

Module title	4.4 Impact assessment
Workload (ECTS)	3 ECTS
Module coordinator	Dr. Matthias Meier
Contributing lecturers	<ul style="list-style-type: none"> • Dr. Christelle Ganne-Chédeville • Prof. Dr. Tobias Fritschi • Dr. Maria Franco Mosquera • Aymeric David Niederhauser
Entry requirements	<p>Builds on:</p> <ul style="list-style-type: none"> • 1.1: Technological cycle: materials and processes • 1.2: Biological cycle: environmental systems • 1.3: Pathways to net zero GHG emissions in the energy and chemical sectors
Description	<p>Starting from the ecological sustainability dimension you will learn how to quantitatively assess the environmental impact of products and services along their life cycle using life cycle assessment (LCA). You will conduct an LCA on a case study using common LCA software and inventory databases and acquire a profound understanding on how to interpret the results. You will gain insight into different applications of life cycle assessment from industrial to agricultural products and gain an overview of further applications of life cycle thinking for social sustainability issues (social LCA / S-LCA) and economic aspects (life cycle costing / LCC). Further you will learn about the newest developments in LCA applications linking LCA impact categories to sustainable development goals (SDG-LCA) and referencing LCA results with planetary boundaries.</p>
Learning outcomes and competences	<p>Competences:</p> <p>Students</p> <ul style="list-style-type: none"> • understand the principles of life cycle assessment (LCA) and appraise the potential and limitations of the method for different applications. • are able to correctly plan and carry out an LCA using software tools and databases. • can report an LCA in a scientifically sound and comprehensible manner. • understand how environmental impacts in the product-based perspective need to be interpreted and how LCA results contribute to the overall sustainability discussion. • improve their social, self-management and group work skills. <p>Outcome:</p> <p>Life cycle assessment of own case study including a comprehensive interpretation showing strengths and limitations. Written report including all necessary information to make inventories, underlying assumptions, and calculations comprehensible and transparent.</p>
Assessment of learning outcomes	<ul style="list-style-type: none"> • Written report • Oral presentation
Didactic approach	<ul style="list-style-type: none"> • Contact teaching • individual and group exercises • group coaching
Project-based learning	The module content will be applied to a self-selected case study.



Links to other modules	<ul style="list-style-type: none">• 3.1 Society and technology
Bibliography	<p>Klöpffer W, Grahl B, 2014. Life Cycle Assessment (LCA): A Guide to Best Practice. Wiley-VCH Publishers.</p> <p>Ryberg, M W; Owsianiak, M; Richardson, K; Hauschild, M Z (2018): Development of a life-cycle impact assessment methodology linked to the Planetary Boundaries framework. In Ecological Indicators 88, pp. 250–262. DOI: 10.1016/j.ecolind.2017.12.065.</p> <p>UNEP/SETAC, 2009. Guidelines for Social Life Cycle Assessment of Products</p> <p>Weidema B, Goedkoop M, Meijer E & Harmens R, 2020. LCA-based assessment of the Sustainable Development Goals. 2.-0 LCA consultants and PRé Sustainability.</p> <p>Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. (2019): Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. In The Lancet 393 (10170), pp. 447–492. DOI: 10.1016/S0140-6736(18)31788-4.</p>
Language	English
Location	Bern