



Product Stewardship as an enabler to Net Zero

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Net Zero *Impact*

Net zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere

Important because (for CO2 at least) – this is the state at which global warming stops

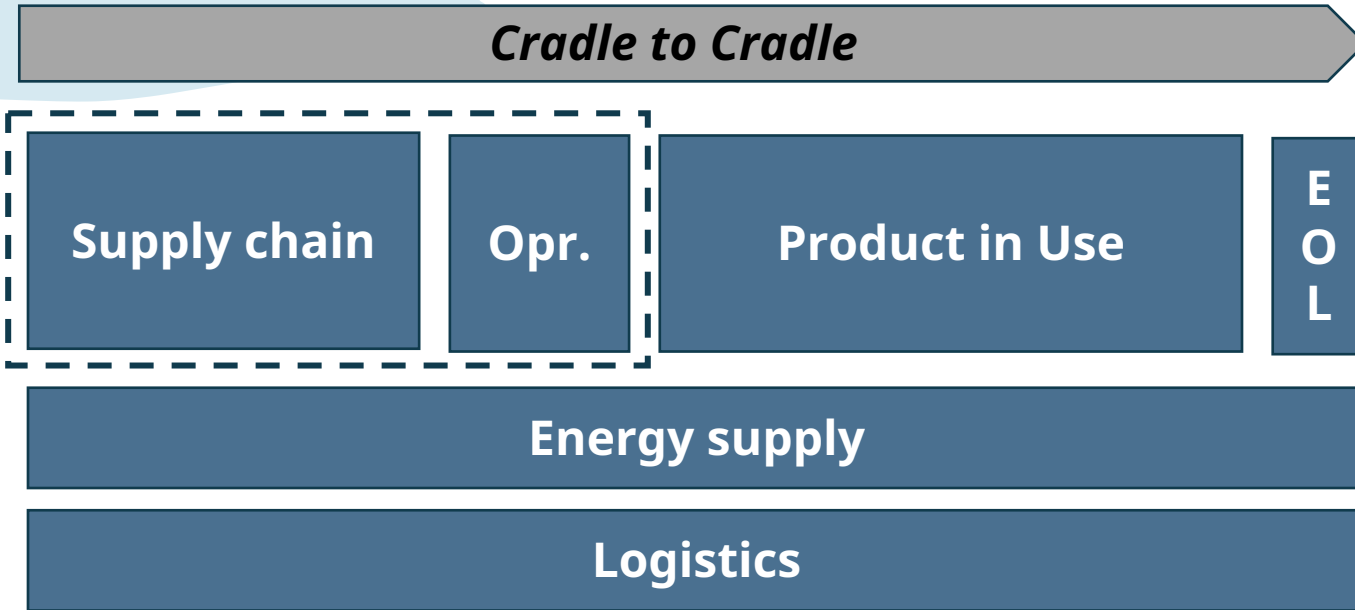
Extended to other Planetary boundary impact areas – Water, Novel entities, Land use, Biodiversity etc.

Product stewardship involves the responsible management of the lifecycle of a product to minimize its environmental impact and maximize its value

Product Stewardship Principles:

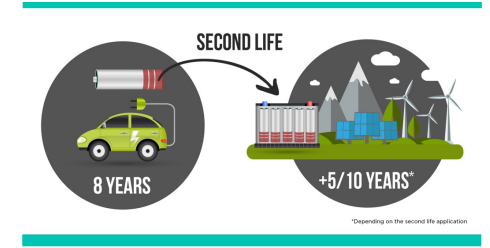
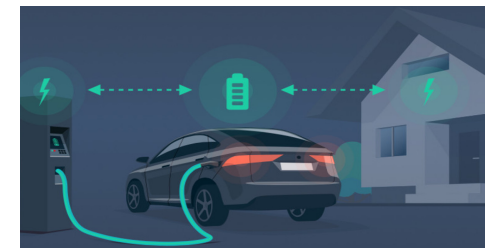
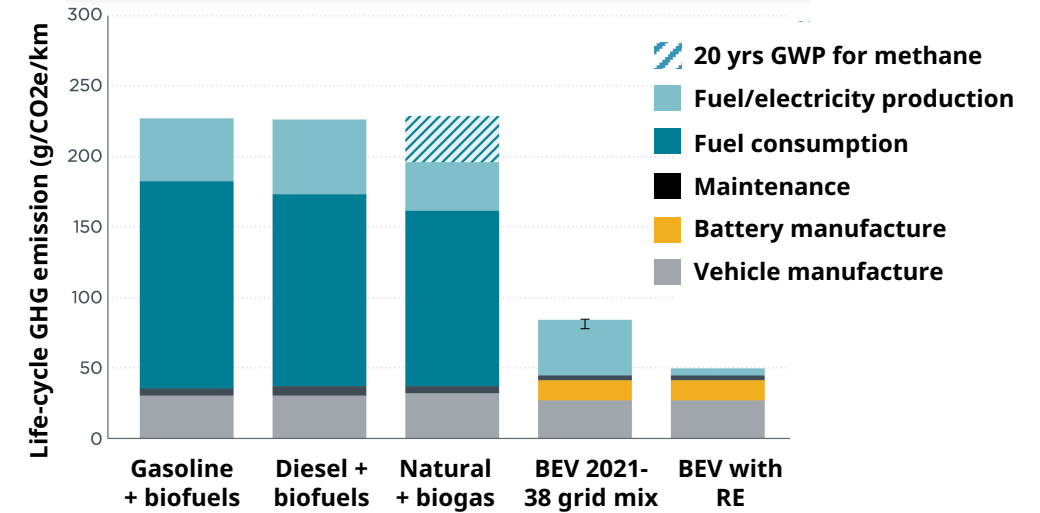
- 1 Life cycle impact assessment
- 2 Designing for Sustainability
- 3 Effective Waste Management
- 4 Collaborations for shared responsibility
- 5 Consumer engagement & behavior shift

1 Life cycle impact assessment



	Manufacturing	Product In Use	End of life
Automotive (ICE)	17%	85%	(2%)
Automotive (EV)	58%	50%	(8%)
Mobile	80%	17%	3%
Garments	70%	20%	10%
Machine tools	35%	60%	5%

Life-cycle GHG emissions (EU regd. Cars 2021)



2 Design for Sustainability

Designing for sustainability involves balancing social, ethical and environmental issues alongside economic factors within the product or service development process. (Curtis and Walker)

Six sustainable Design strategies

Circularity

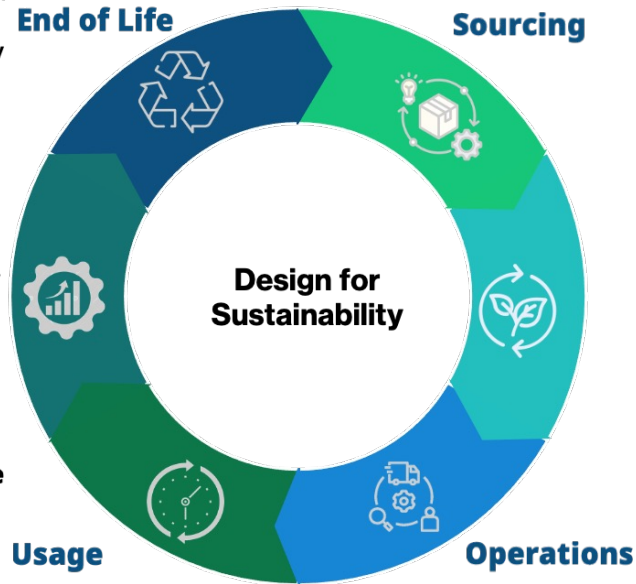
- Design for disassembly
- Design for end-of-life collection
- Design for reuse
- Design for material traceability
- Enable material homogeneity

Product Efficiency

- Variable energy consumption
- Energy consumption efficiency
- Material consumption efficiency
- Change consumer behavior

Longevity and effective usage

- Design to last
- Design for remanufacturing
- Design for multiple uses
- Design for upgradability & adaptability
- Design for reparability and maintenance



Dematerialization

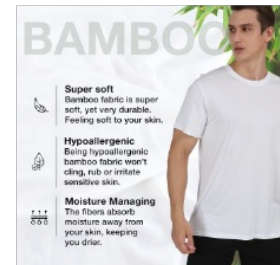
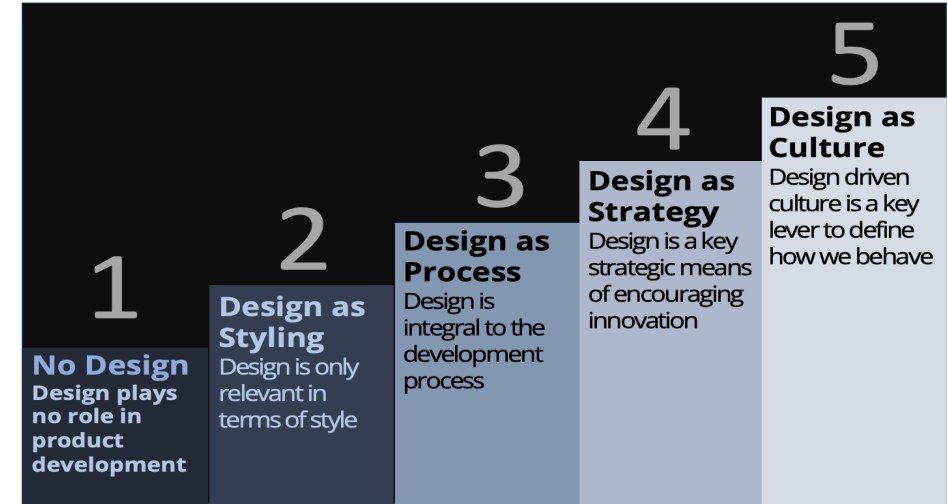
- Content reduction
- Product as a Service /Service/ Virtualization
- Digitization
- Weight reduction
- Minimal material & packaging
- Generative design

Next-best material selection

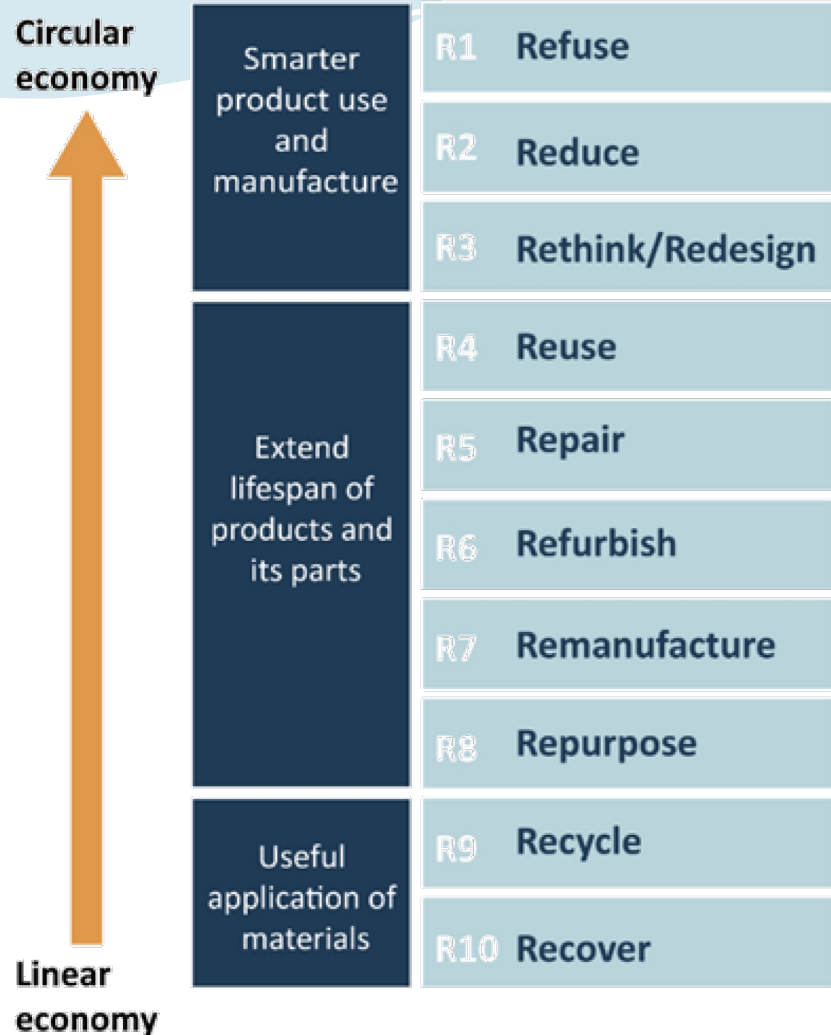
- Renewable and biodegradable material
- Recycled material
- Recyclable material
- Lightweight material

Green Supply chain

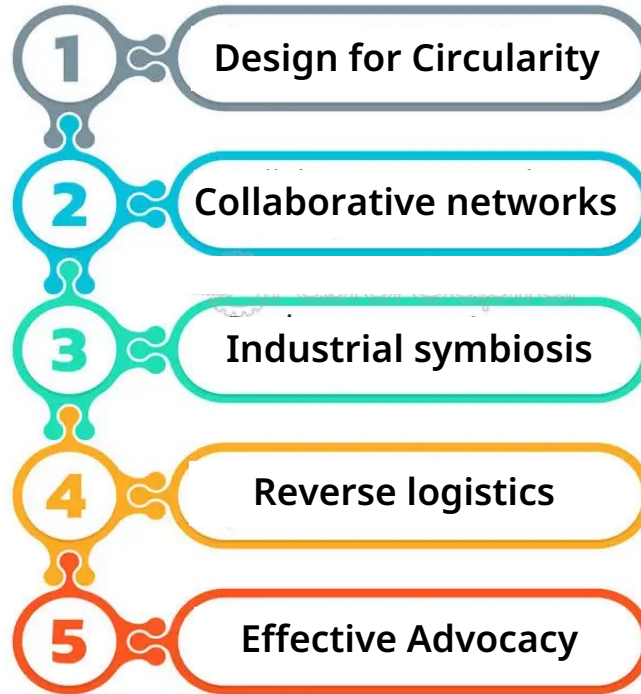
- Frugal processes and operations
- Detoxified processes
- Standardization and modularity
- Design for logistics



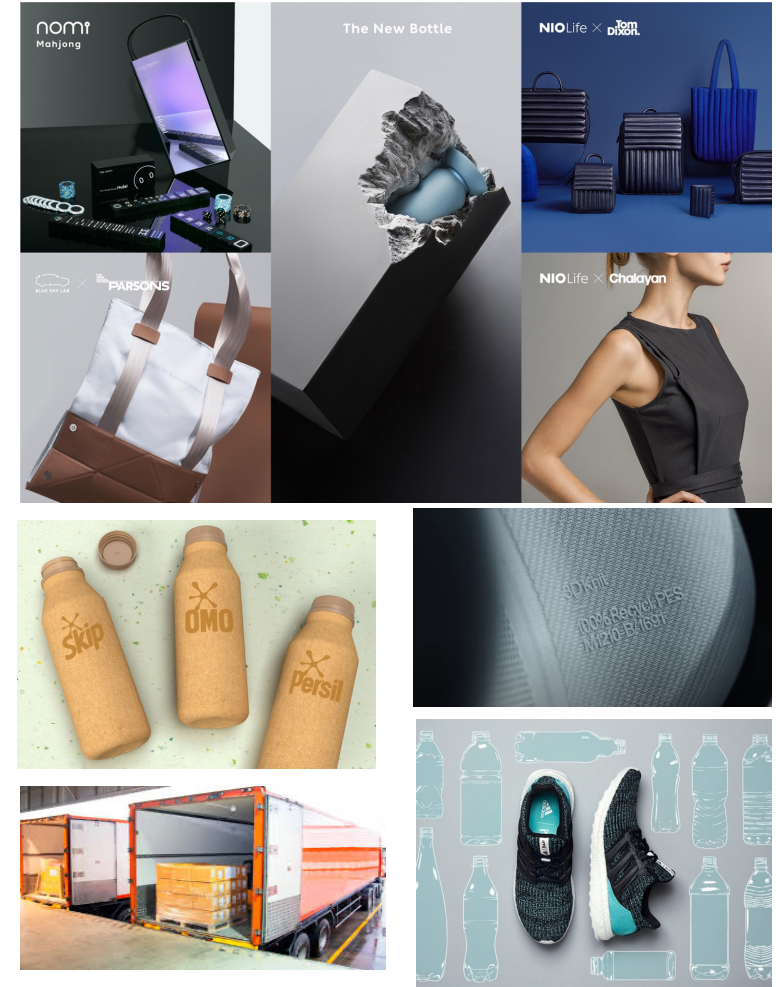
3 Effective Waste management



Creating Value - enablers



- Global circularity rate is 7.2% currently
- India produces 65 MT of waste every year, which is estimated to go up to 165 MT by 2030 and 436 MT by 2050



4 Collaborations for shared responsibility

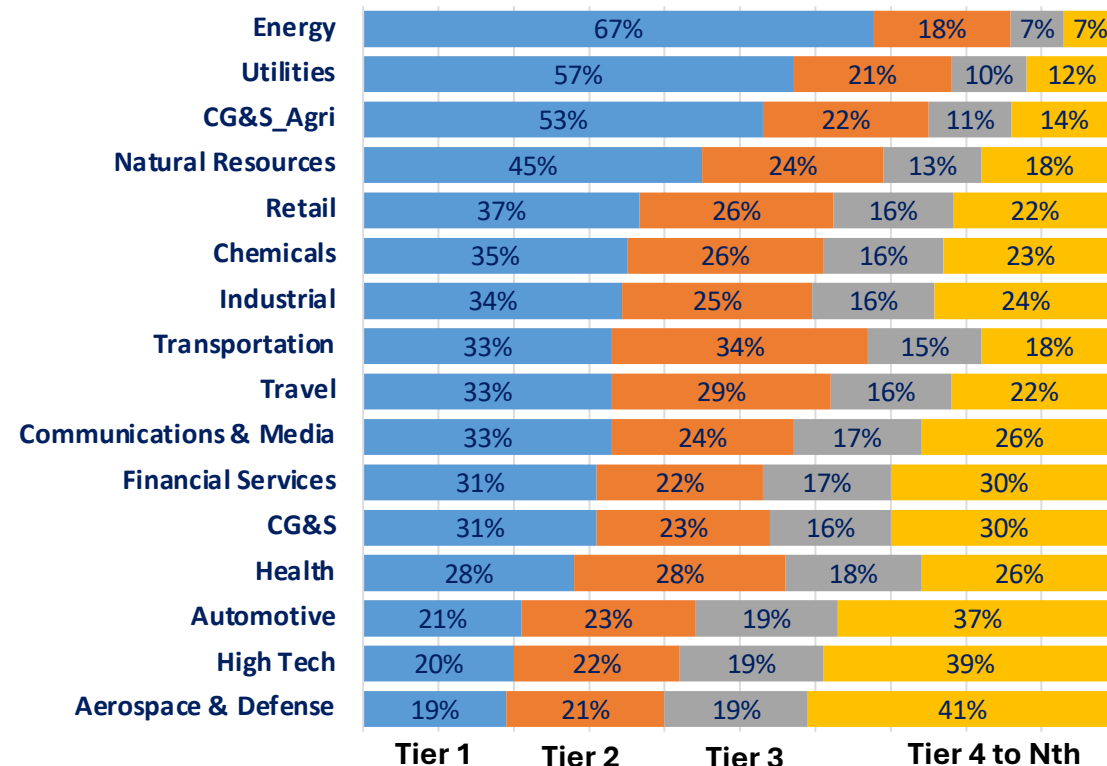
From Value chains to Value clusters.....



Downstream players and their impact is additional load/opportunity:

- Collection and scrapping centers
- Reverse logistics players
- Recyclers and repurposing agencies with 2nd life users

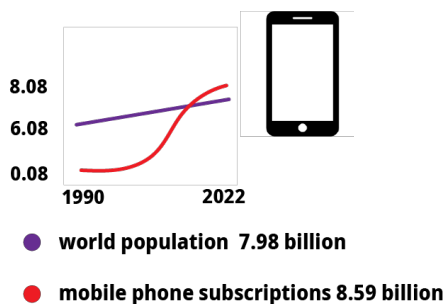
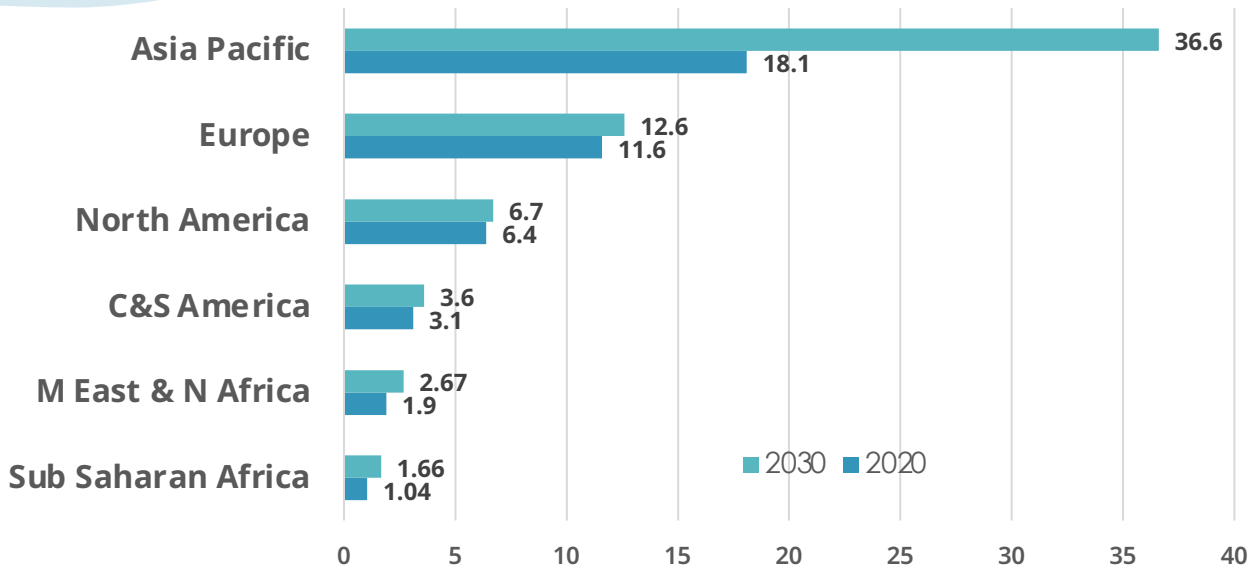
Distribution of upstream emissions by supplier tier



Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

5 Consumer engagement & behavior shifts.....

Spending by the global middle class (\$Tr)

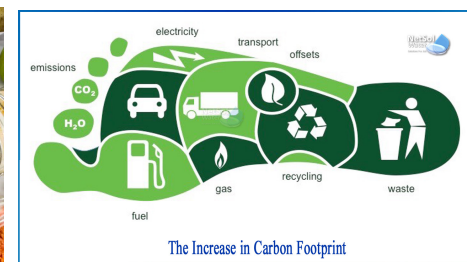
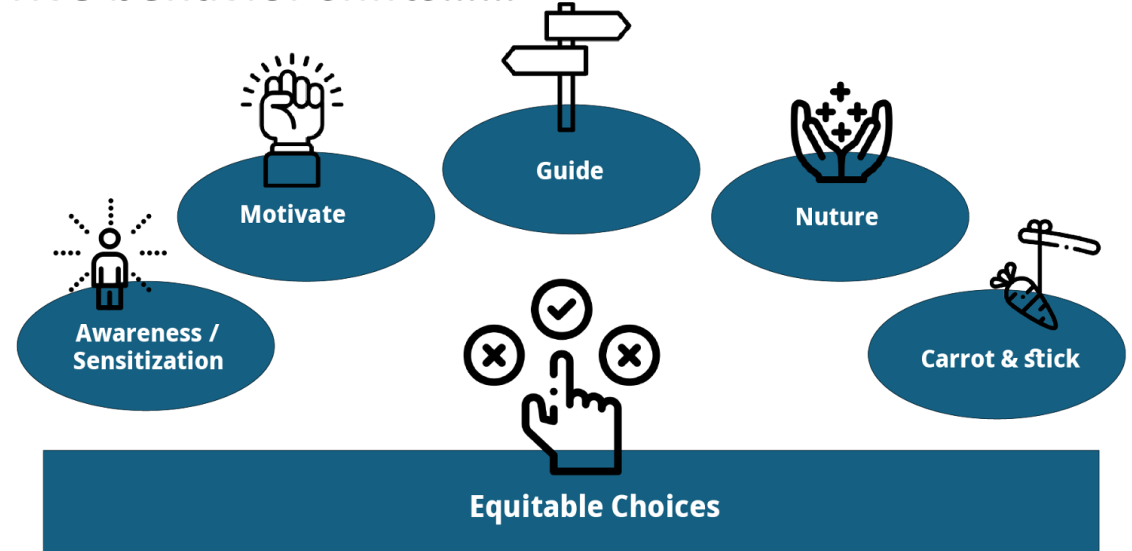


80-150 billion garments produced, of which 30% are never sold, 50% are disposed off within a year, 92 Million tons toxic waste, 12.8 Million tons to landfill



Estimated 1.47Bn cars globally (183cars/1000 people)
 USA – 860; Germany – 627
 Finland – 577; China – 223;
 India – 33

Drive behavior shifts.....





'If there is no planet, there is no sport.' - Nike

An absolute reduction of Scope 1 and 2 emissions by 65% and Scope 3 emissions by 30% by 2030

Net Zero by 2050

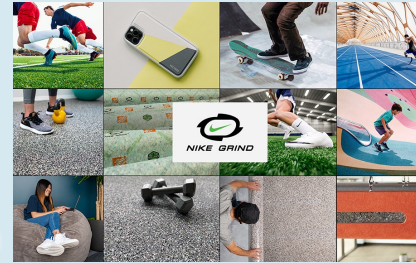
- Materials make up about 70% of Nike's GHG footprint.
- The company is aiming to reduce 0.5 million tons of GHG emissions by 2025
- 100% waste diverted from landfill and incineration.
- 80% recycled in manufacturing, packaging

Space Hippie Project



- Flyknit yarns ~85% rPoly made from recycled plastic water bottles, t-shirts and yarn scraps.
- Crater Foam uses 15% Nike Grind rubber combined with 100% recycled foam materials
- For each pair, just 3.7kg of carbon dioxide is generated compared to more than 13kg that a conventional pair of sneakers

Nike Grind programmes



- 114M Pounds of Nike Grind have been recycled into partner products since 1992.
- Manufacturing scrap, unused manufacturing materials and end-of-life footwear

The Reuse-A-Shoe



- Keep out of landfill and incineration by refurbishing and reselling, donating or recycling 3.1 million units of finished product



“We’re in the business of zero and nothing else.”

Polestar

Not offsetting but eliminate all emissions throughout the supply chain and production of the car

A Zero Carbon car by 2030



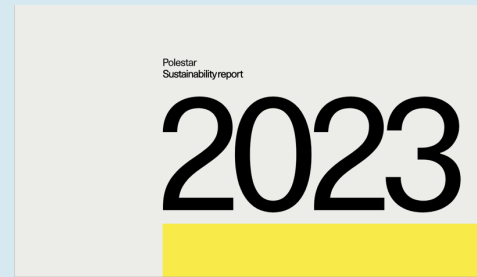
- Halving per-vehicle-sold greenhouse gas emissions by 2030
- Becoming climate-neutral across our value chain by 2040

Cradle to gate carbon footprint (tCO2e)



	Matl	Batt.	Mfg.	Total
P2	15.7	5.9	1.6	23.1
P3	16.8	5.9	2.0	24.7
P4	13.3	7.6	0.5	21.4

Reporting transparency – Sustainability report 2023



- Recycled content in P4 – Al. – 18%, Steel – 12%, Plastic – 19%
- Emission per sold car (YOY) – (9%)
- Absolute emission (YOY) – (5%)

Polestar Climate Truths (<https://bit.ly/49QInvO>)



- Polestar puts spotlight on climate disinformation and misinformation
- the Truth Bot on X created to help debunk the most common inaccuracies relating to climate change within the automotive industry



Thanks.....

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