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EDUCATION TOWARDS
CIRCULAR & SUSTAINABLE
ECONOMY

EXPERT TRANSFER STRATEGY HAND- BOOK



Education Towards Circular and Sustainable Economy

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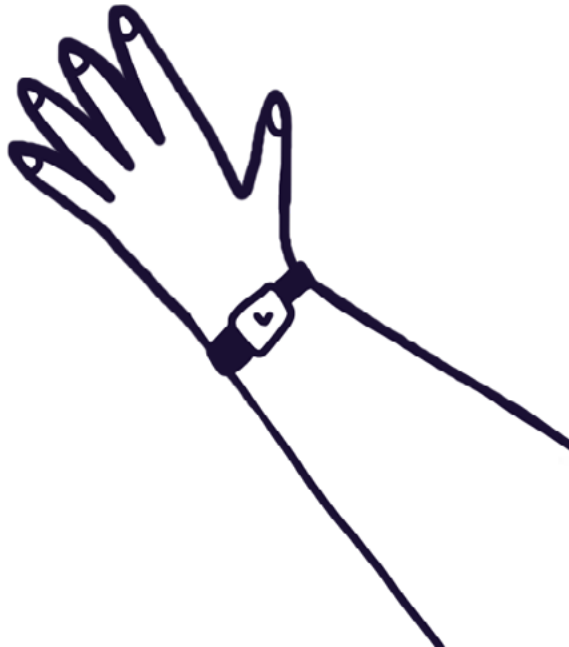
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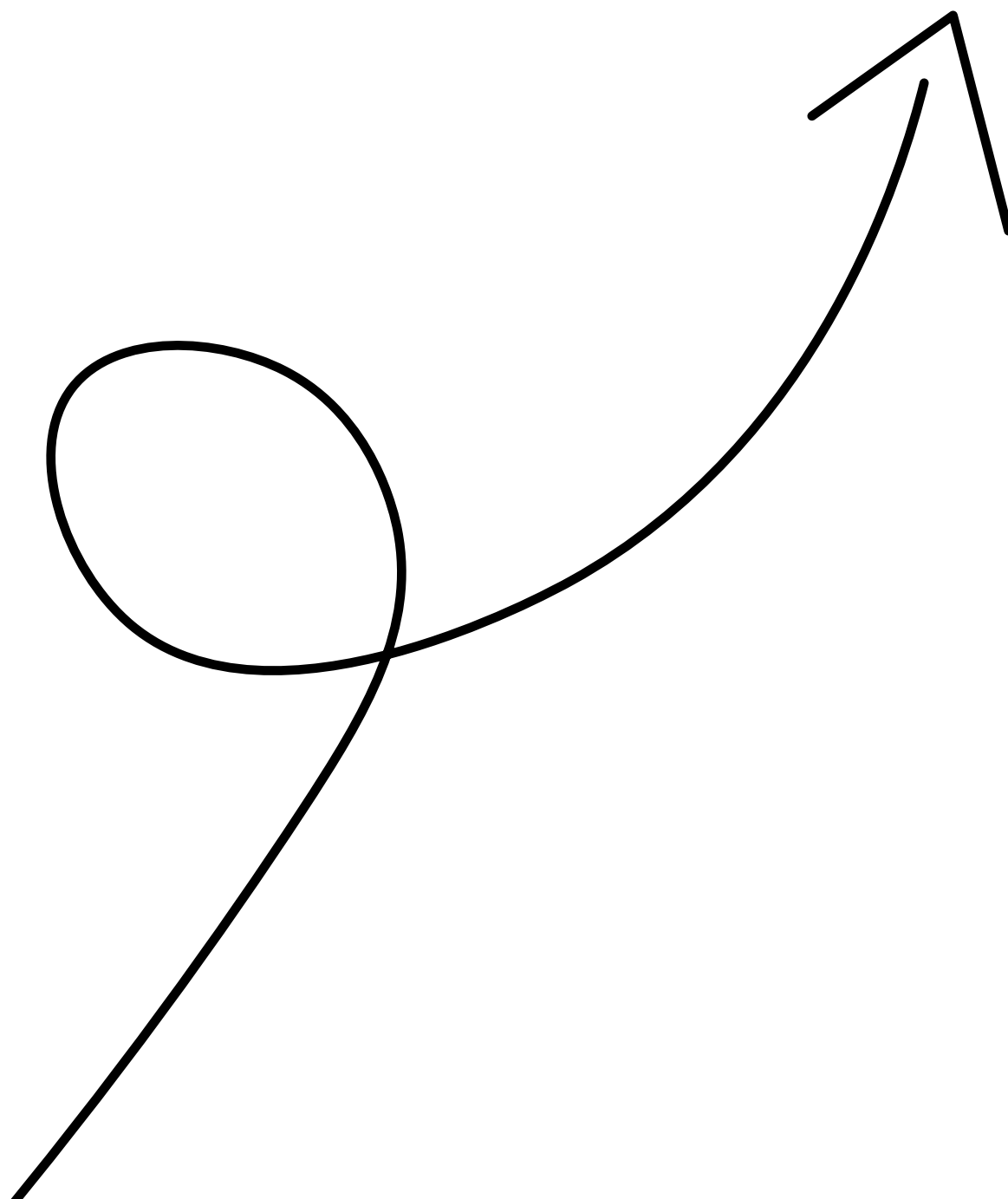


INTRODUCTION

We are rapidly approaching irreversible tipping points in our global ecosystem. Time is running out and sustainability is the lifeline we must hold on to. Every year, the Earth Overshoot Day is calculated by the Global Footprint Network. It marks the day when a country has used all the natural resources it should consume within a year. After that, it lives at the cost of future generations and other countries.

The truth is alarming: if everyone on Earth lived the way we do now, the world's natural resources that could be sustainably used in 2025 would already have been consumed by July (Global Footprint Network, 2025). For the remaining five months of the year, humanity is borrowing the resources from future generations, putting not only our environment at risk, but also our economic and social stability. Out of nine measurable planetary boundaries, six have already been exceeded. And the climate is only one of the many systems under threat. Everything is at stake: the amount of available drinking water, the declining fertility of soils, the contamination of the environment with plastic, the loss of biodiversity and much more.

Our linear economic system, based on the “take-make-dispose” principle, is a major driver of the climate crisis and disastrous for our future. In the 21st century, production needs to be designed to be regenerative. Our economy should function in a circular way, integrating people into the Earth's cyclical life processes. Educational institutions can play a key role in supporting this transformation. If we want future generations to be equipped for the challenges ahead, education should go beyond traditional subjects and integrate sustainability and circular economy principles across curricula. Education should empower a new generation of environmental conscious students.



PURPOSE

To support shift in education, the ‘Expert Transfer Strategy Handbook’ was created as part of the Erasmus+ project ‘ET CASE’ (Education Towards Circular and Sustainable Economy). The handbook aims to connect schools and universities with experts from companies and NGOs in order to promote practice-oriented circular economy education and jointly meet the new demands of our environment. We provide schools with concrete and practical recommendations for integrating the pressing topic of the circular economy into education.

The Expert Transfer Strategy Handbook offers examples and creates inspiration on how schools and external partners can cooperate. This approach supports teachers in using practical guidance to combine theory with real-life experiences.

METHODOLOGY

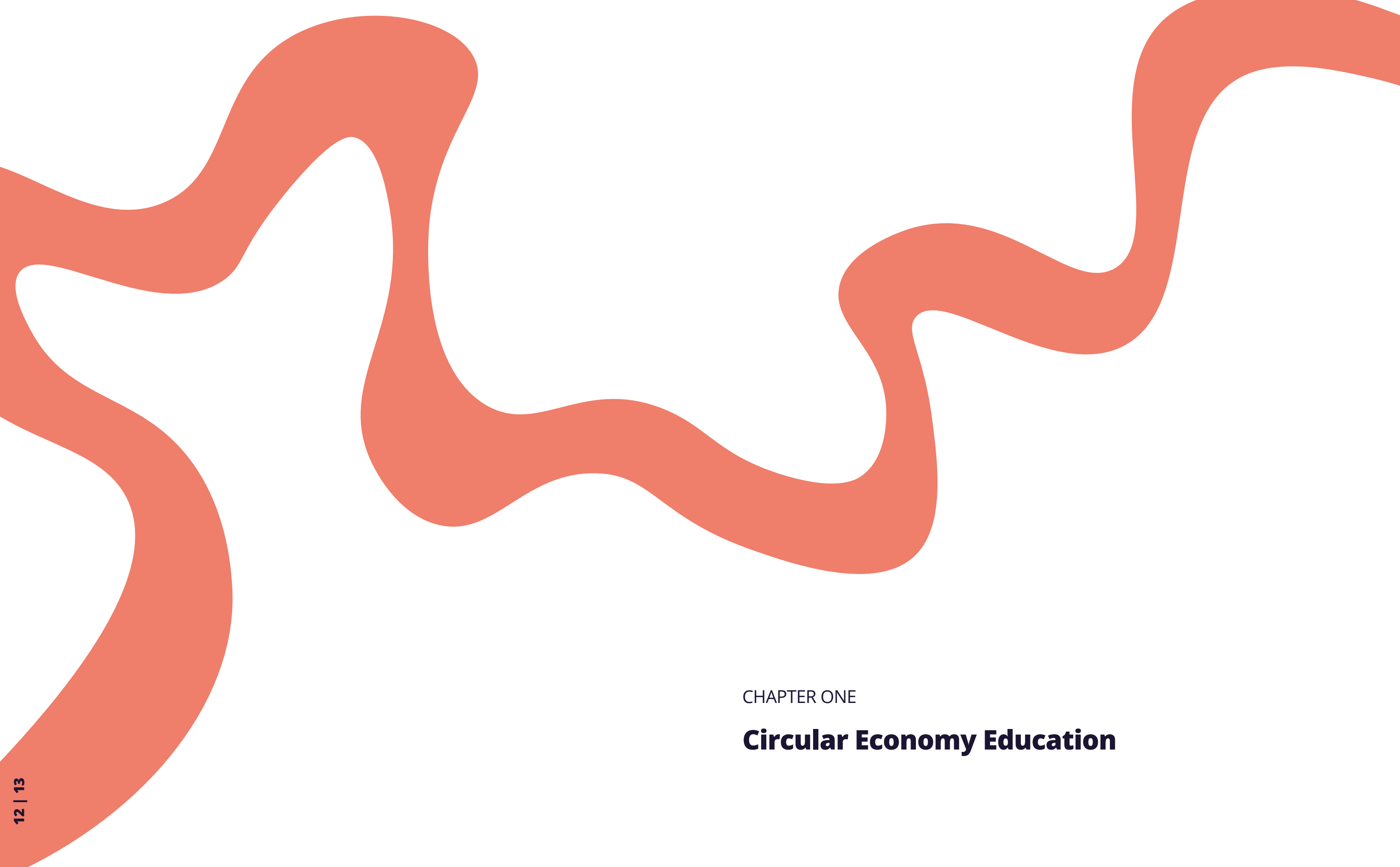
The findings compiled in this handbook were obtained in a qualitative, explorative study with guided interviews with experts. 26 experts from various European countries and four professional groups were interviewed. In addition to teachers from secondary schools, company representatives (start-ups, SMEs, large companies), NGOs (species protection, cradle-to-cradle, youth organisations) and scientists (sustainability research, architecture) were interviewed with the aim of investigating the transfer of expert knowledge into school-based circular economy education and identifying best practice examples.

The Interview guidelines focussed on:

- (1) the definition and understanding of circular economy and sustainability,
- (2) experiences with school cooperation formats,
- (3) success factors and challenges and
- (4) specific practical examples and recommendations.

The interviews lasted between 30-60 minutes and took place via video call, podcast recording and in some cases face-to-face meetings. For logistical reasons, some interviews were conducted in a written form. The interviews have been performed in the respective national languages, were transcribed verbatim and then translated into English. A qualitative content analysis was then carried out, in which the interviews were paraphrased and categorised (deductive-inductive). The main and sub-categories were then combined. All participants took part in the interviews voluntarily. Content and demographic data were anonymised where requested. The findings from the interviews were compiled as best practices for this handbook which focuses on practical learning and considers external cooperation to be indispensable for this.





CHAPTER ONE

Circular Economy Education

Given the significant societal challenges we face today, the concept of a circular economy is increasingly coming into focus as a promising approach to a sustainable and resilient way of living. Education plays a key role in this context, as it fosters mindset and behaviors that align with planetary boundaries. Awareness about the climate crisis has existed for many years. Now, one of many challenges is communicating it in ways that students can truly engage with and act upon.

Various experts have pointed out that terms such as “circular economy”, “biodiversity” and “greenhouse effect” are still unfamiliar to many students and that sustainability topics often do not receive the attention in curricula that they deserve. Projects, workshops, excursions, competitions, the use of digital and interactive platforms and awareness campaigns open up real opportunities for action. They enable young people to understand cognitively and emotionally how important a sustainable lifestyle is.

Much attention is given explaining the severity of the crisis. However, as many of the interviewed experts said, it is just as important to provide information about solutions. To foster imagination and introduce approaches that address these challenges. External partners can serve as bridges in this process, bringing practical knowledge and real-world experience into schools and offering new perspectives.

By building connections between schools and partners, students gain more chances to have their ideas heard far beyond the boundaries of the classroom. As Agata Delmaczyńska said in our interview:

They take on a crucial role as multipliers: when young people learn about the conscious use of resources at school, they pass this knowledge on to their parents, grandparents and communities.

The following chapters present a range of approaches and tools that educators can use to integrate circular economy topics into their teaching. They also illustrate how cooperation between schools and external expertise can be fostered effectively.

This handbook is not intended as a definitive guide, but rather as an invitation to ongoing dialogue: How can we create learning environments in which the principles of the circular economy are not only understood, but also applied in everyday practice?



CHAPTER TWO

Key Competencies for Students

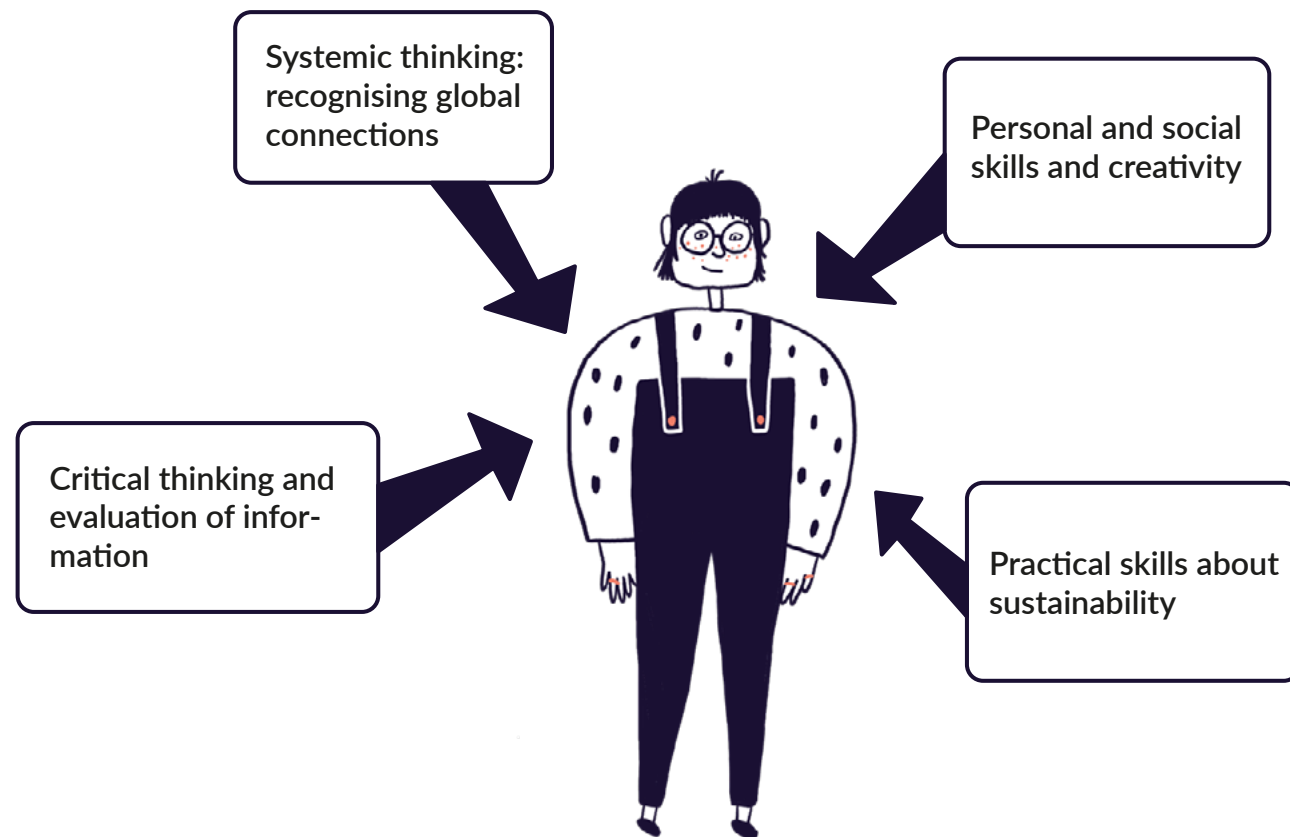


Figure 1: Key Competencies for Students (Source: Own Illustration)

The discussions with the experts from companies showed that young people should have knowledge about the circular economy and sustainability when they start their careers. However, practical and personal skills are much more important than just knowledge. This skills development is crucial in order to integrate sustainable behaviour into everyday life and thus to be able to organically participate in sustainable processes in companies and proactively establish them. These core competences are summarised in Figure 1.

Young people entering the workforce are expected to demonstrate critical thinking when dealing with their environment and their own behaviour. Above all, this includes consciously confronting disinformation, greenwashing and marketing strategies (see Case study: Empowering the customers in Education Towards Circular & Sustainable Economy, 2025). Reflection also includes the ability to question certain waste utilisation processes. “Burning plastic waste is considered part of the recycling quota because it generates heat and electricity,” said Jakob Zellmer in our interview. Further he added, “that can be confusing for young people—they think plastic is being recycled into new products, but in reality, much of it is simply burned”.

However, young people can only support companies in the circularisation of their processes and business models if they have an understanding of the linear economic model and have internalised the requirement that sustainable alternatives must be proactively and consistently demanded in order to avoid taking the supposedly more convenient route. If we abstract this to the private consumer behaviour of young people, one example of critical consumer decisions cited by the experts is the distinction between fast fashion and second-hand products.

Personal and social skills in the context of sustainability and the circular economy are also required for continuous further development in the constantly changing fields of action. Young people should experience active learning through project work that focuses on co-design and participation. In particular, creativity and a spirit of innovation for their own solutions such as upcycling and zero-waste campaigns should be encouraged. Empathy and the ability to work in a team to incorporate different perspectives are the basic prerequisites for dealing with economic processes and their sustainable design.

Finally, practical skills in the context of sustainability and circularity are also a core competency for young people, as addressed by various experts. They are the basis for a culture of repair and upcycling (craftsmanship, sustainable materials, recycling and waste technologies). In order to actively shape change in companies, young people also need knowledge of CO₂ capture technologies and innovative disposal methods. In addition to the aforementioned requirements, technical skills also have a digital component. For example, young people should be familiar with the use of apps for resource sharing, online campaigns and tools for sustainable projects.

Practical skills should be underpinned by a deep systemic understanding of the circular economy. In particular, young people should be familiarised with the interplay between ecological, economic and social aspects. In the corporate context, it is important for our experts from companies that young people are able to analyse product life cycles in order to recognise the impact of consumption on global resources and to be able to bring this knowledge into the company or help shape processes that promote this.

Ultimately, this also means categorising complex interactions in the context of the circular economy, such as supply chains and material cycles. Across the board, these core competences require, above all, learning to take personal responsibility in order to be able to make sustainable decisions and anchor them in the social environment.



CHAPTER THREE

Current Challenges for Schools

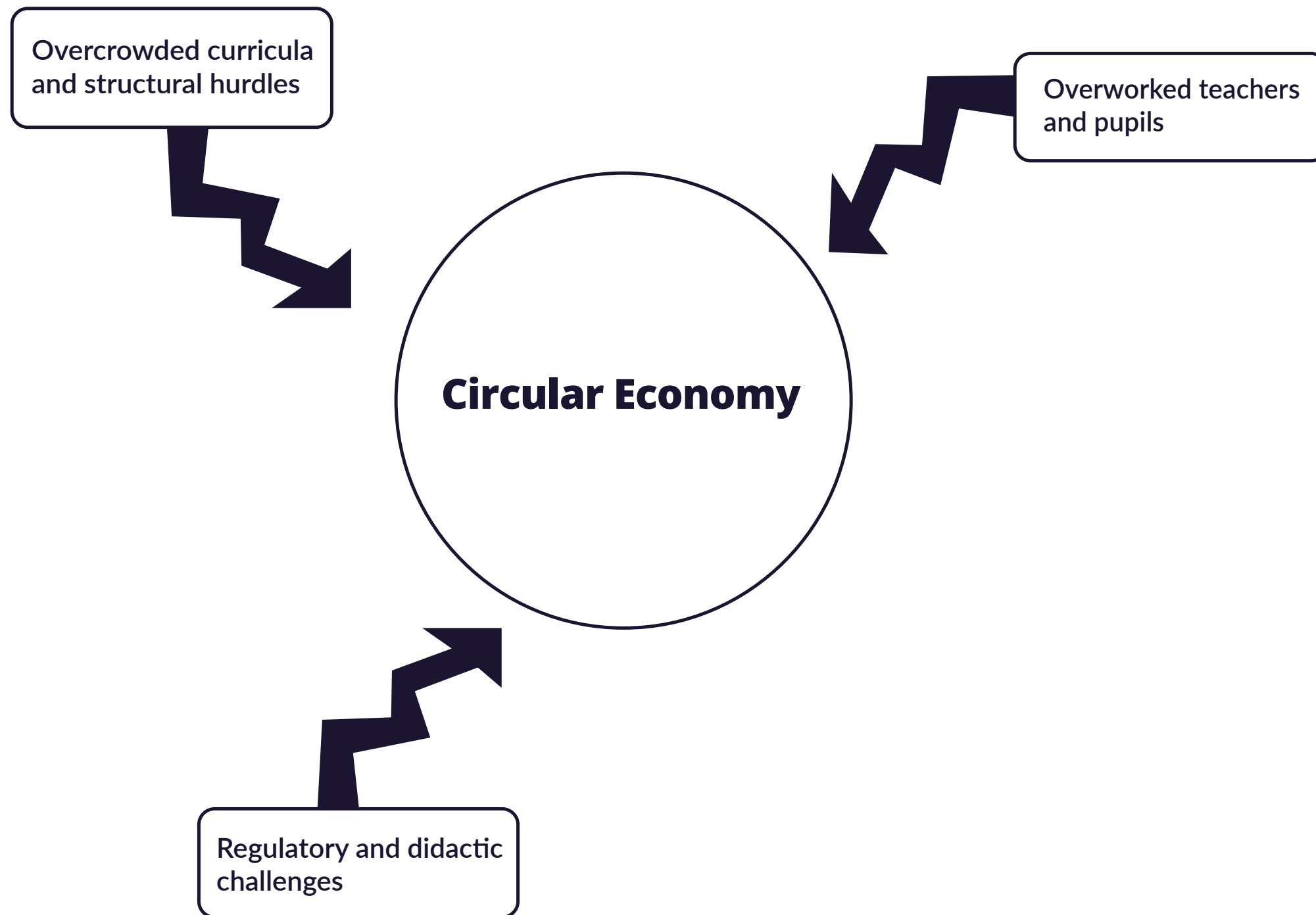


Figure 2: Implementation challenges (Source : Own Illustration)

Young people can certainly be taught these core skills by their own parents and social environment. As there is naturally a large variance between individual young people, it is essential that schools also contribute to teaching young people the core competences. However, school also reflects the later professional environment. If young people are to demonstrate these competences in a professional environment, it is essential that they also learn them in a similar environment. Only school education can achieve this. Schools that have already attempted this have encountered recurring challenges, which the experts we interviewed from the education system were able to clearly identify. Figure 2 shows the most relevant challenges faced by schools in the context of providing education on the circular economy and sustainability.

The most frequent reference here was to the already overcrowded curricula, which makes it very difficult to include additional content. It is often the case that although sustainability topics are formally included, they are often only covered superficially. In particular, complex topics and constructs such as extended producer responsibility or green claims, which require abstract thinking and a deeper understanding of the subject matter, are absent. Both teachers and students are quickly overwhelmed here because they are not given the time to deal with the subject matter in sufficient depth.

Regulatory hurdles are also often an obstacle to the implementation of educational measures. For example, rigid requirements repeatedly make innovative and practice-oriented teaching approaches difficult. A lack of suitable materials for global contexts and material cycles is also often an obstacle. These are sometimes non-existent or can only be acquired with monetary resources that state schools cannot afford.

The elimination of hands-on subjects such as textile education reduces young people's repair and upcycling skills. In addition, time constraints and workload pressure pose significant challenges for teachers and students. In particular, the high workload caused by regular teaching demands within an already overcrowded curriculum affects those involved. Teachers feel that they do not receive sufficient didactic support. This high demand reduces their motivation to incorporate further sustainability-related topics into their lessons.

Support could be provided by external actors and experts, yet cooperation with NGOs and companies usually remain one-sided initiatives. The ongoing lack of networking, for example through workshops and

company visits, prevent continuity. All these challenges highlight the urgent need for structural reform. In order to successfully establish circular economy education, practice-oriented didactic concepts and reliable collaborations between schools and external partners must be developed.

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CHAPTER FOUR

**Building the Bridge:
Schools and External Expertise**

Many companies make valuable contributions by providing real-life examples and problems in the fields of refrigeration technology and waste management. By organizing workshops and inviting employees, they ensure practical learning experiences that directly involve students in sustainability topics. Waste management companies such as Ormož Communal Services (Beyond Car Dependency & Brain Drain, 2021) provide enlightening insights into circular economy systems with excursions. Competitions such as “Solve for Tomorrow” (see Chapter 5.3), “Centre of Electro-Ecology” (#PROsAtWork, 2024) and “Hackathon” (see Chapter 5.2) encourage young people to develop creative solutions to current challenges. Start-ups are also involved: “Släppa” (see Chapter 6.1), a startup focused on producing eco-friendly home care products, uses their social media channels to upload educational materials. Meanwhile, “EcoBean” (see Chapter 6.1) promotes sustainable thinking by recycling coffee grounds and raises awareness through targeted campaigns.

Another important contribution comes from partnerships with local businesses and design workshops. “Fast fashion operates like a one-way street, where new clothing is constantly produced and thrown away,” said our interview partner Martina Glomb. These clothes are produced in distant locations through opaque processes to make them as cheap as possible, rarely worn by people and then disposed of. Entire collections are going straight to the trash and with them the resources that were used. Through upcycling projects, students can gain direct experience and learn what it means to create a piece of clothing themselves and give it a second life.

The role of NGOs should not be underestimated when it comes to making sustainability topics authentic and feasible.



With their expertise in raising awareness and education campaigns, they are able to inspire young people to adopt sustainable practices. This has been demonstrated in successful projects, such as creating flowering meadows, reforestation and repair cafés. “Make a project that is easy to implement,” recommended Artenglück founder Lara Boye in our interview. Sustainability can be done in a practical manner and does not require major sacrifices.

“In our case [Artenglück], that was flowering meadows on agricultural land that is not suitable for food production and off we went.” Instead of remaining fallow, land is now being used in an ecologically valuable way to create habitats for animals that are essential for the ecosystem and our food supply.

Organizations such as “Cradle to Cradle” (Cradle to Cradle NGO, 2024) develop educational materials that support teachers in designing and teaching sustainability topics. At “Play Sustain” (see Chapter 6.2), cultural and artistic methods are combined with sustainability concepts. Meanwhile, Ewelina Sasin uses social media campaigns and school competitions to teach complex topics like decarbonization and circular economy in a more accessible and interactive way. For schools where their own implementation would be lacking, “Eko-centrum” (Ekocentrum, 2022) offers practical one-day workshops on circular economy, providing support where needed.

“Issues related to the circular economy or climate change often seem distant and abstract to young people. Their every-day concerns - school pressures, peer relationships or personal choices - overshadow global challenges. The task of the educator is to show to what extent our daily decisions effect global processes.”

Agata Delmaczyńska

Challenges in school networking can prevent the transfer of knowledge in the area of sustainability and circular economy into education. Yet integrating these topics should be seen as an important part of education in the wake of current global challenges (See Chapter 5.3). Different timetables, outdated curricula and rigid subject structures are organisational hurdles hindering the continuous learning process for students. In addition, teachers often do not have access to centralised contact points and platforms for cooperation with partners.

Effectively communicating the complex concepts of the circular economy to students in an accessible way requires both a shift in perspective and appropriate didactic support. For this, teachers need structured materials and easily applicable methods. Digital platforms such as Instagram and TikTok can provide support in presenting multifaceted topics in a visual and youth-friendly manner. Additionally, theme days and campaign weeks such as “Plastic-Free Week” and “Zero Waste Days” offer an opportunity to inspire young people to act sustainably. Interactive tools such as the “En-ROADS climate simulator” (see Chapter 6.5), TEDx-talks (see Chapter 6.5) and the “Circular Economy Challenge” (Design the Loop - Makeathon for Sustainable Culture and Events, 2024) are inspiring and motivating learning formats that encourage younger generations to think and participate in shaping the future.

Teachers are among the key touchpoints and multipliers of knowledge. Therefore, they play a central role in the implementation and establishment of circular economy education. In addition to fostering student competencies, it is equally important to qualify teachers in this area. Didactic support can serve as a foundation for sustainable educational cooperation.



CHAPTER FIVE

Bridging the Gap: Practical Solutions

5.1

How to Network Schools with External Partners

The following examples highlight how a harmonious connection between schools and external partners lead to a successful circular economy education:

COIL formats (Collaborative Online International Learning) are of educational value as they offer authentic learning experiences and enable international collaboration. Many universities and NGOs are working on projects with partners from all over the world. International exchange with peers broadens students' horizons. They learn how sustainability is implemented in other countries, practise their intercultural communication and have the opportunity to learn from each other.

At the same time, **regional and local partnerships** are of major importance. Excursions to Tiny House Villages teach students about sustainable building materials, resource cycles and design principles based on the cradle-to-cradle concept (Education Towards Circular & Sustainable Economy, 2025). "In Finland there is a trash bin connected to a scale, and when you throw away food, a screen displays an emoji in different colors, indicating whether you have wasted a little or a lot. This creates immediate awareness about food waste and encourages people to reconsider their habits," advised the interviewed expert Anja Wollesen. The link between technology and consumer behavior works well for collaborations with app developers or canteens.

When students analyse waste and CO₂ balances, direct association is created between consumption habits and the environment. The emotional appeal ensures a higher learning effect. To experience industrial processes such as recycling, packaging and logistics in practice, **excursions to sustainable companies** like AB Circular (ABCircular GmbH, 2022) are recommended.

Sustainability centres such as Kapráľův mlýn (Home Eng, 2022) allow students to see how responsibility for the environment is applied on site. These experiences promote the partnership of schools with regional companies and at the same time strengthen the regional identity and awareness of young people.

Clothing donations, exchanges and upcycling projects are beneficial for **collaborations with NGOs**. “Knowing who made our clothes adds value to them,” highlighted slow fashion expert Martina Glomb in our interview. When students tailor and alter their own clothes in workshops, they gain a deeper understanding of the production process and begin to reflect more critically on their own consumption habits. Glomb said in our interview: “We lost control of this knowledge through globalization. By outsourcing textile production, we also outsourced our awareness of what is in our clothes.

Now, when we try to recycle textiles, we often find unknown materials - chemicals we did not even know were there. This is why slow fashion, circular economy, and supply chains are all interconnected.” Lowering consumption, especially of fast fashion, can help reduce unnecessary resource use. Buying less and choosing second-hand items are important steps in that direction.

The aim is to build **long-lasting networks between schools and external experts**. These have reciprocal benefits. A practical approach is particularly important in order to sensitise students for green professions and sustainable action.

5.2

Practical Formats: Project Days and Competitions

Sustainability should be made tangible for young people. Through interactive and practice-oriented formats, students can be actively involved in developing solutions.

The core idea of **hackathons and makethons** is to collaboratively solve problems with companies and ultimately develop creative solutions. In our interview Christian Schlimok pointed out: “We explored the use of materials in the theater industry, where a significant amount of material is consumed for stage sets and costumes for each production. A group of scenographers in Germany brought us a challenge: to design a digital platform for sharing materials and costumes in the theater industry. Students worked on this specific challenge during the hackathon”. These practical examples are appealing and increase students’ motivation. It also fosters creativity and teamwork.

Collaboration with external partners such as cultural institutions or companies are based on a reciprocal approach: schools and students gain valuable insights through real-life experiences and companies benefit from new, innovative ideas. Excursions to technology museums and sustainability businesses in areas like repair and recycling offer great encounters that complement theory.

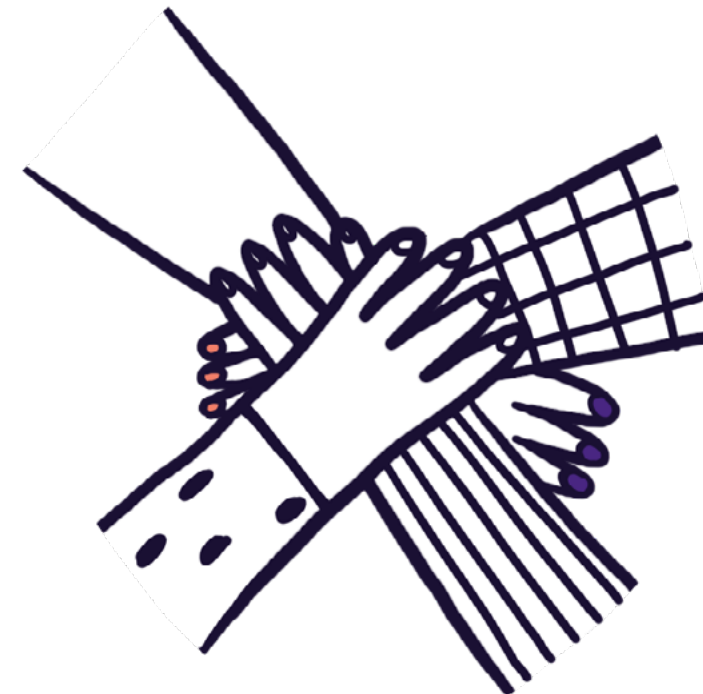
The **makethons** are primarily focusing on rethinking circularity from the beginning. This not only includes the readaption of theater costumes, but also the upcycling of marathon or festival T-shirts, which are often worn just once. By doing this, the design process integrates sustainability with practical action. It is also a great opportunity for artistically talented students to showcase their creative problem-solving skills.

“In the classroom, I have also participated in role-playing exercises, where students take on different perspectives and simulate real-world scenarios. This method works well because the more external stimuli the brain receives and the more vividly students experience a topic, the better they retain the information. By actively engaging with circular economy issues, young people begin to identify with them on a personal level,” proposed students to critically evaluate their actions. By assigning them into roles like entrepreneur and environmentalist, they can transfer their learned knowledge into real-life discussions.

Project weeks and practical activities such as planting trees, growing flower beds and waste collection are one of the best ways to encourage students to take action. When they experience the positive results of their actions first-hand, their sense of responsibility and empathy increases. They combine haptic skills with sustainability awareness. These projects can be financed through crowdfunding. Therefore, students learn to develop and organise projects independently. Most young people adore challenges and competitions. Agata Delmaczyńska observed: “July without plastic: doing my grocery shopping without acquiring plastic packaging was demanding and, above all, made me realize how great the scale of the problem is”.

The **gamification** approach enables young people to learn through playful and motivating lessons, changing behaviour through self-reflection. “Plastic-free” campaigns, repair workshops, gardening projects, workshops, sustainable fashion shows and digital storytelling formats can be integrated in schools.

To make sustainability an integral part of education, schools can take inspiration from successful formats such as problem-based learning offered by universities. “Examples include analyzing the lifecycle of products or showing how changing small habits (e.g., reducing plastic, choosing second-hand clothes) can contribute to larger changes,” proposed Agata Delmaczyńska. As a result, students gain both knowledge and a sense of agency. The modular structure commonly used in universities can also inspire school curricula. Mandatory courses such as “Seminar on Sustainable Future” ensure consistent engagement with sustainability topics.



5.3

Recommendations for Integrating CE Topics into Existing Subjects

Education is not a linear process, but a transdisciplinary river where every branch of knowledge finds its confluence. Circular economy and sustainability cross and enrich all subjects. In order to find sustainable solutions, interdisciplinary learning approaches are crucial. Environmental topics should no longer be confined to geography lessons, they can be embedded in all subjects: from economics, to math and art. This raises students' awareness of the environmental crisis as an omnipresent and urgent issue. Teachers play an important role in addressing current challenges by presenting examples that may provoke discomfort, but support the critical reflection of lifestyles and values.

One of the driving forces behind the climate crisis is our economic system. In a world with finite resources, the assumption of infinite growth is questioned. No tree grows endlessly, because nature's space has limits. So why should a system based on exploiting nature defy those limits? From this perspective, a shift towards qualitative rather than quantitative growth is being discussed. One towards more freedom, health, happiness and independence for everyone, while remaining within ecological boundaries.

In **economics classes**, students should engage with alternative indicators beyond the GDP, such as the National Welfare Index, which reflects all the characteristics mentioned above. The higher the material wealth and therefore the GDP of a country, the greater its carbon footprint. GDP and prosperity may rise in the Global North, but so does inequality and environmental degradation. Not everyone has contributed equally to the climate crisis and not everyone is affected by it in the same way. So the climate crisis is inherently also a justice crisis. This makes the topic highly relevant for **social studies** as well, where global inequalities, ethical implications and power structures can be critically

examined. “Repairing products should be cheaper than replacing them - but that requires a change in the system,” insisted Jacob Zellmer. This statement highlights a key economic and political challenge: due to price structures and industrial interests, our current system favors throwing away rather than preserving. One of the most important skills students can acquire at school is an understanding of interconnected systems and the impact they have on our environment. Within the lessons, policy frameworks necessary to promote repair and recycling can be discussed. Concrete examples, such as the EU’s initiative to legally enforce the “right to repair” (European Parliament, 2024) can be used to encourage discussions and teach critical reflection.

Another example is to explore the topic of deposit systems. “Raising the deposit on more products would encourage people to return them to the system instead of throwing them in the trash,” recommended Jacob Zellmer. This illustrates how financial incentives stimulate sustainable behavior.

Even in **geography and biology lessons**, sustainability issues are often overlooked. Yet, the curriculum can be expanded by integrating current examples from areas such as green mobility, slow tourism and sustainable food systems. Cities can be used as examples to analyse how local mobility encourages travellers to behave environmentally friendly by using rental bikes and public transport. Often the question arises whether a comfortable life that makes travelling possible is compatible with taking responsibility for the environment. On this subject Anja Wollesen stated that she does “not want to discourage anyone from doing a semester abroad. Quite the opposite: These experiences are important and formative.” Emissions should just not be glamorized. It is important to reflection one’s lifestyle.

Prosperity is not about fulfilling desires for status, but about meeting basic needs. Questions like “Do I really need a luxury hotel, or would a simpler accommodation be more suitable to connect with locals?” provokes students to reflect about their own way of living. Nutrition and gastronomy are relevant as well: from the selection of regional products, reduction of meat consumption and intelligent portion sizes to the avoidance of food waste. All these topics foster critical thinking and environmental responsibility.

Subjects like **mathematics, physics and chemistry** also offer ideal touchpoints for addressing sustainability. In the construction sector, for example, where cement and steel are significant sources of CO₂ emissions, it often seems as if there has been no progress towards sustainability. However, new perspectives are being opened up by innovative technologies, such as CO₂ carbon capture processes. These procedures are suitable to be explored in physics and chemistry classes, as their mechanisms and effects can be calculated.

The topic of energy-efficient recycling can be addressed as well: simple classroom experiments can be used to explore processes that operate at room temperature and low voltage in order to save energy. Agata Delmaczyńska pointed out: “A big impression on participants is made by analyzing the lifecycle of products. For example: clothes, the production of which requires enormous resources from sourcing materials at the cost of water in entire regions, to sewing in factories in Asia, pollution of rivers in Africa and finally dumping in the desert in South America.”

For students, the processes behind new clothes are often unseen. That is why in maths lessons, the carbon footprint or water consumption of a product can be integrated into assignments.

These help students understand complex global relationships. “We have already depleted most of our building materials; now we have to redefine them,” highlighted Bartosz Felski. Students should be encouraged in **art lessons** to think about the use of circular materials and the reuse of existing buildings to achieve sustainable architecture. International and regional examples help to communicate sustainable approaches in architecture, craftsmanship and technology.

The **EN-ROADS simulator** enables the planning of climate-neutral cities and thus combines theory with practice. **Cradle to cradle principles** must be promoted in the education sector as well: Products and clothing can be rethought and redesigned through slow fashion and upcycling projects. Expert Lisa Kinne believes that the question goes far beyond “What do we recycle?” It is about thinking “What are we putting into these cycles?” Circular thinking could serve as a guide for more sustainable action across all areas of society.

Societies that emphasize innovation without exnovation eventually run out of space, because even the best ideas need room to take root. For example, promoting green energy means not just expanding solar, but phasing out coal. Similarly to schools: if sustainability is to enrich the curriculum, outdated content should be replaced with current examples. To equip students for the complex challenges ahead, education should aim to combine critical reflection with a realistic view of future developments.



CHAPTER SIX

Successful Example and Best Practices

6.1

Closed loops in a Practical Context

Closed loops refer to systems in which resources are continuously reused rather than disposed of. This transforms waste into new value and reduces environmental impact. Companies across Europe are not only rethinking their use of resources and product design process, but also involving schools in their activities. Organizations like **EcoBean** (See Appendix) are pursuing the idea of extracting sustainable raw materials from waste. This process brings waste products back into the cycle, avoids disposal and creates new products.

EcoBean's successful concept is based on intensive co-operation with partners from the coffee industry. This shows that companies can successfully tackle the complex issues of sustainability and the circular economy if they actively promote cooperation. The same applies to institutions in the education system. Other examples of closed loops include a theatre fund sharing platform, which provides used materials, especially clothing, to people interested in culture in a simple way.

Resources are thus passed on and not disposed of. Waste separation is increasingly becoming the focus of the circular economy. Here, it is crucial to make preliminary decisions in everyday life in order to organise the process quickly and cost-effectively. It is therefore very important to involve young people in environmentally conscious behaviour at an early age and to encourage them to learn about resource conservation and recycling. This is made easier through cooperation with waste management companies, where young people can directly experience their own behaviour and its effects.

Teaching young people about the circular economy is the key to empowering them to become shapers of a sustainable future. Only if we create an understanding of how valuable resources can remain in the economic cycle will innovative concepts emerge that go beyond the disposable and throwaway mentality.

“Previously, in our jobs we had dealt with topics completely different from those related to circularity but the education and information (e.g. from the activists) made us decide to change our career paths and open an ecological startup.”

Ada Stępień

In an interview with us, Släppa CEO Ada Stępień explained that this shows the inspiring nature of education, which offers young people the opportunity to become drivers of change themselves. **Släppa** itself stands for environmentally friendly household products with refillable containers - a concept that reduces CO₂, generates less waste and avoids water transport, as water is not supplied but used at home from the tap (Släppa, n.d.).

6.2

Storytelling for Circular Learning

Envision students standing in a dimly lit room, holding their smartphones in front of an augmented-reality installation. Suddenly, the cotton fields of India appear before them. After a few swipes, they find themselves in a textile factory in Bangladesh. One more swipe and a landfill site flashes across the screen. The journey of a single T-shirt unfolds. By embedding the AR/VR tool in a story, students can experience how their consumption affects the environment.

Similar immersive learning experiences are offered by the **Play Sustain Foundation**. Through creative communication and multimedia methods such as webinars, fashion shows, podcasts and AR/VR tools, they use technology to convey the circular economy in an emotionally appealing way. “A good story encourages people to reflect on their purchasing choices,” says Play Sustain Foundation representative Barbara Wybacz in an interview with us. Educational formats that tell stories spark interest and critical thinking.

One of the most effective examples is the “learning journey of a T-shirt”. This illustrates the holistic approach from raw material extraction to upcycling. Pupils not only learn where their clothes come from, but also what happens to them after they have been worn, thrown away or reused. By introducing concepts such as life cycle analysis (LCA), young people can transfer their knowledge to real-life examples.

Additionally, TEDx talks are also exciting for interested young people, as they share valuable information about the circular economy and for example low-carbon construction. These talks engage a wide audience, presenting difficult topics in a captivating manner without simplifying it. Storytelling does not stop with narratives: role-playing games, hackathons and competitions can be complementary methods to encourage this behaviour as well. These enable pupils to participate as equal players, which strengthens their motivation and long-term commitment. In addition, excursions to sustainability centres and waste management companies offer an exciting add-on to theoretical knowledge.

6.3

Competitions and Gamification

The Polish company **Ewesa Impact Hub** is a brand and customer experience agency. “Better knowledge about sustainability means better decisions in one’s personal and professional life, and a more solid basis for influencing their environment,” say Ewesa Impact Hub representatives Ewelina Sasin and Ewa Kietsznia in our interview. By raising awareness of sustainability issues and disinformation on social media, they encourage people to make fact-based decisions.

Young people are particularly predisposed to emotional stimuli and social trends. This can be both an opportunity and a risk, making an educational approach to social networks essential. Critical reflection must not be neglected, as the founders point out: “Deepening knowledge in the field of circularity is largely connected with confronting unpleasant facts and exposing the inadequacies of the world and business“. Our reluctance to face discomfort must not lead to ignorance and inaction. To put this knowledge into practice, the experts organise creative competitions with attractive prizes. Competitions motivate young people to take a greater interest in environmental issues and find innovative solutions for waste avoidance. They are encouraged to engage with sustainability creatively, exploring new approaches to environmental problems.

Another example is Samsung Electronics Polska’s **‘Solve for Tomorrow’** format, in which the 4C competences Critical Thinking, Creativity, Collaboration and Communication are applied independently to real-life sustainability problems (Samsung Electronics Polska, n.d.). Challenges are solved using digital technologies and methods such as hackathons. Such formats are ideal for finding practical solutions to challenges. The same gamification approach is also used in the ‘collection box system’. This involves a playful competition to collect as many used batteries as possible and recycle them properly. Such competitions, swap markets and repair campaigns are promoted by social media campaigns. By encouraging their peers to take part in sustainability efforts, young people foster not only environmental responsibility but also a sense of social cohesion. These competitions are supported by workshops in which theoretical knowledge is conveyed. For example, pupils learn how to repair electronics and thus extend their lifespan.

6.4

Innovative Materials meet Practice

The use of innovative materials and tools opens up new possibilities for sustainable and circular solutions in the field of design and construction. The following companies show how modern materials can be used in everyday school life.

Vera Banas works as a freelance material innovation designer and material consultant with international experience in Germany, Denmark, China and the USA. The designer has specialized in sustainable material cycles and circular thinking. This is particularly evident in the design and production of fashion, architecture and technology. In her “New Materials Masterclass”, she motivates young women to creatively explore the circular economy through practical design and materials research.

In the workshop, the participants discover self-healing materials such as polymers that can repair minor damage, as well as biodegradable materials based on algae and fungi. This will help them to rethink the life cycles of products. „Allowing them to directly interact with innovative materials makes abstract concepts more tangible and engaging,“ says Vera Banas about her collaboration with women. In her empowerment formats, Banas highlights the role of young women in shaping sustainable solutions for the future in order to make them visible in male-dominated fields such as technology and design.

These types of workshops are also suitable for students, as they go beyond teaching individual actions and help them understand systematic connections. For instance, they might explore how smartphones can be redesigned from a circular perspective, incorporating modular and easily repairable components. This hands-on experience fosters critical thinking and blends technical knowledge with environmental awareness.

Another example is **Skanska**. The company is looking for innovative material and solutions in four areas:

1

Implementing modern, sustainable construction solutions in Skanska investments, such as:

- air-purifying concrete (used for sidewalks in office construction projects) or low-emission concrete (used in Central and Eastern Europe);
- LED lighting, chilled beams, photovoltaic panels, heat recovery, ventilation with recuperation;
- electricity consumption of many of the Skanska’s buildings is 100% covered by renewable energy under the declaration of origin.

2

Materials, waste management and a circular economy:

Waste generated in the construction process is closely monitored and reduced. Globally at Skanska, in 2022, 72% of waste was recycled, 8% was prepared for re-use, and 13% was disposed of in other ways.

3

Certification:

Skanska is increasing the number of green buildings and LEED, BREAAAM and WELL-certified¹ buildings in the US, Scandinavia, the UK and Europe, both at new facilities and buildings it is renovating. However, Skanska is focusing mostly on BREAAAM and LEED certification in Poland.

4

Sustainability reporting:

Skanska has been publishing environmental impact reports since 1997. Starting in 2019, reporting in this area is carried out in conjunction with the company’s annual reporting. This provides greater transparency and allows to observe the company’s progress in sustainability.

¹ These certifications are recognised standards for assessing sustainability in the building industry.

The case study shows students that the development of climate-friendly solutions are possible even in high-emissions industries. Responsible action is not only desirable, but actually achievable. This example can be used in the classroom to illustrate how sustainable development is compatible with economic efficiency and social responsibility.

The **Sopocka Akademia Nauk Stosowanych** is a university that focuses among others on sustainable, climate-friendly architecture and circular construction. One professor contributed to this approach by sharing good practices from his own experience. He aims to raise student's awareness of resource scarcity by using interactive tools like the EN-ROADS climate simulator. By developing and using such tools, complex systems can be explained in an accessible manner.

These practical examples show how innovative materials and interactive learning formats not only promote an understanding of the circular economy, but also enable young people to actively integrate sustainable solutions into their future working and living environments.

6.5

Repair and Social Engagement

Another pioneer of circularity in Europe is the company **woshwosh**: a specialist in the professional cleaning and repair of shoes since 2015. Via the wosh wosh website (<https://woshwosh.com/en/>), everyone has the chance to give shoes and other items of clothing a second life by having them cleaned, disinfected and repaired by woshwosh.

According to the founder Martyna Zastawna, who is no longer involved with the company's operations, woshwosh has „given a second life to nearly 550,000 pairs of shoes, saving over 7 million kg of CO₂ and over 4 trillion litres of water“. This is equivalent to New Zealand's water consumption for an entire year and illustrates the strong, quantifiable contribution that the company is making towards sustainability and a circular economy.

The company combines services with education and social commitment. For schools, Martyna Zastawna offers workshops and training sessions in which circular economy is taught in a tangible and realistic way. With younger target groups, references to gaming, social media and influencer are used to attract attention and make the content relatable. The focus never sways from repairing, reusing and donating instead of throwing away.

Woshwosh is also involved in social projects: Up to this day, over 200 000 donated shoes have been given to people in need. They regularly organize collection campaigns in cooperation with over 40 charity foundations all over Europe. In doing so, young people learn the importance of conserving resources and become aware that our environment and surroundings are their responsibility as well.

CHAPTER SEVEN

Guidelines for Successful Collaboration

7.1

Checklist for Schools: How do I find external experts?

Collaborating with external experts proves to be a valuable support for schools when it comes to communicating sustainability in a tangible and accessible way. This toolkit provides teachers with step-by-step guidance on how to find suitable partners, co-create hands-on formats and maintain successful partnerships. From defining goals to celebrating outcomes, it supports schools in turning ideas into actions.



Figure 3: Practical Toolkit (Source: Own Illustration)

7.2

Checklist for experts and NGOs: How do I work with schools?

The canvas serves as a strategic planning tool for NGOs and experts who want to collaborate with schools. It helps align sustainability initiatives with educational needs by addressing factors such as partnerships, value creation, communication channels and long-term impact. The canvas ensures that collaborations are meaningful and tailored to school realities.

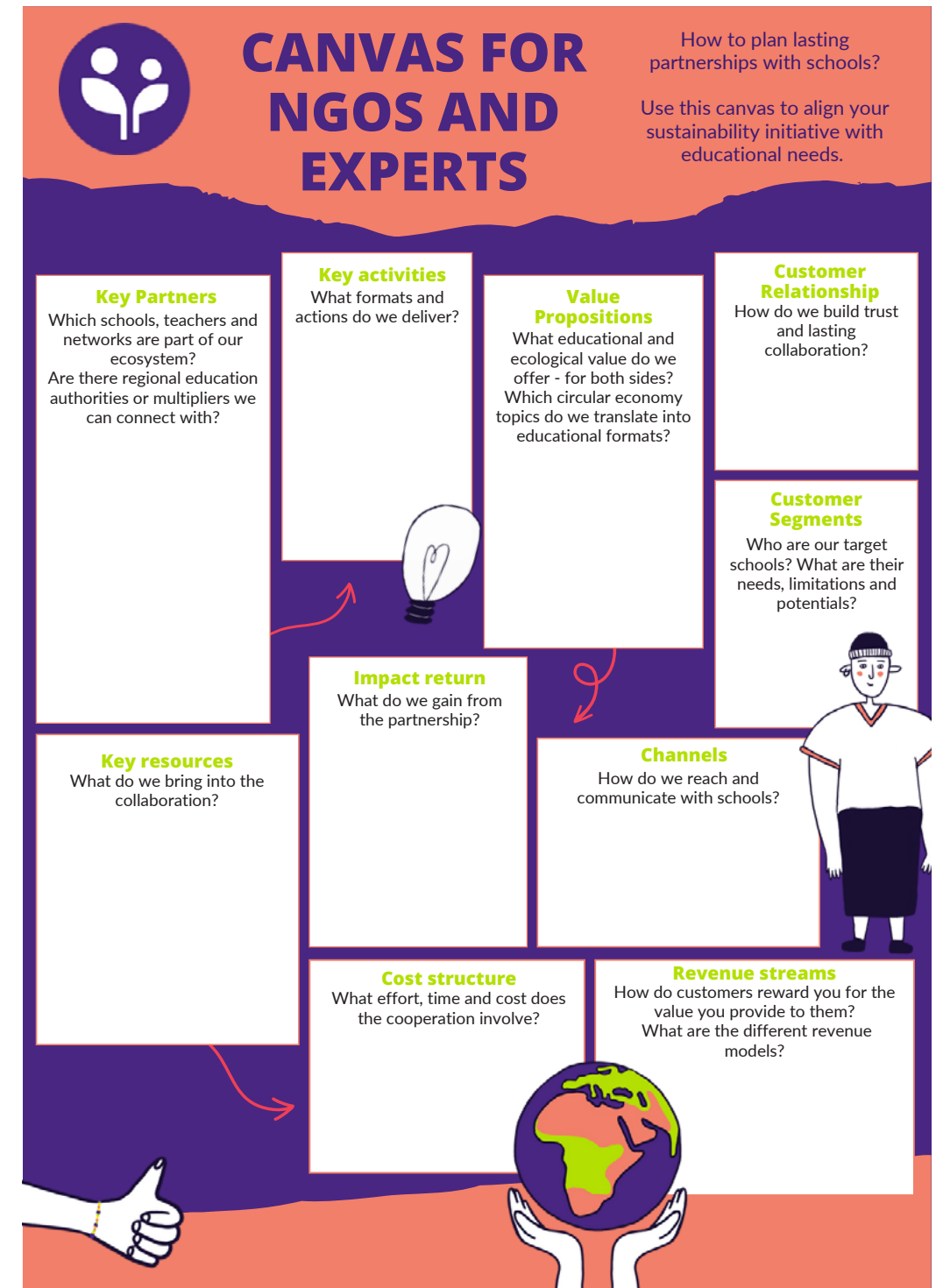


Figure 4: Circularity Project Canvas (Source: Own Illustration)

7.3

Simple Steps towards Long-Term Co-operation

The roadmap outlines key steps for building long-term cooperation between schools and external partners to promote sustainability. It emphasises accessible formats, hands-on learning, emotional engagement, critical thinking and embedding sustainability in school culture. The goal is to empower teachers and partners to make sustainability a natural and lasting part of education.

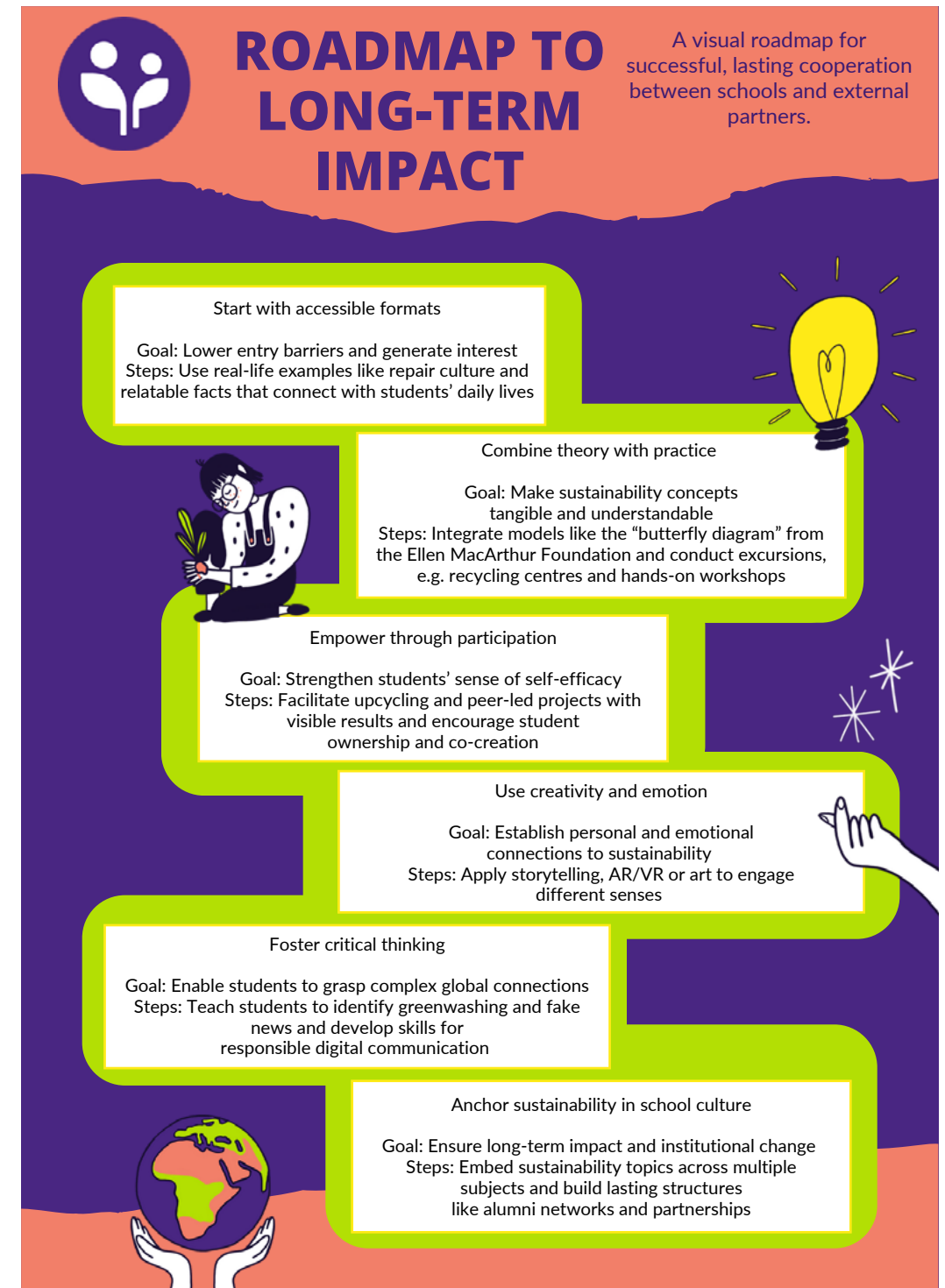
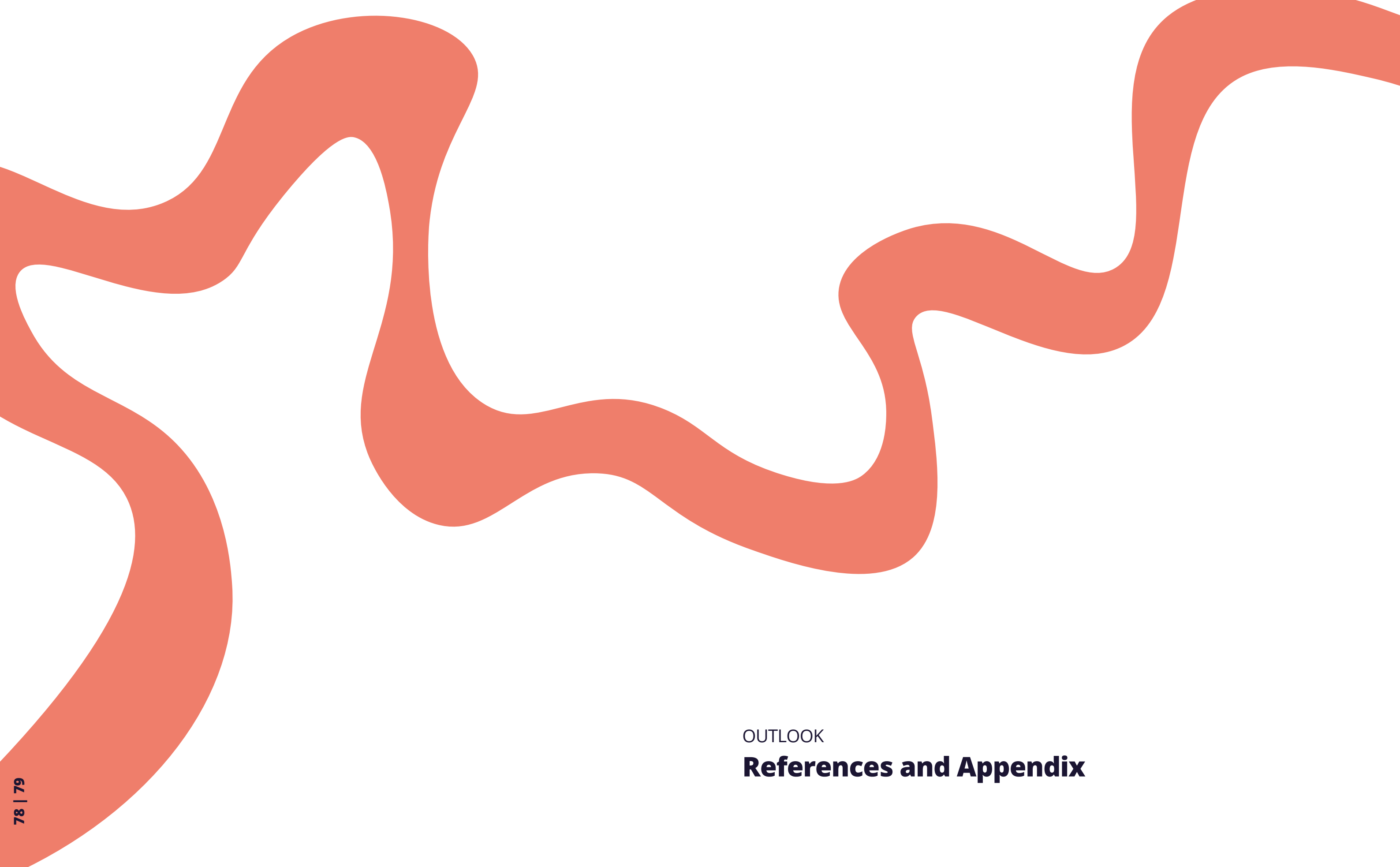


Figure 5: Roadmap to long-term Impact (Source: Own Illustration)



OUTLOOK

References and Appendix

The climate crisis calls for courageous people. If we want young people to face the future with courage and confidence, we should empower them to understand and shape the world they live in. That requires a shift in how we think about education: not as a collection of facts, but as a space to explore real-world issues, ask critical questions and create solutions. The approaches shown here can only be a first step towards the integration of circular economy and sustainability in schools. Our long-term vision is for schools to act as catalysts for a circular society.

This can only be achieved if the integration of relevant content into the curriculum becomes a matter of course. In ten years' time, the circular economy could be firmly anchored in the curriculum and schools could establish themselves as the focal point of social transformation. In order to achieve this vision, structural adjustments are needed as soon as possible. This applies in particular to school buildings, teaching materials and catering systems, which must be made more sustainable. Before, during and after these fundamental, structural transformations, further training for teachers is the key to achieving the vision.

Teachers are multipliers who reach pupils and, as role models, must not only teach change, but also live it. These changes must also resonate in the political agenda. A sustainable school can only be credibly realised if it is embedded in the larger strategic framework of political systems. Circularity only becomes meaningful to students when its relevance is visible in society. For example, extended producer responsibility, deposit systems, right to repair and taxation of primary raw materials could emphasise the necessity and urgency, as could the promotion of recycling through a clear legal framework. Political support should include financial support for sustainability projects in the education sector.

Binding requirements for circular measures must be adopted and political incentives for sustainable business practices must be created.

Care must be taken not to enforce the desired change primarily through coercion, but to emphasise intrinsic willingness. This also requires a new understanding of prosperity. If quality of life and resource conservation are the maxim that can be credibly communicated in addition to pure GDP growth, regulatory measures will be more readily accepted. In this context, schools can shape new modes of consumption and production.

Schools can tackle these huge challenges much more realistically if they actively establish partnerships for sustainable learning. Close collaboration between different stakeholders across the spectrum of schools, businesses, NGOs and academia should actively promote cooperation. This can lead to practical experience and an emotional connection to sustainability (e.g. through workshops). In addition, interdisciplinary projects such as repair workshops, upcycling challenges and design thinking processes can and should be developed. In these, open and flexible forms, young people develop solutions and scrutinise existing models. Young people should be seen as ambassadors, the initiators of change. They pass on sustainable ideas to family, friends and society. Art, culture and media are the appropriate means for long-term inspiration.

To achieve this, the digitalisation of teaching must first be caught up with and a political framework created. Digitalisation does not mean lifting analogue teaching into the digital sphere. Rather, the way in which teaching is imparted should be based on tried and tested digital media mechanisms. Complex topics should be taught in a playful and realistic way. Gamification, climate simulations and interactive apps in particular increase motivation and can incentivise students to engage with the circular economy and sustainability.

At a societal level, intergenerational dialogue should be intensified in order to promote mutual learning and joint solution development. However, the desired changes require new skills for the future. Creativity, critical thinking, technical expertise and social skills are becoming increasingly important. Understanding complex problems in our multi-layered world, where many small steps are needed to bring about major changes, is also essential. The role of schools is of particular importance here. They have a central key position in shaping a circular future and their committed, creative and responsible pupils are the primary drivers of change.

This handbook has hopefully shown you, dear readers, not only why change is needed, but how it can happen. The future is open. It is in our hands to decide its outcome.



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Appendix

List of Interviewed Partners

1

Beck, Gesa

PROFESSIONAL BACKGROUND

Positions: Professor of Environmental Process Engineering at SRH Berlin
Vice President for Sustainable Development
Director of the Institute for Applied Resource Strategies
Co-founder of AB Circular (a startup in the field of circular economy)

WORK/RESEARCH FOCUS

Environmental Process Engineering: Topics such as recycling of complex waste (e.g. electronic waste, PV systems, batteries), CO₂ capture technologies

Circular Economy: Development and optimization of recycling processes, green chemistry, and the establishment of regional, resource-efficient systems

Sustainability Assessments (ecological, economic, social), particularly in international projects (Ghana, India, South America)

2

Boye , Lara

PROFESSIONAL BACKGROUND

Entrepreneurship: Founder of “Artenglück” – an initiative or company implementing nature and species conservation projects in Germany, Austria, and Switzerland (e.g., flowering meadows, re-forestation campaigns).

Academic Background: Master’s degree in Online Communication from Hochschule Anhalt (Bernburg); already self-employed in marketing during her studies

Foundation of Artenglück: The idea for “Artenglück” emerged from the combination of her passion for nature conservation and her expertise in online communication and marketing

WORK/RESEARCH FOCUS

Nature and Species Conservation: Works closely with agriculture, forestry, and companies (e.g., corporate social responsibility, employer branding, sustainability reporting)

Communication of Sustainability: Focuses on communicating simple, accessible information about biodiversity and sustainability to encourage concrete public engagement

3

Delmaczyńska, Agata

PROFESSIONAL BACKGROUND

Organization: Green Officer – a training and consulting company in the field of sustainable development

Position: Chief Executive Officer (CEO)

Activities: Conducts workshops on circular economy, performs audits in small and medium-sized enterprises (SMEs), and provides consulting on resource savings (waste, energy, water, emissions)

4

Dvořáková, Zita

PROFESSIONAL BACKGROUND

Organization: Ekocentrum Trkmanka

Position: Director of a Public Institution, Environmental Education Specialist

Core Topics: Environmental education, raising awareness about reuse, co-llaboration with volunteers (e.g., for swap activities). Use of reusable pack-aging at public events.

5

Felski, Bartosz

PROFESSIONAL BACKGROUND

Field of Expertise: Architecture, with a focus on sustainable, climate-adapted, and cir-cular construction

Memberships & Roles: Member of the Polish Green Building Association (PLGBC), the Habitat for Humanity Advocacy Coalition, and expert in the Climate Leadership Program of UNEP/GRID-Warsaw.

6

Glomb, Martina

PROFESSIONAL BACKGROUND

Position: Professor in the Fashion Design program at Hannover University of Applied Sciences and Arts

Focus Areas: Experimental and sustainable fashion design

Entrepreneurship & Leadership: Founder and head of the “Use Less Center for Sustainable Design Strategies” at Hannover University

Previous Experience: Has collaborated with, among others, Vivienne Westwood.

7

Hriberšek, Ludvik

PROFESSIONAL BACKGROUND

Organization: Municipal Service Provider in Ormož, Slovenia

Position: Director

Core Activities: Water and wastewater infrastructure, collection and treatment of certain types of municipal waste, various commercial and public services (e.g., construction work, chimney sweeping, property management, public hygiene).

8

Kinne, Lisa

PROFESSIONAL BACKGROUND

Position: Responsible for the „Education and Learning“ department at the Cradle to Cradle NGO.

Academic Background: Background in cultural studies

Career Path: Developed an interest in sustainability during university studies; later specialized in educational work related to circular economy and Cradle to Cradle

WORK/RESEARCH FOCUS

Educational Development: Creates educational materials and workshop formats to integrate circular economy and C2C concepts into schools and other learning environments

Awareness and Knowledge Transfer: Promotes basic knowledge on resource conservation and sustainable design (e.g., starting with “Design for Circularity” rather than just waste management)

Societal Perspective: Raises awareness of the societal, political, and cultural dimensions of sustainability

9

Krawczyk, Marta

PROFESSIONAL BACKGROUND

Organization: SGS Polska Sp. z o.o.

Position: Environmental Products Development Manager

Expertise: Legislation in the fields of waste and packaging, Extended Producer Responsibility (EPR), green claims, packaging ecodesign, recycling audits, training sessions, and expert articles/publications on recyclable packaging, environmentally friendly product design, and more.

Focus: Audits and consulting in recycling and waste management, collaboration with companies, board membership in industry networks.

10

Krombholz-Zabielska, Joanna

PROFESSIONAL BACKGROUND

Position: Independent Expert (Freelance Consultant)

Business Experience: Over 20 years in financial services, business development, and service design. For the past two years, advising companies on product-as-a-service models and circular business approaches.

11

Lukasík, Adam

PROFESSIONAL BACKGROUND

Role: Teacher, Social Pedagogue

Subjects Taught: English, Geography, Natural Sciences, Health Education, Civics, Craft Education

Experience in Environmental Education: Teaching topics such as climate change, waste separation, sustainability, and recycling – partly integrated into the curriculum, partly driven by personal initiative.

12

Olborska, Magdalena

PROFESSIONAL BACKGROUND

Organization: Samsung Electronics Polska

Position: ESG Manager

13

Radomska, Monika

PROFESSIONAL BACKGROUND

Organization: EcoBean

Position: Communication and ESG Manager

Activities: Repurposing used coffee grounds as a resource for sustainable chemical production (coffee grounds were previously considered waste). Development of a technology that keeps materials, water, and energy in a closed-loop system. Minimization of additional resource use, integration of renewable energy, and optimization of logistics and transport to reduce the carbon footprint.

14

Sasin, Ewelina and Kiełsznia, Ewa

PROFESSIONAL BACKGROUND

Organization: Ewesa Impact Hub

Position: Brand and Customer Experience Agency

15

Šehič, Emil

PROFESSIONAL BACKGROUND

Organization: ZEOS (Slovenia)

Position: Director

Background: ZEOS ensures compliance with EU directives on waste electrical and electronic equipment (WEEE) and continuously expands its scope of activities (including batteries, accumulators, candle waste, etc.). As a non-profit organization, it manages WEEE compliance for producers and places strong emphasis on public outreach and educational initiatives.

16

Scherer, Lara

PROFESSIONAL BACKGROUND

Previously: Waste Management Consultant (optimization of waste streams for companies)

Currently: Independent founder of CircuCulture – offering coaching, seminars, and training on circular economy and waste management

Podcast: CircuCast – featuring career paths and practical insights into the circular economy

17

Stępień, Ada

PROFESSIONAL BACKGROUND

Company: Släppa (Startup for sustainable cleaning products)

Position: CEO / Co-Founder

Main Mission: Reducing CO₂-emissions and single-use plastic in household cleaning products (pure tablets, no water transport, glass bottles instead of single-use plastic)

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Schlimok, Christian

PROFESSIONAL BACKGROUND

Company: Founder of Novamondo (an agency for sustainable brand communication) and Novisio (an innovation consultancy focused on sustainability)

Teaching Role: Lecturer at the HWR Berlin (focus areas: Circular Economy, Design Thinking, innovation projects)

WORK/RESEARCH FOCUS

Sustainability & Circular Economy: The expert is deeply engaged with material cycles, the communication of sustainable solutions, and practical implementation in design, business consulting, and teaching

Project-Based Learning: The expert conducts (partially funded) innovation projects with students, such as makethons, hackathons, or industry-related workshops (e.g., in the theater, cultural, and events sector)

Interface Between School/University and Practice: Close cooperation with companies, NGOs, and public institutions; use of real-life case studies (e.g., sharing platforms, waste reduction)

19

Wolszczak, Katarzyna

PROFESSIONAL BACKGROUND

Organization: Akademia Zero Waste / Zero Waste Dayse / Pure Earth

Position: Sustainability Coach, Consultant, and Mentor

Expertise: Work in the fields of sustainability, ESG, DEI, generational diversity, and HR. Recognized expert in various climate and environmental programs (including in Climate Leadership created by the UNEP/GRID-Warsaw, Partnership for the Climate Warsaw, Climate Reality Project, European Climate Pact). Active as a „closed loop manager“ in projects and facilitator of Climate Fresk workshops. Conducts annual trainings for over 1,000 people.

20

Wollesen, Anja

PROFESSIONAL BACKGROUND

Position: President of the West Coast University of Applied Sciences

Academic Background: Degree in Landscape Planning (Dipl.-Ing.) from TU Berlin, with a focus on urban and regional development as well as tourism

Career Path: Worked in a newly established consulting firm following German reunification, addressing the high demand for landscape planning

Doctorate: Completed a PhD in Business Administration, shifting from a purely environmental focus to the integration of economic, ecological, and social perspectives

University Leadership: As university president, connects business administration, engineering, and sustainability

WORK/RESEARCH FOCUS

Strategic University Development: Promotes sustainability, transformation, and the 2030 Agenda as guiding principles (e.g., „Campus for Sustainable Development and Transformation“)

Tourism and Circular Economy: Focuses on resource efficiency and environmental protection in the tourism and hospitality industry (e.g., cradle-to-cradle concepts in hotel construction, food waste reduction)

21

Wybacz, Barbara

PROFESSIONAL BACKGROUND

Organization: Play Sustain Foundation

Position: Creative & PR Manager

Responsibilities: Development of educational and communication programs to promote the circular economy (textile, apparel, and fashion industry) and to enhance biodiversity (especially in urban areas).

22

Zellmer, Jacob

PROFESSIONAL BACKGROUND

School: Teacher at the Max-Taut-Schule in Berlin (a vocational school with a focus on environment and technology)

Previous Occupation: Originally trained as a mechatronics technician for refrigeration technology; worked as a technician, engineer, and project manager

Company: Founded his own company focused on energy efficiency

Teaching Career: Entered the teaching profession (teaching electrical engineering); later completed a degree in mathematics and obtained official teaching certification (has been a tenured civil servant since 2021)

WORK/RESEARCH FOCUS

Technical and Sustainability Education: Teaching in the fields of electrical engineering, refrigeration technology, and sustainability (resource conservation, climate protection, handling of refrigerants)

Practical Relevance: Combines theoretical lessons with real-life examples from energy technology (e.g., working with copper, avoiding climate-damaging refrigerants)

23

Zastawna, Martyna

PROFESSIONAL BACKGROUND

Former Organization: woshwosh

Position: Founder (former owner)

Expertise: Pioneer in circularity in Europe, Forbes Sustainability Leader, climate expert for the EIB and the UN, Mentor and lecturer.

24

PROFESSIONAL BACKGROUND

Role: Biology Teacher

Teaching Experience: Relatively new to the teaching profession

Sustainability Focus: Covers circular economy and sustainability to a limited extent (biology seminar, 3rd year). Occasionally organizes activities such as collecting unused clothing for donation.

25

PROFESSIONAL BACKGROUND

Position: Material Innovation Designer and Material Consultant

Experience: MFA in Industrial Design (Parsons School of Design, Fulbright Scholarship); professional experience in Germany, Denmark, China, and the USA (e.g., Silicon Valley: medical and technology industries)

Currently: Leading workshops (New Materials Masterclass for Girls Future Ready Foundation), guest lecturer at Zhengzhou University of Aeronautics (teaching materials and structural theory), with a focus on material innovation as a key to a sustainable future.

26

PROFESSIONAL BACKGROUND

Role: Teacher of Geography and Physical Education at a combined primary and secondary school, including science lessons for 7th grade (primary level) and 3rd year (secondary level).

Focus: Introduction of a new course, Seminar on Sustainable Future, in cooperation with VŠB – Technical University of Ostrava, focusing on waste management and circular economy.



Appendix

List of Case Studies

EcoBean

- 1. Coffee waste processing:** EcoBean has developed a technology to fully value coffee waste, transforming it into chemical raw materials with a low carbon footprint, such as coffee oil, antioxidants, lignin, polylactide (PLA) and protein additives. This process eliminates waste and supports the creation of new products.
- 2. Collaboration with partners:** EcoBean focuses on international cooperation with market leaders in both the coffee and ingredients industries, transforming how waste is managed and raw materials are utilized—all without exploiting natural resources.
- 3. EcoBean's first biorefinery:** The company is preparing to build a cutting-edge technology center designed to operate at market scale. This facility will advance the development of products derived from coffee waste, unlocking its full potential and pushing the boundaries of sustainable innovation.
- 4. Education and promotion of the circular economy:** EcoBean is committed to educating partners and customers about the benefits of the circular economy, demonstrating that sustainability can be both green and profitable.

woshwosh

- 1. Shoes cleaning and repair:** the core business of woshwosh is based on cleaning, disinfecting and repairing footwear and clothing. Since 2015, woshwosh has given a second life to nearly 550,000 pairs of shoes, saving: more than 7 million kg of CO2 and more than 4 trillion liters of water.
- 2. Shoes and clothing donations:** woshwosh supports second life of clothes and shoes, as well as charitable activities. Since 2018 it has organized shoe and clothing collections for people in need in cooperation with more than 40 foundations across Europe, as well as with companies.
- 3. Workshops and education:** woshwosh conducts training and workshops on shoe cleaning and care, circularity, sustainable fashion, circular economy.
- 4. Support of ESG activities:** woshwosh declares to its partners that the offered services are in line with sustainability reporting.

Skanska

Skanska has three companies operating in Poland. The practices indicated below are executed either by all of them or part of them, depending on the practice.

- 1. Implementing modern, sustainable construction solutions in Skanska investments, such as:**
 - air-purifying concrete (used for sidewalks in office construction projects) or low-emission concrete (used in Central and Eastern Europe);
 - LED lighting, chilled beams, photovoltaic panels, heat recovery, ventilation with recuperation;
 - the electricity consumption of many of the Skanska’s buildings is 100% covered by renewable energy under the declaration of origin.
- 2. Materials, waste management and a circular economy:** Waste generated in the construction process is closely monitored and reduced. Globally at Skanska, in 2022, 72% of waste was recycled, 8% was prepared for reuse, and 13% was disposed of in other ways.
- 3. Certification:** Skanska is increasing the number of green buildings and LEED, BREAAAM and WELL-certified buildings in the US, Scandinavia, the UK and Europe, both at new facilities and buildings it is renovating. However, Skanska is focusing mostly on BREAAAM and LEED certification in Poland.
- 4. Sustainability reporting:** Skanska has been publishing environmental impact reports since 1997. Starting in 2019, reporting in this area is carried out in conjunction with the company’s annual reporting. This provides greater transparency and allows to observe the company’s progress in sustainability.

Rebread

- 1. Transforming bread into food products:** The company converts unsold bread into raw materials that can be used in new baked goods (e.g. breads, cookies or low-calorie snacks). Surplus or bread side streams, when properly milled and dried, can replace between 10% and 50% of traditional flour in new bakery products. They can also be used as a fermentation base for filamentous fungi and become a functional ingredient for plant-based foods.
- 2. Production of fermented beverages:** Rebread has developed technologies to use left-over bread to produce fermented beverages. Such beverages provide an additional source of revenue for bread producers, while promoting a closed-loop economy (up-cycling).
- 3. Creating bread-based cosmetics:** Rebread has developed innovative cosmetic concepts using surplus bread. They aim to reduce food waste as well as promote local upcycled ingredients for the cosmetic industry.
- 4. Services instead of products:** The company mainly shares its knowledge and technologies by offering advice and licences to bakeries, retailers and FMCG producers, enabling local players to implement circular economy practices into their own production. Rebread uses its microproduction capacity as examples (Proof of Concepts) of bread valorisation possibilities for B2B2C companies.

