Certificate in ESG Management Program by SET & Sasin

SET ESG ACADEMY

Sasin School of Management

Self-paced online learning program

M1 Module 1 ESG Fundamentals

- **S1** Session 1 Introduction to ESG
- **S2** Session 2 ESG Management: Environment
- **S3** Session 3 ESG Management: Social
- **S4** Session 4 ESG Management: Governance

M2 Module 2 ESG Integration Management

- **S1** Session 1 ESG Integration Management
- **S2** Session 2 Integration - Case Studies

M3 Module 3 ESG Disclosure

- **S1** Session 1 ESG Disclosure
- **S2** Session 2 Data Management
- **S3** Session 3 ESG Performance Assessment and Indices

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M1S2

Module 1 ESG Fundamentals

Session 2 ESG Management: Environment

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M1S1
Module 1 ESG Fundamentals
Session 1 Introduction to ESG

M1S2
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Session 2 ESG Management: Environment

M1S3
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Session 2 Data Management

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Module 3 ESG Disclosure
Session 3 ESG Performance Assessment and Indices

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Learning Objectives

Course Structure	Learning Objectives
Module 1 ESG Fundamentals **Session 2 ESG Management: Environment**	
1. Environmental Factors in Business Operation	To enable learners to… **Explain** the key environmental issues in business operations, the impact of business activities on the environment, and the importance of resource management in conducting business activities.
2. Resource and Management: Raw materials, Water, Energy, Waste and Pollution and Greenhouse Gas	**Apply** resource management strategies in organizations, including waste, pollution, and greenhouse gas management, to reduce environmental impact from business activities.
3. Environmental Case Studies	**Explain** the lessons learned from various case studies, such as key factors leading to success or failure in environmental management, things to do and not to do in environmental issues (Do/Don't) and apply them to one's own organization.

Instructor

M1S1

Module 1 ESG Fundamentals

Session 2 ESG Management: Environment

Instructor

Ditthayanan Punyaratabandhu

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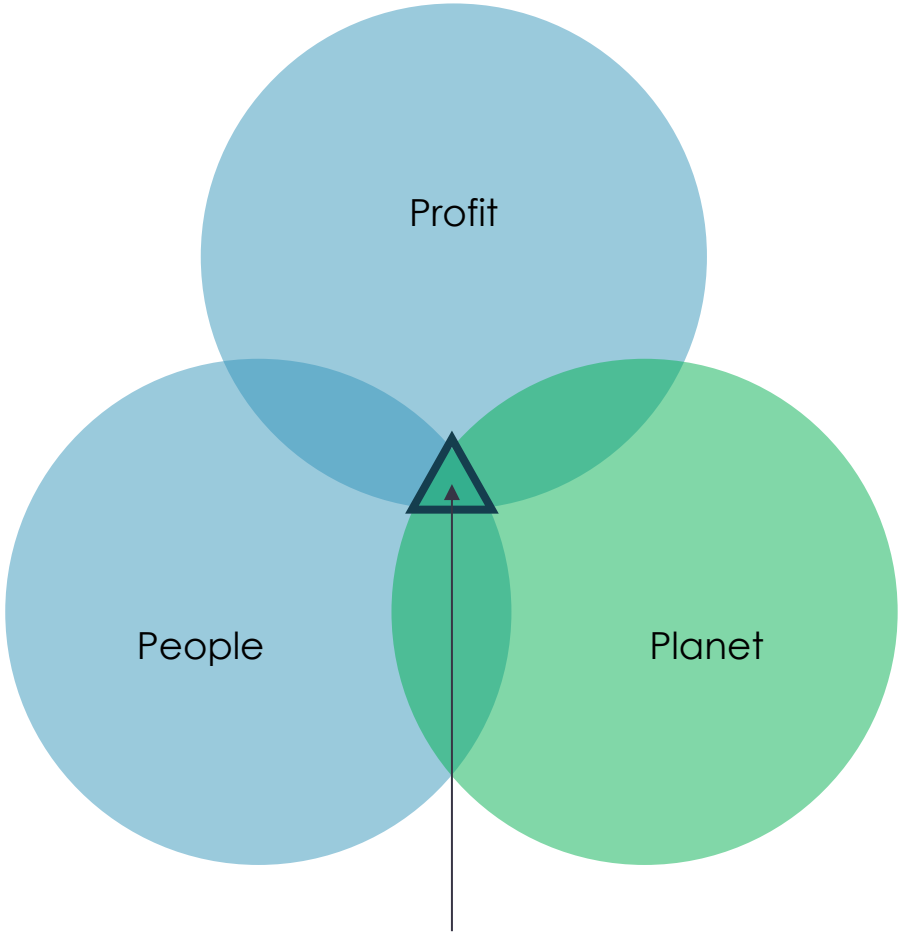
Module 1 ESG Fundamentals

Session 2 ESG Management: Environment

What is Sustainability?

The triple bottom line



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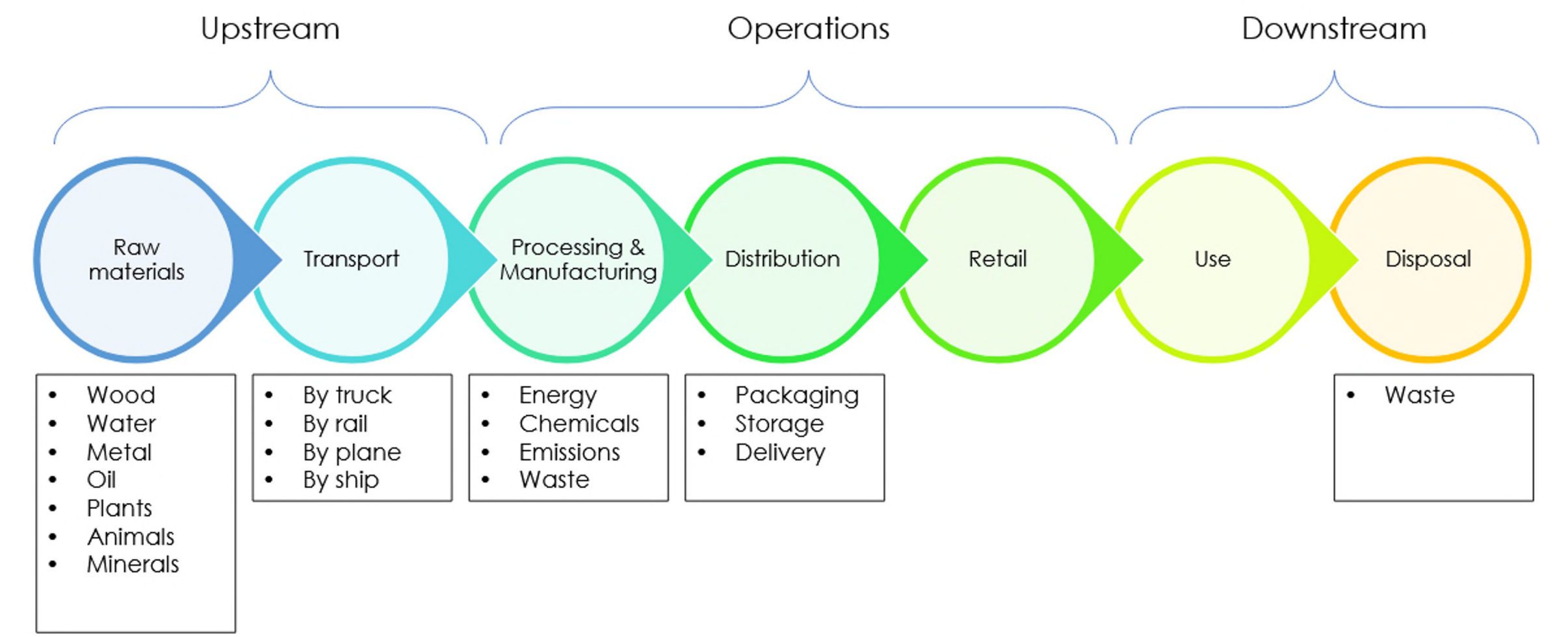
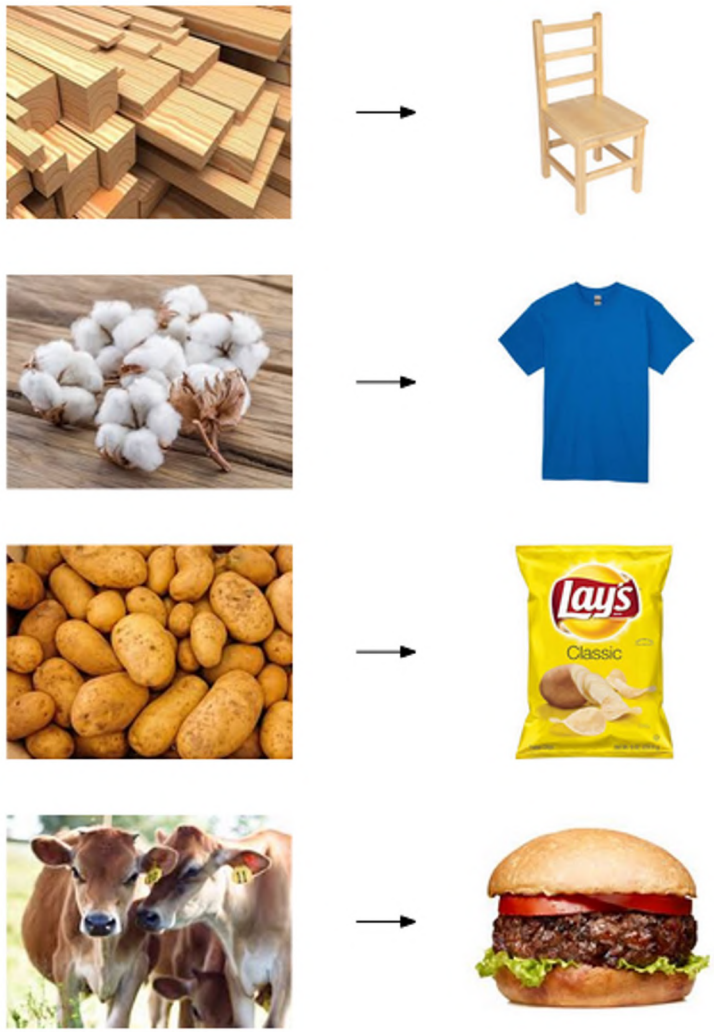
Basic Business Value Chain



Key Environmental Issues

Raw materials



- Deforestation
  - Soil erosion
  - Flooding
- Loss of biodiversity
  - Loss of ecosystem services
  - Collapse of food chains
- Use of resources
  - Water
  - Land
- Environmental damage
  - Chemicals

Key Environmental Issues

Processing & Manufacturing

- Energy consumption
  - Fuel
  - Electricity
- Greenhouse gases
- Pollution
  - Air emissions
  - Waste water
  - Noise
- Environmental damage
  - Leaks / spills
- Waste generation

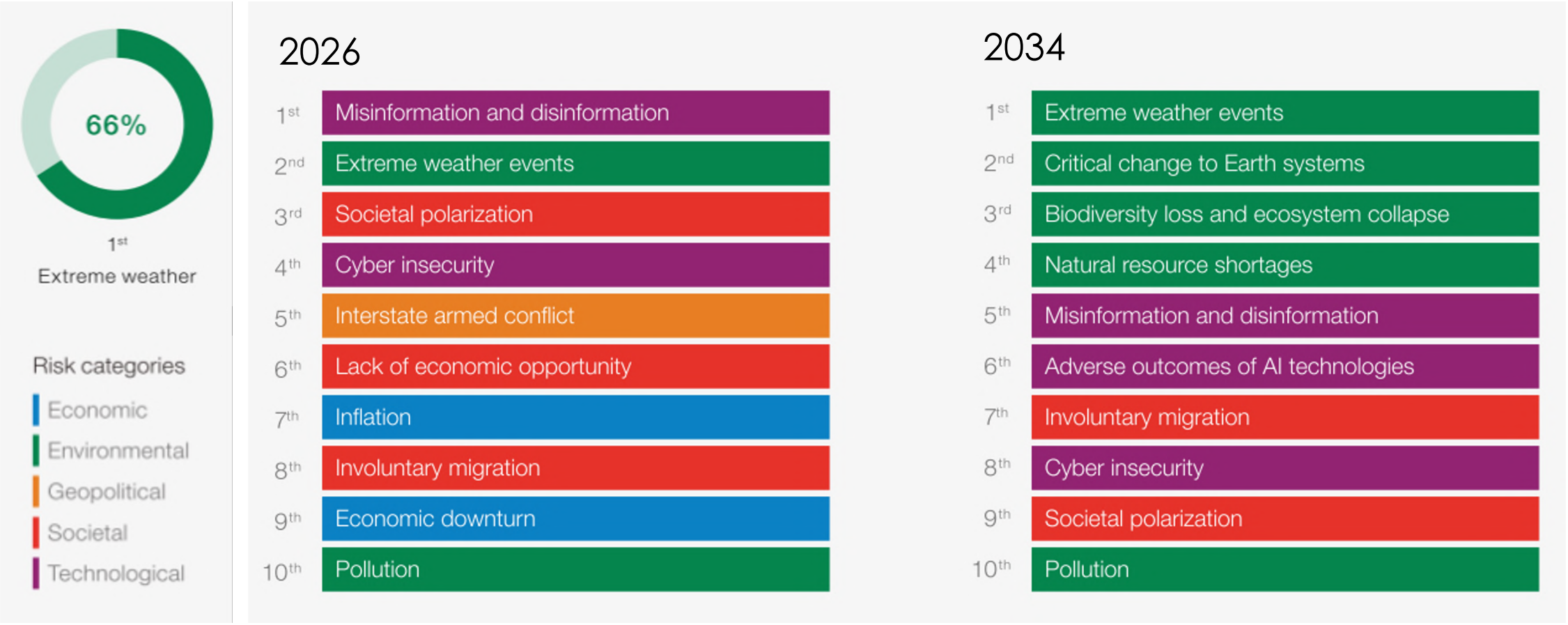
Key Environmental Issues

Disposal

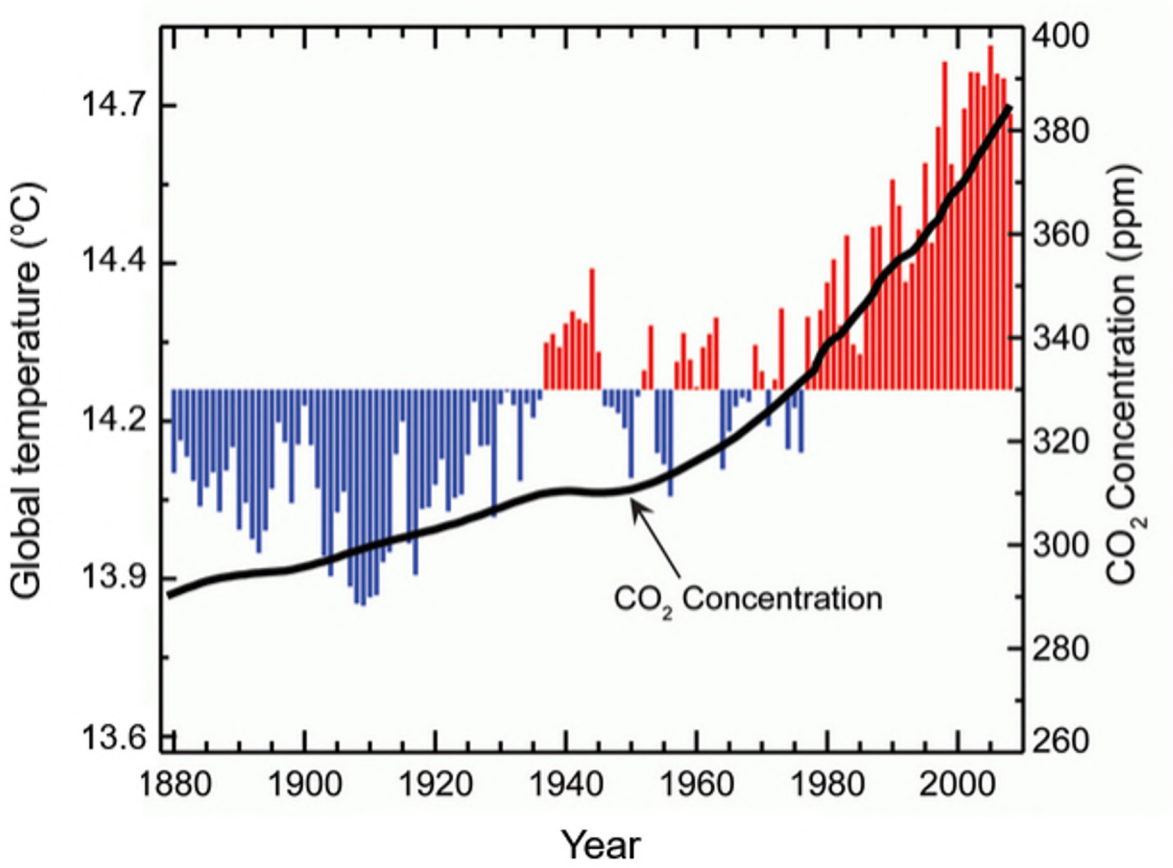
- Landfills
  - Use of space
  - Methane (greenhouse gas)
  - Disease
  - Leachate
- Incineration
  - Air pollution
  - Greenhouse gases
  - Ash
- Hazardous waste

Environmental Risks

2024



Climate Risk



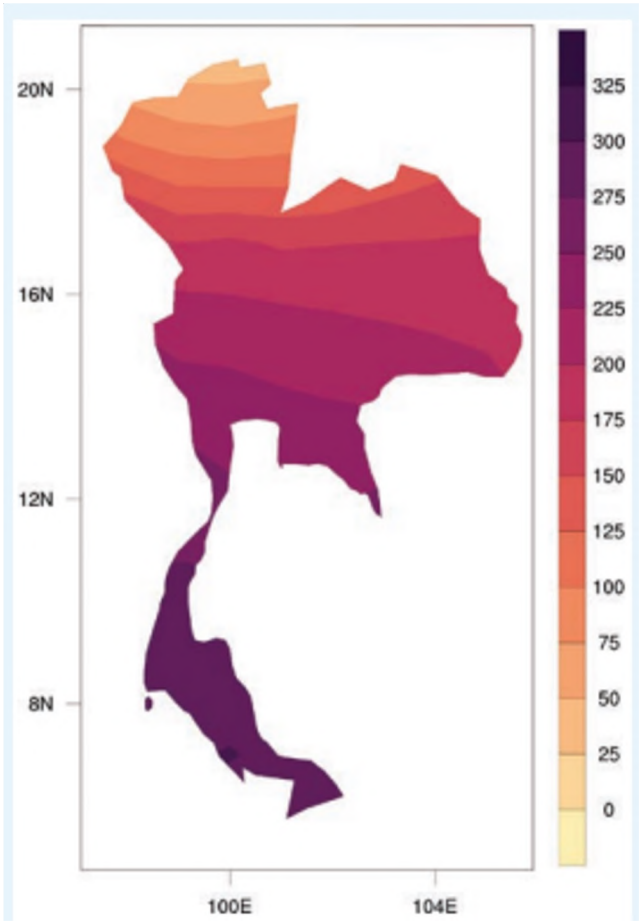
https://www.e-education.psu.edu/egee439/node/641

Temperature rise (2100)	Economic impact
2.8°C	296 B USD / year
4.5°C	520 B USD / year

https://news.climate.columbia.edu/2019/06/20/climate-change-economy-impacts/

Climate & Environmental Risks in Thailand

Extreme heat



Flooding

Drought

By 2030:

- **~3,000,000 people** affected annually
- **~8,000,000,000 USD** in urban damage

Forest fires & PM2.5

https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15853-WB_Thailand%20Country%20Profile-WEB_0.pdf

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Climate & Environmental Risks to Businesses

How Can Businesses…

… increase their operational efficiency and use fewer resources?

land

water

energy

raw materials

… minimize environmental impacts?

biodiversity

deforestation

leaks & spills

… reduce the amount of waste and pollution released into the environment?

waste

emissions

pollution

leaks & spills

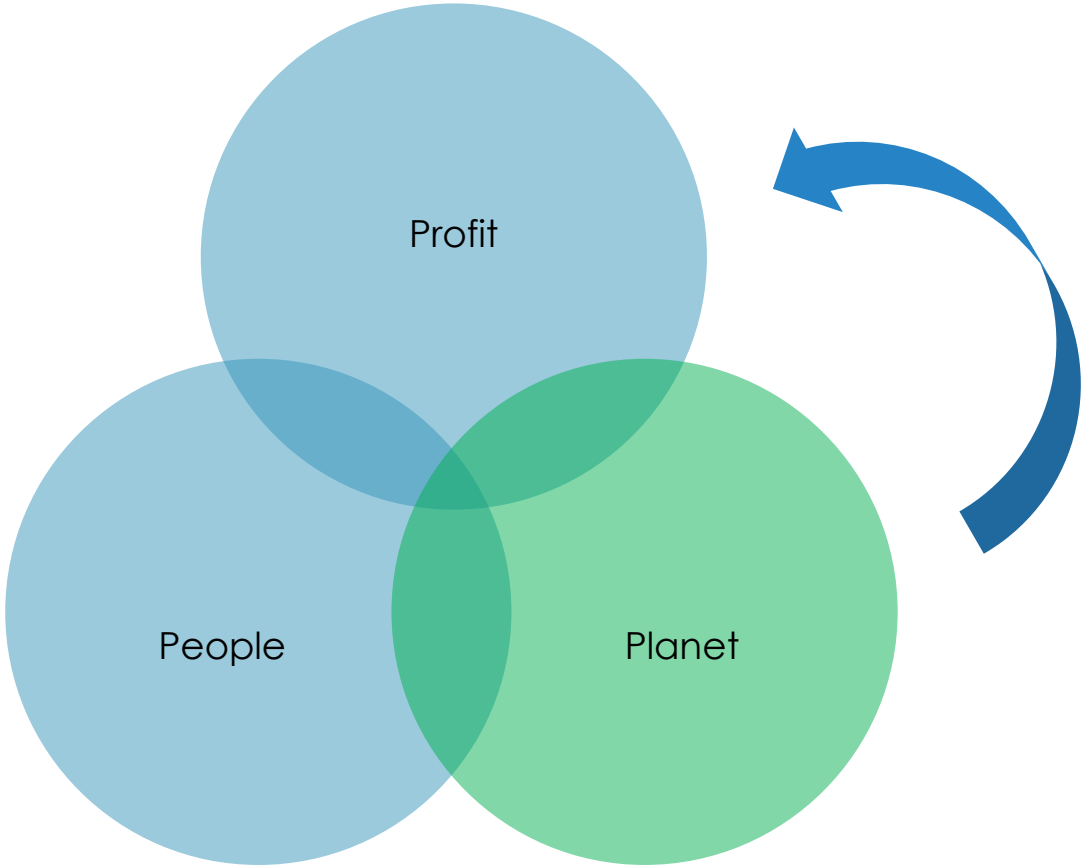
… reduce their greenhouse gas emissions and contribute to climate action?

mitigation

adaptation

Net Zero

Key Takeaways



Business activities contribute to environmental impacts.

Environmental & climate risks will impact all businesses.

Good environmental management helps promote **corporate sustainability**.

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Module 1 ESG Fundamentals

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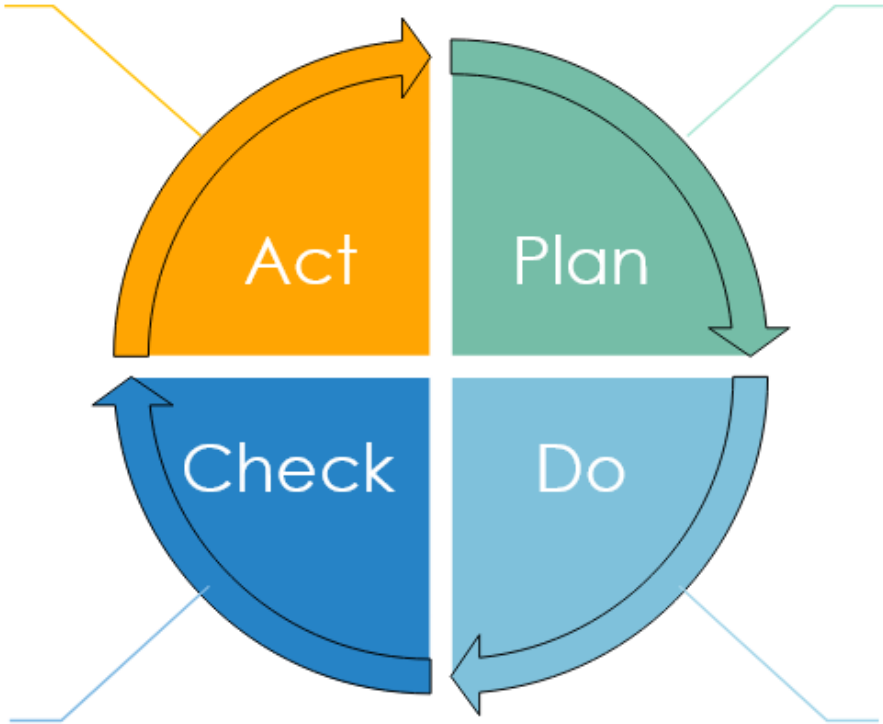
What is Environmental Sustainability?

Achieving an appropriate balance between managing the use of resources for business needs and minimizing environmental impacts from business activities while ensuring the needs of future generations can be met.

How Can We Manage Environmental Issues Sustainably?

Environmental management system:
A systematic approach to help businesses manage people, processes, resources, and environmental impacts.

- Identify areas for improvement
- Develop preventive measures
- Develop contingency plans



- Define policy & scope
- Identify compliance requirements
- Set objectives

- Monitor & measure progress
- Conduct reviews & audits
- Evaluate compliance

- Assign roles & responsibilities
- Communicate requirements
- Build awareness & competency

Examples of Guidelines for Environmental Management

ISO 14001 : Environmental management system

ISO 14044 : Life cycle analysis

ISO 14064 : Greenhouse gas emissions

ISO 20121 : Event sustainability management system

ISO 20400 : Sustainable procurement - guidance

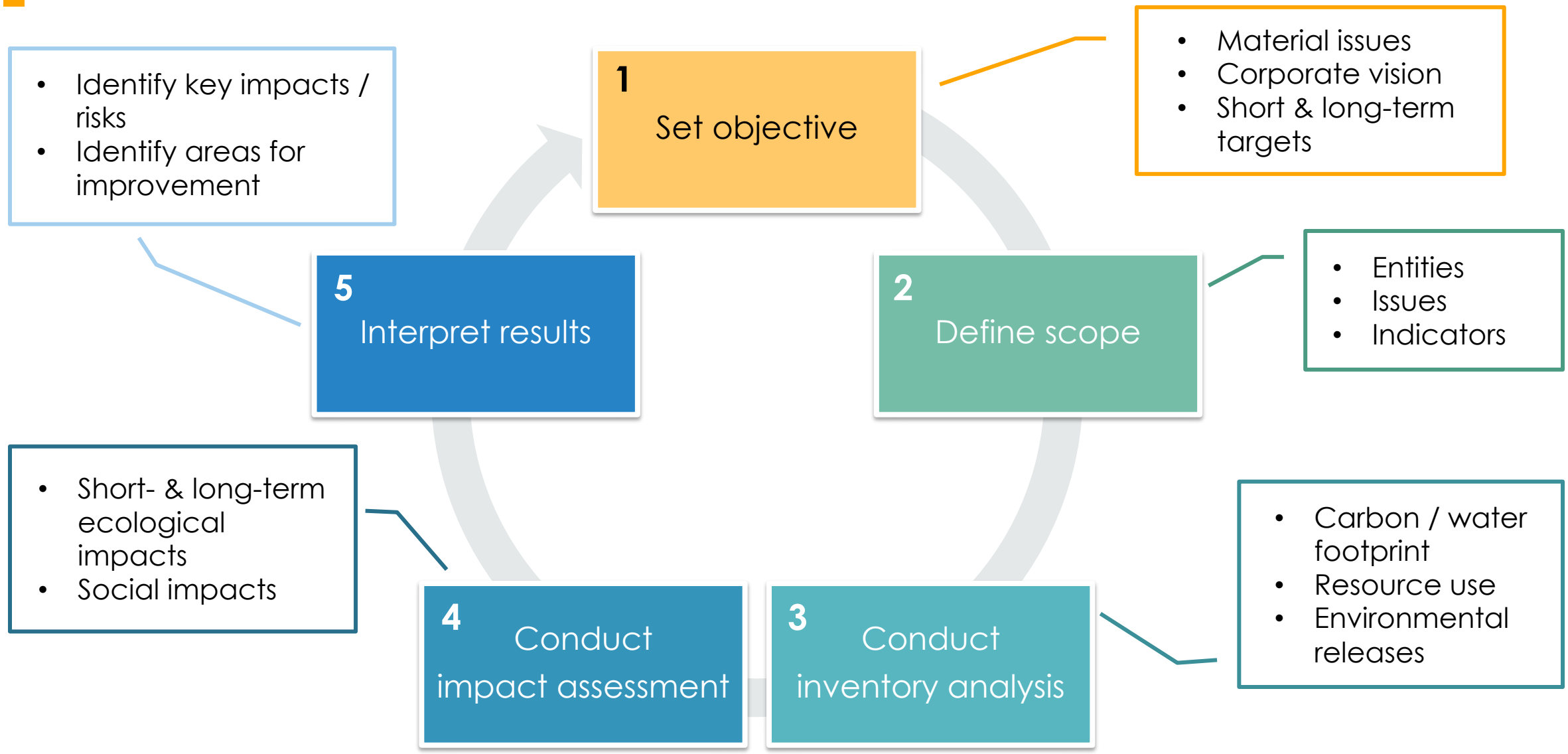
ISO 24518 : Drinking water and wastewater services

ISO 38200 : Chain of custody of wood and wood-based products

ISO 50001 : Energy management

ISO/TC 234 : Fisheries and aquaculture

Life Cycle Analysis / Footprint Analysis



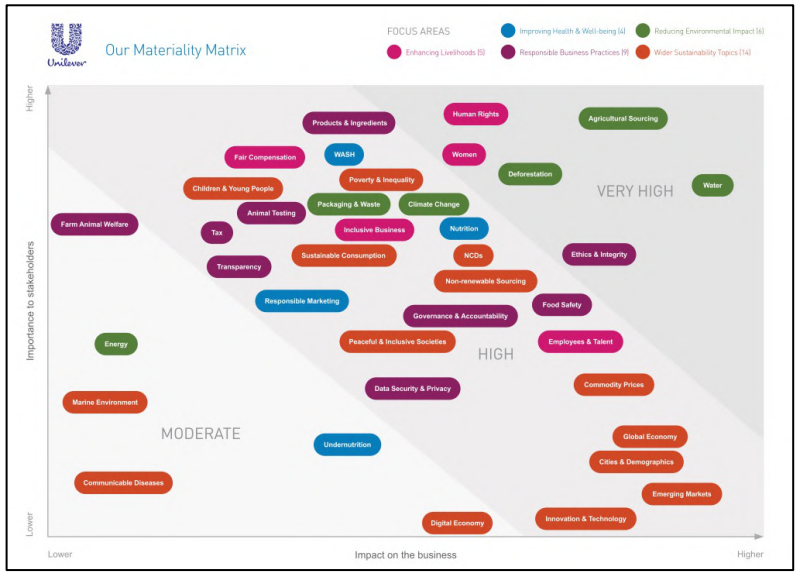
Life Cycle Analysis / Footprint Analysis

1

Set objective

- Clarify the corporate vision & mission
- Identify key issues using a double materiality approach
- Set relevant short- and long-term targets

Materiality assessment → Short- & long-term targets



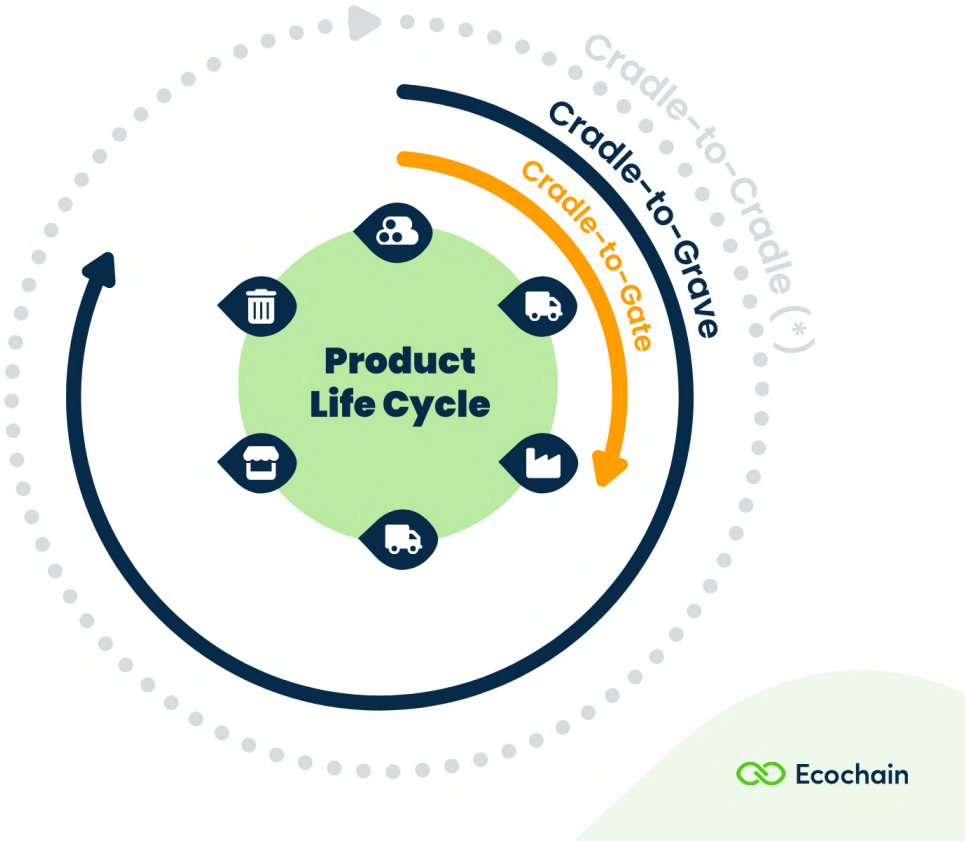
https://www.unilever.com/files/origin/cf17132cc64d96e9c05235892d16969313289a67.pdf/unilever-materiality-matrix-final.pdf

https://www.unilever.com/files/our-sustainability-goals.pdf

Life Cycle Analysis / Footprint Analysis

2 Define scope

- Identify which processes to include
- Identify which entities to include
- Identify which issues & related indicators to include



https://ecochain.com/blog/life-cycle-assessment-lca-guide/#four-phase-lca

Cradle-to-Gate:
- Raw materials to processing / manufacturing

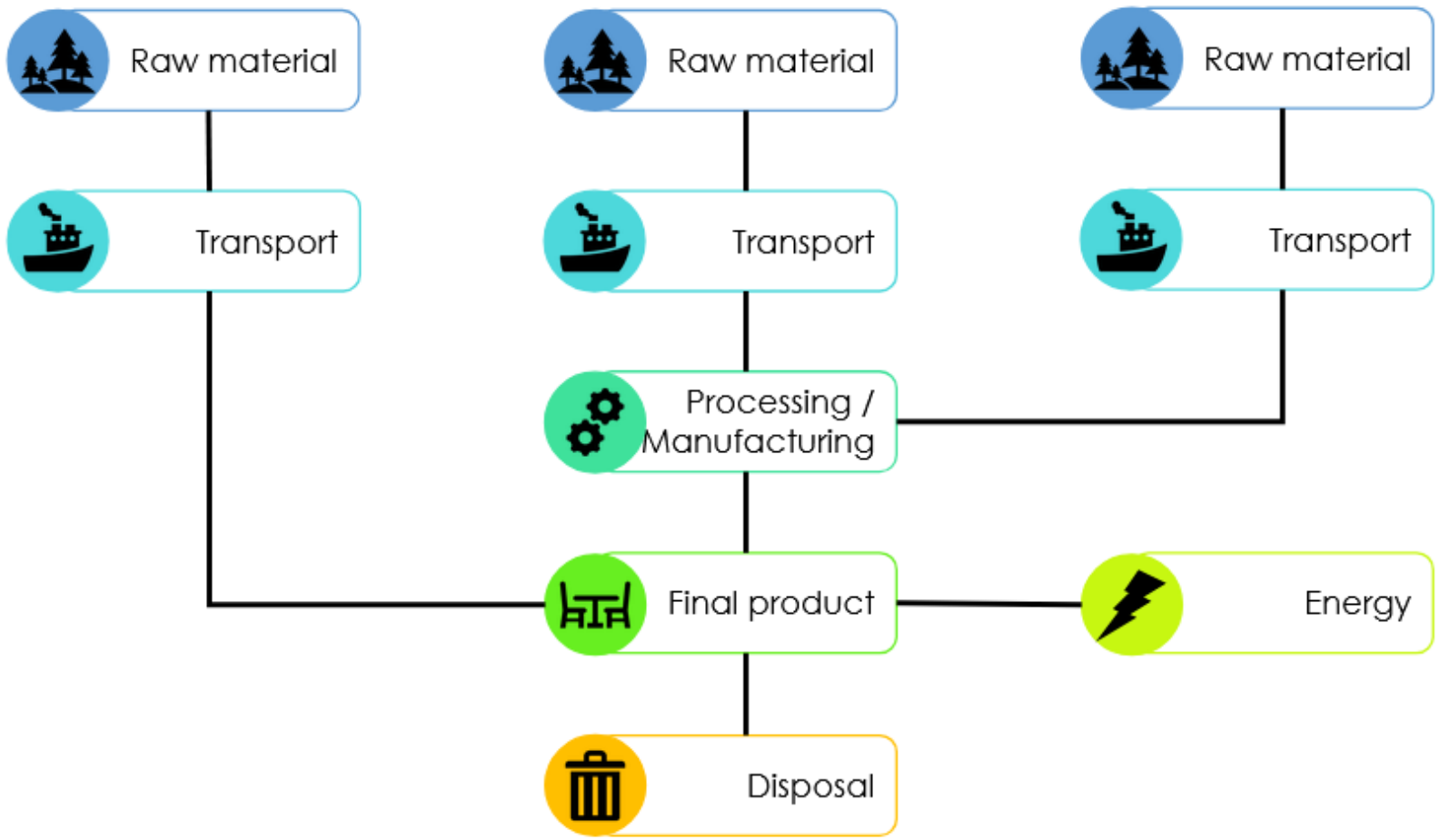
Cradle-to-Grave:
- Raw materials to disposal

Cradle-to-Cradle:
- Circular economy

Life Cycle Analysis / Footprint Analysis

3 Conduct inventory analysis

- Identify & quantify resource usage
- Identify & quantify environmental releases / discharge
- Utilize carbon / water footprint analysis



Life Cycle Analysis / Footprint Analysis

4 Conduct impact assessment

- Identify the relevant metric(s) for each indicator included
- Assess the social and environmental impacts of the company's resource usage and environmental releases

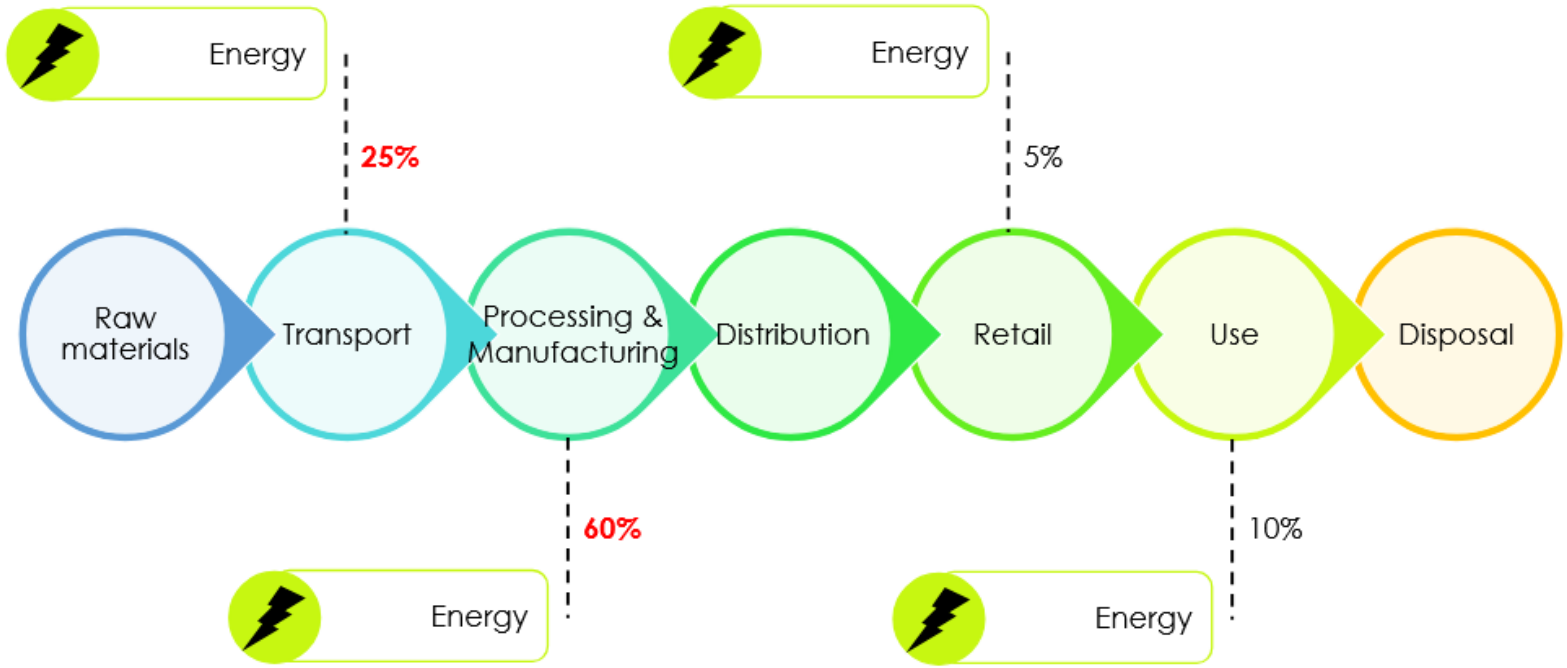
Examples of environmental issues / indicators

Category / indicator	Measurement units
Climate change / GHG emissions	kg CO_2e
Eutrophication (freshwater)	kg PO_4e , kg Ne
Human toxicity / cancer	CTUh
Water use / water withdrawal	m^3
Emissions / PM (dust) emissions	ppm , metric tons

Life Cycle Analysis / Footprint Analysis

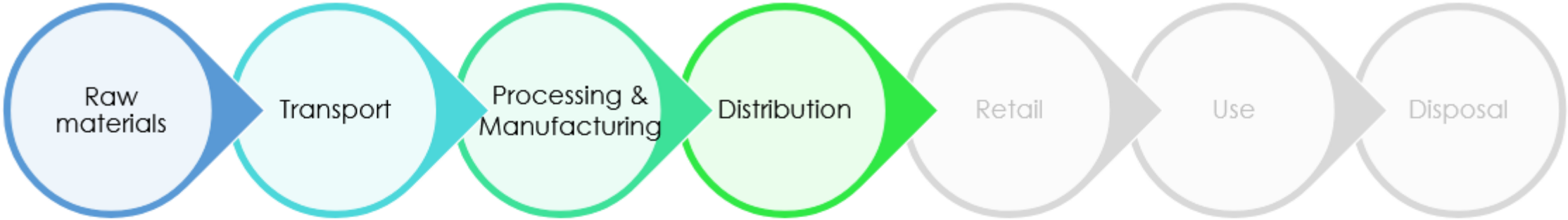
5
Interpret results

- Compare the results with other products / services
- Identify which processes have the most significant impacts
- Look for ways to reduce the impact and/or improve the efficiency of that process



Environmental Management

Resource Consumption & Raw Materials Management



Objective

Reduce the consumption of natural resources

Focus areas

- Raw materials
- Energy & electricity
- Water
- Land

Management Strategies

Raw materials

- Redesign products / packaging : use less packaging, use different materials
- Reuse(d) & recycle(d) materials : use refill containers, use recycled & recyclable materials
- Innovate new materials : plant-based plastics, mushroom packaging, strength-adding structures

Kao

Reduced resin in packaging by 34%

Coca-Cola x KeelClip

Saves 2,000 tonnes of plastic annually

Ecovative Design

Zero plastic, home compostable

Management Strategies

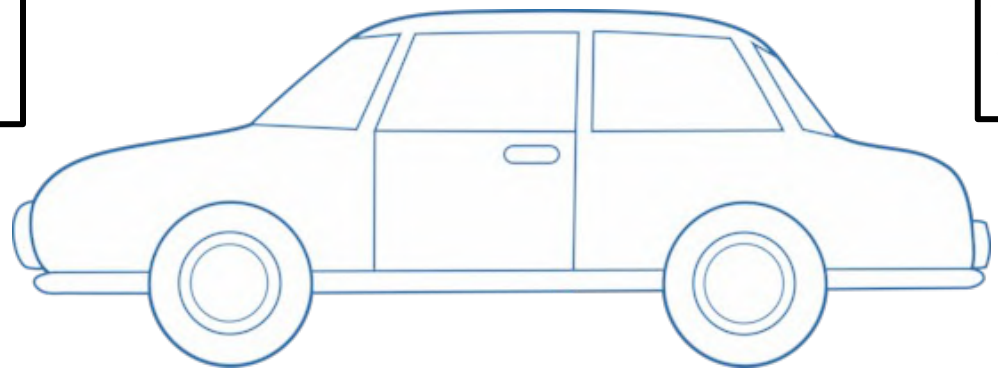
Energy & electricity

- Increase operational efficiency : reduce amount of fuel / energy & increase earnings per production unit
- Optimize processes : conduct preventive maintenance, maintain steady production rates
- Use renewable energy : solar, wind, biomass, hydropower

- Use renewable energy
- Lower energy costs
- Will not run out

- Reduce risk of human error through training
- Encourage innovation

- Remove/ turn off unused/ unnecessary energy consumers



- Use appropriate tools/ technology
- Choose higher quality where possible

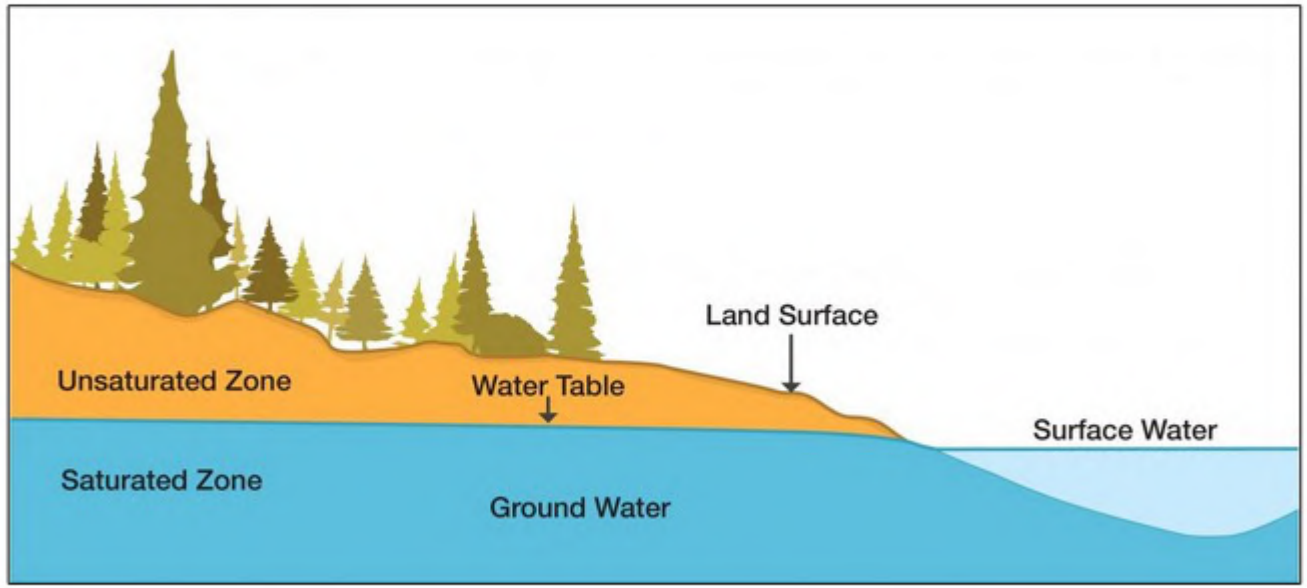
- Preventative maintenance
- Corrective maintenance

- Run in higher gear
- Maintain steady rate

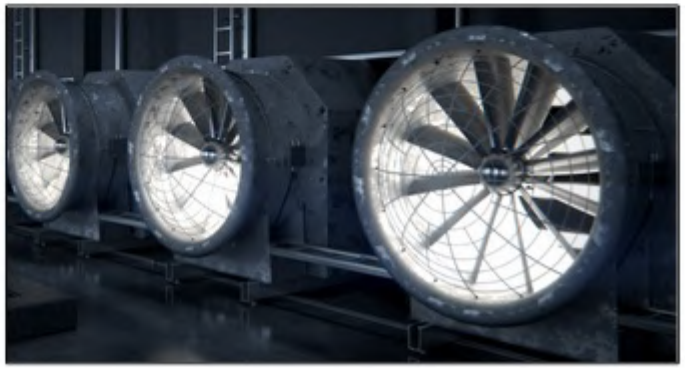
Management Strategies

Water

- Increase efficiency : reduce costs & consumption per production unit
- Change the source : use sustainable sources, use reclaimed water
- Choose appropriate products : drought-resistant crops, air-cooling technology



https://www.cdc.gov/healthywater/drinking/public/water_sources.html



Management Strategies

Land

- Optimize use of space : build upwards, share space
- Employ long-term planning: use crop rotation, use rotation cycle of cutting trees
- Rehabilitate the land: reforest / restore damaged areas to bring back a healthy ecosystem

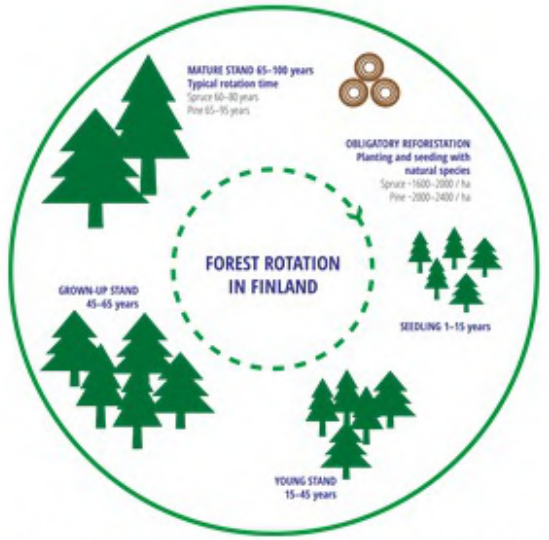
Vertical farming

10-20x higher yield per acre

Solar grazing

Shared space prevents fire risk

Cycle of forestry



Cut & regrow trees in rotating sections

Environmental Management

Waste & Pollution Management

Objective

Reduce the generation of waste and pollution

Focus areas

- Non-hazardous & hazardous waste
- Contamination of air, water and/or soil
- Other types of pollution

Waste vs. Pollution

Unwanted byproducts of a process

Non-hazardous

Hazardous

Substances that are harmful to the environment

Air

Water

Soil

Noise

Light

Heat

Management Strategies

Waste & pollution

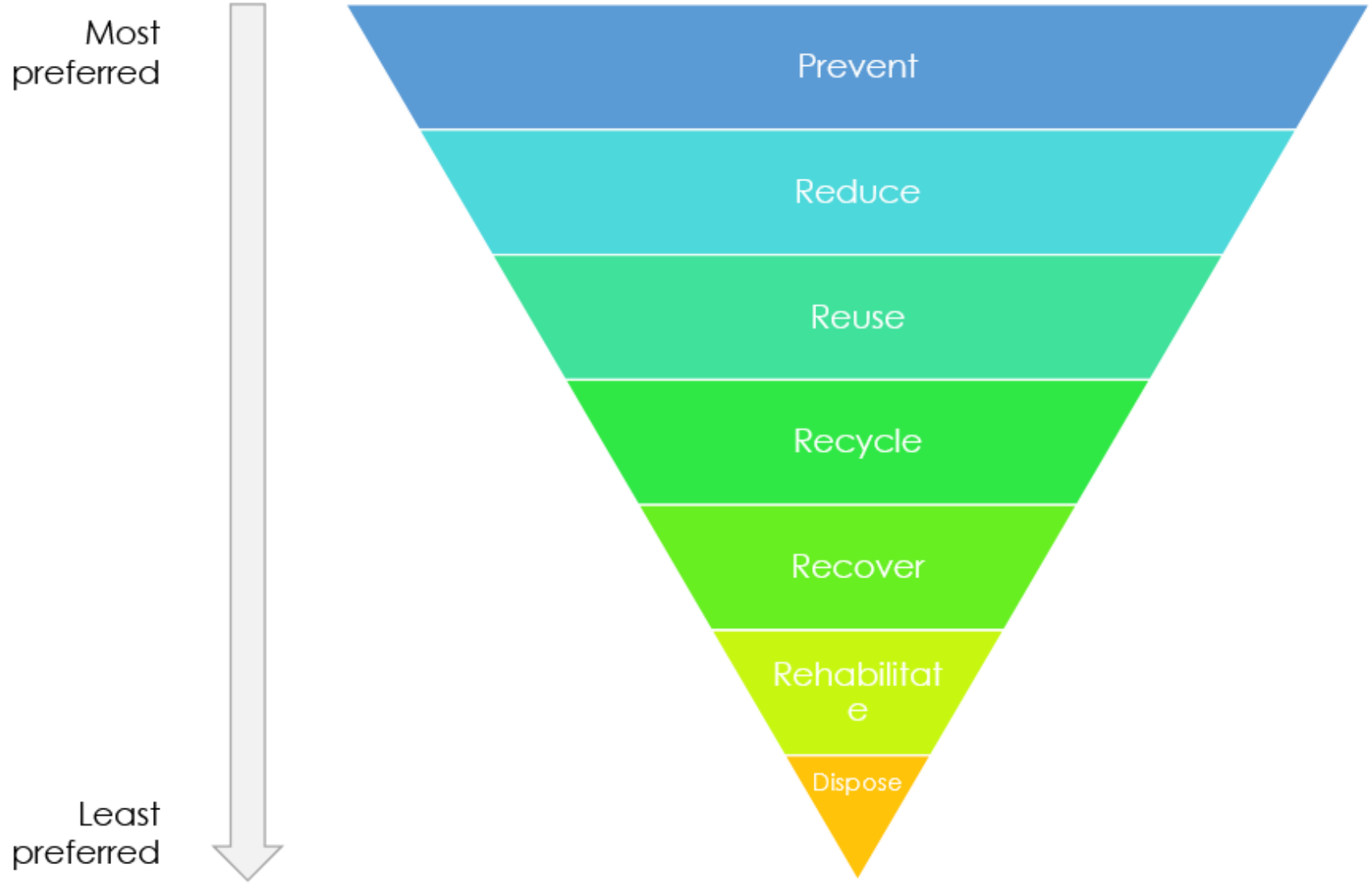
- Utilize appropriate technology & processes
- Employ the waste mitigation hierarchy
- Develop circularity / circular economy

Appropriate disposal methods

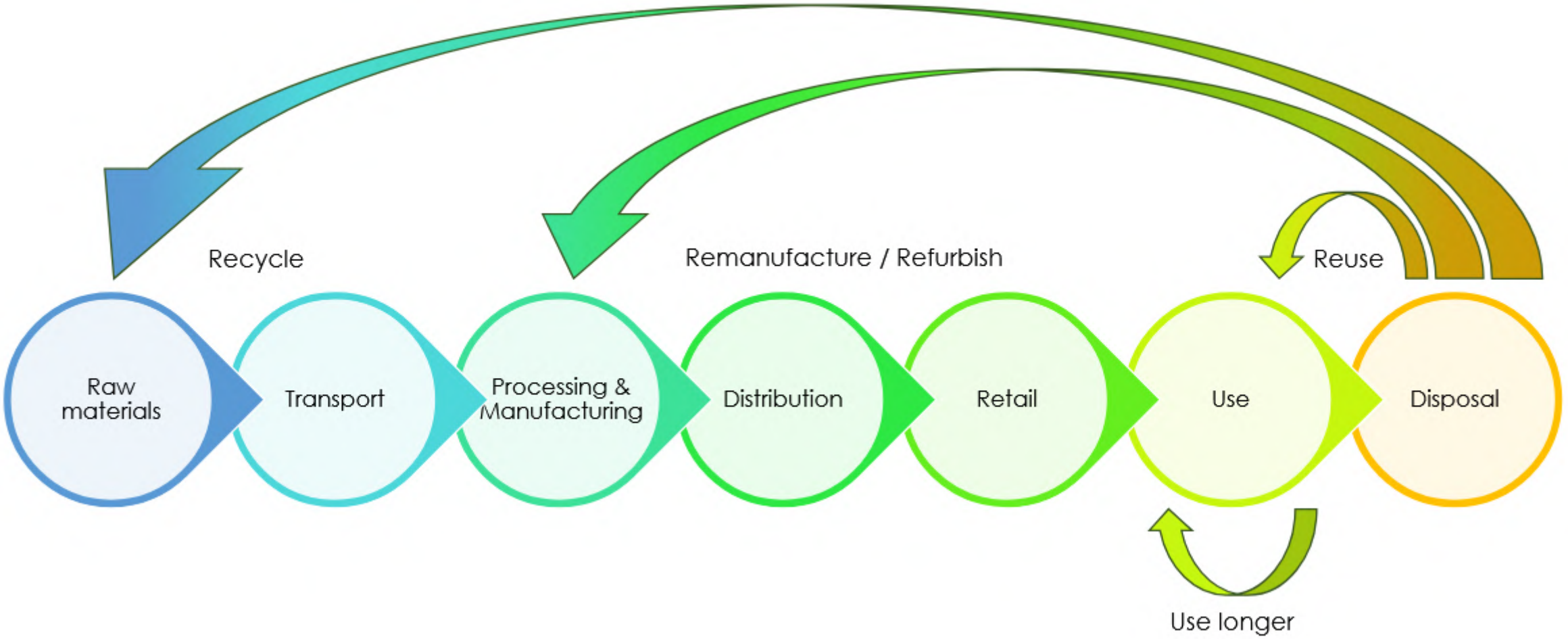
Appropriate storage & transport

Appropriate technology

Waste Mitigation Hierarchy

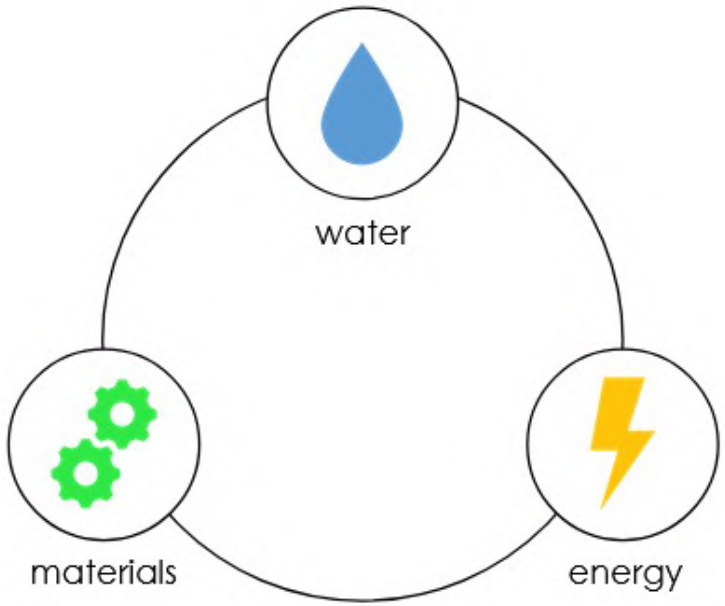


Circularity in Business

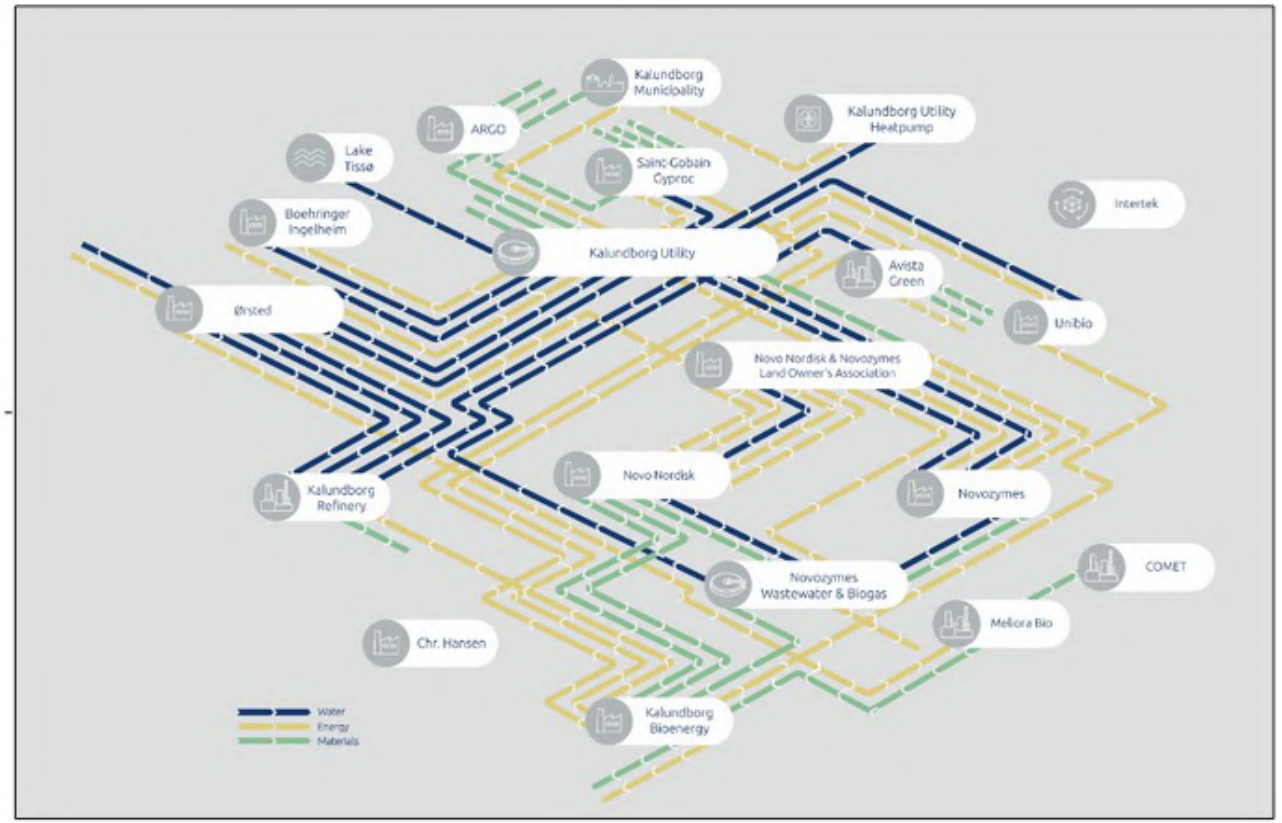


Circularity in Business

The Kalundborg Industrial Symbiosis Model:
A circular system where the waste / byproducts from one company is used as the input for another company.



62,000 tonnes of materials recycled
4,000,000 m^3 groundwater saved
586,000 tonnes of CO_2 saved



https://www.symbiosis.dk/en/

Environmental Management

Understanding Greenhouse Gases

Types of greenhouse gases

Carbon dioxide (CO_2)
- Fuel consumption

Methane (CH_4)
- Agriculture, decomposition

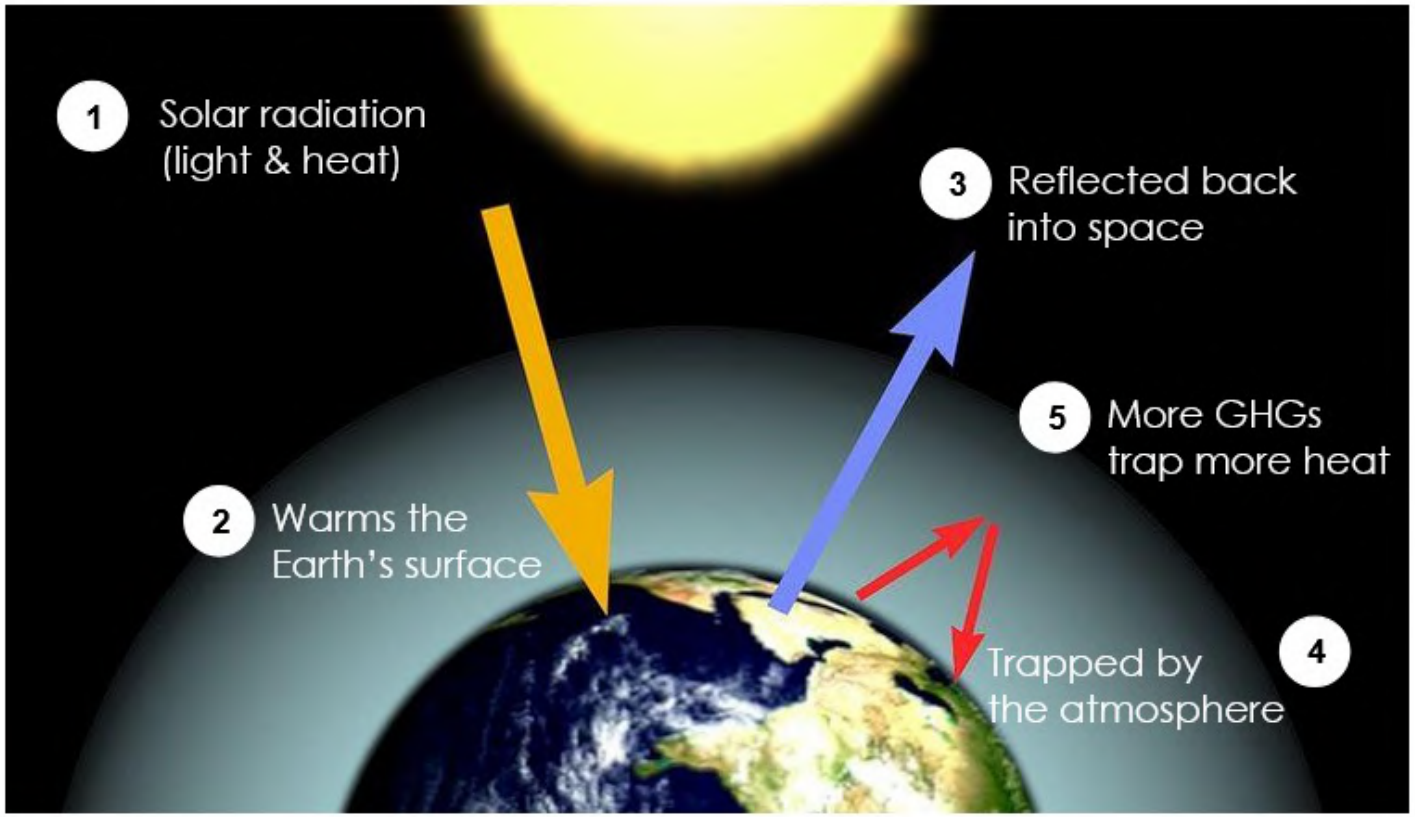
Nitrous oxide (N_2O)
- Fertilizers, animal waste

Sulfur hexafluoride (SF_6)
- Electrical insulation

Hydrofluorocarbons (HFC)
- Refrigeration, cooling

Perfluorocarbons (PFC)
- Semiconductors

Nitrogen trifluoride (NF_3)
- Semiconductors, LEDs, solar panels



Greenhouse Gas emissions & Climate Management

Objective

Reduce greenhouse gas emissions
Increase resilience to physical climate risks

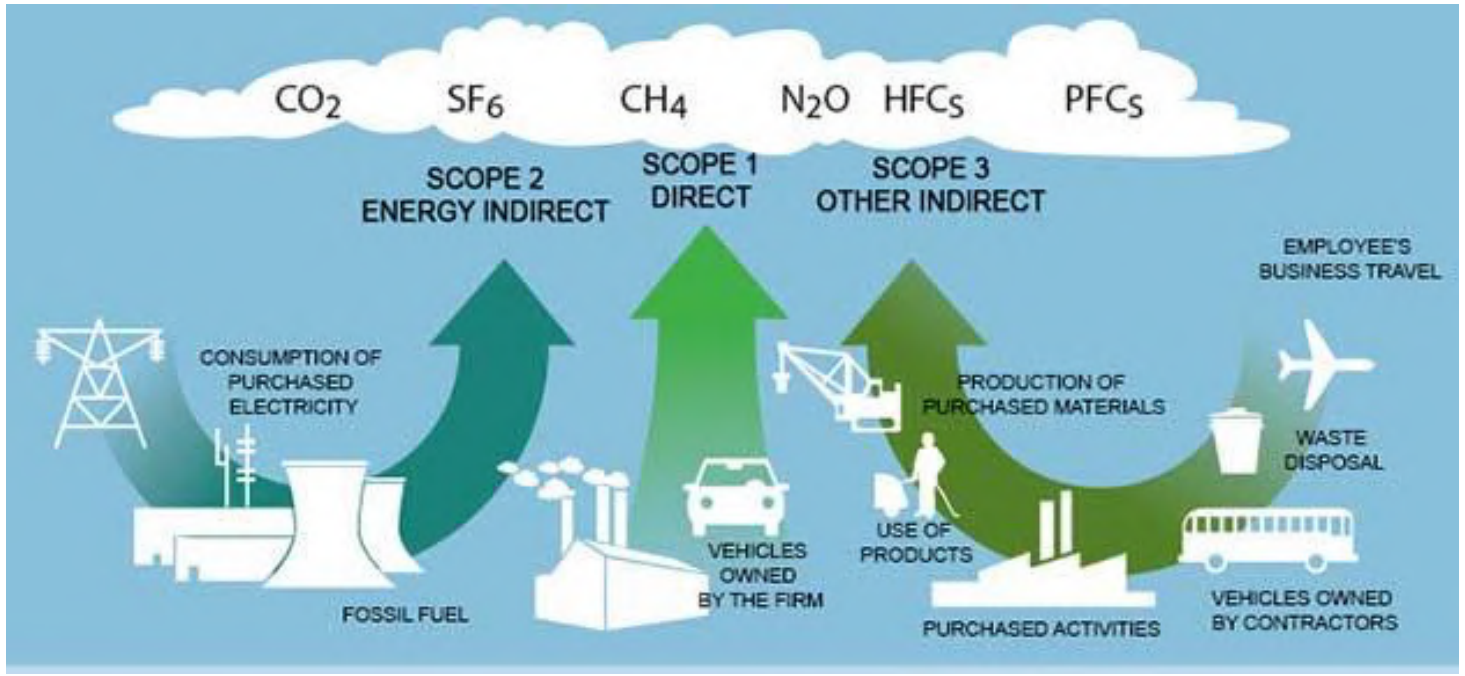
Focus areas

- Greenhouse gas emissions
- Climate mitigation
- Climate adaptation

Mitigation vs. Adaptation

Mitigation:
Reducing greenhouse gas emissions

Adaptation:
Building resilience to physical climate impacts

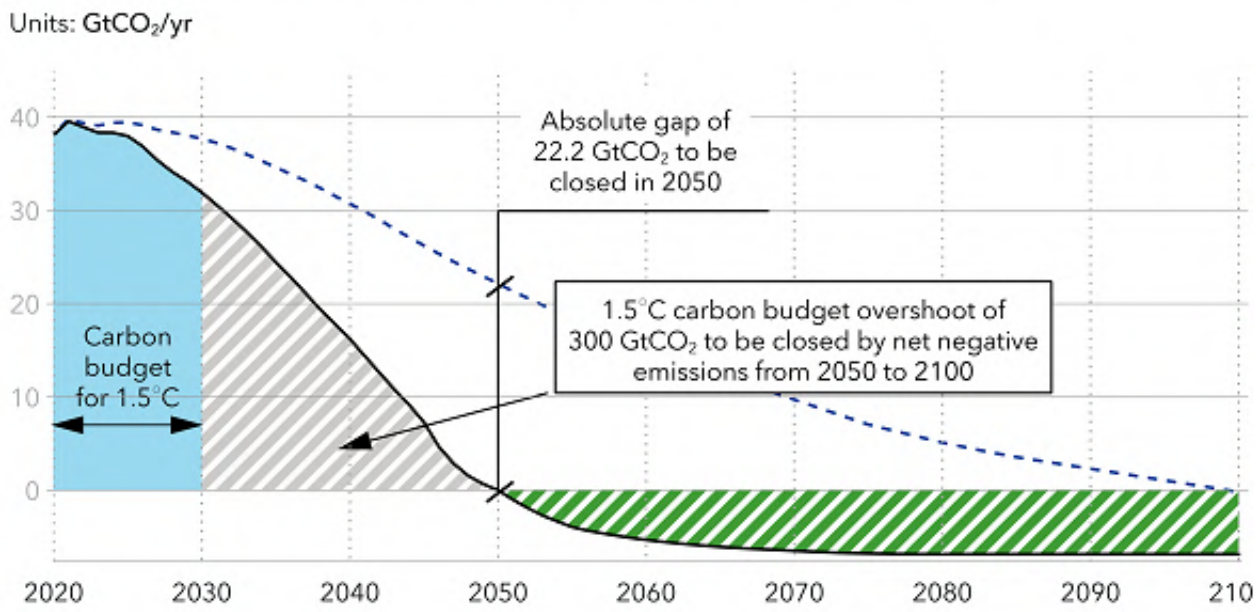


https://www.corporateknights.com/natural-capital/emission-impossible/

Management Strategies

Mitigation

- Scope 1 : reduce fossil fuel consumption
- Scope 2 : reduce electricity consumption, use renewable energy sources
- Scope 3 : reduce resource consumption, reduce transportation, reduce waste generation



https://www.dnv.com/energy-transition-outlook/pathway-to-net-zero-emissions/

Electrify where possible
Use renewable energy or biofuels

Improve energy efficiency
Install / purchase renewable energy

Prioritize online / remote work
Buy local where possible
Emphasize circularity

Carbon offsets (e.g. tree planting)
Carbon capture (e.g. direct air capture)

Management Strategies

Adaptation

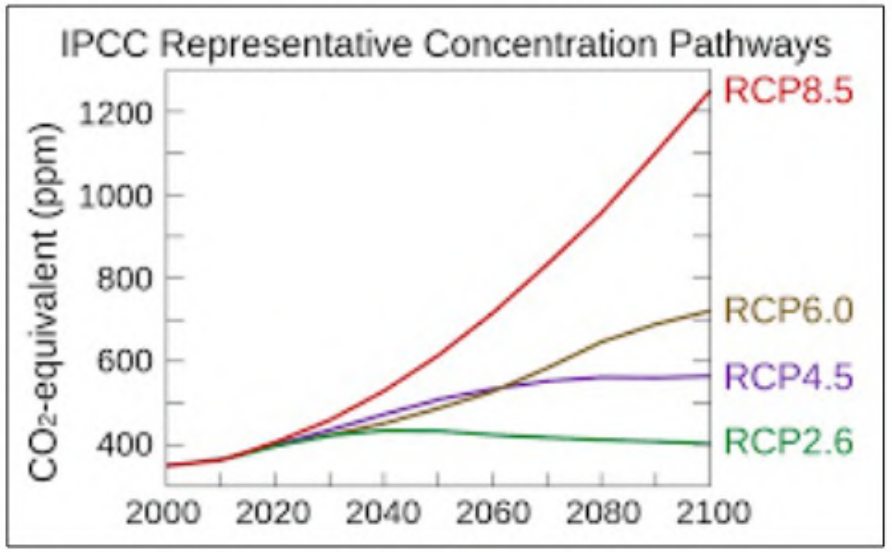
- Enhance disaster preparedness : emergency planning, capacity building
- Appropriate designs & processes : location, materials, techniques, solutions
- Climate scenario analysis : long-term risk assessment

SENDAI FRAMEWORK

FOR DISASTER RISK REDUCTION 2015-2030

REDUCE	INCREASE
Global disaster mortality	Countries with disaster reduction strategies
Number of people affected globally	International cooperation to developing countries
Direct economic loss in relation to GDP	Availability & access to early warning systems
Disaster damage to critical infrastructure	… by 2030

Climate scenario analysis for physical risks



Key Takeaways

Good environmental management contributes to environmental sustainability and financial benefits.

Know thyself :
Assess your business' environmental risks & impacts.

Set targets :
Outline your **ambition** and set targets accordingly.

Take **action** :
Implement strategies to
- reduce resource consumption
- reduce waste generation
- reduce greenhouse gas emissions
- promote sustainability across the value chain

Contents

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Case Study: PUMA
Reducing resource consumption

Germany

Apparel

522 million EBT

~21,000

#54 Corporate Knights

#67 TIME Magazine

#71 Sustainability Magazine

TOP 10% S&P Global Sustainability Yearbook

Chemicals

Water & air

Climate

Products

Biodiversity

Circularity

Plastic & Oceans

PUMA's Environmental Management Strategies

1. Identify material issues
2. Set targets & strategies
3. Implement strategies
4. Measure results

- 90% of our footwear contains at least one component made of recycled or certified material

- 90% of PUMA products contain more than 50% recycled or certified material
- Increase use of recycled polyester to 75% by 2025

Prioritize large-scale use of sustainable products
- 100% cotton, polyester, leather, cardboard

Use more recycled material
- Reduces use of virgin material

Make products lighter
- Use less material in footwear

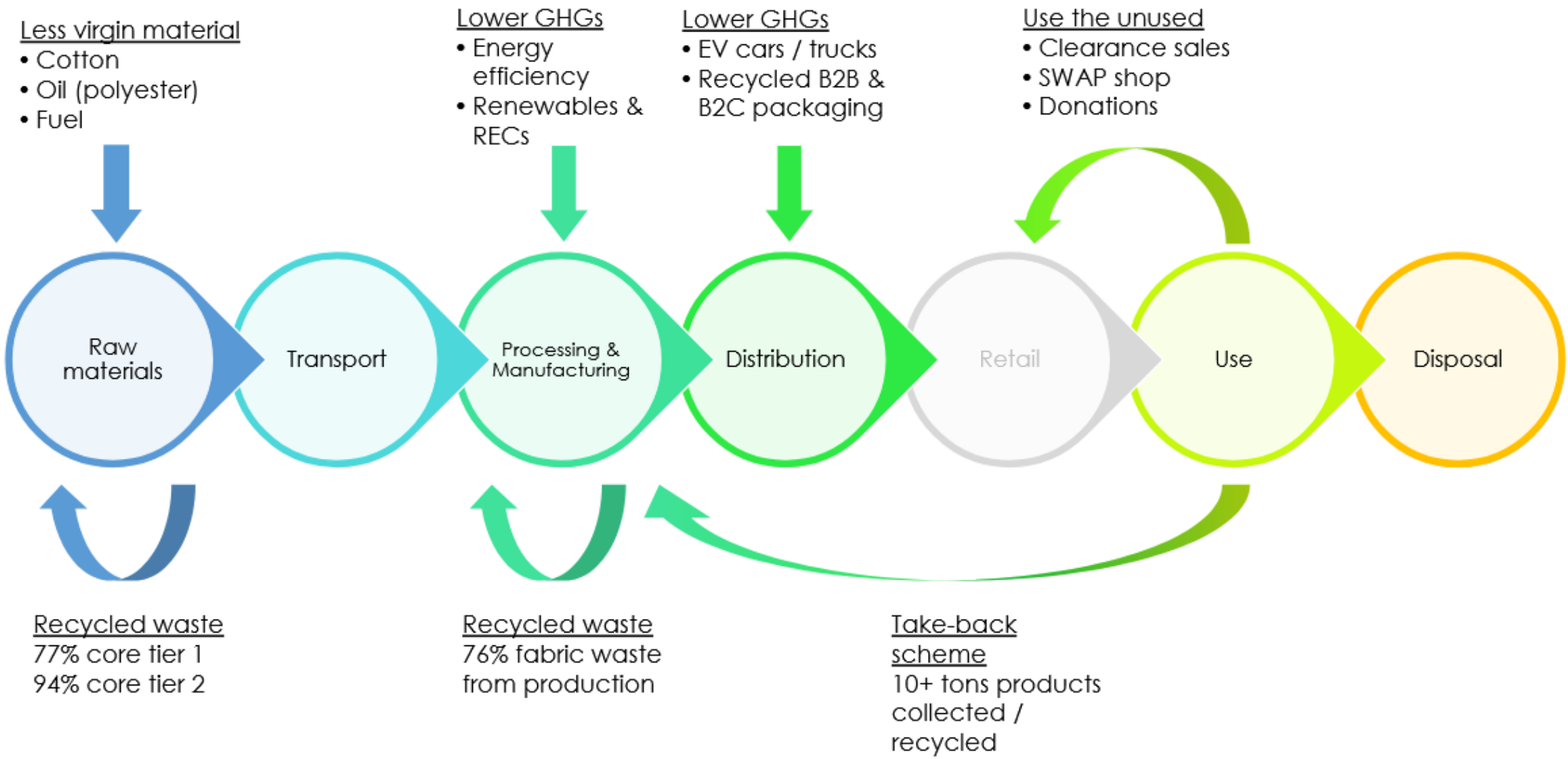
Stop using:
- Certain materials (e.g. exotic leather, wool, coal)
- Hazardous chemicals
- Plastic bags

Reduce waste by:
- Investing in more energy and resource-efficient processes
- Implementing "take back" programs for customers

Initiate training & collaboration
- Designers, developers, partners, suppliers

Use renewable energy

PUMA's Environmental Management Strategies



Results

Case Study: Hyundai
Greenhouse Gas & Climate Management

HYUNDAI

South Korea

Automotive

12.8 billion EBT

~123,000

#182
TIME Magazine

TOP 1%
S&P Global
Sustainability Yearbook

The Right Move
for the Right Future

Move for Our Planet

Global Environment
The Right Move for Our Planet

- Carbon Neutrality & Energy Transition
- Circularity
- Clean Tech Products & Services
- Operational Eco-efficiency
- Natural Capital Conservation

Move for Our People

Internal Stakeholders
The Right Way for Our Growth

- Diversity & Inclusion
- Human Rights
- Corporate Culture Innovation
- Talent Growth Experiences
- Occupational Health & Safety

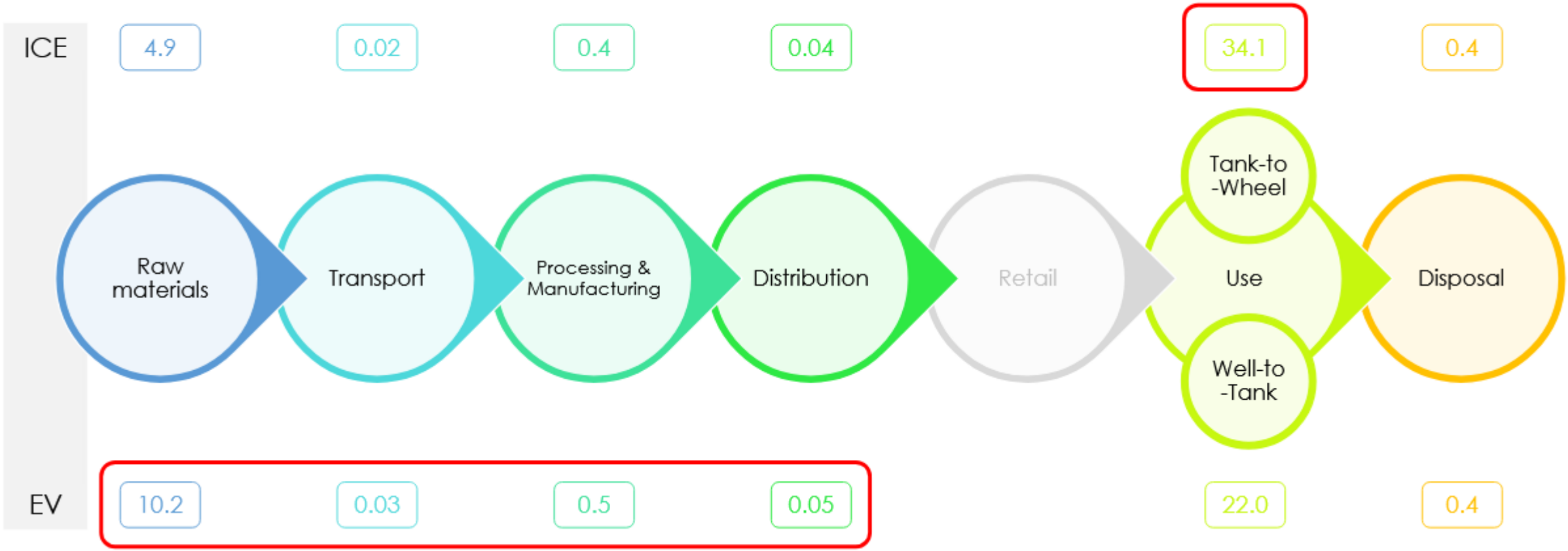
Move for Our Community

External Stakeholders
The Right Change for Our Society

- Social Impact
- Customer Experience Innovation
- Product Quality & Safety
- Sustainable Supply Chain
- Job Creation for the Future

Hyundai's Product Life Cycle Assessment

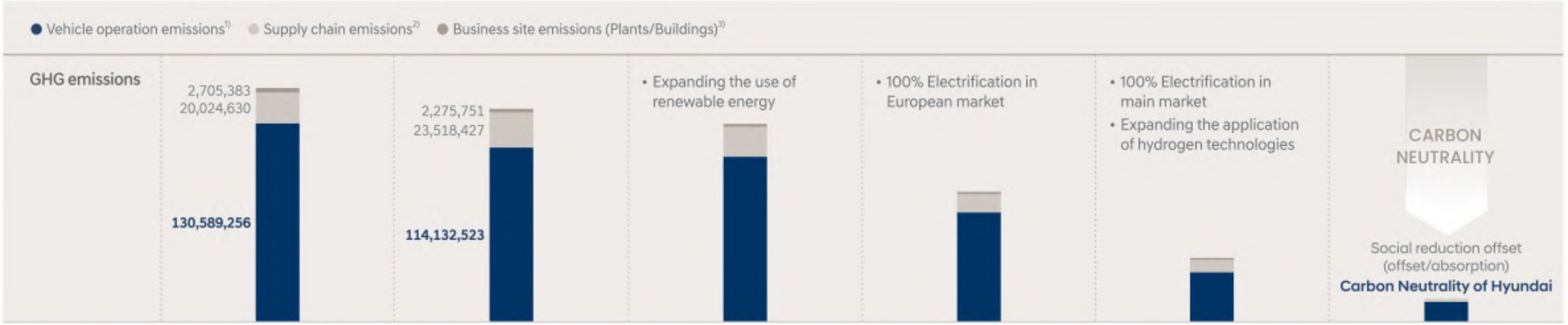
Cradle-to-Grave LCA	Kona gasoline engine (ICE) vs. Kona EV	t CO_2 eq / vehicle	**39.9** vs. **33.2** (-17%)



Hyundai's Environmental Management Strategies

2045 Carbon Neutrality Roadmap

(Unit: tCO_2-eq)



Sector	2019(base year)	2023	2030	2035	2040	2045
Business Site Reduction	Business site emissions[3] ($2,705,383$ tCO_2-eq)	Business site emissions ($2,275,751$ tCO_2-eq)	45% reduction	60% reduction	75% reduction	100% reduction
			Achieve RE100 at overseas business sites	Introduce hydrogen in major processes	Achieve RE90 at all business sites	Achieve RE100 at all business sites and use green hydrogen
Supply Chain Reduction	Supply chain emissions[2] ($20,024,630$ tCO_2-eq)	Supply chain emissions ($23,518,427$ tCO_2-eq)	15% reduction	40% reduction	60% reduction	90% reduction
			Expand application of recycled materials	Apply low-carbon materials	Expand application of low-carbon materials	Apply carbon-neutral materials
Vehicle Operation Reduction	Vehicle operation emissions[1] ($130,589,256$ tCO_2-eq)	Vehicle operation emissions ($114,132,523$ tCO_2-eq)	15% reduction	45% reduction	75% reduction	90% reduction
			30% share of electrified vehicles	50% share of electrified vehicles (100% electrification in European market sales)	80% share of electrified vehicles (100% electrification in major market sales)	90% share of electrified vehicles (acceleration of electrification in emerging markets)

* GHG reduction targets were established based on the "Science-based Target", and the reduction targets were calculated for 100% of the base year's emissions.
** The reduction percentages for 2030, 2035, 2040, and 2045 refer to the reduction rates compared to the base year of 2019.

https://www.hyundai.com/content/dam/hyundai/ww/en/images/company/sustainability/about-sustainability/hmc-2024-sustainability-report-en-v2.pdf

Case Study: WHA UP & Gulf
Industrial Symbiosis/Circularity

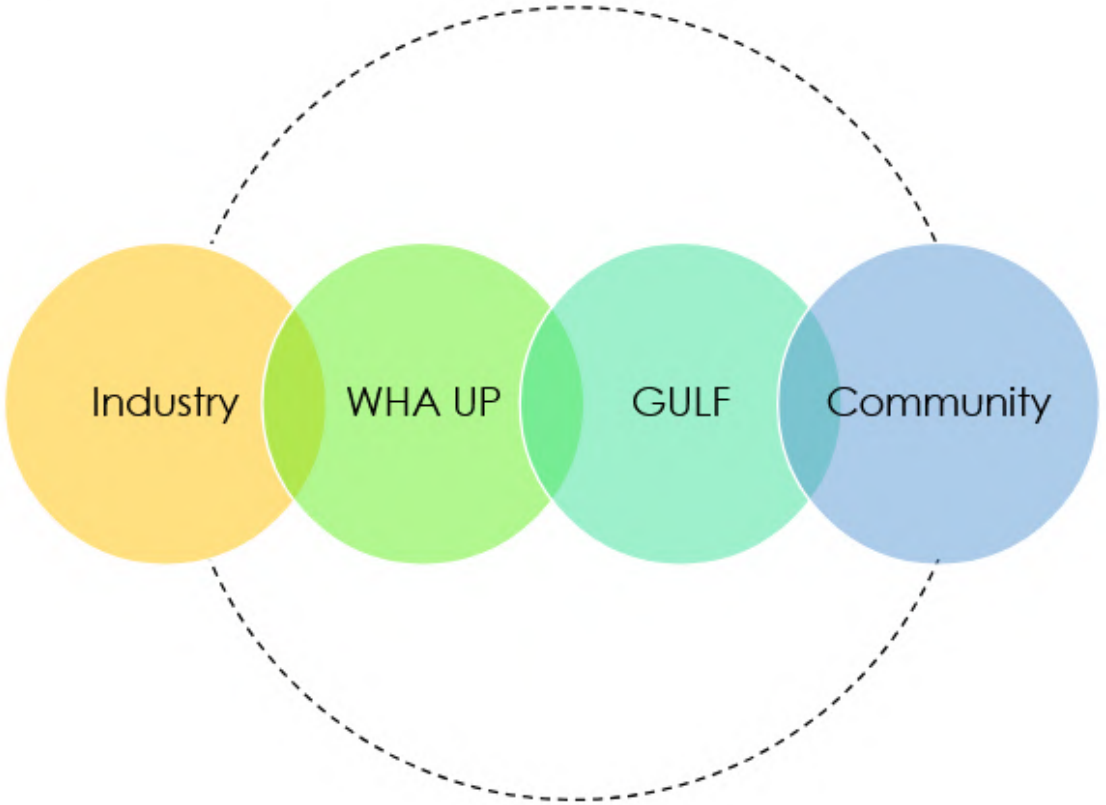
WHA Utilities & Power

- Thailand
- Utilities (water, power)
- 46 million EBT
- ~200

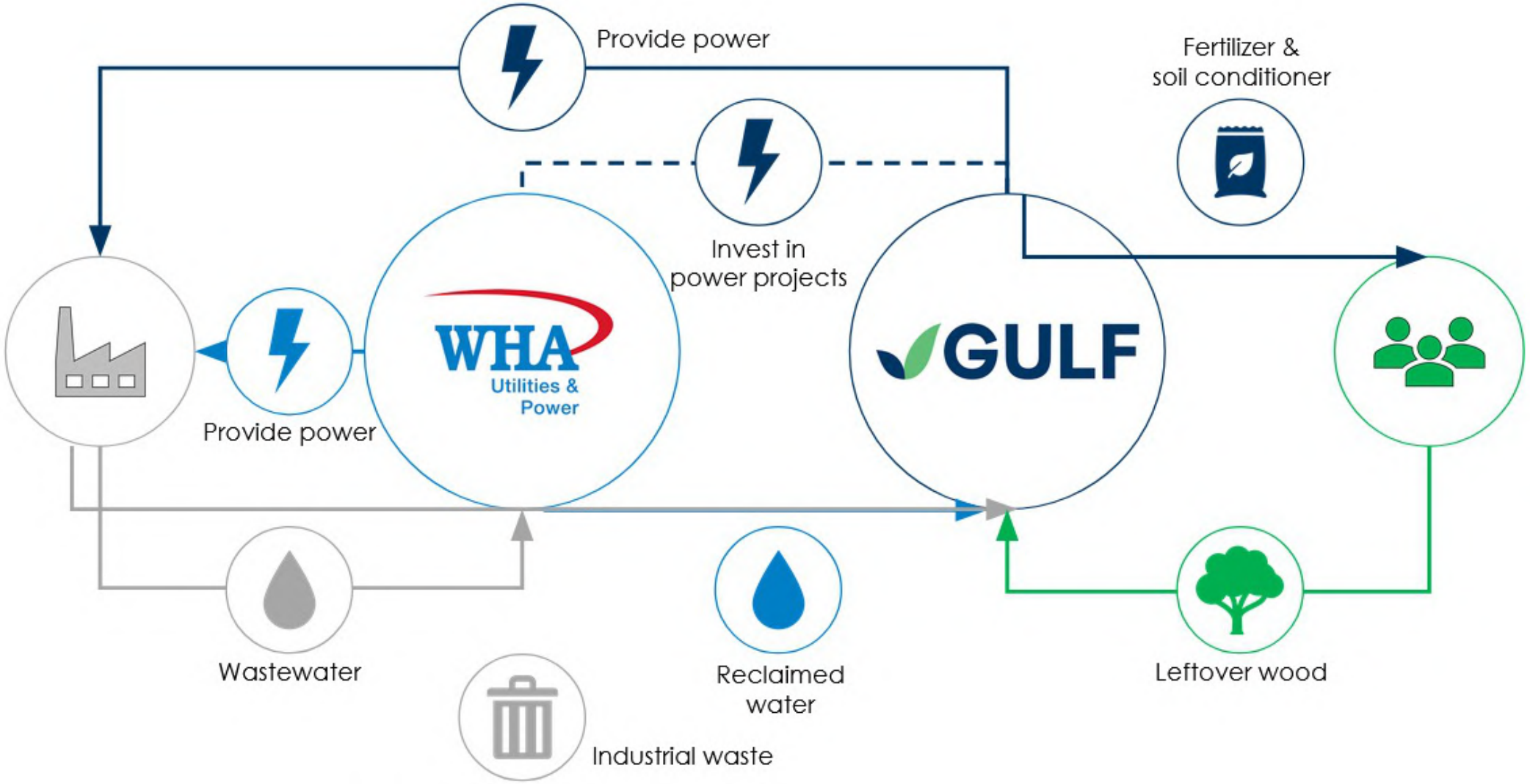
GULF

- Thailand
- Utilities (electricity)
- 572 million EBT
- ~1,200

TOP 15%
S&P Global
Sustainability Yearbook



Industrial Symbiosis in Action



Impacts

- **7,300,000 m3** avoided withdrawal and discharges to natural waterways
- **232,400,000 THB** revenue from water reclamation program (WHA UP)
- **8%** reduction in water intensity from the previous year (GULF)

- **Additional income** for rubber farmers / furniture companies from selling wood waste
- **Additional income** for industrial customers from selling industrial waste
- **6,000,000 THB** in savings from reduced cost of waste disposal (GULF)

- **~120,000 tCO_2e** avoided greenhouse gas emissions (WHA UP + GULF)
- **96 megawatts** capacity from new industrial waste-to-energy projects
- **0 tonnes** operational waste to landfill (GULF)

Case study: Airlines / Fast Fashion / CSR Activities

Greenwashing / Sustainability as a Marketing Trend / Missing the Point

Greenwashing:
Making false or misleading claims about how "green" or environmentally-beneficial a product or service is

The industry	The claims	The problems
 Airlines	• The airline is operating sustainably / is moving towards net zero greenhouse gas emissions. • The airline is using sustainable aviation fuel. • The airline offers a "low carbon" or "carbon offset" flight. • The airline provides a carbon calculator to show customers how much CO_2 the flight emits.	• There is no real evidence of how the airline is taking action or what impacts those actions have. • There is no assessment of environmental impacts. • There is no evidence of actual carbon reduction. • There is no data to backup the scientific accuracy of carbon savings claims or comparisons.

The reality

980,000,000 t CO_2 eq	> 99%	5x	< 1%
Operational and supply chain emissions	Fossil fuels in the fuel mix	Higher cost than jet fuel	Required SAF infrastructure exists

Case study: Airlines / Fast Fashion / CSR Activities

Greenwashing / Sustainability as a Marketing Trend / Missing the Point

Greenwashing:
Using sustainability as a marketing tool / trend to draw customers

The industry	The claims	The problems
 Fast fashion	• The brand provides sustainable products, often with sustainability certifications / credentials. • The brand uses recycled materials in its products. • The brand provides take-back schemes to collect clothes from customers which will be recycled. • The brand is eco-friendly.	• There is a lack of verification; many "certificates" are just the company's sustainability branding. • Most recycled materials come from plastic, not textiles. • The collected clothing is not used to produce new clothes, or is sometimes not even recycled. • There is no information about what environmental issues are taken into account.

The reality

100,000,000,000+	8-10%	20%	300,000,000+
Items of clothing produced per year	Global GHG emissions	Global wastewater	Trees cut / year to produce MMFC*

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Case study: Airlines / Fast Fashion / CSR Activities

Greenwashing / Sustainability as a Marketing Trend / Missing the Point

Greenwashing:
Conducting "CSR" activities that have little to no impact and ignoring the real issues

The reality

- One-time activity with no follow up
- The wrong species / too few trees used
- No effort to reduce carbon emissions

- One-time activity with no follow up
- Improper management of collected litter
- No effort to reduce waste generation

- Office trend with no explanation
- Narrow focus / only one issue addressed
- No effort to change operations

Key Takeaways

https://www.freepik.com/free-photos-vectors/sustainability

Sustainability is not a trend. It is a necessity.

Environmental management efforts should be based on data from operations and the value chain.

Beware of greenwashing!

You have successfully completed Module 1, Session 2.

Go to the next session

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