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United Nations Industrial Development Organization





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UNIDO Experiences of Industrial Waste Management and Circular Economy Approaches

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UNIDO's Mandate

- **Advancing Economic Competitiveness**
 - Advancing economic and industrial growth
- **Creating Shared Prosperity**
 - Advancing poverty eradication and inclusiveness
- **Safeguarding the Environment**
 - Advancing environmentally sustainable growth
- **Strengthening knowledge and institutions**



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Safeguarding the Environment

- UNIDO supports countries in their environmental management efforts, including the implementation of multilateral environmental agreements and the provision of sustainable energy
- The long-term, post-COVID-19 ambition of the UNIDO's waste management strategy is working towards a sustainable industry and circular economy providing various technical cooperation services to enhance the contribution of the private sector to industrial development and waste management system
- Initiatives at this phase will contribute to green recovery at the country level through circular economy approaches while continuously improving waste management systems and recycling industries





Mitigating Industrial Pollution

- Reducing/eliminating the release of toxic chemicals, such as POPs, into the environment in industrial processes. Key industrial sectors include:
 - Electric transformers: PCBs;
 - Metallurgy/Cement: uPOPs;
 - Fashion / Textiles: PBDEs; PFOS
 - Construction: HBCD;
 - Recycling industry / waste management: BDEs, uPOPs, mercury
- Fostering circular economy approaches is key to all areas of focus
UNIDO currently has projects in these sectors in over 80 countries



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UNIDO Approach

- **Green Industry** approach: promote the **greening of existing** industries while also **creating new green** industries through resource recovery, reuse and recycling.
- Promotion of the **Circular Economy** concept for POPs and hazardous chemicals/waste reduction and their environmentally sound management
- **Value chain approach and involvement of the private sector**
- Access to UNIDO's **networks**, platforms and financial development partnerships (RECPnet, PAGE, BAT/BEP Forum, etc.)
- Development of new business models for **POPs alternatives** and eco-effective chemicals.

Green Industry
for a Low-Carbon Future



CIRCULAR ECONOMY

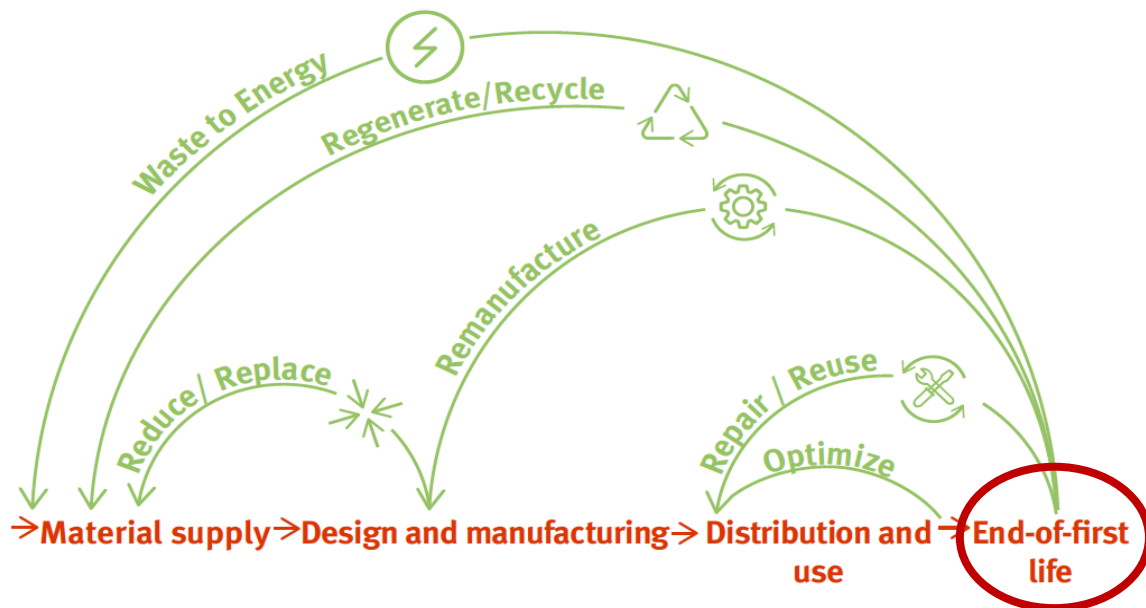


Circular Economy

- Returns products, parts and materials into use several times
- Based on principles that
 - Products are designed to last
 - Value is maintained for as long as possible
 - Generation of waste and pollution is minimized
 - Renewable energy is used along value chains, as much as possible

■ Linear supply chain

■ Circular economy practices





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Circular Economy in the Textiles Sector

For a POPs-free fashion industry

- Second largest polluter in the world
- UNIDO's management and disposal services focus on creating the fundamental capacities within industries, governments and institutions for complying with regulations and environmental standards
- Circular economy techniques include establishing recycling chains and implementing waste management techniques to minimize the generation and release of POPs and hazardous substances throughout the industry



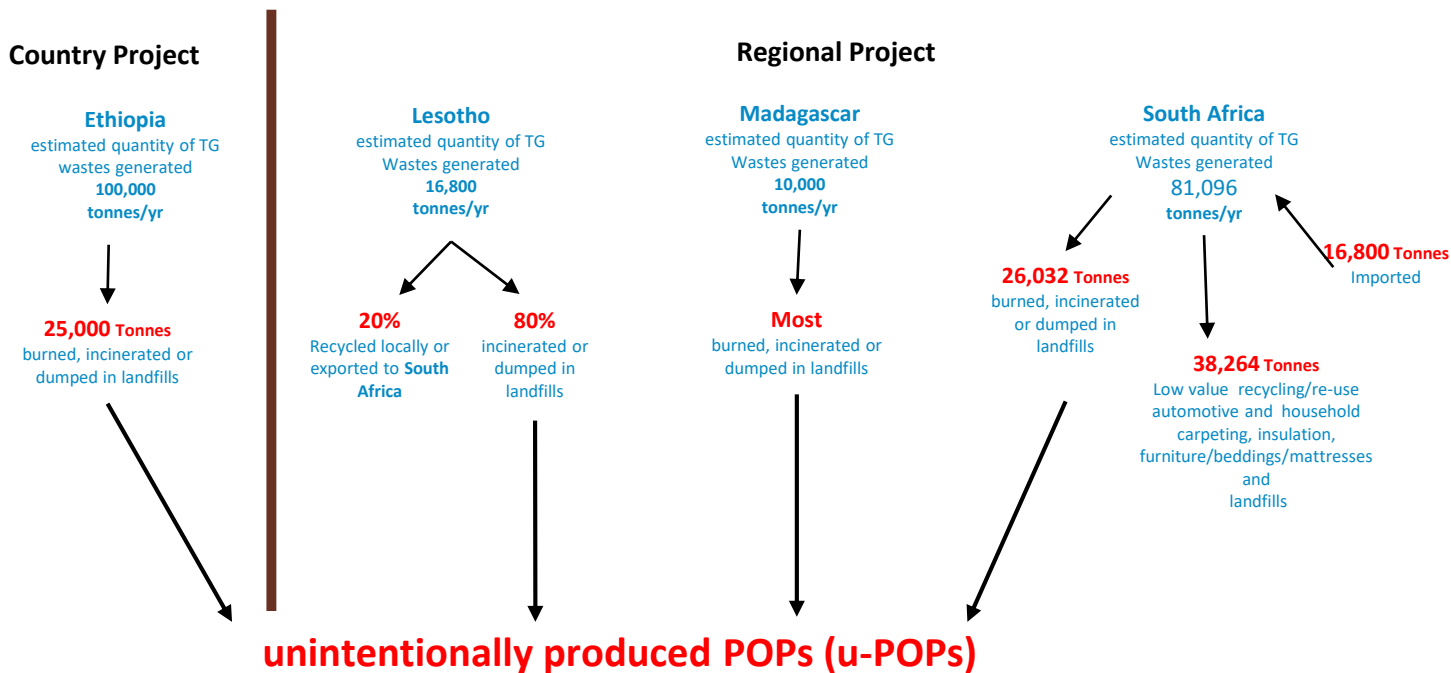


CE Best Practices - Textile Value Chain

| Value chain stage | CE Strategy/Best practice | Key Target actors on VC |
|---|---|--|
| Material Supply / Manufacturing | Recycling /Regenerate textile waste (post-industrial and pre-consumer) into recycled yarns, fabrics and fibers for textile and non woven applications (cascading value to other sectors/VC) | Brands, garment producers, spinning and weaving companies, non-woven products manufacturers (automotive, furniture, construction, etc..), waste collectors |
| Design | Increase use of recycled content in textile products | Brands, garment producers |
| Manufacturing | Maximize Resource Efficiency (water, energy, materials) and minimize waste generation in production | Spinning, weaving, finishing, garment sectors |
| Manufacturing | Eliminate/replace Hazardous Chemicals and disclosure of safer chemicals use in textile manufacturing in line with international protocols (ZDHC) | Textile finishing sector |
| Manufacturing/ End of first Life | Better waste management and segregation of textile waste by fiber, improved collection system and integration of informal sector | Garment producers, waste collectors |
| Design and Manufacturing/ End of first Life | Remanufacture of used garments or unsold stocks (pre-consumers) into upcycled products | Brands, garment manufacturers, waste collectors |



Promotion of CE in the Textile Sector





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Medical Waste Management

For safe medical waste management during COVID-19 and beyond

- In response to the unprecedented growth of infectious medical waste being generated during the COVID-19 pandemic, UNIDO is building on its significant experience of supporting medical waste management efforts in countries across the world, including China, Senegal and beyond.
- For example, in India, UNIDO has been collaborating with the Ministry of Environment, Forests and Climate Change on a project focusing on medical waste management in five states: Gujarat, Karnataka, Maharashtra, Odisha and Punjab.





ESM of Medical Waste in India

- Under the project, the Biomedical Waste Management & Handling (BMWM&H) Rules, 1998 were revised in 2016.
- A domestic market survey for cost-benefit analysis on services and equipment, recycling prospects, financial tools and affordable technologies was carried out.
- State-wide guidelines on the safe management of COVID-19 wastes based on the BMWM Rules of 2016 were prepared and disseminated
- Assessment of local capacity of manufacturing industries, in particular supply chain for circular economy solutions and green recovery was completed
- Feasibility study on recycling of medical waste plastics carried out
- Provision of non-burn treatment technology (microwave disinfection) and shredders to 20 large HCFs and 4 CBMWTFs in 5 States



E-Waste Management

For safer connectivity in a hyper-connected world

- As one of the fastest-growing waste streams in the world, UNIDO's IPM Division focuses on supporting countries across the world from Cote d'Ivoire to the Philippines to effectively manage, recycle and dispose of e-waste.
- The UNIDO LAC e-waste project is funded by the GEF and assists 13 Latin-American countries with effective e-waste management through capacity building, awareness-raising and policy assistance.
- The project is the first regional project of its kind in Latin America and engages a broad range of partners, including local and national governments, industry, producers and recyclers, private sector, NGOs and CSOs.





E-Waste Management

- Enhancing regional cooperation on e-waste management is a core component of the project and the Regional centres of the Stockholm and Basel Conventions (Argentina, Brazil, Panama and Uruguay) as well as WHO-PAHO, ILO, ITU, UNU, EMPA, ISWA, BOKU University Vienna, Dell, RELAC, US-EPA are engaged on the regional level.
- Under the project, two case studies for the implementation of recommendations of the ITU Group on E-waste and Circular Economy (take-back systems, EPR, reconditioning, recycling, etc) are being developed in Argentina and Costa Rica.
- UNIDO is a member of the E-waste Coalition, working alongside nine other UN agencies for enhanced e-waste management at the global level.



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PCB Decontamination

For safer power systems

- UNIDO addresses the risk of PCB contamination in countries across the world, including in North Macedonia, which became the first country in the region to establish a PCB treatment facility with the support of UNIDO
- The treatment facility supports the circular economy by enabling the decontamination and reuse of PCBs-laced transformer oils.
- The GEF-funded project provided PCB treatment technology and training and is now 100% run by the private sector.
- UNIDO also has experience of working on this issue in the Philippines, Indonesia, Serbia, Morocco, Cote d'Ivoire, Paraguay, Bolivia, and Turkey.





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