

MED TEST III

Improving the circularity of Israel's plastic waste value chain



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The SwitchMed programme

Launched by the European Union (EU), the SwitchMed Programme has since 2014 demonstrated the potential for a green and circular economy in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. Through industry demonstrations, policy development, networking opportunities, and support for start-ups and green entrepreneurs, SwitchMed up-scales the transition towards Sustainable Consumption and Production (SCP) practices in the Southern Mediterranean region.

Through the promotion of business models that can reduce the inefficient use of resources and the environmental footprint of existing economic activities, the SwitchMed Programme supports long-term resilience and an economic transformation of the region to meet economic, social, and environmental challenges related to the climate change.

Designing out waste, reducing pollution, and keeping products and materials longer in use are all cornerstones of a circular economy. These principles also outline the activities of the United Nations Industrial Development Organization (UNIDO) in developing resource-efficient and circular industries under the second phase (2019-2023) of the SwitchMed Programme.

The plastic waste value chain in Israel

Cheap, light and versatile, plastics have become the universal material of our economies and consumers and businesses alike rely more and more on plastics. Nevertheless, as plastic use is growing, so does the amount of plastic waste. Unfortunately, much of this plastic waste rarely gets a second chance and ends up in incineration, landfills, or worse, finding another pathway into the environment.

The pattern of producing, consuming, and discarding plastics not only creates significant amounts of waste, but also results in an economic loss for the society. To stem this trend, circular economy principles need to be integrated across the plastic value chain to support reuse, improve waste management and advance recycling capacities that can source safe, sustainable, and secondary raw materials.

Under the SwitchMed/MED TEST III project, UNIDO has, together with the Ministry of Economy, the Ministry of Environmental Protection, and the local plastic industry, undertaken a mapping study of the plastic streams along the value chain and assessed the potential for synergies among local plastic industrials for various types of recycling in Israel. This process, along with the development of guidelines for improving the recyclability of plastic packaging design, aims to increase the quantity and the quality of sorted plastic waste, while improving the ability of the local recycling industry to handle higher volumes of post-consumer plastic waste and to offer more sustainable plastic packaging alternatives on the Israeli market.

From 2020 to 2021, UNIDO accomplished a market study for setting up a recycling PET bottle-to-bottle plant in Israel and provided recommendations to leverage the regulatory framework in key sectors such as Green Public Procurement, Green Building Standards, and the existing EPR scheme for plastic application. This set of recommendations gears national institutions with inputs for the development of a new national strategy on plastics and opens market based opportunities that can support the development of a plastic circular economy in Israel.

In collaboration with the two ministries, the outcomes of the mapping study have allowed to identify areas of the Israeli plastic value chain with the highest potential to develop circular business models. As a result, the next phase of the SwitchMed/MED TEST III project in Israel will focus on implementing three pilot projects to demonstrate the potential of circular business models for plastic material in Israel, reducing the needs and dependence of imported virgin resins and exploring new business synergies among value chain actors.

[Recommendations for amending green public procurement regulations in Israel to increase demand for recycled plastics](#)



[Recommendations for amending green building standards to increase incentives for using plastic recycled material in the construction sector in Israel](#)



[Recommendations of other economic instruments, technological suggestions and regulatory/market-based opportunities to support plastic circular economy in Israel](#)



[An interactive tool for designing sustainable packaging](#)

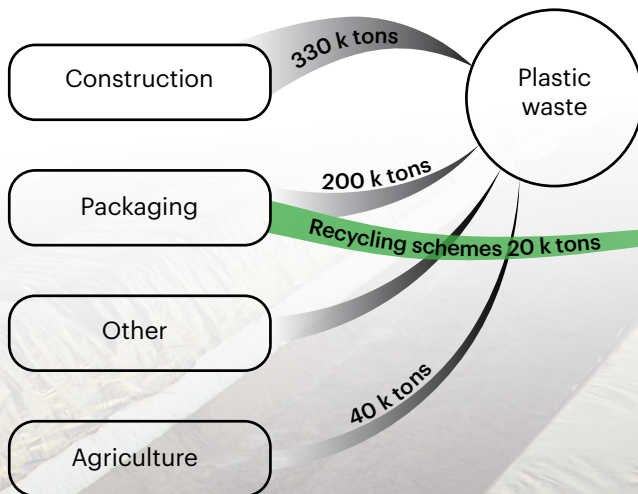


Repurposing plastic waste from the Israel's agriculture sector

The agricultural sector in Israel produces about 35-50 thousand tons of plastic waste every year, while only about 7% are recycled, the majority of the plastic waste is exported, landfilled, incinerated or dumped illegally in open areas.

Most agricultural plastic products manufactured in Israel are films, ground coverings, irrigation pipes and bags, and the plastic waste originates mainly from the agricultural areas of northern and southern Israel. Most of the agricultural plastic waste is polypropylene (PP) and polyethylene (PE), both materials with a high recycling potential.

While plastic irrigation pipes are mostly collected and recycled in Israel, plastic films are to be diverted by the farmers, at their own cost, to dedicated hubs where they are compacted for end-of-life treatment. Due to the high contamination, the plastic films, currently, cannot be recycled at an economic viable scale in Israel. An alternative circular business model needs to be sought to enhance the sustainability of the value chain.



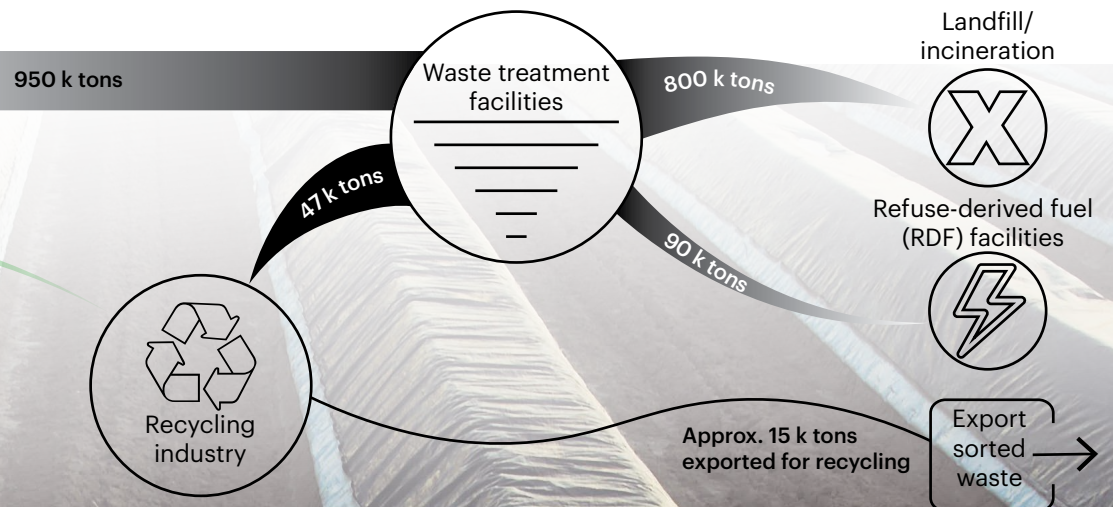
Improving the circularity of the plastic packaging waste stream in Israel

In recent years, several global brands have set ambitious goals to use more recycled material in the production of new packaging. For example, Unilever Global has stated that by 2025, 25% of packaging materials will be recycled materials. One of the major food producers in Israel has set a target for 100% of the packaging to be recyclable or reusable by 2025. This trend also critically influences the recycling market, as it creates a market incentive to invest and develop more advanced recycling technologies that can handle the anticipated increase in volumes.

In Israel, 200,000 tons of plastic waste are generated each year from plastic packaging, making up approximately 20% of the annually created plastic waste. Post-consumer flexible packaging is challenging to sort and when not properly segregated at source is currently not recycled in Israel.

To meet the emerging market demand for more sustainable plastic packaging solutions the recycling facilities and plastic packaging industry would need to develop more circular business models that can:

- Adopt sorting-enabling technologies such as package watermarking for easier identification;
- Invest in new high-class recycling infrastructure;
- Collaborate with public authorities for a separate collection mechanism
- Re-design packaging applications to increase the technical and economic feasibility of recycling more and better plastic packaging waste.



Pilot A: Setting up a system for collecting, sorting and recycling plastic waste from agriculture

Pilot A aims to design and implement a small-scale system to recover used plastic films from the agricultural sector and convert them into recycled resins and products with recycled content for the local market. The pilot will prove the business viability of recycling plastic waste from agricultural applications and develop recommendations for expanding the business model across the market. This pilot will engage different actors along the agricultural plastic waste value chain, e.g., farmers, plastic converters, end users, recyclers, logistic companies, agricultural associations etc.

The objective of Pilot A is to design and develop a prototype for a greenhouse film collecting machine, in collaboration with agriculture machinery developers, test the machine's performance on the field and measure the pollution level in the collected plastic and its suitability for recycling. The collected film will be recycled and reprocessed into marketable products.

Alternatively, Pilot A will develop a training program for agricultural workers to instruct them on how to dismantle greenhouses in a manner that ensures low contamination levels of the film, trial the training program in selected agricultural farms and prepare an upscale approach for the agricultural sector

The intervention logic of the three pilots:

Step 1: Inception & Baseline analysis

Baseline review of existing barriers and regulatory framework in Israel as well as existing international best practices (technological, logistical, operational) and policy instruments/standards relevant to the scope and objective of the pilot.

Step 2: Business model definition

Elaboration of the circular solutions based on the outcomes of the Step 1 and selection of the business case to be implemented at pilot scale in Step 3.

Step 3: Implementation

Pilot Scale testing (redesign development, training, testing of production lines, testing of sorting processes, prototyping of new products with recycled content,) depending on each pilot.

Step 4: Evaluation

Evaluation of the environmental impact of the pilot and techno-economic assessment.

Step 5: Dissemination and upscale

Documentation of the business case, upscale analysis and outreach to national institutions, decision makers and the business community.

Pilot B: Demonstrating circular design of plastic packaging

The objective of pilot B is to convert existing plastic packaging applications into packaging products with a recyclable design. The pilot will use the guiding principles from the Sustainable Packaging Guide developed by the Manufacturers Association, and the "interactive tool for evaluating and designing recyclable plastic packaging" developed by UNIDO and the Afeka Institute of Circular Engineering and Economy under the SwitchMed Programme.

The pilot project will aim to demonstrate the feasibility of converting conventional PVC packaging sleeves into Polyolefin for two families of polypropylene cups popular and largely consumed in Israel. Ultimately, the intervention aims to provide an analysis of business and financial potential of each actor in the value chain.

Pilot C: Setting up a system for sorting and recycling flexible packaging

Closed loop recycling (into non-food packaging applications) has the lowest life-cycle footprint of all recycling options for flexible packaging. The main barrier for closed loop recycling of flexible packaging in Israel lies with the inability to sort a mixed stream of PE and PP flexible and rigid packaging applications.

The objective of pilot C is to explore the feasibility of alternative solutions to recycle flexible packaging by sorting PE and PP packaging waste at source from a mixed waste and/or separate PE and PP at the recycling stage, in order to segregate plastic streams into a range of recycled material compatible with plastic processing industries.

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