



Federal Ministry
for Economic Cooperation
and Development

Improving the sustainability of electronic waste management

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POSITION PAPER



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1 Our goals

1. DEVELOP REGULATIONS AND STANDARDS FOR ENVIRONMENTALLY SOUND, CLIMATE-FRIENDLY MANAGEMENT OF ELECTRONIC WASTE

Compliance with internationally accepted environmental and social standards is necessary in order to avoid harmful impacts from the uncontrolled disposal of waste electrical and electronic equipment (WEEE or e-waste) on human health, the environment and the climate.

We will campaign for the worldwide implementation of international agreements and standards for the environmentally sound management of electronic waste, and will support our partner countries in their efforts to establish and enforce their own national e-waste legislation.

2. IMPROVE THE RECOVERY OF RAW MATERIALS THROUGH INCLUSIVE BUSINESS MODELS

In many of our partner countries, recycling e-waste is an important source of income for poor and disadvantaged people. This must be taken into account when developing more sustainable e-waste management systems.

Together with selected partner countries, we will develop and test new strategies with an emphasis on labour-intensive systems for the collection, sorting and dismantling of e-waste, and also on creating options for environmentally sound recycling.

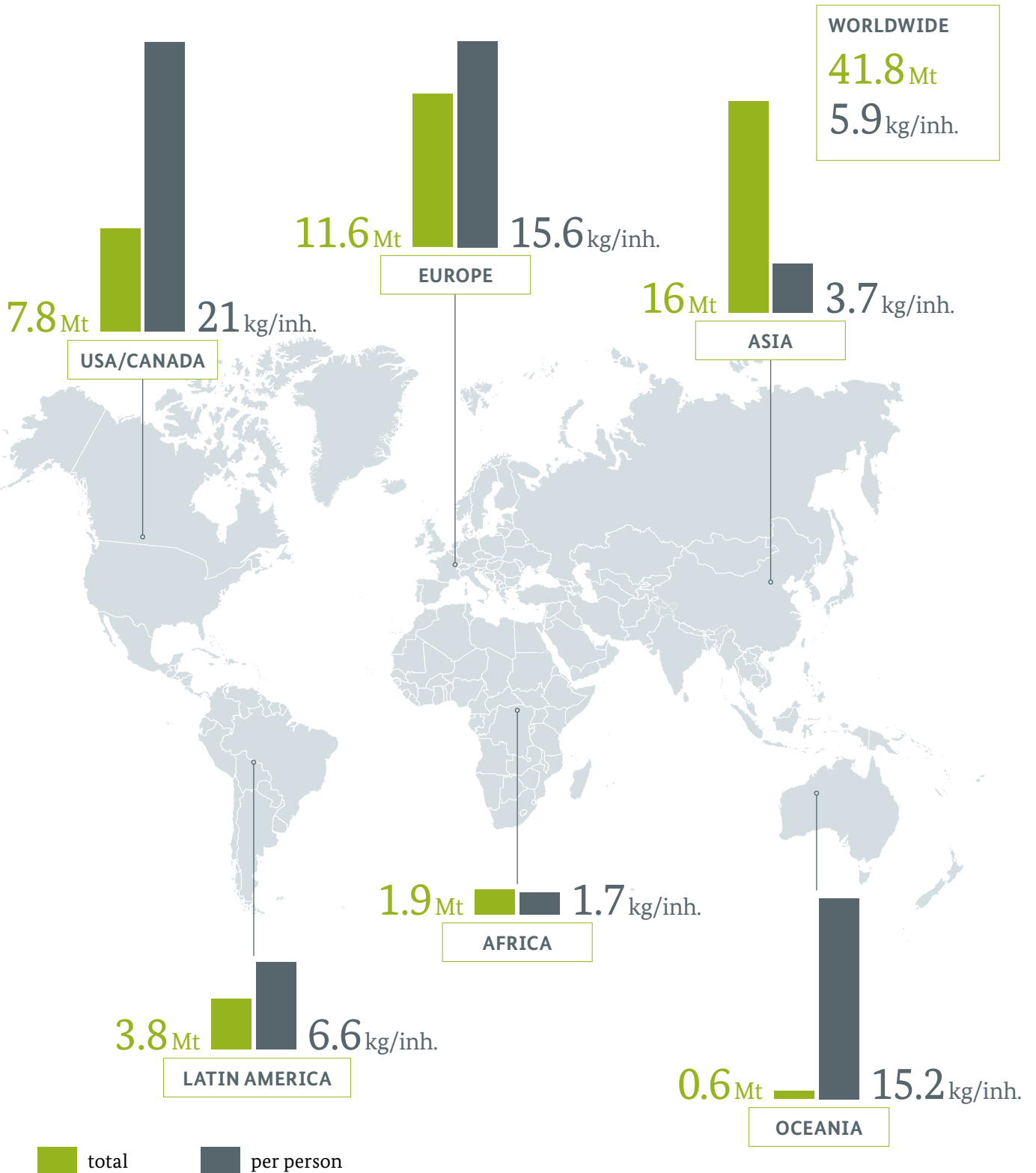
Our goal is to recover valuable raw materials more efficiently, whilst also creating jobs with improved working conditions.

3. ENCOURAGE PRODUCERS TO TAKE MORE RESPONSIBILITY FOR END-OF-LIFE WASTE MANAGEMENT OF THEIR PRODUCTS

The extent to which electronics can be recycled depends very much on product design and material composition. Products should be designed for easy repair and recycling, ideally using materials sourced from sustainable supply chains. The responsibility of manufacturers does not, however, end at the design stage. Producers and traders must also be involved in the setting-up and operation of collection and recycling systems – especially in developing and emerging countries.

In collaboration with the private sector, we want to develop recycling and waste management systems that can sustainably cover their own operating costs, for example through mechanisms for extended producer responsibility. Our support will cover how to introduce product fees or take-back schemes for recycling managed by producers. With a view to preventing illegal exports of e-waste, we will continue to provide support for improved screening of imports and exports, for example through training courses or advice on import registers, and also to support inter-agency cooperation.

Estimated volumes of e-waste per world region in 2014



2 The challenge

1. ECONOMIC GROWTH AND THE SPREAD OF DIGITAL TECHNOLOGIES ARE CAUSING INCREASED VOLUMES OF E-WASTE TO BE GENERATED

Discarded electrical and electronic devices that are broken or obsolete (e.g. televisions, lights, mobile phones and batteries) are the fastest growing waste stream worldwide. This is particularly true in developing and emerging countries, where economic growth coupled with changing patterns of production and consumption are resulting in rapidly increasing volumes of e-waste.

Improved energy supplies in rural areas, along with increased automation and the spread of digital technologies throughout the economy are also contributing to this trend. On the one hand, these technologies play an important enabling role in the realisation of the 2030 Agenda, but on the other hand they also depend on electronics which will ultimately become e-waste. In Africa in particular, the steadily growing demand for information and communication technology (ICT) products, entertainment devices and household appliances is largely being met via imported used goods from Europe that are often near the end of their useful life. The result has been that devices which no longer work are also being shipped to Africa.

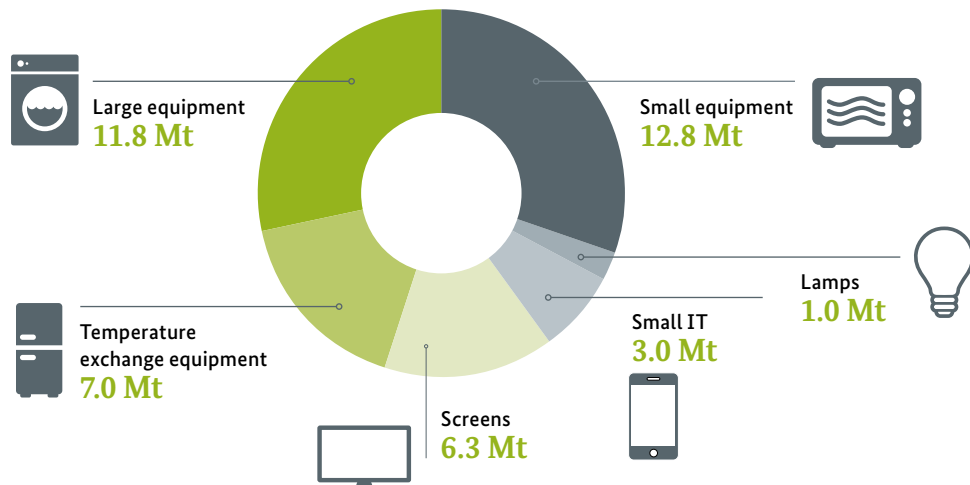
Since the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal entered into force in 1989, the export of e-waste has been prohibited.¹ Despite the ban, considerable volumes of e-waste are still being exported illegally, because it is often impossible to distinguish between e-waste and second-hand goods without excessively time-consuming and expensive inspections of shipments.

The increasingly important role of digital solutions in the implementation of the 2030 Agenda means that ICT technologies are also being used more widely in German development cooperation.

The BMZ's Digital Agenda therefore calls for appropriate steps to be taken to avoid possible negative consequences from ICT, such as might arise from improper handling of e-waste. Led by the guiding principle of human rights, the BMZ is committed to the goal of sustainable end-of-life value chains for electronic devices. By dealing with e-waste in a manner that is environmentally and socially compatible we can help to promote responsible consumption and production (SDG 12), support inclusive growth and decent work (SDG 8), prevent illnesses (SDG 3), and protect life below water (SDG 14) and life on land (SDG 15).

¹ Since 1992, 186 countries have ratified the Basel Convention. The US is the only industrialised country that has not ratified the Convention. The export of functioning used electronics for further use is permitted under the Convention. See <http://www.basel.int/> for further information.

Total e-waste per category and as a share of the global e-waste volume in 2014



Source: Baldé et al (2015): The global e-waste monitor – 2014, United Nations University, IAS – SCYCLE

2. ELECTRONIC WASTE IS AN IMPORTANT SOURCE OF RESOURCES AND INCOME IN DEVELOPING COUNTRIES

For many people in emerging and developing countries, repairing discarded electronic appliances or dismantling them for spare parts, and also selling valuable materials recovered through recycling e-waste constitutes an important source of income. This “business model” is in principle already contributing to a circular economy.

However, when manual techniques are used for activities that go beyond straightforward dismantling and are applied in more complex recycling processes, important resources are often lost which could have been recovered and reused in the circular economy if the work had been done in a modern recycling facility.

Solutions must therefore be found which can also be applied in developing and emerging countries, allowing these countries to establish climate-friendly, resource-efficient recycling processes that meet the minimum standards for protecting human health, the environment and the climate. These solutions must also include appropriate working conditions and training opportunities for workers engaged in recycling e-waste so as to secure their livelihoods in the long term.

3. ELECTRONIC WASTE POSES A DANGER TO HUMAN HEALTH AND POLLUTES THE ENVIRONMENT

E-waste contains many hazardous substances. These include heavy metals such as mercury, lead and cobalt, and also flame retardants that are used for example in plastic casings. Other substances such as dioxins are released when, for example, cable sheaths are burnt away to get at the metals inside. Materials with no market value for informal scrap dealers are often burnt in the open air or released into the environment via some other route. This causes serious pollution of the soil, air and groundwater, harms the climate and also compromises the health of people nearby. Often it is poorer communities that are particularly affected by these impacts, with studies showing that women and children who live next door to scrap yards or open-air recycling sites can have considerably higher levels of heavy metals in their blood.

The coolants and propellants in refrigerators and air conditioning units are extremely harmful to the climate and in some cases also damage the ozone layer, especially the CFCs and HCFCs still in use in old appliances. It is therefore absolutely essential that the methods used to dismantle these products and recover any reusable raw materials are environmentally sound.

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The methods being used for handling discarded refrigerators pay no heed to environmental safety and they are destroying the ozone layer and harming the climate with estimated annual emissions of more

than 2 gigatonnes of CO₂ equivalent.² Developing countries urgently need support to improve the way they deal with these discarded appliances and the gases they contain.

4. A CIRCULAR ECONOMY IS AN IMPORTANT ELEMENT OF SUSTAINABLE DEVELOPMENT

Electronic waste contains valuable materials such as gold, copper, tantalum, palladium and rare earth metals. These metals are in short supply, but they are vital for the technologies of the future, such as renewable energies or energy efficiency applications. Producing electronic appliances with longer lifespans and improving resource recovery from e-waste reduces the demand for primary resources, thereby also reducing the negative environmental and social impacts that often go hand in hand with resource extraction.

Most developing and emerging countries have no effective legislation in place for recycling e-waste. Weak law enforcement and public administrations make it more difficult to implement legal regulations. Furthermore, many places do not have appropriate recycling facilities to deal with partly toxic components, or with the ozone- and climate-damaging gases resulting from e-waste.

Valuable materials in e-waste (contained in the estimated total volume of e-waste in 2014)

Material	Amount (kilotons)	Value (million euros)
Iron, steel (Fe)	16,500	9,000
Copper (Cu)	1,900	10,600
Aluminium (Al)	220	3,200
Gold (Au)	0.3	10,400
Silver (Ag)	1.0	580
Palladium (Pd)	0.1	1,800
Plastics (PP, ABS, PC, PS)	8,600	12,300
Total	18,630	48,000

Source: Baldé et al (2015): The global e-waste monitor – 2014, United Nations University, IAS – SCYCLE

² The impact from the emissions caused when a discarded refrigerator containing CFCs is not disposed of professionally is equal to the greenhouse effect from the annual CO₂ emissions of a small car with average mileage. It is estimated that the global warming potential from (discarded) refrigerators and air conditioning units in developing countries is about 16-18 GT CO₂ equivalent. Source: UNEP, TEAP, 2009, Environmentally sound management of banks of ozone-depleting substances, p. 17

3 Our priorities

1. ESTABLISH REGULATIONS AND STANDARDS FOR ENVIRONMENTALLY AND SOCIALLY SOUND RECYCLING OF ELECTRONIC WASTE

1.1 Develop and implement legal regulations to enable compliance with environmental and social standards

The sustainable management of e-waste as part of a resource-efficient circular economy requires a legislative framework and reliable enforcement mechanisms dealing with all aspects, ranging from placing electronic goods on the market to the proper recycling and disposal of e-waste. All this should be embedded in a comprehensive body of legislation for sustainable waste management.

This legislation should aim to reduce the volume of e-waste generated. This can start at the design stage with designs that maximise the lifespan, repairability and recyclability of products from the outset, and restrict the amount of hazardous substances used in their manufacture. However, there is a need for globally harmonised regulations regarding product lifespans and recyclability. The BMZ supports efforts to get corresponding regulations introduced at the European and the international level.

In its partner countries, the BMZ supports the application of guidelines on environmentally sound management of e-waste developed under the Basel Convention and by the recycling industry.

Offering capacity building to enforcement agencies is a major component of our development cooperation with partner countries, as these agencies play a key role in the implementation of legislation by monitoring compliance and prosecuting infringements. This cooperation includes anti-corruption measures in the public sector.

The approach we follow addresses multiple levels and stakeholders. We support governmental and non-governmental partner institutions on the ground, at both the national and the local level, and seek to foster institutionalised cooperation between public authorities, manufacturers, sellers, waste collectors, recycling operators and civil society. We also seek to promote the establishment of easily accessible mechanisms for filing complaints, which can give people living near waste and recycling facilities protection and options for legal recourse in the event of harmful exposure.

1.2 Pay special attention to toxic components

Certain products require special capacity building efforts and awareness raising measures to highlight the need for special dismantling and disposal. These products include refrigeration and air conditioning units that contain climate-damaging and ozone-depleting substances, leaded glass from CRT monitors and appliances containing mercury. Appliance exchange initiatives which swap out older appliances for more energy-efficient ones are a possible solution. Such initiatives should only be supported when proper professional disposal of discarded appliances can be ensured. The high costs of safe disposal and processing of hazardous components mean that additional financing mechanisms and international cooperation are often required.

2. PROMOTING INCLUSIVE BUSINESS MODELS FOR IMPROVED RESOURCE RECOVERY

2.1 Involving the informal sector in the management of e-waste

The BMZ supports decent work for all, in line with the core labour standards of the International Labour Organization (ILO). Informal workers who earn their living by recycling e-waste must not be excluded from the formalised recycling industry. In fact, channelling significant volumes of electronic waste into controlled recycling facilities depends on involving the informal sector in this process.

We help informal operators in the sector to organise themselves into cooperatives, set up small businesses and optimise their processes so that they can partner with formal sector recycling agents. This work includes information campaigns and awareness-raising measures with the aim of limiting the tasks carried out in the informal sector to safe collection and dismantling activities, thereby minimising the health risks. Affected stakeholder groups are involved in the development of these strategies, so that their knowledge can be taken into account and their interests are represented.

2.2 Setting up national and local recycling structures

Electronic appliances that no longer work and cannot be repaired should only be recycled in suitable recycling centres. By offering training and advice, and providing capital for investments we support companies in developing economically viable business models for environmentally and socially sound recycling of e-waste, and assist them in improving their recovery processes.

We also support the acquisition of equipment needed to carry out controlled recycling of individual electronic waste components, and the setting-up of waste disposal units for non-recyclable components. Through cooperation with financial institutions, special credit lines are provided and capital is mobilised. Supporting local start-ups can contribute towards the development of creative solutions that are adapted to the local situation. Our Tech-Entrepreneurship Initiative, Make-IT, is one of the ways that we provide this kind of support.

Another area in which we are actively engaged involves ensuring that clear framework conditions are established in our partner countries, as this is a prerequisite for safe investments in national recycling infrastructure and fair competition. At the local level, we support the efforts of local governments to improve access to municipal collection points for electronic waste, and to design efficient take-back systems that are as simple as possible.

2.3 Fostering international business partnerships

For some metals, the global production volume is relatively small, while the technological effort needed to recycle them is still considerable. In these instances, it makes sense to establish cross-border value chains for the effective recovery of important materials. It is thus possible to combine labour-intensive pre-processing in the partner country with high-tech processes in other countries (the best-of-two-worlds approach) in order to recover important secondary raw materials. We support the development and testing of ideas and example processes to see how these “two worlds” can be combined more effectively.

3. ASSUMING RESPONSIBILITY, TRANSFERRING KNOWLEDGE, CREATING AWARENESS

3.1 Dialogue and raising awareness among policymakers, industry and consumers

Both in Germany and in partner countries, there is often a lack of awareness and understanding of the issues around recycling electronic waste, reducing the willingness of all concerned to assume responsibility for the sustainable management of e-waste.

In our partner countries, we therefore support dialogue between civil society, industry and policymakers, with a view to elaborating national strategies that are supported and advocated by all involved. Furthermore, we are engaged in activities aimed at making consumers, public institutions and also businesses more aware of the need for sustainable consumption and the importance of recycling electronic waste.

3.2 Better monitoring of international flows of electronic devices and electronic waste

The proper monitoring and inspection of e-waste flows worldwide is a huge challenge. Often shipments of e-waste are declared as “still functioning used appliances” or “personal effects”, so that they can be sent to developing countries despite legislation which prohibits such exports.

Capacity building and international cooperation are necessary in order to ensure that the Basel Convention is implemented effectively. The authorities in our partner countries need support with regard to

- the inspection and screening of imports,
- the registration of importers, and
- the registration of appliances that have been put on the market.

Accompanying anticorruption measures can ensure that the checks carried out by the authorities in question are effective and remain so.

Civil society organisations can also make an important contribution towards monitoring international flows of electronic devices and e-waste. They can place the data they collect on shipments of goods in the public domain, thereby holding international manufacturers to account. With a view to creating a better understanding of the volume of e-waste being illegally exported to countries outside Europe, we are supporting measures to monitor imports in Nigeria, for example.

3.3 Utilising the opportunities offered by new digital technologies

Online platforms or even apps offer innovative ways of making available information about repairing discarded products or managing and properly disposing of e-waste. They can be used to make various stakeholders and groups in society aware of the issues involved. Furthermore, the rapid developments taking place in the field of sensors and software offer new possibilities for extending the lifespan of electronic devices, for refurbishing them and thereby saving resources, and for recycling them when they have reached the end of their useful life. The possibilities for the decentralised, local production of spare parts where they are needed using 3D printing should also be considered.

4. FOSTERING SUSTAINABLE FINANCING AND INCENTIVE SCHEMES

4.1 Introducing incentives to channel e-waste to recycling facilities

For recycling centres to be economically viable, realistic ways to cover their operating costs are needed. In most developing and emerging countries, the take-back and recycling of e-waste mainly takes place in the private sector (mostly informally) and is financed by the sale of the recovered materials.

Environmentally sound recycling facilities require national strategies for covering the additional costs entailed. In order to encourage e-waste to be channelled towards controlled facilities instead of being dumped or improperly recycled, we support the development of incentive mechanisms and take-back schemes. With the right incentives, both generators of waste and informal collectors/recyclers can be motivated to send waste electrical and electronic equipment to environmentally sound recycling centres.

4.2 Getting business on board for sustainable e-waste management in emerging and developing countries

The growing middle class in emerging and developing countries is an important market for the electronics industry, and a key reason why industry should take more responsibility for the recycling and disposal of its products in these countries.

Working in partnership with manufacturers and the international recycling industry, important prerequisites for controlled take-back and recycling schemes can be put in place. In order to do this we seek to engage in dialogue and cooperation with manufacturers, for example through the Solving the E-waste Problem (StEP) network.

4.3 Promoting mechanisms for increasing producer responsibility

Manufacturers and exporters must take more responsibility for what is done with their products – not just within Europe's borders but also beyond them – by supporting the development of collection and recycling structures for e-waste in other jurisdictions. Taking responsibility for their products also includes making sure that they are recycled or disposed of properly. In many industrialised countries the necessary structures are already in place.

In emerging and developing countries on the other hand the situation is often very different. In many cases, there is a multitude of small importers; informal players dominate and consumers tend to expect to be paid for giving back their used appliances.

In a first step, manufacturers and importers must register the volume of goods that they place on the market; they must also ensure the appropriate collection and recycling of discarded products via producer organisations or service providers and must pay the necessary recycling fees.

Since the conditions in our partner countries are very different to the conditions prevailing in Europe, adapted solutions will need to be developed that take account of specific challenges with regard to implementing such systems. In emerging and developing countries, special attention needs to be paid to the costs for the recycling and treatment of additional imported second-hand goods and e-waste flows when designing such systems.

4 Our approach

→ WE WILL SUPPORT PROBLEM-SOLVING APPROACHES IN PARTNER COUNTRIES AND PROMOTE EXCHANGE OF EXPERIENCES

The BMZ is supporting a new project involving both Technical and Financial Cooperation for the sustainable management of e-waste in Ghana in which exemplary problem-solving approaches will be implemented.

Furthermore, the Ministry supports capacity building and sharing of experiences, for example through international “e-waste academies”. It is also examining possible avenues for new measures in this field in partner countries.

→ WE ADVOCATE GIVING MORE ATTENTION TO DISPOSAL AND RECYCLING STRATEGIES IN PROJECTS CONCERNED WITH THE SPREAD OF DIGITAL TECHNOLOGIES, ENERGY SUPPLY AND ENERGY EFFICIENCY

Fostering better access to sustainable energy supply, to electrical and electronic appliances, and to digital applications is an important development-policy goal for the German government. However, it is a goal that must not be allowed to increase the medium-term risks to human health and to the environment due to the improperly managed disposal of appliances.

In the future, measures to promote decentralised, sustainable energy supply, public procurement programmes and exchange schemes for the introduction of energy-efficient appliances will therefore need to be increasingly combined with appliance take-back schemes, and ensuring that sustainable recycling and disposal procedures are in place.

→ WE WILL HELP TO PUT THIS ISSUE ON INTERNATIONAL DEVELOPMENT AGENDAS AND DEVELOP IT FURTHER

We are campaigning for approaches that promote the sustainable management of e-waste to be taken into account in the implementation of the 2030 Agenda. We will also increase our advisory activities with a view to improving the implementation of the guidelines of the Basel Convention on e-waste. Illegal exports of electronic waste must be effectively halted and national recycling systems must be set up. Furthermore, we are actively promoting the expansion of international multi-stakeholder partnerships like the StEP Initiative.

→ WE CALL FOR LONGER PRODUCT LIFESPANS AND BETTER REPAIRABILITY OF ELECTRICAL AND ELECTRONIC DEVICES

In order to achieve the goals of the 2030 Agenda for Sustainable Development and ensure the sustainable management and use of natural resources, we need production and consumption patterns that are oriented towards longer product lifespans, repairability and resource-efficient recycling. When it comes to avoiding electronic waste, manufacturers in particular have a high responsibility that they are only partially meeting at the present time.

→ **IN GERMANY AND IN THE EU WE WILL
CAMPAIGN FOR STRONGER SHARED
RESPONSIBILITY FOR THE SUSTAINABLE
MANAGEMENT OF E-WASTE
WORLDWIDE**

The value chain that ends with electronic waste being dumped in developing and emerging countries often begins with producers and first consumers in Europe. At the government level we advocate appropriate rules and regulations, and incentives to encourage the production of electrical devices that have a longer lifespan and can be recycled.

We will make the case to producers to actively take on more responsibility, setting up partnerships and making financial contributions to systems for the sustainable management of e-waste.

At the consumer level we want to create more awareness for the impact that individual purchasing decisions can have when it comes to tackling global challenges.

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