remain at the Customs Department and are dealt with through administrative sanctions due to the absence of communication channels between departments, thus excluding other relevant authorities. Similarly, Viet Nam's Supreme People's Procuracy is the authority mandated to handle waste trafficking cases, but violations that are considered "administrative" often do not reach prosecution because prosecutors are only involved in criminal cases. The national experts in Viet Nam noted that lack of involvement of prosecutors from the beginning of investigations may hinder the process and thus criminal cases may go undetected. Additionally, prosecuting the exporters, who are typically based abroad, is difficult due to the lack of information.

Regional and interregional cooperation

After China's waste import ban, operators redirected a major part of their shipments of illegal waste towards countries in Southeast Asia, adapting their methods to evade detection and enforcement. Law enforcement in the region observed a domino effect a few years after the China Ban: Receiving countries that had revised their regulations to limit imports of illegal waste reduced the scale of the problem in their own country, but illegal waste was then shipped worldwide to countries with regulatory loopholes and weaker enforcement. Organized criminal groups were quick to adapt and move their operations accordingly. As with other trafficking crimes, the illegal exports do not stop but shift elsewhere.

Although national experts in the origin countries pointed out the lack of dedicated

or appropriate legislation in destination countries, the experts in the destination countries lamented the lack of awareness of their regulations regarding waste by authorities in the origin countries. The lack of understanding between importing and exporting countries' mutual regulations is an important barrier to international cooperation and sound enforcement of regulations. The national experts also recognized some limitations in the Harmonized System; for instance, Thai authorities noted that some elements had been missing in the HS codes related to e-waste but the situation was eventually remedied by assigning an additional digit to statistic codes specifically for monitoring e-waste trade in the country.[219]

At the interregional level, officials cited the lack of collaboration between exporting and importing countries as a major challenge to cooperation. The experts from the European Union also noted that cooperation with non-European Union stakeholders can be challenging, while officials in Southeast Asia regarded the lack of awareness of the regulations in place by authorities outside of the ASEAN region as being a major challenge to addressing waste trafficking. The differences in policies, procedures and documentation procurement are also a barrier for cooperation. Another critical challenge is the limited data-sharing between countries to understand the flows coming from outside and within the region.

The channels for communication between countries can be challenging, further impeding the progress of investigations and hindering the sharing of crucial information. Across the four countries, the experts described their struggles to receive responses to their Mutual Legal Assistance requests, which are crucial for information-sharing, legal cooperation and the prosecution of crimes across borders. Indeed, the Mutual Legal Assistance requests are often left unanswered, leading to a time-consuming and lengthy communication process. Although electronic evidence can be requested and shared through the Mutual Legal Assistance procedure (depending on the type of evidence and the legal requirements to make it admissible in court in specific countries), sometimes the legal frameworks of countries regarding the Mutual Legal Assistance do not have any provision on electronic evidence. For instance, the experts in Viet Nam reported that electronic evidence in not always accepted and original documents are needed to pursue cases.

Often, by the time the requests are received and fulfilled by the foreign authority, the window for the crime to be prosecuted in Viet Nam has closed. Because the Mutual Legal Assistance procedure can be lengthy, they often do affect the time limit to handle these cases, resulting in many cases being settled administratively or otherwise superficially and then not leading to identification of the real owner of the imported shipment. The Indonesian experts also noted that the Mutual Legal Assistance procedure is time-consuming and complicated, thus leading them to choose not to pursue support or international cooperation through these channels.

The national experts from Indonesia and Malaysia pointed out that cooperation to repatriate waste remains challenging, with requests often left unanswered or having lengthy response times. For instance, the Indonesian experts reported that, based on their recent experiences, of five countries involved in illegal waste trade cases, only one was willing to repatriate the containers following a court decision. If exporting countries refuse to accept the repatriated waste, the receiving country government must destroy it.

Box 14 – Regional and interregional cooperation initiatives against waste trafficking in Southeast Asia

ASEAN Working Group on Chemicals and Waste.[220] The ASEAN Working Group on Chemicals and Waste is a platform within ASEAN that focuses on coordinating efforts and policies to address chemical and waste management challenges in the region.

Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes.[221] This informal network brings together authorities in Asia to foster information-sharing on transboundary movements of hazardous waste and assists countries in implementing the Basel Convention under each member's system.

Basel and Stockholm Conventions Regional Center for Southeast Asia in Indonesia.[222] The Regional Center supports and facilitates adherence to the Basel and Stockholm Conventions in Southeast Asia. It acts as a focal point for information exchange, capacity-building, technical assistance and coordination among countries to address issues related to hazardous waste and persistent organic pollutants. The Regional Center promotes regional cooperation and assists countries with their obligations under the Conventions.

***Unwaste* project.** [223] Implemented by the United Nations Office on Drugs and Crime in cooperation with the United Nations Environment Programme and with European Union funding, the Unwaste project aims at fighting trafficking in waste between the European Union and Southeast Asia. It promotes enhanced partnership between the European Union and ASEAN Member States in support of ongoing efforts towards the circular economy transition.

ENFORCE. [224] The mission of the Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic (ENFORCE) is to bring together experts to promote parties' compliance with the Basel Convention provisions pertaining to preventing and combating illegal traffic in hazardous and other wastes through the better implementation and enforcement of national laws. The network also brings together existing resources to enhance and improve cooperation and coordination between entities with a mandate to deliver capacity-building activities and tools on preventing and combating the illegal waste trade.

Operation DEMETER.[225] Operation DEMETER is a collaboration between Customs administrations and their partners, led by the World Customs Organization and China Customs. It focuses on monitoring and controlling cross-border movements of environment-sensitive commodities within the scope of the Basel Convention. Since 2019, the scope of the operation has expanded to also include the movement of ozone-depleting substances regulated by the Montreal Protocol. The ninth iteration of the operation will be conducted in 2023.

Operation Noxia.[226] Operation Noxia is an ASEM joint Customs operation lead by OLAF aimed at placing shipments under surveillance in order to detect sensitive, prohibited or dangerous goods, including waste shipments, sent from Europe to Asia.

World Customs Organization Asia–Pacific Plastic Waste Project.[227] The World Customs Organization's Asia–Pacific Plastic Waste Project is an initiative designed to strengthen the capacity of Customs administrations to mitigate and appropriately respond to environmental threats related to plastic waste in the region. The project targets implementation of the Basel Convention and matters related to plastic waste and illegal shipments. The second phase of the project ended in June 2023.

UNODC–WCO Container Control Programme's Project on Countering Illegal Hazardous Waste Trafficking.[228] The project, jointly implemented by the United Nations Office on Drugs and Crime and the World Customs Organization, seeks to improve the capacity of enforcement agencies to counter illegal shipments of plastic and hazardous waste in the cargo trade supply chain.

POLICY IMPLICATIONS AND BEST PRACTICES

This section provides a summary of policy implications and best practices for ASEAN countries on how to prevent or stop waste trafficking, covering the following topic areas:

1. Strengthening national legal frameworks
2. Increasing enforcement and cooperation at national level
3. Optimizing international cooperation
4. Building expertise and capacity
5. Improving data collection, harmonization and sharing

While these policy implications and best practices are grounded in data, research and expert consultations pertaining to the main waste trafficking destinations in the ASEAN region, they are also applicable in a global context, particularly for regions facing influxes of illegal shipments. Despite categorization by topic, there are also inevitable overlaps between the issues raised in this set of recommendations. Each topic area is given some general consideration within the Executive Summary to this report. The list provided below involves a more detailed set of suggestions. By following these recommendations, ASEAN countries will be better equipped to combat the problem of waste trafficking, which is currently viewed as a low-risk, high-profit crime.

1.Strengthening national legal frameworks

The waste crime framework

- Strengthen the criminalization of waste offences through updating and enhancing legislation or regulations at the national level.
    - Classify waste trafficking as a “serious crime”. This will enable states to counter such activities through the stringent provisions of the UNTOC.
    - Legislation should cover the three physical elements that comprise a waste trafficking offence: (a) the acts leading to trafficking; (b) the waste and objects trafficked; and (c) the elements of an act which constitute criminal trafficking.
- Penalties should be effective, proportionate and dissuasive. As such, criminal sanctions should cover both imprisonment and non-custodial penalties, such as tougher fines and community service orders as well as additional ancillary orders.
- Legislation on waste crime should encompass additional crimes such as fraud, misdeclaration and other opportunities for falsification (customs fraud, tax fraud and licensing) and cover predicate offences related to waste crime, such as organized crime, money laundering and tax evasion.
- There should be provisions imposing liability for legal persons, as well as secondary liability for players other than the main offender. Such provisions should also include liability for attempt of waste crime offences. A legal basis should be developed for the attribution of liability to legal persons for acts of natural persons.

The waste-specific framework

- Each country should enact a comprehensive legal framework committing to implementation of the Basel Convention. States should be further guided to fully transpose the Convention into national law, while states that have not ratified the Basel Convention Ban Amendment should be encouraged to do so. Comprehensive waste-specific regulations should be developed, especially for specific waste types, such as plastic waste and e-waste. These regulations must ensure that definitions,

conditions and waste schedules are clearly set out in legislative provisions, annexes and lists. Technical and legal guidance must also be provided on the interpretation of annexes and terminology of the Basel Convention's Plastic Waste Amendments and E-waste Amendments.

- Ensure that waste exporters and importers strictly adhere to the notification and consent processes outlined in the Basel Convention: Exporting countries should strengthen their compliance with the Prior Informed Consent procedure and ensure strict adherence to the take-back procedures outlined in the Basel Convention for the return of hazardous or other waste. Importing countries should put in place import permit requirements and introduce deposit policies to cover the costs of storage and demurrage when suspicious shipments are stuck at ports.
- Harmonize data, definitions and the categorization of relevant commodities among different agencies and countries (including among ASEAN Member States). This is necessary for the accurate and consistent monitoring and reporting of waste flows and for enhancing detection, investigation and sentencing for specific wastes. Governments should establish standardized protocols and definitions for waste classification for both hazardous and non-hazardous waste to ensure that all relevant agencies use a common framework. This can increase the recycling of non-hazardous waste and prevent the overburdening of hazardous waste treatment facilities.
- Encourage timely and comprehensive national reporting to the Basel Convention, and harmonize national reporting with the standardized codes (develop a correlation between the Harmonized System and the A, B, Y codes; use specific tools, such as the World Customs Organization's self-assessment tools on plastic waste, etc.).

2.Increasing enforcement and cooperation at national level

- Strengthen inter-agency cooperation through institutional arrangements, for example in the form of a national environmental security task force to facilitate information-sharing between law enforcement and environmental agencies, align law enforcement and prosecution procedures, with the competence to address waste crime and ensure successful prosecution as part of a wider strategy to combat organized, transnational crimes that affect the environment.
- Adopt national plans for emergency periods that include specific measures on waste management and trade, based on the lessons learnt from the COVID-19 pandemic (which led to a spike in clinical waste flows).
- Strengthen collaboration between the national authorities and private-sector actors involved in waste management and waste trade. Through this collaboration, promote responsible practices, information-sharing and compliance with regulations; enhance transparency, accountability and enforcement measures; and implement measures to prevent the illegal disposal or export of waste. Such measures can reduce opportunities for waste trafficking and promote a more sustainable waste management system.

3.Optimizing international cooperation

Between the European Union and ASEAN and among their Member States

- Optimize enforcement and inter-agency cooperation in the European Union, along with inter-Member State cooperation to ensure compliance with international and national legal frameworks, with regulation in the destination countries, and to prevent trafficking at the source. Expand successful projects such as IMPEL SWEAP, Operation Demeter and Operation Noxia and connect them with relevant ASEAN regional platforms and initiatives.
- Strengthen cooperation between ASEAN countries through an action plan facilitated by regional platforms, such as the ASEAN Cooperation on Environment and the ASEAN Working Group on Chemicals and Waste. Also, under the ASEAN Treaty on Mutual Legal Assistance in Criminal Matters, countries should further develop interfaces for cooperation on criminal investigations and information-sharing. Make use of existing regional platforms and networks, such as SEAJust, to share information about legal frameworks on waste trafficking and to expedite responses to Mutual Legal Assistance requests.
- Strengthen partnerships between ASEAN countries and the European Union regarding the trade of waste materials and prevention of waste trafficking as a key component of circular economy policies. This entails a dedicated effort to study and enhance the trade dynamics between the two regions, demonstrating a proactive commitment to sharing knowledge and practices in waste management.

Between exporting and importing countries

- Consolidate and optimize existing communication platforms between waste exporting and waste importing countries to facilitate the exchange of information on illegal waste shipments, coordinate efforts, and ensure compliance with the Basel Convention and national legislation. Make the most of existing communication platforms and networks focused specifically on waste management and trafficking issues.
- Improve communication between Customs and environmental authorities in origin, transit and destination countries: Verify the documentation, quality, proper waste classification, and import-export authorization status and quotas. Identify companies engaged in illegal activities, share patterns in modus operandi to identify regulatory and enforcement gaps, support coordinated actions or operations and prevent illegal shipments.
- Share information on relevant legislation in a timely manner and foster a consistent interpretation of standards and definitions (waste, scrap, hazardous, non-hazardous, green-listed waste, end-of-waste, etc.) to enable importing and exporting countries to increase enforcement, improve compliance and cooperate in combatting waste trafficking. Align export and import regimes to ensure consistency in waste management practices.
- Create and implement a standardized reporting framework for illegal exports and imports covering both hazardous and non-hazardous waste. This system should include key indicators to monitor and evaluate waste trade activities, ensuring transparency, accountability, and the availability of reliable data for informed decision-making both nationally and

internationally.

- Refine targeting strategies: Integrate the identified trends in waste trafficking into targeting strategies to promptly identify and address high-risk areas and adapt risk profiling accordingly and in a timely manner. Utilize data analytics and technology to enhance precision in identifying areas prone to waste trafficking.
- Develop strategies to deal with abandoned containers: Launch a dedicated project focused on identifying and addressing the issue of abandoned containers to mitigate potential environmental risks. Collaborate with relevant stakeholders to develop strategies for the proper disposal or return of abandoned containers.

4.Building up expertise and capacities

- Develop a comprehensive toolkit and delivery strategy to assist the agencies tasked with prosecuting and investigating waste crime issues, particularly in terms of detection, investigation and case-building.
- Develop and encourage the use of forensic testing techniques in waste crime investigations to differentiate waste components that indicate crime and provide robust evidence for prosecution.
- Promote active government collaboration with international organizations, to seek support, contacts, training and expertise building in combatting waste trafficking. International organizations such as UNODC can provide technical assistance, capacity-building programmes and knowledge-sharing platforms to enhance the capabilities of law enforcement agencies and other relevant stakeholders. Collaborating with international organizations can strengthen national efforts, promote standardized practices and international cooperation, support multi-stakeholder intelligence and data-sharing mechanisms and leverage global expertise in addressing waste trafficking.
- Specialized international organisations (such as INTERPOL, EUROPOL and UNODC) should raise awareness on transnational organized crime trends and help improve intelligence sharing between importing and exporting countries.
- Ensure that prosecutors are well-equipped in terms of legal responses and deterrents to handle cases involving illegal waste trafficking - Implement comprehensive training programmes for prosecutors to enhance their understanding of environmental laws and regulations related to waste management.
- Encourage actions to formalize the informal sector by giving value to existing good practices and also improving respect for security and safety measures, etc.

5.Improving data collection, harmonization and sharing

- Improve methodologies for data collection at national, regional and global levels to enhance the accuracy and comprehensiveness of risk and trend analyses for waste trafficking to inform policy decisions, support law enforcement efforts and enhance international cooperation to combat waste trafficking. Relevant data is needed to understand waste flows, transit points and the fate of illegal shipments (i.e. whether they are actually returned to the sender or whether they are redirected to another country). Monitoring of waste flows entering ASEAN countries can help to prevent an excessive burden on waste management and recycling facilities in the receiving region, while at the same time encouraging the environmentally sound management and the recycling of waste to support circular economy policies and strategies.
- Ensure transparency across all levels of

government, enabling public access to environmental information at any point in the value chain. This will advance public participation and access to remedies for violations of environmental rights, thus promoting accountability for environmental harm caused by waste offences.

- Coordinate and harmonize data collection and processing among the authorities of ASEAN Member States, ensuring linkages between different systems of reporting.
- Carry out targeted monitoring exercises to improve data collection:
    - Assess, through ad hoc and in-depth analysis, the effects of national policies put in place by ASEAN countries to control different waste flows (plastic and metals from the European Union and other world regions).
    - Improve national and regional data generation on waste collection and recycling, and perform in-depth analysis to better understand the role of the informal sector.
    - Identify and monitor transit and re-exporting hubs.
    - Assess and monitor the enforcement of the 2019 Basel Convention Ban Amendment and the 2021 Plastic Waste Amendments.
- Invest in the development of comprehensive data management systems and monitoring mechanisms to track the outcomes and effectiveness of waste crime cases. For example, establish a database to record information on processes of investigation, prosecution and conviction of waste trafficking cases. Ensure that these data-sharing systems are established on secure platforms or systems for centralized data storage and exchange, to ensure the efficient and secure sharing of information among relevant agencies, both domestically and internationally.

CONCLUSION

Data on illegal shipments of waste is scarce, hindering a comprehensive assessment of the scale of the illegal trade. Nonetheless, the findings presented in this report, which was developed by the *Unwaste* project, show that ASEAN countries remain a major destination for illegal waste shipments, many of which are sent from the European Union. Insights into national initiatives, such as waste reduction road maps, restrictions, licenses and quotas, demonstrate policy efforts to tackle the issue. Such policies are crucial for sustainable waste management, reducing the reliance on imports, supporting domestic recycling industries, and including the informal sector.

Waste trafficking is a symptom of the current economic model, which is based on a pattern of "take-make-consume-dispose". This model relies on large quantities of materials and energy, from which it generates significant amounts of waste. While the waste trade is vital for the global economy, waste trafficking can severely disrupt legal trade flows and prevent recycled materials from returning to the production system. This constitutes a significant threat to the circular economy model. Some countries have already chosen to ban the import of certain types of waste, in an effort to avoid importing the waste problems of others. Other countries are putting in place strict measures to allow only imports of waste that can feed their own industrial production systems. Measures aimed at tackling waste trafficking in many countries and regions should support legal trade, both complementing and aiding the transition to circular and green economies.

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Unwaste first Waste Trafficking Taskforce for Thailand meeting, 30 June 2022, with 20 participants; *Unwaste* second Waste Trafficking Taskforce for Thailand meeting, 27 January 2023, with 32 participants; *Unwaste* first National Working Group for Indonesia meeting, 27 October 2022, with 20 participants; *Unwaste* second National Working Group for Indonesia meeting, 14 July 2023, with 23 participants; *Unwaste* first National Project Consultation for Viet Nam, 23 September 2022, with 11 participants; *Unwaste* second National Project Consultation for Viet Nam, 16 June 2023, with 11 participants; *Unwaste* National Consultation for Malaysia, 22 March 2023, with 17 participants; Launch in Southeast Asia of the UNODC Legislative Guide on Waste Trafficking, 24 February 2023, with 29 participants; and *Unwaste* Study tour in Europe, 2–6 October 2023, with 32 participants.

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92. Under the Basel Convention, illegal traffic is defined as a transboundary movement of hazardous wastes: without notification pursuant to the provisions of the Convention to all States concerned; without the consent of a State concerned; through consent obtained by falsification, misrepresentation or fraud; that does not conform in a material way with the documents; or that results in deliberate disposal (such as dumping) of hazardous wastes in contravention of the Convention and of general principles of international law.
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95. Link to scoping report: UNEP (2022). Review of General Issues of Compliance and Implementation Under the Convention: Illegal Traffic: Scoping Exercise. https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-CC.15-4-Add.1.English.pdf.
96. The scoping paper over 2021 and 2022 was not yet available at the time of publishing this report.
97. Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste.
98. Basel Convention (n.d.). Guidance on the Implementation of the Basel Convention Provisions Dealing with Illegal Traffic (Paragraphs 2, 3 and 4 of Article 9). https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-PUB-GUID-IllegalTraffic-2020.English.pdf.
99. The reported fines are rather modest: combined for 2018 and 2019 only four reported fines exceeded US$50,000, and seven reported fines were between US$5,000 and US$50,000, with the vast majority of fines appearing to be less than US$5,000.
100. WCO (2019). Customs Successfully Target Environmentally Sensitive Goods during Operation DEMETER V. https://www.wcoomd.org/en/media/newsroom/2019/december/customs-successfully-target-environmentally-sensitive-goods-during-operation-demeter-v.aspx.
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104. WCO (2019).
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108. Seizures in 2018 involved cases of mineral slag of 283,672 tonnes (to allow better visualization of the other waste streams, it was omitted from Figure 23).
109. WCO (2018), WCO (2019), WCO (2020), WCO (2021), WCO (2022).
110. WCO (2018). Illegal Trade in Waste: Overview of Operation Demeter IV. https://www.wcoomd.org/en/media/newsroom/2018/november/illegal-trade-in-waste-overview-of-operation-demeter-iv.aspx?p=1.
111. While profiles are usually set mostly for Asian and African countries, as they are among the main receiving regions, no country or region is excluded by controls.
112. Differently than for Eurostat statistics, UK reporting is included in the SWEAP project also after 2020.
113. Article 18 of the EU Waste Shipment Regulation 1013/2006 requires that shipments of non-hazardous waste are accompanied the document contained in Annex VII.
114. ASEM has 53 Members: the 27 Member States of the European Union plus Norway, Switzerland and the United Kingdom on the European side and the 10 ASEAN countries, plus Australia, Bangladesh, China, India, Japan, Kazakhstan, the Republic of Korea, Mongolia, New Zealand, Pakistan and Russian Federation on the Asian side. The European Union and the ASEAN Secretariat also participate in the process: ASEM InfoBoard (n.d.). Fostering Dialogue and Cooperation Between Asia and Europe. Overview - ASEM InfoBoard
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116. The port of Genoa was selected also due to the key role it has been playing in the *Unwaste* project, including in the study tour that took place in October 2022.
117. Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on Shipments of Waste. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006R1013.
118. SWEAP (2020). Fact Sheet: Green List Waste Shipment. https://www.sweap.eu/wp-content/uploads/2020/08/LIFE-SWEAP-Factsheet-Green-Listed-Waste-March-2020.pdf.
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122. TEU is a unit of cargo capacity used for container ships and container ports and stands for Twenty-foot Equivalent Unit.
123. No data available for catalyst waste.
124. Article 18 of the EU Waste Shipment Regulation 1013/2006 requires that shipments of non-hazardous waste are accompanied the document contained in Annex VII.
125. Shipments of “green-listed” concerned shipments of non-hazardous wastes listed in Annex III of the EU WSR. Within the EU and OECD shipments of green-listed waste do not usually require the prior consent of the authorities, but information requirements apply. More information: Correspondents’ Guidelines No 10. https://ec.europa.eu/environment/system/files/2021-03/Correspondents%27%20guidelines%20No%2010%20revised%20Jan2021.pdf.
126. No precise number of containers controlled is available. The controls carried out relate to the number of declarations. The controls carried out may relate to one or more containers of a declaration.
127. Under article 18 of Regulation (EC) No. 1013/2006 waste shipments should be accompanied by the Annex VII document in the case of the following types of waste: green-listed recoverable waste (Annexes III, IIIA and IIIB) (>20 kg), and waste destined for laboratory analysis (< 25 kg).
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129. Science Direct (n.d.). Electric Arc Furnace Dust. www.sciencedirect.com/topics/engineering/electric-arc-furnace-dust.
130. See J. Naser (2021). Regeneration of spent Bleaching Earth and Conversion of Recovered Oil to Biodiesel, Science Digest, 1 May 2021.
131. Because different unit of measures have been included in the reporting – bags, containers, bales etc. – it was not possible to develop an overall estimate of the imported waste related to the reported cases.
132. BEA Cukai ID (2021). Dumai Customs Thwarts Smuggling of Health Waste and Medicine. beacukai.go.id. (In Indonesian).
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166. Tax evasion: cases that go through normal customs procedure, but the importers/ exporters falsely declare quantity, weight, price, type of goods, HS codes with the intention to avoid paying more tax.
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169. Plastic waste means goods under Tariff No. 3915.
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211. Regulation (EC) 1013/2006 established a classification system for waste shipments, consisting of two lists: Amber List and Green List. The Green List applies to the majority of non-hazardous waste shipments to the European Union and OECD countries and select non-OECD countries. Such shipments can be imported or exported for recovery purposes without the need for prior written notification or consent from the competent authorities. See: IMPEL LIFE SWEAP EU (2020). Fact Sheet: Green List Waste Shipments. www.sweap.eu/wp-content/

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