EXECUTIVE SUMMARY

"E-waste is a term used to cover all items of electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intent of reuse" (Step Initiative 2014). E-waste, or waste electrical and electronic equipment (WEEE), is a complex and fast-growing waste stream that covers a large variety of products. The composition of this waste stream, that is, its constituents including toxics and its resource potential, varies significantly by product. This makes e-waste very difficult to manage. Rapid product innovation, miniaturization and replacement, especially for information and communication technology (ICT) products and consumer equipment are fuelling the increase of e-waste. Moreover, more and more products contain a battery or plug, categorising it as EEE, such as intelligent clothes, smart toys and tools, dispensers and ubiquitous medical equipment. From past assessments, it is still unclear precisely how much e-waste is generated and collected in each country and region. Available estimates are either out-dated or impossible to compare across regions due to different product scopes, e-waste definitions and evaluation methods.

This monitor aims to present the first comprehensive assessment of e-waste volumes, their corresponding impacts and management status on a global scale. This is measured using an internationally-adopted measuring framework that has been developed by the Partnership on Measuring ICT for Development (Baldé et al., 2015). The methodology calculates the amount of e-waste generated from harmonised modelling steps and data sources. The outcomes show an unprecedented level of accuracy and harmonisation across countries and are very useful for international benchmarking. It is estimated that the total amount e-waste generated in 2014 was 41.8 million metric tonnes (Mt). It is forecasted to increase to 50 Mt of e-waste in 2018. This e-waste is comprised of 1.0 Mt of lamps, 6.3 Mt of screens, 3.0 Mt of small IT (such as mobile phones, pocket calculators, personal computers, printers, etc.), 12.8 Mt of small equipment (such as vacuum cleaners, microwaves, toasters, electric shavers, video cameras, etc.), 11.8 Mt of large equipment (such as washing machines, clothes dryers, dishwashers, electric stoves, photovoltaic panels, etc.) and 7.0 Mt of cooling and freezing equipment (temperature exchange equipment).

The official take-back legislation is organized only in a limited number of countries. Because of the large population in both India and China (both of which have national e-waste regulation in place), official take-back legislation covers around 4 billion people. However, the existence of legislation does not necessarily imply successful enforcement of this legislation and the existence of a sufficient e-waste management system. Most national take-back legislation does not cover all e-waste categories as measured in this publication. In some countries, legislation exists for only one type of appliance, or the collection amount is low. Driven by these national laws, at least 6.5 Mt of e-waste was reported as formally treated by national take-back programs and schemes at the global scale (around 15.5 per cent of the e-waste generated in 2014). Through these programs, the highest quality of recycling and safe disposal of e-waste takes place.

Besides national take-back systems, e-waste is also disposed of with mixed residual waste (the waste bin), where it is treated together with other municipal wastes. Disposal of e-waste in mixed residual household waste accounts for 1 to 2 kg per inhabitant in the EU. This fraction is mainly comprised of small equipment, such as mobile phones, lamps, electrical toothbrushes, toys, etc. In the 28 EU Member States, it is estimated to be 0.7 Mt of e-waste annually. This statistic is unknown for other countries.

For the collection outside the take-back systems, no harmonized data with good regional coverage could be gathered in this edition of the monitor. In addition, the transboundary movement of e-waste is not recorded by official sources. In some developing countries, the collection outside the take-back systems probably equals of the whole e-waste market. In other developed countries, it can be as large as one third of the e-waste market. The impact of collection and recycling outside the official take-back systems on the society and the environment varies significantly as this sector is less regulated than the official take-back scenario.

The intrinsic material value of global e-waste is estimated to be 48 billion euro in 2014. The material value is dominated by gold, copper and plastics contents. The annual supply of toxins from e-waste is comprised of 2.2 Mt of lead glass, 0.3 Mt of batteries and 4 kilo tonnes (kt) of ozone-depleting substances (CFCs). Other toxic substances are not quantified in this report. Whether the raw materials are recycled or the toxins lead to actual harmful emissions largely depends on their collection and treatment manners. As mentioned before, only 6.5 Mt of the 41.8 Mt of e-waste are documented and recycled with the highest standards. Thus, the full potential of e-waste collection and treatment has not been explored. These figures are useful for policymakers, like those in international regimes, governments and recycling industries, to document e-waste collected and to plan the location, capacity and technologies for creating the necessary recycling infrastructure.