A Digital and Global Ecosystem for Plastic Waste

Region	Europe and Central Asia
Award Scheme	EXPO Dubai Global Best Practices
Start Year	2020
Sustainable Development Goals	Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

Summary

By giving plastic waste a value we stop leakage of plastic into the environment and incentivize its collection. By tracking it and making digital inventories we ensure that most of it is recycled. We set up collection points around the world with partners, who then issue financial rewards for the plastic deposited. Our digital tools provide increased transparency and low-cost operations. All the plastic is registered digitally when deposited, and traced through the value chain.

Background and Objective

Plastic waste causes a plethora of problems when it leaks into the environment. Plastic bags can block waterways and exacerbate natural disasters. By clogging sewers and providing breeding grounds for mosquitoes and pests, plastic bags can increase the transmission of vector-borne diseases like malaria. High concentrations of plastic materials, particularly plastic bags, have been found blocking the airways and stomachs of hundreds of species. Plastic bags are often ingested by turtles and dolphins who mistake them for food. There is evidence that the toxic chemicals added during the manufacture of plastic transfer to animal tissue, eventually entering the human food chain. Styrofoam products, which contain carcinogenic chemicals like styrene and benzene, are highly toxic if ingested, damaging the nervous systems, lungs and reproductive organs. In poor countries, plastic waste is often burned for heat or cooking, exposing people to toxic emissions. Disposing of plastic waste by burning it in open-air pits releases harmful gases like furan and dioxin. According to a UN Environment report, the economic damage caused by plastic waste is vast. Plastic litter in the Asia-Pacific region alone costs its tourism, fishing and shipping industries $1.3 billion per year. In Europe, cleaning plastic waste from coasts and beaches costs about €630 million per year. Studies suggest that the total economic damage to the world's marine ecosystem caused by plastic amounts to at least $13 billion every year. The economic, health and environmental reasons to act are clear. In this context, an opportunity beckons for the plastics value chain to deliver better system-wide economic and environmental outcomes, while continuing to harness the benefits of plastic packaging. Achieving such systemic change will require major collaboration efforts between all stakeholders across the global plastics value chain – consumer goods companies, plastic packaging producers and plastics manufacturers, businesses involved in collection, sorting and reprocessing, cities, policymakers and NGOs. Hence the Empower Digital and Global Ecosystem for Plastic Waste is perfectly in line with the global aim to tackle the global plastic crisis by addressing the whole value chain, creating synergies between economic and environmental goals and aiming to bring all stakeholders onboard.

Actions and Implementation

The waste sector is highly informal, fragmented, silo based and known for little or none transparency. By connecting all the actors in the supply chain with a transparent and traceable solution we can provide them with important and relevant data. Our strategy is to do that by providing carefully tailored tools and financial incentives for each stakeholder and add to that a layer of trust and transparency. Thus we will be able to disrupt and create accelerated growth for the whole sector. Our strategy has been, and will also be for this project, to go out, quickly deploy and test our ideas and solutions in the field, do real things with real impact, our philosophy is to be humble, positive and to take action. We do this mainly through product development, meaning we are entering an existing market but with a value proposition that is a lot better than what is available today. Empower provides digital tools to rapidly implement incentivised collection of plastic waste anywhere 1. Digital incentives, enabling: • Crowdsourced collection of plastic waste • Crowdsourced segregation at source 2. Digital registration, inventory and stakeholder ID, enabling: • Stakeholder level tracking of collected plastic waste • Live monitoring and optimisation of waste & material quantities and -streams 3. Digital immutable cleanup certificates, enabling: • Alternative funding mechanisms • Plastic waste cleanup certificates • Extended Producer Responsibility (EPR) schemes – Use Case: Plastic Bottle & Snusbox (tobacco container) Deposit Systems • Mixed private /public funding solutions. Since February 2018, Outcomes: • Piloted our digital deposit system in 15 countries • established 14 permanent collection points and strengthened local partnerships • Involved nearly 6000 people in clean-ups • collected 195 tons of plastic waste Metrics: • kgs of plastic waste cleaned up and collected • how much plastic is hindered from ending in nature, sea, rivers, etc • track how much, what types and what collected plastic is used for, end of life/recycling • jobs created • number of waste pickers provided a stable income and access to ID and financial services • gender and age distribution

Outcomes and Impacts

Main Benefits of implementing the Empower system • Rapidly deployable and scalable plastic waste collection driven by a simple digital infrastructure • Disruptive cost-efficiency in waste management collection, segregation and monitoring • Transparency and traceability – ensuring correct handling and fair payments to contractors and waste pickers • Higher value of collected materials – increasing profitability for collectors/waste collection companies • Inclusion, incentivisation and formalisation of the informal waste sector and -economy • The basic infrastructure needed for a circular economy, to follow materials through several life cycles of production - use - collection - recycling and empower the industry to stop leakage of waste into nature The disruptive distributed model ensures cost-efficient collection of plastic waste, sorting at source, local jobs both for waste pickers and in waste management facilities. Finally it is all done under local ownership, creating value and assets locally, further incentivising expansion and local motivation to develop it into sustainable local waste management systems. The flexible, easy to deploy solution is also a great way to create local awareness both around the problem and solutions that can be implemented and has show amazing results in local awareness building throughout the pilot phases.

Sustainability and Scalability

Founded in February 2018, Empower has so far tested out our collection model in more than 15 countries, and collected nearly 200 tons of plastic waste, involving over 6000 people in very different settings - ranging from the jungle in Laos, to the multi-million city of Mumbai or the fjords of Norway - keeping it scalable and as flexible as possible. Empower built the first digital deposit system for "snus boxes" (powdered tobacco containers) for Swedish Match, launched in February 2019 in Norway, and June 2019 in Sweden. The solution has helped collect over 30 000 snus boxes so far. This is an example where Empower's technology is used to create digital incentives and deposit schemes for new products, ensuring that containers come back to the producer, as well as keeping them out of nature and creating the basic system to bring them back into production for a circular full loop again. We are now in a phase where we want to scale up our operation in order to create reliable streams of higher value plastic and create jobs for people that need it the most. Our solutions enable cost-efficient and reliable sourcing of recycled plastics with fully traceable materials and impact data. With this as a backdrop Empower has set a goal to distribute our solutions at global scale in order to help as many people as possible, clean as much plastic waste as possible while also providing traceable plastic to cater for growing global demand. Our strategy to reach these goals are by connecting existing actors in the whole sector in a much smarter way, all the way from source to new recycled products.

Gender and Social Inclusivity

Empower is building a value chain around the collection, recycling, and re-use of plastic to promote social inclusivity. We: - provide a basic income to plastic collectors on a permanent basis, create jobs through the building of new collection points, guaranteeing their livelihoods; - connect collection points to waste aggregators, recycling facilities and factories worldwide wanting to source social plastics, creating a global waste management infrastructure that will add value to local economies; - support establishment of new enterprises with our micro-loans solution repayable with plastic via our digital platform to be launched in autumn 2019. Our project also promotes gender equality as women from local communities will earn as much as the male plastic waste collectors, given that there is a set price for the plastic waste at the collection point. Female entrepreneurs can also take part in Empower's micro-loans solution, helping them to build their business dream.

Initiative Contribution

• Goal 1 - End poverty in all its forms everywhere • Goal 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture • Goal 3 - Ensure healthy lives and promote well-being for all at all ages • Goal 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all • Goal 5 - Achieve gender equality and empower all women and girls • Goal 6 - Ensure availability and sustainable management of water and sanitation for all • Goal 7 - Ensure access to affordable, reliable, sustainable and modern energy for all • Goal 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all • Goal 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation • Goal 10 - Reduce inequality within and among countries • Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable • Goal 12 - Ensure sustainable consumption and production patterns • Goal 13 - Take urgent action to combat climate change and its impacts • Goal 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development • Goal 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss • Goal 16 - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels • Goal 17 - Strengthen the means of implementation and revitalize the global partnership for sustainable development

Innovative Initiative

Innovation can make a difference in addressing urgent developmental challenges such as providing access to drinking water, creating jobs, eradicating neglected diseases, reducing hunger and cleaning the ocean and nature of plastic waste. The transfer and, when necessary, adaptation of technologies in developed countries can often contribute significantly to these goals. Effective international co-operation that involves both public and private bodies is an important mechanism for finding these much needed solutions. Innovation also helps to drive economic growth and address socio-economic challenges such as poverty and health. The Empower approach is characterized by the conjunction of well known digitizing technologies like blockchain, cloud databases, smartphones and introduction of new business models into the plastic waste industry. The real innovativeness in the Empower solution, and why we believe so strongly in its scalability, lays in the simplicity of use, the high value it creates to all stakeholders through incentives in the value chain, the low cost of both use and implementation, the local ownership model, and the way it ties together the whole silo based plastic waste value chain. To establish a fully functional value chain the real challenge is matching a dynamic demand with a dynamic supply, and when we succeed with this the impact will be massive in terms of jobs created, lower co2 emissions, number of new products based on recycled plastic, cleaner environments and better awareness of the value and problem related to plastic waste. The Empower value proposition echoes the New Urban Agenda principles to support solutions that will prevent leakage as well as recover and create value from plastic waste. We all want to deliver lasting change. The Empower solution is our commitment to support and build solutions that prevent the leakage of plastic waste into the environment and contributing to a circular economy.

Resources devoted to delivery

Different parts of the Empower digital solution have been tested and prototyped in the market through investments of approximately €410,000, with both deposit and tracking being at TRL 6. 14 full time employees with the following core competencies: Back-&/Front-end/Blockchain; UX/UI/Graphic Designs; Business Development; Financial/Accounting; Sales & Marketing; Legal; Projects/Operations Management Main technologies Blockchain / Cloud storage Empower Tokens - EMPs P2p payments Data analytics / Machine learning Immutable Clean up certificates Mass balance Digital twins Product journey pass