The Global E-waste Monitor 2020

Quantities, flows, and the circular economy potential

Authors: Vanessa Forti, Cornelis Peter Baldé, Ruediger Kuehr, Garam Bel

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Sustainable Cycles Programme

unitar
United Nations Institute for Training and Research

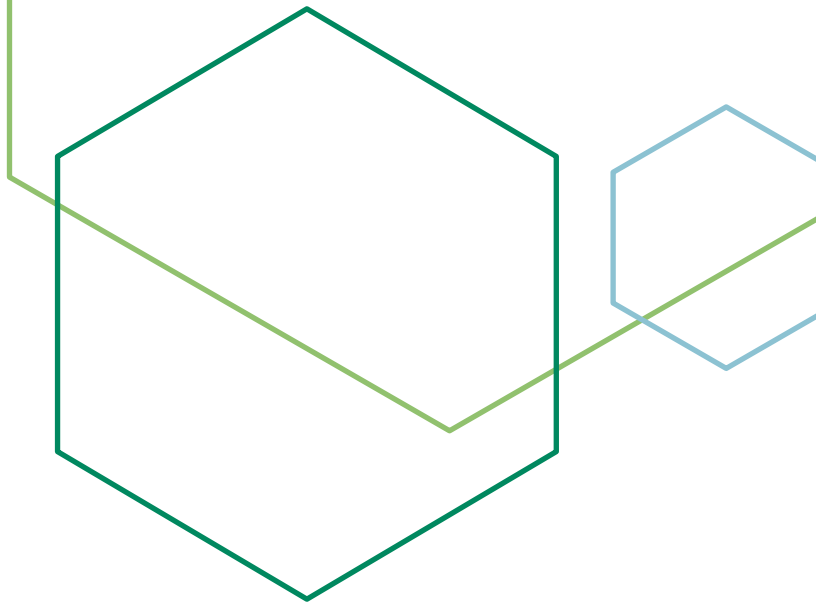
ITU

ISWA
International Solid Waste Association

Supporting Contributors:

World Health Organization

Federal Ministry for Economic Cooperation and Development



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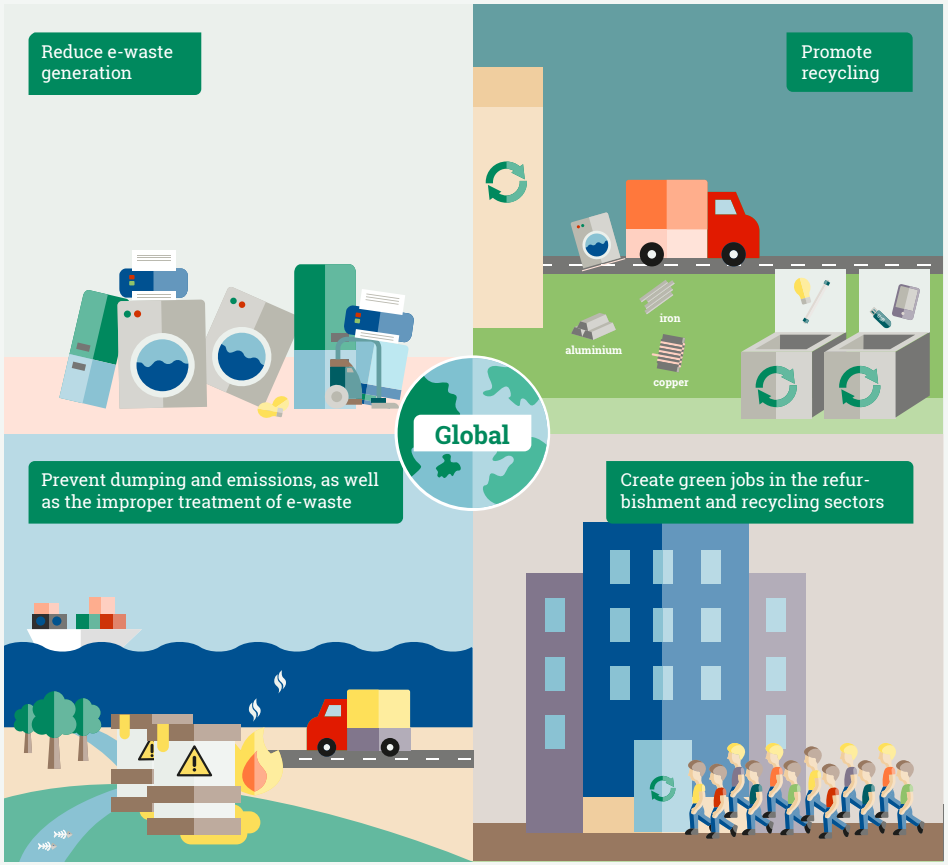
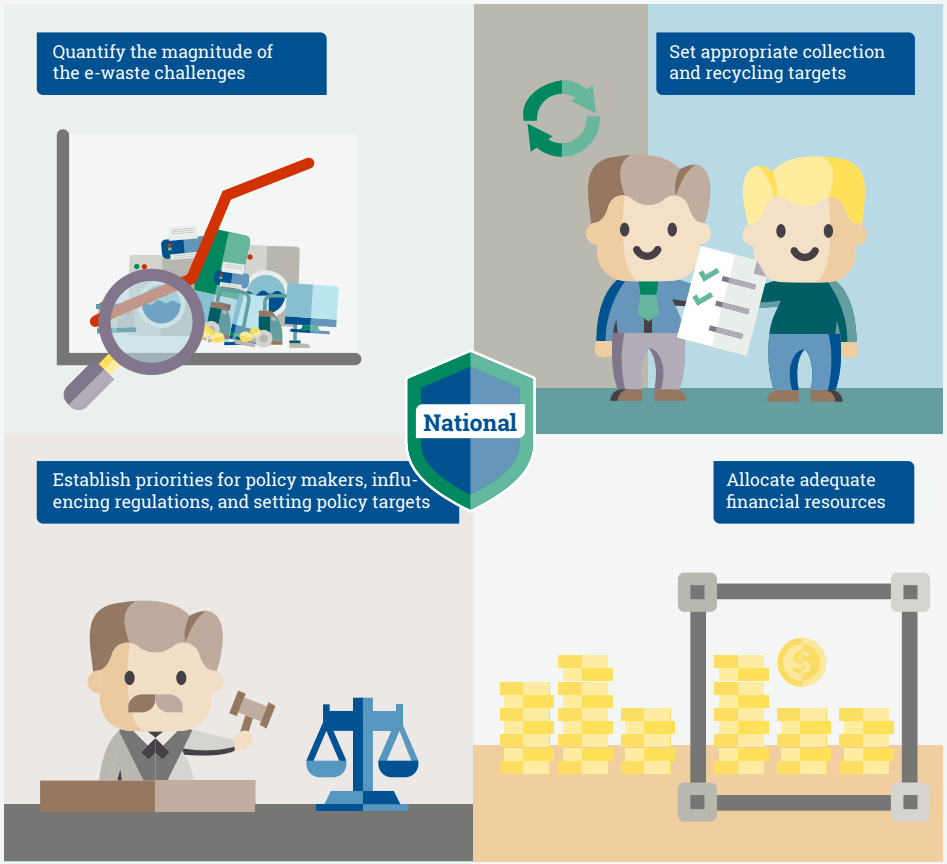
Chapter 4

Measuring E-waste Statistics


SAMSUNG
Panasonic
NOKIA
NOKIA
Panasonic
omnia
SAMSUNG
NOKIA
SF-400
ZERO
TARE
g
oz
CAPACITY:
5000gX1g/177ozX0.1oz
ON/OFF
MODE
TARE

Monitoring the quantities and flows of e-waste is essential for evaluating developments over time, for setting and assessing targets. The development of sound policies and legal instruments can only be achieved with better e-waste data. Understanding the quantities and flows of e-waste provides a basis for monitoring, controlling, and ultimately preventing illegal transportation, dumping, and improper treatment of e-waste. In the absence of any quantification of transboundary movements or informal e-waste activities, policy makers at the national, regional, and international levels will not be in a position to address these issues.





At the global level, better data will help to minimize e-waste generation as a result of taking stock of the challenges and having the basis to make targeted policy interventions. Understanding the quantities of e-waste better helps and setting up ad-hoc instruments to promote recycling. Understanding the potential for e-waste recycling and refurbishment activities enables a forecast of potential green job creation in the refurbishment and recycling sectors. Having better e-waste data is essential in order to measure progress towards the global target set in 2018 at the ITU Plenipotentiary Conference of increasing the global e-waste recycling rate to 30% by 2023.

Meanwhile, at the national level, harmonised and coherent e-waste data will also contribute to estimating the magnitude of challenges relating to e-waste, setting appropriate collection and recycling targets, establishing priorities for policy makers, influencing regulations, setting policy targets, and allocating adequate financial resources.

The internationally standardized methodology for measuring e-waste has been developed by the UNU SCYCLE Programme, in collaboration with the Task Group on Measuring E-waste within the UN Partnership on Measuring ICT for Development. The first edition of the E-waste Statistics Guidelines on classification, reporting, and indicators was published in 2015 and authored by UNU-SCYCLE[4], and underwent global consultation (Baldé, et al. 2015). The second edition was updated by UNU in 2018 (Forti, Baldé, and Kuehr 2018). The international methodology helps to harmonize the measurement framework and indicators, proving to be a substantial step towards reaching an integrated and comparable global measurement framework for e-waste. The same concepts formed the basis for the first Global E-waste Monitor (Baldé, Wang et al. 2015), and they are also used in the European Union as the common methodology to calculate the collection target of the recast EU-WEEE Directive (EU WEEE Directive 2012/19/EU).

The framework captures and measures the most essential features of a country's e-waste. The following indicators can be constructed from the framework:

1. Total EEE Placed on the Market (POM) (unit kg per capita).This represents the size of the national e-goods market.

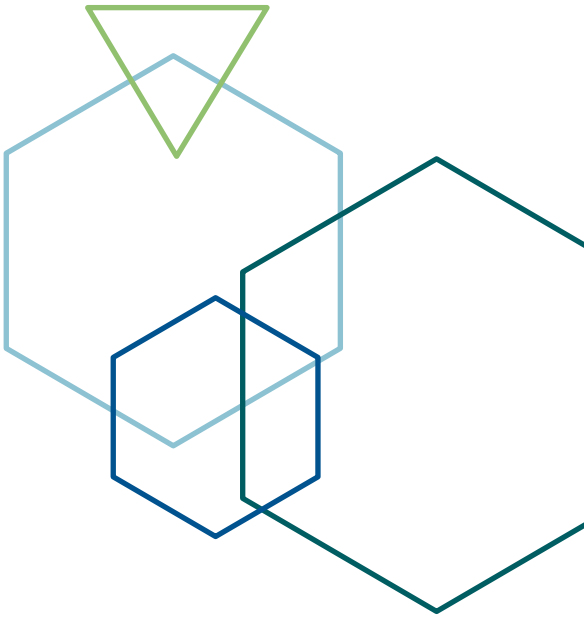
2. Total e-waste generated (unit kg per capita). This represents the size of the national e-waste generated.

3. E-waste formally collected (unit kg per capita). This represents the amount of e-waste that is collected as such by the formal collection system.

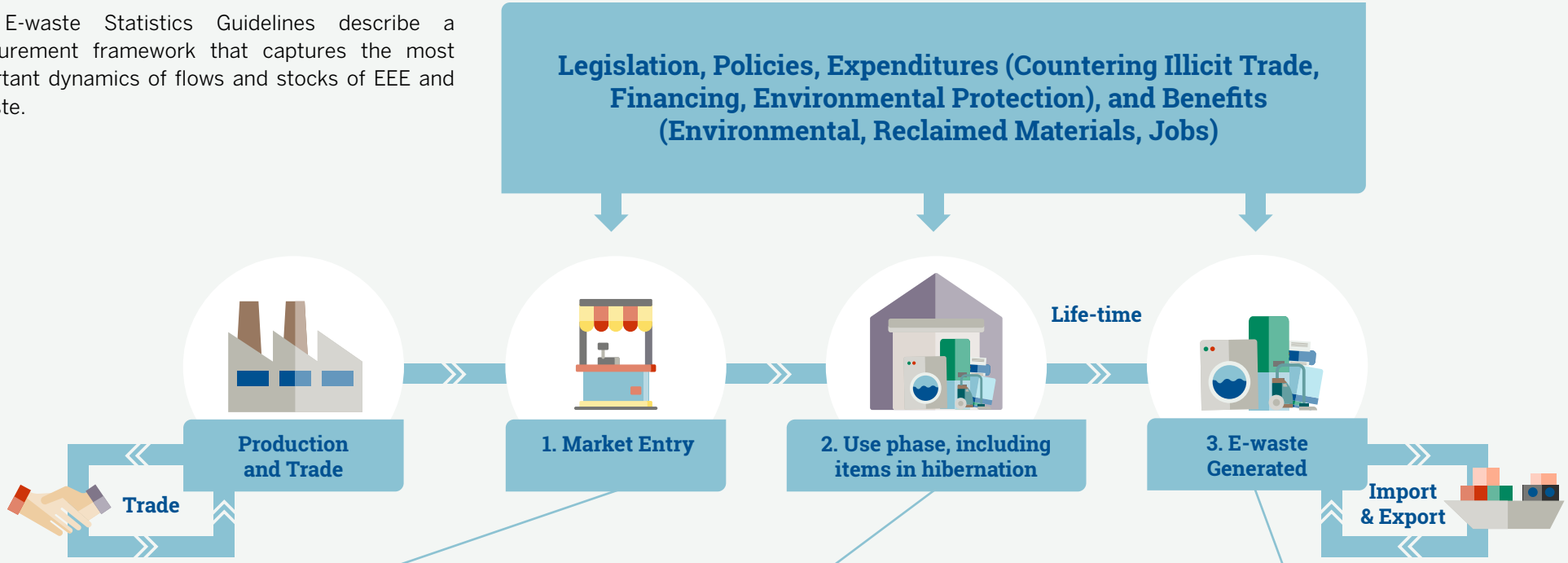
4. E-waste collection rate = $\frac{\text{total e-waste recycled}}{\text{total e-waste generated}}$ x 100 per cent

   This indicator represents the performance of the formal collection systems.

Nowadays, there are only a few data sources on e-waste statistics that have global coverage, such as the WEEE Calculation tools developed by UNU-SCYCLE (European Commission 2019). International agencies, such as the Organization for Economic Co-operation and Development (OECD), the OECD Working Party on Environmental Information (WPEI), targeting non-EU OECD Member States, the United Nations Environment (UNEP), and the United Nations Statistics Division (UNSD, Environment Statistics Section) have recently begun gathering data on e-waste through specific questionnaires addressed to the ministries in charge of e-waste monitoring or National Statistical Offices. Several countries outside the EU still lack a measurement framework for measuring e-waste statistics. Other less developed countries lack a waste management infrastructure, specific legislation, and/or enforcement. Most importantly, the majority of the countries, including those that have received a survey, have reported the unavailability of official data on e-waste formally collected and recycled.



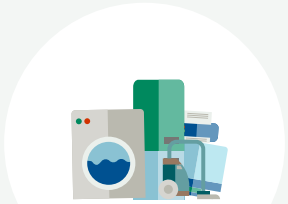
The E-waste Statistics Guidelines describe a measurement framework that captures the most important dynamics of flows and stocks of EEE and e-waste.



The measurement framework starts with tracking the "production and trade" of EEE. There is a strong link between trade statistics and national production statistics. In this stage, the data is collected and published by custom organizations and/or national statistical institutes. By deducting the exports from the EEE imported and domestically produced, one is able to obtain data on EEE POM. The market entry includes EEE placed on the market by households, businesses, and the public sector.

After the equipment has been sold, it stays in households or businesses for some time until it is disposed of. This period is called "lifetime". The equipment in households, businesses, and the public sector is referred to as the "use phase", and includes the items that are in hibernation. This is destined to become e-waste in the future. The lifetime includes the dormant time in sheds and exchange of second-hand equipment between households and businesses within the country.

The third phase is when the product becomes obsolete to its final owner, is disposed of, and turns to waste, which is referred to as "e-waste generated". It is the annual supply of domestically generated e-waste prior to collection without imports of externally generated e-waste.



E-waste Generated

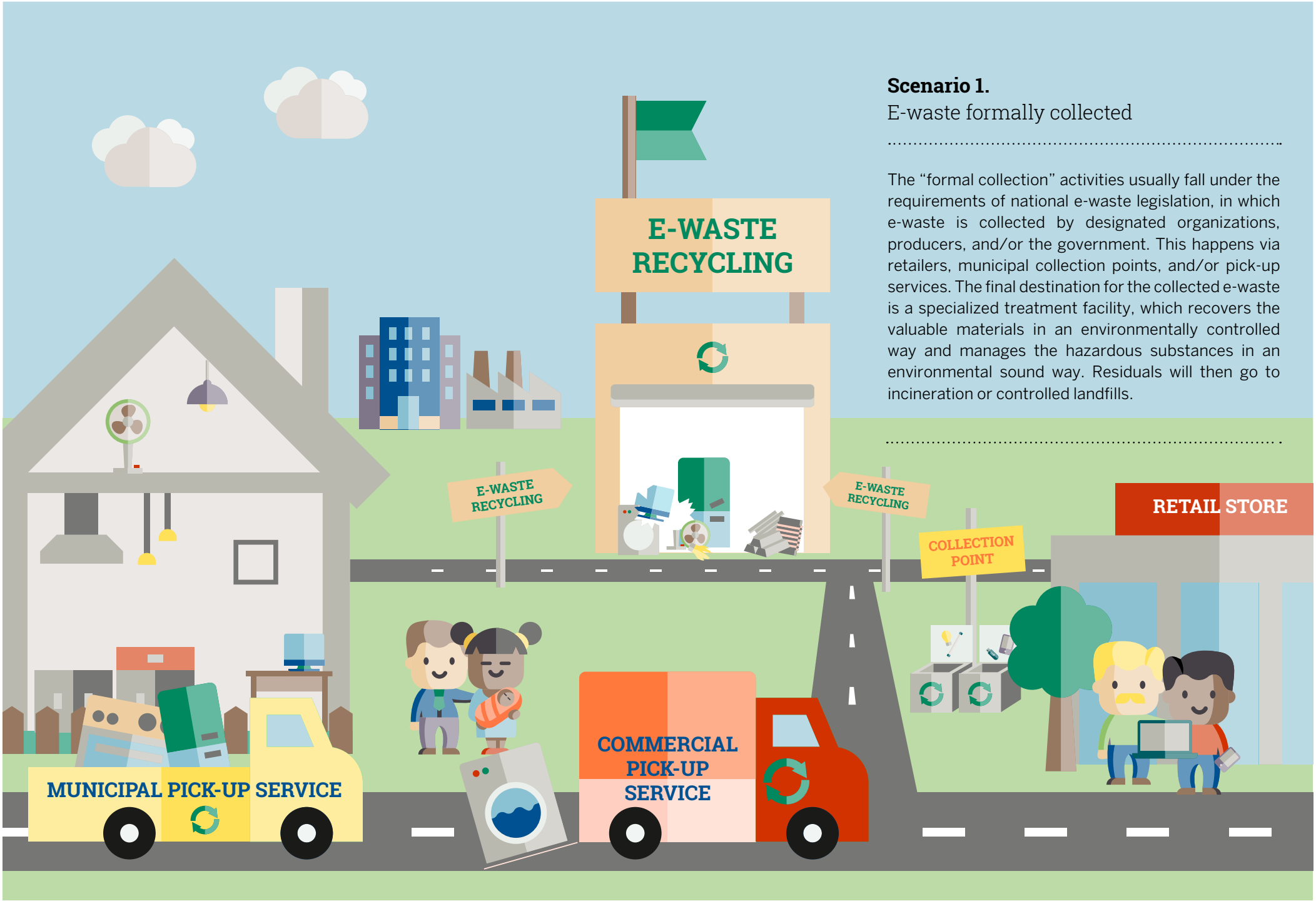
The e-waste generated is usually managed in one of four ways[5]

Scenario 1:
E-waste formally collected

Scenario 2:
E-waste in waste bins

Scenario 3:
E-waste collected outside of formal systems in countries with a developed (e-)waste management infrastructure

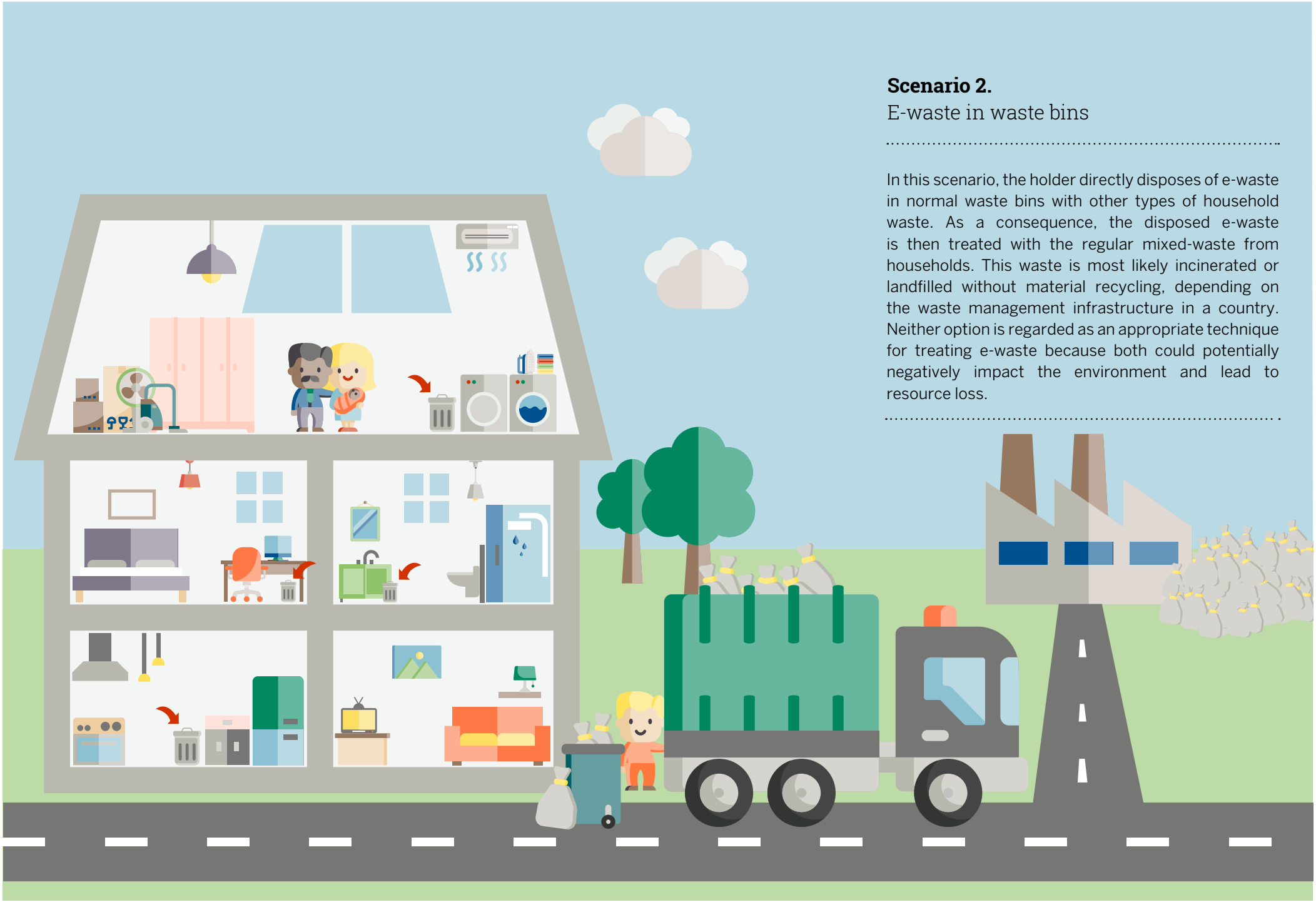
Scenario 4:
E-waste collected outside of formal systems in countries with no developed (e-)waste management infrastructure



Scenario 1.

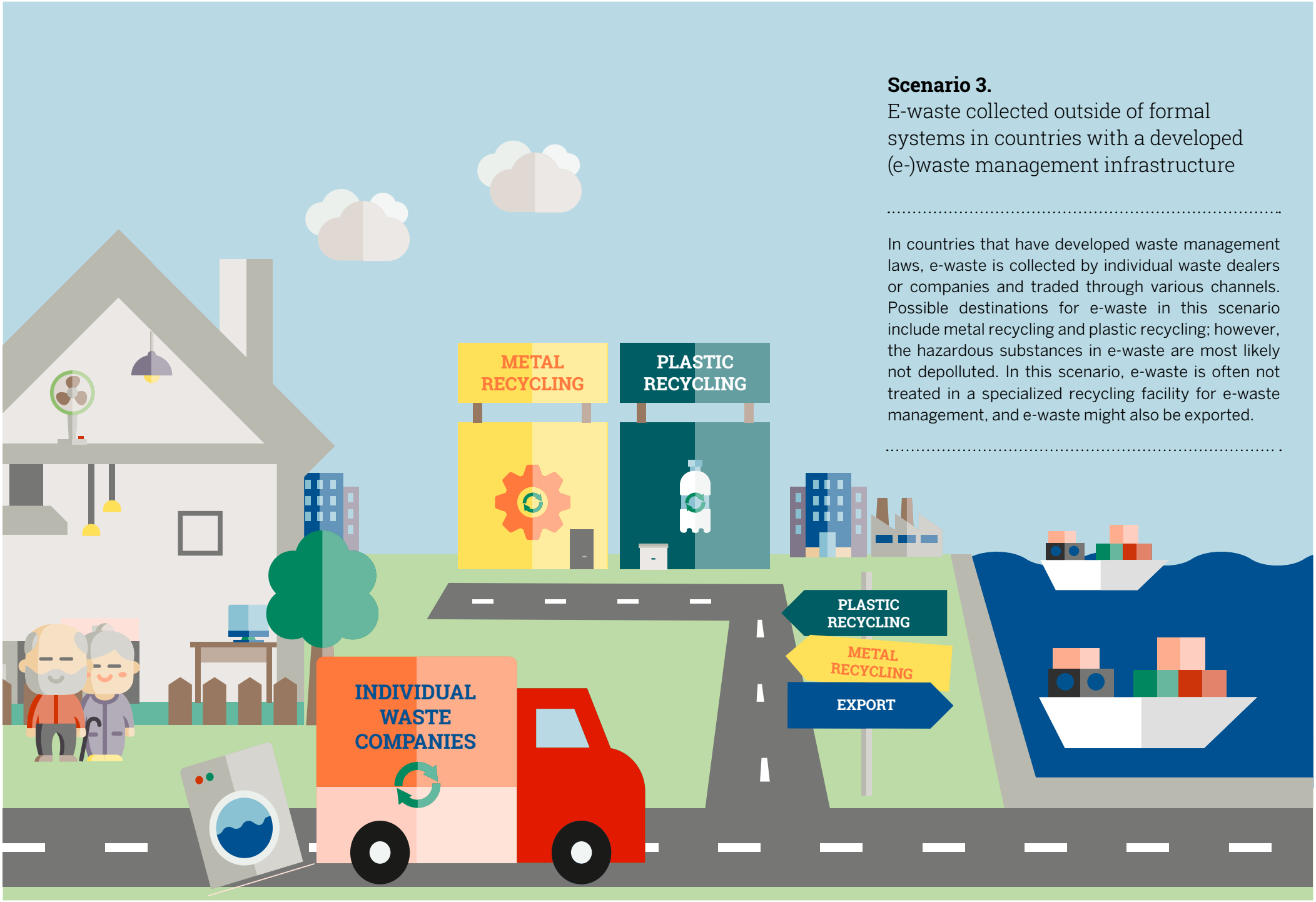
E-waste formally collected

The "formal collection" activities usually fall under the requirements of national e-waste legislation, in which e-waste is collected by designated organizations, producers, and/or the government. This happens via retailers, municipal collection points, and/or pick-up services. The final destination for the collected e-waste is a specialized treatment facility, which recovers the valuable materials in an environmentally controlled way and manages the hazardous substances in an environmental sound way. Residuals will then go to incineration or controlled landfills.



Scenario 2.
E-waste in waste bins

In this scenario, the holder directly disposes of e-waste in normal waste bins with other types of household waste. As a consequence, the disposed e-waste is then treated with the regular mixed-waste from households. This waste is most likely incinerated or landfilled without material recycling, depending on the waste management infrastructure in a country. Neither option is regarded as an appropriate technique for treating e-waste because both could potentially negatively impact the environment and lead to resource loss.



Scenario 3.

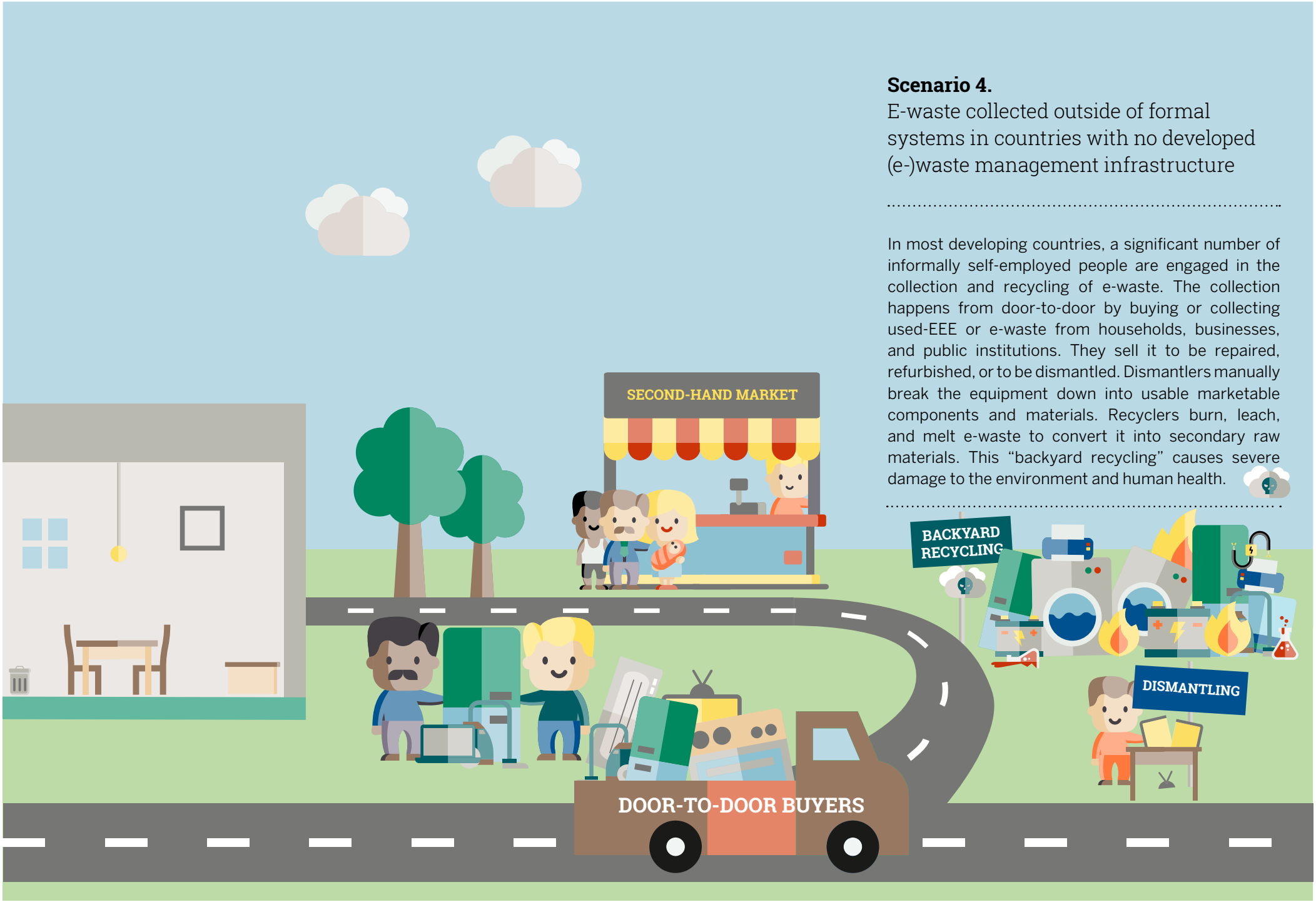
E-waste collected outside of formal systems in countries with a developed (e-)waste management infrastructure

In countries that have developed waste management laws, e-waste is collected by individual waste dealers or companies and traded through various channels. Possible destinations for e-waste in this scenario include metal recycling and plastic recycling; however, the hazardous substances in e-waste are most likely not depolluted. In this scenario, e-waste is often not treated in a specialized recycling facility for e-waste management, and e-waste might also be exported.

Scenario 4.

E-waste collected outside of formal systems in countries with no developed (e-)waste management infrastructure

In most developing countries, a significant number of informally self-employed people are engaged in the collection and recycling of e-waste. The collection happens from door-to-door by buying or collecting used-EEE or e-waste from households, businesses, and public institutions. They sell it to be repaired, refurbished, or to be dismantled. Dismantlers manually break the equipment down into usable marketable components and materials. Recyclers burn, leach, and melt e-waste to convert it into secondary raw materials. This "backyard recycling" causes severe damage to the environment and human health.



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