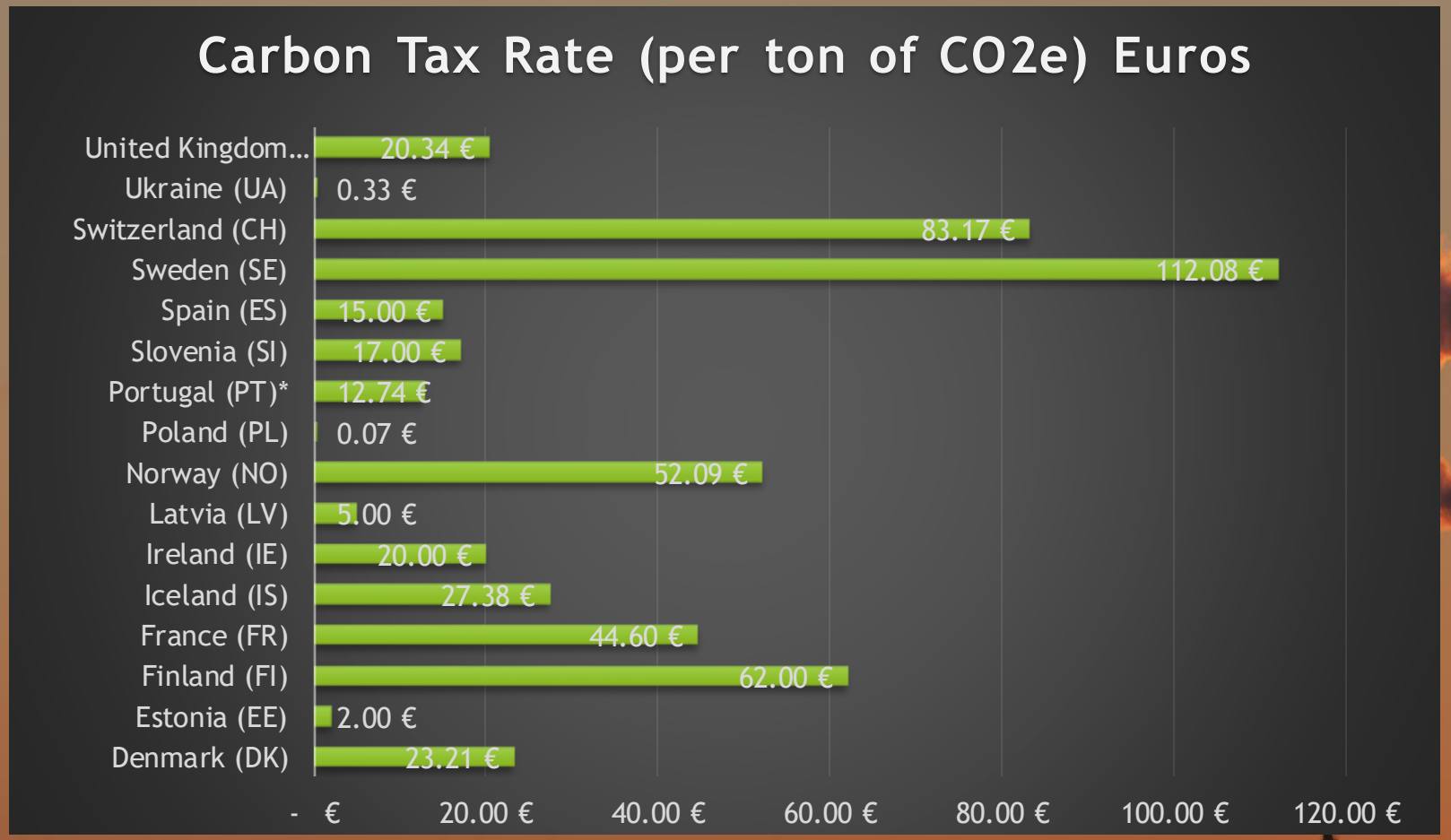
Introduction to LCA

Environmental impact and how to measure it


TAX
THE
RICH

Carbon tax



Sources: OECD, "Taxing Energy Use 2019: Figure 3.7, Explicit carbon taxes do not cover all energy-related emissions," Oct. 15, 2019, http://www.oecd.org/tax/taxing-energy-use-efde7a25-en.htm, and World Bank, "Carbon Pricing Dashboard," last updated Aug. 1, 2019, https://carbonpricingdashboard.worldbank.org/map_data.

Self Introduction

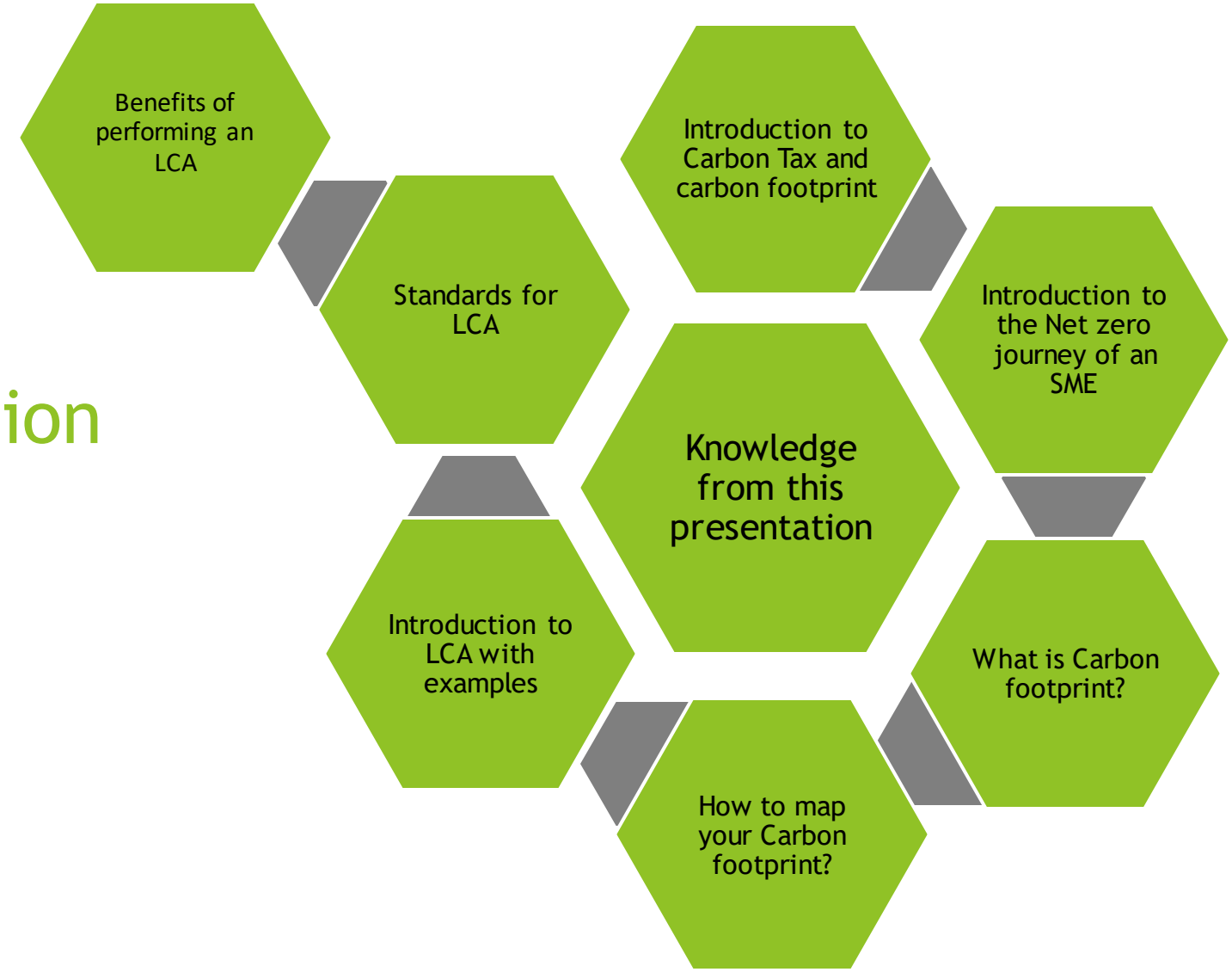
Finishing **PhD student in DMEM** at the University of Strathclyde

Research focused on 'Decision support for promotion of **Circular Economy for SMEs'**

MSc in Industrial Management and **Operational Research** in the National Technical University of Athens (NTUA)
BSc in **Mechanical Engineering** in the National Technical University of Athens (NTUA)

aineias.karkasinas@strath.ac.uk

Presentation goals and gains



The Net Carbon Business Journey of an SME

Green Business Canvas

How do I change/what are my needs?

- Action Planning
- Introduction of a circular Approach(Reman/ Reuse)
- Goals Identification:

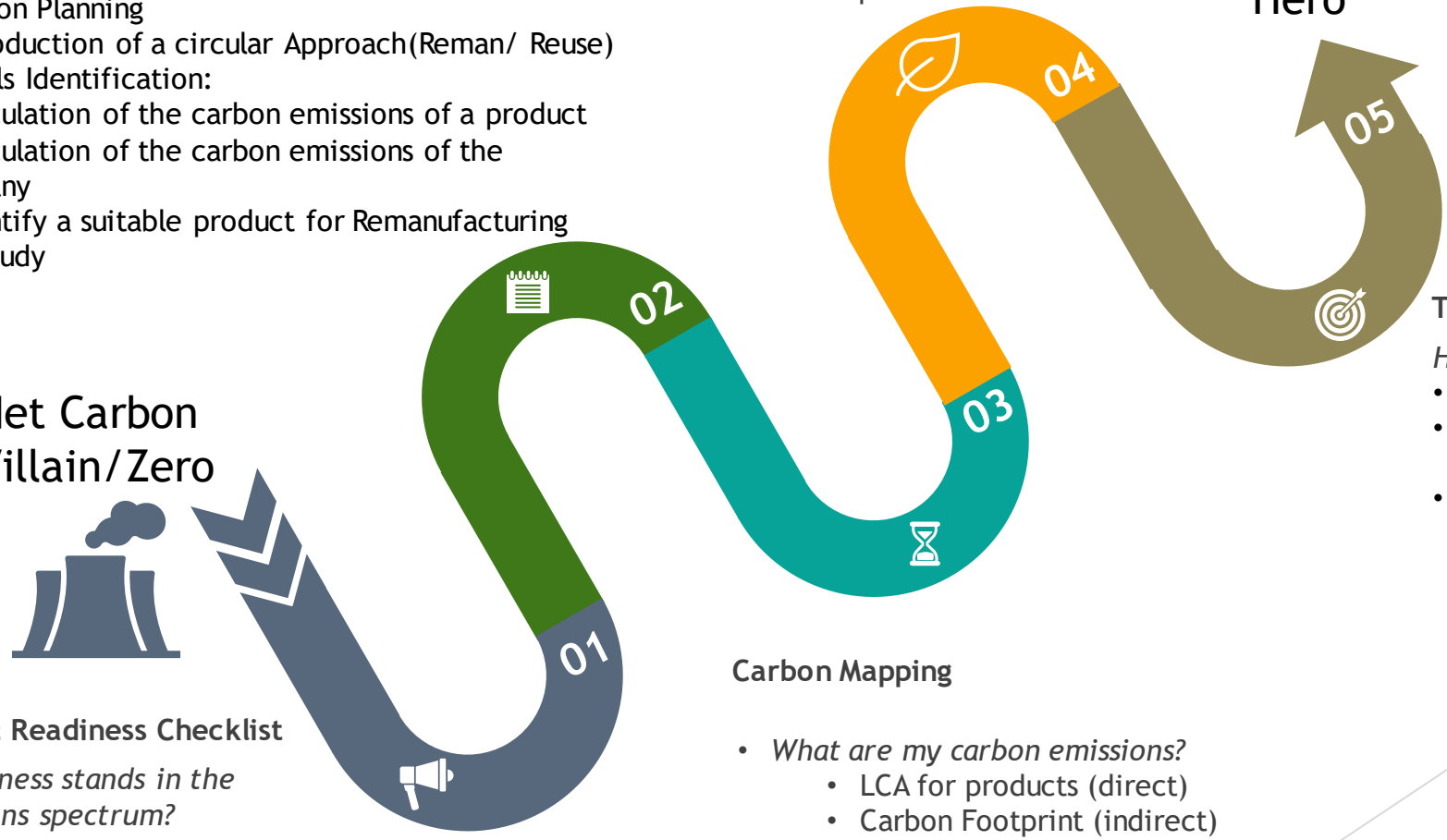
1. Calculation of the carbon emissions of a product
2. Calculation of the carbon emissions of the Company
3. Identify a suitable product for Remanufacturing case study

Circular Business Model

What does my new BM look like/BM Definition?

Remanufacturing decision support CEDA for the products of choice

Net Carbon Hero



Net Carbon Villain/Zero

T:Goals and results analysis

How well am I doing?

- Detailed carbon Capturing
- Branding/marketing – Carbon footprint Certificate
- New developed BM for Remanufacturing of a product

Introduction & Readiness Checklist

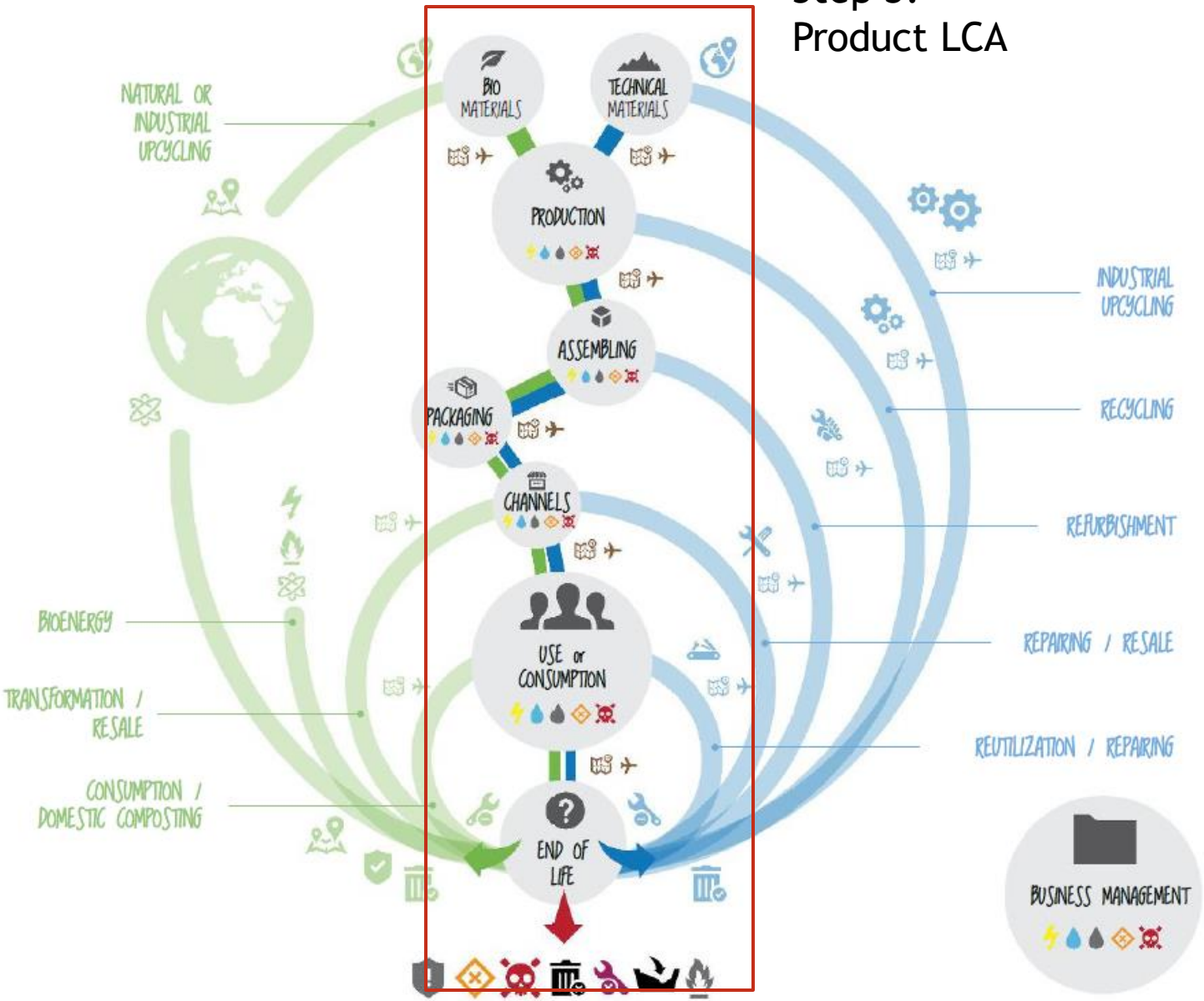
Where my business stands in the Carbon emissions spectrum?

Carbon Mapping

- *What are my carbon emissions?*
  - LCA for products (direct)
  - Carbon Footprint (indirect)

Carbon Mapping

Step 3:
Product LCA



Step 1:
Facilities emissions

Step 2:
Business Travel and Commuting

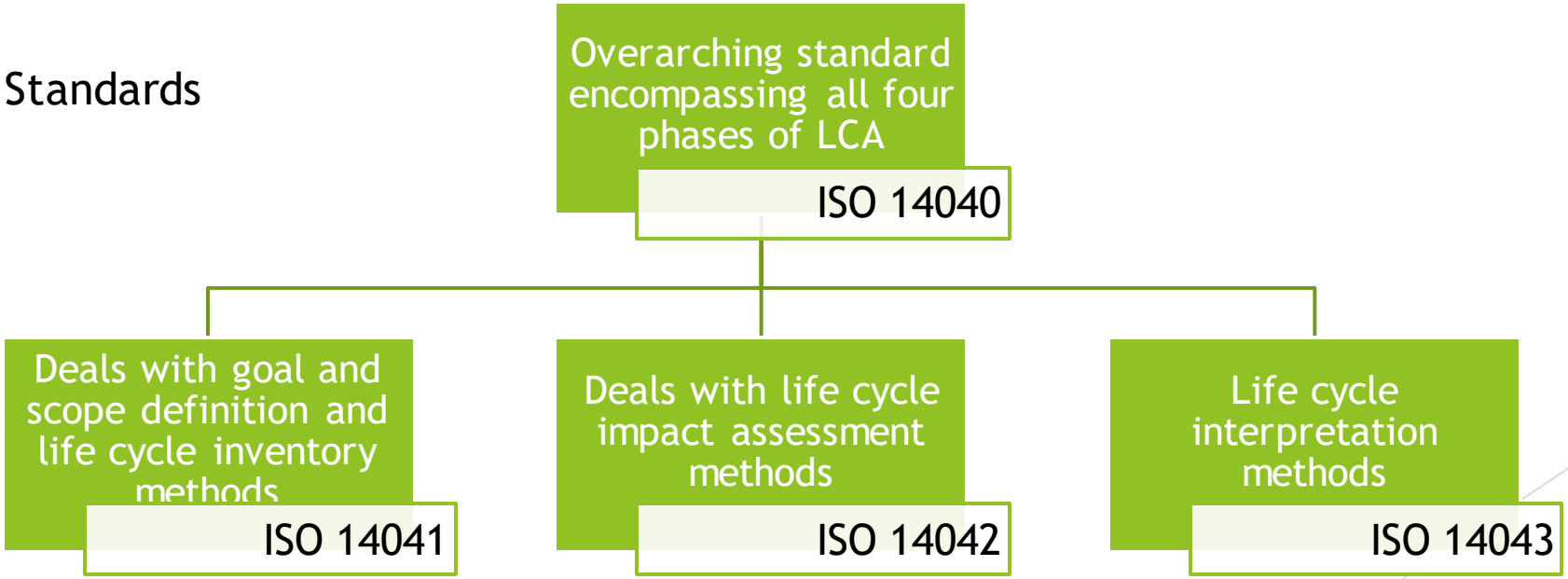
Source: http://greenmentor-project.eu/

Lifecycle Assessment (LCA)

Definition

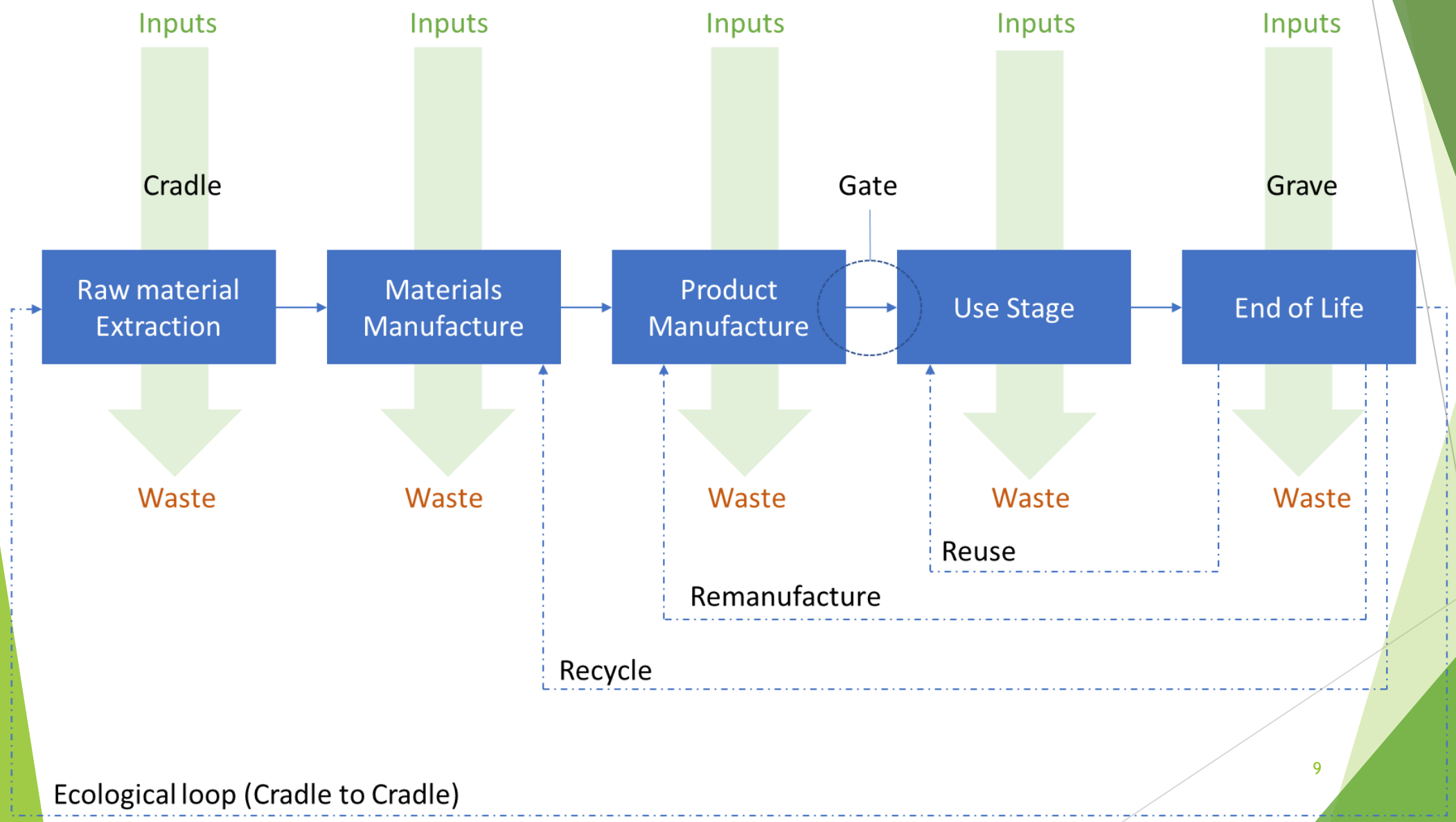
'LCA studies the environmental aspects and potential impacts throughout a product's life cycle (i.e. cradle-to-grave) from raw materials acquisition through production, use and disposal. The general categories of environmental impacts needing consideration include resource use, human health, and ecological consequences.'

Standards

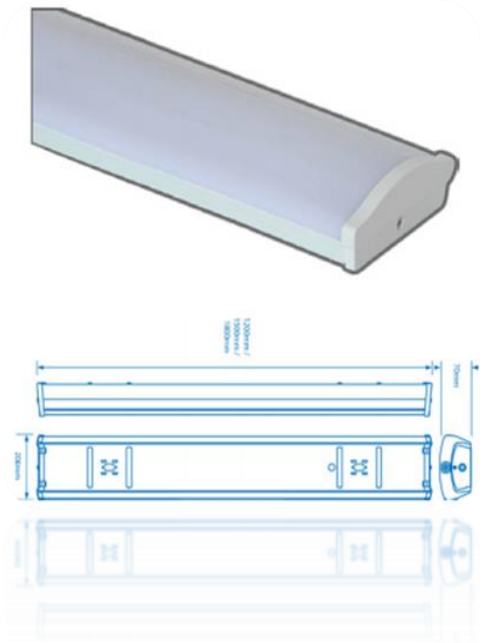


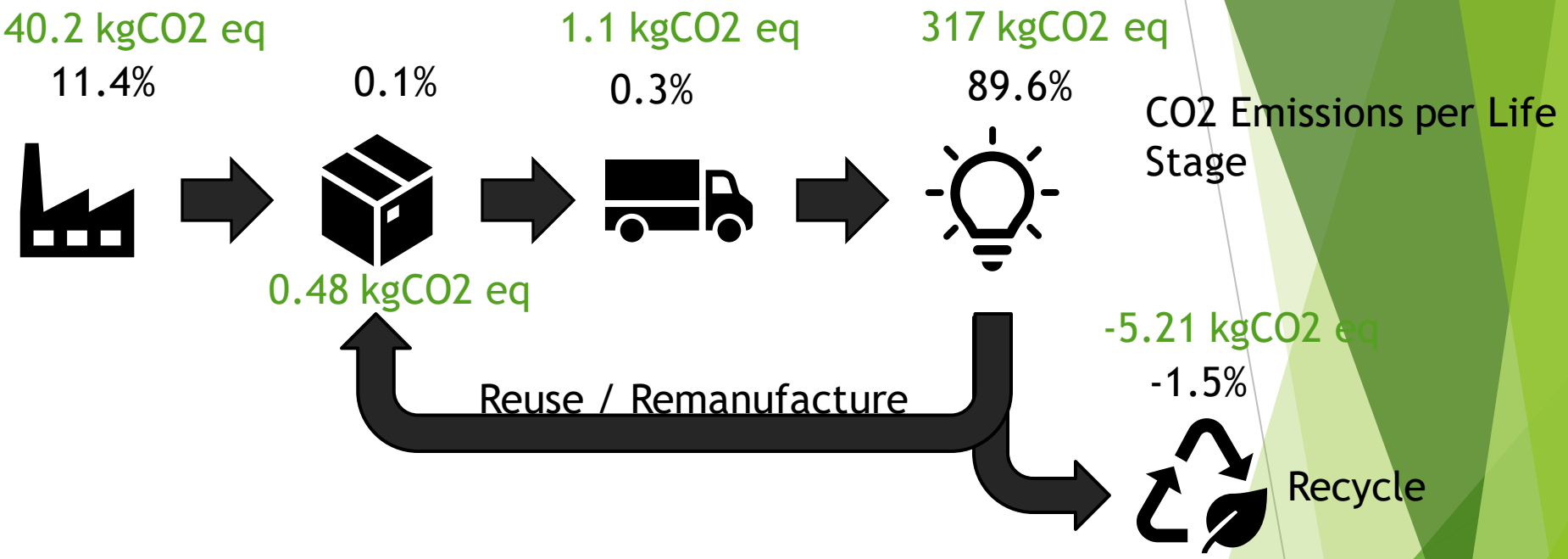
Source: Klopffer, Walter and Birgit Grahl (2014). Life Cycle Assessment (LCA). Wiley-VCH Verlag GmbH & Co. KGaA. pp. 1–2.

Lifecycle Assessment (LCA) Stages



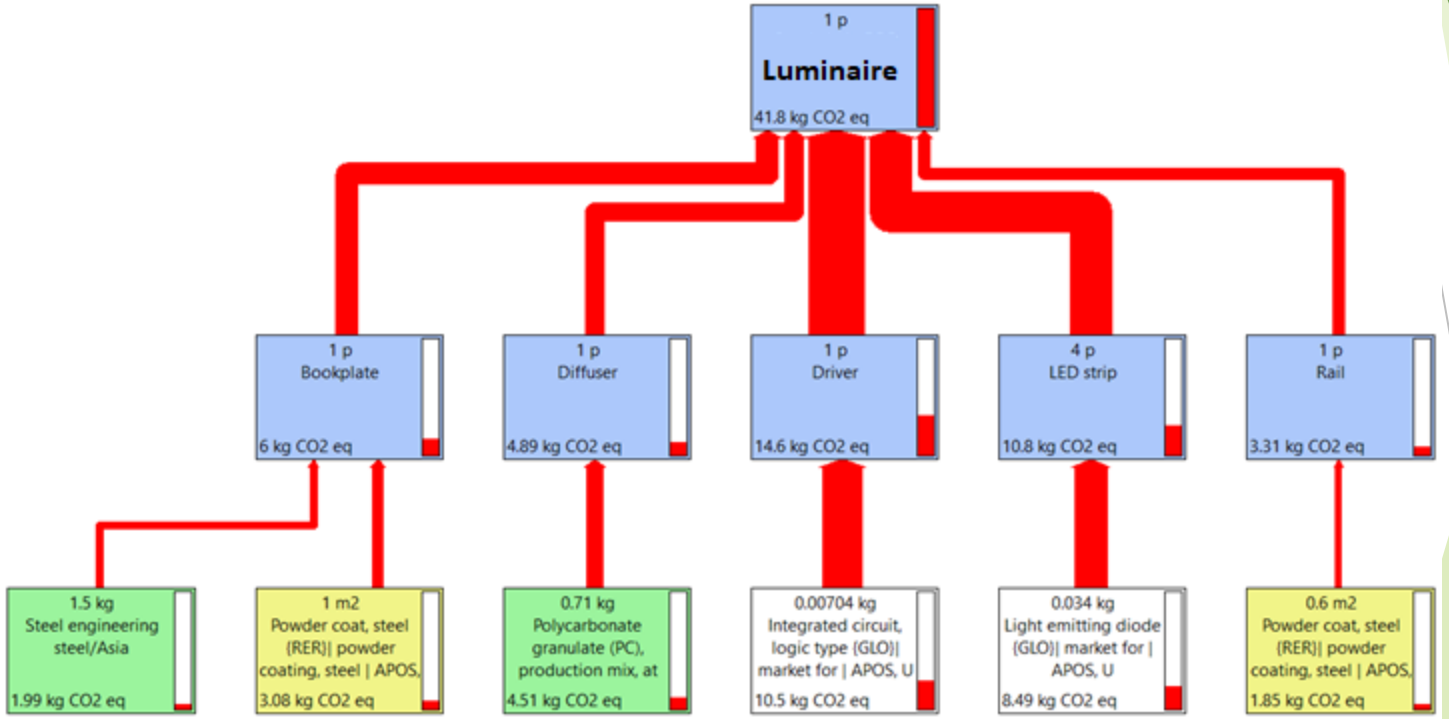
LCA-'Cradle to Grave' example



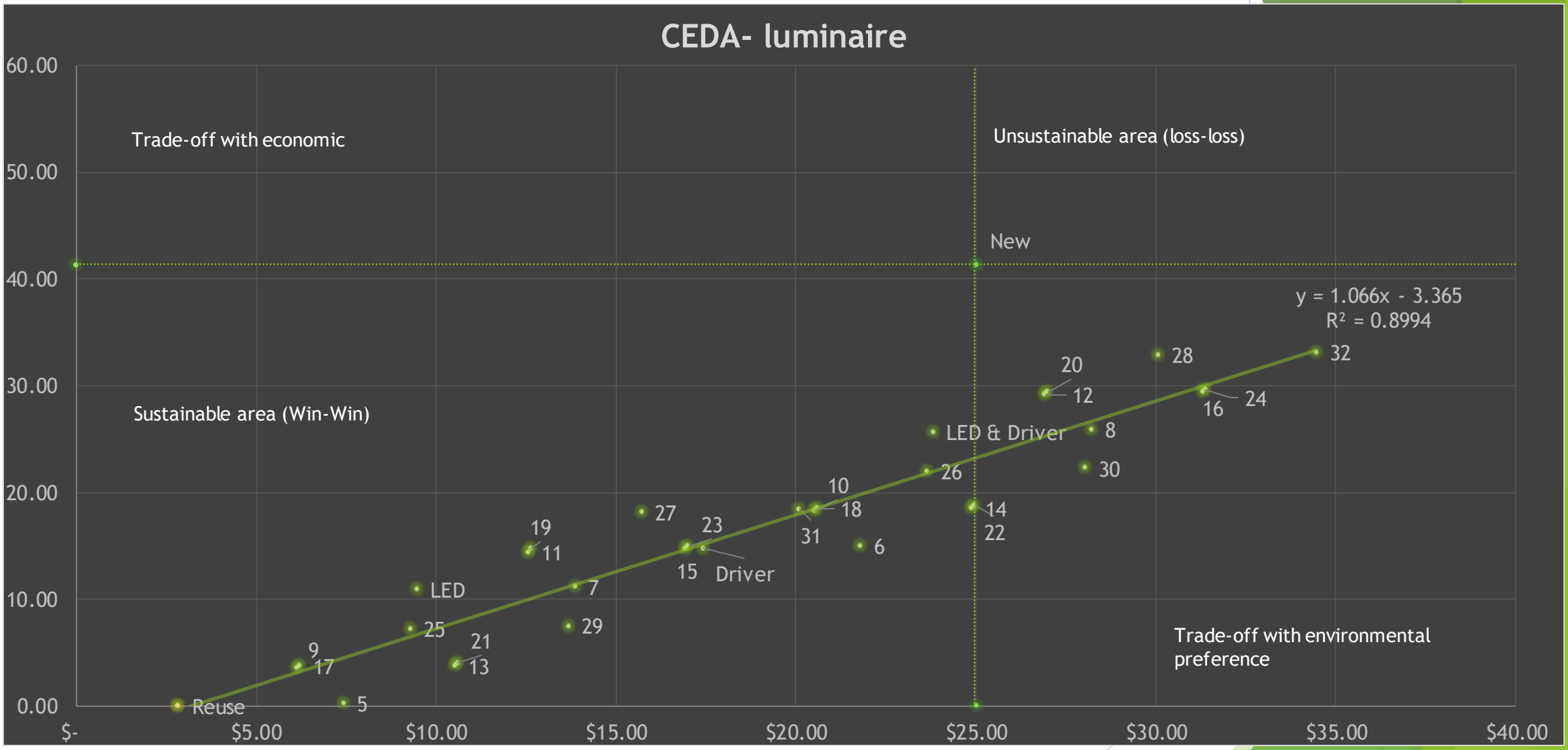


For this analysis the method of choice was the ReCiPe 2016 Midpoint (E) V1.04 / World (2010) E and the software of SimaPro with the Ecoinvent database

LCA-’Cradle to Gate’ example



Further use of an LCA- CEDA



What are the benefits for a company to perform an LCA?

- Introduction to the concepts of Sustainability and Zero Carbon Emissions
- Gain knowledge on the sources of env. impact across you organisation
- Deep understanding of their env. impact and ways to minimise it
- In depth knowledge of their products env. Impact related to its design decisions
- Minimise the risks of not being up-to date with the changing env. standards
- Support of Strategic decisions
- Access to new markets through a ‘green advantage’
- Funding opportunities identification for mitigating their env. impact

Simple guidelines to limit your carbon footprint today

Extraction and Production

- Use cleaner Materials
- Use highly renewable materials
- Use recycled (recyclable) materials

Packaging

- Avoid unnecessary packaging
- Optimise mass load volume
- Use returnable containers

Logistics

- Encourage local production and consumption (<300km)
- Optimise number of trips and loads

Use/ Consumption

- Use energy efficient products
- Make long lasting products
- Design for repair/ maintenance

End of Life

- Create a take back scheme
- Choose easily recycled materials
- Think Circular!

Business Management

- Design facilities with sustainable criteria
- Promote green commuting
- Limit waste

Thank you