LCA | Coveralls

EPFL EssentialTech Centre

ICRC

Climate Action Accelerator

Description of Items

Single-Use Type II
- Lifespan: 1 use
- Materials: Polypropylene, polyester and aluminium
- Mass: 5g

Reusable Type I
- Lifespan: 20 uses
- Materials: Cotton, polyurethane and polyester for reusable one

Functional unit

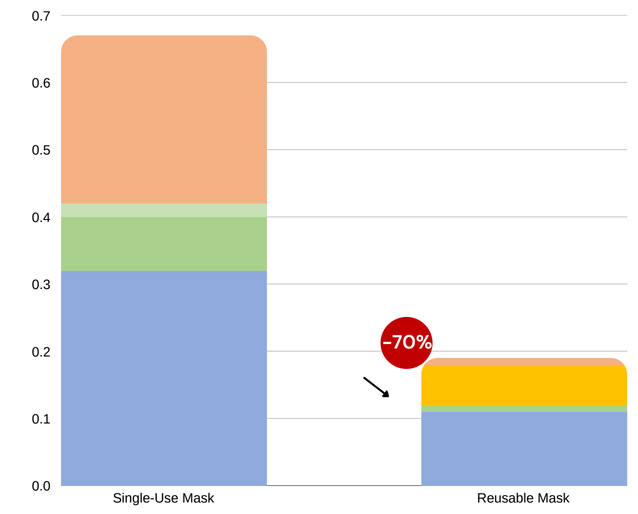
20 mask uses in Type I context

Item	Use life	Reference Flows
Single-Use	1	20
Reusable	20	1

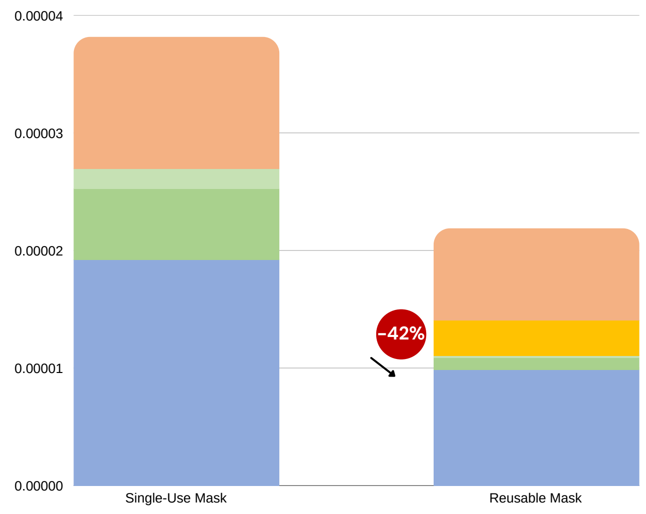
Assumptions

Both masks are intended for use in a Type I-compliant context, i.e. by patients or other individuals, rather than by healthcare professionals in medical settings. Both products are manufactured from locally sourced materials in China and transported to the field by ship. Reusable mask is washed with laundry. Open burning in considered as end of life.

Results of the computation



Stage		kgCO₂e Single Use	SmartPPE
Raw Material		0.32	0.11
Production		0.08	0.01
Transportation		0.02	0.00
Use		0.00	0.06
End-of-Life		0.25	0.01



Stage		Human Health Single Use	SmartPPE
Raw Material		1.92E-05	9.85E-06
Production		6.03E-06	1.01E-06
Transportation		1.73E-06	1.82E-07
Use		0.00E+00	3.02E-06
End-of-Life		1.12E-05	7.82E-06

Analyses

Switching from a disposable mask to a reusable face mask can reduce the **climate change impact by 70%**, from about 670 grams of CO2e to 200 grams, to answer the functional unit of 20 uses. The **impact on human health can be reduced by 42%**.

Deploying reusable masks at scale would require **a logistics system to collect, wash, and track the number of uses for each mask** throughout its lifespan.

Note

This assessment **does not cover face masks used in surgical unit or medical contexts** by health workers, but for the Type I face mask use case according to EN 14683:2019+AC:2019.

This solution **applies only to masks not used by healthcare workers, where reuse is permitted.**

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	gCO2e/unit Single-Use	SmartPPE
Cradle-to-grave	N/A	33.2	196
Cradle-to-gate	3.1 Purchased Goods	20	121

References

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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.

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