UNHCR
The UN Refugee Agency

IMPROVING THE SUSTAINABILITY OF UNHCR **CORE RELIEF ITEMS**

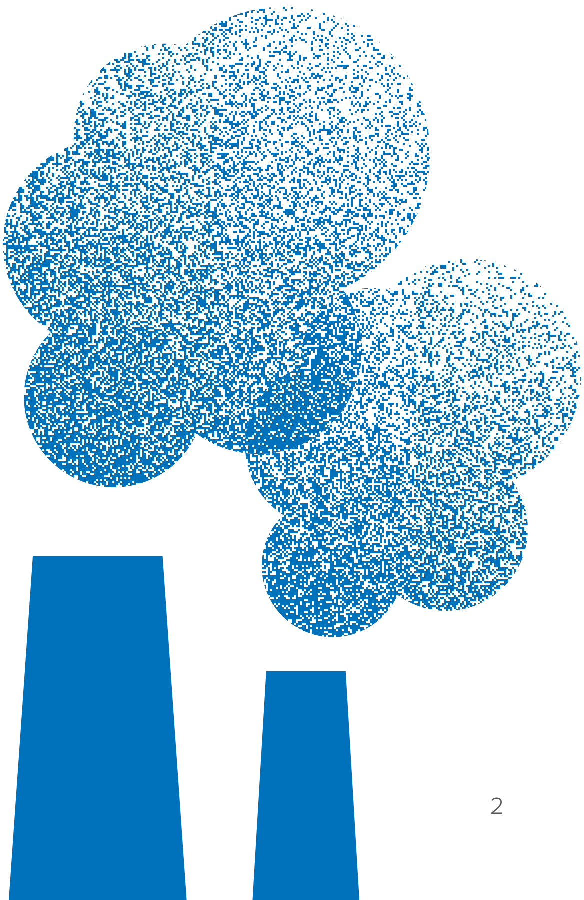
UNHCR REPORT SUMMARY

SUMMARY OF UNHCR REPORT: IMPROVING THE SUSTAINABILITY OF UNHCR CORE RELIEF ITEMS

1. Introduction

More than 60 per cent of UNHCR greenhouse gas (GHG) emissions arise from procured core relief items (CRIs). Most of the CRIs procured by the organization are made of virgin plastics. Plastics are essential to many aspects of sustainability due to their beneficial qualities of being lightweight and having good corrosion resistance. However, due to the high volume of production, their petroleum-based nature, the high carbon intensity of manufacturing and limited possibility of degrading in the natural environment; virgin plastics are not considered ecologically sustainable materials. Therefore, to **reduce the GHG emission of UNHCR by up to 20 per cent by 2025**, it is of paramount importance to reconsider technical specifications for the procured CRIs and find more sustainable alternatives for the plastic materials currently used to produce CRIs.

Sustainability is typically realized as trade-offs between equally desirable goals: reduced environmental impact, increased economic efficiency and increased social security. The aim of this report was to find more sustainable alternatives to the currently used virgin plastics for CRIs, including blankets, jerrycans, heavy duty buckets, sleeping mats and mattresses. The exploration of sustainable alternatives also required a thorough look at the environmental impact of plastics, the pros and cons of different sustainable alternatives of plastics, the principles of circular plastic economy and the plastic market and related legislation. The report therefore also provides insight on the role of plastics in sustainable development, dispels the myth that all plastic is harmful to the environment and forms a rational approach to reduce the GHG of UNHCR through the replacement of virgin plastics with more sustainable alternatives.



2. The role of plastic in reducing CO2 emissions

Plastics account for 4-6 per cent of non-renewable fossil-fuel consumption and they contribute around 6 per cent of the global amount of CO2 emissions. Contrary to widespread belief, replacing plastic with traditional materials (such as wood, glass, metals, etc.) would result in much higher CO2 emissions and more energy being consumed, due to increased weight and transportation needs. The **use of plastics results in lighter products, which in turn means less fuel demand**, i.e. less carbon dioxide emitted during transportation. Moreover, the manufacturing stage of plastics production is also less carbon-intensive than for example glass manufacturing, due to the temperatures needed for processing these materials. This effect is called the 'plastic paradox' and in practice it means that the increased use of recycled plastics in a constructive way would in fact reduce the overall consumption of fossil fuels, as well as reduce the global carbon footprint.

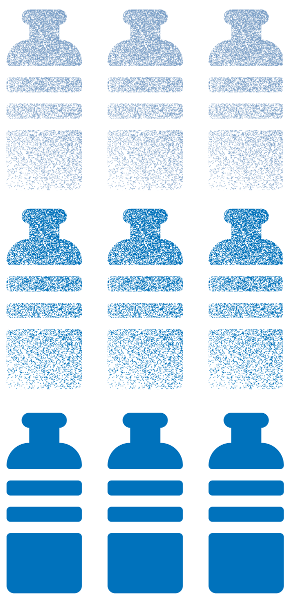
The critical issue which needs to be solved is plastic pollution. Despite the enormous potential of bio-based and biodegradable plastics, their share in global plastic production today is less than 1 per cent, and is unlikely to increase in the next decade. Moreover, biodegradable plastics cannot degrade in a natural environment, and therefore cannot be landfilled. They must be collected and either composted locally or sent to a special composting facility.

There are four strategies to decarbonize the plastic industry:

1. the use of bio-based plastics;
2. the use of renewable energy;
3. extensive recycling of plastics;
4. and demand management.

Among them, the decarbonization of the energy system (i.e., shifting towards renewable energy, such as wind, solar power, etc.) shows the greatest potential. If combined with extensive recycling or demand management, decarbonization of the whole energy sector could reduce global GHG emissions by 2050. The current global average plastics recycling rate of 18 per cent presents substantial room for further improvement.

However, a key barrier to dramatically increasing recycling rates is the low price of virgin plastics. Nevertheless, recent legislation has set an ambitious target for plastic recycling in the European Union, with 50 per cent of collected plastic packaging waste to be recycled by 2025, rising to 55 per cent by 2030.



3. Synthetic blankets

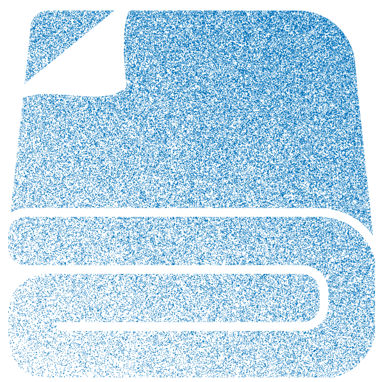
Recycled PET plastic fibers (rPET) offer significant CO2 savings. **The CO2 emission of rPET fibers is 24 - 76 per cent lower than that of virgin PET**. Global rPET fibers production is around 9 million tons (in 2021) , which is almost 15 per cent of the global PET fibers production. The total amount of PET fibers necessary to assure the production of UNHCR blankets is around 5.4 kilo tons, which is 0.06 per cent of the total yearly production of rPET fibers in the world. Moreover, the rising expectations of recycling will stimulate the industry and make it possible to increase the percentage of rPET in UNHCR blankets.

An estimated 99 per cent of all rPET fibers are made from PET plastic bottles. The remaining 1 per cent of rPET fibers is made up of other post-consumer plastics, such as ocean waste and discarded polyester textiles, or from pre-consumer processing residues such as fabric scraps. The strength of mechanically recycled PET is on average 15-46 per cent lower than that of virgin fibers. However, the quality of recycled fibers strongly depends on the purity of the waste. rPET yarns can even reach the same quality as virgin PET yarns if a clean bottle source is used, i.e., bottles are properly sorted and the impurities are carefully removed.

Tests have proved that the strength of chemically recycled rPET fibers is almost the same, or even higher than those of virgin PET fibers. These had already been shown to significantly exceed the strength requirement of the technical specification (64 - 400 per cent stronger). Therefore, it was recommended to shift towards blankets made of 100% rPET fibers.

To prove the origin of rPET fiber in the blankets, the supplier must provide a certificate for recycled materials used. The possible certificates can be: Global Recycled Standard (GRS), the Recycled Claim Standard (RCS), the SCS Recycled Content Standard or the Ocean Bound Plastic (OBP) certification, or equivalent.

To make blankets compliant with the design-for-recycling (DfR) principles it was proposed to include the following information on the tag of the blanket: material composition (type of material(s)) and the ratio of each material in the product; certified sustainability claim/eco-labelling; information related to the reuse/recyclability of the item; and a QR code, linking the user to the https://help.unhcr.org, with protection info for refugees, asylum-seekers and stateless people. An example of a tag proposed for recycled blankets can be found in the UNHCR Core Relief Items Label Catalogue.



4. Buckets and jerrycans

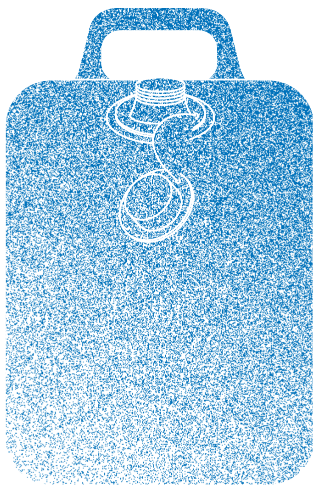
Recycling LDPE plastic can potentially save 1.9 kg CO2e per kg of plastic, which is the equivalent to saving almost half a litre of diesel fuel. Recycling HDPE plastic can in turn potentially save 1.6 kg CO2e/kg of plastic. These numbers will differ from region to region and depend on the calculation method used. Global recycling of LDPE and HDPE amounts to 10-15 per cent of the global production of these plastics (11.6-17.4 Mt/year).

At the moment, it is not possible to use mechanically recycled HDPE from post-consumer waste for any application requiring food contact approval, such as for example buckets and jerrycans. Only if the waste is at least 99 per cent food-contact compliant (for example HDPE milk or juice bottles), can contaminants in the recycled plastic be reduced to a level deemed suitable. If this concentration limit is met, these recycled plastics can be re-used in direct contact with food.

Pre-consumer LDPE and HDPE are ideal sources of recycled food-grade plastic, as it is usually clean and of a single type, of known composition and requires no further treatment. Currently, all pre-consumer plastic waste is fed back into the plastic production stream. It is estimated that the amount of pre-consumer recycled LDPE and HDPE can be up to 30 per cent of recycled plastic.

To prove the origin of rLDPE and rHDPE, the supplier must provide a non-objection letter (NOL) provided by the FDA in the case of post-consumer recycled use. The following certificates for the recycled materials used are also welcomed: Global Recycled Standard (GRS), the Recycled Claim Standard (RCS), the SCS Recycled Content Standard.

Mechanical properties (such as strength) of LDPE and HDPE unavoidably decrease due to recycling. Therefore, it is necessary to test the items which contain recyclable plastic. To make jerrycans and buckets compliant with the DfR principles, the following changes have been proposed: to delete **UNHCR logo from jerrycans and buckets; to avoid additional colorant during the production** of buckets; to include the following additional information on the items: material composition (type of material(s)) and the ratio of each material in the product; certified sustainability claim/eco-labelling; information related to the reuse/recyclability of the item; and a QR code.



5. Sleeping mats

Sleeping mats purchased by UNHCR are made of polypropylene (PP) plastic. **Recycling PP can potentially save 1.31 kgCO2e per kg of PP produced, up to 88 per cent of energy, and up to 46 per cent of water.** These numbers will differ from region to region and depend on the calculation method used. Global recycling of PP amounts to 8 per cent (6 Mt/ year) of the global production of these plastics.

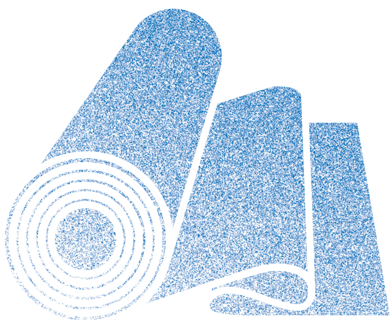
Mechanical properties of PP unavoidably decrease due to recycling. Therefore, it is necessary to test the items which contain recyclable plastic. A sleeping mat made of 100 per cent recycled PP can be accepted by UNHCR if it passes the bursting strength test.

To make sleeping mats compliant with the DfR principles the following changes were proposed: to delete UNHCR logo; to avoid additional colorant during the production; to include the following additional information on the items: material composition (type of material(s)) and the ratio of each material in the product; certified sustainability claim/eco-labeling; information related to the reuse/recyclability of the item; and a QR code. An example of a tag proposed for recycled sleeping mats can be found in the "Core Relief Items Label Catalog", which is available online.

6. Mattresses

Mattresses purchased by UNHCR are made of flexible polyurethane (PU) plastic foam. To produce flexible PU foam two main components are needed: polyol (60-65%) and isocyanate (40-35%). To make PU foam greener, the market offers two solutions recycled and bio-based polyol. Up to 30 per cent of virgin polyol in PU foams can be replaced by recycled / or bio-based polyols without losing the quality of the final mattresses. Bio-based polyols are already on the market, and the annual production of bio-based polyols suitable for mattresses is around 1.0 Mt. For all mattresses purchased yearly by the United Nations, 0.004 Mt of the bio-based polyol is required. Consequently, UNHCR can set a requirement of 30 per cent bio-based polyols in mattresses. However, it is important to better understand and assess the capacity of the mattress suppliers to buy bio-based polyols and use bio-based polyols in their production.

Up to 30 per cent of recycled polyols can be used for mattresses. However, as recycled polyols only recently appeared on the market in 2021, producers of mattresses could face difficulties in obtaining recycled polyol.



7. Conclusion

The aim of the report was to give reasonable and realistic recommendations on how to change CRIs (i.e. blankets, jerrycans, buckets, sleeping mats and mattresses) to make them more sustainable, while at the same time addressing the complex nature of the sustainability concept and state-of-the-art market situation.

When searching for sustainable alternatives for CRIs, three aspects were considered: 1) **reduced environmental impact**, 2) **increased economic efficiency**, and 3) **increased social security**. For the reduction of the environmental impact of the purchased CRIs, it was recommended to shift toward higher content of recycled plastics in the purchased items, as this will reduce a considerable amount of GHG released in the atmosphere and help to solve the problem of plastic pollution. However, the introduction of recycled plastic in CRIs should not compromise product quality and durability and the end users' safety.

The report concluded that the properties of recycled plastic are similar to virgin ones and by following the recommendations given, the use of recycled plastic in CRIs was found to be safe. The report also found that the market of recycled polyester is able to satisfy the current and future needs of UNHCR.

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For more details regarding the findings, please refer to the full version of the report.

Abbreviations

ABS – Acrylonitrile butadiene styrene

CO_2 – carbon dioxide

DfR – Design for recycling

EFSA – European Food Safety Agency

EoL – End-of-life

EPS – Expanded polystyrene

FDA – Food and Drug Administration

GHG – Greenhouse gas

LCA – Life cycle assessment

MW – Molecular weight

NOL – Non-objection letter

PA – Polyamide

PBAT – Polybutylene adipate terephthalate

PBS – Polybutylene succinate

PC – Polycarbonate

PE-HD or HDPE – High density polyethylene

PE-LD or LDPE – Low density polyethylene

PET – Polyethylene terephthalate

PHA – Polyhydroxyalkanoate

PLA – Polylactide;

PMMA – Polymethyl methacrylate

PP – Polypropylene

PS – Polystyrene

PUR – Polyurethane

PVC – Polyvinyl chloride

rHDPE – Recycled high density polyethylene

rLDPE – Recycled low density polyethylene

rPET – Recycled polyester

rPP – Recycled polypropylene

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