



Circular Solutions Finder

Proven Approaches to Address Key Circular Economy Challenges

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Introduction

This catalogue provides an **overview of proven circular solutions** for different material streams (plastic waste, e-waste and organic waste) addressing the main challenges and gaps which the transition towards a circular economy (CE) is facing. Each solution is briefly described and illustrated with project examples and resources such as studies, guidelines and recommendations.

The circular solutions presented in this document come from three sources:

- 1) From the [Sector Project on Concepts for Sustainable Waste Management and Circular Economy](#), which was implemented from 2016 to 2022 and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ).
- 2) From the multi-stakeholder initiative [PREVENT Waste Alliance](#), whose secretariat was hosted by the sector project and is now hosted by the global project Go Circular.
- 3) From the EU-funded project [Rethinking Plastics \(2019 to 2022\)](#), which piloted plastic waste solutions in Southeast Asia.

Building on this, the Global Project [Go Circular](#) now seeks to promote further innovation as well as the scaling of proven solutions in partnership with other stakeholders from the circular economy community.

We hope that this catalogue will encourage organisations and companies to scale some of the solutions which have proven efficient.



Solutions Finder

Select your topic



PLASTICS/PACKAGING



E-WASTE



ORGANICS

GENERAL

Funding Gap

- [EPR/Global Action Partnership for EPR](#)
- [Transition Financing: Plastic Credits](#)

- [Transition Financing: E-Waste Compensation](#)

- [Study: Financing the Circular Economy](#)

Data Gap

- [Waste Flow Diagram](#)
- [Corporate Plastic Waste Disclosure](#)
- [Life Cycle Assessments of Single-Use Plastic Alternatives](#)

- [GHG Calculator](#)

Capacity/ Awareness Gap

- [Behaviour-Centred Design](#)
- [Learnings from Awareness Raising Projects](#)
- [Building Capacities at the Organisational and Business Level](#)

- [Behaviour-Centred Design](#)
- [E-Waste Academy for Managers](#)
- [Trainings on E-Waste Plastics and Battery Recycling](#)

- [Behaviour-Centred Design](#)

- [Building Capacities at the Academic Level](#)

Technical Gap: Upstream Solutions

- [Circular and Sustainable Packaging Design](#)
- [Promoting Reuse Models and Alternative Materials](#)

- [Reuse, Repair and Refurbishment of Electrical and Electronic Equipment](#)

- [Circular Economy & Climate: CE-smart NDCs](#)

Technical Gap: Downstream Solutions

- [Plastic Waste Collection](#)
- [Strengthening Informal Waste Workers](#)
- [Reducing Marine Litter](#)
- [Waste-to-Energy Options and Co-Processing](#)

- [Treatment Solutions and Innovative Finance Models for Problematic E-Waste Fractions](#)
- [Improving the PIC Procedure for Transboundary E-Waste Movement](#)

- [Guideline for Organic Waste Treatment in East Africa](#)

- [Digital Tools to Support Circular Solutions](#)

Collaboration Gap

- [Plastics Working Group](#)

- [E-Waste Working Group \(with StEP\)](#)

- [Organic Waste Working Group](#)

- [PREVENT Waste Alliance as a Multi-Stakeholder-Partnership](#)

Closing the Funding Gap through (Transition) Financing Mechanisms for Circularity

The circular economy (CE) is significantly underfunded. Although the shift to CE creates new business opportunities, jobs and economic resilience, a broader scaling of financing CE is impeded by various challenges:

- Awareness and expertise on CE among financial institutions remains low.
- New CE business models may not fit into existing financial mechanisms and products, and comparable models that can be used as a basis for risk assessments are still rare.
- Regulatory certainty for investments into the CE sector is missing in many countries.

Additionally, the costs of environmental, social and economic impacts of linear models are barely acknowledged, leading to linear business models remaining economically more competitive than CE business models. To shift from a linear to a circular economy, a level playing field for CE business models is required.

Financial institutions and policy makers can promote financing CE through a large variety of activities, ranging from a harmonisation of standards, definitions and metrics of CE, the development of policies to close the viability gap between linear and circular business models, the establishment of special funds, bonds and financial instruments, to knowledge and awareness generation on CE business models and financing, only to mention a few.

While a functioning EPR scheme, which holds producers responsible for managing the costs and end-of-life of products they place on the market, is considered an effective long-term policy

tool, it can take many years to set up and become operational. As a result, the informal recycling economy is thriving, achieving high collection rates and processing increasing quantities of waste – whilst often applying sub-standard processes, resulting in severe social and environmental impacts. Transition finance mechanisms are necessary to address growing waste volumes and to finance the operational costs for sustainable waste management in an ongoing manner. Transition finance mechanisms may work independently of but should always be complementary to emerging local legal frameworks.

2.1 STUDY: FINANCING THE CIRCULAR ECONOMY

By investigating and highlighting current international developments on financing CE, GIZ developed a report and background study which provide a prospective guidance on how development cooperation could contribute to closing the financing gap for circular economy in low- and middle-income countries (LMIC). They assess distinct barriers that hinder as well as drivers that stimulate circular economy in LMIC. A special focus is placed on five country cases: Colombia, the Dominican Republic, Vietnam, Albania, and Rwanda.



Report: [Financing Circular Economy – Insights for Practitioners](#)

Background Study: [Finance for circular economy in low- and middle-income countries](#)



2.2 EXTENDED PRODUCER RESPONSIBILITY

More and more countries are putting Extended Producer Responsibility (EPR) on their agendas and an increasing number of organisations is working on the topic. As a result, there is a great need for technical and practical support in setting up EPR legislation and enforcing it as well as for a space to discuss and further develop the concept of EPR.



Global Action Partnership for EPR



GIZ, WWF and OECD have partnered to establish the Global Action Partnership for Extended Producer Responsibility (GAP for EPR) – hosted by the PREVENT Waste Alliance. The partnership also receives circular economy support from the Ellen MacArthur Foundation and is in close collaboration with UNEP on providing technical support to governments and PROs.

The aim of the GAP for EPR is to:

- Create a common understanding by offering an overview of existing resources, including the PREVENT Waste Alliance's EPR Toolbox.
- Build an EPR community by connecting practitioners.
- Provide coordinated technical support through an expert pool, which can provide tailored and demand-driven support to the public and private sector.
- Think ahead jointly to develop innovative approaches, e.g. incorporate waste prevention (upstream solutions) more strongly into EPR mechanisms.



Know-how to enable
Extended Producer Responsibility
created by PREVENT Waste Alliance



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EPR Training Handbook

How to conduct an EPR training based on the PREVENT Waste Alliance EPR Toolbox? A handbook from the project Rethinking Plastics, based on experiences in Vietnam, will support you in successfully preparing an EPR training, selecting the right stakeholders and taking local perspectives and conditions into account.



Website: [Global Action Partnership for EPR](#)

EPR Toolbox by the PREVENT Waste Alliance: [EPR Toolbox](#)

Webinar (on YouTube): [Setting up an EPR System for Packaging – Lessons Learned & Best Practices](#)



Handbook: [Guide for Practitioners – Conducting a Training Course on EPR for Packaging](#)

2.3 TRANSITION FINANCING: PLASTIC CREDITS

The concept of plastic credits offers significant opportunities for financing circular plastic systems, while providing a sustainable source of income to low-income groups. However, uncoordinated and unregulated plastic credit schemes bear certain risks, especially with regard to incentives for waste prevention and the introduction of EPR systems.



Critical Review and Further Development of Plastic Credit Schemes

A PREVENT Waste Alliance round table of plastic credit scheme operators, industry as well as environmental NGOs and researchers developed a discussion paper on necessary quality requirements and standards to ensure that plastic credit schemes lead to more circular systems and do not undermine incentives for EPR and waste prevention. Additionally, PREVENT brought together a group of voluntary standard setters and facilitated a joint position paper. The further aim of the group is to align the definitions, scope and methodologies of plastic credits to ensure global acceptance for the instrument and create a level playing field amongst plastic credit issuers.



Discussion paper: [Plastic credit schemes and EPR – risks and opportunities](#)

Joint statement: [Plastic credit standard setters welcome global plastics agreement](#)



Project Example

Harmonizing the International Plastic Credit Market – Standard Process Model

Based on the analysis of stakeholders, roles and dynamics of plastic credit schemes and markets, the PREVENT Waste Alliance pilot project Plastic Credits for Inclusive and Transparent Circularity elaborated a Standard Process Model (SPM). A handbook explains guiding principles for the integration of minimum requirements for the plastic credit market to foster greater transparency and accountability of all stakeholders involved. The SPM is globally applicable while allowing for local tracing and measurement of social and environmental impacts through digital tools (which are interoperable – see [mapping](#) of the PREVENT Waste Alliance Digital Group). The SPM was tested in India and Vietnam, proving social benefits of the model. Through the pilot project, plastic credit principles, which include both environmental and social aspects, as well as third party verification and monitoring and reporting tools were developed and implemented. 1710 circular credits (equivalent to 70,000 EUR) were issued in Brazil and Mexico: benefitting 10 organisations (252 waste pickers) in Brazil and 4 community organisations as well as 82 collectors in Mexico (during the project phase of 1.5 years). This is equivalent to 1,562 tons of plastic recovered in Brazil and 148 tons in Mexico.



Standard Process Model Handbook: [ValuCred SPM Handbook](#)

Report: [Plastic Credits – Friend or Foe? Retrospective of recent market dynamics](#)

Project website: [Plastic Credits for Inclusive and Transparent Circularity](#)

Webinar (YouTube video): [Key Lessons Learnt from Socially Inclusive, Circular Plastics Value Chain Projects](#)

2.4 TRANSITION FINANCING: E-WASTE COMPENSATION AS AN OFFSET MECHANISM

In many low- and middle-income countries, there are small formal recyclers that try to manage e-waste in a sustainable way. After dismantling, some fractions can be sold to the local industry, while others still need to be exported at high costs to appropriate end-processing facilities. Fully responsible e-waste recycling might theoretically be possible in some countries, but sound end-of-life management often comes with high net costs – which is one reason why there are only little investments in recycling infrastructure. Sustainable e-waste management is not a profitable business model per se, therefore alternative financing approaches, such as e-waste compensation, must be established until they can be replaced by a functioning EPR system.

Through e-waste compensation, international brands and users of electronic equipment can contribute to the sound management of equivalent volumes of e-waste in low- and middle-income countries by providing finances to organize collection and environmentally sound management of e-waste on their behalf.



Project Example

E-Waste Compensation as an International Financing Mechanism in Nigeria (ECoN)

Based on the model of e-waste compensation, a PREVENT Waste Alliance pilot project responsibly collected and processed 30t of waste batteries and flat panel screens (which are economically negative) in Nigeria during the project period of 1.5 years. This demonstrates that incentive-based collection and sustainable management can be replicated within larger solutions such as EPR schemes. Furthermore, the project could prove that a link between informal collectors and formal recycling facilities can be built and further developed. ECoN project partner Verde Impacto collected 21.7t of flat panel screens and 11.4t Li-ion batteries through registered agents in Nigeria. These agents work with local collection networks and use financial incentives.

However, e-waste compensation needs rules to ensure that the money benefits a sound e-waste management and that unintended side-effects are avoided. Therefore, the ECoN project developed 11 e-waste compensation principles: [Principles and comparison criteria for e-waste compensation](#)



Project website: [E-Waste Compensation as an International Financing Mechanism in Nigeria](#)

Feasibility study: [Management of End-of-life Li-ion Batteries through E-waste Compensation in Nigeria](#)

Feasibility study: [Management of End-of-life Flat Panel Displays through E-waste Compensation in Nigeria](#)

Webinar (YouTube Video): [E-Waste Compensation as an International Financing Mechanism in Nigeria](#)

Report: [Taking recycling to another level](#)

Quantifying the Problem and Measuring Impacts: The Role of Data and Digital Tools

Understanding the leaks and pathways of (plastic) waste into the environment, as well as the effects of proper waste management on GHG emissions, is key in developing effective measures to beat (plastic) pollution and reduce climate impacts. Nevertheless, little reliable

information and data is available to make informed decisions – this applies to both governments and the private sector. The following tools and resources can support decision makers in closing the data gap.



3.1 MEASURING WASTE FLOWS



Waste Flow Diagram

The Waste Flow Diagram (WFD) is an open-source toolkit that enables a rapid assessment of a city's municipal solid waste flows. It maps and visualizes the material flows within a municipal solid waste management system, and quantifies the amounts, sources, and fates of plastic leakage into the environment. A scenario function simulates how improved waste management could reduce pollution and prevent marine litter. It is complementary to and harmonized with the SDG Indicator 11.6.1 (proportion of municipal solid waste collected and managed in controlled facilities). Since its launch in 2020, GIZ and other actors have applied it in more than 100 cities worldwide. It has proven to be a pragmatic tool that suits many purposes, including baselining, benchmarking, and scaling up to national leakage assessments. Lastly, it helps to develop effective local waste management solutions and track their progress, while being easy to handle. An online portal facilitates its use and improves data analysis and sharing. Dedicated training such as a training of trainers course improves the quality of the WFD applications.

 **Website:** [Waste Flow Diagram](#)



Corporate Plastic Waste Disclosures – Towards a Universally Accepted Framework

Many companies measure and report their footprint and circular economy progress. Yet, a universally accepted framework for corporate plastic waste disclosures is not in place and the reporting differs in four main areas: approaches, measurement boundaries, disclosure mechanisms and strategic integration potentials – making them difficult to compare to one another. The discussion paper summarizes the existing frameworks for corporate plastic waste disclosures. It concludes that existing frameworks already provide a good starting point for universal acceptance and provides recommendations for their improvement, particularly with regard to harmonising the approaches companies take to measure plastics in their products, packaging, operations and supply chains. Recommendations include piggybacking on corporate climate disclosure, considering the full lifecycle of plastics, enhancing collaboration and being more accessible for smaller and medium-sized businesses

 **Discussion paper:** [Corporate Plastic Waste Disclosures – Towards a Universally Accepted Framework](#)
Webinar (on YouTube): [Corporate Plastic Waste Disclosures: Towards a Universally Accepted Framework](#)



3.2 MEASURING IMPACTS



Project Example

Life Cycle Assessments (LCA) of Single-Use Plastic (SUP) Alternatives

As part of the PREVENT Waste Alliance innovation programme The SUP Challenge, a holistic life cycle assessment of four alternatives to single-use plastics in the foodservice industry was conducted. The four solutions include: a reusable takeaway container, a refill machine for dispensing liquid cleaning detergents, a single-use takeaway container made from areca palm leaves and a single-use drinking straw made from coconut palm leaves. The LCA offer a more comprehensive understanding of the environmental impacts and costs of different solutions and provide an informative basis for decision-making of policy makers, foodservice operators, solution providers and consumers. The results of the LCA provide evidence that SUP alternatives generally offer environmental benefits under certain conditions. The LCA also surfaced key factors which drive environmental impacts, ways how products can be optimized and infrastructures which can support SUP alternatives to provide even greater environmental benefits.



Report: [Life Cycle Assessment – The SUP Challenge](#)



The LCA Calculator

The LCA calculator helps to compare the life cycle environmental impacts of alternative solutions versus SUPs and to understand how different parameters can affect the environmental performance of alternative solutions versus SUPs.



Tool: [LCA Calculator – The SUP Challenge](#)



Greenhouse Gas Calculator

The solid waste management (SWM) - GHG Calculator allows quantification and comparison of GHG emissions for different waste management strategies at an early stage in the decision-making process. Default values allow approximations to be made even if basic data is not (yet) available. Additionally, the SWM-GHG Calculator provides information on the costs associated with different waste management strategies. By comparing and selecting the most appropriate waste treatment systems, developing countries and emerging economies can considerably reduce their GHG emissions at comparably low costs and significantly contribute to public health and environmental protection. Stepping up recycling could further reduce emissions.



Excel tool: [SWM-GHG Calculator](#)

Increasing Capacities and Changing Behaviour

4.1 BEHAVIOUR-CENTRED DESIGN

Environmental challenges are behavioural challenges: Someone somewhere needs to be doing something differently to drive change. For example, households need to better segregate their waste or citizens need to move to more sustainable consumption patterns that include reuse, repair or refurbishment. Environmental solutions traditionally only use rational material incentives, rules and regulations and information as levers for behaviour change. However, these

levers often miss important aspects of human behaviour and thus are not effective on their own. Applying a structured behaviour-centred design approach can help many circular economy projects to effectively change behaviours and achieve more impact.





Project Example

Innovation Contest on Behaviour-Centred Design

The PREVENT Waste Alliance innovation contest BE.Innovative provided self-paced trainings on behaviour-centred design accompanied by tailored coaching and mentoring as well as financial support to pilot solutions. The innovation contest was implemented by Rare's Center for Behavior & the Environment. Participants learned about the entire spectrum of levers of behaviour change and reflected on behavioural motivations and barriers of their target groups. By working through the behaviour-centred design journey, which is based on the design thinking methodology and includes user research, prototyping and testing of solutions, participants designed targeted interventions. This provided them with a structured and methodological process to address waste challenges through behaviourally informed solutions, ensuring that interventions are informed by real-world evidence.



With a relatively small budget and within only 12 months the BE.Innovative programme reached 100 individuals who attended the behaviour-centred design course, and 10 selected organisations who were supported to implement behaviour-centred design in their projects. The pilot projects produced tangible results, for example:



Basel Convention Coordinating Centre for the African Region: In two weeks after the intervention the segregation of food waste in university dorms increased from 0 to 40%.



Common Seas: 90% of the target group became active users of reusable diapers, saving nearly 2,000 diapers during the project period.



CENN – Caucasus Environmental NGO Network: 80% of the target group switched to glass bottles instead of PET bottles for drinking water, reducing the overall PET consumption in the target company by 21%.



Project website: [Be.Innovative Programme on Behaviour-Centred Design](#)
Webinar (on YouTube): [Behavioural Solutions to Prevent Waste](#)



Project Example

Increasing Household Waste Segregation in Indonesia

As part of its systemic approach, the PREVENT pilot project Creating Value in Plastics through Digital Technology in Indonesia identified 4 interventions after applying the behaviour-centred design process:

- Distribution of a second bin to enable better waste segregation
- Redesigning the waste truck and making visible that the truck separates waste to create trust
- Implementing a collaboration game (win a prize together community party) to motivate people
- Distribution of stickers as an incentive to self-commit and to signal participation to neighbours

These simple measures reached approximately 900 households, of which over 80% started segregating their waste.



Project website: [Creating Value in Plastics through Digital Technology Webinar \(on YouTube\): Behaviour Change Interventions to Increase Household Waste Segregation in Indonesia](#)



Project Example

Single-Use Plastic Free Schools

Another simple and impactful approach was implemented in the Rethinking Plastics pilot project Single-Use Plastic Free Schools in Indonesia. The project trained 45 teachers so that they could inspire school children to help establish waste free habits and become long-term multipliers for plastic waste prevention. With the help of a specially designed handbook, the teachers used easy, fun, and interactive eco-education activities and passed on their knowledge to more than 1,000 school children over a period of three months. Using what they had learned about alternatives to plastic use, the students changed their daily routines. Plastic diaries and surveys showed that they managed to reduce single-use plastics in their lives by 40%. This project was scaled by PREVENT's BE.Innovative challenge and extended to households.



Project website: [Single-Use Plastic Free Schools](#)



© GIZ / Maren Jäger: Second bin for better waste segregation

© Single-Use Plastic Free Schools Project by Rethinking Plastics / MOPF



Learnings from Awareness Raising Activities in Asia

In addition to proven behaviour-centred measures, awareness raising campaigns and other communication activities present an important (complementary) way to create understanding, acceptance or even the demand for the introduction of circular economy solutions within society. The Rethinking Plastics project conducted extensive communication and awareness raising activities and campaigns in China, Indonesia, the Philippines, Thailand and Vietnam, combining online and onsite formats and especially focusing on children and young adults. They resulted in a broad outreach and an infographic that summarises the insights gained.



Project website: [Rethinking Plastics - Learnings from Awareness Raising Activities](#)



4.2 CAPACITY BUILDING

Establishing integrated waste management systems in low- and middle-income countries requires a skilled workforce in the public and private sectors. However, many countries lack comprehensive and up-to-date academic programmes in waste management and circular economy. In addition, the private sector, especially small and medium-sized recycling companies, often lack the financial and technical capacity to improve their business.

Building Capacities at the Academic Level


Project Example

German-MENA University Network

Establishing a collaborative network between universities from Germany and from the MENA region proved to be a successful approach to generate qualified personnel for the political, regulatory, municipal and private sector. The network developed an online educational programme on state-of-the-art technologies in waste management and circular economy for under-graduate and graduate students. The online programme was scaled to other universities, educational institutions, and decision-makers in the MENA region to create a critical mass of experts for circular economy. In total, almost 300 Bachelor and Master students participated in the 38 online lectures on best practices in waste management and circular economy delivered over 1.5 years with the support of practitioners and experts.

The network published [Wastiepedia](#), learning material for both bachelor and master lectures, which contains:

- General technical lectures (characterization, treatment of waste, etc.)
- Handling specific waste fractions (WEEE, construction waste, etc.)
- Framework (LCA, financing, regulations, etc.)

 **Project website:** [German-MENA University Network](#)
Webinar (on YouTube): [Education is the Foundation of the Circular Economy – Lessons from the German-MENA University Network](#)

Building Capacities at the Organisational and Business Level



Project Example

Transferring Operational Expertise to Enhance Plastic Recycling in Serbia

As part of a PREVENT pilot project, a SME in the recycling sector in Serbia was matched with an experienced recycler from Germany, who provided a tailored mentoring programme. Mentoring included the development of business plans and options for increasing recycling streams, as well as the identification of respective technical equipment, mandatory skills, standard operating procedures and health and safety plans and equipment. Additionally, through the PREVENT Waste Alliance, an international network for further (business) partnerships was provided. Through the mentoring in organisational development, the recycler was able to increase the throughput of an existing plastic recycling plant by 50%, install another recycling line, stabilize revenue, improve working conditions, and expand the facility.



Project website: [Enhancing Awareness and Employment through Recycling Pitch \(on YouTube\): Expanding the Capacity of Small and Medium-Sized Enterprises in the Recycling Sector](#)



Project Example

E-Waste Academy for Managers

The PREVENT Waste Alliance together with the StEP-Initiative developed a concept for an E-Waste Academy for Managers, which invites stakeholders along the value chain of electronics to improve their knowledge about the set-up and implementation of environmentally sound management (ESM) of e-waste. It is a one-week training that allows for exchange on challenges in ESM particularly in the Global South.

The objective of the academy is to train selected experts from the Global South to become topic leaders in improving recycling practices in the formal and informal e-waste recycling sector. The participants will be equipped to provide support to recyclers both formal and informal to improve their processes in their home countries and support the establishment of sustainable e-waste recycling. The training curriculum includes theoretical inputs (on guiding principles for e-waste management, policy design, auditing and treatment standards, e.g.) practical group work (on proper dismantling, assessment of legislation, e.g.), as well as field visits.

Contact gocircular@giz.de if you would like to offer a training on e-waste management and want to learn more about the concept.



Example: E-Waste Academy in Tanzania (implemented by UNITAR)

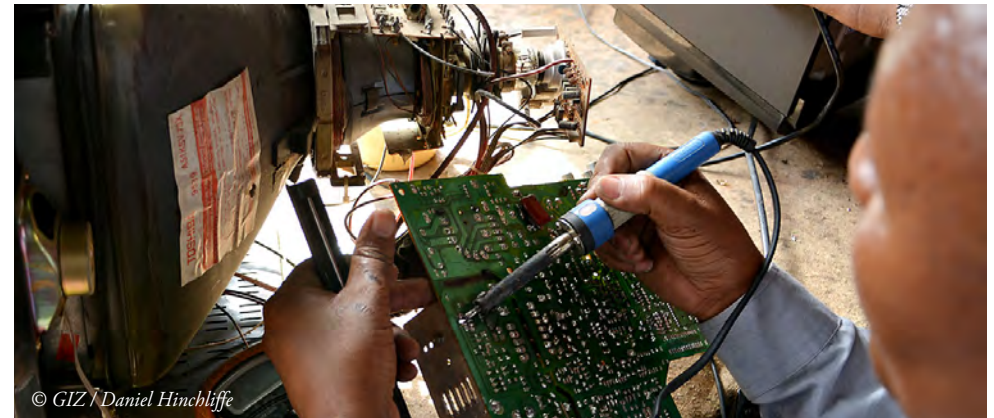


Trainings on E-Waste Plastics and Battery Recycling

The PREVENT Waste alliance has hosted online trainings on e-waste plastics and battery recycling. The trainings focus on identification, sorting and end-of-life management. The training on battery recycling is also available in French.



Trainings (on YouTube): [Trainings E-Waste/WEEE Management](#)



Upstream Solutions: Innovations to Prevent and Reduce Waste

Plastic has become the material of choice for protecting consumer goods due to its advantages over other packaging materials. However, the amount of waste generated and particularly its durability has led to global challenges, with the majority of mismanaged plastic waste being packaging and single-use plastics. Better design choices for products and packaging are needed to reduce waste and promote recyclability.

At the same time, the global generation of e-waste is increasing rapidly due to the fast-growing product category of electrical and electronic equipment. E-waste contains toxic fractions that contribute to the input of toxins into local waste streams, as well as valuable fractions that provide an opportunity for urban mining. In 2019, only 17% of the total e-waste generated was demonstrated to be collected and recycled.



5.1 CIRCULAR AND SUSTAINABLE PACKAGING DESIGN

As the design phase of a plastic product or packaging determines its ecological impact and suitability for high quality recycling, circular product design and eco-design approaches play a key role in tackling plastic pollution and enabling the transition to a circular economy.



Achieving More Circularity in the Future Global Plastics Agreement: Common Criteria to Improve Packaging Design

The study analyses the potential of circular product design and eco-design for plastic packaging and SUPs. It presents:

- Definitions for a common understanding of the most relevant terms
- Existing standards for recyclability which are analysed for their suitability in a global context to develop generally applicable guidelines on design for recycling
- The three key pillars that must be considered when redesigning packaging to achieve a more circular design
- A matrix showing how the design of packaging can be changed according to the filling



Study: [Achieving more circularity in the future global plastics agreement: Common criteria to improve packaging design](#)



Infographic on Sustainable Plastic Packaging Design

This infographic on sustainable packaging design by Rethinking Plastics summarises important criteria that should be considered when designing plastic packaging to achieve recyclability.



Infographic: [Sustainable Plastic Packaging Design](#)



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Project Example

Promoting Sustainable Packaging through Ecolabels

Another way to promote alternatives to SUP packaging is to introduce an ecolabel into the retail sector, certifying sustainably produced packaging, whether it is biodegradable, reusable or recyclable, and guaranteeing that a recovery system is in place. The ecolabel “Green Choice Philippines” considers the entire product life cycle, holding manufacturers more accountable to use resources efficiently and manage their waste properly, while encouraging consumers to use more environmentally friendly products. Additionally, a private sector roadmap for sustainable packaging was elaborated to inform the retail sector about the ecolabel and complementary communication activities such as an information campaign, seminars, and social media posts, were conducted.



Project website: [Promoting Innovative and Sustainable Packaging through Ecolabels](#)

Policy brief: [Reducing Single-Use Plastics in Food Consumption, Takeaway and Delivery in the Philippines](#)



5.2 PROMOTING REUSE MODELS AND ALTERNATIVE MATERIALS

As governments begin to prioritise the reduction of single-use plastic (SUP) in their policies and a growing number of consumers demand environmentally friendly alternatives, foodservice operators are under pressure to find reliable and affordable alternatives. Yet they often struggle to navigate a market with early-stage businesses. At the same time, entrepreneurs and start-ups offering these solutions struggle to scale up due to lack of capital, underdeveloped value chains, and complex policy and regulatory frameworks.



Project Example

Promoting Innovative Zero Waste Solutions

The project worked with 11 micro, small and medium-sized enterprises in the Philippines that aimed to reduce or prevent single-use plastic waste through innovative circular designs and business models. The businesses received financial and business support to further develop and market their ideas, which included micro-refilleries for personal and household liquid products, deposit-return schemes for reusable containers, and compostable packaging made from sugarcane bagasse. The business owners introduced their ideas to their communities and became advocates for the circular economy being featured on international and local social media channels. During the 15 months of the project, the local businesses prevented 214 kg of plastic waste. In addition, two hackathons were conducted to encourage students, businesses, and start-ups to develop further zero waste solutions. The pilot project set up a network that became a community to share experiences, address challenges, and find partners. A toolkit captures the lessons learned and provides guidance for implementing zero-waste and circular business ideas.



Toolkit: [The Business of Reducing Waste – A Toolkit for MSMEs implementing Zero Waste and Circular Business Ideas](#)

Project website: [Wala Usik – Nothing is wasted](#)



Project Example

The SUP Challenge

In a collaborative approach, the PREVENT Waste Alliance innovation contest The SUP Challenge matched start-ups and foodservice operators to support market entry, acceleration, and adoption of upstream alternatives to SUPs. The SUP Challenge was a ten-month cohort-based programme which focused on reducing single-use plastic consumption and waste in the foodservice industry across five countries in South and Southeast Asia. The programme selected 8 Entrepreneur Support Organisations (ESOs), who worked with 76 start-ups. By matching the start-ups with foodservice operators, 91 pilot projects were implemented. Those pilots include:

- Taj Resorts & Convention Centre (India) with Srishti, a refillable and reusable bottled water technology.
- Coffee chain Coffee Bike (Vietnam) with Aya Cup, a reusable cup solution.
- Health chain and online subscription business The Green Table (Philippines) piloting with Bambuhay's bamboo containers.
- Burgreens, Indonesia's plant-based eatery chain of 15 outlets with Plepah's containers.
- theCOMMONS, Thailand's food mall, piloting with DropRefill's refillable cleaning products.

During the 30-day pilot phase, approx. 1,000 kg of plastics were avoided. It is estimated that a total of 6.24 mt of plastics can be avoided over a full year if all alternative solutions remain in use at the foodservice outlets where the pilots were conducted. Based on the insights from the SUP Challenge, a technical playbook "Accelerating Circular Solutions to Single-Use Plastics" was developed. It serves as an end-to-end guide for market acceleration of circular products.



Technical Playbook: [Accelerating Circular Solutions to Single-Use Plastics](#)
Project website: [The Single-Use Plastics \(SUP\) Challenge](#)

Cohort booklet of the selected ESOs and start-ups: [Cohort Booklet Insights Report: The SUP Challenge – Insights Report](#)

Webinars (on YouTube):

- [Playbook: Best Practices to Support Circularity Market Access](#)
- [Impact and Environment Measurements of Upstream Solutions in the Food & Beverage Industry](#)



Project Examples

Replacing SUP Packaging with Reusable Options

In the Rethinking Plastics pilot project *Less Plastic Waste in Indonesian Markets*, almost 650 vendors in four markets offered reusable bags to their customers and handed out up to 27% fewer single-use plastic bags after participating in trainings. As a result of communications campaigns directed at hundreds of customers, between 13% and 42% started carrying multi-use bags when shopping at one of the four markets. The project developed Standard Operating Procedures for Plastic-Free Markets which can be widely used and adapted. Identified success factors are: (1) Support from the government (ministry and local government), (2) Direct engagement with local stakeholders (market management and vendors) and (3) Regular public campaigns.



Project website: [Less Plastic Waste in Indonesian Markets](#)

Infographic: [Phasing out sachets in Indonesia](#)

The Rethinking Plastics pilot project *A Supermarket Alliance to Reduce Single-Use Plastic Bags in Hanoi, Vietnam*, collaborated with partners in government, supermarkets, and retailers to initiate an alliance to promote alternatives to single-use plastic bags. 16 retailers who operate 117 stores jointly developed an action plan, in which they committed to reduce and replace single-use plastic bags. Suppliers and consumers were incentivized by promotional activities, such as free reusable shopping bags, bonus points or small discounts when using eco-friendly packaging and bags. In-store as well as online awareness raising initiatives were conducted, such as a monthly “No plastic-bags day”, an online fan page or (live) streams of video clips and a photo exhibition.



Project website: [A Supermarket Alliance to Reduce Single-Use Plastic Bags](#)



© The Indonesia Plastic Bag Diet Movement (GIDKP)

The project *Reusable Packaging in the Online Express Delivery Industry* introduced 10,000 reusable “Green Stream Boxes” in the warehouse of an express courier company in Haikou, China. Customers placed their orders online and received it in these reusable boxes, which were returned to the warehouse within three days. In 16 months, the pilot project saved 90 tons of single-use packages. Over 90% of the customers had a positive experience with the Green Stream Boxes and reported an increase in knowledge and awareness about environmental consequences of packaging materials. Based on these experiences, guidelines were developed and shared with China’s e-commerce and logistics industry to expand this business model.



Project website: [Less Plastic Packaging in Deliveries](#)



Recommendations for Businesses and Policy Makers: How to Promote Reusable Packaging in Food Delivery and Takeaway

Based on examples from Asia and Europe, this guide by Rethinking Plastics provides orientation and practical examples for businesses and policymakers about how reusable packaging can celebrate its come-back and contribute to cost savings, waste prevention and healthier air, soil, water, and marine environments. Part 1 offers insights into business models and practices while Part 2 summarises public policies and includes a list of recommendations as well as policy examples from different countries in Asia and Europe.



Guideline and recommendations:

- [How to Promote Reusable Packaging in Food Delivery and Takeaway \(English\)](#)
- [How to Promote Reusable Packaging in Food Delivery and Takeaway \(Bahasa Indonesia\)](#)

Further resources:

- [Guideline for reducing single-use plastics in Thailand \(English\)](#)
- [Guideline for reducing single-use plastics in Thailand \(Thai\)](#)
- [Study on Introducing Refill and Bulkstore Business Models in Indonesia](#)



Project Example

Promoting Digital Tools to Support Reuse Models in China

The pilot project Promoting Environmentally Friendly Containers developed a circulation system for 60,000 reusable fruit and vegetable boxes in China to replace disposable packaging products. Per box, 120 kg of disposable packaging materials could be reduced while additionally saving more than 500 litres of water annually and reducing food damage during storage and transportation from 35% to almost zero. In addition to the environmental benefits, the new box is significantly cheaper than the SUP packaging. An online management platform allows all actors along the value chain to follow the reusable boxes: their code, load, location, and time of delivery.



Project website: [Promoting Environmentally Friendly Containers in China](#)
Case study: [Reusable standardised crates in Europe – Case study of Svenska Retursystem's](#)



5.3 REUSE, REPAIR AND REFURBISHMENT OF ELECTRICAL AND ELECTRONIC EQUIPMENT

Concepts for repair, refurbishment, and reuse of electrical and electronic equipment (EEE) reduce negative environmental impacts by extending product lifetime, closing resource loops and optimising resource efficiency, while providing a range of social and economic benefits.



Project Example

The RRR Accelerator

The RRR Accelerator was designed to support business models which advance re-use, refurbishment, and repair. The accelerator programme supported local innovations and solutions with grants to meet immediate business needs, while the global PREVENT Waste Alliance e-waste working group was used as a network for partnership development and technical advice from e-waste experts. This approach proved to be successful:

- The Repair Revolution Workshop (Nepal) trained 100 students from 5 governmental schools in Kathmandu Valley on proper dismantling, repairing, and refurbishment by encouraging experimentation at the Doko Recyclers Repair Lab.
- The idea of Innova Ambiental (Colombia) was to reuse lithium batteries from electric vehicles that have been discarded and remanufacture them into rechargeable batteries for applications in e.g., stationary solar home energy systems.
- Sucata Quântica (Brazil) developed an upcycling demonstration and engagement facility, fully equipped with toolkits, manuals, and spare parts for conducting workshops on EEE reuse anywhere.



© Jo Rosales

- Vertmonde (Ecuador) developed and tested equipment and software for educational robotic kits using parts and components from e-waste. This was accompanied by the destruction of data, the establishment of a repair and refurbishment laboratory to support RRR roll out in existing operations with importers/wholesalers, and the establishment of a shop for pre-loved IT equipment.
- Inno-Neat (Kenya) re-used lithium-ion batteries to make new refurbished battery packs for solar energy storage and e-mobility purposes.

If the timeframe of the programme had been longer, complementary activities, e.g. gaining customer trust through behaviour-centred approaches or greater involvement of the public sector to improve the framework conditions, could further increase the sustainability and efficiency of the impact.



Project website: [RRR Accelerator](#)

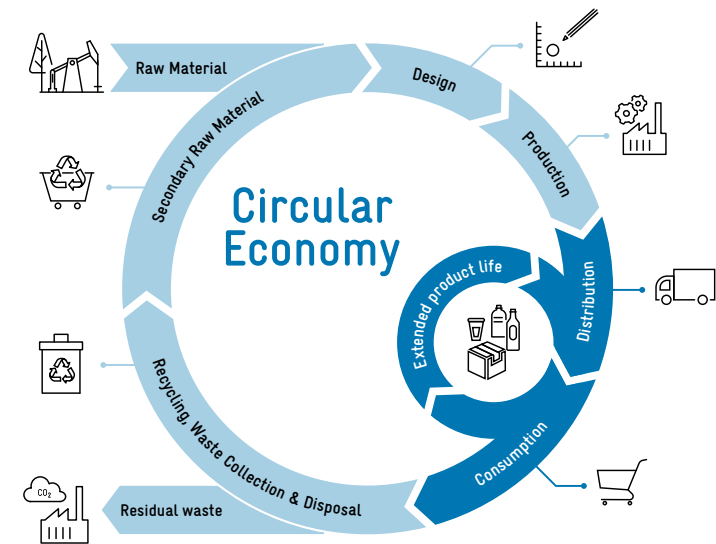
Webinar (on YouTube): [Solutions to E-Waste: Lessons Learned from the RRR Pilot Projects](#)

5.4 CIRCULAR ECONOMY & CLIMATE: CE-SMART NDCS

Circular Economy as a Cornerstone for Meeting the Goals of the Paris Agreement

Circular economy (CE) presents a meaningful lever to reduce GHG emissions. This study provides a practical guide for NDC coordinators and policymakers at national and subnational levels who aim to design and implement ambitious climate action in NDCs and long-term strategies. It outlines the potential impact of CE action on mitigating climate change and challenges the sector-focused approaches which are mostly used to design and measure climate action. The study also includes an implementation guide and roadmap towards implementing CE-smart NDCs.

 **Study:** Circular Economy as a Cornerstone for Meeting the Goals of the Paris Agreement



Downstream Solutions: Managing Waste and Tracking Material Flows

From the Mariana Trench to Antarctica, **plastic waste** has flooded some of the most remote places on earth. In 2019, only 9% of plastic waste was recycled. The amount of plastic waste entering the environment is expected to triple by 2040 if we do not act. At least two billion people worldwide do not have access to solid waste collection and three billion do not have access to controlled waste disposal facilities. The lack of holistic waste management systems in low- and middle-income countries poses a multitude of environmental and social challenges. If not properly managed, waste is dumped or openly burned, contributing to environmental pollution and climate change. With no alternative systems in place, the collection and processing of plastic waste often depends almost entirely on the informal sector. However, despite their significant contribution, waste workers, the majority of whom are female, are among the most marginalized groups in society, with no recognition of their valuable services and often being deprived of access to sustainable income sources and basic social services.

E-waste is one of the fastest growing waste streams and only 17% of e-waste is documented to be recycled. In Africa it is only 0,9%. If problematic e-waste fractions (e.g., e-waste plastics, lithium-ion batteries, fluorescent lamps, refrigerator foams) are not managed in an environmentally sound way, they can present an environmental hazard. In many low- and middle-income countries, there is no environmentally sound management (ESM) for these fractions due to a lack of local facilities and regulations for environmentally sound treatment, business models for ESM, and local markets for the recyclates or the quantities available. Local recycling is always preferable to exporting waste, but recycling – especially of e-waste – is sometimes not possible in low- and middle-income countries due to a lack of economies of scale or sustainable treatment pathways. Therefore, only export is possible at this stage. However, transboundary movements of e-waste are regulated, and the implementation of the regulation comes with difficulties.

Organic waste accounts for 80% of waste generated in low- and middle-income countries. Currently, organic waste is often unmanaged and not treated separately, contributing to numerous negative environmental, health and social impacts, including significant greenhouse gas emissions. Besides climate mitigation, organic waste plays an important role as a valuable resource to improve soil quality, circulate crucial nutrients, and utilize organic compounds for industrial processes. Root causes for missing sustainable organic waste management include the lack of framework conditions, infrastructure, and technologies as well as missing funding, markets and business opportunities.



6.1 PLASTIC WASTE MANAGEMENT

Plastic Waste Collection



Project Example

A Holistic Approach to Improve a Municipal Waste Management System

The pilot project Reducing Plastic Waste in Iloilo City specifically targeted the waste collection system in 13 barangays (neighbourhoods) in Iloilo City, Philippines, that were not accessible to the city's waste services due to narrow roads or a shortage of trucks. The project team took a holistic approach:

- In close collaboration with the city authorities, it provided equipment and tools for waste collection, such as specially designed motorbikes with sidecars, push-carts, weighing scales, waste scoopers and rakes.
- Trainings on sustainable waste management were conducted for more than 50 people; 39 of the participants started working as waste workers and managers of material recovery facilities who classify and record the waste as part of an improved monitoring system.
- The project team also established an ongoing dialogue between district officials and recycling chain actors, such as junk shops that buy recyclables. The collaboration influenced policies which have been adapted based on project recommendations.
- Through brochures, banners, radio jingles, trainings and events, local communities were informed about the importance of reducing and effectively segregating waste in households and businesses.

Today, households and businesses in the 13 barangays can rely on a regular waste collection service.



Project website: [Reducing Plastic Waste in Iloilo City](#)



Project Examples

Low-Tech Solutions for More Efficient Processes

The pilot project Households Fit for Recycling in Rayong Province, Thailand, built prototypes of small plastic waste compactors that were installed in three communities. The compactors crush plastic bottles and packaging into cubes, which allows to save storage space and make transportation more efficient. The team also installed a small-scale cleaning machine in a school for the daily milk bag that all 800 students receive to allow better recycling while using one third of the amount of water compared to manual cleaning.



Project website: [Households Fit for Recycling](#)

The pilot project Sustainable Waste Management in Malang City supported and improved the waste collection and segregation point, the so-called TPS-3R facility, in Indonesia. The objective was to technically implement waste collection and segregation. The project team conducted trainings for community leaders and households which led to higher volumes of segregated waste at the TPS-3R facility. New solutions, such as separators in the waste carts to keep the waste segregated during transport, were introduced. Consequently, processes became more efficient, and the workers could focus on other areas of business, such as selling organic compost, which provided an additional source of income. Also, the amount of valuable waste being sold to dealers increased due to segregation, which generated more income.



Project website: [Sustainable Waste Management in Malang City](#)



Project Example

How to Improve Plastic Mulch Film Collection

Plastic waste in form of mulch film is an issue in the agricultural sector as it is hard to collect and recycle due to its thin texture. The pilot project Innovative Plastic Mulch Film Collection tested three types of mulch film in the Inner Mongolia Autonomous Region, China, that would enable an even greater rate of collection: two high-quality mulch films with different levels of thickness and one degradable film. This resulted in remarkable ecological, social, and economic benefits: the increased thickness of the film not only led to a higher amount of film being collected, but also reduced the influence of the film on the farmland. The related time and costs of collection were lowered by over one third; and recycling the thicker material was also easier, e.g. into briquettes for fuel. The project collaborated with farmers, mulch film producers as well as the government who paid the price difference between the thinner and thicker film and supervised the pollution control. Researchers contributed with knowledge and theoretical ideas; rural and village level organisations were involved to learn about environmental issues and strengthen the farmers from within their community. Based on the project's experiences, the project team provided policy recommendations to the Ministry of Agriculture and Rural Affairs on the promotion of thicker mulch film in China. In 2022, a national subsidy was issued to support the use of thicker mulch film.



Project website: [Innovative Plastic Mulch Film Collection](#)



Project Example

Introducing a Deposit Refund Scheme for Drinking Bottles

The pilot project A Better Collection of Drinking Bottles tested a deposit refund system in Xiamen, China, together with research institutes, local organisations, and companies across the supply chain. The tested scheme was based on the principle that consumers buying a drink were charged a deposit, which they received back after correct disposal of the bottle, carton or can. This activity was accompanied by an exhibition and online campaign promoting plastic recycling as an important way to prevent and control plastic pollution. One main recommendation after closing the project was that fiscal, tax and financial support policies can encourage recycling of beverage packaging waste and support recyclable resource enterprises with independent funding channels.



Project website: [A Better Collection of Drinking Bottles](#)



Strengthening Informal Waste Workers



Informal Waste Workers and Sustainable Waste Management in Vietnam

When setting up an EPR system, it is critical to reconsider the integration of collectors into the waste management system. As key actors, they actively contribute to reducing the amount of waste entering the environment and thereby decrease the financial burden on municipalities. This publication by UNDP Vietnam and Rethinking Plastics offers recommendations for provincial and central policymakers to strengthen the livelihoods of informal waste workers and support their inclusion in evolving waste management systems.



Publication:

- [Informal Waste Workers \(IWWs\) and sustainable waste management \(English version\)](#)
- [Informal Waste Workers \(IWWs\) and sustainable waste management \(Vietnamese version\)](#)



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Project Example

Integrating the Informal Sector

The project Partnership for Plastic Waste Recycling tested methods for improving the current waste management system in Semarang City, Central Java, Indonesia, and enabling the various actors along the waste value chain to understand their role and cooperate better. The project promoted central waste collection and segregation points, and informal waste collectors partnered with recycling industries and communities who learned to organise their waste responsibly. By merging and synergising the local waste management actors, they were able to work more efficiently, handle a larger amount of waste, and hence, increase their income. In addition, the service area for the waste workers increased and the recycling rate doubled. As the important role of informal workers for waste management is often not recognized, the project organised trainings to better understand their position in the waste management value chain and their options for accessing finance from banks. To improve their working conditions, the project provided driving safety training for the mostly motorised waste workers and equipped them with uniform jackets, helmets, and ID cards. In addition, an app was created that connects the different actors along the value chain. It makes price ranges transparent and records how much plastic of a certain kind is disposed of. As a result, confidence and income of the informal workers increased, as they could receive a better profit margin from the transaction of recyclable materials facilitated by the app.




Project website: [Partnership for Plastic Waste Recycling](#)

Reducing Marine Litter

Preventing Marine Litter

GIZ has been supporting global efforts to improve waste management systems for more than 20 years. The study “Towards Clean Oceans” summarises learning experiences and takes a closer look at new approaches along the entire plastics value chain. The study derived four key success factors for marine litter prevention projects:

- Stakeholder participation
- Sustainable financing mechanisms along the plastic value chain (including Extended Producer Responsibility (EPR))
- Informed decisions based on data and digitalization
- Systemic project frameworks

 **Study:** [Towards Clean Oceans. Reducing plastic pollution through circular economy – Learning experiences of GIZ and its partners](#)




Project Examples

Reducing and Managing Marine Litter from Sea-Based Sources

It is essential that ships and fishing vessels bring their operational waste and gear back to land instead of dumping it illegally into the sea. Several Rethinking Plastics pilot projects in China, Indonesia, Philippines, Thailand, and Vietnam addressed the issue of sea-based marine litter sources. The teams introduced standards and best practices from ports around the world, particularly from those in Europe, by developing a waste management manual that describes all waste-related processes at seaports: from responsibilities and contact points to obligations and controls; creating digital procedures for ship waste notifications and approvals by the port authority; and setting up a cost recovery system that provides an incentive to the ships to actually use the waste management services in place instead of dumping waste in the water.

 **Infographic:** [Improving Ship Waste Management in Ports](#)
Policy paper: [How to Improve the Management of Ship-Generated Waste and Cargo Residues?](#)

Fishing communities also play a significant role: Often fishers catch plastic waste while working at sea. So called Fishing for Litter approaches encourage fishing communities to collect and dispose of this litter on land instead of throwing it into the sea. In the context of several pilot projects in above mentioned countries, the Rethinking Plastics project engaged with fishing communities to inform about marine protection, incentivize waste collection by fishermen, and connect them with recyclers to whom they can sell the collected materials. The activities and results were shared with local and national authorities to enable their contribution to national waste management goals and allow replication.

 **Infographics:**

- [Fishing for Litter at a Glance](#)
- [Fishing for Litter in Indonesia](#)



Project Example

Improving Municipal and Plastic Waste Management Policies in Coastal Communities

The pilot project A Circular Economy for Islands worked with eight coastal communities in Koh Libong, Thailand, to avoid plastic waste and improve municipal plastic waste management practices and policies. Working closely with local government actors, the pilot project developed community agreements and action plans for waste management that provided an enabling framework. The improved municipal and plastic waste management policies aimed at increasing the recycling rate, improving waste collection systems, and reducing the amount of waste ending up at dump sites



Project website: [A Circular Economy for Islands](#)

Waste-to-Energy Options and Co-Processing



Making Informed Decisions at the Bottom of the Waste Hierarchy

To provide guidance to decision-makers on appropriate waste to energy as well as pre- and co-processing applications, GIZ initiated the development of guidelines for waste to energy and co-processing technologies. “Waste-to-Energy Options in Municipal Solid Waste Management – A Guide for Decision Makers in Developing and Emerging Countries” assists decision-makers and their advisors in assessing the opportunities, limits, and risks of various waste to energy technologies for effective planning and efficient investments in waste management.



Guide: [Waste-to-Energy Options in Municipal Solid Waste Management](#)

The publication “Guidelines on Pre- and Co-processing of Waste in Cement Production” offers updated and objective information about pre- and co-processing of waste in the cement industry. It also contains knowhow and practical experiences gained in implementing pre- and co-processing since the first edition of the publication, which served as a reference document in international agreements and adaptation of various national guidelines.



Publication: [Guidelines on Pre- and Co-processing of Waste in Cement Production: use of waste as alternative fuel and raw material](#)

6.2 E-WASTE MANAGEMENT



Project Example

Treatment Solutions and Innovative Finance Models for Problematic E-Waste Fractions

This PREVENT Waste Alliance project aimed at finding both treatment and financing solutions for fractions of e-waste for which recyclers in low- and middle-income countries have no local solutions, so-called problematic e-waste fractions. The project team developed innovative financing mechanisms and treatment solutions for PUR Foams,

lithium-ion batteries, e-waste plastics and mixed waste shipments together with recyclers. Different finance models were tested in four pilot projects in the Balkans, Latin America, as well as East and West Africa. Throughout the project, recyclers received support in the form of technical advice (including trainings for the treatment of batteries and e-waste plastics) as well as matchmaking with state-of-art recyclers operating in industrialised countries. Further, potential local markets for certain fragments were identified in the countries.

REGION	BALKANS	EAST AFRICA	SOUTH AMERICA (BRAZIL)	WEST AFRICA
FRACTION	PUR foams	Li-Ion batteries	Plastics	Mixed waste
PROJECT DESCRIPTION	Shipment of PUR foams to a certified recycling facility in Greece	Shipment of complete batteries for recycling to Asia or pre-treatment locally and shipment of powder only. Solution could benefit also neighbouring countries	Creation of consolidation and sorting centre(s) for plastics from smaller recyclers to offer offtakers expected volume and quality levels. Disposal of contaminated fractions funded with revenue from offtakers	Shipment of all e-waste fractions collected by the recycler to Europe
POTENTIAL FINANCE PARTNER	Tradewater or equivalent	Producer (tbc) and/or BVRio	Circular Brain & BVRio	n/a
FINANCE MODEL	Carbon credits	Fundraising (Circular Action Hub)	Market place for trading of valuable fractions (Circular Brain) and Fundraising for consolidation centre (Circular Action Hub)	Cross-financing



Project website: [Finding Solutions for Problematic E-Waste Fractions](#)

Report: [Piloting of treatment solutions and innovative finance models for problematic e-waste fractions](#)

Overview sheet of finance models (in Excel): [Finance Models for Treatment of Problematic E-Waste Fractions in Low and Middle Income Countries](#)



Partnerships between the Formal and Informal Sector

The study “Leveraging Formal-Informal Partnerships in the Indian E-Waste Sector” looks at prominent case studies to identify the drivers for and barriers to a continued process of formalisation. In addition, it provides suggestions for the design of partnerships and recommendations for their longevity, replication, and scale-up.



Study: [Leveraging Formal-Informal Partnerships in the Indian E-Waste Sector](#)

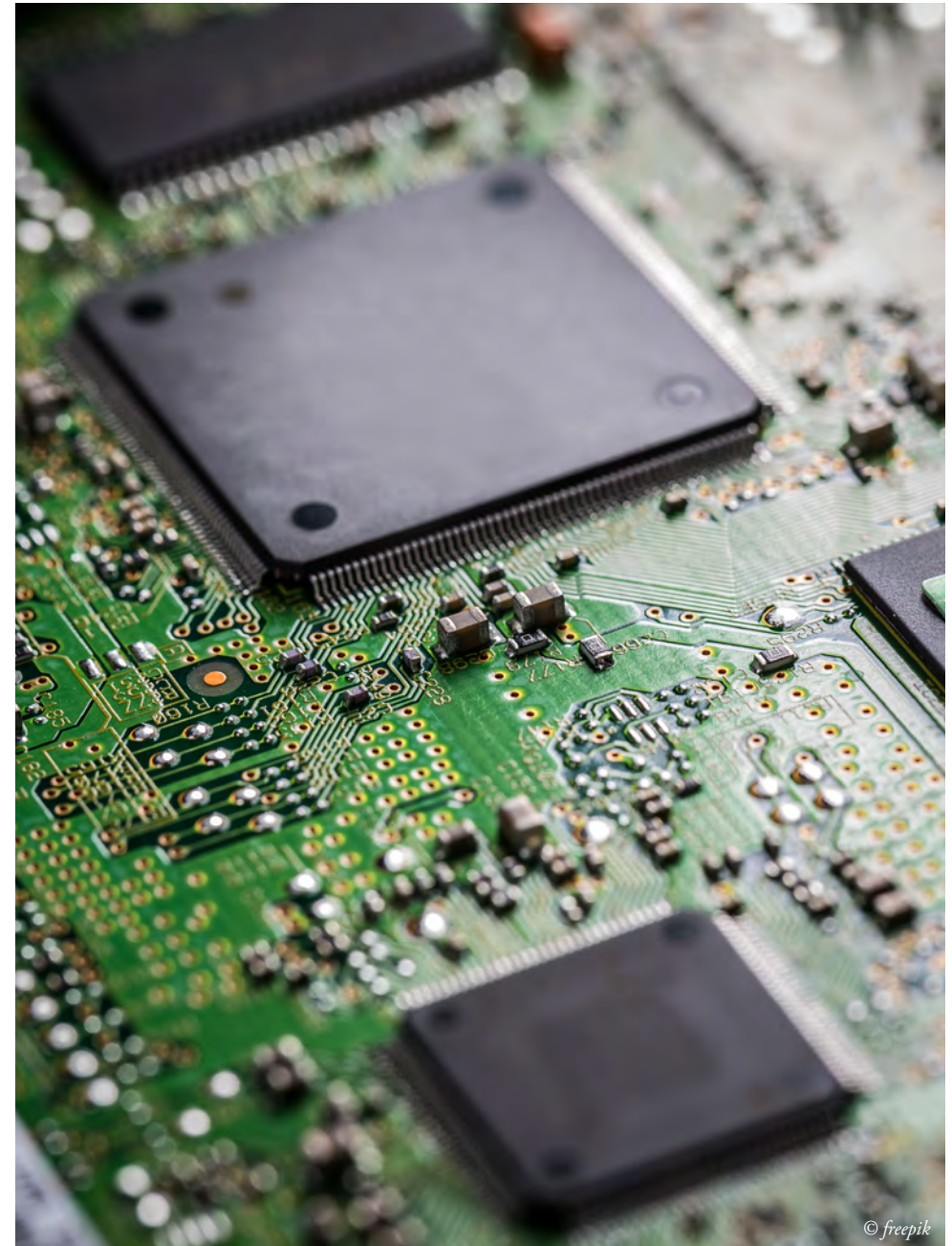


Measure Catalogue for End-Of-Life Management in Solar Energy Access Projects

This measure catalogue supports planners, managers, and operators of solar energy access projects in planning, designing, and implementing waste-related activities to mitigate hazardous waste and pollution risks associated with the life cycles of energy access projects. It provides an overview of the end-of-life (EoL) environmental and safety challenges associated with solar off-grid equipment. Furthermore, it introduces the ethical and economic background of Extended Producer Responsibility (EPR) and presents the major entry points for improved EoL management of solar system components.



Measure catalogue: [End-of-life management in solar energy access projects](#)





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Improving the PIC Procedure for Transboundary E-Waste Movement

The Basel Convention is a multilateral environmental agreement designed to control transboundary movements of hazardous wastes, and thus preventing dumping of hazardous wastes in countries without treatment capacities. Under the Basel Convention, transboundary movements of hazardous wastes must follow a Prior Informed Consent (PIC) notification process in which the competent authority in the state of export is to provide a notification to the competent authorities of the state of import and any state of transit. However, practical experiences in applying PIC procedures especially from non-OECD to OECD countries indicate that the process is time-consuming and costly, and the national processes can vary between the parties, leading to challenges in complying with the provisions of the Basel Convention in practice.

The PREVENT Waste Alliance and the StEP-Initiative have started a joint dialogue for all their members to gain practical experience with real world examples of notification processes. A discussion paper was published with the aim of improving the PIC procedure for transboundary e-waste movement. The paper:

- gathers practical experiences with the export of e-waste from low- and middle-income countries to environmentally sound management (ESM) facilities abroad according to the Prior Informed Consent (PIC) notification procedures of the Basel Convention.
- starts a discussion on how to improve implementation and compliance for both recyclers and authorities so that resources can be freed to tackle illegal traffic of e-waste.

The discussion paper was presented at high-level events such as the Basel COP and the World Circular Economy Forum (WCEF), raising international awareness of the need to improve PIC procedures. The PREVENT Waste Alliance and StEP also presented concrete solutions that can be tested, such as harmonization of processes for PIC procedures, fast-track arrangements, bilateral country agreements beyond OECD, capacity building measures and a digital platform for PIC procedures.



Discussion Paper: [Practical Experiences with the Basel Convention: Challenges, Good Practice and Ways to Improve Transboundary Movements of E-Waste in Low and Middle Income Countries](#)

World Circular Economy Forum (WCEF) 2022 Accelerator Session: [Practical Implementation of the Basel PIC Procedure for Exporters](#)



Project Example

Capacity Development to Reduce and Control Illegal Imports of E-Waste

A particular challenge is that Used Electronic and Electrical Equipment (UEEE) imports are often mixed with e-waste and inspectors cannot differentiate them at point of entry. Even if identified, it is not clear how to proceed with e-waste in many low- and middle-income countries. A PREVENT Waste Alliance pilot project in Tanzania promoted capacity development to reduce and control illegal imports of e-waste by implementing the Basel Convention:

- Analysis of imports
- Drafting of a national implementation plan of the Basel Convention Guidelines (for Tanzania), including a checklist for inspectors, providing clear guidelines and instructions for the control, classification and recording of imports
- Workshops with authorities to clarify roles and responsibilities in import control
- Enforcement training on inspection, detection, enforcement, management and control of UEEE and WEEE was conducted for 60 participants



Project website: [Controlling E-Waste Imports in Tanzania](#)

Webinar (on YouTube): [Used Electronics or E-Waste? Setting up Control Mechanisms for UEEE-Imports in Tanzania](#)



6.3 ORGANIC WASTE MANAGEMENT

For effective organic waste management, separation at source is key to achieving high quality outputs. Examples on how source segregation can be promoted are illustrated in the chapter on behaviour-centred design.

Guideline for Organic Waste Treatment in East Africa

Building on the analysis of the status quo of organic waste management in East Africa, the guide provides a sound basis for decision makers and describes a range of technical solutions for organic waste management. Ethiopia is particularly highlighted as a country when it comes to case studies and data. The guide provides an overview of the definition of biodegradable waste as well as current practices in the region and their social, environmental and climate impacts. It then includes a chapter on organic waste collection and separation, processes that largely determine waste composition, and next steps. After the description of treatment concepts focusing on composting, anaerobic digestion and mechanical biological treatment, the guideline assesses costs and potential for implementation in urban and rural areas in East Africa.

 **Publication:** [Guideline for Organic Waste Treatment in East Africa](#)
Webinar (on YouTube): [A Guide to Organic Waste Management in East Africa](#)



© Lena Kampe: Floating market in Thailand

6.4 DIGITAL TOOLS TO SUPPORT CIRCULAR SOLUTIONS

We are witnessing a rapid development of digital tools to improve traceability, transparency, efficiency, and networking between circular economy stakeholders. Digital technologies can improve processes and logistics at different stages of the value chain – for example through smart waste management systems making collection, tracking, tracing, and/or recycling more efficient.

Digital Approaches for Circular Economy

To get a better understanding of the roles and interconnections between the different digital actors within the PREVENT Waste Alliance, a mapping of digital solutions for circular economy was created. The mapping suggests that most PREVENT members cluster at the collection-recycling interface where products reach their end-of-life and enter the waste management system. It also shows that interoperability between the different solutions/platforms is necessary to increase impact in an international and fragmented market. Enabling the exchange of information between the different systems can ensure that duplication of efforts is avoided and that internationally developed solutions do not push local operators out of the market.

 [Summary notes and mapping of solutions: Digitalisation for a Circular Economy](#)

Additionally, the factsheet “Digital Approaches for the Circular Economy in Low- and Middle-Income Countries” provides orientation on technology areas where digital approaches can contribute to the circular economy and sustainable waste management.

 [Factsheet: Digital Approaches for the Circular Economy in Low- and Middle-Income Countries](#)





Project Example

Linking Local Collection Apps to a Global Digital Marketplace in Indonesia

The PREVENT pilot project Creating Value in Plastics through Digital Technology tested how local collection apps can be linked to a global digital marketplace for recyclates to increase efficiency. This involved:

- Verification, tracing of material and incentive distribution via a mobile blockchain app.
- Global sale of plastic waste and recyclates on a digital marketplace by connecting buyers and sellers, including the localisation of the global marketplace to the Indonesian context and establishment of a material standard (DIN) to ensure stable quantity and quality.

Plastic Banks' blockchain app and cirplus' marketplace provide easy access for brand owners to source ethically recycled material – paying a premium price to raise local living standards. 1,000 mt of “social plastic” per month were offered on the digital marketplace.



Project website: [Creating Value in Plastics through Digital Technology](#)
Webinar (on YouTube): [Systems Thinking for Digitalised Circular Plastic Value Chains](#)



ValuCred Digital Solution for the Plastic Credits Market

To support and test the ValuCred Standard Process Model for the plastic credits market, a digital solution in the form of a web-based application was developed. It enables service providers to track their service-related data and socio-economic parameters based on the SDGs for all stakeholders involved. The digital solution serves as a mechanism to track and report waste management data such as collected waste quantities, composition, processing steps, and socio-economic aspects. In addition, Sponsoring Companies can register and provide information related to relevant GRI and ISO criteria. The digital solution has been developed in a way that stakeholders from across the entire value chain are taken into consideration in line with the processes defined in the Standard Process Model.



Learn more: [ValuCred Standard Process Model Handbook](#)



Enhancing Collaboration and Building Partnerships

Addressing the complex challenge of a systemic shift from a linear to a circular economy requires collaborative action by all stakeholders. This change needs to be supported by policies and frameworks as well as market-based solutions.

PREVENT Waste Alliance

The PREVENT Waste Alliance serves as an international ‘Think and Do Tank’ for circular economy practitioners. As a platform for knowledge exchange and international cooperation, PREVENT brings together organisations from the private sector, academia, civil society, and

public institutions. PREVENT’s mission is to advance the circular economy in low- and middle-income countries by minimising waste, eliminating pollutants, and maximising the reuse of resources in the economy worldwide.

The thematic working groups of the PREVENT Waste Alliance focus on three material streams: plastics, e-waste and batteries, and organic waste. In addition, members work on cross-cutting topics such as financing mechanisms, digitalization for a circular economy as well as awareness raising and behaviour change.





Plastics Working Group

The plastics working group advocates for the development of a circular economy for plastics to stop plastic pollution. It focuses on:

- Effectively promoting the prevention of plastic waste worldwide, guided by the waste hierarchy, e.g., through the sub-working group on reusable packaging
- Bringing forward producer responsibility and establishing sustainable financing mechanisms, e.g., through the EPR and plastic credits sub-working groups
- Promoting plastic recycling along the entire life cycle, thinking from design to the use of recycled plastic in new products, e.g., through the circular design sub-working group
- Measuring plastic impacts, e.g., through the data accounting sub-working group



E-Waste Working Group

The e-waste working group focuses on:

- Developing solutions for worst polluting fractions of e-waste with companies
- Contributing to the implementation of Extended Producer Responsibility (EPR) concepts and the development of e-waste compensation models
- Strengthening of local reuse, refurbishment, and repair activities, taking social working conditions into account
- Providing recommendations on how to improve the processes for transboundary e-waste movement

GIZ and the PREVENT Waste Alliance cooperate closely with the StEP-Initiative. The PREVENT e-waste working group focuses mainly on the concrete implementation of solutions related to its objectives. The StEP-Initiative is a valued knowledge partner and has collaborated on online trainings, conference sessions and several studies.

Website of the PREVENT Waste Alliance: <https://prevent-waste.net/>



Organic Waste Working Group

The purpose of the organic waste working group is to provide an exchange platform for organic waste prevention and management. It focuses on:

- Enabling framework (including climate nexus, entrepreneurship, finance, collaboration between municipalities and national level)
- Food waste prevention and utilisation
- Separate collection of organic waste
- Small-scale decentralized treatment solutions



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