Climate Action Accelerator

Reducing the carbon and environmental footprint of procurement – What is the role and what are key findings of lifecycle analyses in the humanitarian sector?

HNPW – March 25th 2025

A Leading Edge Programme Event
HNPW 17-28 APR 2023
Humanitarian Networks & Partnerships Week

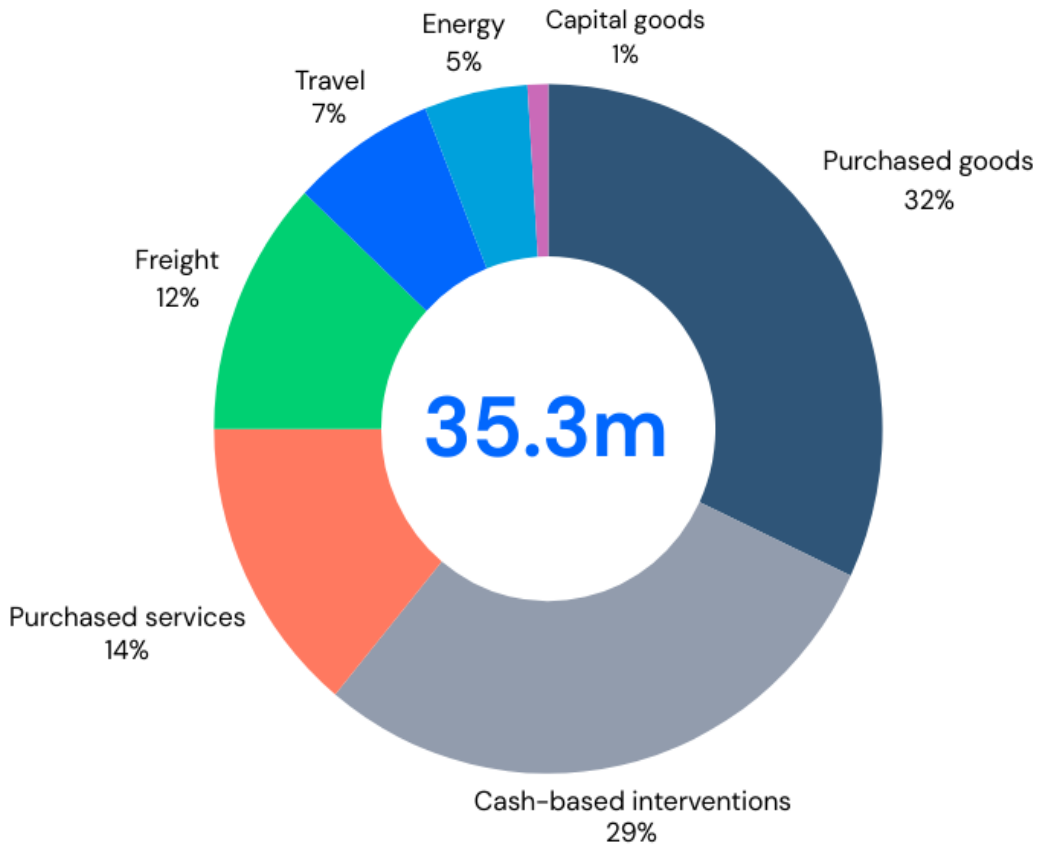
Key findings - 2022 baseline estimate

Global footprint of the International Humanitarian Aid Sector by nature

Main sources of emissions

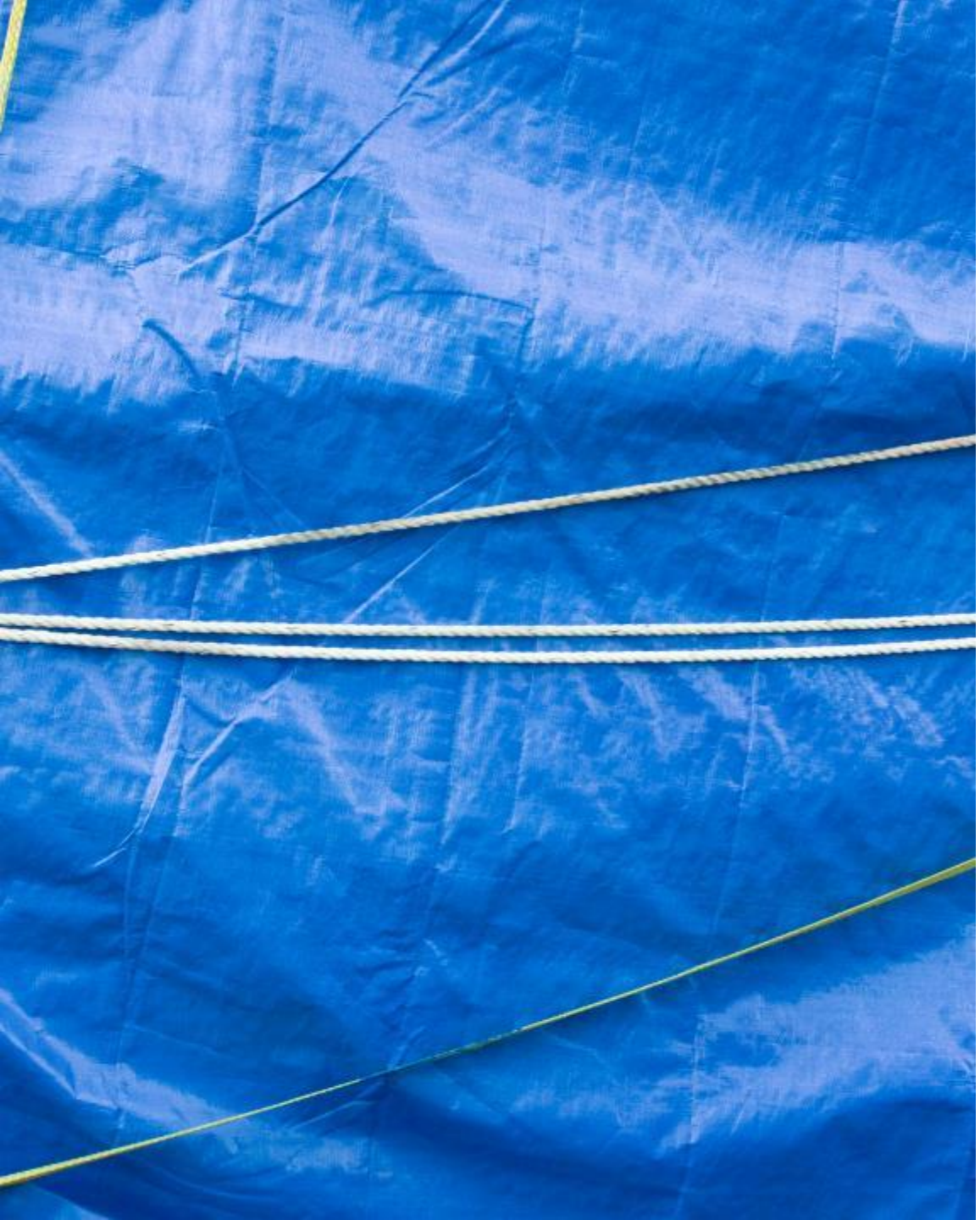
1. Purchased goods 32%,
2. Purchased services 14%
3. CVA 29%
4. Energy, freight, travel 24%

Procurement = 75% of emissions



Overview of global emissions for the humanitarian aid sector in 2022

Sectoral Analysis (p. 18)

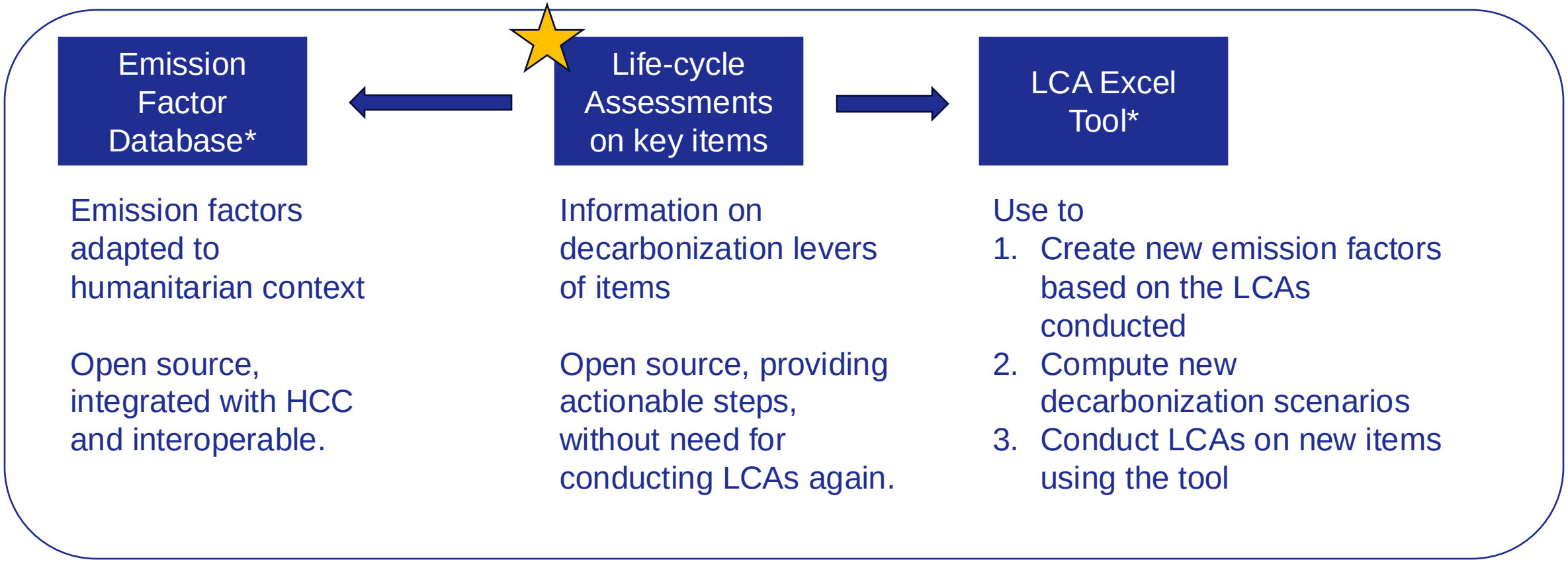


Accelerating the reduction of the environmental impact of humanitarian action

Findings from LCAs on key items of humanitarian organizations

Ashima Rajput, 25.03.2025

About the Project



*pending licensing discussions

About the Items

- Why did we choose these?

Selected items are distributed in large numbers by the ICRC and other humanitarian organizations. Lack of publicly available information on most promising decarbonization strategies; lack of adapted emission factor

- What are we studying?

*The impacts of producing, distributing, using, and disposing of these items **in humanitarian contexts** to find impact reduction pathways*

- What do we want achieve?

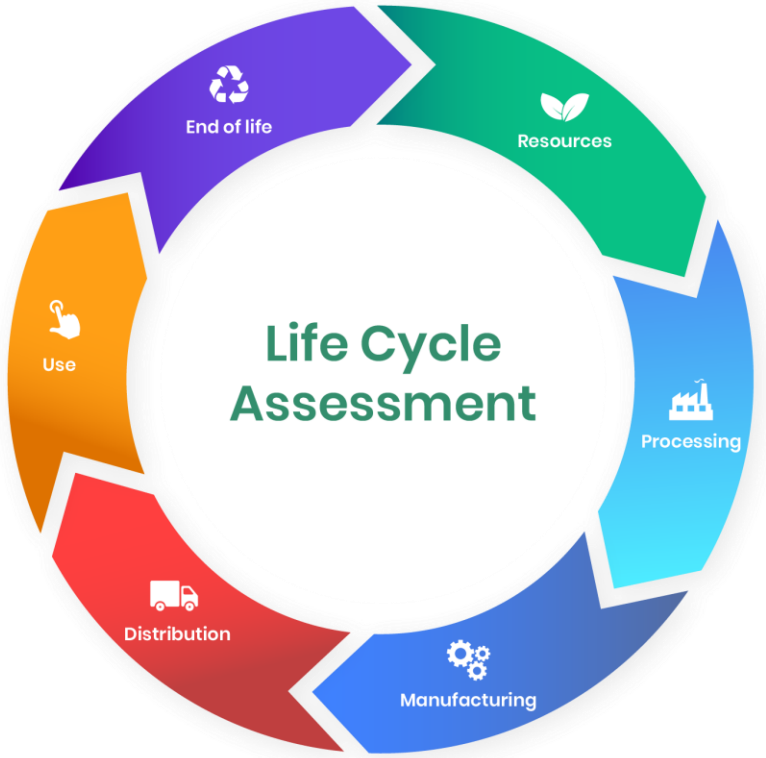
Clear conclusions that can be acted upon by the humanitarian organizations

1. Blanket (high thermal)
2. Jerrycan (20 l foldable)
3. Plastic bucket (Oxfam variant)
4. Plastic floor mat (sleeping mat)
5. Soap bar
6. Mattress (PU Foam)
7. Solar Lamp*
8. Hygienic pad
9. Facemask*
10. Coverall
11. RUTF*
12. Hygiene kit
13. Mosquito net*

** No full LCA will be performed, instead existing studies will be analysed, potentially missing indicators updated, and outcomes made available in a streamlined format.*

LCA methodology

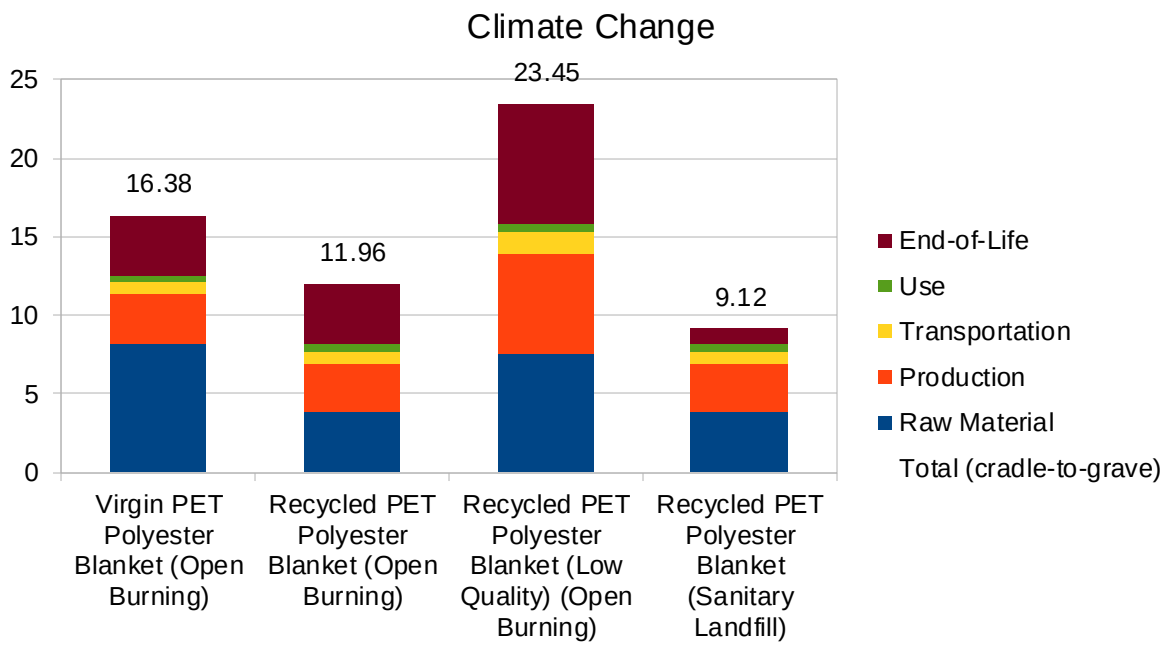
- **Data collection:** Secondary data derived from ICRC and other organizations
- Standard assumptions made to model humanitarian supply chain patterns
- Modelling with Ecoinvent 3.11
- Cradle-to-grave & cradle-to-gate
- Analysis using Environmental Framework (EF) 3.1 method
- Primary impact categories: **Climate Change** & **Impact on Human Health**
- Additional indicator: mismanaged plastic waste (plastic leakage)

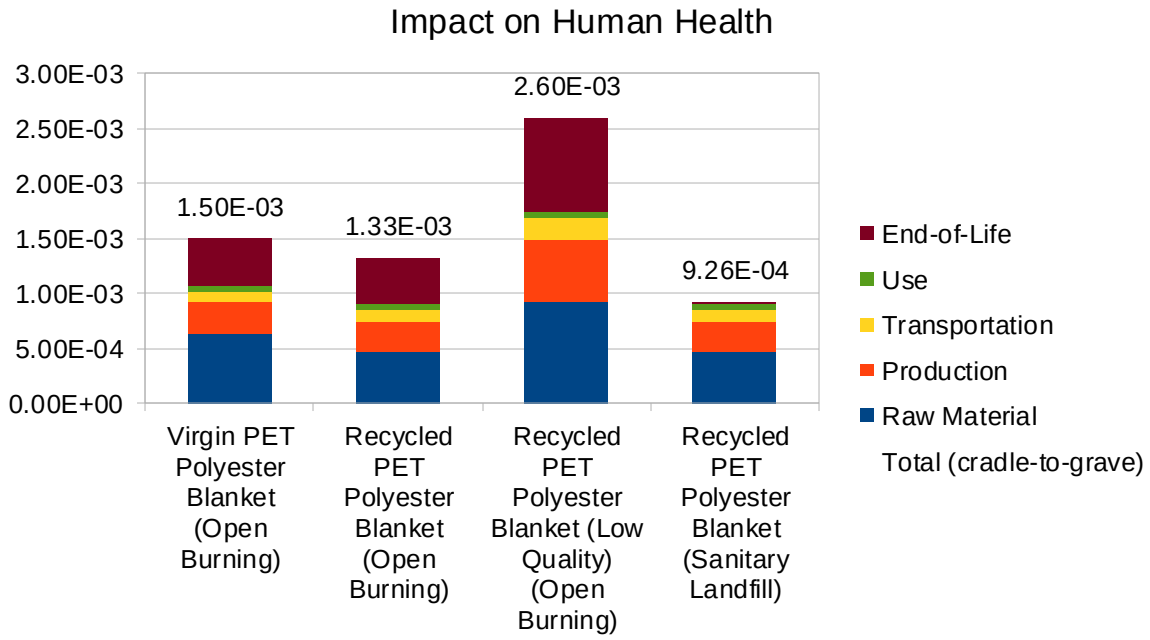


Results for High-thermal Synthetic *Blankets*

Assumed use life: 5 years

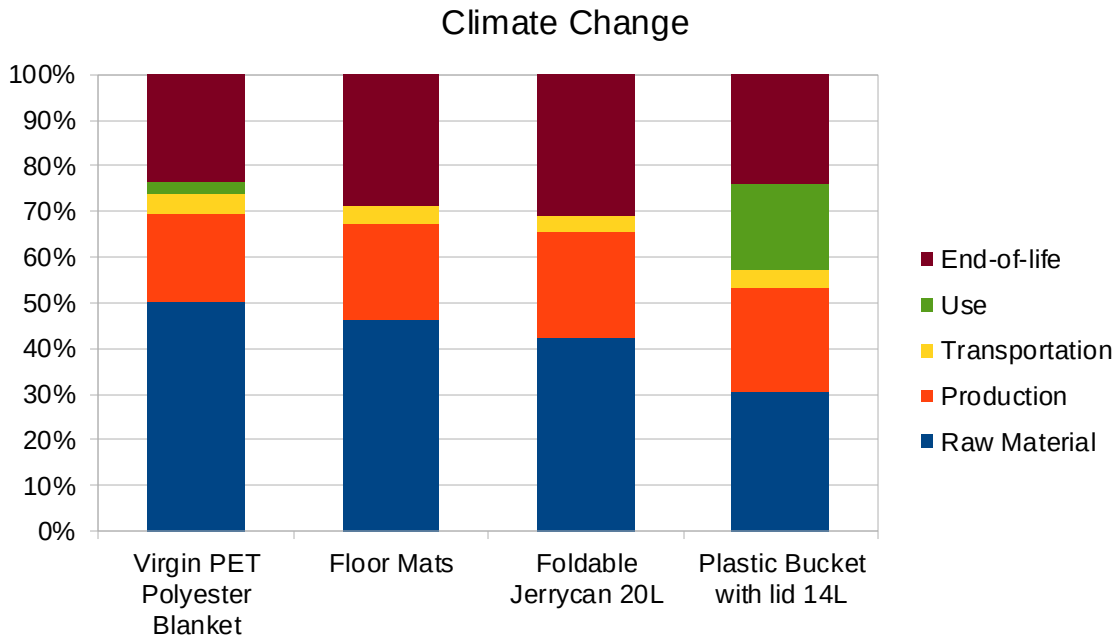
- **60-70% of the impact from raw material + production**
- Replacing virgin PET with recycled PET results in:
- A 27% reduction in climate change impact
- A 12% improvement in impact on human health
- In case low quality recycled PET used (i.e. 50% less durable), the impact increases by 43% (climate change) & 73% (human health)
- Additionally changing from open burning to sanitary landfills results in 17% reduction in climate change & 27% in impact on human health. Hence providing:
- A combined reduction of 45% (climate change)
- A combined reduction of 39% (human health)

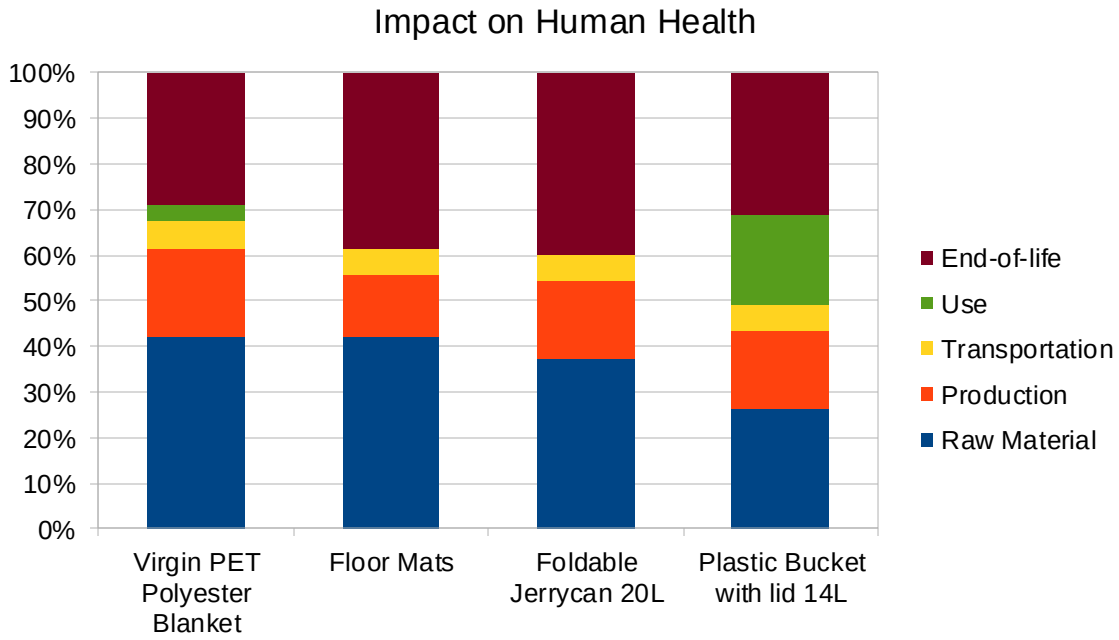




Impact Assessment: Use life and durability

- For plastic items: majority of the impact is at raw material & production stage
- Making the item durable and long-lasting improves the overall impacts across the life cycle





Impact Assessment: Materials

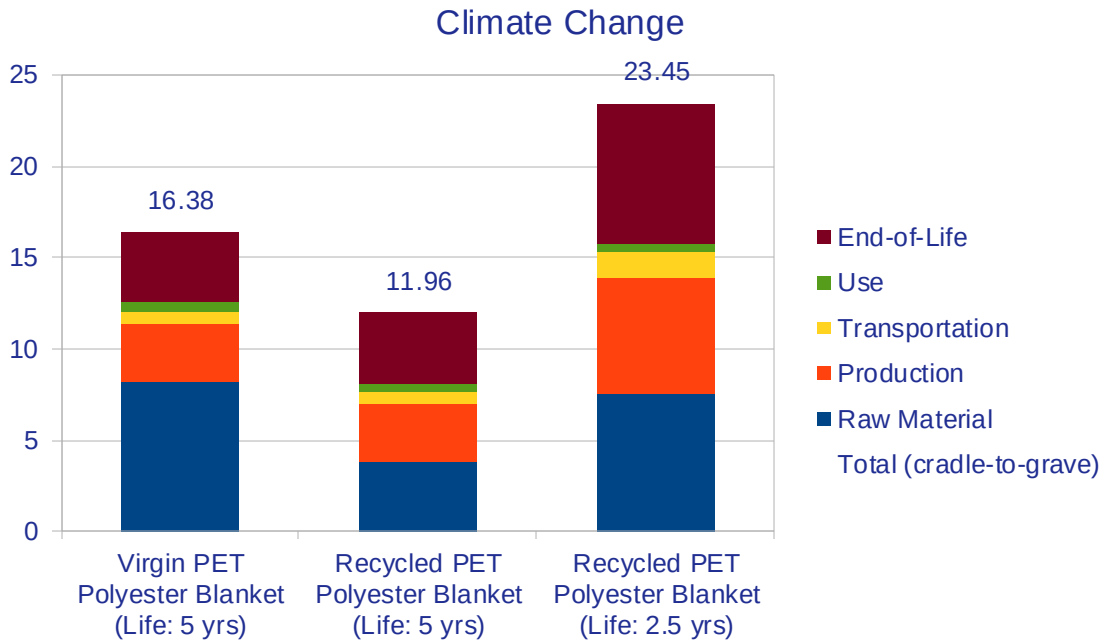
Substituting virgin plastic with recycled plastic can reduce overall impact by approximately:

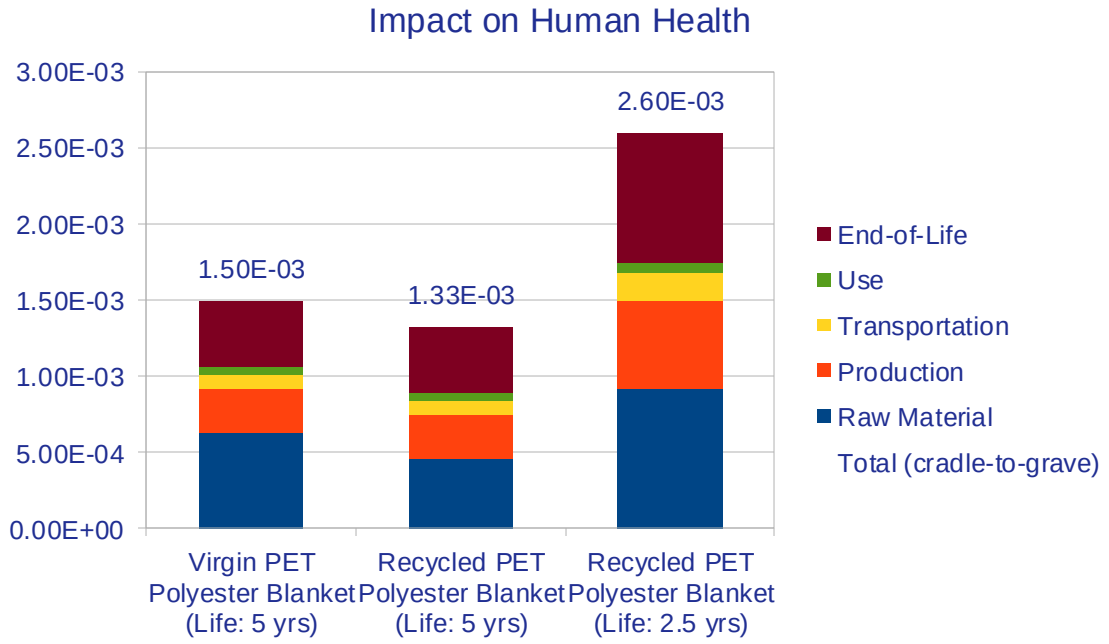
- **30% for climate change**
- **10-15% for human health**

But only if the quality and lifespan of the item are maintained.

If quality is compromised, the lifetime will be reduced, increasing the overall impact instead.

Solution: Design with durability in mind to maximize the benefits of low-carbon materials while ensuring a long product life.

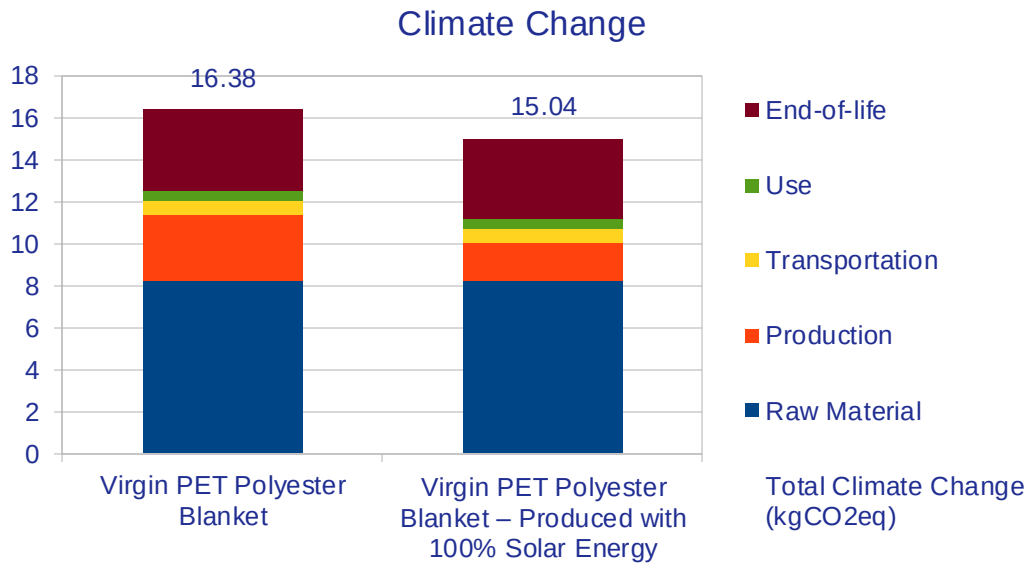


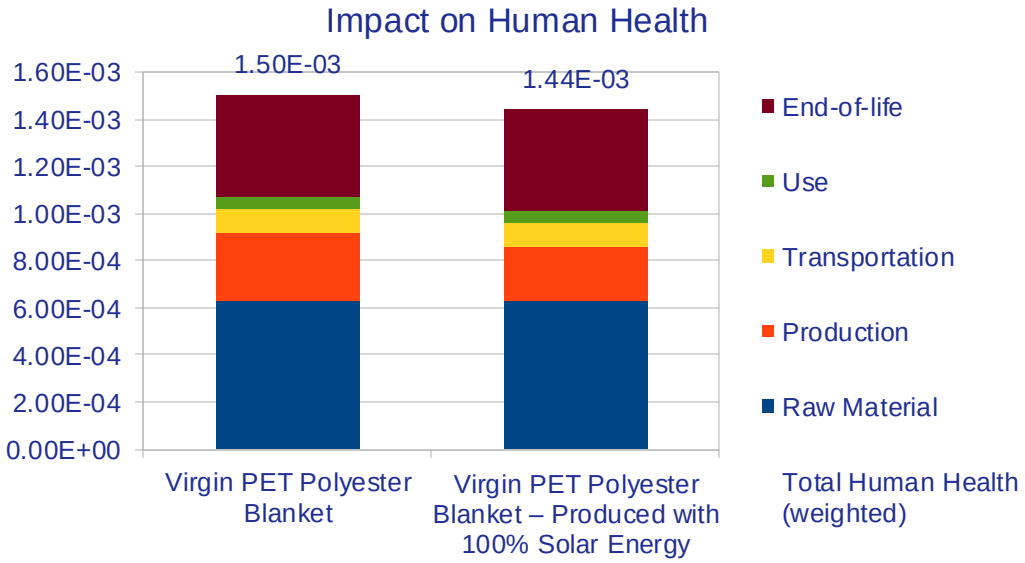


Impact Assessment:
Renewable Energy

- Switching from the grid energy mix in the country of production to 100% solar energy is estimated to reduce:
- Climate change impact by 8-10%
- Human health impact by 3-5%

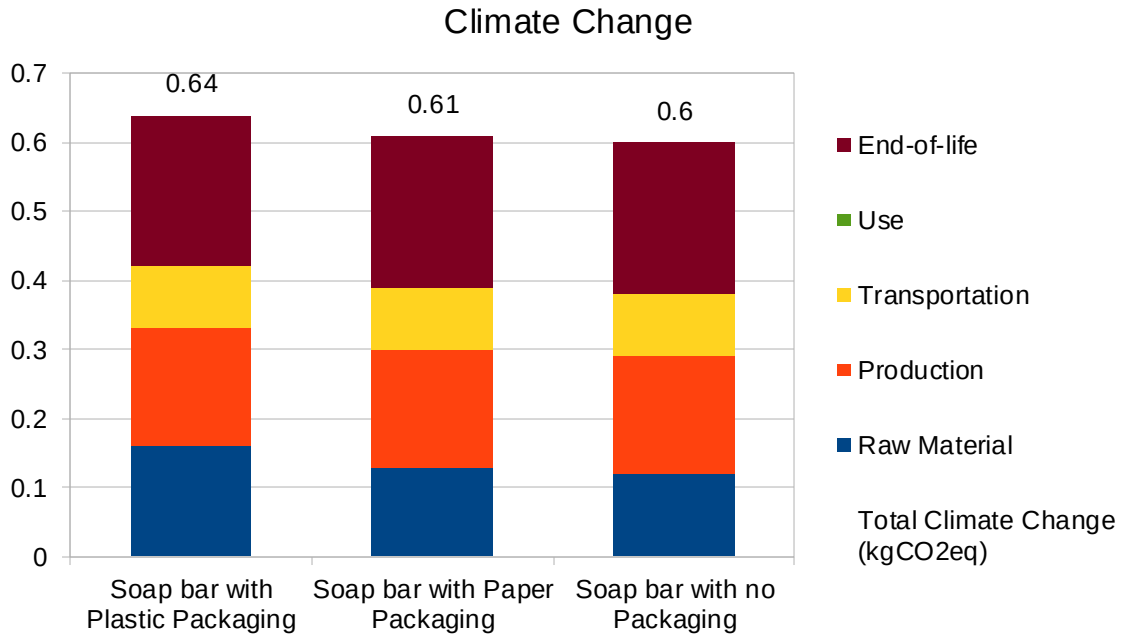
Beyond direct reductions, adopting renewable energy creates a ripple effect—lowering the overall environmental footprint for all organisations that buy from this supplier.

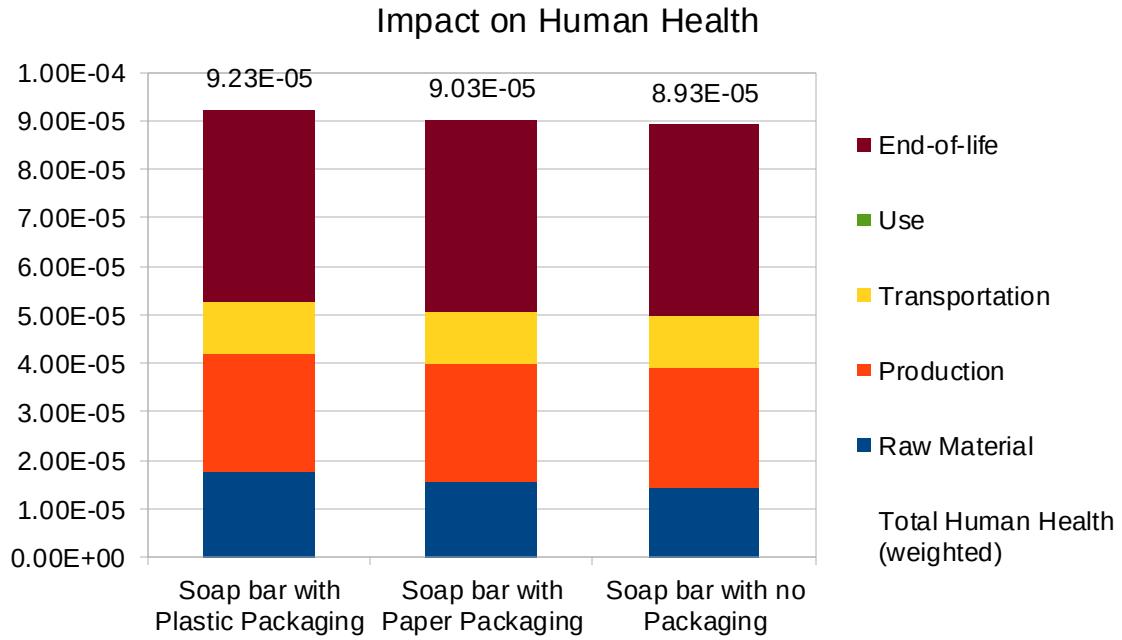




Impact Assessment: Packaging (Soap Bar)

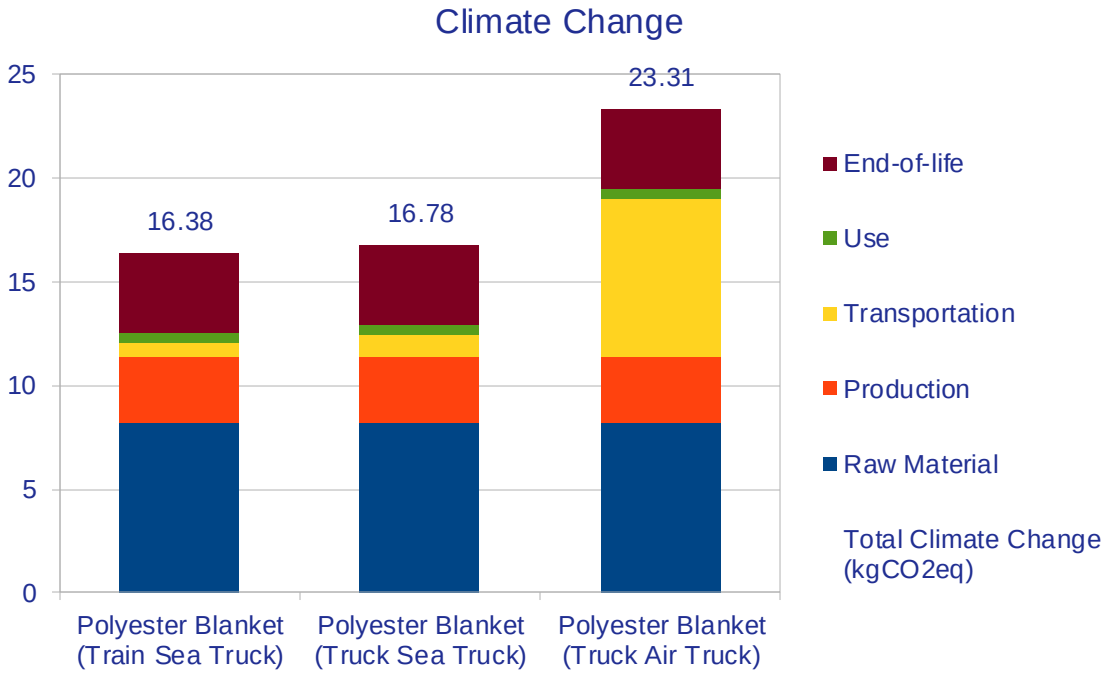
- From the perspective of the LCA of the soap bar, the weight of packaging is small compared to the weight of the soap bar
- Replacing plastic with paper reduces the impact by 4% for climate change and 2% for impact on human health.
- Removing the packaging entirely reduces the impact by 6% for climate change and 3% for impact on human health

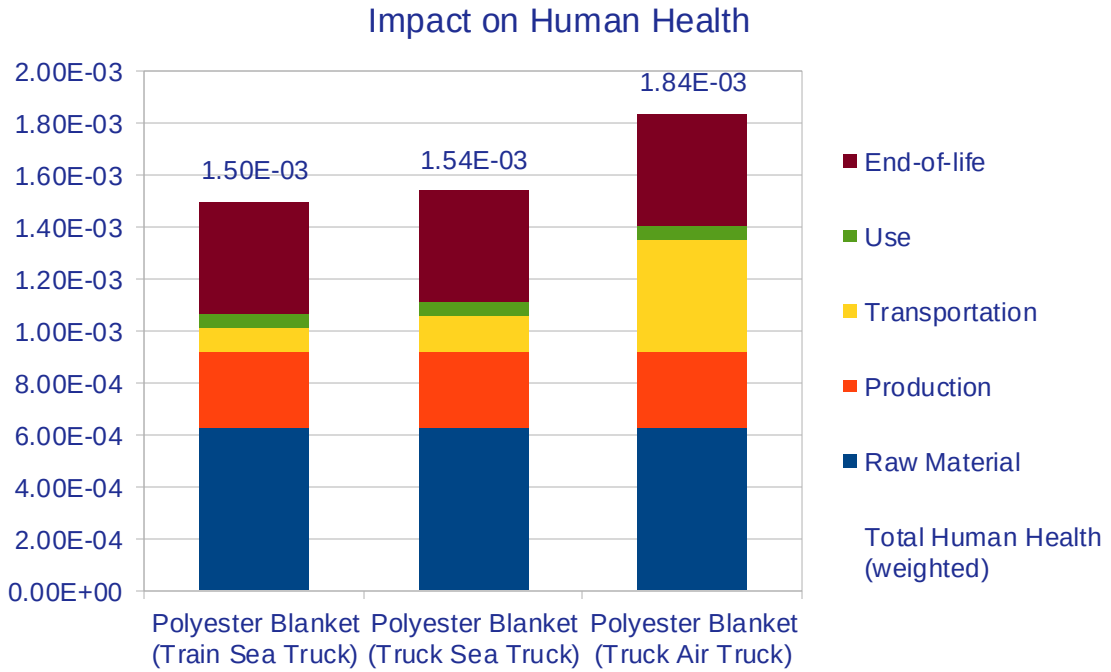




Impact Assessment: Transportation

- Transportation is usually a smaller share of the life-cycle impact of any product – as long as the transport is by sea
- However, when using air freight, the impact increases drastically and can add up to 30-50% impact to a lightweight product





Impact Assessment: End-of-Life

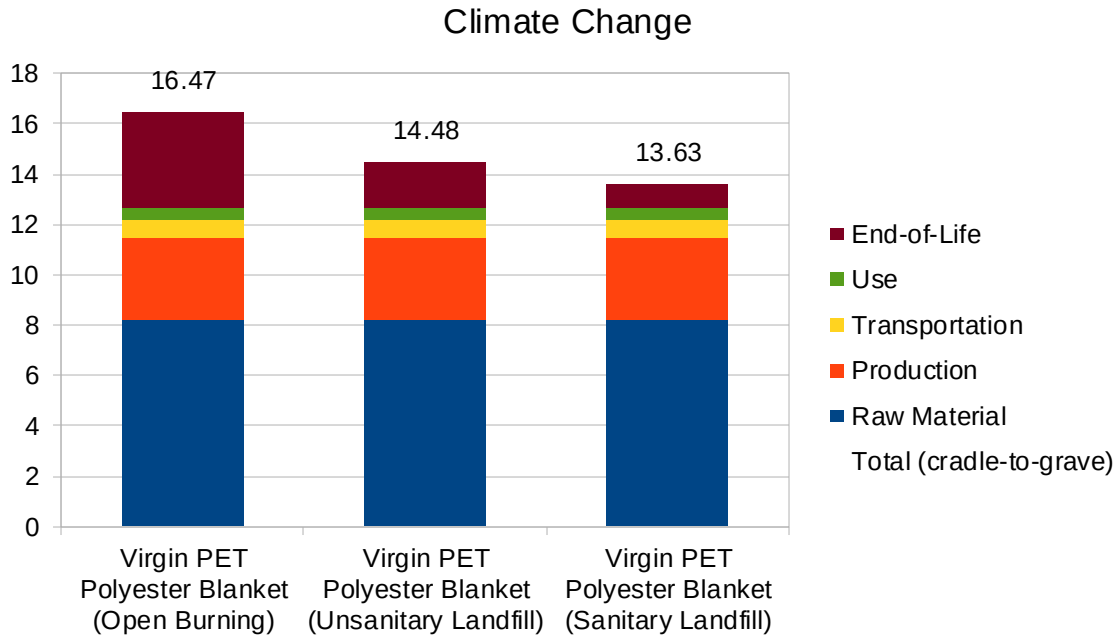
Baseline: Open burning in pits, leading to high emissions and health risks.

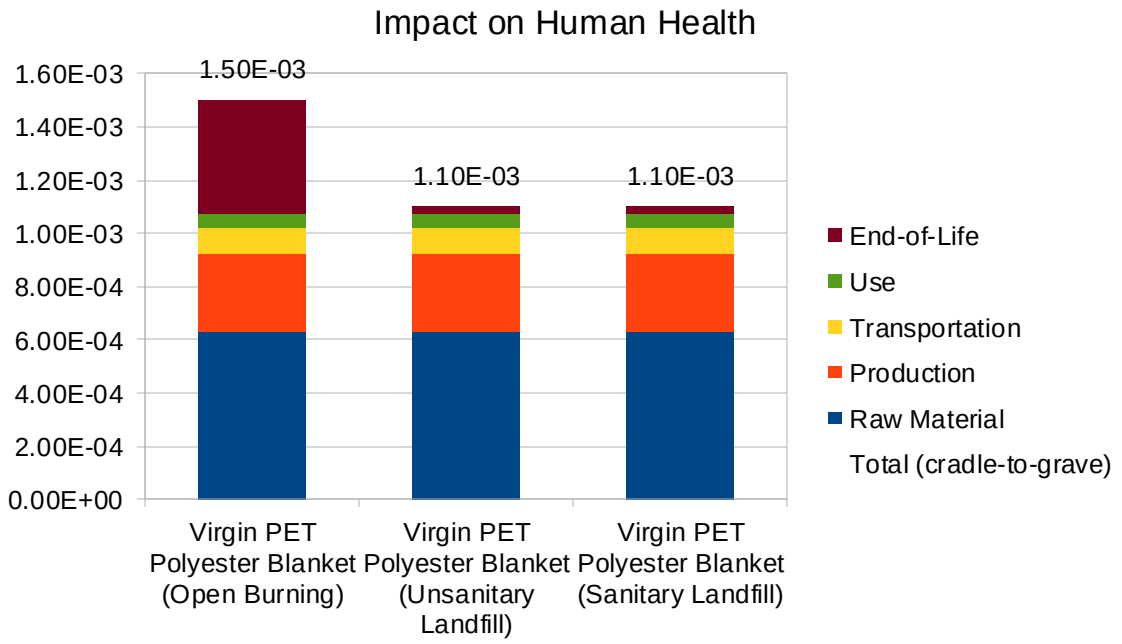
Unsanitary Landfills:

- Reduces climate change impact by 10-15% compared to open burning.
- Lower impact on human health by ~25%.

•Sanitary Landfills:

- Use of lined systems to prevent toxic pollution.
- Reduces climate change impact by 15-20%.
- Lower impact on human health by ~25%
- Ecological Benefits: Not included in impact assessment but significantly better than unsanitary landfills.





Key Conclusions

1. Raw material, production and end-of-life are key impact stages across analysed items
2. Choosing a quality product that lasts a long time is essential to reducing impact
3. Alternative materials can be used while designing with impact (and hence: quality) in mind
4. Sourcing from suppliers that use renewable energy is a relatively easy to implement solution and has effects beyond the individual organisation
5. Waste management is an important impact reduction pathway – but requires improvements at national level

THANK YOU

Ashima Rajput

ashima.rajput@epfl.ch

HNPW | Geneva

Environmental Sustainability: Life Cycle Assessment and Case Studies from the Humanitarian Sector

- March 25th, 2025
- Dr. Sarah Joseph

KLU KÜHNE LOGISTICS UNIVERSITY

CHORD CENTER FOR HUMANITARIAN LOGISTICS AND REGIONAL DEVELOPMENT

©WFP/Sayaed Asif Mahmud

LCA Projects at CHORD/KLU

What are some examples of our LCA projects?

LCA PROJECTS

6 Life Cycle Assessments measuring the environmental impacts of end-to-end supply chains across different sectors and stages of the disaster management cycle using data collected with practitioners.

worm

EU-funded project focusing on leveraging bio-based materials, reducing waste and the impact of waste in humanitarian operations, and supporting sustainable livelihoods for waste pickers. LCA focus is on **bio-based materials and waste management**.

OUTPUT

- **Practitioner reports*** for health, food, and fleet
- **WREC final report** on GHG emissions and waste
- **Scientific paper** that outlines where humanitarian organizations should focus to reduce environmental impacts *(in progress)*

- **LCA and project report**** on production and end-of-life of bio-based vs. conventional materials
- **LCA and project report**** analyzing less destructive methods for HWM

*Practitioner and project reports found here: https://www.help-logistics.org/news-media/publications/reports

**WORM project reports found here: https://wormproject.eu/

Advocacy paper: GHG emissions results

Which processes have the highest impact?

International supply chain stage results in **42-78%** of total GHG emissions when air is used

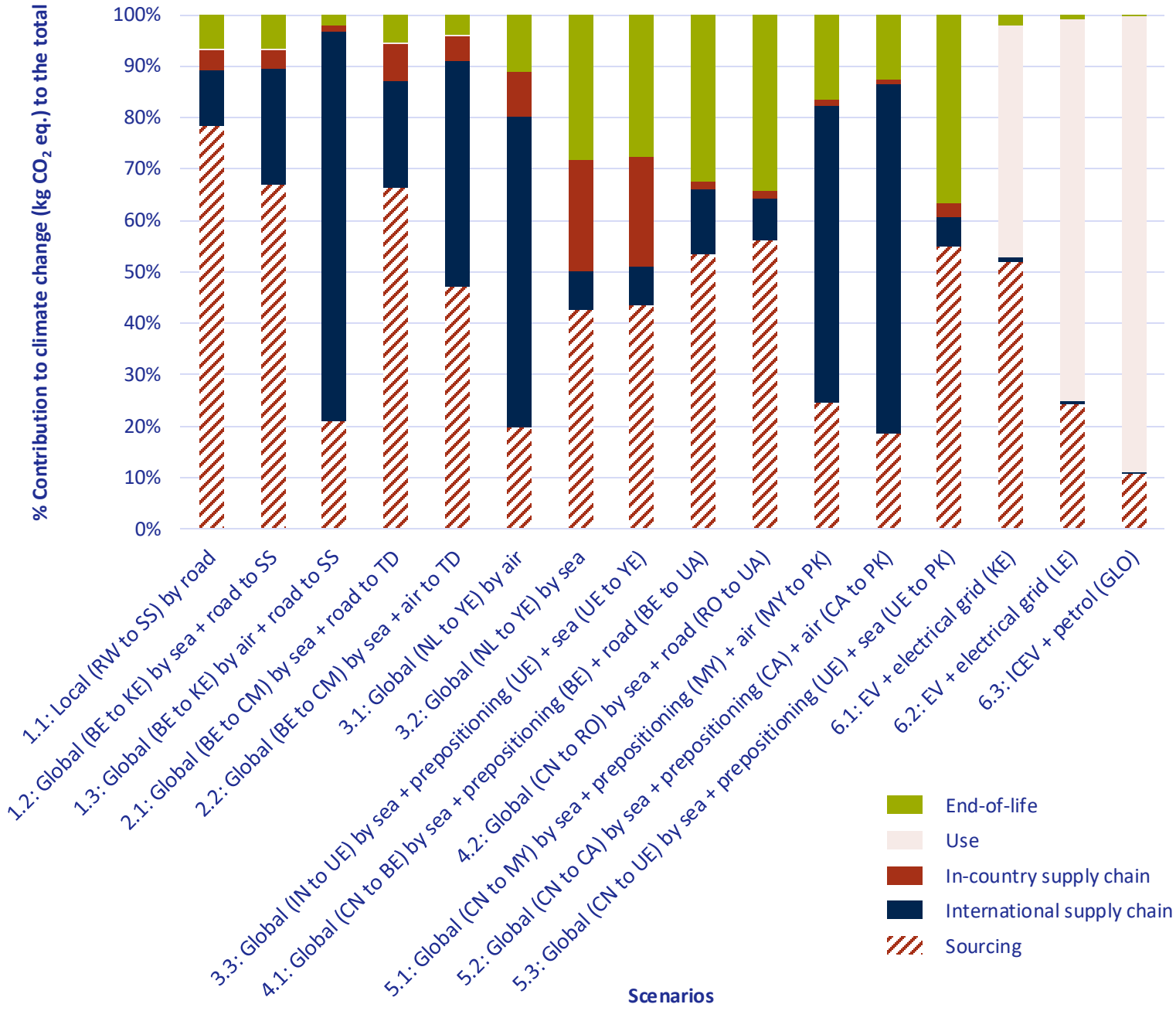
- Air transport results in 70-80x more GHG emissions per ton kilometer than sea and roughly 4-5x more than road

Sourcing results in an average of **57%** of total GHG emissions when air transport is not used

Inefficiency is a key driver for greater GHG emissions

- Prepositioning may increase distances
- Complexities (e.g., cold chain) exacerbate inefficiencies

Most end-of-life emissions result from open burning and incineration



WORM Project: priority medical products for humanitarian field hospitals

What were our objectives?

1. Compare **the production of eight priority products** using **bio-based vs. conventional** (e.g., fossil-based plastic) materials

   - Facemask
   - Surgical gloves
   - Surgical gown
   - Protective boots
   - Syringe and needle
   - Sharps container
   - Body bag
   - Temporary water bladder

2. Compare **the waste treatment processes of eight priority products** using **bio-based vs. conventional** (e.g., fossil-based plastic) materials

   - Incineration
   - Landfill
   - Open burning
   - Open dumping

3. Compare **waste treatment processes for hazardous waste** and identify **less-destructive alternatives**

   - Incineration
   - Autoclaving + sanitary landfill
   - Chemical disinfection + sanitary landfill
   - Microwaving + sanitary landfill

WORM Project: facemask production example

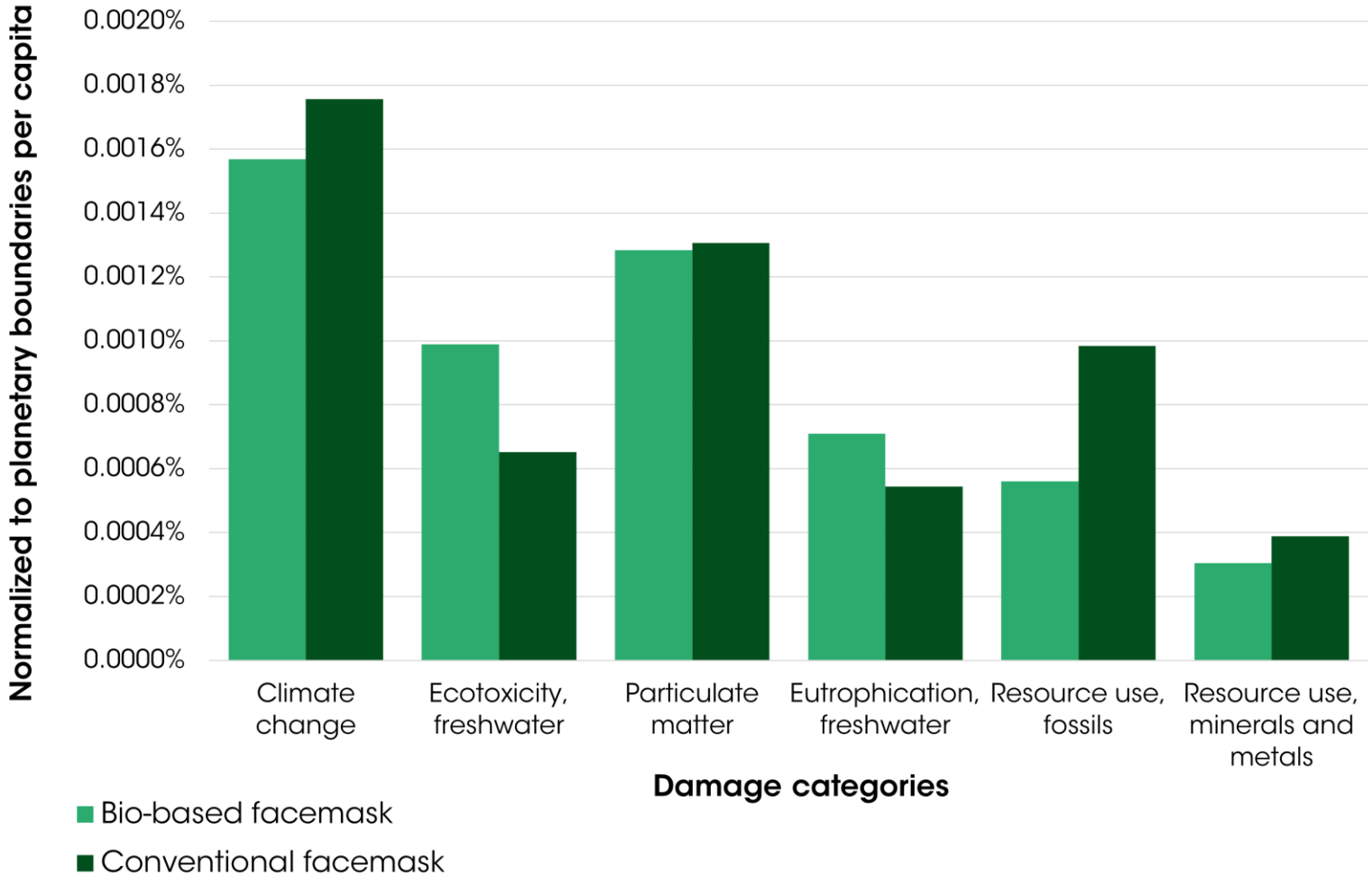
Conventional or bio-based?

Waste in humanitarian Operations: Reduction and Minimisation

Bio-based outperforms conventional for **climate change**, and **resource use** and relatively aligned for **particulate matter**

Bio-based options perform worse regarding **freshwater ecotoxicity** and **eutrophication**

→ This is due to high use of synthetic pesticides and fertilizers to produce raw materials (maize) under industrialized agricultural conditions



WORM Project: facemask waste management example

What treatment methods have the highest impact?

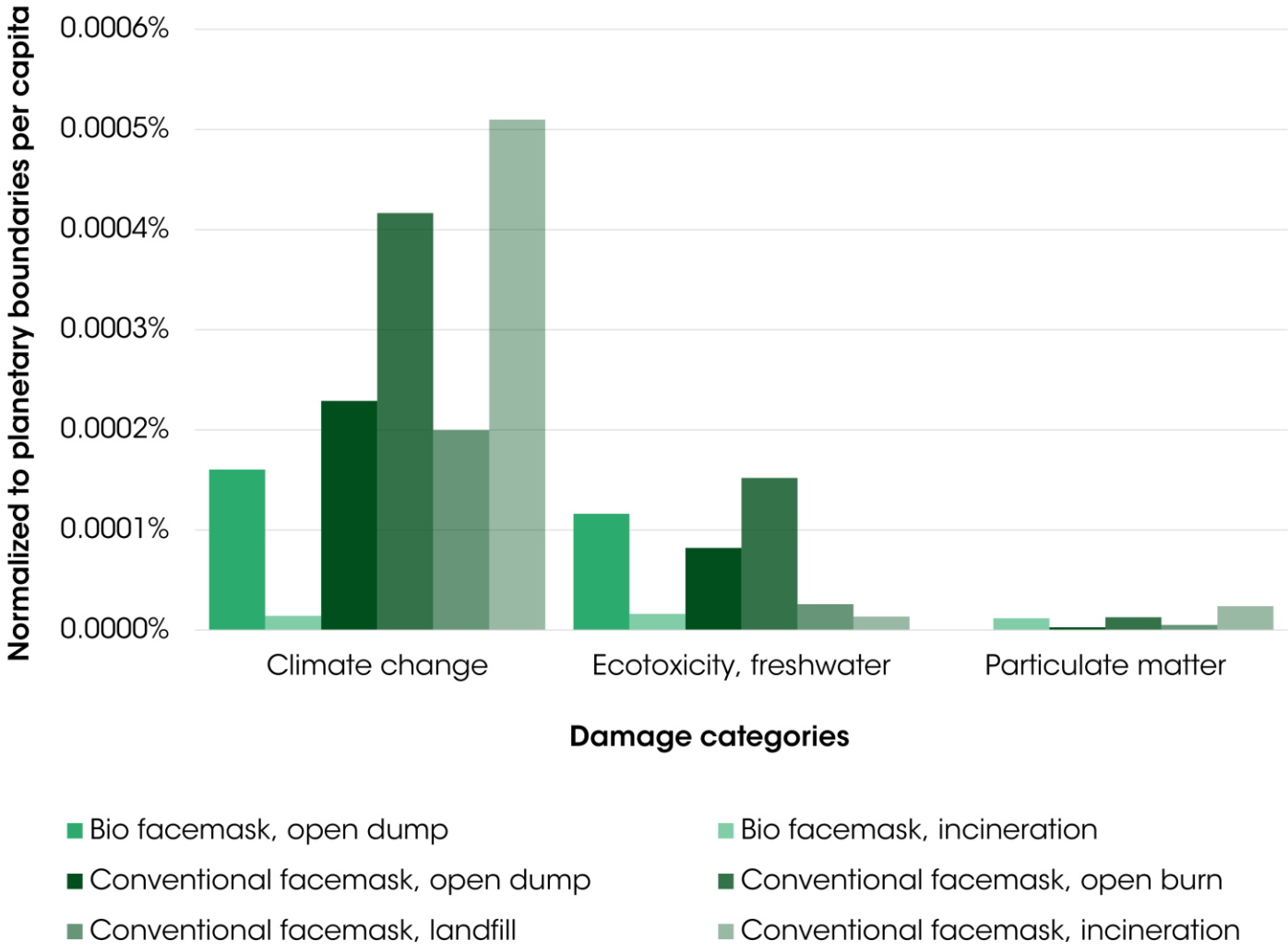
Waste in humanitarian Operations: Reduction and Minimisation

WM of bio-based products is **almost always lower** than conventional (e.g., plastic)

Incineration and open burning of fossil-based plastic materials is significantly higher for climate change

Open dumping bio-based products* leads to high climate change and freshwater ecotoxicity emissions than incineration

→ This is mostly due to the methane produced during the biodegradation process



*We assume the bio-based materials are also bio-degradable due to data limitations in the software

WORM Project: facemask hazardous waste management example

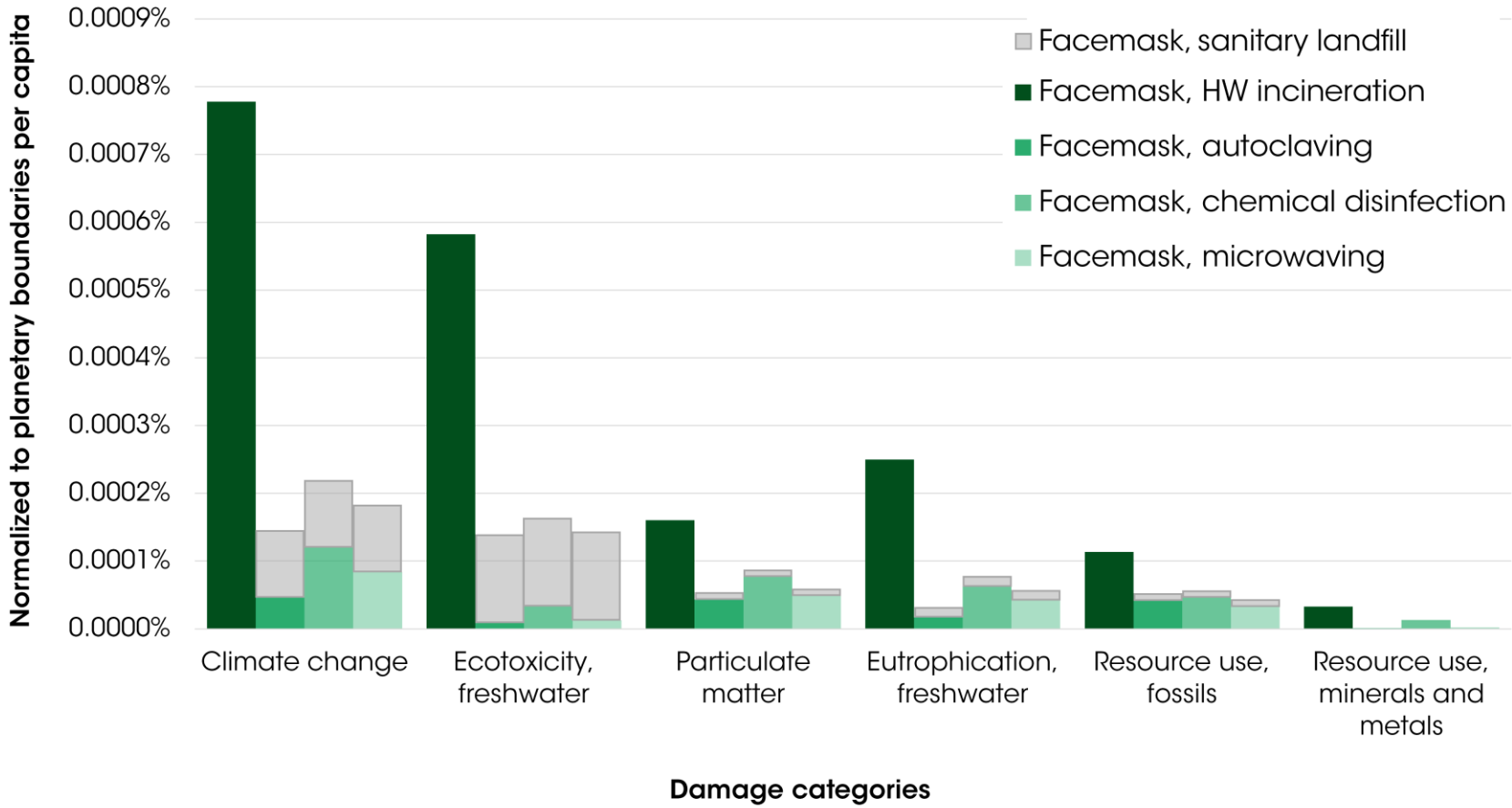
What is the result of alternative methods?

Waste in humanitarian Operations: Reduction and Minimisation

Incinerating hazardous waste has a significantly higher environmental footprint across all categories compared to alternative methods

Autoclaving, chemical disinfection, and microwaving produce relatively similar results

→ But autoclaving is the lowest among all methods



Summary and conclusions

Where should humanitarian organizations focus?

Product & supplier choice

The product & supplier choice contributes to roughly half of total emissions on average – thus, need to **systematically embed sustainability criteria** into procurement procedures

Procurement is also a gate keeper for the rest of the supply chain – design and purchase products with a **life cycle thinking approach**:

- Can it be repaired?
- How long will it last?
- Can it be recycled?

How the item is produced and what inputs (e.g., materials) are used is more important than **where** it is produced

+

Planning (efficiently)

Items move on average more than 15,000 km and are stored for 190 days before they reach their destination – **planning supply chains to reduce transport and storage times** is key for sustainability

Air transport results in roughly 70-80x more GHG emissions than sea – reduce air as much as possible through **anticipatory planning** (e.g., prepositioning as close to location as possible) and collaboration with other organizations

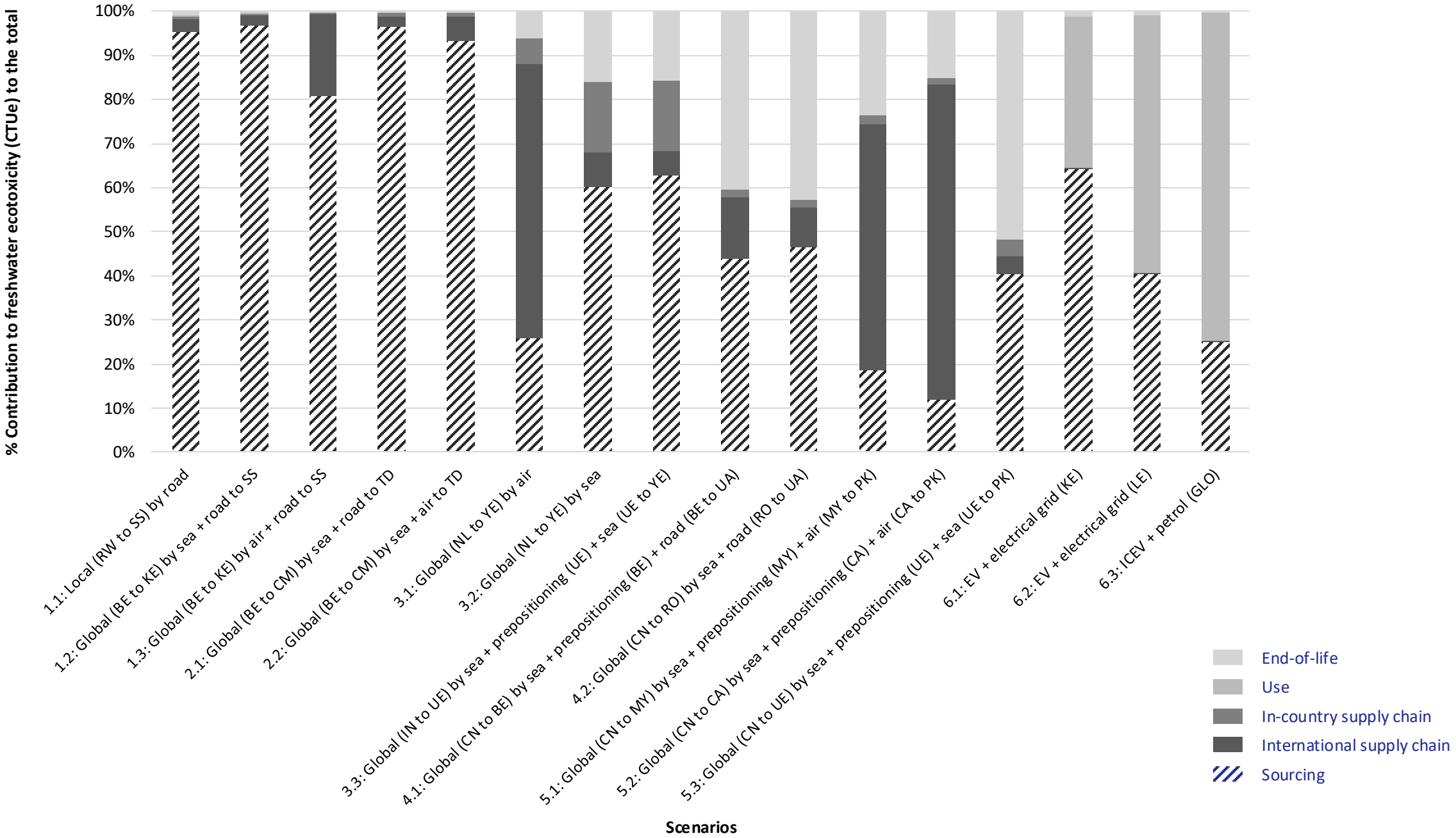
Complexities such as accessibility or cold chain requirements can drive up emissions should be **identified and prioritized**

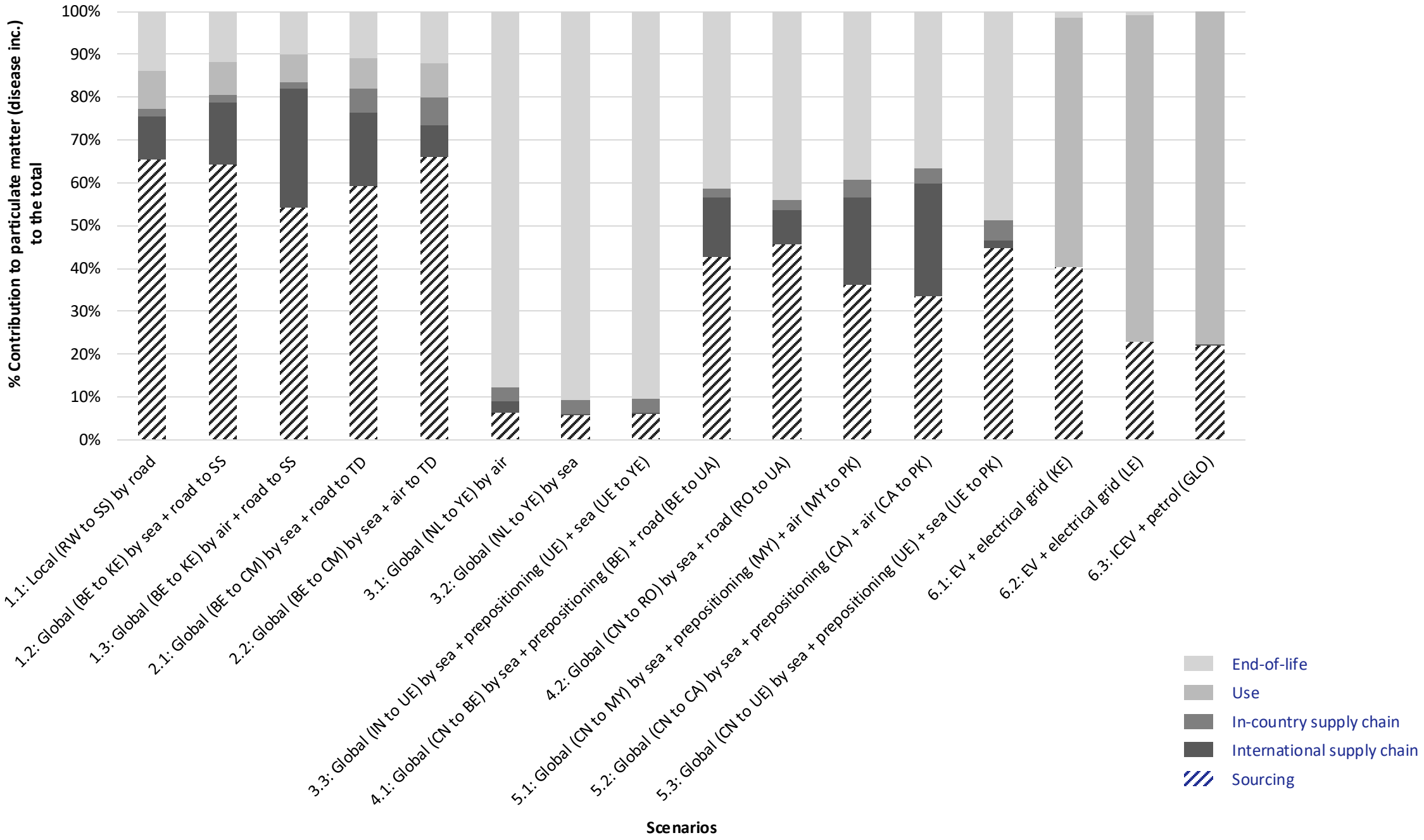
Thank you for your attention!
Questions?

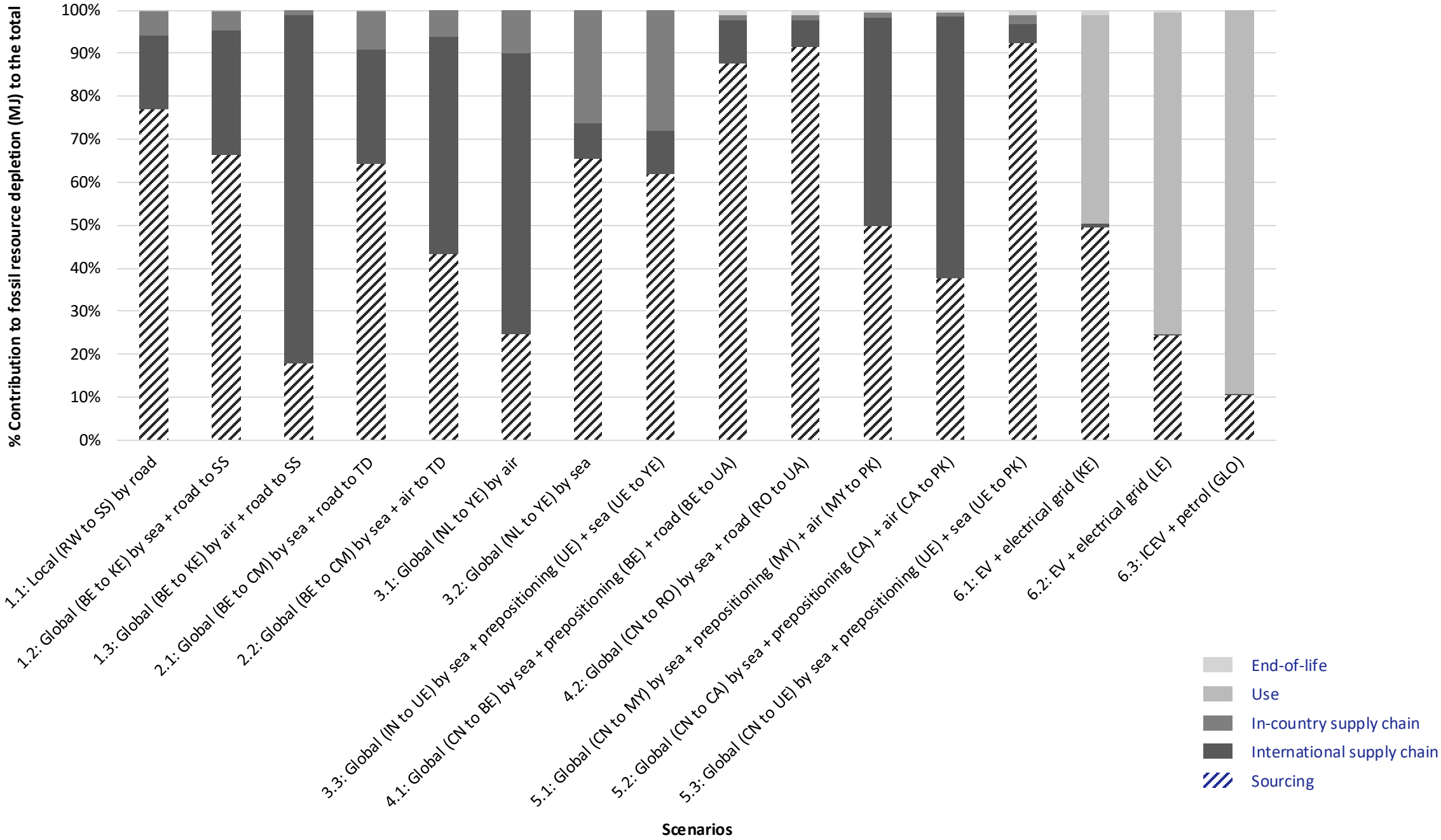
Contact me at: **sarah.joseph@klu.org**

3 Impact assessment categories

EF impact category	Abbreviation	Unit	Indicator	PB	PB per capita
Acidification	AC	molc H+ eq	Accumulated Exceedance (AE)	1.00E+12	1.25E+02
Climate change	CC	kg CO_2 eq	Global Warming Potential (GWP100)	6.81E+12	8.51E+02
Ecotoxicity, freshwater	ECOTOX	CTUe	Comparative toxic unit for ecosystems	1.31E+14	1.64E+04
Particulate matter	PM	Disease incidence	Impact on human health	5.16E+05	6.45E-05
Eutrophication, marine	MEU	kg N eq	Fraction of nutrients reaching marine end compartment (N)	2.01E+11	2.51E+01
Eutrophication, freshwater	FEU	kg P eq	Fraction of nutrients reaching marine end compartment (P)	5.81E+09	7.26E-01
Eutrophication, terrestrial	TEU	molc N eq	Accumulated Exceedance (AE)	6.13E+12	7.66E+02
Human toxicity, cancer	HTOX_c	CTUh	Comparative toxic unit for humans	9.62E+05	1.20E-04
Human toxicity, non-cancer	HTOX_nc	CTUh	Comparative toxic unit for humans	4.10E+06	5.13E-04
Ionising radiation, human health	IR	kBq U^{235} eq	Human exposure efficiency relative to Uranium 235	5.27E+14	6.59E+04
Land use	LU	kg soil loss	Soil erosion	5.19E+15	6.48E+05
Ozone depletion	ODP	kg CFC-11 eq	Ozone depletion potential	5.39E+08	6.74E-02
Photochemical ozone formation, human health	POF	kg NMVOC eq	Tropospheric ozone concentration increase	4.07E+11	5.09E+01
Resource use, fossils	FRD	MJ	Abiotic resource depletion - fossil fuels	2.24E+14	2.80E+04
Resource use, mineral and metals	MRD	kg Sb eq	Abiotic resource depletion - ultimate reserves	2.19E+08	2.74E-02
Water use	WU	m^3 world eq	User deprivation potential	1.82E+14	2.28E+04


% Contribution to freshwater ecotoxicity (CTUe) to the total
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1.1: Local (RW to SS) by road
1.2: Global (BE to KE) by sea + road to SS
1.3: Global (BE to KE) by air + road to SS
2.1: Global (BE to CM) by sea + road to TD
2.2: Global (BE to CM) by sea + air to TD
3.1: Global (NL to YE) by air
3.2: Global (NL to YE) by sea
3.3: Global (IN to UE) by sea + prepositioning (UE) + sea (UE to YE)
4.1: Global (CN to BE) by sea + prepositioning (BE) + road (BE to UA)
4.2: Global (CN to RO) by sea + road (RO to UA)
5.1: Global (CN to MY) by sea + prepositioning (MY) + air (MY to PK)
5.2: Global (CN to CA) by sea + prepositioning (CA) + air (CA to PK)
5.3: Global (CN to UE) by sea + prepositioning (UE) + sea (UE to PK)
6.1: EV + electrical grid (KE)
6.2: EV + electrical grid (LE)
6.3: ICEV + petrol (GLO)
Scenarios
End-of-life
Use
In-country supply chain
International supply chain
Sourcing


% Contribution to particulate matter (disease inc.) to the total
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1.1: Local (RW to SS) by road
1.2: Global (BE to KE) by sea + road to SS
1.3: Global (BE to KE) by air + road to SS
2.1: Global (BE to CM) by sea + road to TD
2.2: Global (BE to CM) by sea + air to TD
3.1: Global (NL to YE) by air
3.2: Global (NL to YE) by sea
3.3: Global (IN to UE) by sea + prepositioning (UE) + sea (UE to YE)
4.1: Global (CN to BE) by sea + prepositioning (BE) + road (BE to UA)
4.2: Global (CN to RO) by sea + road (RO to UA)
5.1: Global (CN to MY) by sea + prepositioning (MY) + air (MY to PK)
5.2: Global (CN to CA) by sea + prepositioning (CA) + air (CA to PK)
5.3: Global (CN to UE) by sea + prepositioning (UE) + sea (UE to PK)
6.1: EV + electrical grid (KE)
6.2: EV + electrical grid (LE)
6.3: ICEV + petrol (GLO)
Scenarios
End-of-life
Use
In-country supply chain
International supply chain
Sourcing


% Contribution to fossil resource depletion (MJ) to the total
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1.1: Local (RW to SS) by road
1.2: Global (BE to KE) by sea + road to SS
1.3: Global (BE to KE) by air + road to SS
2.1: Global (BE to CM) by sea + road to TD
2.2: Global (BE to CM) by sea + air to TD
3.1: Global (NL to YE) by air
3.2: Global (NL to YE) by sea
3.3: Global (IN to UE) by sea + prepositioning (UE) + sea (UE to YE)
4.1: Global (CN to BE) by sea + prepositioning (BE) + road (BE to UA)
4.2: Global (CN to RO) by sea + road (RO to UA)
5.1: Global (CN to MY) by sea + prepositioning (MY) + air (MY to PK)
5.2: Global (CN to CA) by sea + prepositioning (CA) + air (CA to PK)
5.3: Global (CN to UE) by sea + prepositioning (UE) + sea (UE to PK)
6.1: EV + electrical grid (KE)
6.2: EV + electrical grid (LE)
6.3: ICEV + petrol (GLO)
Scenarios
End-of-life
Use
In-country supply chain
International supply chain
Sourcing

Advocacy paper: 6 LCA case studies

Description of case studies and scenarios

Case study	Supply chain scenarios	Average distance traveled (km)	Average storage time (days)
(1) Food: maize-soy blend, CSB++ delivered to South Sudan	1.1: Local (Rwanda to South Sudan) by road 1.2: Global (Belgium to Kenya) by sea + road to South Sudan 1.3: Global (Belgium to Kenya) by air + road to South Sudan	9,403	188
(2) Food: maize-soy blend, CSB++, delivered to Chad	2.1: Global (Belgium to Cameroon) by sea + road to Chad 2.2: Global (BE to CM) by sea + air to TD	11,390	110
(3) Health: reproductive health kit, Kit 6B, delivered to Yemen	3.1: Global (Netherlands to Yemen) by air 3.2: Global (Netherlands to Yemen) by sea 3.3: Global (India to United Arab Emirates (UE)) by sea + prepositioning (UE) + sea (UE to Yemen)	14,725	328
(4) Shelter: tarpaulin, IFRC standard tarpaulin, delivered to Ukraine	4.1: Global (China to Belgium) by sea + prepositioning (Belgium) + road (Belgium to Ukraine) 4.2: Global (CN to Romania (RO)) by sea + road (RO to UA)	20,153	115
(5) Shelter: tarpaulin, IFRC standard tarpaulin, delivered to Pakistan	5.1 Global (China to Malaysia) by sea + prepositioning (Malaysia) + air (Malaysia to Pakistan) 5.2 Global (China to Canada) by sea + prepositioning (Canada) + air (Canada to Pakistan) 5.3 Global (China to UE) by sea + prepositioning (UE) + sea (UE to Pakistan)	19,884	208
(6) Fleet: electric vehicle (EV) and internal combustion engine vehicle (ICEV) used in Kenya and Lebanon	6.1: EV + electrical grid (Kenya) 6.2: EV + electrical grid (Lebanon) 6.3: ICEV + petrol (Global average (GLO))	n.a.	n.a.

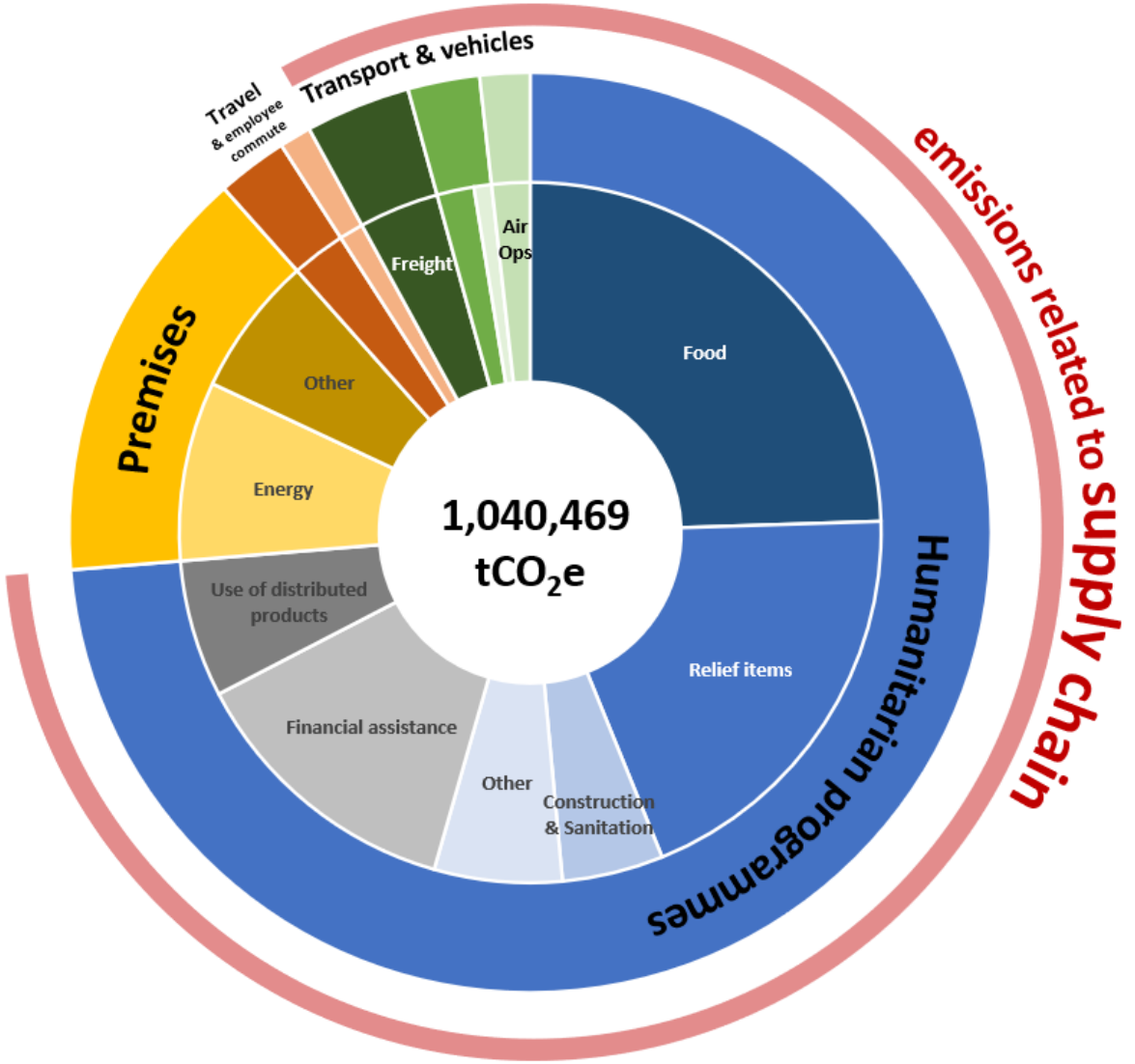
HPNW 2025 ICRC

Carmen Garcia Duro

Sustainable Supply Chain Alliance Project Manager

ICRC

ICRC
Carbon accounting results 2022



Carbon accounting first measuring ICRC 2018

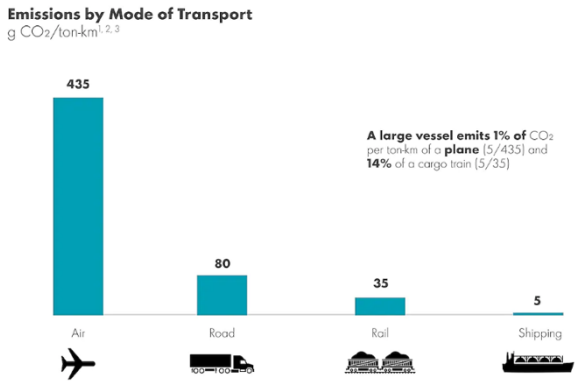
What really drives C02 emissions in a product

- **Manufacturing & Raw Materials – 60-70%** *
- Energy Source Used in Production – 10-15%
- Transport (by sea/land) – 5-10%
- Packaging & Distribution – 5%

Sustainable specifications + QUALITY / LIFESPAN!

- **Transport (by air)** – **30-50%** (if applicable)

Reduction of air transport, without increasing lead time PLANNING (forecasting + demand planning)



* Carbon footprint fact sheet, Center fos sustainable systems (css.umich.edu)

Review of main EHI

Many stakeholders.
- Interal: ICRC Logistics and ECOSEC (requester), beneficiaries
- External: IFRC, UNHCR, QSE working group, Suppliers, Universties, etc.

ICRC

Video: Eco-design tarpaulin - towards a more sustainable future (vimeo.com)

Tarpaulin

14% reduced weight
Doubled lifespan by improving the strenght, UV resistance, etc

Hygienic parcel

Ecofriendly materials, reducing volume (aprox.40%) and plastic,

Solar lamp

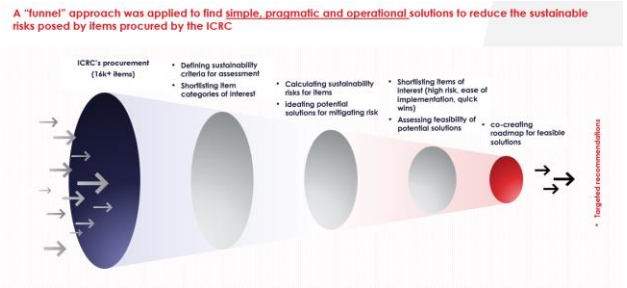
OLD

VS

NEW

Higher durability, reduction of volume (more than 50%)

Impact of reducing Weight & Volume
- ⚙ **Less material and energy used in production**
- 🚚 **Less volume needed for transport**
- ♻ **Less waste generated at the end of life**
- ✔ $ **NO HIGHER COST!**



Sorghum vs rice

90% c02 reduction

30% reduction of cost

SUSTAINABLE SUPPLY CHAIN - ICRC Logistics web page

Life Cycle Analysis

ICRC

LCA done?

LCA, YES or NOT? No really although it can help to

- Data-driven decisions
- Able to prove your reduction
- Identify areas of improvements

LCA done?

Sorghum vs rice

General emissions factors

Where can an organisations start?

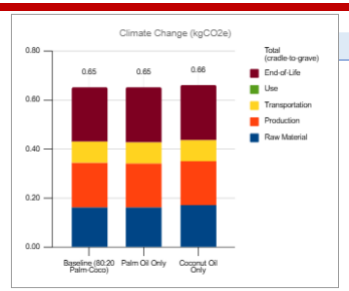
- Carbon Accounting
- Highest Spend
- Prioritize categories with high impact
  - Focus on durability, material, etc.

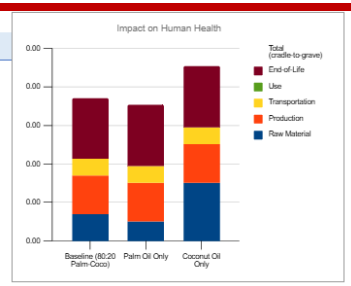
THE MOST IMPORTANT – *start the conversation* *internally and externally with suppliers.*

Functional Unit	1 soap bar							
VALUES	Use Life (yrs)	Reference Flows		Weight (kg)	Packaging (kg)			
Palm/Coco w. pckg	1.00	1.00		0.26	0.01	Palm Oil	0.614	0.15964
Palm/Coco w. paper pckg	1.00	1.00				Coconut Oil	0.139	0.03614
Palm/Coco no pckg	1.00	1.00				Total/kg	0.753	0.19578

Results Table (incl. Reference Flows)	Total Climate Change (kgCO2eq)			Total Human Health (weighted)		
	Baseline (80:20 Pa	Palm Oil Only	Coconut Oil Only	Baseline (80:20 Pa	Palm Oil Only	Coconut Oil Only
Raw Material	0.16	0.16	0.17	1.74E-05	1.28E-05	3.78E-05
Production	0.18	0.18	0.18	2.51E-05	2.51E-05	2.51E-05
Transportation	0.09	0.09	0.09	1.07E-05	1.07E-05	1.07E-05
Use	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00
End-of-Life	0.22	0.22	0.22	3.96E-05	3.96E-05	3.96E-05
Total (cradle-to-grave)	**0.65**	**0.65**	**0.66**	**9.29E-05**	**8.82E-05**	**1.13E-04**
		0.26%	-1.17%		4.97%	-21.97%
Total (cradle-to-gate)	**0.34**	**0.34**	**0.35**	**4.25E-05**	**3.79E-05**	**6.29E-05**
		0.50%	-2.21%		10.87%	-48.01%

Total/unit





Unitaid
SAVE LIVES FASTER

Key Insights from Life Cycle Analyses: Unitaid's Climate Perspectives on Global Health

unitaid.org

Humanitarian Networks and Partnerships Weeks

Reducing the carbon and environmental footprint of procurement, March 25, 2025

About Unitaid

Unitaid accelerates the introduction and adoption of lifesaving health products in LMICs through catalytic grants in HIV, TB, malaria, maternal & child health, and global pandemics.

1. **Unitaid is a Grant-Making Organization** dedicated to introducing and ensuring equitable access to innovative prevention, treatments, diagnostics, and health tools in low- and middle-income countries.

2. **Unitaid Plays a Market-Shaping Role** by identifying and addressing barriers that prevent lifesaving health products from reaching those who need them

3. **Unitaid's Has Climate and Health Strategy.** Unitaid's climate-smart approach prioritizes health products with strong value for health and :

   - With lower carbon and environmental footprints
   - Resilient to climate-induced risks
   - Responding to climate-driven health needs
   - Locally adapted

- HIV
- Tuberculosis
- Malaria
- Women & children's health
- Global health emergencies

US$200m grant making/year

Our funders

“From Milligrams to Megatons” Study: a LCA-based, climate and nature assessment of ten health products

Study Goals

1. **Hotspots at Market Scale:** Understand climate and nature risks & impacts of strategic health value chains
2. **Solutions:** Set agenda for action to mitigate risks and impacts in an affordable way
3. **Evidence:** Contribute to learning, with a framework applicable to other value chains

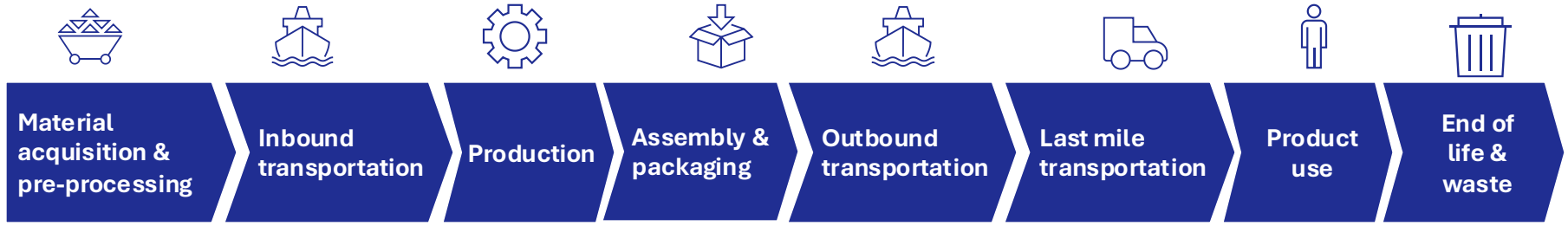
Products in scope

- **Medicines** (5 small molecule medicines)
- **Diagnostics** : Rapid tests, Point-of-Care Diagnostics, Integrated Diagnostics Platforms (x3)
- **Vector control products**: Dual AI Mosquito nets
- **Oxygen**: Production of medical oxygen via PSA plants

Impacts & risk categories

- GHG emissions (GHG-P, PAS2050)
- Nature impacts
- Climate & nature risks

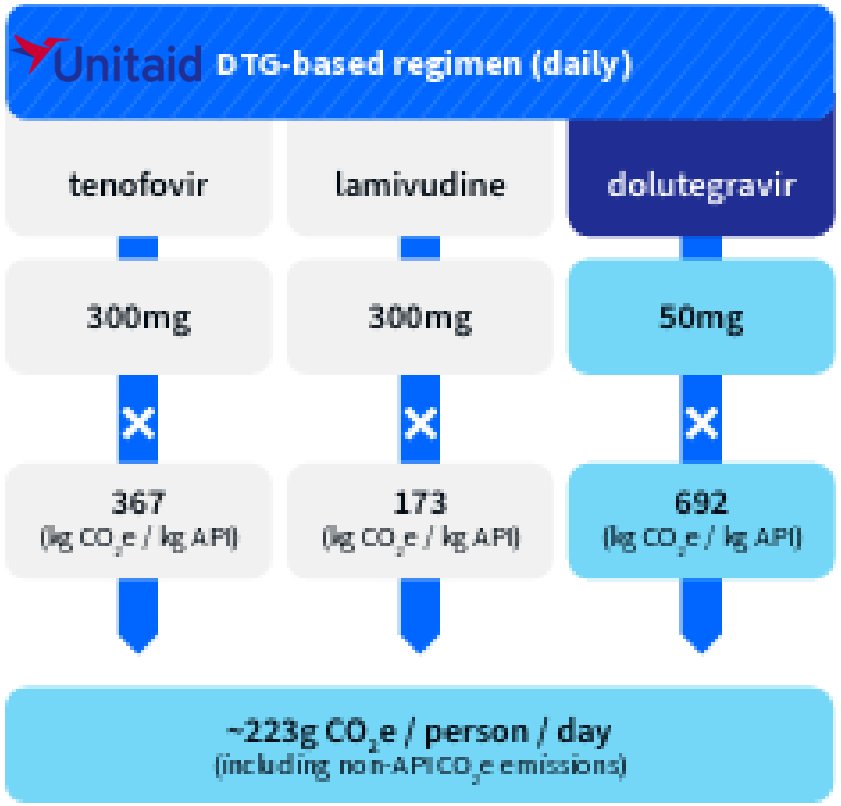
Life cycle approach



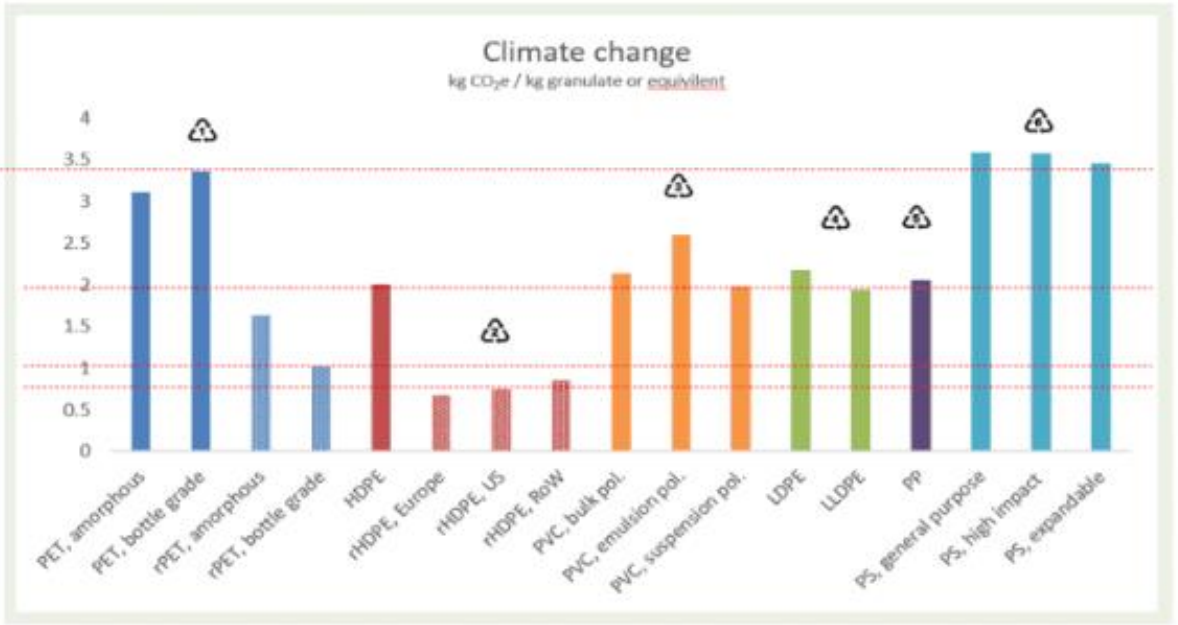
Key Insights

The Hidden Carbon Impact of Medicines

Medicines' active pharmaceutical ingredients (API) are highly carbon intensive: 1 kg of API can emit up to 692 kg of CO_2 e (and even more!)



VS



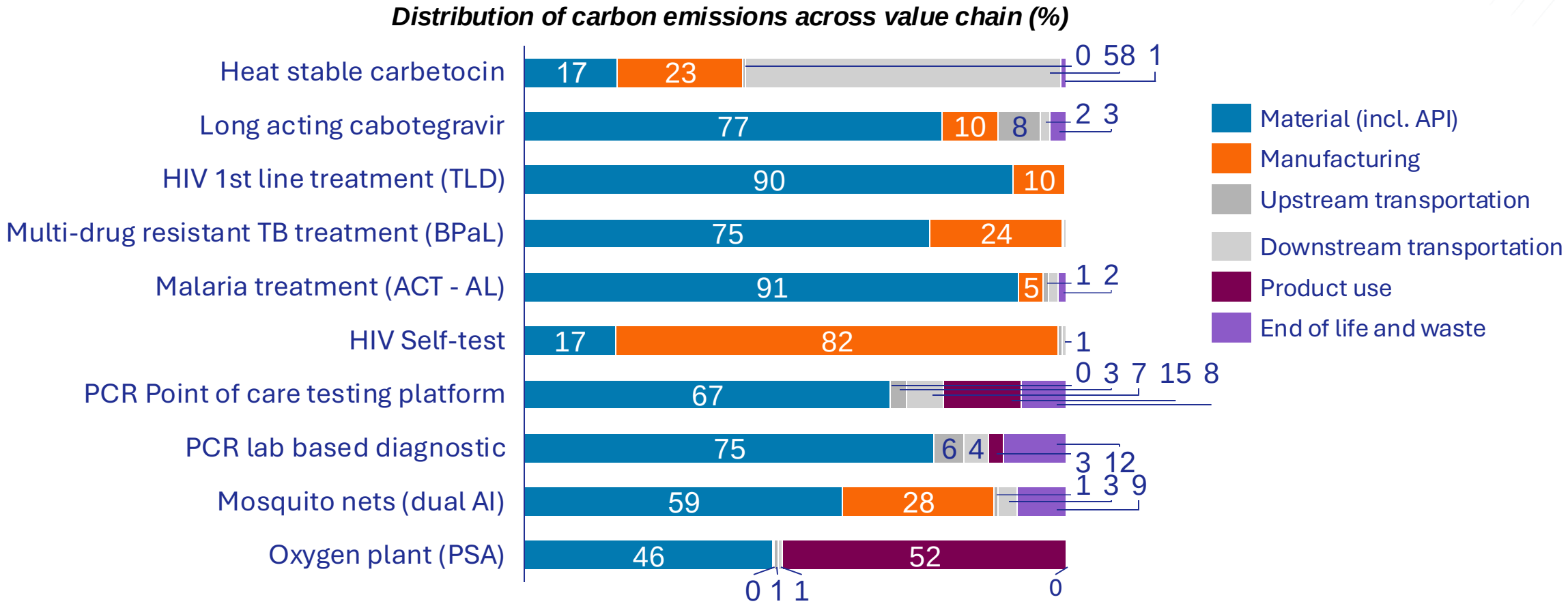
Study: Not all plastic's carbon footprints are equal

Carbon intensity of plastics

Min: 0.7KgCO2/Kg
Max: 3.5KgCO2/Kg

Global Health Supply Chains: A Climate Blindspot

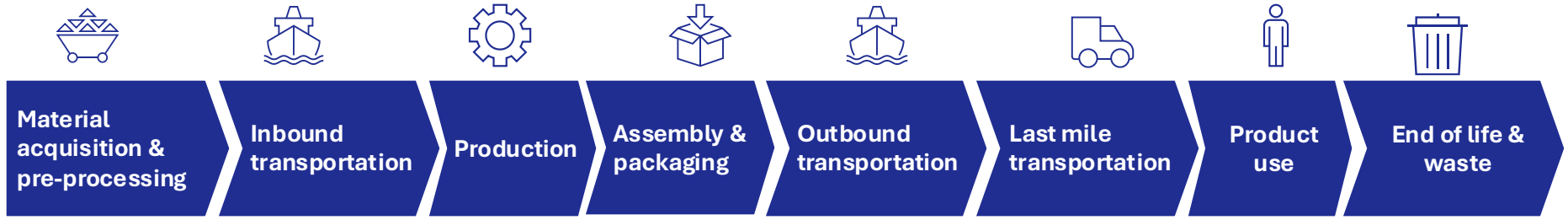
Over 80% of products' carbon footprint is locked in before it reaches a patient, with majority of emissions originating from upstream manufacturing



Nature impacts at both ends of health supply chains

Health value chains are water- and waste intensive and can be toxic.

Nature impacts are notably problematic upstream and downstream



Upstream impacts are driven by water pollution and leakage of hazardous materials, including toxic solvents like chloroform used to make ACT, and B-PaL APIs which accelerate antimicrobial resistance

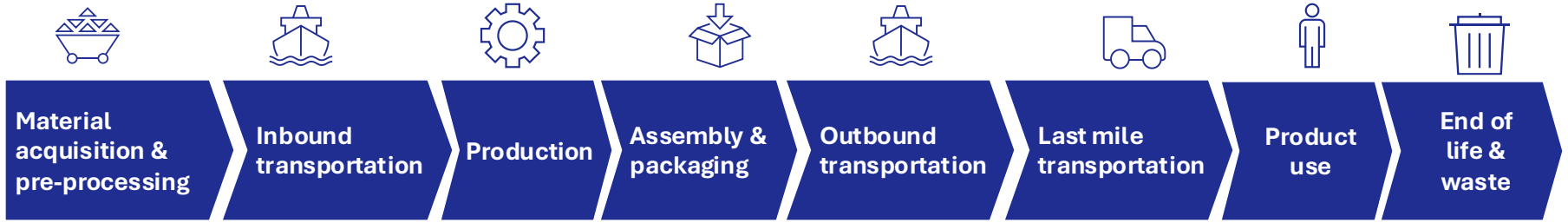
Downstream impacts are driven by waste, such as plastic pollution from single-use products (eg rapid tests, bed nets).

Ex: Malaria bed nets are expected to create 57,500 tons of plastic waste by 2030

Impacts are concentrated in regions with more sensitive natural environments and fewer resources for waste management.

Heat Sensitivity & Climate Vulnerability

Artemisinin-based Combination Therapies (ACTs) save millions of lives from malaria but are increasingly vulnerable to climate change at every stage of their supply chain



Artemisia Annual can be affected by droughts (eg, drop in crop yield, less concentration of active ingredients)

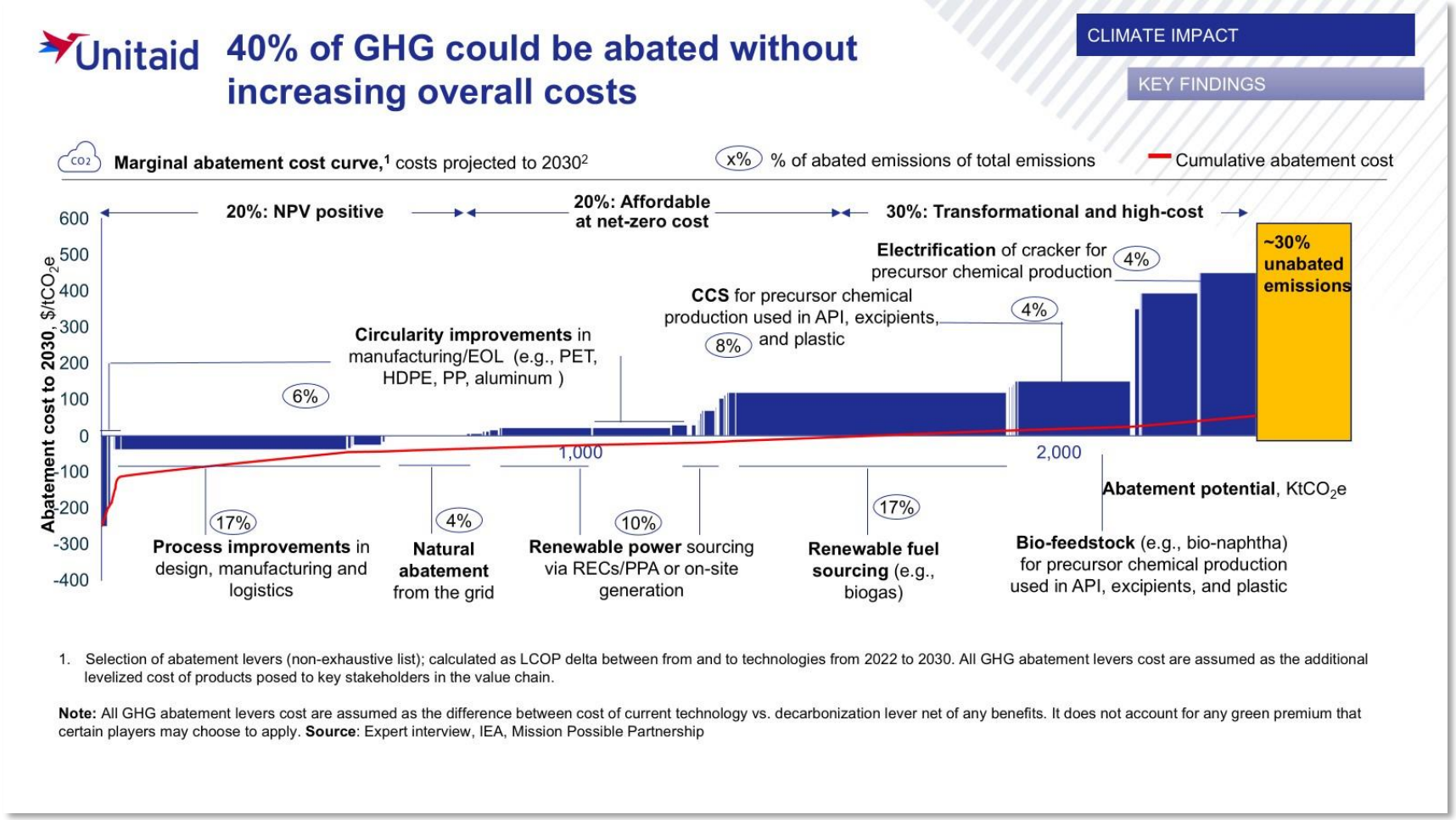
Potential concentration risks in climate hazard exposed manufacturing hubs

The heat stability of certain ACT formulations may be compromised by climate conditions along the supply chain, particularly during storage, which requires temperatures below 30°C.

Decarbonization for zero costs to patients

Carbon emissions could be reduced through a combination of process, material, and energy efficiencies, along with renewable energy – at no cost to patients or product users.

Consolidated Marginal Abatement Cost Curve



Leveraging Life Cycle Assessment to Drive Decarbonization

Unitaid's Journey Toward Decarbonizing First-Line HIV Treatment for LMICs: From Initial LCA to Decarbonization Initiatives

2023

"Outside-in" LCA

- Antiretroviral treatment
- 3 drug-in-one daily pill of 650 milligrams

Carbon footprint: 1.6 megatons of CO2 at market scale

2024-2025

Real-world LCA

- Advanced GHG footprinting (secondary to primary data, market and supplier-levels)
- Pressure-testing of decarbonization potential
- Detailed decarbonization lever analysis

Market analyses

- Volumes, market dynamics
- Decarbonization barriers
- Opportunities and co-benefits
- Product development pipeline

Ongoing

Decarbonization through market shaping interventions

1. Manufacturers
2. Procurement
3. Financing
4. Regulators
5. Patient populations
6. Product adaptation / development
7. Countries (NDC)

Questions?

https://unitaid.org/climate-and-health

More about Unitaid's climate and health work

Unitaid's climate and health strategy

How we define climate-smart health products

Not harmful
Products that are not harmful to climate and nature, globally and locally, all along their life cycle – from minimized greenhouse gas emissions during manufacturing to responsible recycling.

Resilient
Products that can be manufactured, delivered, stored and used in a way that is resilient to climate and nature risks.

Responsive
Products that address the evolving needs of communities in low- and middle-income countries impacted by climate change, including health risks exacerbated by climate change and increases in infectious diseases.

Locally adapted
Products that are delivered as part of locally adapted interventions, based on local context and knowledge, delivered through community-led models, and produced regionally.

More on: https://unitaid.org/climate-and-health

Unitaid's studies