Designing Net Zero Products using LCA

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- What is Net Zero?
- Is it really achievable?

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Introduction to Net Zero

- Net zero refers to achieving a balance between the amount of greenhouse gases (GHGs) emitted into the atmosphere and the amount removed or offset, resulting in no net increase in atmospheric GHG levels.
- Net zero focuses on reducing carbon emissions as much as possible first, and only offsetting unavoidable, residual CO_2 at last.

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Net Zero Product

- A product that, over its entire lifecycle, results in no net increase in greenhouse gas (GHG) emissions to the atmosphere.
- That means the total amount of GHG emissions produced during the extraction of raw materials, manufacturing, transportation, use, and disposal of the product is balanced by an equivalent amount of GHG emissions being removed from the atmosphere or offset through various measures.

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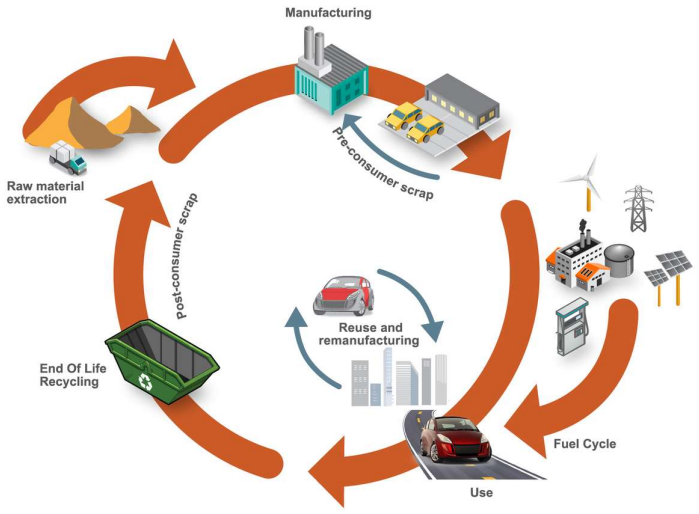
Stages in Product Life

Raw material extraction

Product manufacturing



Distribution (transport)

End of life (disposal)

Product use

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Key characteristics of Net Zero Product

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1. Life Cycle Emission Analysis
2. Identification of hotspots
3. Emission Reduction
4. Carbon Offsetting
5. Sustainable Practices

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What is the concept of LCA? How LCA can be used for Net Zero Product Design?

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What is Life Cycle Assessment?

- A systematic method for evaluating the environmental impacts of products, processes, or services throughout their entire lifecycle.
- This comprehensive approach, often referred to as a "cradle-to-grave" analysis, encompasses every stage from raw material extraction, production, and usage, to disposal or recycling.

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Standards for LCA

ISO 14040:2006-Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006- Environmental management — Life cycle assessment — Requirements and guidelines

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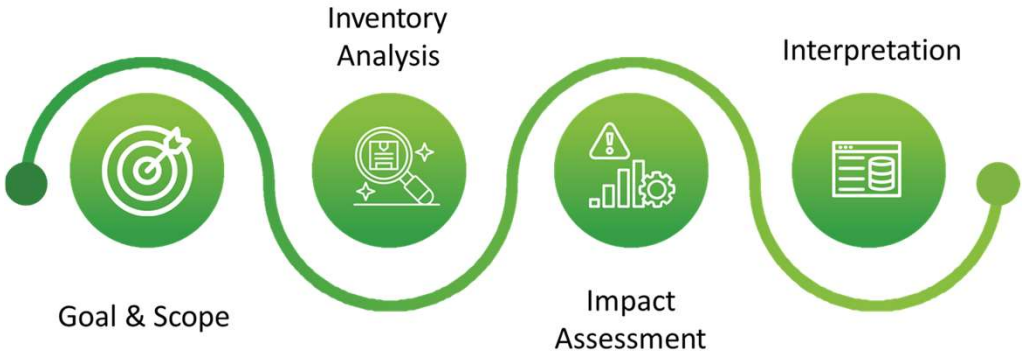
LCA framework

Systematic and Structured approach given by ISO Standard



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Outcomes of LCA

- Provides precise insights into the environmental footprint of products.
- Helps to identify environmental "hotspots" within the product life cycle.
- Guides material selection, manufacturing processes, and packaging choices to design sustainable product.
- Analyzes the product's impact from "cradle-to-grave", promoting circular approaches to material usage.

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LCA and designing Net Zero product

01	02	03	04	05
Life Cycle Assessment during product development stage	Design optimization and manufacturing	Implement emission reduction measures	Offset remaining emissions	Continuous improvement

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LCA and designing Net Zero product

01

Life Cycle Assessment during product development stage

- Goal & scope definition to set system boundary
- Data collection and inventory analysis
- Impact assessment using LCA tools
- Interpret the assessment to understand the hotspots of emissions.

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LCA and designing Net Zero product

02

Design optimization and manufacturing

- Redesign the product and its manufacturing processes to minimize emissions. This could involve selecting more sustainable materials, improving energy efficiency, and reducing waste.

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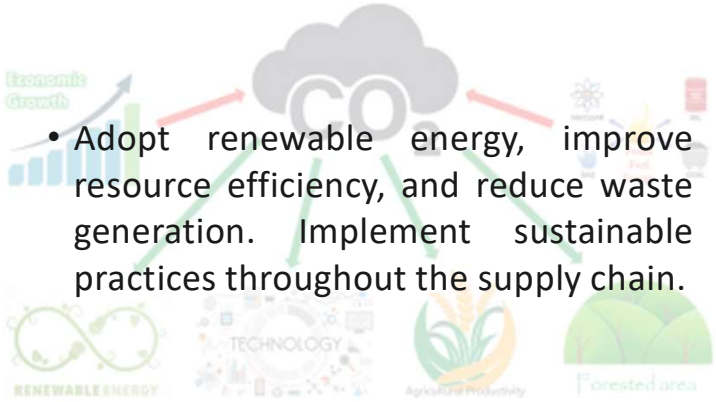
LCA and designing Net Zero product

03

Implement emission reduction measures



- Adopt renewable energy, improve resource efficiency, and reduce waste generation. Implement sustainable practices throughout the supply chain.

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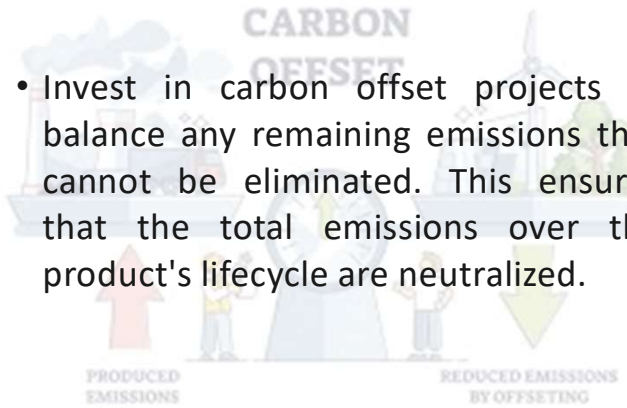
LCA and designing Net Zero product

04

Offset remaining emissions



- Invest in carbon offset projects to balance any remaining emissions that cannot be eliminated. This ensures that the total emissions over the product's lifecycle are neutralized.

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LCA and designing Net Zero product

05

Continuous improvement

- Regularly update the LCA and adjust strategies as necessary to maintain net zero status. Continuously seek new ways to reduce emissions and improve sustainability.

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Benefits of Net Zero Products

- **Environmental Impact:** Significantly reduces the overall environmental footprint of the product, contributing to climate change mitigation and environmental conservation.
- **Market Advantage:** Appeals to environmentally conscious consumers and can differentiate the product in the marketplace, enhancing brand reputation and loyalty.
- **Regulatory Compliance:** Meets or exceeds regulatory requirements related to environmental performance and sustainability.

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Benefits of Net Zero Products

- **Corporate Responsibility:** Demonstrates a company's commitment to sustainability and social responsibility, improving stakeholder relations and investor confidence.
- **Innovation:** Drives innovation in product design, materials, and manufacturing processes, leading to potential cost savings and new business opportunities.

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"Let us delve into the intricacies of the upcoming case study and unravel the threads of innovation, strategy, and execution that have shaped its outcome."

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1) Use of recycled material
2) Reduce the waste
3) 100 % use of renewable energy
4) Recycling and donation
5) Refurbishing
6) Nike Grind

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Thank You!

Study Nature, Love Nature, Stay close to nature.

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