

Zero Waste within Businesses and Industry

18 April 2024
2024 Planetary Health Summit and 6th Annual Meeting (PHAM 2024)

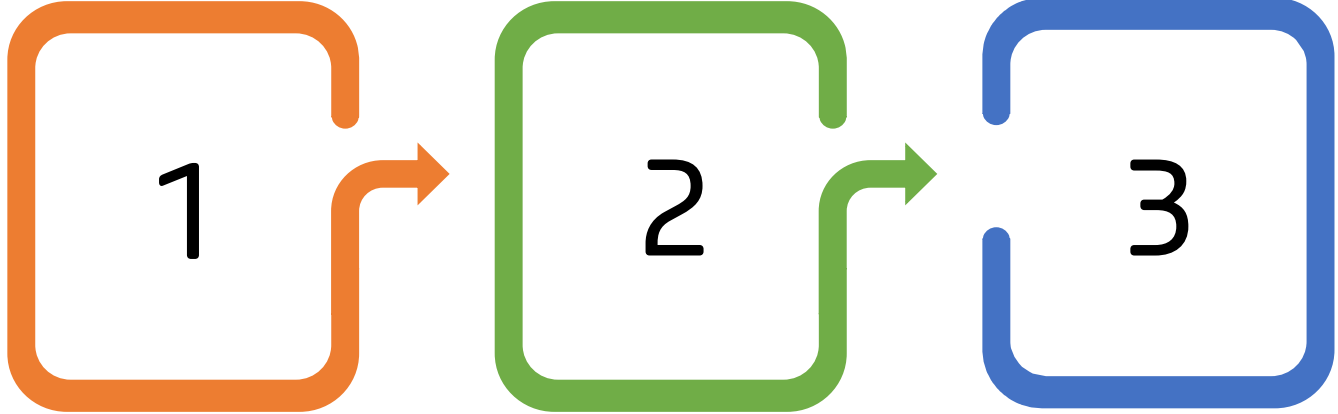
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Presentation Outline



Global Waste Issues
Understanding waste
issues from its core

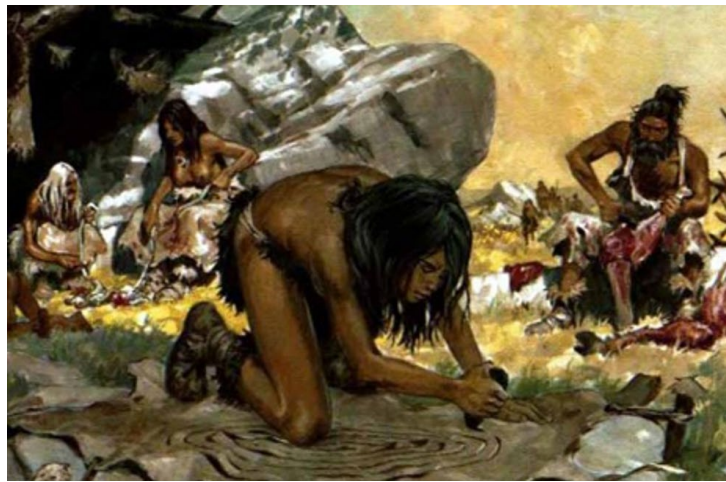
Zero Waste
The concept and
principles

Case Study
Electric Rickshaws in
Bangladesh

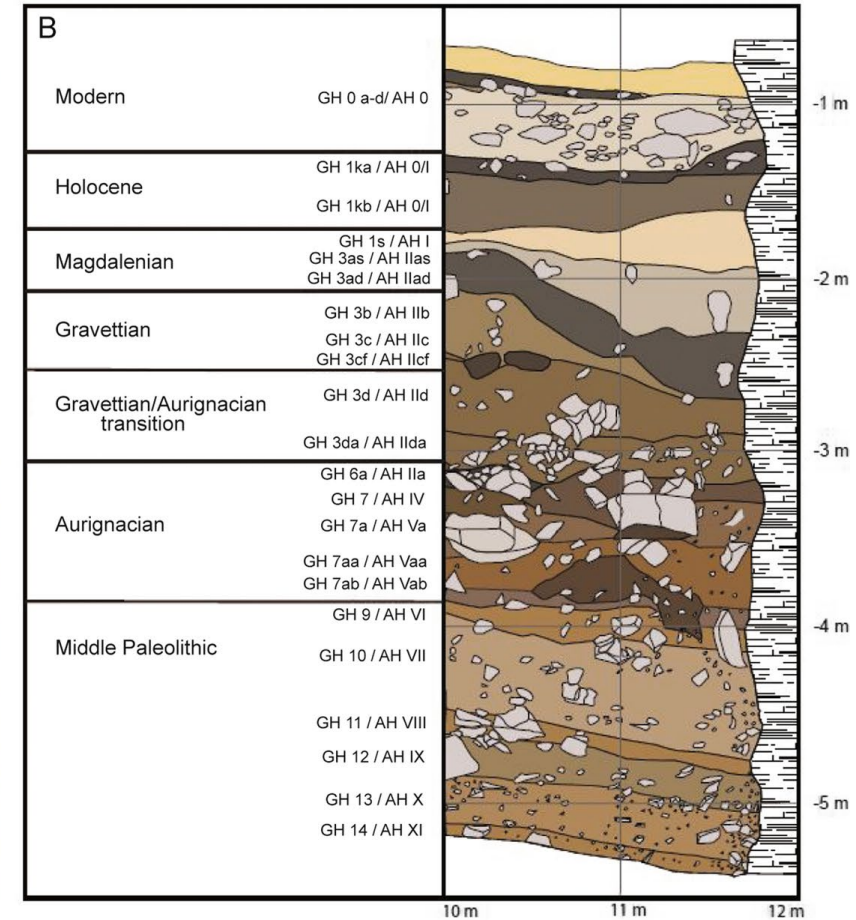
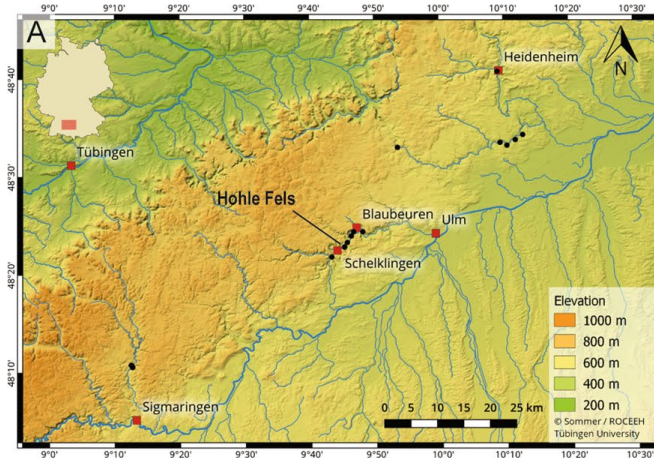
Waste in the Human History



The Illustration of Clovis people



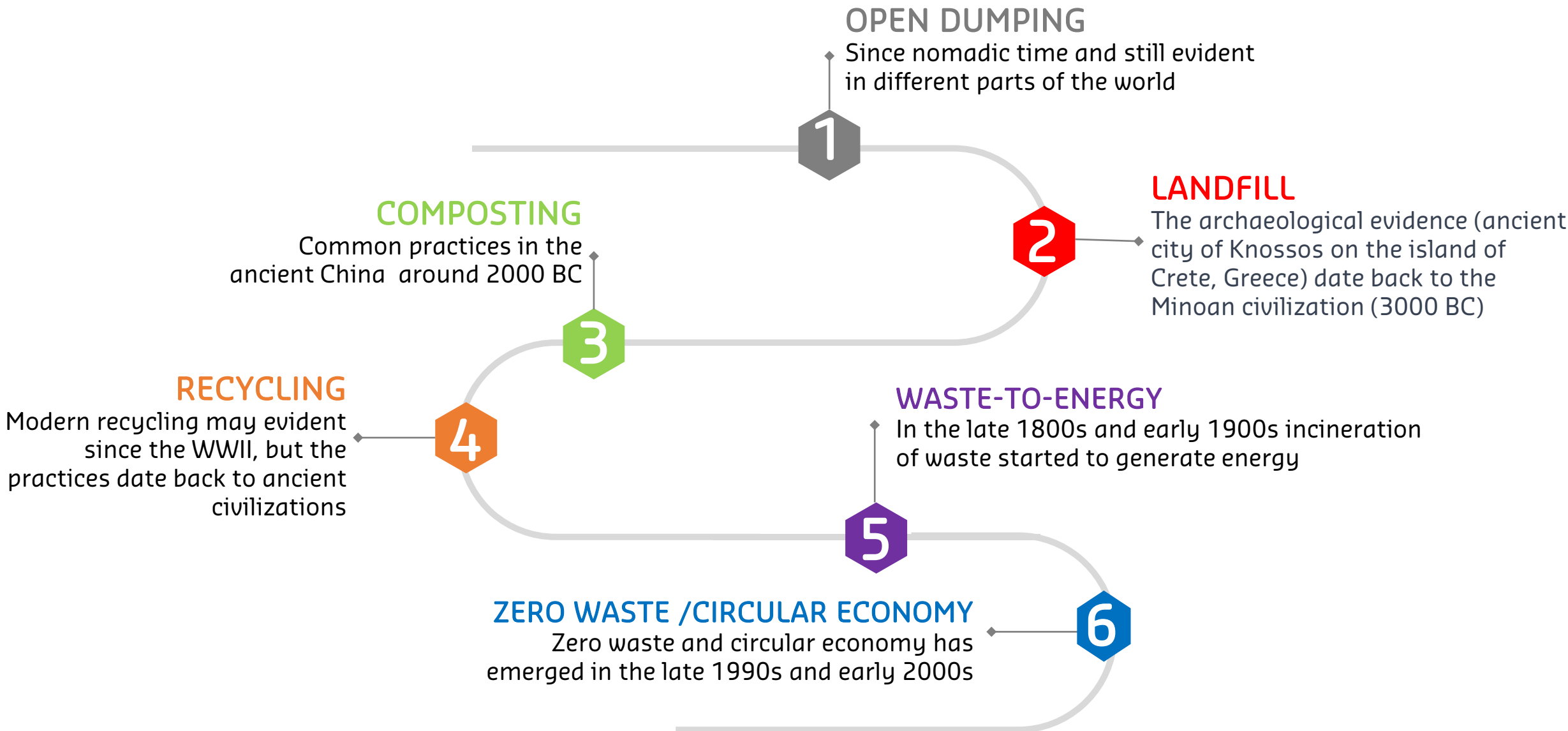
The Illustration of Palaeolithic people



Burning, dumping, and site use during the Middle and Upper Palaeolithic at Höhle Fels Cave, SW Germany (Marcazzan, Miller & Conard, 2022)



Notable Waste Management Approaches



Global Waste Crisis

Increasing waste generation

The world generates 2.01 billion metric tons of MSW and predicted to be 3.4B by 2050



Severe plastic pollution

Production has increased 20-fold since 1964 and expected to double by 2040. There will be more plastic in the ocean than fish by weight by 2050



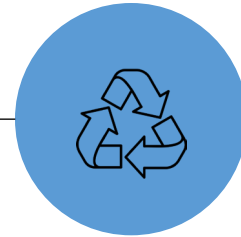
Unreported e-Waste management

53.6 million metric tons of electronic waste and is expected to reach 74.7 million metric tons by 2030. 80% of e-waste remains unreported



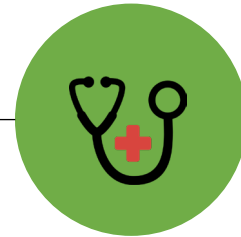
Highly depended on landfill

It manages about 85% of global waste and the 3rd largest emitter of methane after the USA and China.



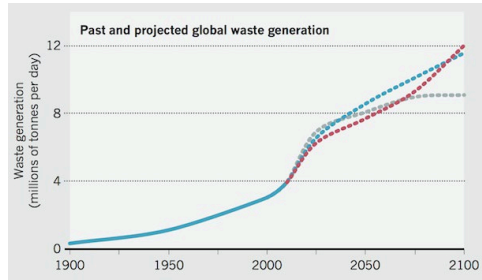
Poor recycling/circularity rate

We recycle only 15% of the collected MSW, Global circularity rate in 2023 is 7.2%,



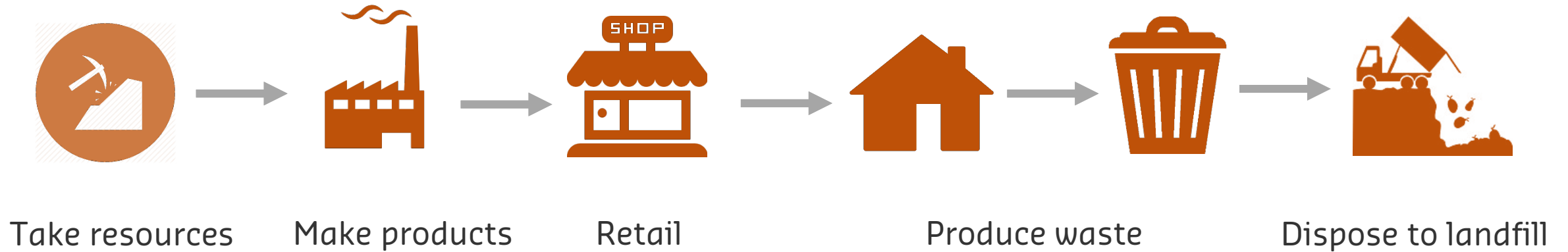
Health & environmental impact

It costs \$5.9 billion per year for health and env. damage in the L-M-I countries

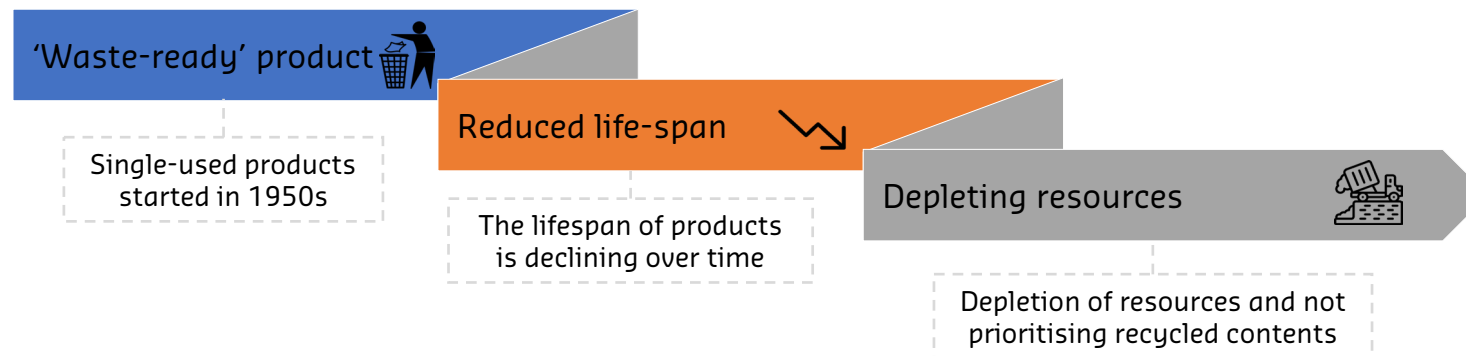


System Problems: Linear economy and linear urban metabolism

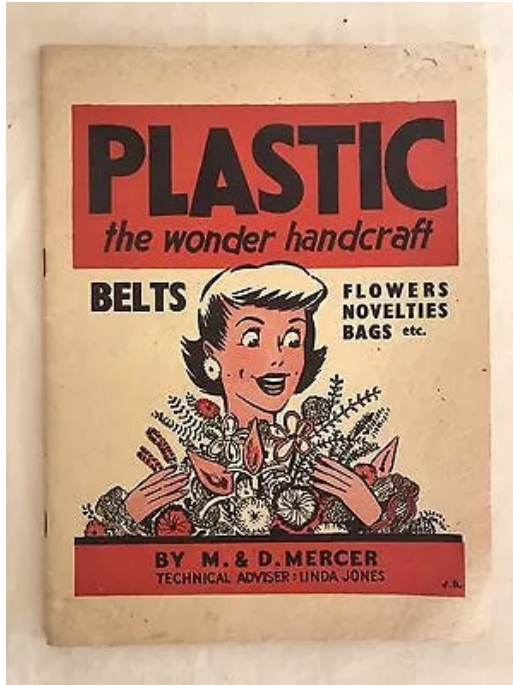
“Take-Make-Dispose” System



Planned Obsolescence



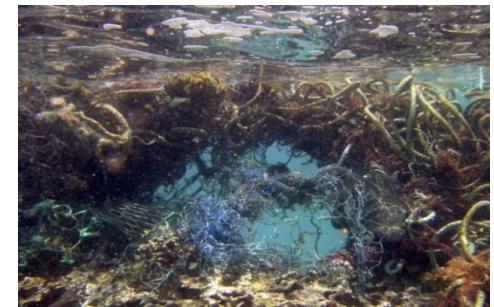
Planned obsolescence in 1950s lead to the throwaway plastic society



1950s



'Throwaway Living': August 1955, TIME, LIFE



Coastal Ocean Research Institute, Vancouver Aquarium Marine Science Centre, 2015

TIME

Researchers Have Found Microplastics in Human Waste for the First Time



Researchers Have Found Microplastics in Human Waste for the First Time



"THIS IS THE FIRST STUDY OF ITS KIND AND CONFIRMS WHAT WE HAVE LONG SUSPECTED, THAT PLASTICS ULTIMATELY REACH THE HUMAN GUT. OF PARTICULAR CONCERN IS WHAT THIS MEANS TO US, AND ESPECIALLY PATIENTS WITH GASTROINTESTINAL DISEASES."

BY CASEY QUACKENBUSH OCTOBER 25, 2018

A new study found microplastic particles in human waste for the first time, a worrying sign of the prevalence of plastic in the food chain, the Guardian reports.

MIMCO





Personalised gifts to make her year.

SHOP GIFTS



est.com/2015/07/28/microplastic-in-marine-food-webs/
 ntp://time.com/5431668/microplastics-human-waste-study/

Rapid shift in social value, cultural norms and priorities

	Pre-industrial era	Post-industrial era	
Scarcity-to-accessibility	Scarcity of resources: resourcefulness and frugality	Accessibility to resources	
Needs-to-wants	Access to basic needs	Excess consumerism/ 'compulsory' consumption	
Durability and quality	Durable and quality products	Disposable and throwaway lifestyle	
Respect to nature	Harmony and stewardship to nature	Environmental degradation leading to environmental awareness	

Persuade Consumerism

Advertisements

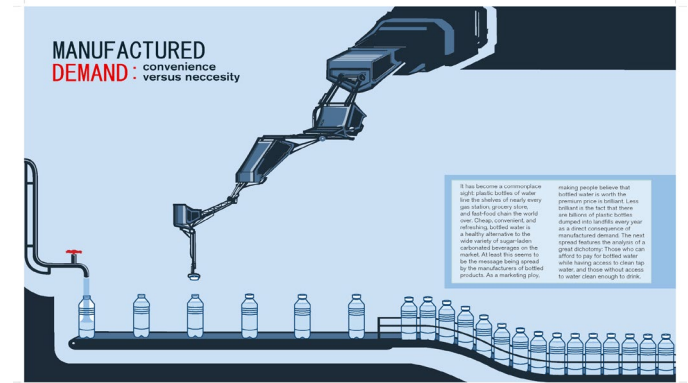


Americans are exposed to around 4,000 to 10,000 ads each day

Influence of social media



Manufactured demand



Consumerism as Identity



Shopping well-being

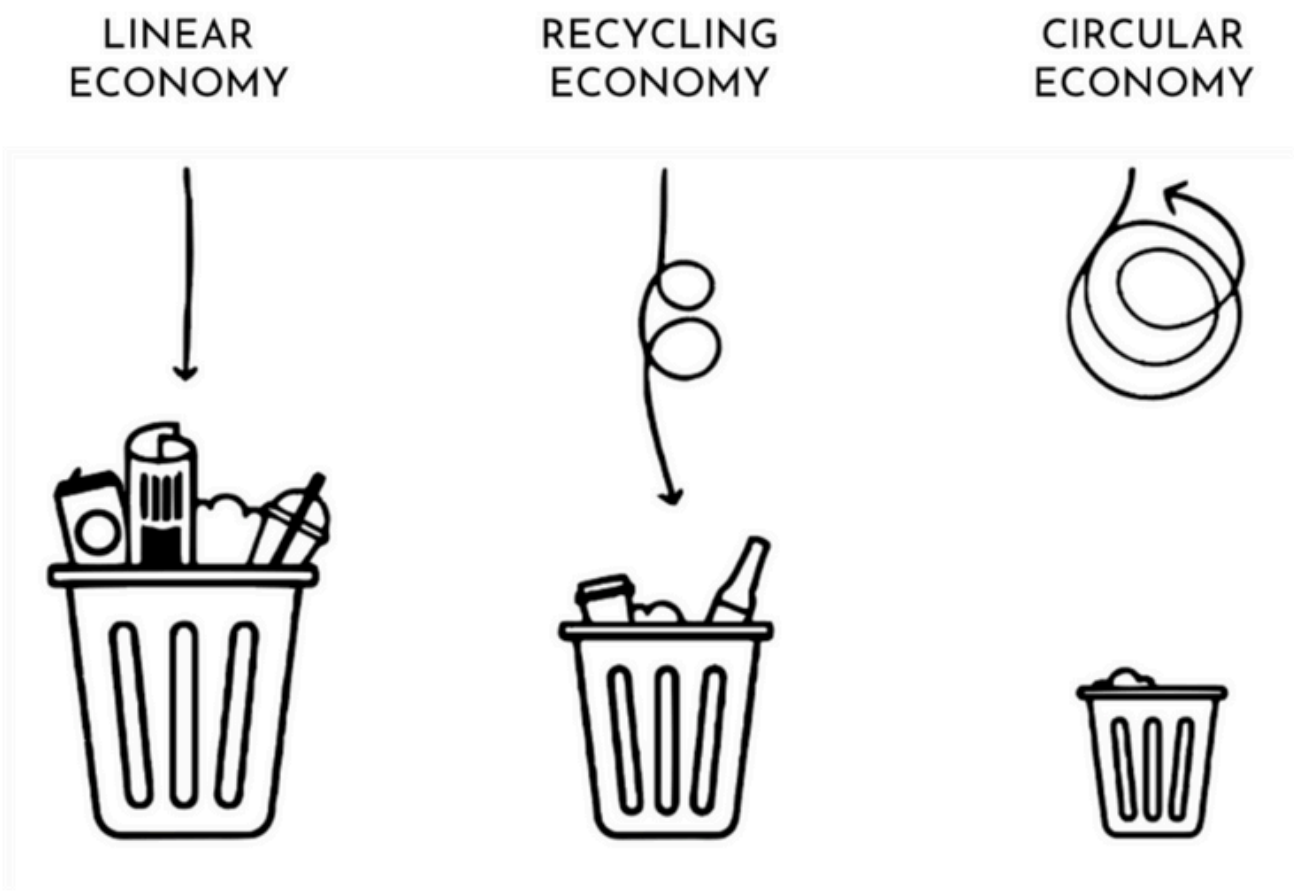


Greenwashing

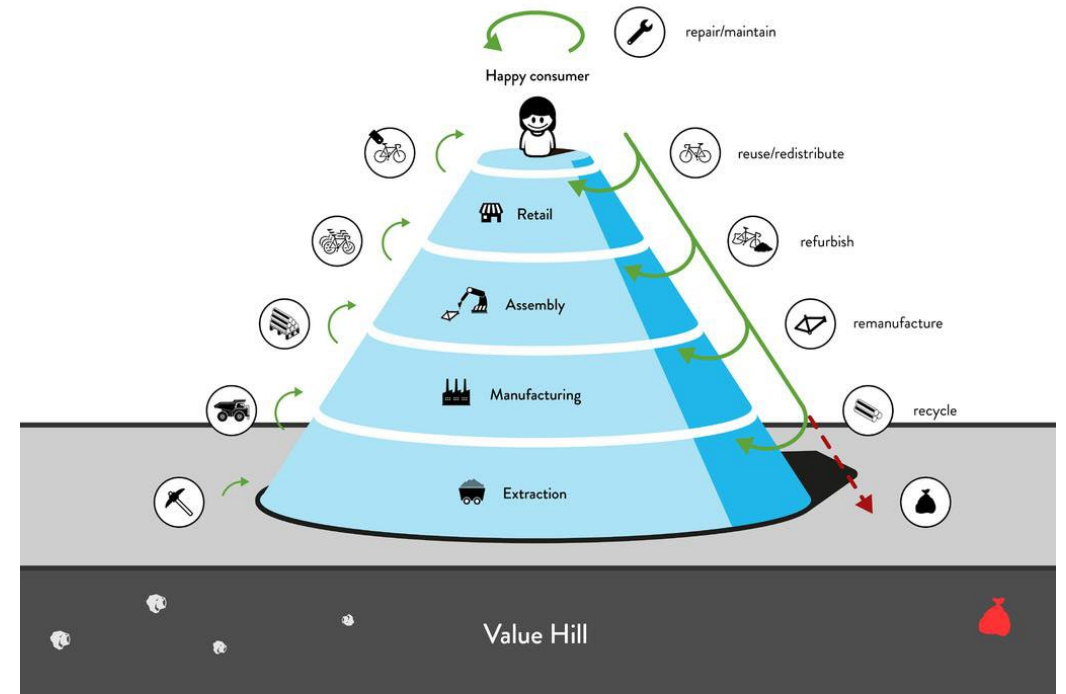
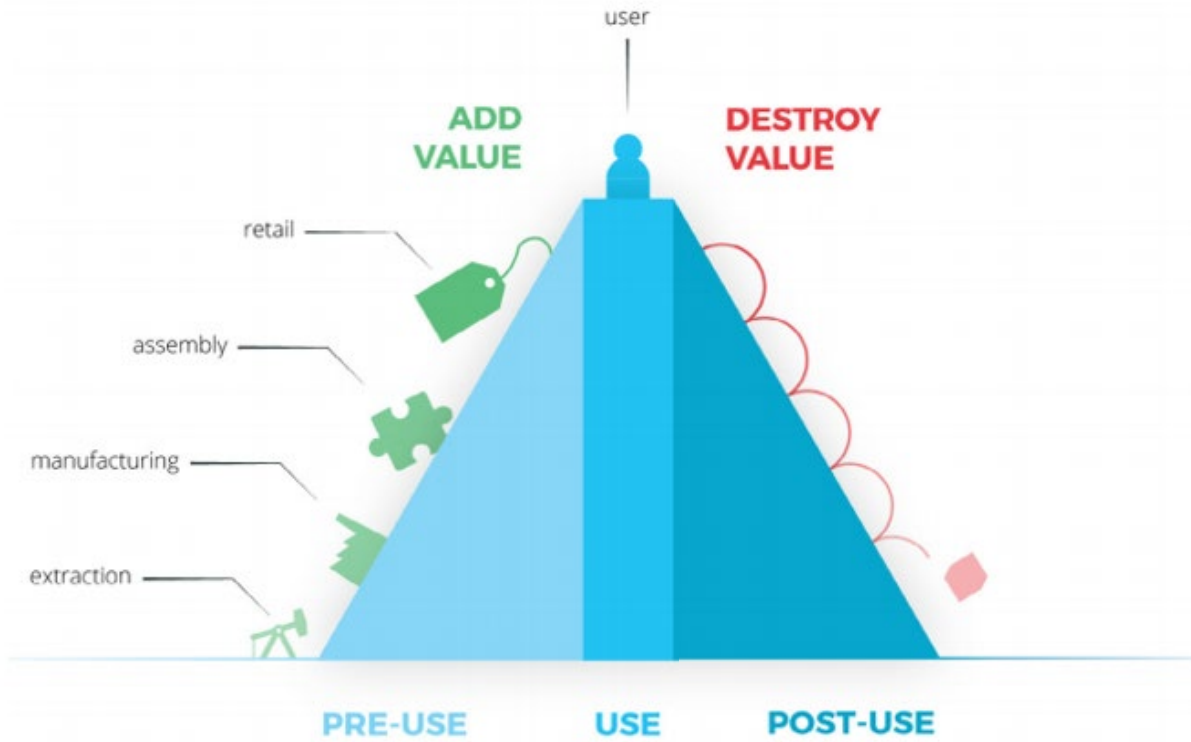




Towards a Circular Society

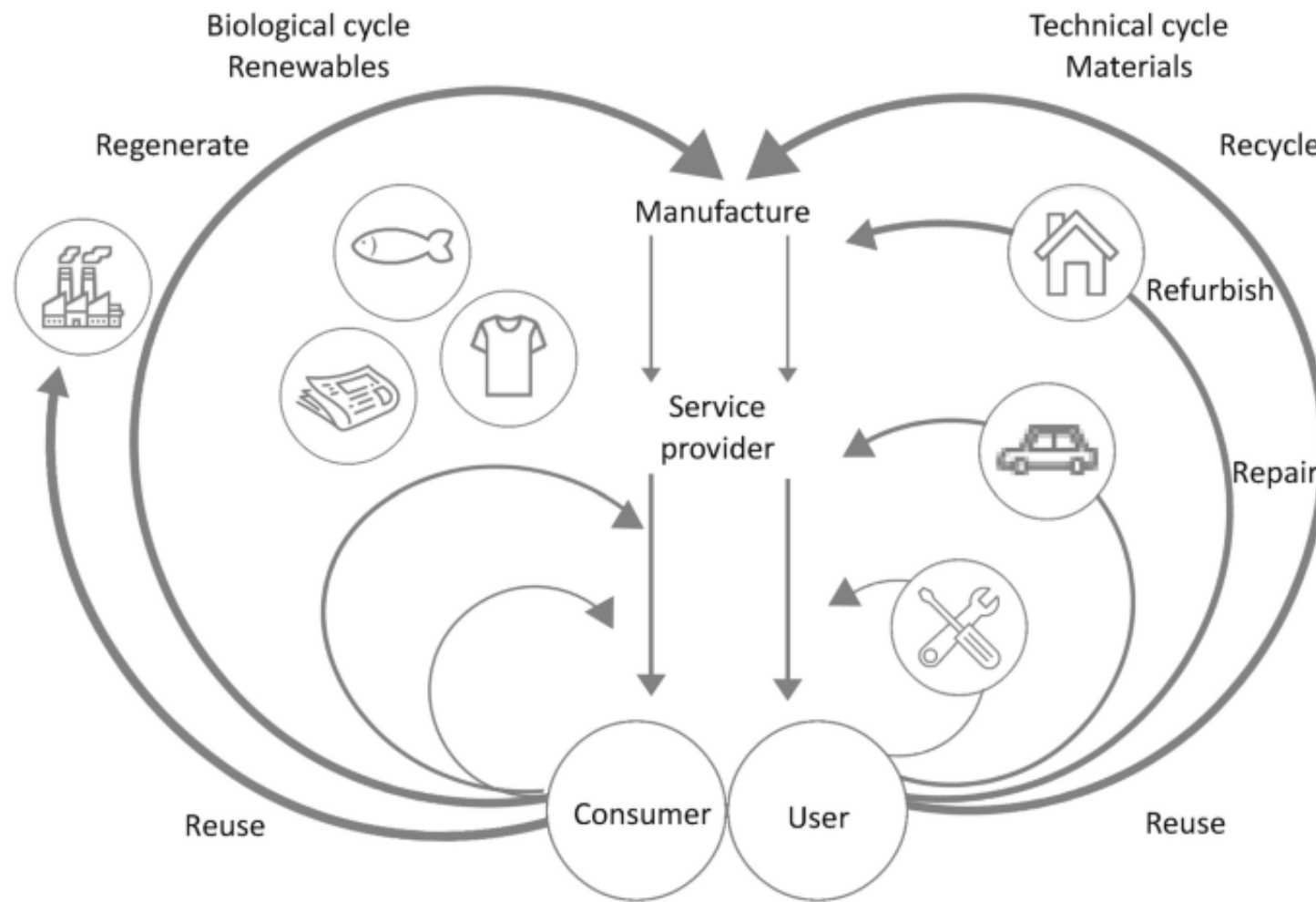


The Value Hill Principle in a Circular Economy System





The Circular Economy/Zero Waste Principles

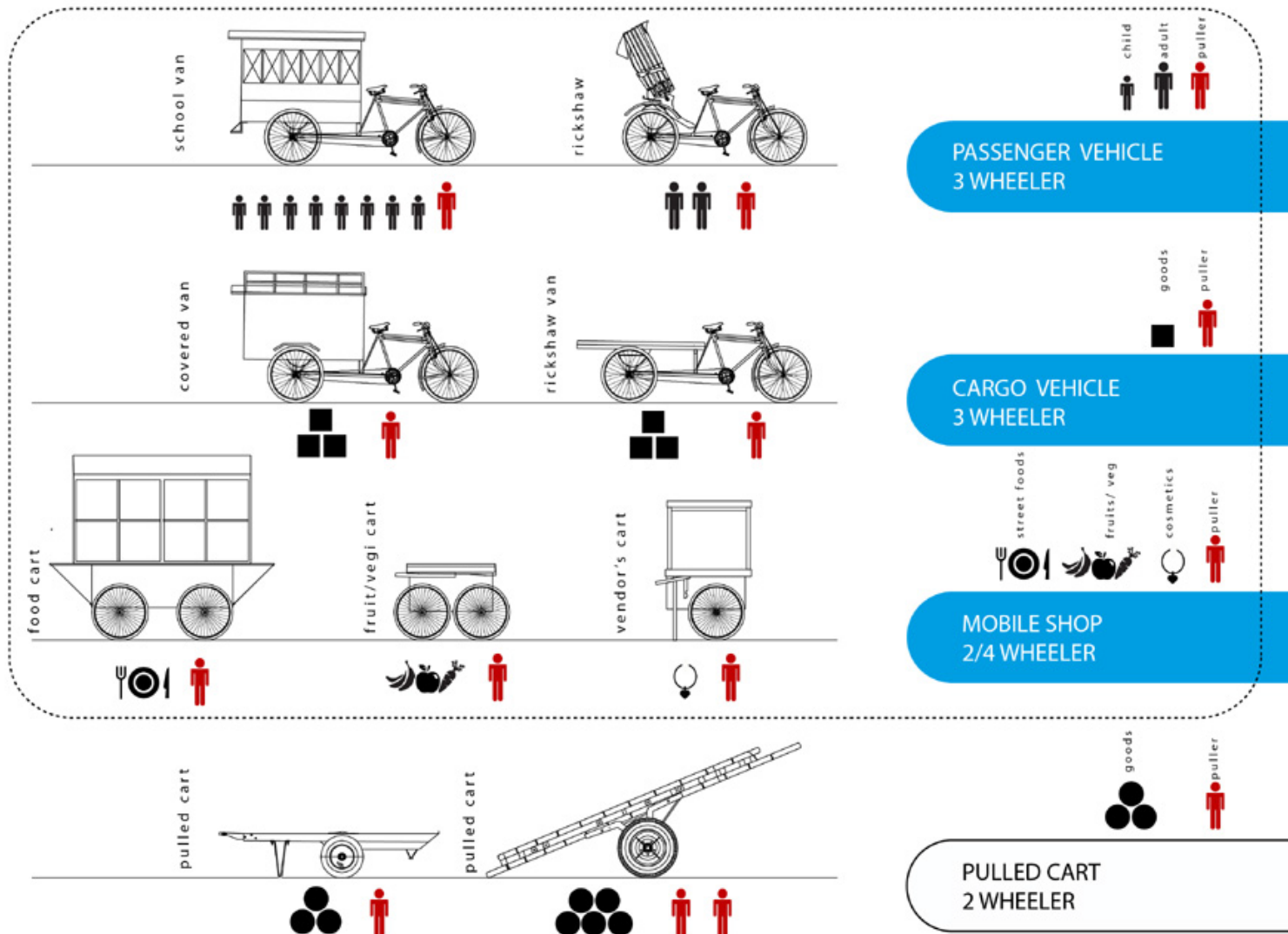




Case Study : Electric Rickshaws in Bangladesh



Electric Rickshaws (e-rickshaws) in Bangladesh



The Roles of E-rickshaws in Bangladesh



The Daily Star

Sports Business Entertainment Life & Living Youth Tech & Startup Multimedia

'Tesla of Bangla': Nasrul Hamid defends battery-run three-wheelers



State Minister for Power, Energy and Mineral Resources Nasrul Hamid. Star file photo

The Roles of E-rickshaws in Bangladesh



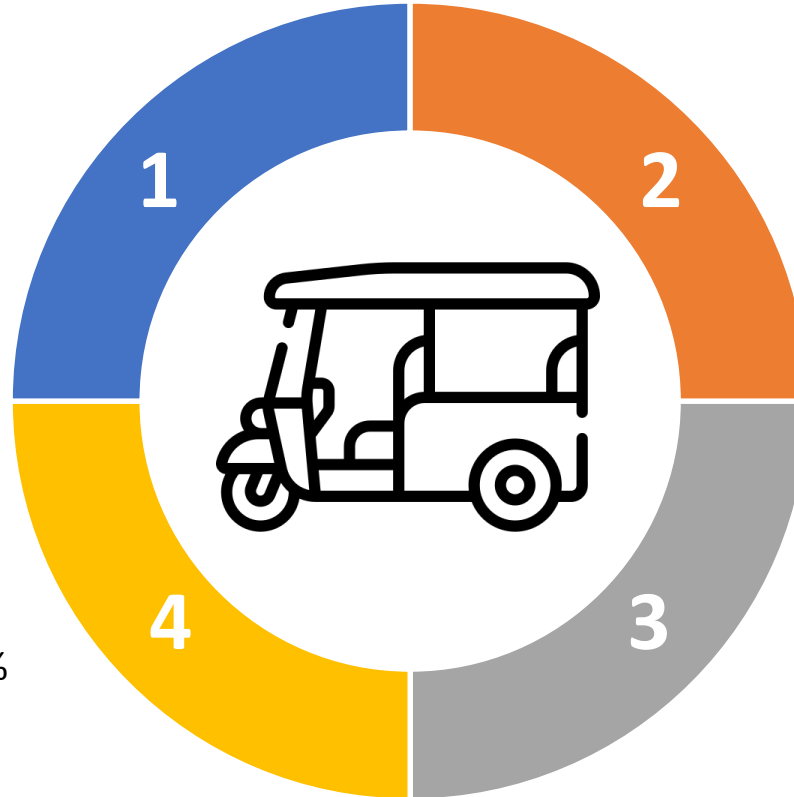
1. Socio-Economy

- Employments (3-4 million vehicles)
- Around US \$1B LAB industry
- Informal recycling industry and employment opportunities
- Cost-effective transport solution
- Decongestion and rural connectivity



4. Government/Strategic

- Reduced dependency on fossil
- National carbon emission reduction
- National electric vehicle targets (50% by 2050)
- Local industry and capacity building



2. Technology

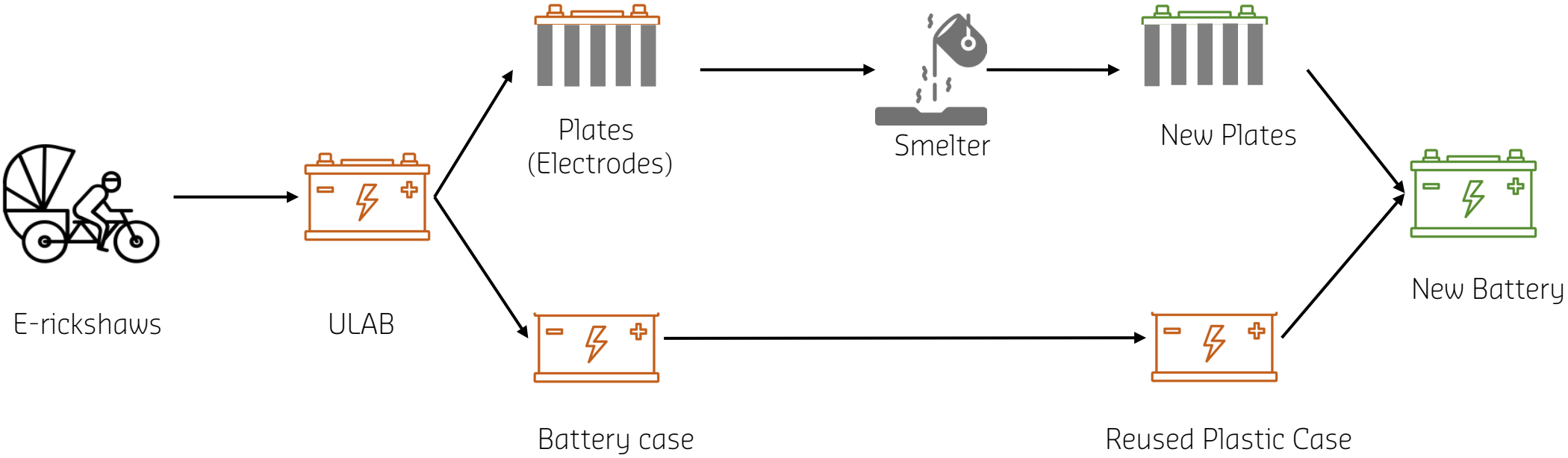
- Electric-mobility
- Diversification in transportation
- Technical capacity/skills (e-mobility)



3. Environmental Aspects

- Recycling of almost 100% of ULABs (30% formal and 70% informal) with 70% efficiency
- Reduce noise pollution
- Potential for net-zero transport
- High recycling practices and potential for a circular system

The Supply Chain of Used-Lead-Acid Batteries(ULABs) in Bangladesh

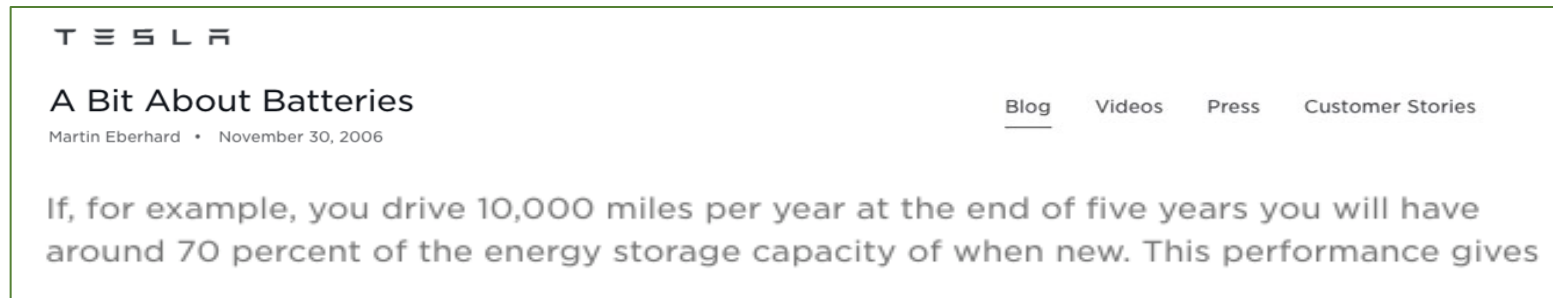


Challenges of E-rickshaws in Bangladesh



Technical Challenges of the Informal ULABs Recycling

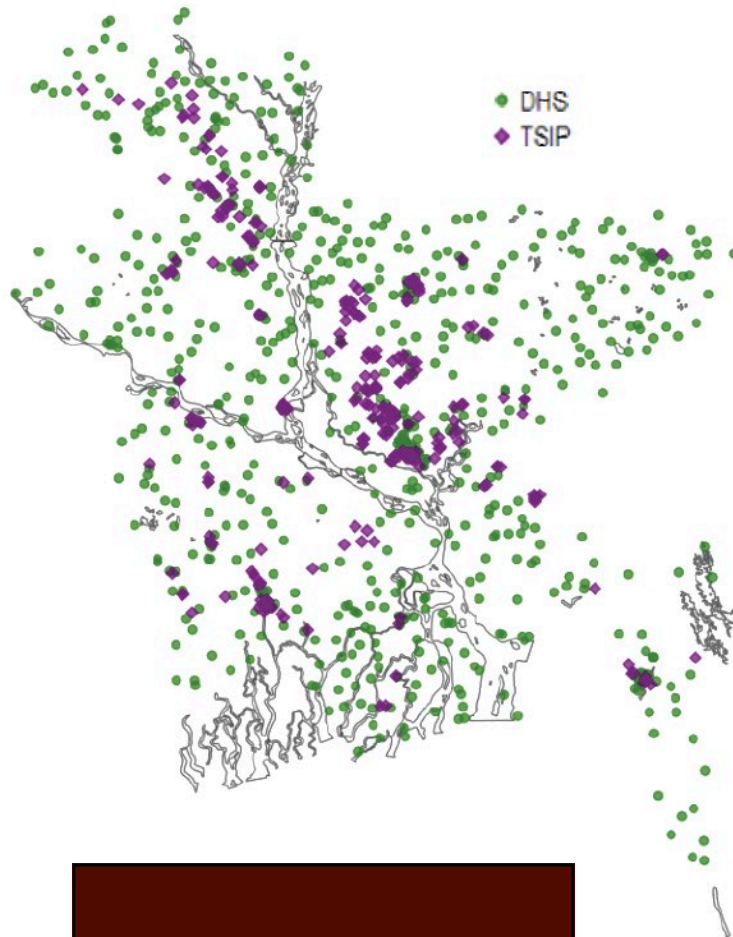
- The typical life of the batteries is between 8 and 11 months
- Corresponds to 12-16 k miles during the battery lifetime (assuming average mileage of 80km/day)
- Lack of conformance quality and prevalence of counterfeits
- Misinformation on product performance in the market
- Inflated mileage, Amp-hr, and durability promises



The most economically vulnerable are paying a high price for electric vehicle use!



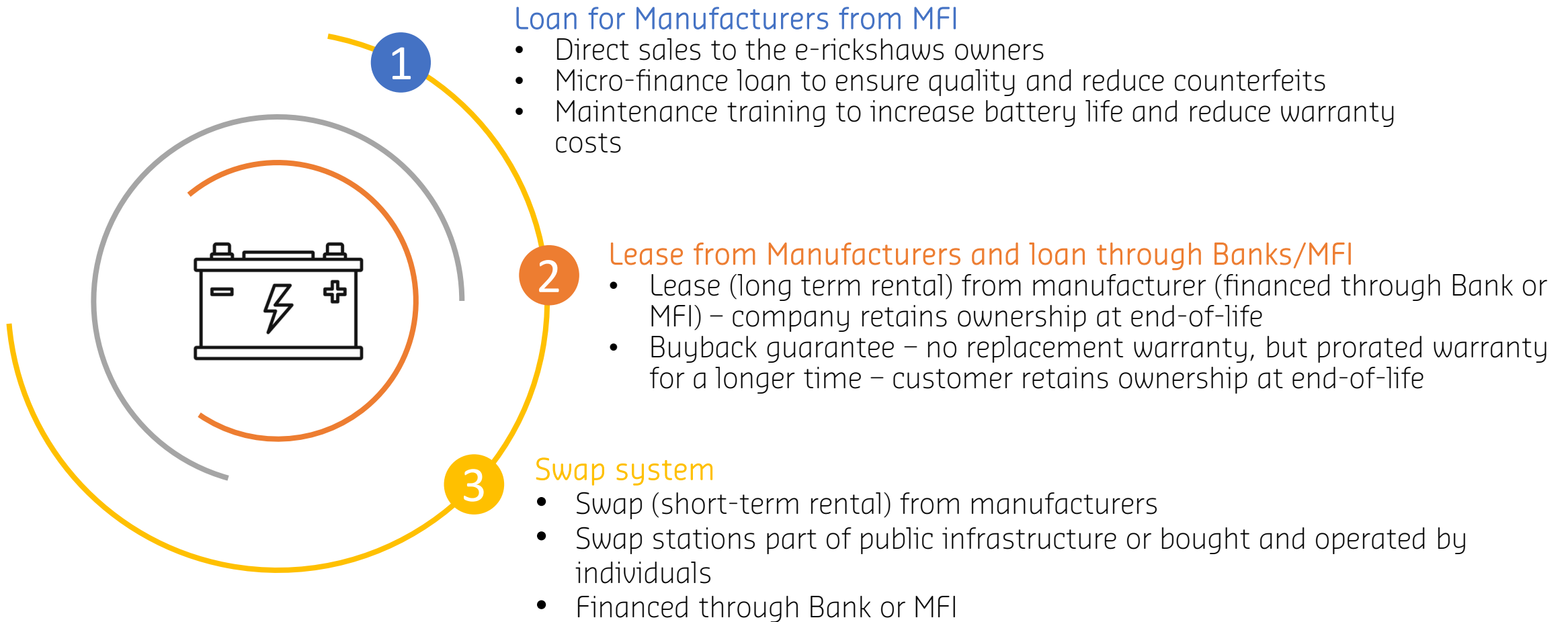
Env. and Health Challenges of the Informal ULABs Recycling



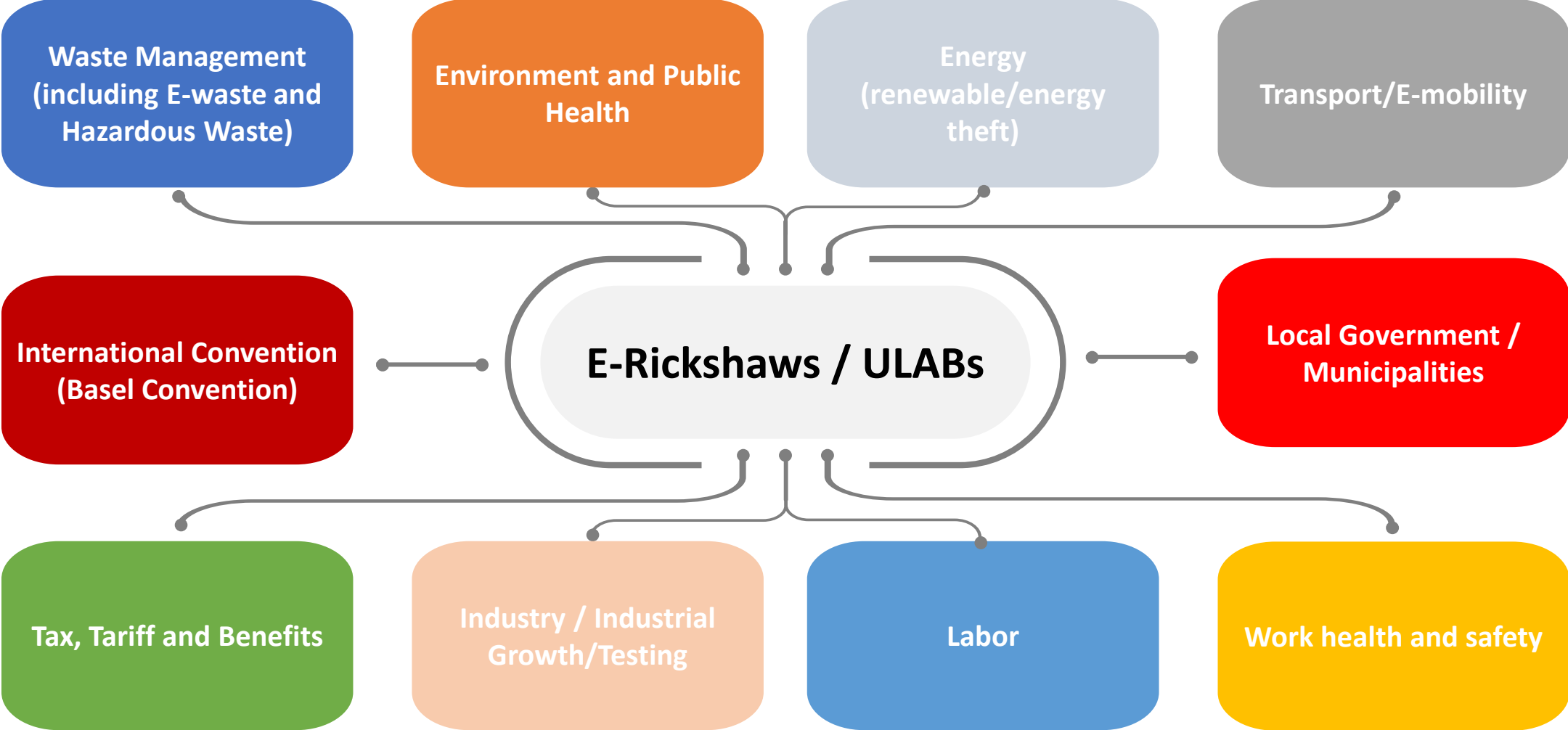
- Two in Three Children in Bangladesh have high Blood Lead Levels (Pure Earth and UNICEF, 2020)
- The Stanford University and George Town University, USA study found 6 percentage point increase in terminated pregnancies in households within 5 km of ULAB smelting facilities identified by Pure Earth, after implementing a high battery import tax in 2015
- 20% of the country's population lives within 5km of a ULAB smelting site.
- Lead is a potent neurotoxin – that leads to loss of IQ, education and income ability in children and cardiovascular, renal and reproductive issues in adults.



Circular Innovation in the E-rickshaws Sector in Bangladesh



Relevant Regulatory Policy Areas



Relevant Regulatory Laws/Policies/Guidelines



Regulatory Structure



Gaps in the Regulatory Policies

Discrepancies in policies

- Not recognise e-rickshaws in the BRTA and national EV policy
- Household batteries are listed in the national hazardous e-waste policy but not ULAB from transport
- No minimum quality and standards on efficiency and performance



Oversight of the informal sector

- The role, activities and opportunities of the informal sector are widely oversight in the current policies



A lack of harmonisation and integration

- ULABs links with multiple regulatory bodies; however, there is no harmonisation and integration amongst themselves



A lack of monitoring policy requirements

- The entire sector lacks monitoring and compliance



Key Recommendations for a Circular ULABs



1. Harmonisation and Integration

Foster harmonisation and integration in existing regulatory policies related to ULAB management



2. Recognition/Formalisation of e-rickshaws

Recognise/formalise e-rickshaws as part of transport solutions and thus integrate with the relevant policies (e.g. BTRA mandatory registration)



3. Enforcement and monitoring

Strengthen the enforcement and monitoring of the current relevant regulations (e.g. compliance and safety in ULABs recycling), and execute penalties and set examples for non-compliant entities



4. Consistency

Consistent and clear messaging across various stakeholders and actors involved with e-rickshaws



5. Public health

Prohibit the involvement of children labour and vulnerable women and informal workers' occupational safety hazards in the recycling of ULABs



6. Foster business opportunities

Foster business opportunities for both formal and informal ULAB recycling with appropriate support and incentives from government bodies





Zero-Waste

Reconsidering Waste Management
for the Future

Atiq Zaman and Tahmina Ahsan

Routledge Studies in Waste Management and Policy



Thank you for your attention! Any Question?

Email: atiq.zaman@curtin.edu.au
Please join via LinkedIn QR Code

