Intro To Climate Impact Assessment

This action is supported by the European Institute of Innovation and Technology (EIT).

A body of the European Union

Content

- **What is Impact Measurement**
- **Why** is Impact Measurement Important, and **so, what**?
- **How** can Environmental Impact be Measured?
- A focus on **LCA** with a deeper dive
- **So, What** at a program level?

What is Impact Measurement?

What is Impact Measurement for start-ups?

It involves...

- Collecting data,
- Analysing outcomes, and
- Evaluating how a startup's products, services, or operations affect various stakeholders and the broader community.

Impact measurement is...

the process of quantifying & assessing the social environmental and economic effects or changes resulting from the activities of a start-up.

Why is Impact Measurement Important, and so what?

Why is Impact Measurement Important for climate start-ups?

Marketing & Sales

Fundraising & Investor traction

Supply Chain, Strategy & Improvements

Legal Compliance

Why is Impact Measurement Important for climate start-ups?

Marketing & Sales

- Competitive Advantage
- Transparency & Trust

Fundraising & Investor traction

- Showcase impacts and increase investor interest

Supply Chain, Strategy & Improvements

- Continuous Improvement
- Innovation & Adaptation

Legal Compliance

- Complying with sustainability regulation

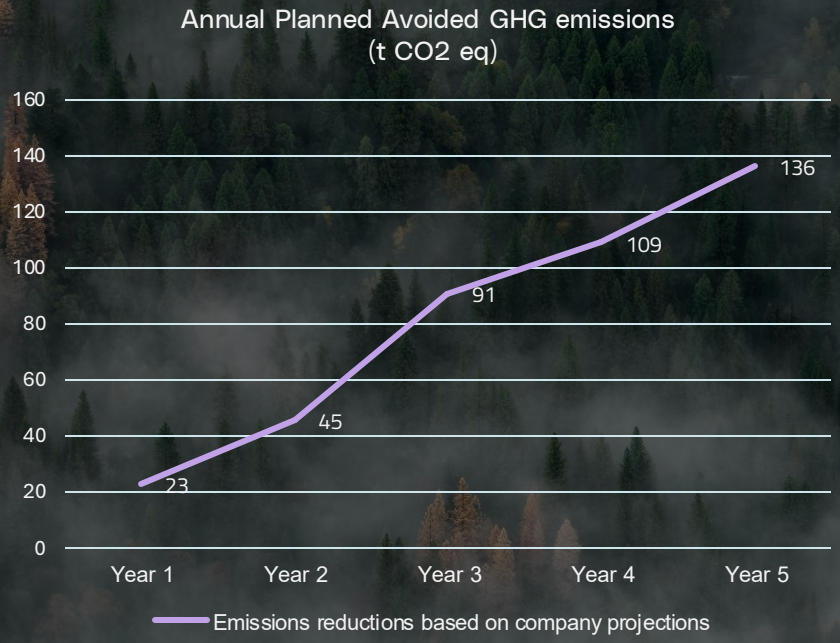
So What?

Self-Assessment Comparative Approach

Extraction	→	***Extraction***	***30%***
Manufacturing		Manufacturing	20%
Transportation	→	**Transportation**	**30%**
Use		Use	10 %
After-Life		After-Life	10%

Emission Projections

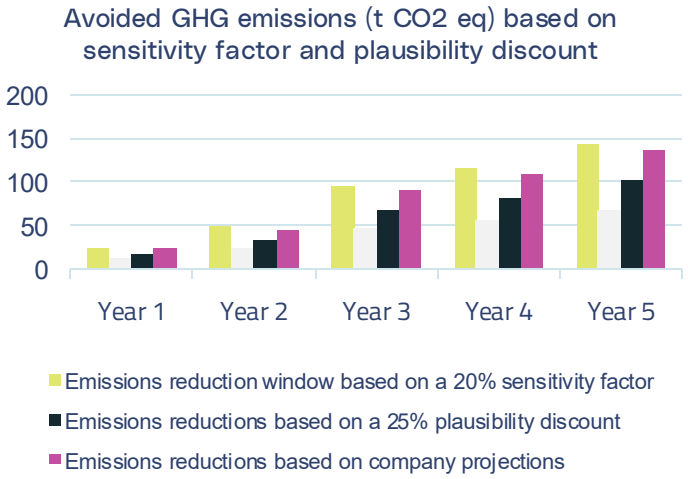
based on the sales projections



So What?

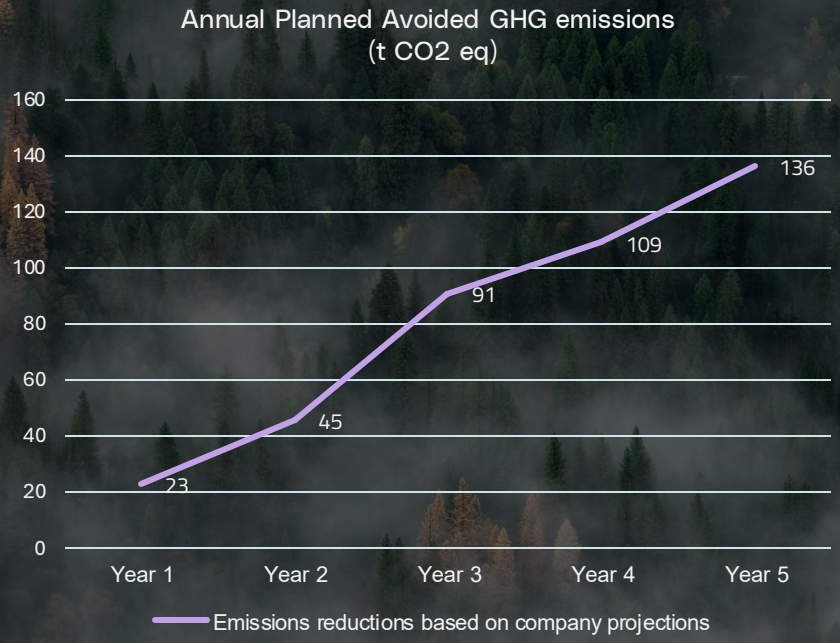
1. Highest emission
2. Sensitivity analysis
3. Plausibility discount

Sensitivity Analysis & Plausibility Discount



Emission Projections

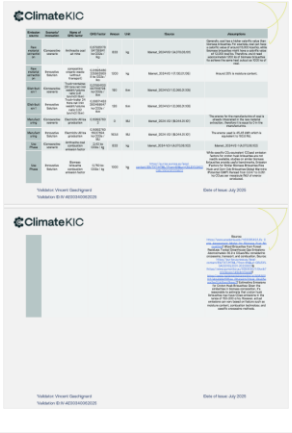
based on the sales projections



So What?

ClimateKIC
Climate KIC International Foundation
Plantage Middlerlaan 45
1018 DC Amsterdam
Netherlands
Potential Avoided GHG Emissions Validation Report
Issued by: Climate KIC International Foundation
Product: Biomass briquettes
Validation Results: Valid and High impact: Mitigation potential between 500 and 5000 tCO2e/year avoided
Indicator
Impact Results
Potential Avoided GHG Emissions per functional unit* (t CO2 eq) 1.83
Cumulative Potential Avoided GHG Emissions over 5 years (t CO2 eq) 11,930
Average Potential Avoided GHG Emissions per Year (t CO2 eq) 2,386
Avoided GHG emissions based on company projections
Validator: Vincent Geschignard
Validation ID: IV-AE00340062025
Date of Issue: July 2025

ClimateKIC
Assessment Report: Mitigation Potential
1 Introduction
This report aims to estimate the potential avoided GHG emissions of biomass briquettes compared to coal considering their sales projection during 5 years.
* This start-up may also have adaptation and resilience benefits which have not been assessed as part of this validation.
2 Definition of Scope and Methodology
The function of the innovation is 1,000 kg of briquettes produced in one day, and considers the following life cycle phases Raw Material Extraction and Manufacturing.
The most relevant emission sources have been selected based on their impact on the total emission balance, availability and quality of data, and their representativeness in comparing the innovation to the base scenario.
3 Life Cycle Inventory (LCI) and Life Cycle Impact Assessment (LCIA)
The impact analysis has been conducted using emission factors with a GHG emissions calculation based on the global warming potential over 100 years (GWP 100a). For each inventory entry, the assumptions and justifications used in the analysis are detailed below:
Validator: Vincent Geschignard
Validation ID: IV-AE00340062025
Date of Issue: July 2025


ClimateKIC
ClimateKIC

ClimateKIC
The quality of the data used in the analysis has been validated, ensuring consistency and representativeness. Additionally, the use of external databases or proxies has been justified by the startup, with appropriate documentation provided for validation.
4 GHG Mitigation Projection
Based on sales projection scenarios of 5 years (2025 to 2029), the estimated reduction in emissions will have a cumulative of 11,930 t CO2 eq.
In conclusion, the analysis indicates that biomass briquettes have a high climate impact compared to coal.
5 Sensitivity Analysis & Plausibility Discount: Impact of Sales Potential
The sensitivity analysis evaluates how variations in projected sales impact the avoided emissions based on a 25 % plausibility discount on the sales projection. This plausibility discount is based on the startup's actual stated projections and an investment expert's analysis.
The sensitivity analysis also applies a 20% variant in the highest emission input (Use Phase), and a 20% variant on the discounted sales projections. For a conservative analysis, a 20% variant is considered for scenarios with high level of uncertainty.
The sensitivity analysis and plausibility discount results highlight that the estimated reduction in emissions will have an average of 1,774 t CO2 eq. annually with a high level of impact.
Avoided GHG emissions (t CO2 eq) based on sensitivity variant and plausibility discount
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Validation ID: IV-AE00340062025
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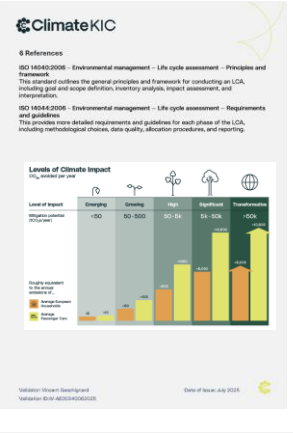
ClimateKIC
6 References
ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework
This standard outlines the general principles and framework for conducting an LCA, including goal and scope definition, inventory analysis, impact assessment, and interpretation.
ISO 14044:2006 – Environmental management – Life cycle assessment – Requirements and guidelines
This provides more detailed requirements and guidelines for each phase of the LCA, including methodological choices, data quality, allocation procedures, and reporting.
Levels of Climate Impact
Level of Impact
Emerging
Growing
High
Significant
Transformative
Validator: Vincent Geschignard
Validation ID: IV-AE00340062025
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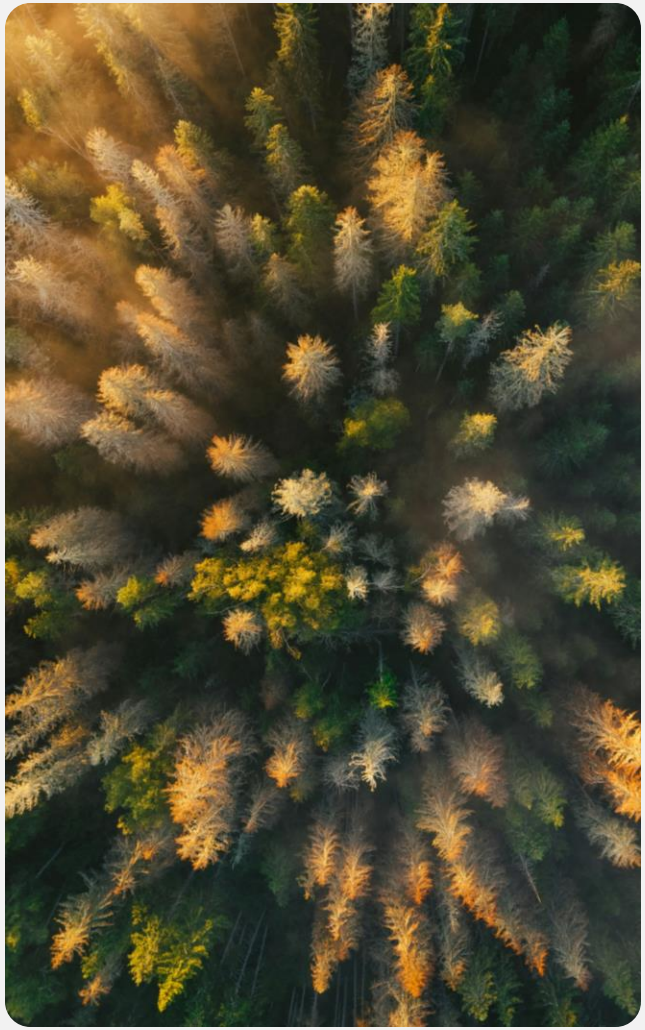
How can Environmental Impact be Measured?



Introduction: Environmental Impact Measurement

- There are many methodologies for measuring and/or projecting the environmental impact of a business.
- While different methods have different strengths and limitations, there is not a ‘unicorn’ or perfect methodology.
- Impact measurement and projection methodologies tend to include a unit of measure and many are governed by standards and frameworks.

What is a Unit of Measurement?

- A unit of measure for environmental impact is used to quantify the impact of a particular environmental factor.
- Using a single unit of measure allows us to easily compare or aggregate data.

Some common units of measure include:

Carbon Dioxide equivalent (CO_2e)

A standard unit for measuring greenhouse gas emissions.

Kilowatt-hour (kWh)

Used to measure electricity consumption or production

Cubic metres (m^3)

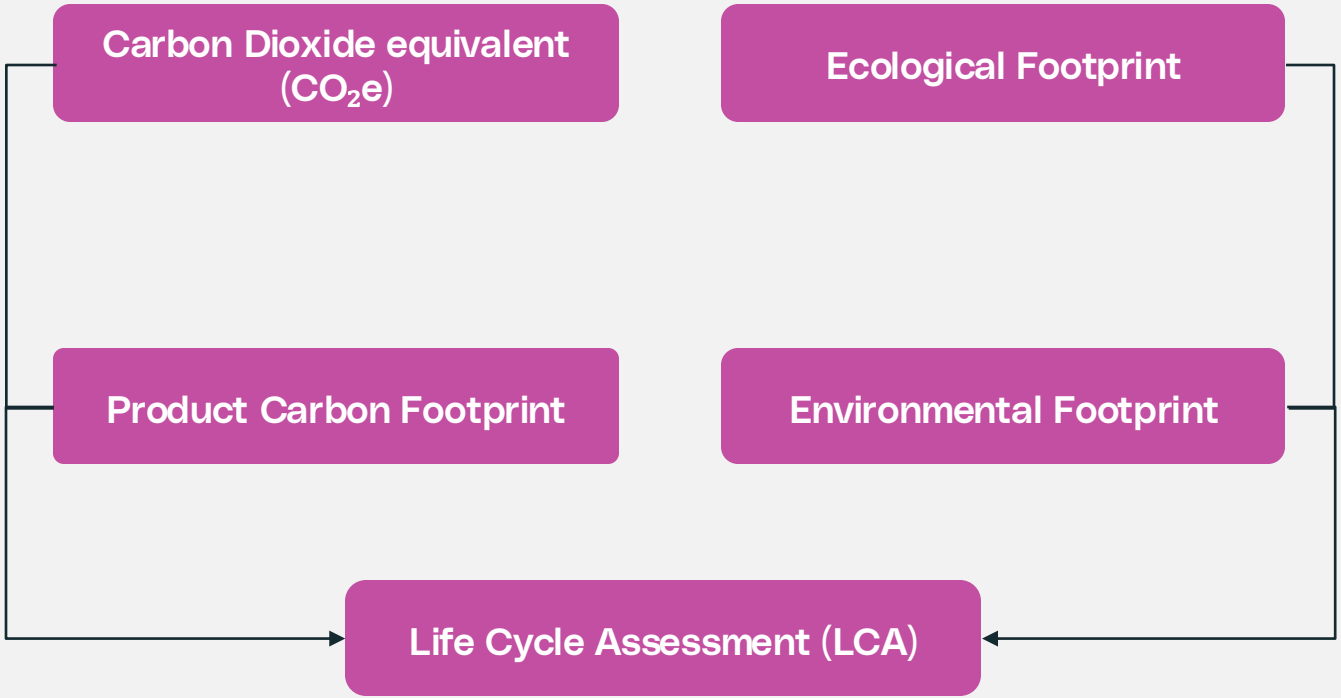
Used to measure the volume of water consumed to produce goods/services

Hectares (ha)

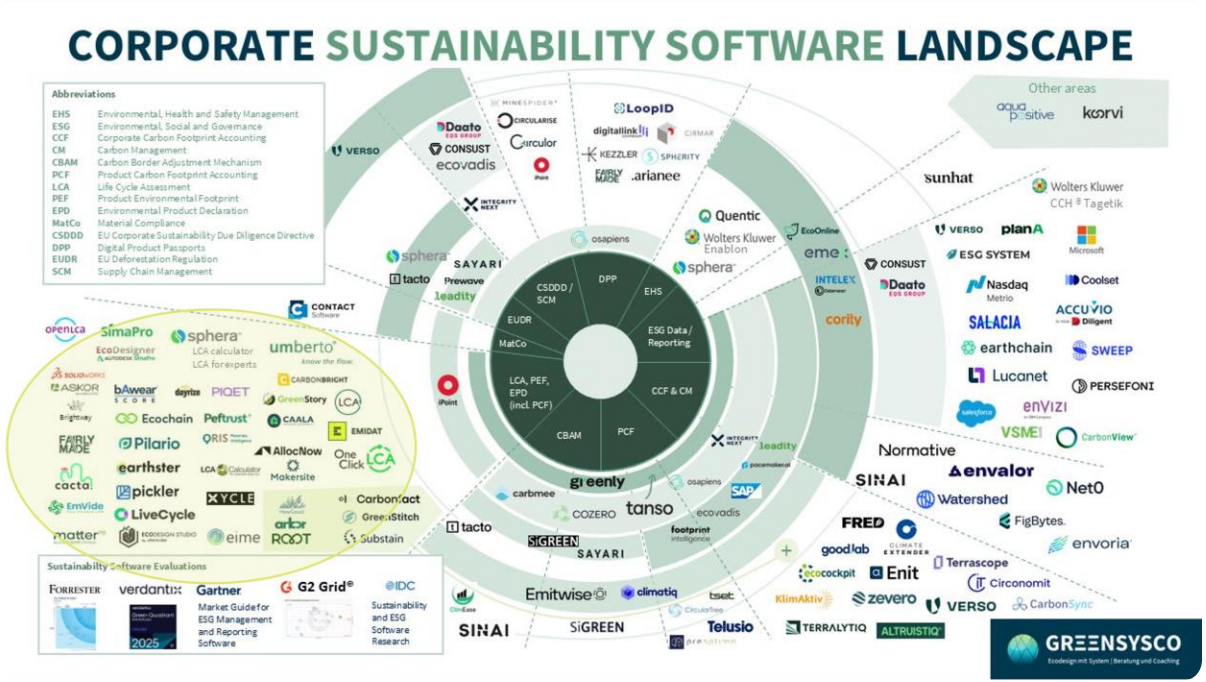
Used to quantify the amount of land required to support a particular activity

How can Environmental Impact be Measured?

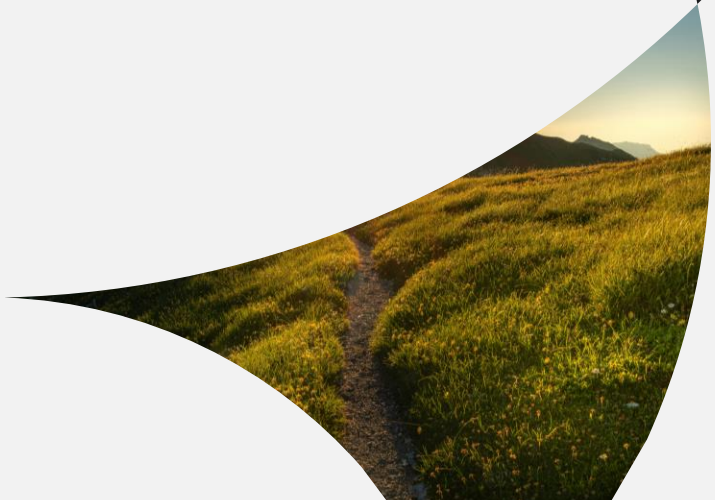
Environmental Impact Labels & Methods



Where Do We Sit?
Unit of Analysis x Methods

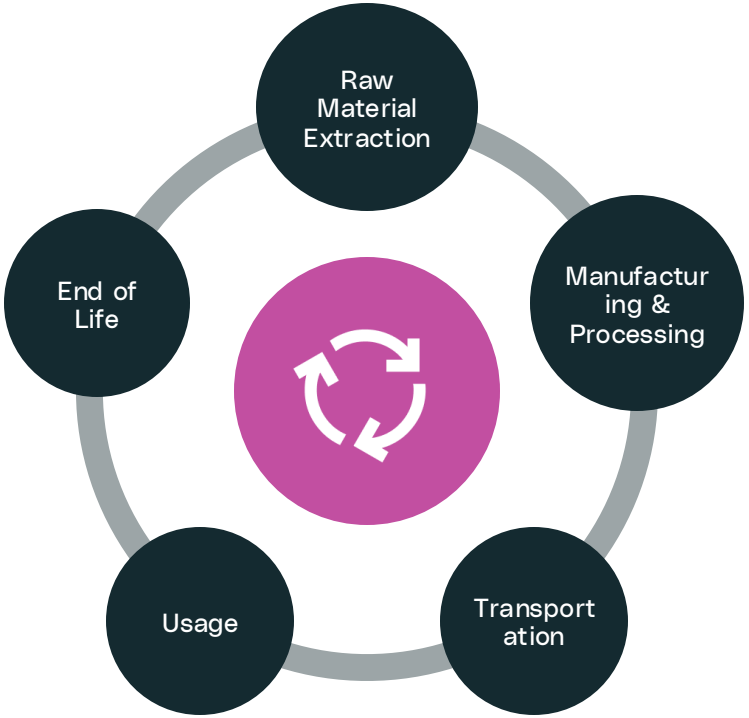


Focus: Life Cycle Assessment



Where Do We Sit?
Unit of Analysis x Methods

From Lina Kindermann, 2025



The Product Life Cycle

- The Life Cycle Assessment (LCA) is a comprehensive methodology which takes into account the environmental impact of a product or service throughout its entire life cycle.
- The life cycle includes five stages, this is sometimes referred to as ‘from cradle to grave’.

1. Raw Material Extraction
2. Manufacturing & Processing
3. Transportation
4. Usage
5. End of Life

Five Stages of the Product Life Cycle

RAW MATERIAL EXTRACTION

Obtaining the raw materials for your product or service. This can include activities like mining, logging, farming, or other processes involved in extracting materials required for manufacture.

MANUFACTURING & PROCESSING

Processing and transforming the extracted materials into the final product. This can include activities such as manufacturing, shaping, assembling and packaging.

TRANSPORTATION

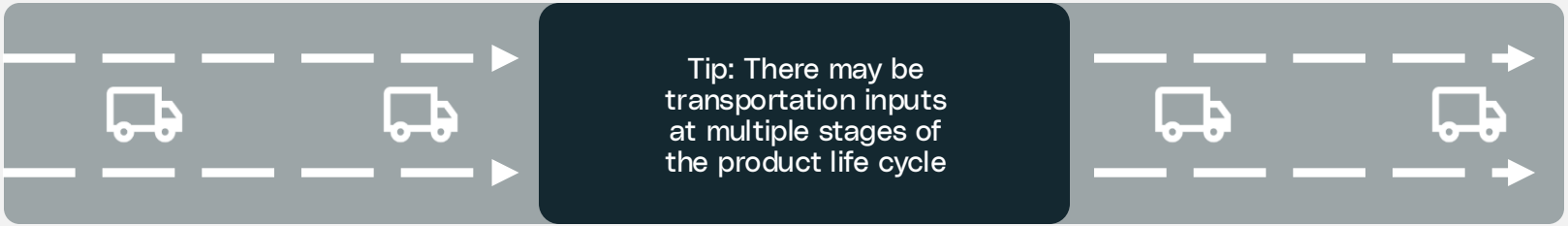
Transporting the product from the manufacturing facility to distribution centres, retailers and ultimately to end-users. This can include various forms of transport, such as road, rail, air and sea.

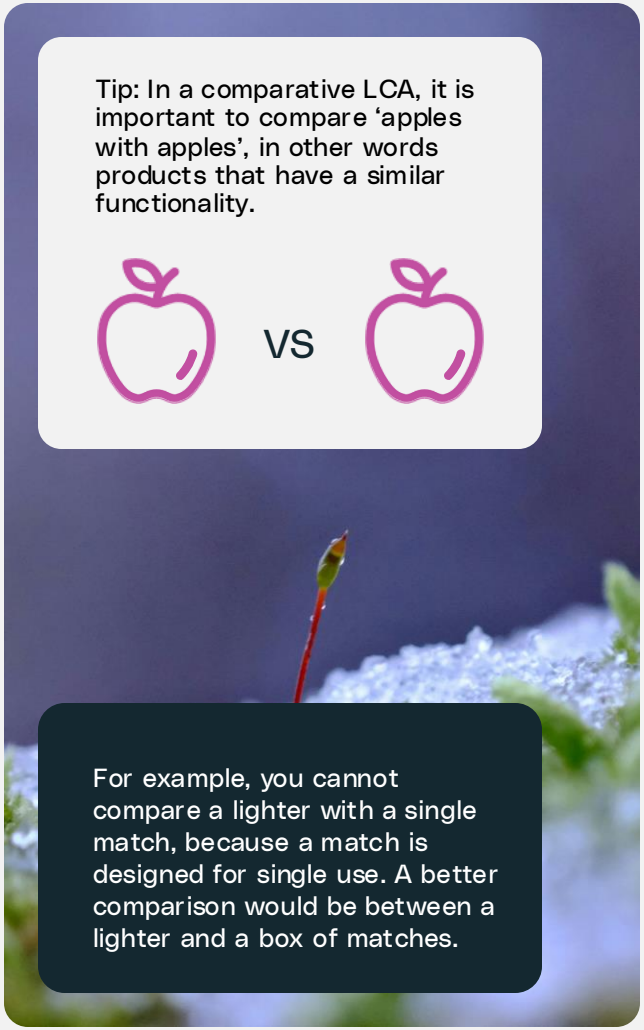
USAGE

The period in which the consumer uses the product for its intended purpose. You can consider the energy consumption and other impacts associated with the product's use.

END OF LIFE

The disposal or end-of-life of the product. This stage includes waste handling whether it is through recycling, landfill, incineration or other means.





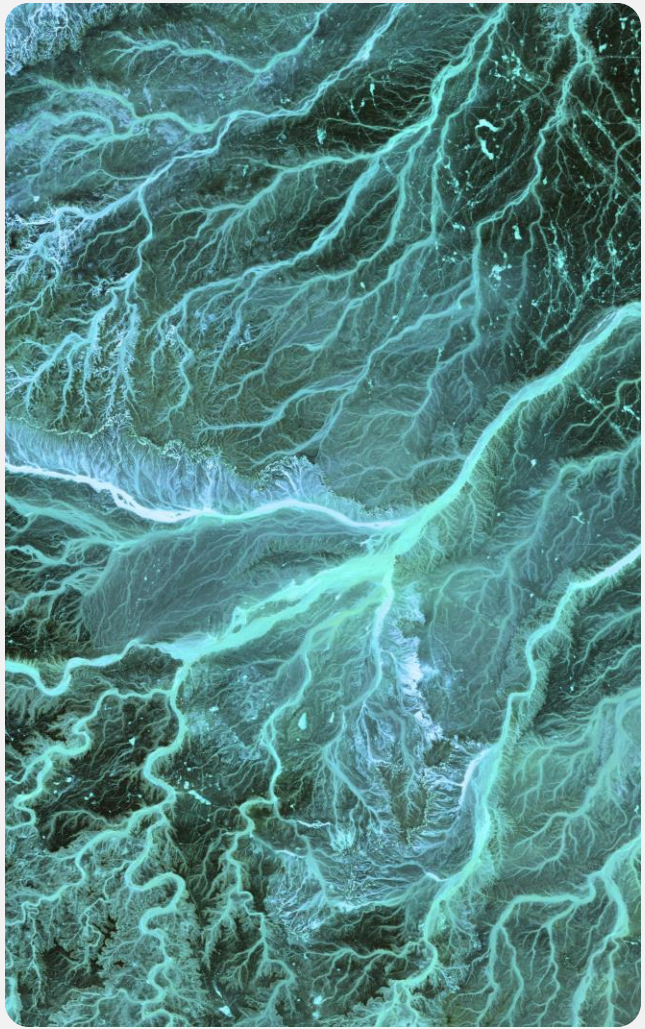
The Comparative LCA

A comparative life cycle assessment (LCA) involves comparing the environmental impacts of a product or service with another similar or comparable product or service.

For innovative or more sustainable products & services, this usually involves comparing your solution with the ‘status quo’, market leader, or industry average.

This allows you to compare and differentiate your product from competitors.

Life Cycle Assessment

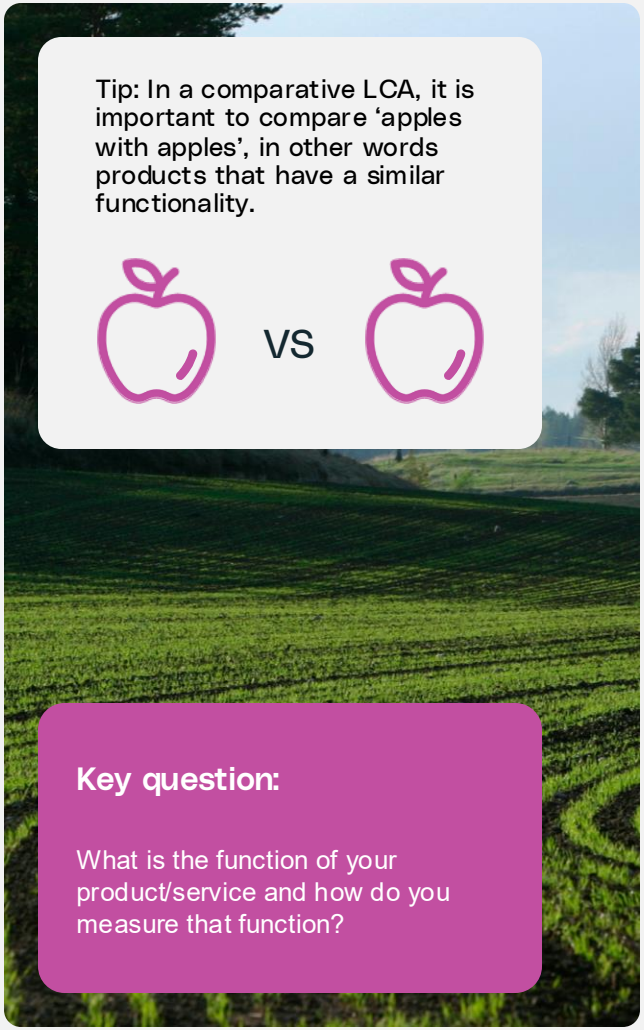


Example: Limitations of the methodology

The Life Cycle Assessment is not a ‘unicorn’ solution for measuring climate impact and has faced some criticism in the following areas:

- **It is not systemic:** LCAs measure the environmental impact of products in isolation, without taking into consideration the implications and interactions of the wider system.
- **It doesn’t take into account social implications:** LCAs do not measure the social or human implications of the product or service they measure.
- **Calculations are often based on averages or samples:** LCAs often rely on databases of ‘industry average’ data, leading to criticisms over the accuracy of the methodology.

A Deeper Dive



Tip: In a comparative LCA, it is important to compare ‘apples with apples’, in other words products that have a similar functionality.

VS

Key question:

What is the function of your product/service and how do you measure that function?

Step 1: Story of Your Innovation

When beginning a Life Cycle Assessment, it is important to ask some basic questions which will help to guide you through the process.

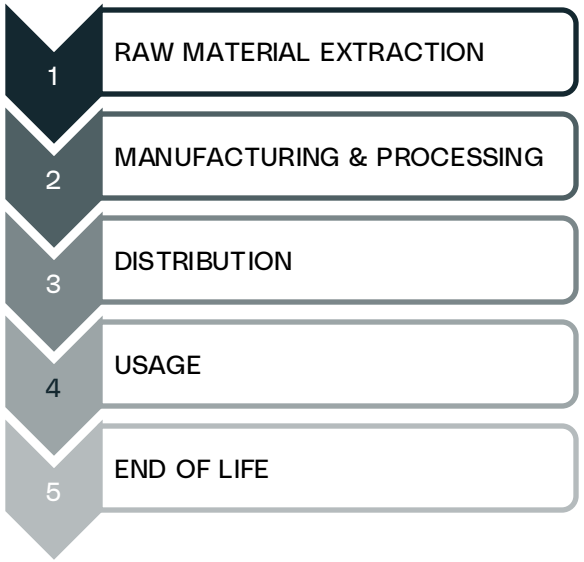
Describe the story of your innovation:

- What is the name of your solution?
- What kind of solution is it: a product, a service or both?
- Who is the customer or target group of your solution?

Define your comparative scenario:

- Identify the product or service that you want to replace in the market.

VS



Step 2: Inventory Analysis

- The inventory analysis phase looks at all of the inputs and outputs involved in the life cycle of a product or service.
- You will describe of all the inputs and outputs.
- Depending on your product or service, this phase can be complex, and require a large amount of data.
- This phase is usually the most time consuming element of performing an LCA.

Key question:

What data do we need?

Key question:

Where can I find the data?

Step 2: Inventory Analysis Life **Cycle of Your Innovation**

Image based on source: **Ecochain**

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

Raw Material Extraction	Distribution 1	Manufacturing	Distribution 2	Use of Product	Distribution 3	End of Life
Obtaining seeds, planting, fertilizing, irrigating, pest protection, and harvesting the cotton.	Transport of cotton from the field to the processing site.	Processing the cotton, spinning, weaving, washing, dyeing, and sewing the t-shirt. + t-shirt is packaged and transported to stores.	Transport from the factory to points of sale (distributors, retailers) mainly by plane + Transportation by the end user (to purchase the t-shirt).	Washing, drying, and ironing.	Transport to recycling plants or landfills.	Send to landfill.
INDIA	INDIA	INDIA	FROM INDIA TO EUROPE	EUROPE	EUROPE	EUROPE

Step 2: Inventory Analysis **Comparative Scenario**

Image based on source: **Ecochain**

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

Raw Material Extraction	Distribution 1	Manufacturing	Distribution 2	Use of Product	Distribution 3	End of Life
Polyester is produced from petroleum derivatives. This process includes oil extraction, refining, and polymerization to create polyester fibers.	Transport of processed fibers to the garment factory.	The polyester fibers are spun and woven into fabrics. These fabrics are then dyed and sewn into t-shirts.	Transport from the factory to points of sale (distributors, retailers) mainly by cargo ship+ Transportation by the end user (to purchase the t-shirt).	Washing, drying, and ironing.	Transport to recycling plants or landfills.	Send to landfill.
CHINA	CHINA	CHINA	FROM CHINA TO EUROPE	EUROPE	EUROPE	EUROPE

Step 3: Scope of Analysis

Raw Material Extraction	Distribution 1	Manufacturing	Distribution 2	Use of Product	Distribution 3	End of Life
Polyester is produced from petroleum derivatives. This process includes oil extraction, refining, and polymerization to create polyester fibers.	Transport of processed fibers to the garment factory.	The polyester fibers are spun and woven into fabrics. These fabrics are then dyed and sewn into t-shirts.	Transport from the factory to points of sale (distributors, retailers) mainly by cargo ship+ Transportation by the end user (to purchase the t-shirt).	Washing, drying, and ironing.	Transport to recycling plants or landfills.	Send to landfill.
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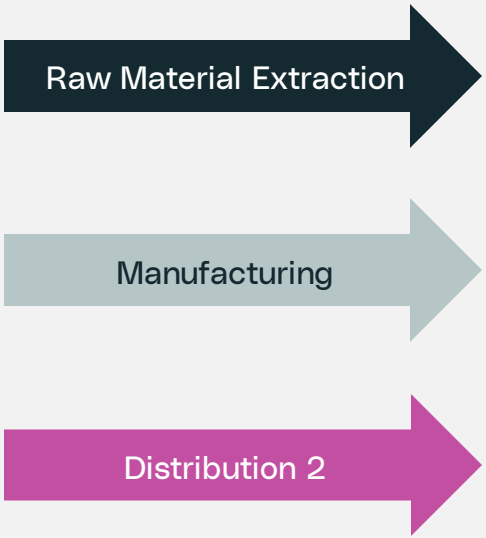
Raw Material Extraction	**Distribution 1**	**Manufacturing**	**Distribution 2**	**Use of Product**	**Distribution 3**	**End of Life**
Obtaining seeds, planting, fertilizing, irrigating, pest protection, and harvesting the cotton.	Transport of cotton from the field to the processing site.	Processing the cotton, spinning, weaving, washing, dyeing, and sewing the t-shirt. + t-shirt is packaged and transported to stores.	Transport from the factory to points of sale (distributors, retailers) mainly by plane + Transportation by the end user (to purchase the t-shirt).	Washing, drying, and ironing.	Transport to recycling plants or landfills.	Send to landfill.
CHINA	CHINA	CHINA	FROM CHINA TO EUROPE	EUROPE	EUROPE	EUROPE

Step 3: Scope of Analysis



Your innovation Vs the comparative product
Raw materials
Manufacturing: Spinning
Manufacturing: Dyeing
Transport of product to store

Step 4: Quantities

Raw Material Extraction

Manufacturing

Distribution 2

Your innovation Vs the comparative product	Comparative Scenario: Quantities per *Functional Unit*	Your Innovation: Quantities per *Functional Unit*
Raw materials	***50 gr*** of Polyester pellets per t-shirt	***500 gr*** of harvested cotton per t-shirt
Manufacturing: Spinning	Polyester spun by melt spinning 125 MJ/kg --> ***18.75 MJ/ t-shirt***	Cotton spun by ring spinning 60MJ/kg --> ***9MJ/ t-shirt***
Manufacturing: Dyeing	50gr of dies --> ***7.5 gr/t-Shirt***	30 gr of dies --> ***4.5 gr/t-shirt***
Transport of product to store	4: 8,800 tkm by cargo ship --> ***1.32tkm***	8,000km by plane --> ***1.2 tkm/t-shirt***

Step 4: Quantities & Emissions Factors

QUANTITIES PER INPUT

PHASES	COMPARATIVE SCENARIO: QUANTITIES PER *FUNCTIONAL UNIT*	YOUR INNOVATION: QUANTITIES PER *FUNCTIONAL UNIT*
Raw materials	***50 gr*** of Polyester pellets per t-shirt	***500 gr*** of harvested cotton per t-shirt
Manufacturing: Spinning	Polyester spun by melt spinning 125 MJ/kg --> ***18.75 MJ/ t-shirt***	Cotton spun by ring spinning 60MJ/kg --> ***9MJ/ t-shirt***
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ImpactNexus

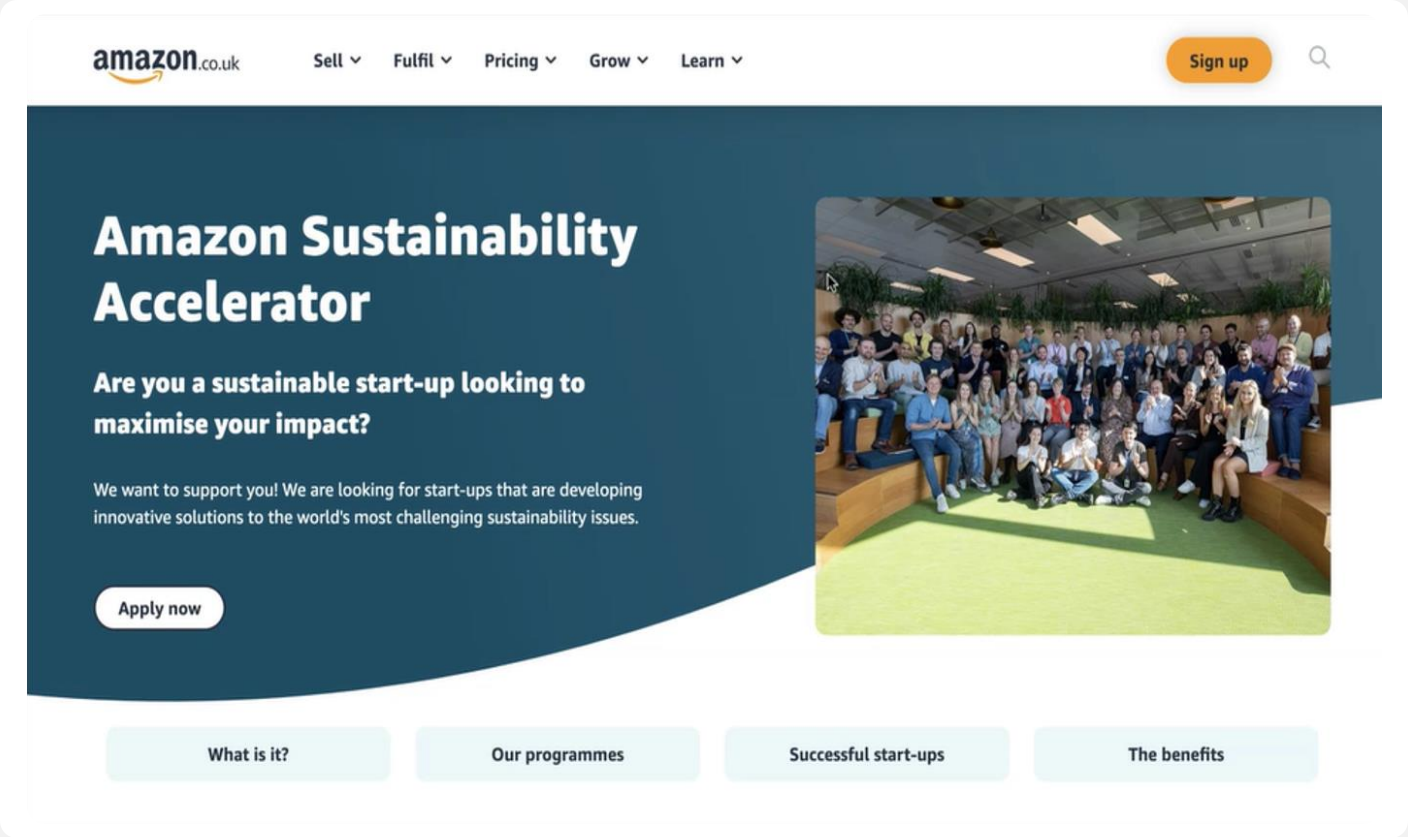
Search for GHG factor (IDEMAT database)

EMISSIONS PER INPUT

PHASES	COMPARATIVE SCENARIO: EMISSION PER *FUNCTIONAL UNIT*	YOUR INNOVATION: EMISSION PER *FUNCTIONAL UNIT*
Raw materials	Polyester = PET pellets ***307.7kg of CO2e***	Bio-Cotton, Inida ***191.5kg of CO2e***
Manufacturing: Spinning	Electricity gas, EU, US, China 60% efficiency ***3.2 kg of CO2e***	Electricity Asia Pacific production ***1.6 kg of CO2e***
Manufacturing: Dyeing	Dyeing, with pollution, without materials input, India ***23.4kg of CO2e***	Dyeing, with pollution, without materials input, India ***14kg of CO2e***
Transport of product to store	Container ship (m3km) ***0.03 kg of CO2e***	Air traffic intercontinental (m3km) ***0.1 kg of CO2e***

So what?

Why is impact measurement important for us?



GEOGRAPHIC FOCUS:

EUROPE

NUMBER OF VALIDATED AND POSITIVE RESULTS:

13

SECTOR FOCUS:

Cleantech (clean energy, Food & Agriculture, Clean Industry, Air & Environment)

TOTAL NUMBER OF AVOIDED EMISSIONS:

2.9 Megatonnes

of avoided CO_2eq emissions

NUMBER OF SUPPORTED STARTUP:

16

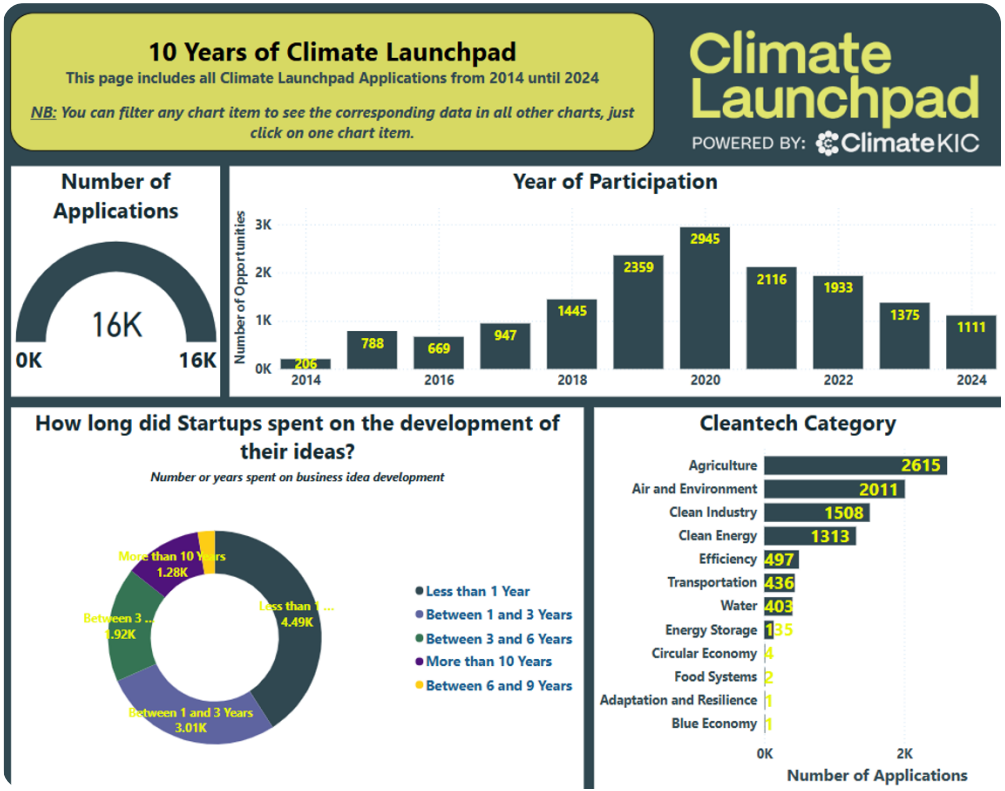
TOTAL INVESTMENT BY THE ACCELERATOR:

156,000€

Understanding the impact of our programmes

Amazon Sustainability Accelerator 2023

Why is impact measurement important for us?



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Academy
Thank you!
climate-kic.org
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Feedback

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https://t.ly/pdvl8