

## Description of Item



### Synthetic Blanket

- Mass: 2 kg
- Material: Virgin Polyester from PET granulate
- Plastic packaging material: LDPE film

## Functional unit

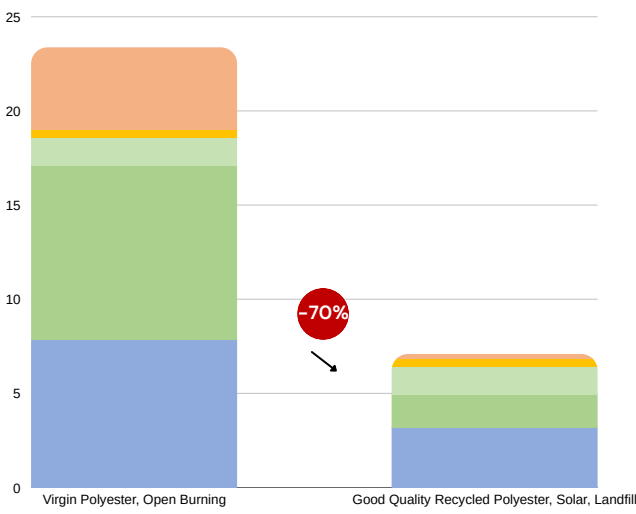
Use of 1 mattress for 10 years

Item	Use life	Reference Flows
Virgin Polyester	5	1
Good Quality, Recycled	5	1
Poor Quality, Recycled	3	1.67

## Assumptions

Baseline product produced in India, sent to port by freight train, and shipped to warehousing and distribution locations. Assumed to be hand washed once a year. Open burning assumed for end-of-life.

## Results of the computation



Stage	kgCO <sub>2</sub> e	
	Scenario 1	Scenario 2
Raw Material	7.87	3.20
Production	9.22	1.74
Transportation	1.48	1.48
Use	0.44	0.44
End-of-Life	4.37	0.23

Stage	Human Health	
	Scenario 1	Scenario 2
Raw Material	4.89E-04	3.37E-04
Production	1.81E-03	1.46E-03
Transportation	1.85E-04	1.85E-04
Use	3.23E-05	3.23E-05
End-of-Life	1.88E-04	1.20E-05

## Variations (% from baseline figures presented above)

### To use recycled material

Computation made by considering recycled polyester – of good quality (5 yrs) & bad quality (3 yrs)

kgCO <sub>2</sub> e	
Good Quality	Bad Quality
-20%	+33%
Human Health	
Good Quality	Bad Quality
-6%	+57%

### To use renewable energy for production

Computation made by considering 100% solar energy for electricity & heat

kgCO <sub>2</sub> e	
Renewable Energy	-32%
Human Health	
Renewable Energy	-13%

### To switch to sanitary landfills

Computation made by considering sanitary landfill (moist infiltration class) at end-of-life

kgCO <sub>2</sub> e	
Sanitary Landfill	-18%
Human Health	
Sanitary Landfill	-7%

### To transport by air

Computation made by considering air freight for international transportation instead of maritime shipping (emergencies)

kgCO <sub>2</sub> e	
Air Freight	+34%
Human Health	
Air Freight	+13%

### Best Possible Scenario

Computation made by considering recycled polyester produced with solar energy, disposed in a sanitary landfill

kgCO <sub>2</sub> e	
Best Case	-70%
Human Health	
Best Case	-25%

## Analyses

combining **recycled polyester**, **renewable energy for electricity and heat at production phase**, and landfill instead of open burning account for the impact reduction of the synthetic blanket.

The highest singular impact reduction point is **energy for production, providing 32% reduction in GHG emissions and 13% in impact on human health**.

## Emission factors

The values displayed here are not per functional unit but per item. These values can be used to compute a carbon footprint of an organisation and can be adapted to a specific case using the tool

Name	GHG Protocol Categories	kgCO <sub>2</sub> e/unit
<b>Cradle-to-grave</b>	<b>N/A</b>	<b>23.38</b>
Cradle-to-gate	3.1 Purchased Goods	17.08
Distribution freight	3.4 and/or 3.9 Transportation	1.48
Use phase	3.11 Use of distributed product	0.44
End-of life	3.12 End of life of distributed product	4.37

## References

Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. 'The ecoinvent database version 3 (part I): overview and methodology'. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <http://link.springer.com/10.1007/s11367-016-1087-8>.

Rajput, A., Tobin Greene, C. and Schmid, S. (no date) 'Life Cycle Assessment (LCA) Methodology'. Available at: [https://climateactionaccelerator.org/wp-content/uploads/2025/06/EPFL\\_LCA\\_methodology\\_v1.0.pdf](https://climateactionaccelerator.org/wp-content/uploads/2025/06/EPFL_LCA_methodology_v1.0.pdf).

Repository of life cycle assessments – Climate Action Accelerator (2025). Available at: <https://climateactionaccelerator.org/repository-of-lifecycle-assessments/>.

## About this project

Designing methodologies and performing life cycle analyses of high-impact items to build a GHG emission factor and environmental impact database adapted to the humanitarian sector with the goal of identifying key strategies to reduce environmental impacts.

**EPFL EssentialTech Center:**  
Dr. Grégoire Castella, Dr. Cara Tobin, Emeline Darçot

**EPFL LEURE:**  
Dr. Sascha Nick, Ashima Rajput

**International Committee of the Red Cross (ICRC):**  
Anna Maria Liwak, Carmen Garcia Duro

**Climate Action Accelerator:**  
Bruno Jochum, Sonja Schmid, Paolo Sévègnes

**Associated expert:**  
Dr. Damien Friot