

Designing for Sustainability

From Idea to Circular Impact

Proposal Sheet

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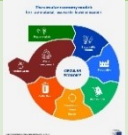
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1 GENERAL INFORMATION

Activity Sector	Sustainable Product Development, Circular Economy, Design Thinking, Innovation Management		
Key words	Sustainability, Circular Design, Product Lifecycle, 10R Framework, Design Thinking, Double Diamond, Value Hill		
Author(s) / Institution / Country	 Martin Dobler, FH Vorarlberg (Austria)  Adam Rovensky, FH Vorarlberg (Austria)		
Public	Initial and alternative education ☐ Beginners ☒ Intermediaries ☒ Experts	Continuing education ☒ Beginners ☒ Intermediaries ☒ Experts	
Domain(s)	☒ CSR ☒ Economics ☒ Entrepreneurship ☐ Finance ☐ HRM ☐ Information Systems ☐ Law ☒ Marketing & sales ☐ Political Sciences ☒ Strategy ☒ Supply chain & logistics	☒ Arts, Architecture, Design, Ergonomics ☒ Education Sciences ☐ Geography & Urban planning ☐ Information & communication Sciences ☐ Literature & language Sciences ☐ Medical Sciences ☐ Physical activities & Sport Sciences ☐ Psychology, Sociology, Philosophy, Demography	☐ Biology & Neurosciences ☐ Chemistry, Biochemistry ☐ Earth & Universe Sciences ☐ Electrical, Electronics ☐ Energetics ☐ Mathematics & Computer Science ☐ Mechanical Engineering ☐ Physics ☐ Processes
UN SDG	☒ SDG 4 Quality Education ☒ SDG 9 Build resilient and sustainable industry ☒ SDG 12 Sustainable Consumption and Production Patterns ☒ SDG 13 Climate Action		
Place in the Circular Economy Model	☐ Raw materials ☒ Distribution ☒ Collection	☒ Sustainable design ☒ Consumption, Reuse, Repair ☒ Waste management	☒ Production ☐ Residual waste 

2 ABSTRACT

2.1 The Case Purpose

This Teaching Case Study (TCS) is designed to equip students with the knowledge and creative tools needed to integrate environmental sustainability into the earliest phases of product and service development. The case focuses on the ideation and conceptualization of sustainable innovations using Design Thinking, the Double Diamond Model, and the 10R Framework. It guides students through the challenge of embedding circular economy thinking in product design — aiming to prevent resource waste before it occurs by addressing root causes during the development phase.

2.2 Introduction to the Case

While sustainability goals are often stated at the corporate level, they are rarely translated into effective innovation practices early in the product development cycle. Too often, sustainability measures are added late — after critical design decisions have already locked in most of the environmental impact.

This case highlights how students can influence sustainability by working at the intersection of user needs, design ideation, and strategic positioning. It introduces the concept of circular product innovation, asking students to apply structured methods such as the Double Diamond and Design Thinking to rethink how a product or service could be more sustainable, regenerative, or circular from the start. The case also introduces the Value Hill and Circular Value Chain models to help students visualize and position their concept within a broader system.

Designed for part-time students or those with business or engineering experience, the case allows for a high level of realism. Participants can apply the tools to existing product concepts, internal company challenges, or entrepreneurial ideas — with a strong focus on translating insight into action.

2.3 Why Use Teaching Case Studies

Case studies provide a powerful way for students to learn by doing — within a guided but open-ended framework. They simulate real-life complexity without the risk, encouraging participants to think critically and creatively about business problems. Students are asked to apply theoretical frameworks to practical challenges and to reflect on their own professional experience.

In this TCS, students act as sustainable designers or innovation leads and work through structured decision-making stages to create more circular, resilient, and value-driven product or service concepts. The use of widely recognized tools such as the 10R model and the Double Diamond ensures that students gain experience with practical, transferable methods that they can later apply in their careers. It also encourages interdisciplinary and systems thinking — key competencies for working toward the UN Sustainable Development Goals (SDGs).

3 PEDAGOGIC GOALS & PREREQUISITES

3.1 Overall Learning Objectives

This case study challenges students to solve an early-stage innovation problem through a sustainability lens. The focus lies on transforming initial product or service concepts into circular, resource-efficient solutions that align with environmental objectives and user needs.

Students will:

- 🔗 Understand the role of sustainability in product and service development.
- 🔗 Apply structured innovation methods (e.g. Design Thinking, Double Diamond, 10R Framework).
- 🔗 Integrate circular economy principles into product and business model ideation.
- 🔗 Position innovations within a circular value chain using models such as the Value Hill.
- 🔗 Make informed decisions about sustainability trade-offs and innovation strategies.

The TCS promotes systems thinking and emphasizes that design choices made in early phases strongly determine future environmental and economic performance. Students will learn to combine creativity with structured analysis to address real-world challenges of sustainable innovation.

3.2 Specific Learning Objectives

Students will tackle applied innovation and sustainability tasks.

They will:

- Use methods like brainstorming, empathy mapping, and stakeholder analysis to explore sustainability potential.
- Create early product or service concepts that apply one or more 10R strategies.
- Identify opportunities to design for circularity using visual and analytical models.
- Consider user needs, market signals, and environmental impact simultaneously.
- Position their innovation in the product life cycle and the Value Hill model.
- Reflect critically on the feasibility and sustainability of their proposed solutions.

3.3 Target Audience

The target audience includes business and engineering students in bachelor-level programs (years 1–3), especially those in part-time or dual study formats. The case also fits continuing education contexts.

The TCS assumes that students may be working in companies and thus have access to real product or service ideas. This enables them to apply the methods to their own company setting or a chosen business environment. It is designed to be adaptable across industries and innovation stages, from new product launches to sustainable re-designs or service expansions.

3.4 Students Prerequisites

To work effectively with this TCS, students should be familiar with the fundamentals of product management, marketing, and sustainability.

Relevant background knowledge includes:

- Basics of product/service development and innovation processes
- Awareness of environmental impacts (e.g. carbon footprint, material usage)
- Understanding of Design Thinking or similar creative methods
- Knowledge of sustainability frameworks (e.g. SDGs, 10R, Circular Economy principles)
- Ability to analyse product life cycles and customer needs

The TCS is designed to be scalable: instructors can adjust complexity depending on student experience.

4 SUSTAINABILITY GOALS

This Teaching Case Study (TCS) focuses on the transformation of product development processes to enable more sustainable and circular outcomes. Rather than merely optimizing existing systems, the case encourages students to rethink how products and services are created from the very beginning — aiming to prevent resource use before it occurs. It emphasizes that sustainability must be embedded in ideation and design, not just applied retrospectively.

The TCS highlights that while circular economy goals are often defined at policy or corporate level, actual implementation depends on individuals and teams being able to navigate uncertainty, challenge assumptions, and design solutions that are desirable, viable, and feasible. Students will be encouraged to embrace creative thinking and systems analysis to balance environmental, technical, and business perspectives.

The sustainability goals are approached through the lens of **early-phase intervention** — when the majority of environmental impact is "locked in" by design decisions. Students will explore strategies to avoid waste, extend product lifecycles, and enhance material circularity from the outset. They will also use the 10R

Framework to examine how their solutions can contribute across multiple levels of circularity — from refusing unnecessary functions to enabling reuse, remanufacturing, or recycling.

For circularity, the emphasis is placed on implementing R-strategies in combination with innovation frameworks such as Design Thinking and the Double Diamond model. The integration of circular thinking and user-centered design helps students discover new pathways toward sustainability that are not only technically sound but also user- and market-aligned.

5 CASE DESCRIPTION

Year of the problematic	2025	
Duration for students	Preparation: 2-4 hours Implementation: 4-8 hours	
Languages	☒ English	☐ Other:
Use case	☒ In class	☐ Examination TCS
Category	☐ C1: Case written in collaboration with a company which has given its consent for using of its internal sources such as the company name, figures, photos, videos, and so on. Join the agreement sheet. ☐ C2: Case based on real company information and with the acceptance of the company to use its data, but names or figures (of company and persons) are modified to keep them confidential. Join the agreement sheet. ☐ C3: Case written using external public sources (annual report, websites, brochures, newspapers, ...) where names or verbatims of the protagonists are used. Join the agreement sheet. ☐ C4: Case based on real company using public information without the agreement of the company (generally, the names (company and persons) are changed to anonymous ones. Impossibility to make the link between the TCS and the company. ☒ C5: Imaginary case based on teacher's experience who collected information from several companies to write a case study with a fictive integrative company. It can also be a compilation of different situations of several periods put together at the same time to form a pedagogic tool.	
Number of pages: Statement / Annex	4 / 17	
Number of pages: Teachers' note:	11	
Diffusion licence	See cover page	

6 Case Pack components

6.1 General documentation

Table 6.1: General TCS documents

Document name	Description	File name	# pages
Proposal Sheet	Teaching Case Study description. This file can be published to inform potentially interested persons about the Teaching Case Study (this file)	SCABEE TCS From Idea to Circular Impact (2025) – Proposal Sheet.docx	8

6.2 Student's documentation

Table 6.2: Documents for students (to be shared when TCS applied)

Document name	Description	File name	# pages
Case scenario	The document for students including the mission and all necessary information.	SCABEE TCS From Idea to Circular Impact (2025) – Base Scenario.docx	25

6.3 Teacher's documentations

Table 6.3: Documents for teachers (not to be shared with students)

Document name	Description	File name	# pages
Teacher's note	The document for teachers to guide them through the Teaching Case Study.	SCABEE TCS From Idea to Circular Impact (2025) – Teacher Note.docx	9