Sustainable Design and Production

Discussion Exercise (approximately 30 minutes)

Task Description

As people's environmental awareness grows, so does the demand for eco-friendly and environmentally responsible products. As a result, it becomes increasingly important that product developers and designers integrate sustainability into product development, ideally right from the start. Discuss the following questions in small groups:

1. How do different stages in the technology development process contribute to greenhouse gas emissions? The technology development process, or the product's life cycle, encompasses the entire journey from concept and design to manufacturing, usage, and end-of-life.

2. Select a few cards from various categories in the Climate Call card game and discuss the greenhouse gas emissions generated at different stages of the life cycle.

Bonus Task: Compare low-emission and high-emission technology development processes, highlighting key differences and discussing strategies for minimizing emissions in product design and production.

Conclude by discussing these questions as a whole class.

Suggested Solution

1. Ask the students to consider the importance of different stages and how choices in one stage can affect emissions in later stages. An idea itself may not generate emissions, but it can significantly impact emissions in later stages. This means that technology developers should consider sustainable development and circular design right from the start.

Emissions during manufacturing depend on product type, materials used (including the share of recycled materials), chosen manufacturing method, and energy usage. Location matters, because different countries have different energy sources. Manufacturing and usage locations also affect emissions due to transportation. Some products have high emissions during use, while others have none. In the product's end-of-life stage, material choices and ease of disassembly impact recyclability.

It can also be noted that using recycled materials results in lower emissions during production since it requires more energy to manufacture materials from virgin raw materials than from recycled ones.

Expected Learning Outcomes

Increased awareness of circular design and the importance of integration of sustainability into technology development, gained through a deeper understanding of greenhouse gas emissions at different product lifecycle stages. Realizing the crucial role of sustainable practices from the very beginning of technology development projects.