The framework for assessing environmental handprints

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WE.3.B SDG Corporate Responsibility

Environmental HANDPRINT

VTT LUT University

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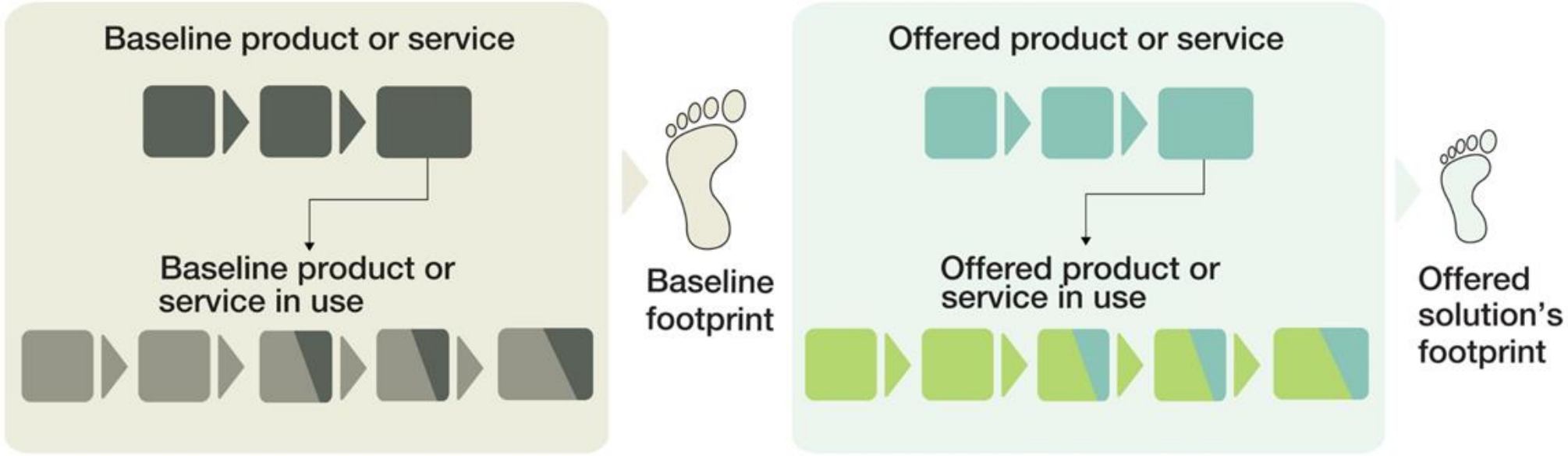
1. From footprint to handprint

- Footprints measure the environmental burden of offerings
  → Need to reveal the positive environmental impacts of products, services and organizations

A handprint refers to the beneficial environmental impacts that organizations can achieve and communicate by offering products and services that reduce the footprints of others.

- Main goal of the handprint is to support cutting emissions and to communicate achieved emission reductions

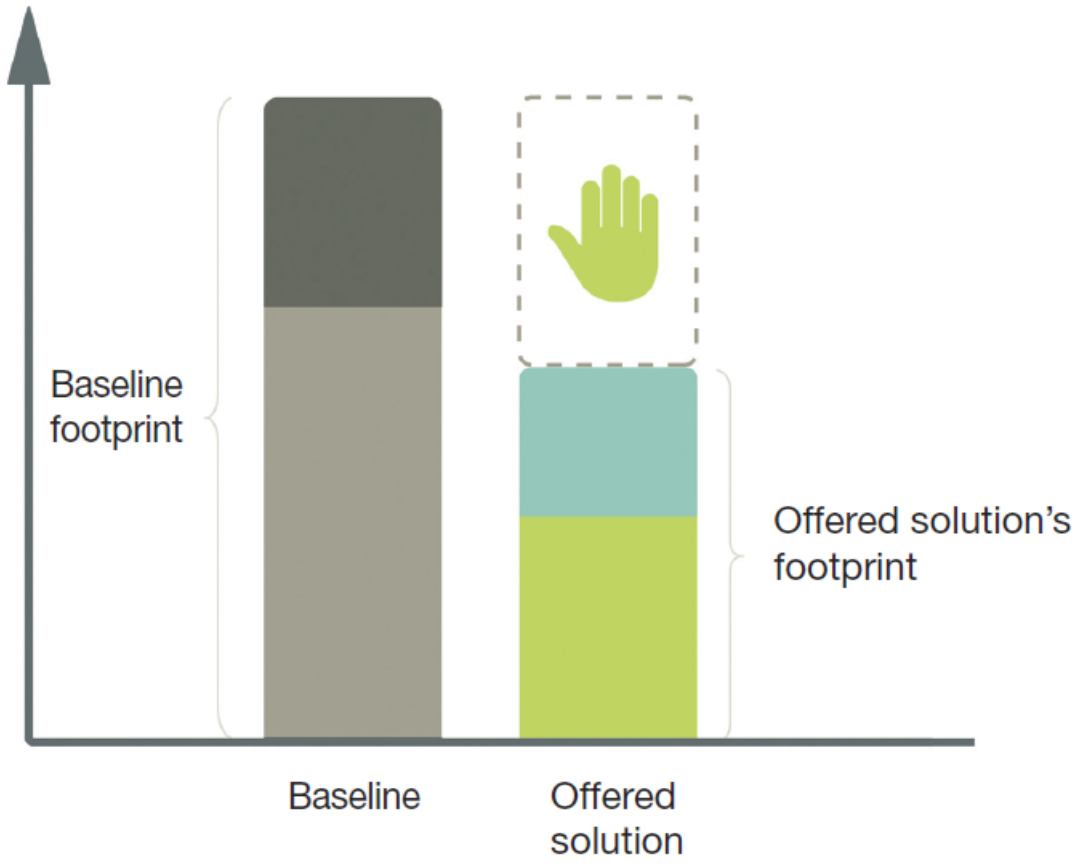
1. From footprint to handprint



Handprint = the difference between the footprints of these two solutions

Every product has a footprint but not necessary a handprint!

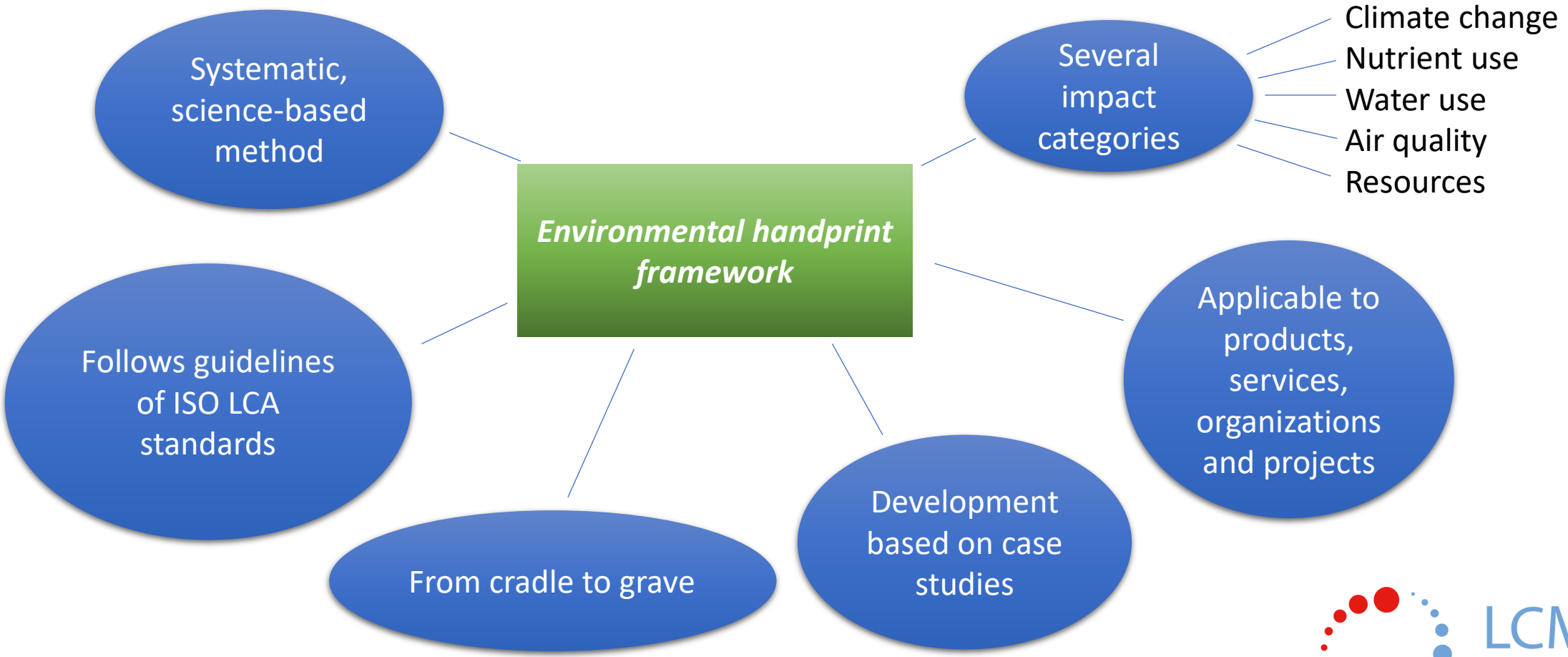
1. From footprint to handprint



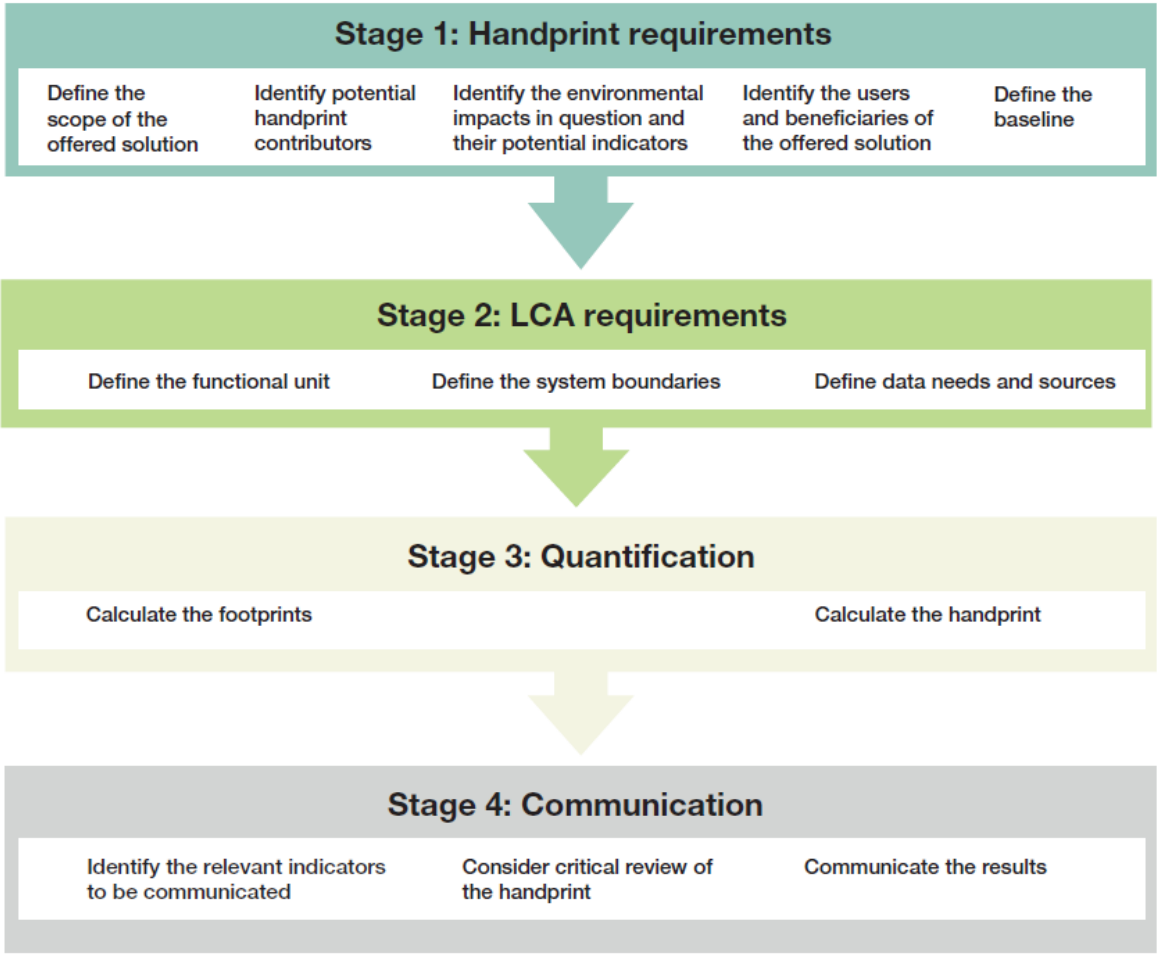
- A handprint can be created by offering solutions with a lower footprint in comparison to the solutions used in the baseline or by helping the user to reduce the footprint of their processes

- Reduction in one's own footprint only doesn't create a handprint

2. The framework for the environmental handprint



2. The framework for the environmental handprint



The handprint calculation process consists of **four stages** and **13 steps** and is closely **based on the LCA** method.

2. The framework for the environmental handprint
Stage 1: Handprint requirements

Stage 1	Define the scope of the offered solution	Product (goods, service, material, component)	Organization (product or service portfolio)	Project (a non-recurrent activity to reach the preferred outcome in a defined time frame)		
	Identify potential handprint contributors	Description, how the offered solution may achieve footprint reductions				
	Identify the environmental impacts in question and their potential indicators	Climate change GHG emissions	Resources e.g. ADP (elements and fossil fuels), cumulative energy demand	Water e.g. scarcity, eutrophication, acidification, toxicity	Nutrients N/P/K balance and eutrophication, in addition e.g. toxicity, acidification	Air quality e.g. PM_{10}, $PM_{2.5}$, NO_x, SO_2, VOC, health impacts, POCP
	Identify the users and beneficiaries of the offered solution	Identify potential or actual customers or other parties that may benefit from the offered solution				
	Define the baseline	Reference case that best represents the conditions (most likely) to occur in the absence of the offered solution				

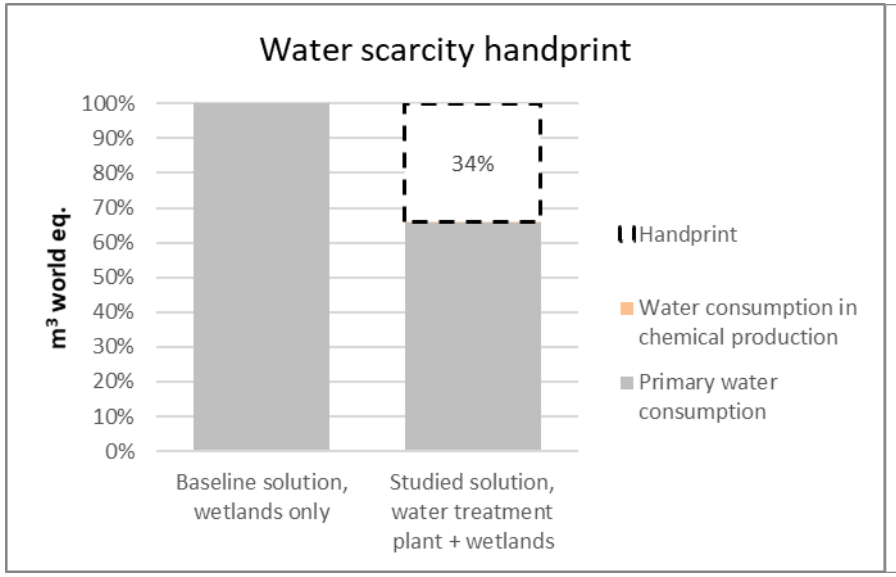
- The first stage is specific to a handprint assessment when compared to a traditional LCA assessment
- The first stage defines the scope of the study, identifies relevant environmental impacts and their indicators of the case in question, and specifies the operating environment for the study.

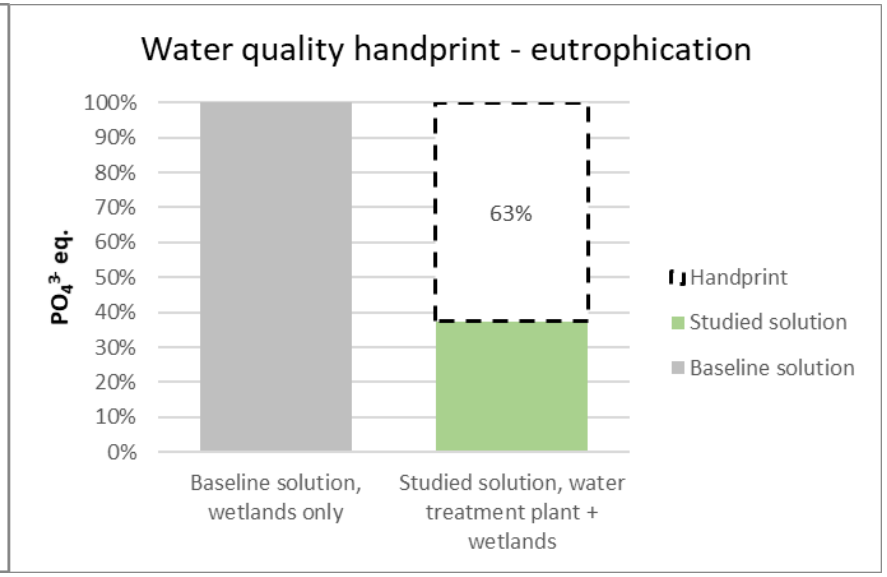
3. Environmental handprint in organizations

- Can be used widely by companies and organizations to communicate the environmental benefits of their products, services and technologies
- A science-based approach for companies to show their environmental responsibility
- Identification of the potential for improvement in own product segment in different markets
- Development of product and production processes
- Comparison of alternatives (e.g., raw materials, technologies)
- Strong marketing and communication tool
- Preparedness for future legislation

4. Case study: Water handprint for water treatment technology

- A water handprint aims to communicate positive changes related to **water scarcity** or **water quality**
- The case study considers water purification technology used in a water treatment plant in a mining company
- Water treatment via the wetlands was considered as the baseline
- In this study, the **water scarcity handprint is 94,25 m^3 world eq. / year, meaning 34% of the water demand** and **the water quality handprint 460 kg PO_4^{3-} eq. / year**, meaning a **63% reduction of the eutrophication potential**





Publications

- Grönman et al. 2019. Carbon handprint – An approach to assess the positive climate impacts of products demonstrated via renewable diesel case. J. Clean. Prod. 206, 1059-1072. https://doi.org/10.1016/j.jclepro.2018.09.233
- Kasurinen et al. 2019. Carbon Handprint: Potential climate benefits of a novel liquid-cooled base station with waste heat reuse. Energies 12(4452). https://doi.org/10.3390/en12234452
- Lakanen, L. et al. 2021. Applying the handprint approach to assess the air pollutant reduction potential of paraffinic renewable diesel fuel in the car fleet of the city of Helsinki. J. Clean. Prod. 290, 125786. https://doi.org/10.1016/j.jclepro.2021.125786
- Pajula, T. et al. 2021. Carbon handprint guide v. 2.0: Applicable for environmental handprint.
- Pajula, T. et al. 2018. Carbon Handprint Guide. https://www.vtt.fi/sites/handprint/PublishingImages/Carbon_Handprint_Guide.pdf
- Vatanen, S. et al. 2021. The environmental handprint approach to assessing and communicating the positive environmental impacts: Final report of the Environmental Handprint project, VTT Technical Research Centre of Finland. VTT Technology 392.
- Vatanen, S. et al. 2018. The Carbon Handprint approach to assessing and communicating the positive climate impact of products: Final Report of the Carbon Handprint project, VTT Technical Research Centre of Finland. VTT Technology 346.

Thank you!

More info about the handprint
www.handprint.fi