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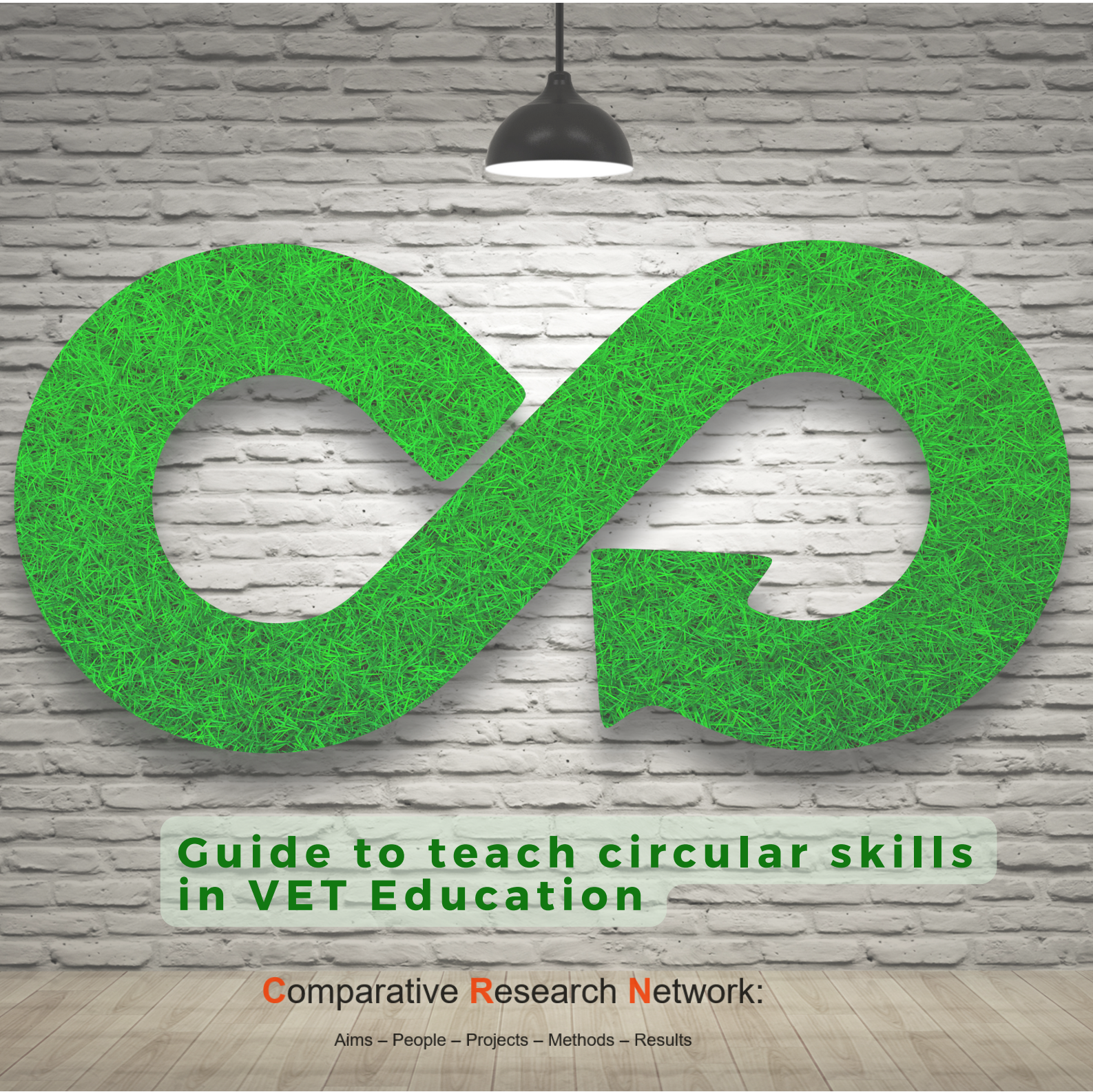
CIRCULAR SKILLS



Guide to teach circular skills in VET Education

Comparative Research Network:

Aims – People – Projects – Methods – Results

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CIRCULAR ECONOMY IN VET

REPORT

1. CONCEPTS OF CIRCULAR ECONOMY

All partner organizations participating in the Circular Skills project are actively involved in education about Circular Economy. Our activities include promoting good practices and solutions among stakeholders, preparing and implementing, in particular, educational and animation activities based on intersectoral and transnational cooperation.

Circular Economy has the intention to overcome the current production and consumption model (linear economy model) based on continuous growth and increasing resource throughput, which is based on the following sequence: production – use – waste disposal. Applying Circular Economy requires a systemic transformation from the linear to circular economy, particularly in how products and services are designed, produced, and consumed.

The European Union proposed to understand Circular Economy as an economy "where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized". Kirchherr, Reike, Hekkert recognize Circular Economy "as an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers".

The Circular Economy concept responds to the challenges of the environment's preservation and constitutes a new paradigm, which can contribute to tackling climate change and therefore meeting some of the Sustainable Development Goals. It can be viewed as an operationalization for organizations to implement the concept of sustainable development (it seems to be, to some extent, a necessary condition for modern sustainable development).

Organizations are to play a broader role in the value chain within Circular Economy to ensure the longest preservation of added value of products (their usability), elimination of waste and increase of energy and material efficiency. They should develop competences aimed at:

- minimizing the use of products and materials maintaining value as long as possible (preserving) – narrowing the loop,
- maintaining products and materials at their highest utility (optimizing) – slowing the loop,
- using a product again (when it reaches the end of its life), creating further value (fostering effectiveness) – closing the loop.

Circular Economy assumes reduction the consumption of raw materials (the energy needed to extract them), the amount of waste deposited and increase the waste stream used for recovery and recycling (waste – If produced – should be treated as secondary raw materials in the sequence: production – utilization – waste utilization in the next production cycle).

More and more organizations have developed alternative business practices; however, the majority of them are not active participants in such activities, partly due to lack of knowledge and understanding of the Circular Economy concept and because it represents a change of practices. Discussions around business models are necessary as circular business models are the core of Circular Economy and "the driving force in the shift towards circular economy".

Social Economy (SE) in Europe is over 10% of GDP and grows systematically in the EU. We perceive Social Economy to play crucial role in future transition from linear to circular economy. Most of SE entities use assumptions of Circular Economy as the key principle in their activities. They successfully combine business activities with social and solidarity aims taking into consideration Circular Economy knowledge dissemination and education in communities. The partnership of the Circular Skills project is committed to support their activities in the field of Circular Economy.

Circular Economy is the key principle embedded into Social and Solidarity Economy assumptions. Circular Economy needs cooperation instead of competition, based on formal and non-formal multisectoral local partnerships between local government and their entities, enterprises, social enterprises, NGOs, and other members of local communities. Growing impact of Social Economy in EU and their activities in Circular Economy should be studied and disseminated in the future. There is still a lot of work to be done in societies to change their behavior and perceive the importance of the circular economy.

2. SITUATION IN THE EUROPEAN UNION

The circular economy is considered as a complex issue and its statistical analysis requires a comprehensive approach using aggregated multi-criteria measures based on areas of CE activity. The assessment of the CE phenomenon is limited by the availability of indicators describing the CE (which do not reflect all CE areas) and the introduction of a framework of indicators that quantify progress towards a more circular economy is a challenge.

A multidimensional comparative analysis of the EU member countries was carried out by E. Mazur-Wierzbicka. She took into account 13 indicators assigned to CE areas and created the synthetic measure IDCE (index of development of circular economy) using zero unitarisation method. The study proposed the ranking of EU countries based on their level of the CE development.

The analysis shows differentiated levels of advancement of countries towards CE which result, among others, from differences in social and economic development (which is mostly noticeable between the EU-15 and the EU-13 countries):

- EU-15 countries were the most advanced in their pursuit towards CE, especially Germany, Belgium, The Netherlands, but also Spain, France, Italy and the United Kingdom. They had undertaken activities towards the CE idea (development strategies concerning CE transitions, institutional solutions implementation) even before the European Commission proposed them.
- Central and Eastern Europe countries must improve their macroeconomic CE indicators, which require active changes in their environmental policy frameworks. Their activities may reduce disparities in the CE implementation between the countries of CEE and Western Europe.

Detailed data with the ranking of countries using IDCE (index of development of circular economy) for selected years (2010, 2014 i 2018) are given in Table 1.

Table 1. The ranking of countries based on IDCE

Country \ Ranking	2010	2014	2018
Germany	1	1	1
Netherlands	2	2	2
Spain	9	7	3
Austria	5	4	4
Belgium	10	9	5
Italy	4	5	6
Lithuania	18	16	7
Sweden	6	8	8
France	3	3	9
Slovenia	13	12	10
Luxembourg	8	10	11
Portugal	16	15	12
United Kingdom	7	6	13
Denmark	21	11	14
Poland	11	14	15
Hungary	17	19	16
Finland	14	17	17
Czechia	12	13	18
Slovakia	19	20	19
Bulgaria	22	22	20
Latvia	24	23	21
Estonia	23	27	22
Romania	20	24	23
Croatia	28	21	24
Malta	27	25	25
Greece	25	28	26
Ireland	15	18	27
Cyprus	26	26	28

Note: The order of countries was based on the ranking in 2018.
Source: Mazur-Wierzbicka, E. (2021). *Towards Circular Economy – A Comparative Analysis of the Countries of the European Union*, Resources, 10, 5.

Recent years, CE principles have more and more impact on EU countries' strategic directions and many EU countries have taken strategic activities to support the principles of the circular economy. National CE documents differ in scope and complexity. It is worth noting that the vast majority of their goals relate to waste management (recycling and reuse of materials), which is one of the main environmental problems in Europe.

From the company's perspective, it's worth looking at the Eurobarometer survey carried out in September 2017, in the 28 EU countries and based on a sample of 13,117 SMEs operating in manufacturing, retail, industry, and services referred to resource-efficiency practices already undertaken or planned for the subsequent two years.

EU companies were classified based on the Eurobarometer survey by the number of resource-efficiency practices (many, some, few, no). The percentage of companies undertaking the examined resource-efficiency actions varies between countries: Ireland, France, the United Kingdom, Portugal, Sweden and Spain showed a high proportion (above 70%) of SMEs implementing many or some resource-efficiency actions; on the opposite side (with 40% or less) were Republic of The Republic of Cyprus, Bulgaria, Lithuania, Romania, and Estonia.

Table 2. CE actions undertaken by companies in EU countries

Country	Many or Some	Few or No
Ireland	81,4	18,6
France	79	21
United Kingdom	78,5	21,5
Portugal	77,1	22,9
Sweden	76,7	23,3
Spain	72,3	27,6
Austria	70,1	29,9
Belgium	69,5	30,6
The Netherlands	67,5	32,5
Germany	66,7	33,3
Croatia	65,5	34,5
Czech Republic	65,2	34,7
Italy	58,9	41,2
Malta	57,1	42,8
Denmark	56,8	43,2
Poland	56,1	44
Luxemburg	55	45
Slovenia	53,4	46,6
Finland	52,3	47,8
Slovakia	49,5	50,4
Latvia	49,1	50,9
Greece	45	55
Hungary	43,9	56,2
Republic of Cyprus	37	62,9
Bulgaria	32,6	67,4
Lithuania	29,4	70,5
Romania	26,2	73,8
Estonia	8,8	91,1

Source: Bassi F., Guidolin M. (2021). *Resource Efficiency and Circular Economy in European SMEs: Investigating the Role of Green Jobs and Skills*, Sustainability, MDPI, 13, 21.

We observe the need for additional environmental skills - a significant number of companies in EU countries declared the need for environmental expertise in order to improve resource efficiency, especially in France (33,7%), Spain (31,6%), Poland (27,7%), Ireland (24%), Greece (22,9%), Czech Republic (21,8%).

SITUATION IN FINLAND

Finland has a history of developing circular solutions, even before the phrase "circular economy" was common. On the consumer side, a deposit scheme helped push the recycling of beverage containers to near 100%. On the industrial side, companies strove to increase efficiency to succeed in global competition. The lack of fossil fuel deposits in Finland has also pushed society towards circular solutions, including developing renewable energy production and utilising waste streams as sources of energy.

The circular economy is expected to add about 3 billion euros to Finland's national economy in added value potential by 2030, according to Sitra.

Finland is ranked 14th in the world for the number of patents issued related to recycling and secondary raw materials, one of the key circular economy indicators tracked by the EU.

The Finnish people are conscientious about minimising waste. Eurostat says Finns waste 7.4% of their domestic material consumption, excluding major mineral waste. The EU average is 12.8%.

Finland recycles 49.2% of its electronic waste, compared to an EU average of 34.8%, according to Eurostat.

SITUATION IN GERMANY

During the last 50 years, in Germany, the notion of a circular economy is closely associated with the idea of a well-functioning waste management system. Society got used to having a reliable waste collection just outside the door and treatment system in place.

During the past decades, separate waste collection and ever more sophisticated sorting and treatment plants paved the way for a world-leading recycling economy that considers waste as a resource and seeks to complete material cycles. All this was achieved while giving priority to the safe elimination of pollutants, thus minimising risks to humans and the environment. This evolution is reflected in the names of the relevant legislatory acts. The Abfallbeseitigungsgesetz (Waste Disposal Act, 1972) was followed by the Abfallgesetz (Waste Management Act, 1986), then the Kreislaufwirtschafts- und Abfallgesetz (Circular Economy and Waste Management Act, 1996), which was finally replaced in 2012 by the Kreislaufwirtschaftsgesetz KrWG (Circular Economy Act).

Germany's waste management industry has made "prevention, then recovery, then disposal" its guiding principle. This means that the first step is to prevent waste as far as possible, then any residual substances arising should be comprehensively recycled at the level of materials or energy, and finally the remaining residues should be disposed of in a manner "commensurate with the public good". The most up to date reform of the legislation – adopted by the Federal Cabinet on 12 February 2020 – Kreislaufwirtschaftsgesetz KrWG.

In this update, EU directives such as the Packaging Directive, the Waste Electrical and Electronic Equipment (WEEE) Directive, the Batteries Directive, the End-of-Life Vehicles Directive and the Landfill Directive must be adopted by Germany.

A key indicator when discussing circularity concerns waste. At first sight, Germany's Circular Economy peformance looks promising in this regard. In 2018, the recovey ate of municipal waste amounted to 98 percent. At a closer look, however, only 67 percent of waste actually gets recycled. The rest is processed through energy recovey. Input indicators reveal a similar picture. In 2019, only 10 percent of production materials in Germany consisted of recovered resources. With a current annual circularity growth ate of 0.1 percent, Germany will reach a 50 percent circularity as late as 2215. Taking all these fact into account, the pace of the transition needs to be accelerated in order to reverse the dangerous trend of consuming even more resources.

With the coalition agreement of the new Federal Government, the decision was presented to develop an overarching, national Circular Economy strategy for Germany. Important political instruments that specifically support the transition to a Circular Economy already exist. These include national programs on resource efficiency, waste prevention and sustainable consumption as well as the raw materials strategy. These must now be bundled and further developed.

SITUATION IN ITALY

The latest report published by Circular Economy Network and Enea, relating to 2019, sees Italy as the first nation in Europe for circularity index, or the value attributed according to the degree of efficient use of resources in five categories: production, consumption, waste management, second commodity market, investment and employment.

The start of a transition to the circular economy represents a strategic input of great importance with the transition from a "necessity" (the efficiency in the use of resources, the rational management of waste) to an "opportunity" or to design products in such a way as to use what is now destined to be waste as a resource for a new production cycle.

Italy, a country technologically advanced and always accustomed to compete thanks to innovation and sustainability, must necessarily move in a European vision of transition to a circular economy, take advantage of opportunities and be a promoter of concrete initiatives.

From an economic point of view, focusing on the circular economy therefore means stimulating the creativity of the Italian entrepreneurial system as a function of the economic enhancement of the reuse of materials: the material never becomes waste. Investing in research and development by creating a system represents a concrete possibility for our SMEs, especially manufacturing, to rethink and modify their production model to consolidate their presence in global value chains.

SITUATION IN POLAND

Poland is the third largest consumer of materials among the EU members, and the material efficiency in our country is 3.5 times lower than in the European Union (due to the high share and low added value of industry in the economy). Poland's economy is more than twice as energy-intensive as the EU average.

Electricity and heat are primarily generated in Poland through combustion of hard coal and lignite, which together accounted for close to 80% of domestic production (coal is the basis for energy generation in Poland).

The total mass of waste generated in Poland was close to 160 million tonnes and waste generated per capita was 4.1 tonnes, i.e. nearly 14% less than the EU average. In 2018, 73% of all waste generated in Poland was recovered (including energy recovery) and backfilled, while 27% was landfilled.

In 2018, Poland's greenhouse gas emissions amounted to 376 million tonnes of carbon dioxide equivalent, representing nearly 11% of total EU emissions – Poland ranked fifth among the EU states (after Germany, France, the UK and Italy). Calculated per capita, Poland's greenhouse gas emissions are more than 25% above the EU average. According to the World Health Organization, Poland is the infamous no. 1 on the list of the 50 most polluted cities in Europe.

SITUATION IN SLOVAKIA

On April 14th 2018 the Slovak Parliament passed the law nmb.112/2018 on the Institutions of the Social Economy. The Law nmb. 112/2018 - already well adapted European social economy approach - gained impressive respond from the Slovak society, immediately. On September 2020 the number of registered social enterprises (SE) in SK reached more than 200. The waste majority of them are called INTEGRATIVE SE with its sharp focus on social and work integration being established by municipalities for its marginalized citizens´ integratio

SITUATION IN SWEDEN

In April 2018, the Swedish government decided to set up a delegation for the circular economy. The delegation is supporting the work to transform Sweden into a circular economy.

Sweden is 3.4% circular, leaving a Circularity Gap of more than 96%. This 'Gap' simply means that the vast majority of resources Sweden uses to satisfy its needs and wants come from virgin sources. The Circularity Gap is composed of a range of elements: many materials (40%) are added to stock in the form of buildings and infrastructure, while around 36% of materials are represented by biomass with the potential for cycling, such as wood products and food crops.

According to the Circular Economy Outlook Report, "The experts are positive about the overall progress towards circularity. They recognize that knowledge is growing but at a slow pace. Businesses appear hesitant to adopt circular models because of high initial costs and uncertain returns. Several experts view the efficiency of the current linear system, which has been improved and optimized for decades, as a big challenge for advancements within the circular economy. The incentives for circular transitions are simply not big enough, and the experts stress the need for bold policy measures to stimulate industry action. This includes reduced social fees for circular businesses and an increased tax on primary raw material. The study on Large Cap-companies reveals mixed but mainly positive results. Although the sample size was rather small (35 companies), the study can provide useful insights. Two-thirds (66 percent) of the companies respond that circularity is included in their strategy. 50 percent are currently engaged in industrial symbiosis-projects focusing on material flows and 57 percent state that they have developed circular business models, or are about to do so. However, practical knowledge of circular business models appears to be lacking.

The respondents list technical barriers for material recycling and limited access to recycled materials as two main challenges for increased circularity. According to the researchers, advancements in circular activities have been slower than expected. Sweden is however in a quite good position to lead the transition. The fact that many companies are levelling up ambitions on circularity is positive, but comprehensive transformation strategies are still missing. Collaboration between academia, industry and the civil society needs to improve. The research community can contribute by making their findings more accessible to the business and innovation domain. The researchers also call for upgraded standardizations and manuals on how to implement circularity within industry and for political action that incentivizes circular system over linear ones. The shift towards a circular economy is speeding up. Technological and digital advancements combined with the changing mindsets of both industry leaders and policy-makers is pushing circularity forward. What we need now is a game-changer."

3. CE DOCUMENTS IN EU COUNTRIES

The EU's main role is seen as providing a political framework that provides better integration between related policy areas and adaptation of the EU financial mechanisms to support activities in the circular economy[1]. The European Commission promotes CE-related activities and underlines a positive impact of the CE systems' implementation in the field of resource efficiency and economic benefits for the EU countries[2]. These activities are a very important factor encouraging member countries to intensify their efforts to improve their policy frameworks (by national strategies / action plans etc.).

Countries adopting such documents early have quite extensive policy framework with mutually strengthening CE initiatives[3]. On the other hand, countries that have started to introduce CE solutions in recent years still need more time to be capable of CE transitioning. Finland stands out among the countries, which have intensified its activities since the beginning of the first decade of the 21st century to implement the principles of the circular economy.

FINNISH ROADMAP TO A CIRCULAR ECONOMY 2016-2025

Finland stands out among the countries, which have intensified its activities since the beginning of the first decade of the 21st century to implement the principles of the circular economy.

The world's first national roadmap to a circular economy was published in Helsinki in autumn 2016 (Finnish road map to a circular economy 2016-2025). The road map created under Sitra's lead set out the starting position for Finland in the promotion of a circular economy. The target set in the first Finnish road map to a circular economy was to make Finland a global leader in the circular economy by 2025. The goal was to be reached by promoting the interests of three fields: the economy, society and the environment.

Sitra, the Finnish innovation fund has recognised the importance of education in creating a new circular economy society. They highlight the necessity for creating a 'new kind of expertise' and facilitating collaboration between silos, with the aim of changing attitudes and methods of operation.

The need for education initiatives to study the circular economy led to the development of study packages and communication materials (in a series of projects for circular economy education in 2017-2019) for primary, upper secondary and vocational schools[3]. Sitra has produced free teaching and studying materials on circular economy and circularity for all levels of education. They co-operated with all levels of education to ensure that circular economy thinking reached as many Finns as possible.

Core tasks of the Finnish National Agency for Education (EDUFI) are to develop education and training, early childhood education and lifelong learning and to promote internationalization in Finland. EDUFI has gathered links for materials and courses to support teaching and learning about climate and environmental education and circular economy. All these materials are free to use.

GERMAN ROADMAP ON CIRCULAR ECONOMY AND VET

Circular Economy Initiative Deutschland in cooperation with experts from industry, science and civil society had developed a Circular Economy Roadmap for Germany. The roadmap is based on 10 key action points:

1. Circular business models: The objective should be to develop and scale data-driven use- and results-oriented service business models based on circular strategies, in line with the narrative envisaged in the European Green Deal.
2. Standardization: Policy makers need to define key Circular Economy objectives, for which businesses can work on corresponding norms and standards within established national and international committees.
3. Transparency: Policy makers need to develop measures which make Circular Economy-relevant information (Such as the raw materials contained in a product and their origin and environmental footprints, proportion of recycled material, corresponding repair instructions etc.) available to all relevant stakeholders.
4. Regulatory instruments: Policy makers both on a national level and at European Union level should define a coherent product policy framework for the Circular Economy, to enable product value retention.
5. Economic incentives: Policy makers at both national and European Union level need to set financial incentives in such a way as to encourage climate- and resource-optimal business decision-making.
6. Infrastructure for reuse, continued use and recycling: Policy makers and business need to accelerate the expansion and development of infrastructure for reuse, continued use and recycling.

7. Technical development and research: Policy makers, businesses and academia need to promote technology-neutral development of relevant material, product and process innovations with an environmental benefit, digital technologies for producing transparency and methods and tools for implementing the Circular Economy.

8. Public procurement: Policy makers need to boost demand for circular products and business models by setting strategic objectives and binding targets for used, remanufactured and recycled products in public procurement.

9. Institutional embedding: Policy makers need to provide a central institutional body with the aim of ensuring Germany's transformation to a Circular Economy, support and align the activities of political, economic and civil society stakeholders and, facilitate knowledge sharing.

10. Education and knowledge transfer: Policy makers, businesses and academia must provide - Circular Economy-relevant education and training to raise public awareness of the Circular Economy and develop skills.

ITALIAN CIRCULAR ECONOMY PACKAGE

In September 2020 Italy implemented the directives of the "Circular Economy Package" with the publication of the following legislative decrees:

- Legislative Decree 3 September 2020, n. 116, on "Implementation of directive (EU) 2018/851 amending directive 2008/98 / EC on waste and implementation of directive (EU) 2018/852 amending directive 1994/62 / EC on packaging and packaging waste ", Published in the Official Journal of 11 September.
- Legislative Decree 3 September 2020, n. 118, on "Implementation of articles 2 and 3 of directive (EU) 2018/849, amending directives 2006/66 / EC relating to batteries and accumulators and waste batteries and accumulators and 2012/19 / EU on waste equipment electrical and electronic ", published in the Official Journal of 12 September; Legislative Decree 3 September 2020, n. 119, on "Implementation of Article 1 of Directive (EU) 2018/849, amending Directive 2000/53 / EC on end-of-life vehicles", published in the Official Gazette of 12 September.
- Legislative Decree 3 September 2020, n. 119, on "Implementation of Article 1 of Directive (EU) 2018/849, amending Directive 2000/53 / EC on end-of-life vehicles", published in the Official Gazette of 12 September.
- Legislative Decree 3 September 2020, n. 121, on "Implementation of Directive (EU) 2018/850, amending Directive 1999/31 / EC on waste landfills", published in the Official Gazette. of 14 September.

These decrees discipline:

- Introduction of a "National Program for waste management".
- Reform of the regulations relating to extended producer responsibility, which provides for the innovation of the specification of the costs that make up the environmental contribution and the minimum requirements of EPR systems.
- Modification of the definition of urban waste, which, in fact, involves the overcoming of the concept of "assimilation".
- Reform of the waste traceability system with the definitive overcoming of the Sistri model and the simplification of the system for the benefit of usability and control activities.
- Introduction of qualitative and quantitative elements in collection and recycling, in relation to the new community objectives.

The medium-long term strategy is to involve enterprises in creating products with new materials, which are entirely reusable and therefore do not generate waste (eco design and innovation of production processes), while the short and medium term one is to manage the waste produced. more responsibly, through reuse and recycling.

In line with the reference framework illustrated, the national strategy for the circular economy must fill the structural gaps that hinder the development of the sector and implement a multi-year economic planning that allows for the consolidation of the many strengths that characterize the national production fabric. Structural gaps are mainly related to plant deficiencies (absence of certain types of treatment, recovery and recycling plants in the Center-South of Italy), to the need for adaptation and modernization of existing plants in order to increase their yield and minimize waste, infrastructures dedicated to separate collection which must be able to guarantee a better quality of the supply chains deriving from collection in order to achieve the Community recycling objectives.

In general, on the environmental issue, the Ministry of Education has already acknowledged for some time the requests that the international community has expressed through the DESS, the "Decade of Education for Sustainable Development" and the world campaign promoted by the UN, through Unesco.

The school's task in education to safeguard the planet's resources consists in identifying the fundamental points of reflection in order to be able to develop a set of training contents that constitute a new "ethics of responsibility". Education for sustainability is necessary as training for young people, called to face environmental problems that are assumed to be increasingly pressing for the near future. The school plays a fundamental role in creating a new mentality, suitable for maintaining citizenship behaviors that have positive prospects and repercussions in the future. It is also through the growth of the person in the values of legality that the young people who will be the citizens of tomorrow are formed in the present. The educational activity aims to build "awareness and responsibility on environmental issues, stimulating the sensitivity of children and teenagers to the point of making them protagonists of experiences in direct contact with nature".

POLISH ROADMAP ON CIRCULAR ECONOMY

The Roadmap includes objectives to reduce raw materials use and waste production, to increase reuse, repair and sharing, and to become fully circular in 2050. It mentioned that:

- There is a strong need for education oriented towards changing consumer behavior by raising their environmental awareness and increasing their knowledge of their rights to access product and manufacturer information.
- In the age of "lifelong learning", educational activities should be diverse and aimed at all social and age groups.
- Awareness-raising of future consumers should start as early as at the level of primary and general education. It is important that this knowledge is practical and reflects market trends,
- It is necessary to launch social campaigns in order to disseminate practical knowledge on sustainable consumption among adults. Changing mindsets and consumer habits will ultimately put pressure on producers).

Actions related to VET in The Polish Circular Economy Roadmap include:

- Developing the concept of a government information platform on CE: The platform will enable the exchange of information between the government administration, business and local governments. The platform should contain CE guidelines, information about incentives for entrepreneurs and current support programmes, as well as educational brochures.
- Social campaign on sustainable consumption patterns: The aim of the campaign is to popularise sustainable consumption patterns (for example, sharing, waste management, food storage, purchasing functions instead of ownership of products, etc.) among all groups of the society.

SLOVAKIAN ROADMAP ON CIRCULAR ECONOMY AND VET

Political pressures from EU - national, regional and local development programs are articulating CE, GREEN DEAL transition as top priority for EU Fin-Framework 2021-2027.

The VET landscape, environment in Slovakia is firmly embedded in traditional top-down approach articulated and fixed in dozens of landscape stakeholders which do understand the urgent need of rapid shift in skills demand and new challenges in labor trade. However, the real change is coming from bottom-up, from national first runners, organizations/countries/projects/programs/BATs (NARA-SK, ngos..., community leaders, public awareness campaigns).

This educational approach is extremely diversified, non-methodological, intuitive, based on enlightened leaders.

Implementation of such diverse and paradigm topic as circular economy and circularity makes certainly some confusion in theoretical discussions, negotiation, and administration among existed stakeholders.

SWEDISH ROADMAP ON CIRCULAR ECONOMY AND VET

On the 9th of July 2020 the Swedish Government has published the new national circular economy strategy that points out the direction and ambition for a long-term and sustainable transition of society. This is an important part for Sweden to become the world's first fossil-free welfare country (https://tinyurl.com/x7wt3xsx).

At the heart of the strategy there is a vision: "A society where resources are used effectively in non-toxic circular flows and replace virgin materials". The transition to a circular economy must be implemented jointly by policy, industry, the public sector, academia, individuals and civil society.

The strategy sets out four focus areas in which measures are necessary:

- A circular economy through sustainable production and product design.
- A circular economy through sustainable ways of consuming and using materials, products and services.
- A circular economy through toxin-free and circular ecocycles.
- A circular economy as a driving force for the business sector and other actors through measures to promote innovation and circular business models.

Each focus area contains a series of more concrete measures to aim for. Those include:

- Steering towards a situation in which products are designed to have a long lifespan.
- Promoting greater use of toxin-free recycled materials in new products.
- Strengthening the innovation and business climate so that more circular companies can grow.
- Promoting the development of Sweden's bioeconomy so that bio-based, renewable and sustainably produced raw materials can replace fossil-based raw materials in products and production processes.
- Improving consumer information to make it easier for individual consumers to make sustainable and circular choices in their everyday lives.
- Making it simple and profitable for business operators and private individuals to share, repair and re-use products.

- Contributing to resource efficiency, recycling and circular business models through public procurement.
- Designing policy instruments that contribute to greater supply of and demand for circular products and services, and re-used and recycled materials.
- Setting the requirement that both recycled and new materials are toxin-free; and
- Promoting research, innovation and technological development in the areas of recycling, digitalisation and traceability.

Virgin materials must be replaced as far as possible by resources used efficiently in circular flows. Consideration must be given to the need for virgin materials to enable the climate transition and recycling. The strategy describes what materials will be prioritised in national action on the circular economy. All of these must be better used and taken care of than is the case today: plastic, textiles, renewable and biobased raw materials, foodstuffs, materials in the construction and property sector, and metals and minerals critical to innovation.

In January 2022 the Government has released the action plan for the transition to a circular economy, establishing a road map with 6 different milestones:

1. Reduction of emissions of greenhouse gases:
    a. greenhouse gas emissions in Sweden in the ESR sector (which mainly includes transport and agriculture) should be at least 63% lower by 2030 than emissions in 1990. No more than eight percentage points of the emission reductions may be achieved through additional measures.
    b. Greenhouse gas emissions in Sweden in the ESR sector should be at least 75% lower by 2040 than in 1990. No more than two percentage points of the emission reductions may be achieved through additional measures.
    c. By 2045 at the latest, Sweden must have no net emissions of greenhouse gases into the atmosphere, in order to achieve negative emissions thereafter. To achieve net zero emissions, additional measures may be credited. Emissions from activities within Swedish territory shall be at least 85 per cent lower than in 1990.
    d. Greenhouse gas emissions from domestic transport (excluding domestic aviation included in the EU Emissions Trading Scheme, EU ETS) shall be reduced by at least70 per cent by 2030 compared to 2010.
2. Recycling of packages
    a. Of the packaging placed on the market in Sweden for the first time, the proportion of reusable packaging must increase by at least 20 per cent from 2022 to 2026 and by at least 30% from 2022 to 2030.
3. Reduction for food waste
    a. Food waste will be reduced so that the total food waste by at least 20% by weight per capita between 2020 and 2025.
    b. An increased share of food production will reach retailers and consumers by 2025.

4. Reduction of municipal waste: by 2025, preparation for re-use and recycling of municipal waste increased to at least 55% by weight, by 2030 at least 60% by weight and by 2035 to at least 65% by weight.

5. Construction and demolition waste: Preparation for reuse, recycling and other recovery of non-hazardous construction and demolition waste, excluding soil and stones, shall be at least 70 % by weight annually until 2025.

6. Food scraps: By 2023, at least 75% of food waste from households, commercial kitchens, shops and restaurants are sorted and treated biologically to produce plant nutrients and biogas.

4. CE EDUCATION – NEEDS

The change from linear to circular system of production and consumption won't just happen and we can accelerate processes of understanding of thought and gathering skilling by effective education. The Circular Economy concept requires to move to a new level of participants' awareness and puts a pressure to the education system, which traditionally is highly focused on own priority areas.

The need to increase stakeholders' involvement in the implementation of Circular Economy makes education a fundamental issue. We are seeing (in the Circular Skills project) a great importance to strengthen Circular Economy education. It is important that those concerned have knowledge of Circular Economy but the current state of conceptual confusion on it might be a barrier to advance in the field. We want to learn some experiences and examples of how education could transform our thinking and behaviour.

Understanding Circular Economy and integrating it into life is an essential factor in the integral development of an integral human being, which in turn is one of the fundamental goals of broadly understood education, based on a multifaceted vision of the person and focusing on the key issues affecting us in order to respond to contemporary needs.

The CE transition requires many activities related to changing technology, new business models and new consumer practices. It is necessary to introduce the CE concepts into education in order to develop the necessary skills. Changes are not only related to lifelong learning and re-skilling of existing workforce, but it is also important to include CE principles into the education of younger generations.

There is still little awareness on Circular Economy, which results in low activity and a narrow range of activities conducted by various stakeholders to make production and consumption of goods and services more circular. Some organizations have long understood the importance of Circular Economy and of engaging in initiatives to protect the environment and reduce their negative impact (they may emphasize these activities in their Corporate Social Responsibility plans). More enterprises, including social ones, NGOs and cities should follow the path of the circular transformation.

Education systems should be properly equipped to accompany the CE transition and ensure the availability of manpower for specialized and technical tasks. There's been a huge amount of change in Circular Economy education and Circular Economy is increasingly becoming a part of the curriculum but we have a systemic challenge in that field. Despite the growing literature on Circular Economy and growing interest in education for Circular Economy, reflection on how to approach and embed the Circular Economy concept in education is currently limited (few studies tackle that issue).

Circular Economy must be embedded into national education systems thorough systemic activities of stakeholders. We need a strategic approach to Circular Economy education to create a versatile learning environment and embrace issues around circular economy in the curriculum at all levels and stages of teaching and learning (as early as possible, from early years of education).

In traditional teaching models different subjects are not usually connected, unlike circular economy, which bridges many curricula[1]. Education for Circular Economy requires interdisciplinary teaching and should be one of the basic issues of modern education and not a separate topic somewhere on the sidelines of the curriculum (not taught separately in the context of particular disciplines).

Circular Economy education should not only be a transfer of theoretical knowledge, but, above all, should ensure the development of attitudes and practices. Theoretical teaching does not go into detail on how to solve real Circular Economy issues and may be incompetent to capture the complexity of designing and implementing changes while moving away from linear to circular economy. Knowledge of and the ability to apply the principles of Circular Economy should become integral to practices (combining theoretical knowledge with practices).

Circular Economy requires new teaching approaches that give learners a holistic and transdisciplinary understanding of complex systems to “see the greater perspective” and comprehend both the drivers behind the problems as well as the possible solution space. Circular Economy education must be presented as a pathway assorted with strategies using challenge-based learning (CBL), which creates conditions (environment) for creativity and for exploration even for risk-taking in areas worth exploring by involvement in real-world situations and defining challenges and implementing solutions.

Circular Economy Education needs to look at some different organizations and approaches and take them to teaching practice with learning by doing approach. Describing good Circular Economy implementation examples, including analyses of how barriers encountered while implementing them could be overcome, can help to understand and accept the Circular Economy concept.

At the same time, communicating Circular Economy (in order to ease oppositions to the transition) requires showing its close relation with accepted trends, such as organic farming, intelligent decentralization and zero waste.

Some examples in Circular Economy education may be taken from related teaching streams (particularly education for sustainable development) but simply integrating sustainability topics into existing courses is not sufficient, as that approach is too reductionist to handle specific business problems. Circular Economy appears to be taught in the context of resource scarcity but not as a response to environmental issues such as climate change.

4.1 NEEDS ASSESMENT OF EDUCATORS - LEARNERS - SMES

FINLAND

Finland recognised the need for education initiatives for students to study the circular economy, which led to the development of study packages and communication materials (in a series of projects for circular economy education in 2017-2019) for primary, upper secondary and vocational schools.

Circular economy is mentioned in the context of the underlying values of basic education as part of a necessary sustainable lifestyle. According to the values, human is part of nature and completely dependent on the vitality of the ecosystems. Understanding this and acting accordingly are an integral part of basic education and this can be seen both explicitly and implicitly in both the objectives and content areas of several subjects.

Climate and environmental education supports lifelong learning so that the values, knowledge, skills and practices of individuals and society as a whole develop in line with sustainable development. The foundations of curricula, degrees and early childhood education provide a basis for addressing climate and environmental issues in teaching and education.

Finland has intensified its activities to implement the principles of the circular economy in education (recognised the need for education initiatives to study the circular economy). Sitra has produced free teaching and studying materials on circular economy and circularity for all levels of education. They co-operated with all levels of education to ensure that circular economy thinking reached as many Finns as possible.

The teaching period can, thus, be carried out in any grade simply by observing the National Core Curriculum in the planning stages. It enables the teacher to focus more on one subject or include objectives from multiple subjects in the form of a transversal module.

Circular economy is present in the lower grades in the form of sustainable development, discussed mainly in environmental studies. In the higher grades, circular development is more apparent, especially in biology and geography. In these subjects, the Inventions for circular economy study unit can be included in teaching as is. With other subjects, circular economy is present in a more implicit manner, but still clearly part of the learning objectives.

GERMANY

Many relevant VET actors in Germany are not yet fully aware of the concept of Circular Economy. As it is translated to "Kreislaufwirtschaft", it is mostly associated towards recycling and waste management.
Still, there is a sense for adapting towards CE and the curiosity. However, educators are mostly dependent on materials from the linear industry and have no current space in the curricula. They are seeking for hands-on tools and instructions, in order to embed circular idea into their teaching. Additionally, educators are seeking resources to educate themselves on the topic.
As the topic is becoming more mainstream and is present in the media, they understand the skills connected to transfer towards a circular economy as crucial.

While the principle of re-use or sharing are already mainstream in the German market, especially skills looking to re-think, re-design and re-discover are missing, so that Germany economy and education system is still far from implementing circular skills holistically.

ITALY

Education for sustainable development and the principles of the circular economy is a fundamental requirement to make citizens more aware of the complexity and fragility of the environmental context in which we live and the absolute need to protect it.

In Italy, there is a tradition in the field of environmental education that sees a plurality of subjects and structures, public and private, actively collaborating with the Ministry of Education in a national coordination. Training remains the strategic and indispensable lever towards the green economy and towards real growth in income and green employment. This is demonstrated by the growth in the share of university hires among green professionals, especially when compared with the demand for graduates for non-green professionals. The incidence of graduates is particularly high and universities generate competent professionals ready for entry into the job market. Howerver, it's necessary, to expand training through professionalizing internships, even of an extra-curricular nature, to be able to train professionals with a background that meets the needs of the production system.

POLAND

Polish society is currently in the process of 'learning' the CE reality and implementing the CE concept a long-term processes. The public has a positive approach towards environmental protection and declare awareness of their impact on the environment (mainly about a part of the CE concept: waste management (i.e. recycling and reuse) which is based on selective waste collection), but it doesn't significantly translate into consumer behaviour and re-evaluation of one's lifestyle or work habits is necessary.

Most SMEs declare that they implement CE solutions to comply with the regulations (legal coercion and the necessity to adapt seems to be one of the most effective stimulants). Other significant stimulants involve market conditions and the activities of the public sector supporting the development and implementation of CE[4]. In particular, public entities can create demand for CE solutions by specifying public procurements with limited environmental impact (Green Public Procurement).

Barriers affecting the CE implementation in Poland include low environmental awareness (the most important one), knowledge (competence gaps) and resources (including the financial resources). SMEs refrain from CE activities due to their cost and the lack of sufficient knowledge (smaller enterprises have problems in determining necessary CE activities and perceive business modelling in that regard as a complex process).

The CE support system in Poland is fragmented and requires a comprehensive and long-term approach to the CE education, involving a broad set of activities, inter alia: changes in education and culture (transfer of knowledge and formation of attitudes and awareness), development of strategies and policy initiatives on CE education, public campaigns (promotion activities, including promotion of recycling), provision of information on product composition ("product passport") and exchange of information and good practices between enterprises.

SMEs require highly qualified staff (frequently with new skills) and some expertise on the solutions that are ready to implement. The development of CE educational offer is important and some Polish educational institutions responded to the needs. Consulting services facilitating identification and implementation of CE solutions or changing business models are important as well.

SLOVAKIA

As because the whole topic of Circular Economy is absolutely new paradigmatically disruptive There is clear and historically settled approach in VET in Slovakia, which follows the sectors´ labor force preparation based on traditional cooperation between schools and industry stakeholders. Even more it was absolutely obvious that state companies before 1989 have created spin-off secondary schools which prepared young labor force right on scale what each particular company needed.

Increasing the acceleration of introduction of new topics in VET/general educational framework in Slovakia is on current days most effectively launched via the general concept of Dual education. This form of direct cooperation in the triangle – (next)employee – secondary school – student is historically well managed because of re-activation of historical cooperation between employee and next labor force (as mentioned above from period before 1989).

There is no specific legislative framework for how to approach VET in CE. If any innovative agenda/topic has to be incorporated to the environment of education the most effective way is to introduce these topics – as like the Circular Economy as – via the Long-Live-Learning, the Act 568/2009 and on the amendment of certain laws, particularly via the Slovak Ministry of Education' Decree 97/2010 Coll. effective from 01.09.2019 of 15 March 2010. It is laying down details of the documentation of the accredited continuing education program, the content of the application for accreditation of the continuing education program and the project of the continuing education program, the certificate of completion of the accredited continuing education program, the requisites of the partial qualification certificate and the full qualification certification.

In proactive development if this educational tool we may gain the most powerful disruptive approach of circular economy topic into the real environment of economical production in state.

The highest body for coordination of merging the new educational topics which reflects the actual demand places on labor force in future in Slovakia is the Committee of the Slovak Government for VET (approved by the Resolution of the Government of the Slovak Republic no. 538/2016 of 30 November 2016). The Committee counts with so called business sector councils (they are somewhat defined in the law on lifelong learning) however, their position has to be strengthened in the forthcoming amendment, in course of the process of informal education.

The interlink in between Job Centers and the central state- managed full list of accredited non-formal requalification and VETs does not exists, as well as the hotspot centre on offer of various LLL products = it means they exists as private webs, only[1]. It is clear that such diverse, multilateral, paradigm topic as the CIRCULAR ECONOMY certainly is cannot be massively promoted as something what is necessary to be incorporated to the LLL as the most urgent topic is unrealistic, nowadays in Slovakia.

The most respective resource about real BATs in respect of circularity we may accept the EU most representative server on European Circular Economy Platform networking - the Slovak Republic does not promote any disruptive circular economy educational tool.

Because of this to approach the circularity topic needs to reflect the facts that:

- no one particular experience of in-formal/ formal VET in Slovakia is well-known and recognized up to now,
- European, respectively global BATs have to be collected on profound desk-top research and then after adjusted, scaled for the living Slovak VET environment.

Desk top research needed case-by-case, school by school because the situation is fully done on the ground of:

- Great support from employers to dual education (due to secure labour force in ageing Slovak society) general framework for such education is framed, regulated, interpreted in course of main business policy of company.
- The Slovak educational curricula are after 30 years of socio-economic transition overloaded by factual information and teachers are generally very reserved to new topics, themes.
- To approach such paradigmatical topic as the CE, cannot be done in whole scope of topic and to get oriented in this subject is quite complicated.

SWEDEN

Between 2018-2020, 22 different sectors presented their roadmaps for transitioning to a fossil-free Sweden by 2045, and on 27 October 2021, the first follow-up report was presented.

Circular solutions are one of the biggest challenges to achieving this transition. This requires incentives and other policy instruments for materials that are not already highly circulated. The follow-up report also shows that Sweden's interpretation of the EU's definition of waste is too broad, making it difficult for the various sectors to develop circular business models. Lack of fast and efficient permitting processes is another challenge that stands in the way of the transition. Several large industries in Sweden (e.g. concrete, mining, iron, steel) highlight the long and unpredictable permitting processes as the biggest obstacle to the transition to a fossil-free country. There is a need for clearer roles for the different authorities involved in the permitting processes and a tendency to get bogged down in the details rather than seeing the whole picture. The Committee on Technological Innovation and Ethics has put forward a proposal for a pilot committee to work on removing barriers when authorities, regions and municipalities want to test new ways of working in the future.

Investing in training and recruitment is another factor that needs further work. For all sectors to succeed in the transition, skills are needed both nationally and internationally, and more opportunities must be provided for the right training, for example in battery chemistry, electrification and hydrogen. In its budget for 2022, the government has proposed measures to provide the labour market with the right skills and to achieve a circular economy. However, according to the report, the government will need to invest SEK 10 billion per year for ten years for the roadmaps to be successfully implemented. Clear guidelines and systems for sustainable public procurement are also highlighted as an important element in promoting the transition. Public procurement is a strong force that should become completely fossil-free as soon as possible to benefit companies that offer fossil-free solutions and to stimulate the transition for more companies. Clear guidelines and systems from the procurement authority and the government are also necessary. One concrete example highlighted by the report is that the industries want the Transport Administration's procurement of all new infrastructure to be climate neutral by 2030.

CIRCULAR ECONOMY IN PRACTICE

INSPIRATIONAL CASES

SMART PRACTICES

One of the results of Circular Skills is to elaborate smart practice methods of teaching and training circular skills in Europe, based on a commonly developed and tested assessment tool. This assessment sheet will help educators and practitioners to identify and develop a focus on circular economy principles.

The practices are classified into business models, which will help VET learners and educators, who want to understand how the linear economy can be transferred into a circular, to find inspiration across Europe.
All practices are evaluated based on this grid and give an overview on their strength and weaknesses and let educators help to understand the smart or innovative character.

Structure of the Assessment Grid

General Information:

1. Name of the practice
2. Organization and country
3. Learners group /Target group / Participants' group
    - age
    - general / specific branch
    - students / VET teachers / employees ...
4. Context / Learning environment
    - formal or non-formal education; vocational education institution
    - VET-learning at work etc.
5. Need covered by the good practice
6. Learning goals
    - knowledge?
    - skills?
    - behaviors?
    - attitudes?
7. Methods - Approach/ Types of activity (f.e. workshop).
8. Materials: are there specific materials that are needed?
9. Evaluation and description
    - what kind of reflection is included in the practice?
    - how are the learning outcomes evaluated in this best practice?
    - what kind of feedback do the learners receive?
10. Transferability potential/Variations

Multidisciplinary aspects

How is the practice collaborative and inclusive by design?

How does the method integrate an interdisciplinary approach to problem solving and ciruclarity?

Does the practice have a holistic approach to circularity? Please describe.

Real life relevance/aspects
Which local needs is the practice based on?

How does the methodology integrate real life cases into the teaching?

How can learners transfer the knowledge to their individual everyday work context?

Teaching content

How does the method stimulate critical thinking for the learners?

How does the method challenge common conceptions about economy?

Which creative or innovative elements are included in the practice? (e.g. games, simulations, design thinking etc.)

Flexibility/Versatility

How does the practice put circular economy in the context of sustainability?

How is the practices result-oriented and process-based?

Which values are taught in the practices?

CIRCULA GAME AS PART OF THE CE EDUCATION AT THE UNIVERSITY

by Maisa Kantanen, Xamk

Circula – The Circular Economy and Entrepreneurship Game is an easy way to teach Circular Economy to students in a practical and fun way. Gamification makes learning fun and is a counterbalance to theoretical teaching.
With Circula, students can create innovative ideas in teams.

Facilitation Process

To play Circula, you need the board game, but after that nothing else is needed! Teachers can also use videos that can be found on the website.
One game takes about three hours, but the teacher can easily adjust the playing time. The game includes pre-assignments, and it is also possible to add extra activities after the board game. The circular economy walk gives prior information and inspiration to the players. Teacher or other instructor operates as a game master and supports the group's learning in teams.
When using the Circula game at the university level, it is often easier if the students have had theory studies before playing the game, and then use the game as a practical tool to utilize their circular economy skills. Short videos before the game give a nice introduction to the topic. Learning in this method is achieved by doing, thinking, and communicating together as a group. The role of the game master is essential, also with young adults, to ensure bright ideas and fulfilling teamwork.

Circular Economy Principles and Learning Goals

Circula game integrates interdisciplinary approaches to circular economy by using different business models and examples. It is an easy method to incorporate into multidisciplinary learning modules and courses.

The learning goal of this practice is to put knowledge (prior or offered through the cards and instructions of the game) into practice, especially on the perspective of entrepreneurial activity and consumption.
Learning goals are evaluated when teams present their own business ideas at the end of the game.

Critical Thinking

This practice is usable when changing students' thoughts from linear economy to a more circular way of doing business. Environmental Technology students study circular economy theoretically prior to playing the game, but they might not have any other ways to put their knowledge into use while studying at the university.

One easy way to integrate real life cases into the teaching is to use real-world surplus materials from local companies as resources instead of the game's ready-made cards. Local companies can also join the game as players or as instructors or outside experts. This might also increase the attraction of the game to university students.

The Circula game encourages students to come up with innovative business ideas that help build a sustainable future. This is how this board game puts circular economy in the context of sustainability. Values taught in the practice are for example sustainability, creativity, cooperation, and responsibility.

Inspirational Story

The players' resources are the starting point of the game: their skills and personality combined with leftover resources that can be materials, spaces, or items. In this game, teams brainstorm their own business ideas.
The purpose of the game is to come up with a business idea that responds to a real need or a problem, uses natural resources wisely or innovatively and is sustainable but profitable business.

Conclusion

This tool gives university students a practical and interesting way to learn practical skills related to the circular economy and entrepreneurship. It can be used to learn about both or to highlight one more through pre-assignments and the use of outside experts. Gamification is an interesting pedagogical method that can lead to positive results also with adults.

BUSINESS FROM CIRCULAR ECONOMY - PLANNING TRAINING FROM SMES

by Maisa Kantanen, Xamk

There is an evident need for Circular economy further training for SMEs. Sitra and Turku University of Applied Sciences piloted an online training in 2020, and we used it as a base for our own further training course for SMEs. The purpose is to:

- Increase SMEs' circular skills
- Develop their business
- Find new potential for it.

The training has not taken place yet, but we have a clear understanding how it could be implemented, and we want to share our insights with you.

Facilitation Process

The training can be organised either in person or online. If it is online, the length of lectures is max. 3 h/day. It is important that there are home assignments for companies so they can master new knowledge also in practice. Personal coaching for each company is essential and it ensures that companies' own development tasks are worthwhile and fruitful. If the training is organized online, it's good to start with theoretical lectures and right after that have time for online conversation and questions.

There are some tools that Sitra has created. These can be used as such or modified if the trainer finds them useful: business model development toolkit, capacity maturity assessment, technology maturity assessment and ecosystem partner identification.

Circular Economy Principles and Learning Goals

The SMEs can come from different fields, and tasks and materials used can be tailored to suit different kinds of companies. It is important that companies know different Circular Business Models and find the ones that best suit their industry. It is essential to leave enough time for communication and networking between attending companies. Sharing ideas and thoughts is an important part of the learning process. The learning goal of this training is to show SMEs how they can change their current business models towards more circular and sustainable ways of doing business. Companies might also find new circular business possibilities. The companies choose their own development tasks and goals for the learning process.

Critical Thinking

The organization that provides the training must understand that circular economy provides profitable business opportunities. They also need to understand that the SMEs' point of view is the most important one – the SMEs must themselves choose to be more circular and do the changes needed. In the training sessions, it is always good to have companies share their experiences in the field of circular economy. This can be easily integrated in the training either in person or online. All course work done in this course should be transferable to participants' everyday work context. The trainer must choose the right exercises for each company.

Flexibility/Versatility: How does the practice put the circular economy in the context of sustainability? How arethe practices result-oriented and process-based? Which values are taught in the practices?

For SMEs, circular economy and the increasing demand for sustainability can offer new business opportunities. It is important to notice that this might be a long process and small steps can also be meaningful. The values taught in the this training is are an attitude of change and a curiosity to see things differently.

Inspirational Story

This practice has not been implemented yet.

Conclusion

Moving towards a circular economy is needed to solve the current climate crisis. Most companies in the EU are SMEs and they have a huge potential to change our current linear economy into a more circular one. SMEs feel that they don't have enough knowledge about the circular economy, and they need help in finding solutions for changing their business models to become more circular.

CIRCLE VET ACTION LAB

by Martin Barthel, CRN

The CircleVET Action Lab is an explorative educational approach, which helps learner to create their own action plans to adapt a challenge toward circular economy principles. The practice was developed by the Comparative Research Network during the Erasmus Plus project CircleVET. For the delivery real or simulated challenges have to be given to small groups, which work with methods of design thinking (repaid prototyping) on drafting solutions. The solutions are analysed through the What? So What? And NOW What? Method, before the action plans are designed with a clear step-by-step description.
The steps should be concrete and implementable, have a timeline and lead logical to a reply to the challenge. In the end of the method, every group can present a concrete action back to the challenge giver, who will provide concrete and constructive feedback.

Facilitation Process

The method can be generally applied to any kind of group setting. In each case the challenges can be adapted. The adaptation can be done according to previous knowledge, learning level, target group, group size or sector. The groups can work offline in the classroom, divided in small groups in breakout rooms or mixed. The duration of the basic session is roughly 3 hours, depending on how much time the groups have to co-design their action plans, the duration can bd extended to a few days.

The implementing needs either post-its or a electronic board, such as mural or Miro. Additionally the facilitator can download the action plan templates. The participants might need space for research and the challenges should presented in a small PowerPoint like presentation.

The first step is the formulation of the challenges. This phase should be done by the facilitator or external challenge giver.
The challenges are presented and each team will pick one. The first task is to Analyse the challenge and potential responses. The first question should be „What can be done?" - the group should brainstorm their responds. In the second step they ask themselves "So what does that mean?". When enough answers are given, they should ask themselves „What can we do NOW to respond to the challenge?".
When this Analyse is done, each group receive the empty action plan. Based on the answers before they start to break down the respond in logical steps. For each step resources are named, challenges identified and a timeline is given. The filled action plan will be pitched to the challenge giver. The challenge giver will give an instant feedback on the implementation and relevance of the plans. In the end the whole group can decide which action plan will be implemented.
As every time the challenges are new, as well the actions are. The co-creation of the responds makes the method highly adaptable and allows new research, which can lead to reformed and innovated action plans, event to the same challenge.
The action plans are tangible and usually lead to easily mid- or shorterm responds, which actually can be created and provide impact on the learners, the challenge giver and their community.

Circular Economy Principles and Learning Goals

As the input challenges form the exercise, any topic could be addressed. Due to the dependence on the challenges, which should be close to the everyday experiences of the learners, have to be thoroughly prepared and presented. The method will lead to independent problem solving and co-creation of answers to challenges of the learners environment. The immediate impact will lead to a feeling of empowerment and motivate learners to get involved and in the context of circular economy, provide knowledge on eco-friendly and sustainable design of solutions. The evaluation can be done in a qualitative pre- and post assessment of the learner skills. The creation of the action plans and the review through the challenge giver, provide qualitative feedback on the learning.

Critical Thinking

The analysis phase, which is helping to understand the challenge, implies a critical assessment. The learner have to understand and question the intention of the challenge giver. By doing so the learners provide their own solutions, which implies a re-thinking and re-design of existing, less effective solutions.

How does the practice challenge common conceptions about the economy?
The challenges are the core. Depending on the formulation, challenges could be redesigning existing processes, raising awareness on consumers or stakeholders or distribution channels. Still the extend is depending on both the needs of the facilitator and the needs , experiences and learning level of the students.

The real-life is the center of the practice. The challenges should reflect the rel-life experiences and contexts. The action plans are build on the skills, experience and knowledge of the learner. The result can directly implemented in the everyday context, as resources, timing and steps are designed directly.

Flexibility/Versatility: How does the practice put the circular economy in the context of sustainability? How arethe practices result-oriented and process-based? Which values are taught in the practices?

The core value of the practice is co-creation and co-design. The learners should question everything, but at the same time use their experiences to find new solutions. Re-thinking, RE-designing and re-creating of process and products is the main aim. The more previous knowledge the learner have on circular economy, the more it will become „naturally" the center of the learning process. As a final product, the each learner will bring a self-created action plan home, which can lead to congregate actions and impact, showcasing how fighting climate change, circularity and sustainability are interlinked and how steps in the everyday life of the learner can help to positive change.

Inspirational Story

During an online Lab an Italian Co-Working space provided the following challenge: The co-working spaces discovered that entrepreneurs have misconceptions of Circular Economy. Please conceptualize a role play which is helping to understand and use the 'real' concept of CE and understand the economic potential of CE.

The learners created a full play, based on three scenarios where an entrepreneur learns to understandably, why they should reuse resources, how r-thinking and -designing their processes. Help not just to save the Environment but as well money and last but not least how sharing resources help entrepreneurs to save money, save the planet and creates new networks.The action plan reflected perfectly the new knowledge of the learners and actually helped the space to raise more awareness on the benefits of circular economy.

Conclusion

The CircleVET action plan lab provides an engaging methodology, which allows learners to co-design creative responses to real challenges in circular economy. Co-creation is invoking all learners and through varying the challenges, many topics can be brought into the lab. This allows suitable responses for all kind of target groups, group sizes, themes, subjects, experience and learner sector. The lab had been run by facilitators online, offline and hybrid. The practices was awarded the status of an Erasmus+ good practice and is used by many partner across Europe.

REPLACE WASTE WITH CULTURAL ACTIVITIES

by Fundacja EkoRozwoju FER

Increasing amounts of waste as a growing problem of modern civilization requires comprehensive teaching materials taking into account environmental risks, and the possibilities of waste recycling and reuse. Learning goals of handbooks include:

- Raising awareness of waste recycling and reuse among teachers and pupils and, through pupils, also among parents.
- Increasing knowledge, the ability to assess the current situation, the consequences associated with the lack of action in this regard, as well as proposing actions to counteract the threats.

Facilitation Process

The practice is proposed for primary school pupils within formal education. The handbooks concern waste management issues related to paper, glass, hazardous waste, metals, plastics, compost, and electrical and electronic equipment.

Exercises use several approaches: discussion, demonstration, description, elements of the lecture, brainstorming, individual work, and group work. They give an opportunity to analyse the current situation in the local environment and encourage to take action to make changes.

Circular Economy Principles and Learning Goals

The topics involve the scope of biology, natural sciences, and geography. They provide a comprehensive approach to waste management problems.

The learning goals are:

- Enhancing understanding of the consequences of unlimited and uneven consumption on the environment.
- Raising awareness of waste recycling and reuse.
- Increasing knowledge, the ability to assess the current situation, as well as to propose actions to counteract the threats.

Critical Thinking

The practice allows to critically assess the current situation and the consequences associated with the lack of action in this regard.

The practice aims to return to a nature-friendly economy in the 21st century - to a waste-free economy instead of the current model of resource management (mass production and consumption) which is leading to the introduction of synthetic products and packaging (which are often one-use) into the economy.

Learners increase the capacity to handle waste management issues (technical, financial, and legal aspects) in their daily routine.

How does the practice put circular economy in the context of sustainability? How is the practices result-oriented and process-based? Which values are taught in the practices?
Waste is a growing problem of modern civilization - it threatens uncontaminated natural areas, pollutes water resources, contributes to warming the atmosphere and the practice provides a better understanding of how to deal with the problem of waste.

Inspirational Story

The practice presents a sequence of actions (conducted step-by-step), allowing to increase awareness of the problem, analyse the situation and counteract it by considering the recognition of environmental risks, through recycling possibilities, to waste reuse.

Conclusion

The practice provides a comprehensive approach to the subject of waste management.

SOCIAL ECONOMY SUPPORT CENTRE

by Association For Social Cooperative, Poznan, Poland

Social Economy Support Centers (SESC) are the network of certified entities for local communities and social enterprises and are also a support centres for SMEs in the field of their workforce education and development, providing support services to more thousands SE entities yearly. The Each educational activities are provided by the Association to create a sustainable ecosystem for social economy entities and social enterprises to grow steadily with help of multisectoral partnerships (public, private, and social sector), reflecting the needs of the Circular Economy which is one of the areas of interest in many local communities. Direct stakeholders are people aged 16 - 65, disadvantaged on/in the employment market because of homelessness, disability, and social and vocational exclusions.

Facilitation Process

The center supports the undertaking and functioning of social economy entities that combine business and social (reintegration) elements, taking into account - where possible - the idea of a circular economy. Many non-formal activities based on the analysis of needs and expectations are provided. The practice includes activities in three areas: animation (services designed to diagnose local potential, motivating groups and environments to undertake activities, establishing partnerships), the incubation (activities to create new enterprises), support of existing entities in an effective and efficient sustainable ecosystem.

Learning by doing" approach is introduced and participants work out a solution to meet their needs and start a business with financial and professional support (using diverse methods: discussion, demonstration, description, elements of the lecture, brainstorming, individual work, group work, dramas, dialogue sessions, study visits, knowledge exchange workshops, and seminars, counselling, mentoring, coaching).

Circular Economy Principles and Learning Goals

SESC promotes a holistic view of the economy, education, social cohesion, and vocational integration with regard to circular economy principles – social economy entities take part in waste management activities in local communities, provide services and goods considering CE issues (the role of green public procurement is increasing).

It provides conditions for the development of participants' competencies in the long term (successive support in the face of new challenges in the company itself and its environment).

Critical Thinking

Learners critically assess the current situation and the consequences associated with the lack of action in this regard. They analyze whether the idea will succeed – SWOT, competition, profitability, etc.

SESC helps learners to face local challenges, using the learning by doing approach (with examples of real-life cases: successful projects – social enterprises).

How does the practice put circular economy in the context of sustainability? How is the practices result-oriented and process-based? Which values are taught in the practices?
It provides an opportunity to conduct collaborative grass-rooted actions (step-by-step), allowing to increase awareness of the problem, analyse the situation and counteract comprehensively. Values taught are awareness, activity, responsibility, social inclusion, and cohesion.

Inspirational Story

After almost fifteen years of the network operation, Social Economy Support Centers are well-known and respected organizations in the Polish social economy sector (they founded thousands of social enterprises and more received their support).

Conclusion

The Network of SESC is a well-known and respected umbrella organization in the Polish social and circular economy sector. The SESC implements socially and environmentally responsible solutions in the area of social policy, and public procurement, and supports people at risk of social exclusion due to their social background, age, gender, or disability.

VVZ-CIRCULAR EDUCATIONAL CENTRE

by Radovan Grollmus/Ján Bolek Ekoray, NARASK

The private company Peter Bolek – EKORAY (*1994) – SME – works in the field of mechanical recycling of industrial and municipal waste (e-waste, scrap) recovery and upcycling of e-waste (other and hazardous), bio, plastics waste materials. In course of the continuous company´ growth, additional production and business activities were developed, based on upcycling and waste recovery. In 2016, the company bought a brownfield – abandoned previous socialistic cooperative farm in Oravská Jasenica village, which is continuously revitalizing into a waste recovery centre, now. In 2019, the company established the VVZ (Science & Research Centre, non-profit organization) that expands EKORAY´ 28 years of production and business activities to the field of public service, education, own research and promoting innovative activities in field of circular economy.

Facilitation Process

The method is implemented through a practical presentation of particular circular solutions – technological demonstrations of BATs/Best Available Techniques – recycling and valorisation of processed waste streams.

The educational experience is structured based on the business opportunity – i.e., EKORAY/VVZ reacts based on the existing market business opportunity. The "concern" of a family business SME and a scientific-educational non-profit organization can solve the waste requirements of organizations in the region, where the only critical point is time, limited human resources and the initial amount of finance for an individual "waste" circular intervention.

Circular Economy Principles and Learning Goals

Education is provided by a guided tour, supplemented by printed information about the wider context of the creation, collection and technological processing of individual waste.
Within the case of waste recovery centre/VVZ centre, it is also possible to see the transformation (reuse) of the entire urbanistic unit/zone of the socialist agricultural cooperative with the existing building objects, which were originally used for livestock breeding. Integrated technologies for the reuse and upcycling of particular waste streams are continuously installed in these refurbished premises (to which the standard maintenance returned back as well as), making the entire centre an example of good practice of brownfield revitalisation (virgin land protection) and even more – for circular economic and production activities.
The uniqueness of the Science and Education Centre lies in the number of collected practical standard, but also innovative, pioneering, pioneering circular solutions, which EKORAY/VVZ implements in the centre, tests with its own research work and presents in various levels of TRL (Technology readiness level 1-3/Pathfinder – 4-6/Transition – 5-9/Accelerator).

Critical Thinking

The aspect of critical thinking is ensured by the verification and validation of the presented solutions, – every single visitor can receive not only textbook/web search information, but practical experience and skill of touching real circular solution. It confirms emerging new economic and social sector – Urban Mining – generating values from material that one on entry into production was named as "waste" in the language of the linear economy. And by using the circular economy´ point of view this material was turned to the new value in circular economy, finally.

The real-life relevance is the bedrock of centre in Oravská Jasenica. First of all, it is business running organisation. All presented circular solutions exists as EKORAY production portfolio – existence of them is verified and validated in the environment of real regional economy interactions. Some circular local solutions are an excellent example of QUADRUPLE HELIX cooperation – as an integrated interaction and local problem solving. (Involvement of local public administration/municipality – EKORAY and other business entities – schools and VVZ as the knowledge institutions and las but not least inhabitants benefiting from this cooperation) The Oravská Jasenica centre is not created as a "museum" with exhibitions behind the glass, but living economic unit in the real environment of the transition from a linear to a circular economy/society.

Flexibility/Versatility

How does the practice put circular economy in the context of sustainability? How are the practices result-oriented and process-based? Which values are taught in the practices?

The educational practice is structured on company business plan as well as on „just in time" principle - this means that waste recovery centre/VVZ actively responds to the needs of municipalities in direct contact with EKORAY/VVZ recycling facilities. In matter of solving waste obligations municipalities and all their existing organizations in region (state administration, self-government, business entities) are continuously imposed by the newly adopted environmental legislation at an extremely fast pace after 2020 (e.g., mandatory solution for collecting and circular processing of kitchen waste in municipalities after 1.1.2021 without any exceptions).

Inspirational story

EKORAY/VVZ provides excursions for those interested in environmental/circular education based on request and agreement, continuously.

Presented circular solutions:

• Production of biofuel from waste oil - and production of electricity that drives other waste processing machines

• Production of paper pellets from pulp, which is a by-product in the processing of paper introduction tapes with Cu and Fe and their subsequent energy recovery during heating of a boiler for sanitizing kitchen waste

• Production of feed pellets from waste bread and its use in the breeding of geese, ducks, fallow deer, chickens

• Processing of biowaste and kitchen waste and production of high-quality compost, which is directly applied on the premises of the cooperative when growing potatoes, carrots, parsley...

• Processing of electrical waste and mixed plastics and storage of individual output commodities before their further processing

• Production of backfill material from waste TV glass

• Production and application of plastic concrete and interlocking plastic paving

• Processing of electronic waste and storage of individual output commodities before their further processing

• Processing of cables to the output product 98% Cu and PVC pipes as input in the production of plastic interlocking paving

• Production of interlocking plastic paving from PVC pipes

• Reuse of electrical appliances - a second chance at life after being thrown away

• Repair STboxes for SLOVAK TELEKOM

Conclusion

Comprehensive recycling - reuse - repair - upcycling material production, production programs aiming towards the ZERO WASTE and INDUSTRIAL ECOLOGY standards (Kalundborg Eco-industrial Park, Denmark) are designed, presented and intends to be promoted in the EKORAY´ waste recovery /VVZ centre in Oravská Jasenica village.

CIREKO® AKADEMI

by Francesca Olivier, Changemaker

CirEko® Akademi is the education department of the association. It proposes different educational modules:

- Circula workshop and game
- Circular Business model canva
- Introduction to Circular Economy
- Circular building project leader
- Circular Purchase manager
- Circular Product designer
- Circular Business developer
- Material Wheel

CirEko® proposes both workshops of the duration of one-full day and short-term training of the duration of six weeks with a final certification.

Facilitation Process

Depending on the specific workshop and course the methods used are different. They use the Circula Game and the Circular Business Model Canvas to present different business models. The short-term courses are run by experts in the specific roles.

Circular Economy Principles and Learning Goals
Some of the workshops present different business models and some other are adaptable to different economic sectors. The fours short-term courses are focused more on specific working roles rather than on specific sectors. Understanding the circular economy to be able to put it into practice in the workplace or to make "circular economy" decisions based on competence.

Critical Thinking

All the workshops and short-term training programs aim at giving to the participants the possibility to reflect upon their current situation and possible changes that can lead to a circular transformation. Some of the methods used present examples taken from the reality and give to the participants the possibility to reflect upon their own enterprises and how to adapt them to become more circular.

Flexibility/Versatility
How does the practice put circular economy in the context of sustainability? How is the practices result-oriented and process-based? Which values are taught in the practices?
The workshops and the short-term courses help participants to introduce circular elements in their daily activities and to create new enterprises using circular business models.

Inspirational Story

The four Jokkmokk companies Mathantverket in Vuollerim, Food by Jokkmokk, Peace & Quiet Hotel and Jokkmokk's Log have undergone a pilot of the Sustainable Business workshop series in the spring of 2022. "The workshop series is a way to put knowledge from two of our ongoing projects, GRUDE-Green Rural Economy and Develoop, into practice." says Amanda Mannervik, project manager of the InterregNord project GRUDE at the business company Strukturum.
During the workshop series, the participating companies have learned about circular economy and circular business models, gender equality as a prerequisite for sustainability and more. In parallel with the meetings, the company representatives have been actively working on their own business development.
Before the start of the workshop series, all companies have been asked to carry out a resource mapping in their own companies, with the help of an external expert, in order to identify under-utilised resources that can be the basis for new circular business.
An example of a concrete result of the workshop series is that a company that currently pays to dispose of a residual product has identified new possible and profitable business opportunities from the same and has now started a development work to realise these business opportunities. The evaluation that was carried out showed that all participants would recommend the workshop series to other companies.

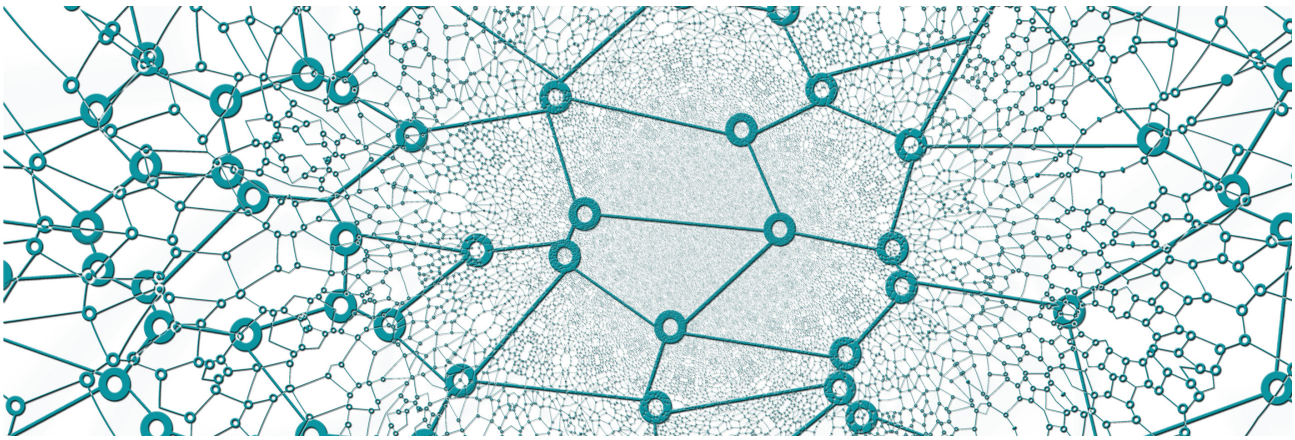
Here is what the participants themselves thought about their participation in the workshop series:
"New ideas for collaboration, ideas for new partnerships and development plus ideas for new customers and packaging!"
“Gained insight and discovered how we can develop!"
"Collaboration between companies is very important"
"Positive to deepen your local network"

Conclusion

The workshops and the short-term courses are entirely organized around the topic “Circular Economy” and they are run by experts in the field.

CRADLENET

by Francesca Olivier, Changemaker



Cradlenet was founded in 2009 by people inspired by the book "Cradle to Cradle - Remaking the way I make things" by William McDonough and Michael Braungart. The network was then about spreading the groundbreaking message of the book - that we should move to a circular society instead of the current wear-and-tear society.

Today, Cradlenet is one of the world's oldest circular economy networks, helping companies and organisations make the transition to a circular economy. We do this by supporting our members with, among other things, weekly theme meetings, advice, new knowledge, environmental monitoring, studies, training, opinion and networking locally, nationally and on a Nordic level. Cradlenet organises open and free national seminars on the latest in the circular economy. Information is also disseminated on our social media, in the media, on the website and through the Cradlenet newsletter. Cradlenet also works on policy advocacy to accelerate the transition and support politicians in their work on the circular economy.

Cradlenet is a non-profit organisation based in Stockholm. Our work is driven by the office, the operational board and by our local networks in the North, South and West.

Facilitation Process

Cradlenet helps to accelerate the transition to a circular economy by developing or contributing to circular projects and initiatives. The method is based on the organisation of specific workshops, facilitating networking and direct consultancy.

Workshops with experts and open questions from participants. Networking events where participants discuss possible solutions to specific issues.

Circular Economy Principles and Learning Goals

The activity of networking gives Cradlenet's members the possibility to get in contact with companies working in other sectors. Every Friday Cradlenet organises a networking event where specific topics are discussed and different solutions are shared among participants.

Cradlenet West organises educational activities, company visits, scenario building, workshops and meetings for the exchange of experience and discussion.

Critical Thinking

In 2017, Cradlenet conducted a feasibility study to create a circular economy toolkit. The consultancies Esam AB and Inno Group have carried out the feasibility study and Cradlenet has been the project owner. The pilot study evaluated established tools for circular business development and a process for creating circular business models was developed.

Flexibility/Versatility

How does the practice put circular economy in the context of sustainability? How is the practices result-oriented and process-based? Which values are taught in the practices?

Cradlenet West focuses on giving tho their members the opportunity to deepen their understanding of how the circular economy can be applied in everyday life, in workplaces and in business operations. Cradlenet West also works to highlight private and municipal initiatives underway in the field. The local network reaches out to the whole of West Sweden, with Gothenburg as its base.

Inspirational Story

Cradlenet and Stena Circular Consulting, which is part of Stena Recycling, will receive funding from Tillväxtverket and the European Regional Development Fund (ERDF) to develop methods for conversion to value-based business models. The aim of the two-year project is to make it easier for SMEs to switch business models for relevant products to Product-as-a-Service (PaaS).

PaaS is the most talked-about value-based business model, where products are sold as services and the producing or selling company retains ownership of the product itself.

By moving to a value-based business model such as PaaS, a company can create incentives for circular design, longer life, more use cycles, remanufacturing processes and so-called take-back systems. However, despite a large number of studies demonstrating significant economic benefits and despite the development of more and more technologies that enable PaaS, the uptake of the model has been relatively low in the market.

Conclusion

Cradlenet uses networking as a method to find circular solutions through a peer-to-peer communication.

CIRCULAR ECONOMY IN PRACTICE

BUSINESS MODELS

BUSINESS MODEL

RESOURCE EFFICENCY AND RECYLING

Resource efficiency and recycling are the basics of circular economy.
Recycling means that materialand energy are used in a sensiblemanner. It also means that the use of the raw material of discarded products and materials in manufacturing new products and materials. Recycled raw material can originate from consumers or the industry. Sometimes several companies operate in the same area and agree that one's waste is another's raw material. This kind of cooperating networkis called industrial symbiosis.

Resource efficiency and recycling can be achieved in every company. They offer a way to save in waste, material and energy costs. Meanwhile, the environmental impact ofthe company becomes smaller. Some companies specialise in the knowhow of resourceefficiency and recycling, and then sell their expertise to other companies.

Companies shouldplan their products in a way that their materials could berecycled after use. A company can also ask their customers to return a used product back to them, thus acquiring more raw material for manufacturing new products. Also the selection of products made from recycled materials is increasing.

RE-USE SHOP

HTTPS://WWW.REUSE-SHOP.DE/

For over three years, the ReUse Shop Köpenick repairs and sells used and new IT equipment. IT equipment means: PC, notebook, monitor/ TFT, printer (laser), keyboard, mouse as well as accessories, recently also smartphones.

Location: Berlin-Köpenick, Germany
Organisation: Re-Use e.V.

PROBLEM

Dealing with electronic waste, repairing it and reselling

SOLUTION

They specialise in repairing notebooks and PCs, but we also try to repair everything else (smartphones, TFT, printers [laser], etc.) first before scrapping the device. They can do these conversions / upgrades of different devices.

BENEFITS

Longer life of electronic devices, re-using and reparing existing resources and products

CE PRINCIPLES

Bringing back electronic products into life and saving waste, re-use und prolonging the life of different devices

DIGITAL WATERMARKS INITIATIVE

HTTPS://WWW.DIGITALWATERMARKS.EU/

There are no manufacturing company in the world which doesn't need packaging. Packaging means additional expenses, additional materials used, and additional waste which have to be generated. To close the loop in packaging industry a Pioneering Digital Watermarks for smart packaging and recycling in the European Union were invented.

PROBLEM

One of the biggest challenge in circular economy of packaging is how to maximize our resources through optimal sorting and recycling. We need to sort our post-consumer waste in a better way with waste management systems by accurately identifying (plastics) packaging, resulting in more efficient and higher-quality recycling.

SOLUTION

Digital watermarks for smart packaging can revolutionize the way packaging is sorted. They open new possibilities currently not feasible with existing technologies. Digital watermarks were found to be the most promising technology, gathering support among the majority of stakeholders and passing a basic proof of concept on a test sorting line. Digital watermarks are imperceptible codes, that size of a postage stamp, covering the surface of a consumer goods packaging and carrying a wide range of attributes. The aim is that once the packaging has entered into a waste sorting facility, the digital watermark can be detected and decoded by a standard high resolution camera on the sorting line, which then based on the transferred attributes (e.g. food vs. non-food).

BENEFITS

Consistent high results across all tested categories of plastic packaging material of on average: 99% detection rates, 95% ejection rates, 95% purity rates demonstrated an impressive performance of the prototype. The community and world could finally have a solution to get the world without plastic waste. The revenues will come for stakeholders according with the same model like it is in bar-code or QR-code.

CE PRINCIPLES

This technology would result in better and more accurate sorting streams, thus consequently in higher-quality recyclates benefiting the complete packaging value chain. The promising technology of eliminating plastic waste from manufacturing and packaging industry. If we eliminate waste plastic, one of our crucial challenge regarding plastic could be solved.

LS PLUS

HTTP://LSPLUS.PL/RECYCLING/

Imagine the world without waste on landfills, where there are companies that even the least recyclable waste are able process into the raw materials which will be part of a new wonderful products ready to put on to the shop shelves.

PROBLEM

Limiting the process of waste generation is one of the world's most demanding needs. The transformation of the linear economy into a circular economy could limit waste significantly, but there is still waste that no one has any idea what to do with.

SOLUTION

LS-PLUS is producing high-quality regrinds from recovered plastics. Successively implemented new technologies allow to increase not only the quantity, but above all the quality of manufactured products. The entire activity of LS-PLUS/RECLINE is based on the belief that we must recover, process and reuse waste to the maximum extent possible, and not dispose of it in landfills. Based on these beliefs company is constantly looking for new technologies and solutions to recycle the maximum amount of raw materials. Having this on their minds LS+ established research center which develops idea of products made using former waste which was thought unrecyclable before under new brand Recline.

BENEFITS

Each resident from local municipalities where LS+ operates benefits by targeting the zero waste idea, it will finally lower expensed costs on waste, because the most of waste will be recyclable.

CE PRINCIPLES

LS-PLUS receives income from local municipalities where they operate based on public contracts by collecting waste from residents, hence they revenues and access to the high scale of waste. Another income comes from sales segregated waste fractions and soon the new products will give another source of income by selling them through wholesale shopping network

RAZEM DLA ŚRODOWISKA

When two local neighboring communities want to combine their resources to tackle climate changes at the local level and create job opportunities for the most excluded people.

PROBLEM

Mass production of waste in Poland became huge challenge for politicians, not only at the national level, but also at the local level. Linear economy generates lots of problems for people untill the environment at all. The future of planet depends on how we organize life circle of products, but even when if we transform linear economy into circular economy there will be some waste.

SOLUTION

Pure waste generated on the local level by households is still a challenge for local communities, especially when they want to increase waste segregation in different fraction and limit as much as possible a level of waste on the landfill. Social Cooperative made it by continuous education of local members of the community, starting from schools till elderly part of communities, organizing of the local events, collecting segregated waste from households and creating an efficient ecosystem of entities who helps organize different wasted stream into raw materials.

BENEFITS

Waste management at the local level is still a challenge. Especially in small and rural communities where residents haven't done it before. The services strengthened local economy by offering local job opportunities for the most excluded persons, gave full education why and how segregate waste or even minimalize the waste stream by incorporating those values into all members of community. This idea is an bottom-up idea.

CE PRINCIPLES

Social Cooperative receives income from local municipalities who collect money from their inhabitants for waste collection and waste segregation. Each year the limit of segregation is gradually increased to meet EU directive. Social Cooperative was created to provide those services in the field of municipal economy, satisfying the needs of the local community, raising a level of ecological awareness and shaping ecological attitudes of the society. Additional value of this cooperation is giving a job opportunities to the disadvantaged members of the community.

RZGÓW COMMUNAL SERVICE COOPERATIVE

HTTP://KOMUNALKARZGOW.PL/

The time to contain linear economy is when you want to change behavior of people, when you want to transform waste management economy into circular economy and create new jobs opportunities for people in need. This local Social Cooperative is a precious recipe for local challenges.

PROBLEM

Mass production of waste in Poland became huge challenge for politicians, not only at the national level, but also at the local level. Linear economy generates lots of problems for people untill the environment at all. The future of planet depends on how we organize life circle of products, but even when if we transform linear economy into circular economy there will be some waste.

SOLUTION

Social cooperative Komunalka Rzgów was established in 2016. The cooperative currently employs the most disadvantaged people form local community, amongst them long-term unemployed and people with disabilities. The main activity of the cooperative is the collection of mixed and segregated waste from residents of the Rzgów municipality. In addition, the company operates in the maintenance of green areas and cleaning services, provides courier services and repairs road using destructive materials from waste.

BENEFITS

The Municipality as a main customer advises others who are looking to replicate this practice as it helps to achieve social policy and environmental objectives through organizing this entity on the local level. Each unemployed member of the local community can have a job opportunity in social cooperative. At the same time local municipality gain solid contractor who helps to get environmental objectives at the local level. It improved recycling, reuse and recovery of municipal waste.

CE PRINCIPLES

Social Cooperative receives an income from local municipality based on public contracts. Through involvement in public procurement, the social cooperative Komunalka Rzgów is strengthened, helping to ensure the sustainability of their programmes and projects. The cooperative employs people who were members of a socially marginalized group. Integrating people from marginalized groups into the labour market, as well as improved recycling, reuse and recovery gives huge benefits to local community. The replication or transferability of this good practice is possible for other organizations, other sectors or other local municipalities.

EKORAY

WWW.EKORAY.SK/

Ekoray started its activity 25 years ago specializing for electric waste. Since that time the company spread its activities to resource efficiency in biomass and private research centre is searching for own products.

EKORAY comp, Námestovo, Slovakia

PROBLEM

Old and non-functional electrical equipment is an important source of production for secondary raw materials. Electrical waste does not belong in the containers intended for mixed municipal waste, as the electrical waste contained in them usually goes to a landfill. Due to the weather, hazardous and toxic substances are released from electrical waste, which subsequently contaminate the soil, groundwater and air. Another problem is the rare minerals used in electronics. Many of them come from countries where human rights are not respected.

SOLUTION

The company Peter Bolek – EKORAY is one of the leading processors of electrical waste not only in the Slovak Republic. Its priority is to ensure the production of the purest possible output materials that are reusable in the production of new products.

BENEFITS

The community of Námestovo town recognized the advantage of having highly professional services in solving the problem with the bulk waste. Thanks to its position in core part of industrial park EKORAY is open to start cooperation not only with the municipal waste treatment company but creating the business contacts to various in region located businesses and entrepreneurs EKORAY is solving the problem with by side products and waste from surrounded industrial producers as the focal point for emerging whole industrial ecology. EKORAY is known as the pioneer in using circularity as social economy green jobs for disabled employees.

CE PRINCIPLES

In process of recycling the electro waste EKORAY is mining whole scale of other non-precious metals as well as other material in purity close to the virgin material. As because the process of recycling is done by labour force the quality of secondary materials (mainly plastics) reaches the standards which makes the material affordable for new products – which makes EKORAY reasonable material supplier for SMEs and big producers. Beside of this EKORAY is creating its own list of products based on secondary materials once again enlarging the products portfolio of this company as one of first runners in circularity in Slovakia.

RETUNA

HTTPS://WWW.RETUNA.SE/

ReTuna Återbruksgalleria is the world's first recycling mall, revolutionizing shopping in a climate-smart way. Old items are given new life through repair and upcycling. Everything sold is recycled or reused or has been organically or sustainably produced.

PROBLEM

The management of household and clothing waste entails various undeniable costs. Collection costs are becoming increasingly high, and include all the stages of waste generation (purchase of raw materials, energy, packaging that becomes waste) right up to its management (transport, treatment costs, sorting, storage, etc.). Landfilling leads to landscape degradation (land use, visual and olfactory pollution, etc.). The decomposition of waste releases methane and toxic elements that contaminate the soil and groundwater. Finally, the incineration of waste releases toxic substances that are dispersed in the air and then end up in the soil and water.

SOLUTION

Eskilstuna Municipality strives to be a green role model. In its environment-related development work, the idea came about to open a mall that had "regular" shops, but with a reused and upcycled range of products. The concept would attract a broad target group, and spread knowledge about sustainability and circular economy. Local government politicians decided to turn the idea into reality, and construction of the project began in August 2014. ReTuna Återbruksgalleria opened its doors to the public on August 28, 2015
ReTuna organizes events, workshops, lectures, theme days, and more – all with a focus on sustainability. The folk high school Eskilstuna Folkhögskola conducts its one-year education program "Recycle Design – Återbruk" on the premises. There are also conference rooms, where guests can hold climate-smart meetings. Organic lunch and baked treats are on offer at Café Returama.

BENEFITS

It is easy for visitors to sort materials they are discarding into the containers and then drop off reusable toys, furniture, clothes, decorative items, and electronic devices in the mall's depot, called "Returen". In the depot, staff from AMA (Eskilstuna Municipality's resource unit for activity, motivation and work) perform an initial culling of what is usable and what is not. The items are then distributed to the recycling shops in the mall. The shop staff then perform a second culling, where they choose what they want to repair, fix up, convert, refine – and ultimately sell. In this way, the materials are given new life. In 2018, ReTuna had SEK 11.7 million in sales for recycled products.

CE PRINCIPLES

The two ReTuna stores are run by the municipality-owned company Eskilstuna Energi och Miljö EMM whose task is to support competitive organizations in the energy and environmental sector. EEM shall deliver optimal benefit to customers and residents – with minimal impact on the environment. The goal is to serve as a role model and source of inspiration in relation to energy and the environment and to create sustainable societal benefits for current and future generations. EEM works within six business areas: Electrical Grid, Electricity Market, Water & Sanitation, Recycling, Energy, and Marketing & Sales.

VÄRT

HTTPS://WWW.VARTSWEDEN.COM

VÄRT was founded in 2016 in Gothenburg with the conviction that the challenges the future holds will be overcome with insightful knowledge of sustainability. Starting out, they were trying to manage the food waste from a handful of wholesales but they soon realized that we needed to stop handling food waste and start solving food waste.

PROBLEM

Food waste is food that has been produced with the intention of becoming food, but for various reasons is not eaten or consumed. Most food waste occurs in households, but the food is unnecessarily discarded throughout the food chain for a variety of reasons.

SOLUTION

They offer consultancy to reduce food waste, starting from the product design. They provide companies with new strategies, packaging alternatives, concepts and solutions. Moreover, VÄRT offers inspirational interactive lectures about sustainable product development, circular economy, social gastronomy and the major sustainability challenges our society is facing.

BENEFITS

They offer catering services for events, using food waste coming from retailers located close to them. They produce products made out of food waste and sold through their channels of distribution. They offer consultancy on product design and workshops.

CE PRINCIPLES

End-users can buy low-impact products and can learn more about how to save food along the transformation chain.

PURE WASTE

HTTPS://WWW.PUREWASTE.COM/

Pure Waste is 'rag-and-bone man 2.0' for the modern era of the circular economy: at the core of this business is upcycling, the sourcing of discarded textiles and their repurposing into new products.

PROBLEM

Cotton farming and the dyeing process burden the environment by consuming vast volumes of water and chemicals, and crops take up large areas of land. Purchased clothes get relatively little wear - they have become almost disposable. Whereas previously prices were determined by textile manufacturers, today they are ultimately dictated by the consumers. Low prices mean lower quality and clothes are discarded quickly.

SOLUTION

Pure Waste recycles waste from the textile industry into new material and garments. The company produces yarn from cutting waste sourced from India's largest tricot production region and waste from yarn producers. Cutting and yarn waste is broken down into fibres and spun into new yarn. The recycled yarn is then used to sew or weave fabric. Pure Waste sells these yarns and fabrics and uses them to manufacture clothes primarily for labels and retail chains.

BENEFITS

Pure Waste buys the recycling materials by the kilo, and they are considerably cheaper than virgin cotton fabric. The company's revenue comes from the sale of yarn, fabric and finished garments. Its largest customers are B2B companies, consumer brands and retail stores, and Pure Waste also has its own store and an online shop. For business customers, Pure Waste offers material options, a manufacturing process and product design and/or consulting services.

CE PRINCIPLES

Consumers can buy high-quality, 100% recycled products. Business customers can design products made from responsibly sourced material. Sustainable textiles can be used as a value proposition in marketing. Buying a Pure Waste T-shirt instead of one produced by conventional methods can save up to 2,700 litres of water.

AMERPLAST

HTTPS://AMERPLAST.COM/

Amerplast uses plastic waste from consumers and industry as raw material for plastic bags, thus helping conserve the environment and lowering manufacturing costs.

PROBLEM

An enormous amount of plastic waste is produced around the world. It has been estimated that by 2050, there will be more plastic than fish in the seas. It has been also estimated that a total of over 100 tonnes of plastic packaging waste enters the Finnish market each year. Plastic is made predominantly from non renewable fossil fuel: oil. Much plastic packaging contains various types of plastic, which makes plastic recycling challenging at times. The dirtiness of plastic also hinders recycling.

SOLUTION

Amerplast produces ESSI Plastic Bags from polyethylene separated from recycled plastic. Of the raw materials, half come from plastic collected from consumers via separate sorting points and half from packaging materials from Kesko's warehouse. Plastic waste is sorted and separated for various types of use at the Fortum processing plant. Amerplast purchases melt-ready polyethylene fractions separated from plastic waste to use as a material for its plastic bags. Used bags can be completely recycled again, except for their print colours.

BENEFITS

Amerplast sells recycled ESSI Bags to leading retail sector stores. The company pays Fortum for the raw materials for its recycled plastic bags, but the use of recycled plastic costs the company less than the use of new fossil fuels. The company's objective is to also develop other products solely from recycled plastic. The development of the recycled plastic solution supports Amerplast's future business opportunities, as it facilitates better material efficiency and the reuse of plastic.

CE PRINCIPLES

Numerous retail stores already purchase the ESSI bags, but only Kesko both supplies and sells the ready products. This solution allows Kesko to increase the share of recycled packaging waste at its central warehouse and to offer its customers a more sustainable plastic bag option. Other retail sector companies can also sell the ESSI plastic bags, and in this way, minimise their environmental footprint. By sorting plastics from other waste and putting them into plastic recycling bins, consumers can better recycle their waste for reuse.

GOLD&GREEN FOODS' PULLED OATS

HTTPS://GOLDANDGREENFOODS.COM/

Gold&Green Foods' pulled oats have taken the market by storm. Pulled oats provide a healthy and environmentally friendly source of protein without compromising on taste.

PROBLEM

The mass production of meat is problematic with respect to land use, animal rights, water consumption and carbon dioxide emissions. However, production continues to grow, as living standards continue to rise in many countries and more people that have traditionally favoured vegetarian diets choose to eat meat.

SOLUTION

Pulled oats developed by Gold&Green Foods combine all the nutritionally important amino acids, and the product is made of sustainable raw materials: oats, beans and peas. The most nutritious parts of these plants are used. Growing the raw materials for pulled oats requires considerably less water than meat farming. For example, it has been estimated that the current production capacity of pulled oats could have saved seven billion litres of water annually if pulled oats had been preferred to beef.

BENEFITS

Distributors and large retail chains as customers gain an easy plant protein product that has become familiar to consumers and has been a great success since its initial launch. For consumers, pulled oats are an easy, fast and nutritious non-meat alternative, regardless of whether the choice was made for health or environmental reasons.

CE PRINCIPLES

Gold&Green Foods is a technology company whose Finnish plant produces patented products for the Finnish market and for export. In addition, the company licenses their product's manufacturing technology and brand of pulled oats to other producers, enabling its products to enter the markets faster without large export organisations or building more production plants. The company's own production facility also enables continued product development.

ZENROBOTICS

HTTPS://ZENROBOTICS.COM/

After the mining industry, the construction industry is one of the largest producers of waste. Some construction material ends up in landfills because of insufficient waste sorting. ZenRobotics develops and sells waste-sorting robots, which reclaim various materials from waste and put them to use.

PROBLEM

A huge amount of recyclable waste ends up in landfills or goes to incinerators. The low value of waste materials results in waste sorting by hand being unprofitable. The problem with mechanised waste-management facilities is that they have traditionally required a lot of financial investment and the facilities are not always able to adapt their operations in accordance with rapidly changing legislation, the price of waste materials and sorting needs.

SOLUTION

ZenRobotics develops and sells waste-sorting robots based on artificial intelligence and sensor technology , which separate different materials for reuse from waste. Whereas before, wood materials, for example, were separated from waste using outdated methods, now the robot is able to sort clean and unpainted wood, painted wood and impregnated wood into different piles. More precise sorting increases the opportunities for reusing waste materials. Over 95% of the waste materials that arrive at waste-treatment facilities equipped with robots can be sorted for recycling.

BENEFITS

Sorting provides lower waste-treatment costs for customers: less waste has to be delivered to landfills or incinerators. In addition, income can be generated from reused, sorted waste. Not as much usable material goes to landfills and natural resources are not wasted.

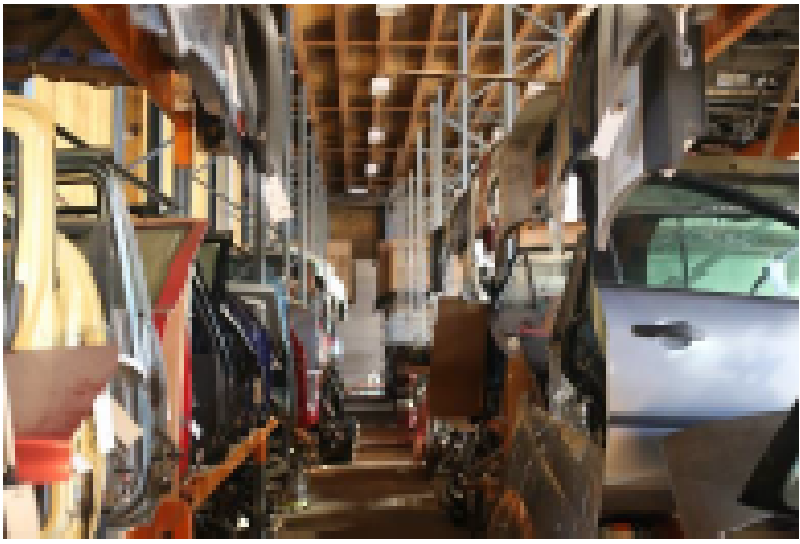
CE PRINCIPLES

The company sells equipment to waste-treatment facility operators that process waste. Alternatively, a plant-building contractor can sell the ZenRobotics solution as a part of the waste-treatment facility being built for their customer. Currently, ZenRobotics focuses in particular on sorting construction waste, but other waste categories offer significant opportunities for the future.

CAR WRECKERS

HTTPS://WWW.CARWRECKERS.COM/

Car wreckers demolish cars that are no longer used and salvage useable parts as spares. Metal is recycled and spare parts are sold. In addition, any hazardous wastes are disposed of accordingly.



PROBLEM

The automobile industry has a great deal of environmental effects. Metals, oil based products, such as rubber and plastic, and electronics are used in car manufacturing, which consumes natural resources. Mining and refining metals destroy natural habitats, whereas the electronics industry uses metals and hazardous chemicals. Also the manufacturing of oil based products consumes chemicals and unrenewable resources. The car manufacturing industry consumes a lot of energy.

SOLUTION

The parts of retired vehicles have utility and should not be wasted. The sale of used spare parts reduces the need of producing new spare parts, thus decreasing the environmental effects. The viable spare parts continue to exist for the purpose they have been made for.

BENEFITS

A wrecker's yard accepts obsolete vehicles. Cars usually cost nothing to the wrecker, so the only expenses are the demolishing costs. Sometimes the customer has detached the spare parts in advance, in which case the profit margin is even better. In addition, the car wreckers are compensated for the recycling of the metal junk. The more cars that are demolished, the better the employment effect is in the field. Renewing the vehicle fleet also removes the more polluting vehicles from traffic use.

CE PRINCIPLES

The spare parts from car wreckers are considerably cheaper and classified by quality. Demolishing is done always in a professional manner and according to environmental regulations. The compatibility of original spare parts is guaranteed and is economically acquired from a wrecker. Car wreckers often have parts in stock where they are easy to access and find, even get them delivered. After bringing a car to a wrecker, the customer receives an official certificate of decommission.

GLOBE HOPE

HTTPS://GLOBEHOPE.COM/

Globe Hope differentiates itself by using high-quality design to make use of discarded materials. The products are not only ecologically sustainable but also individual and cleverly designed. Globe Hope stays with its products over their life cycle by repairing and reselling them.

PROBLEM

Textile production burdens the environment by consuming vast volumes of water and chemicals, and crops such as cotton take up large areas of land. Moreover, synthetic fibres like polyester are often oil-based and therefore environmentally unsustainable. There are also problems in the textile industry regarding human rights and the provision of humane working conditions. Good-quality textiles are often used for less time than they would actually last.

SOLUTION

Globe Hope manufactures functional design products from various discarded materials, such as surplus army textiles, canvas, advertising materials and safety belts. Most of the products are destined for companies, but some are also sold via retailers and Globe Hope's own stores. A customer company supplies a large quantity of one material, and Globe Hope then designs and manufactures products such as corporate gifts and sells them back to the customer. Reusable materials are recovered, and the need for virgin raw materials is reduced.

BENEFITS

Globe Hope's cash flow comes from the sale of manufactured products. Approximately 65% of its sales are B2B sales. The company receives materials for free or buys them depending on the need. The product design and material processing are the most valuable parts of the process.

CE PRINCIPLES

Corporate customers can reduce their waste and disposal fees by offloading their surplus materials to Globe Hope for repurposing. Consumers are increasingly keen proponents of a sustainable lifestyle, also buying into the story of the material. All Globe Hope products are designed with sustainability in mind: each product comes with a warranty, and the company offers a repair service. Used Globe Hope products can be brought into a store for resale in exchange for a gift voucher.

TRACEGROW

HTTPS://WWW.TRACEGROW.COM/

Agriculture is not the first thing that comes to mind when considering what could be done with used batteries. Nevertheless, Tracegrow has developed a cost-effective method for capturing minerals from used alkaline cells. These can be used on fields as nutrients, which helps to reduce the need for virgin minerals extraction.

PROBLEM

Alkaline batteries often end up in landfills where they pollute the environment. They containzinc and manganese, which are extracted as non-renewable virgin resources by mining and refining. Refineries and end-product technologies require expensive investments. The sorting and recycling of alkaline batteries disposed of by consumers generates vast volumes of alkaline mass. The mass contains manganese and zinc, which are difficult and expensive to recover with current methods.

SOLUTION

Alkaline batteries are collected, sorted and crushed. The new technology developed by Tracegrow enables the recovery of a mineral compound which contains zinc, manganese, sulphur and potassium. The mineral is diluted and spread onto fields in conjunction with irrigation or pesticide application to give crops a boost. Global population growth and the loss of arable land mean that increasingly high yields will be required. The manganese-zinc mineral compound manufactured from recycled material is an efficient and environmentally friendly solution.

BENEFITS

The mineral product can be offered to a growing market: the value of the global market is estimated to reach €13 billion by 2021. The sale and licensing of technologies will represent a significant part of the business.

CE PRINCIPLES

Minerals produced from recycled materials are an environmentally friendly and competitively priced alternative. Their use in agriculture is environmentally more responsible and thus good for image. Virgin manganese reserves are limited, and the availability of recycled manganese will help to protect against highly fluctuating prices and ensure price stability.

HELSIENI

HTTPS://WWW.HELSIENI.FI/EN/HOME/

Helsieni provides coffee drinkers with a novel method for using coffee grounds as a cultivation platform for mushrooms. This solution helps consumers reduce waste while also producing truly sustainable local food.

PROBLEM

Many people throw out waste that could be used as a breeding ground for food. For example, coffee grounds from a Finnish-style coffeemaker are usually put either into the regular waste or into biowaste containers. At the same time, the need for alternative, sustainable protein sources for meat is increasing as the world population, and therefore also the need for protein, grows. Local protein production is needed to diminish the emissions from food value chains.

SOLUTION

Helsieni grows oyster mushrooms on used coffee grounds. The company sells both mushrooms and do-it-yourself kits to anyone who wants to grow mushrooms themselves. The mushrooms are sold directly to restaurants in the Helsinki area and the DIY kits are sold in recycled plastic containers that Helsieni collects from the restaurants. For the kit users, the company provides the mushroom spawn that is needed for growing the mushrooms in the kit as well as growing instructions, and the customers use their own coffee grounds. Oyster mushrooms are one of the fastest growing mushroom species and can provide a local, sustainable source of food.

BENEFITS

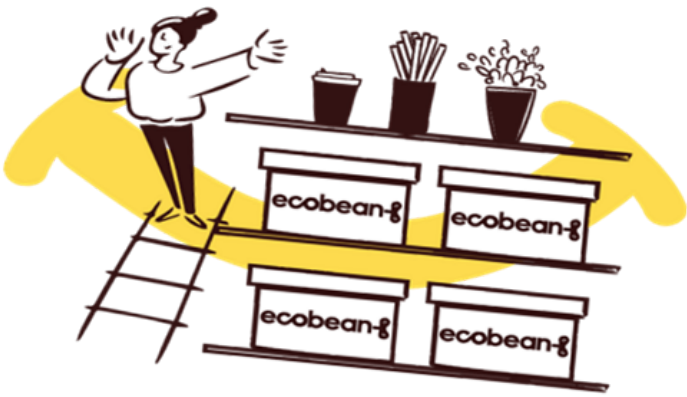
Mushrooms are one of the most carbon-neutral sources of food and growing them on coffee grounds can even make them carbon negative. Being able to replace meat with much healthier mushrooms is one obvious benefit the products have for Helsieni's customers. Also, the amount of organic or regular waste is decreased when using waste as a growing ground, therefore decreasing the costs and emissions from waste. If eating mushrooms becomes more popular, it can also bring new jobs to people who want to grow and sell them.

CE PRINCIPLES

The company's business model is based on growing and selling the mushrooms and putting together and selling the self-starter kits. The mushroom spawn is sourced from the Netherlands and the plastic containers are given to Helsieni for free by restaurants. The biggest cost source for the company is labour. The business model allows Helsieni to really know its customers, as they sell locally. Local food is also a growing trend.

ECOBEAN

HTTPS://ECOBEAN.PL/



Ecobean is an initiative that brings together partners interested in finding innovative ways to turn used coffee grounds into something that can later be recycled so that this production dependency loop doesn't run out. By doing so, the coffee industry has the opportunity to significantly reduce its CO2 footprint.

PROBLEM

The International Coffee Organization has released data showing that some 10 million tons of coffee beans are produced annually worldwide. If one were to make a beverage from this entire crop, one would be left with the same mass of grounds after the process, but increased by the content of water unfiltered from them. The waste generated in this way, unfortunately, is not environmentally neutral, as it generates methane, which is the second largest contributor to climate change after carbon dioxide.

SOLUTION

The creators of Start-up EcoBean have come up with an idea on how to manage the huge amount of grounds generated by a business, which doesn't have to end up in a landfill at all. They convince that it is a valuable raw material that can be turned into, for example, coffee oil, antioxidants, lignin, eco-friendly briquette for the fireplace, tiles, biodegradable pots, cups and packaging, or straws.
he first product based on coffee grounds offered by EcoBean, is an environmentally friendly fireplace briquette. As it is pointed out, the briquette made from coffee has many advantages, among which is the production of up to 20% more energy than wood briquettes, and it leaves less ash and burns longer. The grounds are often used as a filler or building block, as it is possible to replace plastic in a certain part with them. The grounds are a biodegradable building block from which EcoBean offers pots. Antioxidants from grounds, as much as possible, are suitable for use in the cosmetics industry.

BENEFITS

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BUSINESS MODEL

PRODUCT AS A SERVICE

A company can decide to sell a service rather than a product. Service in this case means that the customer is using a product, which is still owned by the company. The company promises to ensure that the product will continue to be flawless.

When buying a service, the customer does not pay a market price for the product. They pay for the benefit they wish to receive in using the product. For instance, a factory may pay for a company for ensuring a functioning lighting in its facilities. The customer does not buy lamps but instead pays a monthly fee for the service. A company operating in this way creates more close and long-term customer relations than a company simply selling its products. It also creates cashflow for a longer period than product sales. The company is responsible for the maintenance and repair of the product, which is why they want to manufacture only long-lasting quality products.

If a customer no longer wants a certain product, the company takes it back and can deliver it to another customer. Thus, products are not required to be manufactured constantly. A customer finds it useful that they do not need to invest in acquiring a product and can also get rid of it when the product is no longer needed. A product can be linked with a digital solution, which collects data on how the product is used. The data can be used to develop even better products.

Source: Sitra

GROVER

HTTPS://WWW.GROVER.COM/DE-EN

Choose the technology you want when you need it. Select the number of months you want it:

- Rent it.
- Simply, flexibly and sustainably.

PROBLEM

In 2018 nearly 853,124 tons of electrical and electronic waste were collected in Germany, 772,934 of it from households. This is the equivalent of 9.31 kilograms per capita and year. The remaining 80,190 tons came from businesses.

SOLUTION

Grover allows you to rent electronic equipment by the month. Select the number of months you want to rent. Place your order and make your first payment. At the end of the minimum rental period, the customer returns the product with a free return label. Grover takes care of the processing and quality control of the device in their warehouse. Once these checks have been carried out, the product is once again available for rental to a future.

BENEFITS

The first month's rental is paid at checkout, then we will invoice you monthly on the anniversary of the date you receive your product. In case of damage, we cover 90% of the repair costs. Want to keep it longer? Continue paying monthly after your minimum rental period, switch to a longer plan to save money, or even buy your technology, etc.

CE PRINCIPLES

Grover's rental system allows the customer to choose to use electronic goods only for a desired duration. Once the customer is tired of the product, they can return it and rent another one that better suits their current needs. Grover allows both private and business customers to rent.

SWAPFIETS

HTTPS://SWAPFIETS.DE/EN-DE

For a fixed monthly fee, you will get an always working bike. Need a repair? Swapfiets will fix your bike within 48 hours.

PROBLEM

In 2020, 4.5 million e-bikes were sold in the EU and the UK, representing one fifth of the total number of bicycles sold. But what is the point of always buying new when there are already thousands of second- hand bikes? Also, the founders realized that it was too complicated to repair bikes that were so different from each other. So they decided to move towards standardized products.

SOLUTION

1. Log in: Choose your city and the model of your dreams.
2. Make an appointment: Collect your new speedster from one of the Swapfiets shops or have it delivered to your home within 48 hours.
3. Broken something?: If you need its help, you can reach them via the Swapfiets app or its customer service.

BENEFITS

Swapfiets rents its bikes in 9 countries and 65 cities and has 250,000 subscribers. The company believes that its experience gives it a significant advantage over the competition. The company is launching a new, more affordable electric bike with no gears. A monthly subscription from each user allows Swapfiets to make regular income.

CE PRINCIPLES

This service allows you to use a bike only for the time you want. Swapfiets takes care of repairs and new bikes in case of theft within 48 hours. It offers new and returning students and trainees up to two months free membership. Customers can choose between different types of bikes, electric or not.

4F CHANGE

HTTPS://4FCHANGE.COM/

Fashion industry experts agree: the disposable clothing culture is killing the planet. Ecology is not a temporary trend. 4F is aware of the impact of clothing brands on the environment and has taken responsibility for its actions. This is its new motivation.

PROBLEM

The fact is that the fashion industry emits as much as 1.2 billion tons of carbon dioxide into the atmosphere every year. This is more than the maritime and aviation industry together. According to the World Economic Forum in its report from 2021, fashion and its supply chain are the third largest polluter in the world. It emits as much as 5% of global greenhouse gas emissions. About two-thirds of the carbon footprint comes from fiber production. As much as 65% of the total clothing is made of synthetic fibers, which are non-renewable and, in addition, come from crude oil. More than 300 million barrels of crude oil are used annually to produce these fibers (mainly polyester and nylon).

SOLUTION

People go skiing only once a season and don't want to invest in expensive clothes? Or maybe it will be first time and you are not sure if you will like it? Instead of buying, you can check out accessible ski outfit rental and choose something for yourself. Do not buy, just rent it. The clothes will serve customers as long as possible, ensuring comfort and warmth. They spend the whole winter in the mountains, so take care of them so that other people can enjoy them as much.

BENEFITS

4F Change swaps revenue receiving model from selling to renting. The clothes that are put in the rental shop are new. In the winter season, they will serve customers, and after its end, are refreshed and repaired, they will go to the second circulation under the 4F Change program and will be available for purchase in Wear_Fair zones.

CE PRINCIPLES

The 4F Change project started from the bottom up. It was the employees who felt that it was time to change and began to look for socially responsible solutions. The customer got further development of the circular model, access to sale of clothes in the second circulation categories: RENEWED, REPAIRED, UPCYCLED and REVIVED, both in stationary stores and online. Lately end user got another service: clothes repair service. The planet and communities gained another initiative which collectively save the planet.

SIGNIFY

HTTPS://WWW.SIGNIFY.COM/GLOBAL

The light – essential and initial moment of society. The vision and mission of SIGNIFY is grounded on purpose to unlock the extraordinary potential of light for brighter lives and a better world.

PROBLEM

While abroad the topic of energy poverty is a real, mapped agenda with possible solutions, in Slovakia it is still taboo. Slovakia does not have comprehensive data, a competent authority, solutions or even a clear definition of energy poverty. Therefore, organizations that collect information directly from the field and offer their practical experience try to solve the situation proactively. Municipalities can play a key role in addressing this issue through the knowledge of the population, the housing stock and the ability to represent the interests of their citizens.

SOLUTION

We design lighting solutions tailored to your business needs, which are clearly defined in the form of key performance indicators (KPIs). You no longer have to buy a lighting system. You can easily pay for the light you use, and thus ensure financial flexibility from the beginning.

BENEFITS

Over the past 125 years, Signify has been behind many key breakthroughs in sustainable lighting and has been the driving force behind several leading technological innovations, including LED technology.

CE PRINCIPLES

Sustainability is part of Signify's DNA. Our mission is to unlock the exceptional potential of light in order to brighten human lives and ensure a better world. By changing the way light is created and used, we can improve lives and positively impact the entire planet. These solutions cover everything from design and installation to operation and maintenance.

HOUDINI

HTTPS://HOUDINISPORTSWEAR.COM

Everlasting Sportswear

PROBLEM

Fashion production makes up 10% of humanity's carbon emissions, dries up water sources, and pollutes rivers and streams. What's more, 85% of all textiles go to the dump each year. In addition, many types of clothes are difficult to recycle because they are made out of different materials.

SOLUTION

Houdini produces sustainable sportswear. Each piece is made out of one and only material, at the end of their using cycle they are easily recyclable. The garments made out of wool are 100% compostable since they are made of natural materials. Houdini offers a service of reparation in case some parts of the garments are damaged, the reparation is simple because the design itself is elementary. They offer moreover the possibility to rent the garments if you need them only for a shorter period. In the retail shops, there is a corner where Houdini´s customers can buy second-hand Houdini´t products.

BENEFITS

The users can either decide to buy new or second-hand garments inside the Houdini's retail shops, but they can as well rent them for a shorter period.

CE PRINCIPLES

In case you buy a garment you can use it forever, since it is easy repairable. In case you want to use a highly technical equipment for a shorter period, you can simply rent it. If you want to buy it but you don't want to spend too much money you can try to find second-hand garments.

FREELWAY

HTTPS://WWW.FREELWAY.COM/

Much more than a car sharing service.

PROBLEM

On average, a car in Sweden stays parked 95% of the time. Smarter use of circulating cars can reduce the consumption of public spaces.

SOLUTION

Initially focused on a sharing service where individuals help each other. In 2015 and 2016, the service was developed with input from the municipalities of Vingåker and Uppsala. In the last years, they changed the target group from private individuals to goods within and between organizations/businesses.

In 2018 and 2019, the target group and the scope of use were broadened to include the coordination of passenger transport with a carpooling service. The passenger transport service was broadened in 2019 to also integrate with public transport and one can be complemented with digital bookings of on-demand transport (call controlled).

BENEFITS

The users can either decide to subscribe monthly or to pay for the single transport.

CE PRINCIPLES

Freelway allows the customer to use shared transport instead of buying a car for the transport of persons and goods.

LINDSTRÖM

HTTPS://LINDSTROMGROUP.COM/

Lindström retains ownership of uniforms to the end of their life cycle. In this way, it can ensure that uniforms are used optimally and their rotation between different customers is managed efficiently. The advanced service model has allowed the company to expand into new countries.

PROBLEM

Work uniforms tie up companies' capital, and their management is often far removed from the company's core business. Value is lost when uniforms are discarded or replaced too early in their life cycle.

SOLUTION

In the service offered by Lindström, work uniforms are taken to a regional service centre for maintenance at regular intervals, and a new set of uniforms is delivered to the customer. The uniforms feature RFID chips which are used to collect data on the clothes in order to optimise the customer/user experience. Over their life cycle, garments are allocated to appropriate applications – as work uniforms or for other purposes – based on their condition. As the owner, Lindström has an interest in maintaining the garments in good condition to ensure a long useful life for them.

BENEFITS

A typical contract term is three years, which ensures steady revenue streams for Lindström. It also gives Lindström opportunities for cross-selling other services, such as carpets and personal protective equipment. The business model supports high levels of customer retention and satisfaction..

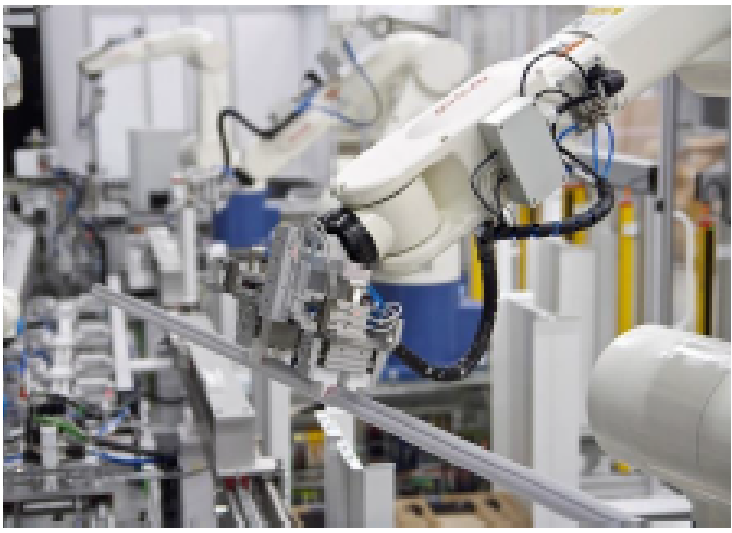
CE PRINCIPLES

Companies do not have to tie up capital in work uniforms or allocate resources to their management and maintenance. Customers have easy access to clean, serviced, safe clothes that meet the required quality standards. Management becomes easier with a joined- up operating model and streamlined costs.

VALTAVALO

HTTPS://VALTAVALO.FI/EN/

Valtavalo sells light instead of light bulbs. The product is a service, which means that the company is committed to the product's longevity starting from the design stage. Valtavalo's service model conserves energy and helps customers save on lighting costs. The customer pays for the service based on the savings. The financing partnership which enables Valtavalo's business model is an integral part of the solution.



PROBLEM

Lighting accounts for a significant part of the energy consumption and costs of business facilities. How can they be reduced, when conventional fluorescent lamps offer poor energy efficiency?

SOLUTION

The standard service model includes initial mapping and the supply of lighting sources. Installation and maintenance services are optional. An energy-efficient, environmentally friendly Valtavalo G4 long-life LED tube is installed in the existing light fittings. The solution also makes it easier to manage larger lighting systems.

BENEFITS

Valtavalo sells led lightbulbs and lighting service. The service agreement period ranges between three and five years. Thanks to the financing partner, Valtavalo immediately receives income on the products included in the service. The products are identified by serial numbers, which means that the finance company can repossess the products easily, if the user does not pay the instalments.

CE PRINCIPLES

The service requires no initial investment outlay, and the monthly service charge can be offset by the savings provided by the service. The service can reduce lighting costs by up to 50% – the charge is less than the customer's previous electricity bill. The monthly service charge is tax-deductible and easy to budget for. Outsourced installation and maintenance costs also lead to additional savings. There are no unexpected maintenance works or repairs.

TAMTURBO

HTTPS://WWW.TAMTURBO.COM/

Reliable availability of compressed air is important for the industry. The production facilities often have old compressed air technology which requires oil and maintenance. Tamturbo has developed a new compressor technology that allows it to produce compressed air without the use of oil. The technology is sold as a service.

PROBLEM

Industry uses compressed air as a source of power for automation and machines. Reliable availability of compressed air is often so important that there must be at least two air compressors in production facilities. The environmental load of devices is increased because most air compressors are oiled, and even the instruments in “oil-less” compressors require oiling. Additionally, oil-less screw compressors are expensive to maintain and break easily as a result of their complex structure and rapid erosion.

SOLUTION

Tamturbo sells compressed air as a service for the needs of industry. The company has developed a new compressor technology that allows it to produce compressed air without the use of oil. The compressor is based on a high-efficiency electric motor with a magnetic bearing, in which the rotors do not mechanically come into contact with one another. As a result of this, the compressor does not require oil, its parts do not suffer from wear and it can be used for long periods without maintenance. The technology also saves approximately 15% in energy consumption compared to old oil-less screw compressor technology

BENEFITS

Tamturbo sells both compressed air as a service and compressors to its customers. In the compressed air as a service model, customers are charged on the basis of the amount of compressed air indicated by the airflow gauge. When an agreement comes to an end, Tamturbo can supply the same machine to another customer with a similar agreement.

CE PRINCIPLES

Customers who select the compressed air as a service model do not need to invest in purchasing the device or see to its repair or maintenance. As a result of the absence of repair costs and the energy efficiency of the solution, purchasing the service is a considerably more affordable option for the customer when compared to traditional technology.

INNORENT

The company builds, rents out and supplies its customers with movable facilities that can be used as sports halls, shops or industrial halls, among other things.

PROBLEM

A lot of resources and money are used to construct buildings that last for decades. However, it is not always possible to predict the use of the building very far into the future. For example, societal changes such as migration affect the need to use buildings. Buildings may also remain empty because they no longer meet the requirements for living. Empty buildings consume resources and take up city space needlessly..

SOLUTION

Innorent builds, rents out and supplies to its customers movable facilities to be used as sports halls, shops or industrial halls, among other things. The facilities have steel frames and their joints and automated systems enable them to be easily dismantled and moved. If the customer wishes, the facilities can be used for years, and the possibilities in terms of usage are not greatly different from those provided by permanent buildings.

BENEFITS

Innorent's business operations are based on renting out and leasing movable facilities. The company builds the facilities and the customer pays rent for using them. After the agreement has ended, the company can use the space solution somewhere else. The facilities can be used for a variety of purposes, which makes it easier to rent them again.

CE PRINCIPLES

With Innorent, the customer does not need to own or build the required facilities or wonder about their further use and/or sale after the need for them has ended. In addition, the customer does not need to build new facilities in a situation where the need for the facilities is likely to be only for short term. The solution enables local authorities, for example, to provide services that would otherwise not be possible because of risks related to construction.

REPACK

HTTPS://WWW.REPACK.COM/

RePack's reusable packaging helps reduce waste in online retail. End customers get a rebate for returning the packaging by post, which ensures a high return rate. The packaging products are owned by RePack, and online sellers pay a fee for their usage.

PROBLEM

Postal packaging for online sale items is hardly ever reused. As online trading continues to grow in popularity, the volume of packaging waste increases.

SOLUTION

Customers of online stores can choose this new packaging product as the delivery method. The packaging can be returned to any public postbox free of charge. Each packaging product can be used up to 20 times, which translates to an 80% reduction in the carbon footprint compared with disposable plastic packaging. The service model significantly reduces the amount of packaging waste.

BENEFITS

RePack has leasing agreements with participating online stores. The store pays RePack each time a customer chooses the delivery method. The consumer pays an additional fee of up to €4 depending on the store. RePack also receives commission for customers referred toonline stores through promotional vouchers.

CE PRINCIPLES

From the store's point of view, the service model promotes customer commitment. Stores can brand themselves as zero-waste operators. The consumer receives a voucher for each returned packaging product, which can be used at any participating online store.

NAAVA

HTTPS://WWW.NAAVA.IO/EN/

Naava offers as a service smart green walls that the company monitors and guides remotely on the basis of sensor data. Updateable and modular walls can be moved to new premises once a contract expires.

PROBLEM

There is an increased need to guarantee the air quality and attractiveness of business premises. Addressing these issues requires, for example, replacing air filters, caring for plants and regularly replacing them, and other efforts that are not part of a company's core business. Usually, these services need to be bought separately from several different operators.

SOLUTION

Naava produces modular, intelligent green walls, which purify and humidify the air in addition to having pleasing aesthetic qualities. The company takes care of the green walls and maintains them on the customer's behalf. Naava's automated system remotely controls each unit's operations by using sensor data received from each unit. Artificial intelligence and remote control reduce the number of service visits and the amount of necessary logistics – Naava knows the precise condition of each product and when, for example, water containers need to be filled.

BENEFITS

The green walls are sold to customers as a service for a specified contract period, which may range from a few months to several years. The service package includes the maintenance and quality of the product. Green walls can also be refreshed by changing the lighting, for example. The benefit of the products offered as services is that they can be directly transferred to new premises once the contract ends.

CE PRINCIPLES

The customer does not have to acquire, maintain and service similar solutions internally. The customer receives a product that increases humidity and cleans the air, while also serving as an aesthetic green wall. Offering the products as services encourages Naava to focus on quality, so that the products last a long time. In addition, the product can be acquired for an agreed period, after which the customer can discontinue its use easily. Because of their modularity, Naava's green walls can also be moved if the floor plan or the function of the premises are altered.

MARTELA

HTTPS://WWW.MARTELA.COM/

Martela offers a user-centred work environment as a life cycle service. The life cycle model for offices is a viable business opportunity for both the service provider and the company buying the service.

PROBLEM

Our ways of working are being revolutionised. At the same time, requirements for workplace environments are also changing. Changes caused by digitalisation also have a bearing on our space needs. In the Helsinki area, the occupancy rates of work stations and meeting rooms have fallen to around 50%. Underused spaces are being heated, lit and air-conditioned year round.

SOLUTION

Martela works with the client's staff to define, design and implement work environments that suit the client's strategy and help the company find ways to use its facilities efficiently. The need for different types of workspaces is determined individually for each company on a case-by-case basis. After the design process, Martela oversees the relocation, the delivery of necessary furniture and fittings and the recycling of old ones that are no longer needed. Any furniture that is still in good condition is restored and sold at Martela Outlet. Alternatively, furniture such as electric tables that are still in working order can be restored for the customer.

BENEFITS

Martela sells life cycle management of work environments and office furniture as a service, and customers can also buy individual services such as a work environment specification, design, furnishing and relocation. By expanding into needs-based design, specification and maintenance, the company has been able to offer an unrivalled holistic service to its customers. With the life cycle model, Martela helps customers recycle and repurpose office furniture.

CE PRINCIPLES

More efficient use of office spaces can significantly reduce costs. At the same time, the introduction of a user-oriented work environment enhances workplace well-being, productivity and enjoyment of work. Customers have understood that the work environment is an important factor when trying to attract the best employees. Younger generations in particular value an inspiring workplace environment.

24RENTAL NETWORK

New flexible transportation services combined with public transport. The car-sharing service offered by 24Rent makes cars easy to order by smartphone.

PROBLEM

Privately owned cars sit unused a lot. At the same time, many Finns drive cars that are considerably over 10 years old and produce more emissions than newer cars. In addition, the construction of car parks according to building regulations prevents land resources being put to other uses and increases construction costs.

SOLUTION

24Rental Network rents shared cars. The cars are placed in locations that people frequent and renting them does not require a separate visit to a service desk. With the 24Rent service, the car is booked online, picked up using a mobile phone and dropped off at the pickup location once the customer is finished using it. A majority of the cars are hybrid vehicles. One shared car could replace the need for between 3 and 25 privately owned cars, depending on the evaluation method.

BENEFITS

24 Rental Network's business is based on renting cars on the internet without sustaining physical offices or a large number of employees. This allows the service to be scaled quickly. The company leases the cars, which allows it to avoid committing a large amount of capital to buying cars.

CE PRINCIPLES

24Rent service reduces the need for consumers to buy a car of their own. With 24Rent, the car can be rented in a flexible manner when you need it and with no monthly commitment. At the same time, you do not have to worry about other motoring-related costs, such as maintenance and insurance policies. Relying on a shared-use vehicle instead of a privately owned car is also likely to increase people's exercise levels and the positive health effects that result from more considerate car use.

BUSINESS MODEL

RENEWABILITY

The world economy has generally based on unrenewable resources: crude oil is used for energy production as well as manufacturing plastics and other raw materials. In addition to oil, other fossilised fuels are used, such as coal and natural gas.

Circular economy aims at abandoning oil as raw material or energy source. Energy can be produced by wind or solar power. Materials can be made from renewable resources, such as wood or algae. They are comparable to plastic, but recyclable or biodegradable. They would replace currently used materials, many of which are toxic, polluting and non-recyclable.

The world has a limited amount of unrenewable resources and they are highly sought after. When a company uses renewable resources, it is no longer as dependent on ever more expensive raw materials. Also customers value more and more safe and recyclable products made from renewable materials.

Source: Sitra

KAFFEEFORM

HTTPS://WWW.KAFFEEFORM.COM/EN/

Product designer Julian Nachtigall- Lechner was intrigued by the idea of creating something new and lasting out of supposed waste, so he began experimenting with coffee grounds.

PROBLEM

Coffee is deeply rooted in many cultures and holds the status of the world's most popular drink. Global consumption continues to grow, which means that too much coffee grounds, the leftovers, are being recycled. The waste amounts to about 20 million tonnes worldwide each year. Although not yet sufficiently recovered, coffee grounds are 100% recyclable.

SOLUTION

A collective of bicycle messengers collects used coffee grounds from selected coffee shops and roasting plants in Berlin and takes them to a social workshop. There it is dried and preserved. In small companies in Germany, the material is then assembled and fashioned into cups. Back in the social workshop in Berlin, the Kaffeeform products are given the final touch, packed and sent to cafés, shops and end customers.

BENEFITS

KaffeeForm creates customised editions for companies, cafés or shops. The plain print becomes meaningful thanks to the marbled surface of the natural material. An innovative figurehead or a special gift for customers, employees and partners.

CE PRINCIPLES

KaffeeForm creates customised editions for companies, cafés or shops. The plain print becomes meaningful thanks to the marbled surface of the natural material. An innovative figurehead or a special gift for customers, employees and partners. Our company works closely with local partners such as a social workshop for disabled people, a bicycle courier collective and a social printing company. We work externally and internally as socially, fairly and transparently as possible.

NESTE

HTTPS://WWW.NESTE.COM/ABOUT-NESTE

Currently nearly 80% of the raw materials in Neste's renewable diesel are made up of waste and residues. The life-cycle carbon dioxide (CO2) emissions of renewable diesel are considerably lower compared to fossil diesel.

PROBLEM

Fossil fuels for transport generate vast amounts of carbon dioxide emissions. The earth's resources are limited and competition for raw materials is increasing. Many waste and residue streams are currently underused.

SOLUTION

The majority, nearly 80%, of the raw materials used in the product are waste and residue fat and vegetable oils from the food manufacturing industry. The products offer considerably lower carbon dioxide emissions over a life cycle compared with fossil diesel. The product has been enabled by Neste's investments in research and development in areas such as renewable raw materials and products and the NEXBTL technology. The company has more than tripled its investment commitment in this area in the last 10 years.

BENEFITS

More and more of the net sales and operating profit comes from renewable products, while only ten years ago the figures were close to zero. Neste is the world's largest manufacturer of renewable products made with waste and residue.

CE PRINCIPLES

For consumers, transport businesses, city authorities and distributors, Neste MY is a cost-effective alternative to the increased use of renewable energy and the reduction of carbon dioxide emissions without investing in new vehicles. It also releases fewer impurities into the atmosphere. The fuel is of high quality and odourless, it burns efficiently, is suitable for sub-zero conditions and doesn't require any additional vehicle maintenance. It can be used, distributed and stored in the same way as regular diesel.

HOISKO CLT

HTTPS://HOISKO.FI/?LANG=EN

The cross-laminated solid wood elements made by CLT Finland enable modern and sustainable solid wood construction. Wooden block buildings bind carbon, and sustainable forest management takes care of a renewable source of raw material.

HOISKO

PROBLEM

The traditional concrete construction process produces plenty of carbon dioxide emissions and consumes a lot of energy and resources due to mining and transportation of raw materials. Concrete is made of non-renewable raw materials and it has limited possibilities for secondary use because of its low cost of production and construction quality requirements.

SOLUTION

HOISKO's cross-laminated timber (CLT) elements are manufactured from Finnish solid wood that can replace load-bearing frame materials that are typically made of concrete and steel. CLT elements are non-toxic and lightweight, thus allowing wooden apartment buildings to be built higher. The products can be used in building wooden apartment blocks and detached houses, and in the wooden components of buildings, such as balconies. Wooden construction commits carbon to buildings and reduces atmospheric emissions. The CLT elements have also been designed to fit a variety of uses throughout their lifecycle.

BENEFITS

CLT Finland's revenue model is based on selling CLT panels to builders and manufacturers that equip the panels for specific uses. The company's current revenue model is based on manufacturing and refining CLT panels and providing builders and construction companies with advice and cost-efficient construction. The production's side streams are also utilised, such as waste timber.

CE PRINCIPLES

For the builder, constructing the frame of a building with CLT elements is considerably faster than using traditional, beam-based frames. Highly prefabricated CLT elements also help reduce risks related to weather changes during the construction period. CLT panels are a cost-efficient and durable material. In addition, wood is much easier to work with as a material and serves also as a marketing factor because of its environmental sustainability. Studies show that residents in wooden apartment blocks find their homes more comfortable than those in concrete buildings.

SULAPAC

HTTPS://WWW.SULAPAC.COM/

Sulapac creates fully biodegradable and organic cosmetics packaging to replace plastic. The existing production facilities and infrastructure can be used for manufacturing the packaging. The solution has vast potential to reduce the amount of plastic waste that ends up in the sea.

PROBLEM

Approximately 80 million tonnes of plastic packaging is produced worldwide every year. Up to 30% of plastic packaging ends up in nature, untreated. Microplastics that are released into the oceans harm the ecosystem and ultimately find their way into our food chain. Oil, which is used to make plastic, is also a non-renewable natural resource.

SOLUTION

Sulapac manufactures luxury biodegradable packaging, which can be used for products such as cosmetics. Packaging material is produced using wood chips from certified forests and natural binding agents, which are used to mould the packaging to meet customer needs. The barrier coating material developed for the packaging ensures that the products will be preserved for their intended life cycle.

BENEFITS

Sulapac offers its customers a ready packaging concept, which includes the design of the packaging according to the customer's needs. The comprehensive solution provides a competitive advantage over the competition, as traditionally the packaging design and finishing is the customer's responsibility. Sulapac packaging can also be sold through licenced manufacturers.

CE PRINCIPLES

The biodegradable packaging made of renewable raw materials reduces the environmental footprint of Sulapac's customers. Ready-to-use packaging also helps its customers, who do not have to design the end product's finishing or company markings.

GASUM

HTTPS://WWW.GASUM.COM/EN/

Gasum offers renewable domestic biogas as an alternative to import-dependent non-renewable natural gas. Gasum produces biogas from partners' waste streams and returns it into their product manufacturing processes to be used as supplementary energy.

PROBLEM

The planet has limited resources of farmland nutrients and fossil energy. Traffic emissions will have to be reduced significantly in the coming years to help abate climate change. Industry, agriculture and households produce high volumes of organic waste, which will have to be utilised in new innovative ways, since the landfill disposal of biowaste will soon be banned in many countries.

SOLUTION

Gasum receives community biowaste and slurry, organic secondary streams from various manufacturing industries and commercial operators, and secondary streams from agriculture. The waste products undergo a biological digestion process, which produces biogas and nutrient residue. The biogas is refined into a transportable form appropriate for the intended application, and nutrients are used as they are or processed for application on fields, in landscaping projects or as a replacement for inorganic nutrients for the manufacturing industry. Biogas is used as vehicle fuel, in households, in heating systems and as industrial energy.

BENEFITS

Gasum sells its energy and nutrient products and waste-processing services to customers. By bringing together different markets and identifying node points, the company is able to form partnerships and create new business.

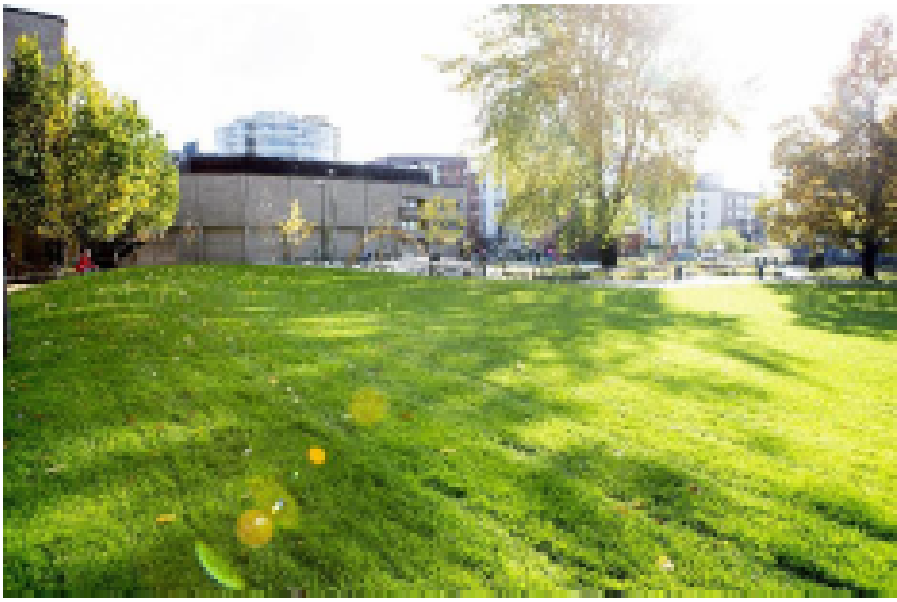
CE PRINCIPLES

Biogas can significantly reduce emissions from vehicles and energy production while giving biowaste a purpose, thus contributing to circular economy targets. Both corporate customers and consumers can reduce their carbon footprint and act in a more sustainable manner, whether as raw material suppliers or product users. In addition, biogas is considerably cheaper than petrol, which consumers will be able to see in their wallets.

KEKKILÄ GARDEN

HTTPS://WWW.KEKKILA-BVB.COM/

Kekkilä manufactures compost fertiliser from organic waste. Its products replace fertilisers made from virgin raw materials, giving long-lasting fertilisation and supporting microbial activity in the soil.



PROBLEM

There is an acute need for solutions to process organic waste produced by local communities and industrial operators. For example, wastewater treatment plants produce high volumes of nutrient-rich sewage sludge from which nutrients could be captured for reuse.

SOLUTION

Kekkilä produces compost fertilisers from organic waste sourced from factory sites. For example, Kekkilä's soil-improving compost, which is made from a combination of biowaste, sewage sludge and grass clippings, is used in its ready-made landscaping substrates. The recycled nutrients are used in growing media in parks and other green spaces. The solution helps to create a closed nutrient cycle and reduces the need for additional nutrients from non-renewable sources.

BENEFITS

Kekkilä sells growing media made from organic waste for various landscaping applications. The company is able to use recycled materials by offering a responsible processing method for problematic organic waste.

CE PRINCIPLES

By using Kekkilä's products, customers are helping to convert waste into new growth in parksand other green spaces. The company's compost products offer long-term fertilisation. They improve water retention and microbial activity in soil, which means happy plants. Microbial activity helps to release nutrients from the growing media at slow rates to better sustain the plants.

AQUAZONE AND EKOLANNOITE

Aquazone and Ekolannoite have developed a solution that cleans the wastewater and a suitable fertiliser, allowing the field to benefit from the nutrients and sparing the water system an additional chemical and nutrient load on the water system.

PROBLEM

The global water situation is constantly deteriorating as a result of pollution, climate change, population growth and industrial growth, among others. It has been estimated that by 2025, two thirds of the world's population will suffer from an acute lack of clean water. In addition, releasing poorly treated waste water into the environment leads to local problems in food production and in the ability to obtain drinking water.

SOLUTION

Aquazone produces technology and expertise, which can be used for remodelling waste water treatment plants into water purification facilities. Waste water is primarily treated biochemically, where water, solid materials and nutrients are separated. The treated water can either be used for irrigation in agriculture or used as drinking water. The treatment of the sludge consisting of the solid materials and nutrients is handled by Aquazone's partner, Ekolannoite, which specializes in the manufacture of organic fertilizers and soil-treatment materials. The sludge is treated with two chemicals, after which the material is free of any harmful bacteria and is ready for use in farming.

BENEFITS

The total solution is still under development. The revenue logic will be based on building or remodeling plants in cooperation with their owners. The goal is to develop through joint operations where cooperation is developed with reliable local partners in developing countries. In addition, Aquazone aims to develop a model where full responsibility for the plant will be assumed for a 3 to 10-year period, which allows time to teach the local partner to use the plant effectively.

CE PRINCIPLES

Aquazone's waste water treatment technology and the soil-treatment material produced from sludge by Ekolannoite can increase the availability of clean water and farming possibilities in developing countries. Cleaning waste water and the soil-treatment material obtained from it allows self-sufficient farming and also improves the ability to live in difficult conditions.

ARCTIC BIOMATERIALS

HTTPS://ABMCOMPOSITE.COM/

Arctic Biomaterials manufactures bio based plastics and composites that provide opportunities for new innovative solutions. The materials can help reduce the product's carbon footprint by up to 80% and cut dependency on non-renewable raw materials.

PROBLEM

The manufacture of plastics and composites requires non-renewable, fossil-based raw materials. At the end of their life cycle, pure plastics can be recycled, but nevertheless plastics and composites are usually destined for incinerators. Plastics and composites are durable, multipurpose materials. For example, they can be used to make vehicles and machines lighter, which reduces fuel consumption. The replacement of plastics and composites with bio-based materials is a challenging task, since biomaterials do not generally tolerate high processing temperatures.

SOLUTION

Arctic Biomaterials has developed an environmentally friendly alternative for demanding technical applications. The company manufactures bio-based plastic from lactic acid polymers and additives as well as a bio-composite, which is available in granular form. The formula varies slightly depending on the intended application and can tolerate processing temperatures of up to 165 °C. The bio-composite is compostable or can be broken down into lactic acids and reused as raw material.

BENEFITS

The company's revenue comes from the sale of bio-plastics intended for technical and medical applications. The sale of material instead of finished products is the best
alternative for the company, as applications vary.

CE PRINCIPLES

Many companies are aiming to reduce their dependency on fossil-based raw materials and cut down the carbon footprint of their products, and Arctic Biomaterials provides a solution for this aim. Customers can also capitalise on the responsibility aspect in their marketing activities.

SYNTOIL

HTTPS://WWW.SYNTOIL.PL/

Currently in the tire industry, the predominant principle of linearity is that the life cycle of a product has its end in the landfill, as soon as it is discarded. Tire recycling, however, is a model example of how a closed-loop economy has many benefits. By using the latest technologies, it is possible to significantly reduce greenhouse gas emissions into the atmosphere at many stages of production, which has a direct impact on environmental protection. In addition, as a result of the reuse of raw materials, the tire industry can become more self-sufficient, generating real economic benefits for itself.

PROBLEM

According to Goldstein Research's "Global Tire Recycling Market Analysis 2025," more than 1.6 billion new tires are produced each year, and nearly a billion are used. The recycling industry recycles 100 million tires a year., also the majority goes to landfills. As practice shows, landfilling used tires is not the best idea for at least two reasons. First, tires left in the environment with the passage of time, become defragmented, and the toxic microplastics that come out of them poison the soil, penetrating further into the water, which poses a direct threat to the health and life of living organisms. Second, cases of tire dumps being set on fire are recorded all the time. For example, in 2020 there were 111 fires in Poland. Precisely for this reason, it is very important to introduce technologies that allow the reuse of used tires.

SOLUTION

Syntoil S.A. has introduced processes that allow used tires to be almost 100% recycled, which involves recovering carbon black from used tires. Not many people realize it, but carbon black is a very important product in the industry. If a new tire didn't contain soot, it could actually go only 100 kilometers, after which it would wear out. The average tire, contains up to 30% soot in it. Currently, the most common way to obtain soot is by burning fossil fuel like oil or natural gas, which emits tons of CO2 into the atmosphere. Syntoil, on the other hand, recovers it from a product that has already been produced in the past, specifically from used tires. What needs to be emphasized is that it is this Polish company that has developed a method of purifying soot, resulting in technical soot of very high purity. Syntoil makes it possible to recover soot in an environmentally friendly way, and at a much lower cost.

BENEFITS

The process of recycling tires brings practically the same tangible benefits. The rubber crumbs are used to create durable asphalt, playground surfaces and sports fields. However, a small portion of the product is still recovered. The model adopted at Syntoil, is based on circular economy, i.e. recovering waste that could be incinerated, and in the meantime producing from it a full-value product that is in high demand on the market. But most importantly, the creators of the whole process were guided by the idea of less waste, which is that there is no need to consume new raw materials each time, but use those that have already been used once. This also has a direct impact on reducing the cost of production of the target product, making it possible to reduce its price, which directly benefits the customer.

INFINITED FIBER

HTTPS://INFINITEDFIBER.COM/

Difficult waste streams, such as rejected textiles and recycled fibres, can produce higher added value as new products. Infinited Fibre recycles fibres to produce virgin raw material for textile products.

PROBLEM

The textile industry is one of the world's most polluting industries. For example, enormous amounts of water, land and chemicals are needed for producing cotton, which results in uncertainty about the future availability of cotton fibre. Oil-based textiles, in turn, release microfibres into waterways when washed. At the same time, the useful life of clothes has become shorter and 85% of textile waste ends up at landfills.

SOLUTION

Textile, paper and cardboard waste can be used to produce a cotton-like, soft textile fibre using Infinited Fiber's technology. The cellulose in the raw materials is processed into a 100% cellulose solution and reshaped into ready fibre using nozzle technology. The fibre can be used to solve the environmental problems caused by textile production and textile waste disposal.

BENEFITS

The company's revenue comes from the sale of bio-plastics intended for technical and medical applications. The sale of material instead of finished products is the best alternative for the company, as applications vary.

CE PRINCIPLES

There is a demand for a cotton-like fibre that is produced ecologically in the global textile and consumer markets. Infinited Fiber offers considerable brand benefits to customers who are seeking more sustainable alternatives for textile fibre - customers will also be able to use the solution to ensure the supply of affordable recyclable textile in the future.

BUSINESS MODEL

PRODUCT LIFE EXTENSION

The life cycle of a product refers here to the period of time in which the product is in use before being discarded. In circular economy the goal is to keep the products in use as long as possible.

Means:

- Design only durable, repairable, quality products.
- Offer maintenance and repair services for the product.
- The product can be updated, upgraded, or otherwise modified.
- A worn or broken product or its part can be repaired and resold.
- If there is no longer any use for the product, it can be sold onward.

A company can create a service where a customer may return the product when it is broken or no longer needed. The company then repairs and/or updates the product and can sell it forward for a lower price. Both the company and its customers can benefit from a considerable financial gain.

When a product has a long lifecycle, the customer needs to buy a new product less frequently and the company can save on material costs. Products are also manufactured less in this case. This saves natural resources and energy, and the production causes less harm for the environment.

Source: Sitra

WOSHWOSH

HTTPS://WOSHWOSH.PL/

WoshWosh is the world's first company dedicated to giving footwear a second life through its renewal, cleaning and repair. Average cost of purchasing new shoes is over 40 €. WoshWosh will clean and disinfect them starting from 4.00 €.

PROBLEM

The production of one pair of shoes means the emission of as much as 14 kg of CO2 into the atmosphere and the consumption of about 50 liters of water. You can limit these processes by deciding to clean and disinfect shoes. This service is offered by WoshWosh.

SOLUTION

WoshWosh is the world's first company dedicated to giving footwear a second life through its renewal, cleaning and repair. It has been offering its services for individual customers since 2015, and since 2018 also for business customers - in the field of cleaning and disinfection of work shoes. Work shoes are mechanically cleaned and disinfected, so that even with a large number of shoes, the process is carried out very efficiently. Importantly, the cleaning offered by WoshWosh is safe for any type of safety or work shoe. This is confirmed through laboratory work by the Central Institute for Labor Protection - National Research Institute (CIOP-PIB).

BENEFITS

WoshWosh generate incomes from dedicated services to the individual customers and business entities for cleaning and disinfection of work and work shoes. In addition to its activities, WoshWosh undertakes initiatives to raise awareness about circularity in both society and business. In 2021, the company organized a collection of shoes, which were then regenerated and refurbished for reuse. In total, more than 50,000 pair of shoes were recycled in this way. For its activities, WoshWosh received an award in the Stena Circular Economy Award competition in the "promotion of the circular economy idea" category.

CE PRINCIPLES

Besides saving 36€, customers save the environment. One pair of work shoes takes around 50 years to decompose. Shoe cleaning extends their life by up to several years. Thanks to cooperation with WoshWosh, end customer contributes to the ecological environment. Business customer express his ESG strategy, by also gives employees health and comfort. Periodic cleaning and disinfection increase the comfort of the employee's work.

REPAIRABLY

HTTPS://REPAIRABLY.COM/

Imagine the world in which, before throwing away a product as waste, you can serve nature and the environment by repairing the product you use.

PROBLEM

In 2018 nearly 853,124 tons of electrical and electronic waste were collected in Germany, 772,934 of it from households. This is the equivalent of 9.31 kilograms per capita and year. The remaining 80,190 tons came from businesses.

SOLUTION

Repairably is an independent certification of products that can be repaired easily and cheaply. The aim of Repairably is to significantly simplify the repair of products in the spirit of the circular economy concept and thus tackle some serious environmental problems. Repairably has the ambition to become a global standard and ecosystem for product repair. Its philosophy is presented in the form of a ten-point manifesto – the rules of repairably. A product that meets all the criteria is eligible for the certificate. The manifesto and the certification itself are designed to enable the rapid emergence of an ecosystem in which it is easy to design, manufacture, use and where appropriate, repair truly repairable products.

BENEFITS

Thanks to repairable products, it is possible to prevent or minimize waste generation. At the same time, the number of raw materials needed in the production of new products is reduced. The repair also has energy efficiency, as it saves its consumption at the beginning of the production process, but also at the end of recycling, as it is not necessary to produce so many products and at the same time they are used longer and do not become waste. Repair and maintenance of products has the lowest required energy consumption within the tools of circular economy.

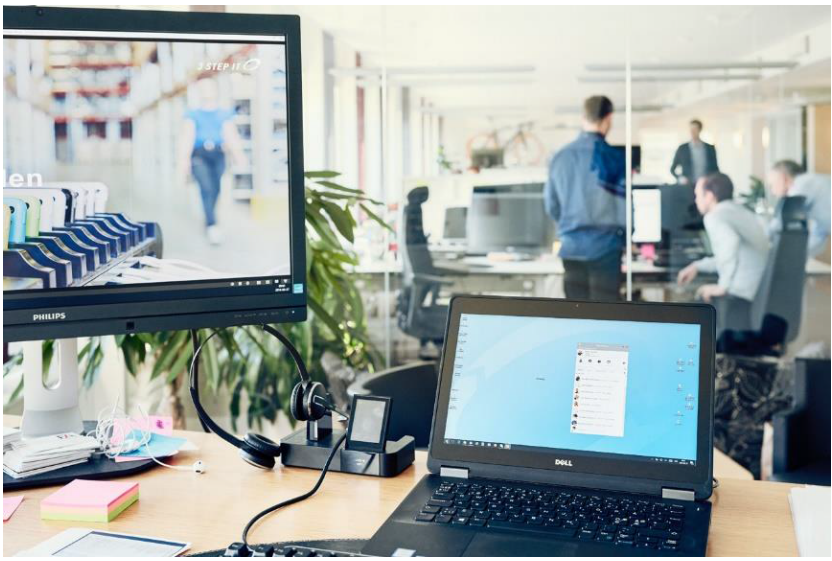
CE PRINCIPLES

A repairable product has an economic benefit especially for the customer. It gives the certified company a mark of reliability and responsibility. Throughout the society, it contributes to the saving of input resources needed for production, resources needed for recycling or disposal of the product after its lifetime. The correction also contributes significantly to increasing employment in services.

3 STEP IT

HTTPS://WWW.3STEPIT.COM/

3 Step IT leases office equipment to organisations. After the leasing period, the equipment is serviced and sold. Extending the useful life of equipment is an integral part of the business model.



PROBLEM

Used IT office devices are often disposed of as waste even when they have residual value and could be used in less demanding settings instead of expensive new equipment. Manufacturing new equipment consumes vast amounts of resources. However, there are data security concerns related to reselling old equipment.

SOLUTION

3 Step IT has developed a life-cycle management service that makes reusing old IT equipment easier. The service comprises three stages: acquisition, management and repurposing. Equipment received from companies undergoes a process that ensures data security, including the destruction of data held on the devices. Over 95% of equipment can be reused.

BENEFITS

Organisations buy a service that includes the financing of IT equipment, equipment database management and the equipment replacement service. Returned equipment is resold by 3 Step IT. The company is one of the largest sellers of used IT equipment in Europe.

CE PRINCIPLES

The service offers an easy way for offices to have well-functioning IT equipment that is replaced as needed. Efficient life-cycle management saves IT costs and users' working time. The customer pays for use instead of ownership, which means that the costs are predictable and allocated across the actual useful life. Customers can opt for used computers, and responsible life-cycle management of IT equipment can be included in the company's environmental programme. The data security of old disposed equipment is guaranteed.

UPHOLSTERERS

There are many pieces of furniture considered to be of great value – both sentimental and monetary – that are passed down through generations of families. But maintaining furniture means restoration work, and a good upholsterer can help preserve items for future generations.

PROBLEM

Most pieces of furniture reach the end of their life cycle too soon, ending up at a recycling centre or being incinerated. Manufacturing new furniture always consumes natural resources and energy. New furniture is often considered better than old but its materials and joints may be of poor quality. Often it may even be impossible to repair furniture because of its poor quality. Even a high price is no guarantee of high quality.

SOLUTION

Upholsterers are often small-scale entrepreneurs that specialise in prolonging the life of old pieces of furniture. A customer will send a request for a quote to an upholsterer and agree on special requests, choice of fabric and the timetable for the work. For example, upholstering a basic sofa will take at most five working days, and often the work can be done within a few months of contacting the professional. A transportation company will pick up the item from the customer and return it once the work is done. For example, one sofa that is reused will save the equivalent of driving 240 km in an average car.

BENEFITS

The upholsterer receives income from the design service and from upholstering furniture. The duration and price for redoing the upholstering are determined on a case-by-case basis. Upholsterers are the circular economy professionals of the interior decoration business and are experiencing growing demand.

CE PRINCIPLES

Often the upholsterer's customer is a household or a business. The professional upholsterer can extend the mileage of a customer's furniture, and the customer has the chance to make special requests and receive a unique result with little extra effort. The customer can trust they will get long lasting, unique, high quality furniture.

SWAPPIE

HTTPS://SWAPPIE.COM/DE-EN/

You don't have to buy everything as new, not even mobile phones. Swappie services and sells used smart phones. The used phone has a guarantee and it costs less than a new one.

PROBLEM

In Western countries, people purchase new mobile phones on average every 18 months, which often means that old phones lie around in drawers or are otherwise unrecycled. Electronic waste disposed of incorrectly is one of the most problematic waste types. Additionally, rare materials and natural resources are wasted if devices end up at a landfill instead of being recycled. The production of new mobile phones, in turn, uses up resources and increases greenhouse gas emissions. From the consumer's perspective, another problem is the continuous rise in the prices of new phones.

SOLUTION

Swappie purchases used phones from companies and private individuals, services them and puts them up for resale. Phones sold to Swappie can be either fully functional or they can be in an inoperable condition – before their resale a technical analysis is run on the phones indicating their condition and potential damages. Phones can nearly always be reused; they can either be used for spare parts or be repaired for resale. Phones that are unfit for the Finnish market are sent abroad via other recycling services. Unusable phones are taken to electronic waste disposal points. Extending a mobile phone's service life from 1.8 years to 4.5 years can help halve the carbon footprint of the phone's life cycle.

BENEFITS

Swappie's revenue logic is based on the revenue earned from the resale of phones. The company's business activities are profitable because of optimised technological analyses and a specialisation in certain products: iPhones. The company pays suppliers for used phones.

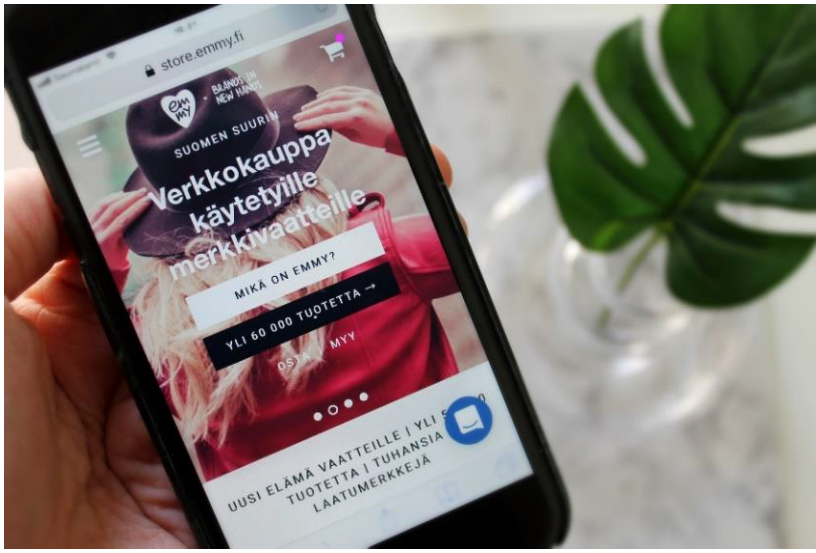
CE PRINCIPLES

Customers benefit from the smaller purchase price of a used phone, the warranty offered for the products and the transparency of Swappie's activities: the customer knows what they are purchasing. The customer can also earn money by selling their old phone to the company.

EMMY

HTTPS://STORE.EMMY.FI/

Emmy.fi offers an easy and transparent way to sell and buy used clothes. Saleable products are easy to obtain, and consumers can buy products from multiple sellers at once. By solving crucial problems for consumers, Emmy.fi helps to ensure that high-quality garments remain in use instead of being discarded.



PROBLEM

Clothing manufacturing consumes vast amounts of water, land and chemicals and causes greenhouse gas emissions. Cheap clothes often have a short useful life, whereas quality items are in high demand even when used. From the point of view of the environmental load of the textile industry, the functioning of the aftermarket is a crucial factor. However, the sale and purchase of used clothes from second-hand stores and online marketplaces can be a hassle. Many consumers do not sell their old clothes even if they believe in recycling.

SOLUTION

Emmy offers consumers a convenient way to sell high-quality used clothes. The clothes can be dropped off at a collection point or sent to Emmy by post. Saleable products are photographed and priced on behalf of the consumer and entered in the online system. The products are then sold via the Emmy online store. Buyers have a 14-day cooling-off period on purchased products.

BENEFITS

Emmy pays the seller the sold price minus Emmy's commission and delivery charges. Since Emmy only pays out on sold items, the business model is low risk, although work hours are spent on all items regardless of whether they sell or not. Buyers pay a delivery charge for any purchases under €49.

CE PRINCIPLES

Sellers save a lot of time and effort compared with other reselling solutions: they don't have to price or photograph the clothes themselves, and they can send a number of items for sale in one go. Buyers can save money by buying used designer clothes instead of new ones. High-quality items can be passed on many times. Emmy has partnership agreements in place for its collection points with retailers such as the Stockmann department store.

VALTRA

HTTPS://WWW.VALTRA.CO.UK/

Valtra has managed to create a new and profitable business from remanufacturing used gearboxes, making good use of their technicians' professional expertise. The customer quickly receives a new gearbox to replace a broken one. A deposit scheme has been created to ensure the return of old gearboxes.

PROBLEM

Value is lost when used tractor gearboxes are taken out of use. Manufacturing new gearboxes consumes a large amount of resources.

SOLUTION

Used gearboxes are returned to the factory to be dismantled, cleaned and refitted with new parts to replace worn or damaged ones. Remanufacturing uses approximately 95% less energy than manufacturing a new product. The gearboxes are assembled, tested and painted like new products. Customers can choose from several different models, which are quickly available direct from the warehouse.

BENEFITS

Remanufacturing gearboxes accounts for a significant portion of Valtra's business and is very profitable. When ordering a Reman gearbox, the customer pays a deposit which is approximately 50% of the gearbox price. This deposit is repaid to the customer upon return of the old gearbox. Close co-operation and sharing information during product development help to improve products. The valuable expertise of Valtra's technicians generates new added value while saving the customer money and time.

CE PRINCIPLES

The remanufactured Reman gearbox is 30-40% cheaper than a new product. The updated, like-new gearbox can be quickly installed in the customer's tractor. Dealers and maintenance technicians enjoy easily scheduled and faster repair times. Valtra pays the delivery costs and offers a warranty for the proper function of the remanufactured gearboxes.

ORANGE POLSKA

HTTPS://WWW.ORANGE.PL/

Orange Polska S.A. is a company that has introduced the principles of a closed-loop economy into its operations, which is expected to result in climate neutrality and save the planet's natural resources. Based on this premise, the life cycle of telecommunications equipment is extended and the amount of waste generated is reduced, with reduced energy demand and greenhouse gas emissions into the atmosphere. Starting from design through reuse, repair and recycling, Orange is integrating the principles of the closed-loop economy into its operations to extend the life of its equipment and reduce waste.

PROBLEM

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SOLUTION

All environmentally conscious consumers realize that completely abandoning the use of electronic devices is not the solution to the problems cited above. Today, we know that there is no need to get rid of an old phone, because you can use it for as long as possible, and when it becomes damaged, use dedicated maintenance services. It is also possible to purchase used phones, the price of which is much lower than new ones.
In addition, at each point of the Orange Polska S.A. network, it is possible to leave a worn-out cell phone free of charge, if only by throwing it into a special garbage can intended for used electronic devices. All devices collected in this way, are further transferred for recycling to specialized companies, which manage them in accordance with the applicable environmental law. These companies are responsible for further transportation, recovery or disposal of waste, which is properly documented. In order to make it easier for customers to get rid of telecommunications equipment they no longer need, Orange Polska S.A. has launched a program to buy back older models of smartphones, which, after possible repair of their damage, are returned to circulation.

BENEFITS

The company hopes that the processes described above, will influence a change in consumer habits of using electronic devices more responsibly and discarding them consciously, which should generally result in saving natural resources and energy. Repeated and prolonged use of cell phones, as well as their recycling, generates less demand for the raw materials needed to manufacture new devices and ultimately reduces waste. All this also translates into the wallets of customers, who, by choosing to buy a used phone or repair a damaged one, save their money by forgoing the purchase of a new device.

MOELVEN BYGGMODUL

WWW.MOELVEN.COM

Moelven Byggmodul offers modular buildings made of sustainable wood.

PROBLEM

The construction sector produces material that can be only partially reused, once the buildings are demolished.

SOLUTION

Moeolven Buggmodul produces modular buildings whose components can be easily reused and recomposed in different shapes.

BENEFITS

Moelven's business concept is based on a qualitative but efficient product with a high degree of completion from the factory. Their goal is that the market will always consider and value modular solutions from Moelven Byggmodul when new construction projects are planned.

CE PRINCIPLES

The customers can recreate new rooms using the same modules they already own, just moving them and giving to the rooms new shapes.

PONSSE

HTTPS://WWW.PONSSE.COM/

Ponsse's services extend the useful life of machinery and save significant amounts of materials and energy alike. The company refurbishes used forestry equipment parts and sells them to its customers with warranty coverage. In addition, Ponsse offers power packs that boost up and modernise the machines.

PROBLEM

The manufacture and purchase of forest machines involves large investments. The requirements related to the harvesting of forests and the specifications of forest machinery develop quickly, which means that new machine models are constantly being produced for the market. New spare parts can be difficult to come by for older machinery, which quickly fall out of date. The manufacture of new machines and spare parts uses a great deal of metals and other resources.

SOLUTION

Ponsse has productised a range of spare parts for various customer needs. In addition to selling new original spare parts, Ponsse offers its customers parts serviced at factories, budget parts and performance packages. According to various estimates, factory servicing decreases energy consumption, materials use and greenhouse gas emissions compared to the manufacture of new parts.

BENEFITS

In addition to forest machinery, Ponsse sells its own parts and maintenance packages. Additionally, the company repairs old parts bought back from its customers, so these parts are reusable, and their resale benefits both the company and its customers. The company has authorised suppliers around the world that sell spare parts and maintain the company's machines. The services offered to customers have been formulated in ready packages which make the work of the global maintenance network easier.

CE PRINCIPLES

A customer can extend a machine's service life by updating it with performance packages, so it is up to date, or by purchasing budget parts or parts serviced at factories. The latter makes it possible to also offer an extensive range of spare parts for older machines. Additionally, the customer is compensated for old machine parts, which Ponsse buys back from its customers for servicing and resale.

EKOX OY

HTTPS://EKOX.FI/

Many organisations dispose of IT and office equipment that is still in good working order and nowhere near obsolete. Ekox is aiming to resolve this problem by servicing equipment for reuse in high volumes. Customers get equipment that is cheaper than buying new devices.

PROBLEM

Companies and organisations continuously dispose of reusable IT and office technology. Instead of reusing these, they purchase new expensive equipment. As a result, the usable equipment is taken to landfills. The manufacture of new technical equipment consumes non-renewable resources and produces emissions.

SOLUTION

PEkox services IT equipment for reuse and empties equipment hard drives while taking into account information security. The company's Noutoturva service collects equipment from the customer, sorts it according to its condition and clears the data off the equipment. Customers can purchase or rent serviced equipment via the Ekone service. The lisi service, in turn, allows customers to purchase the electronics of an office, building site or event venue. The electronics packages are installed and ready to use. By extending the service life of a laptop from three years to seven years the carbon footprint of the device can be up to halved.

BENEFITS

Ekox's revenue comes from servicing equipment, the sale of serviced equipment and equipment rental. Customers who want their equipment back after it has been serviced pay a fee for testing and servicing. If the customer does not claim the equipment back within 60 days, it is sold on the service portal.

CE PRINCIPLES

Reused equipment is a cost effective and ecological option for customers. Pre-owned serviced equipment is considerably cheaper than new equipment. A pre-owned device is suitable for many purposes. Ekox collects equipment directly from the customer, which means that the customer organisation does not have to arrange recycling or storage. Customers can check the portal to see what types of equipment they have handed over, print a report of collected equipment and choose which devices they would like to receive back from Ekox.

COBBLER SERVICES

HTTPS://WWW.COBBLERSDIRECT.COM/

The environmental effects of clothes and textiles have been discussed greatly, but shoes are often overlooked. Some of the materials used in making shoes are even more harmful for the environment than those used in the textile industry. Expanding the lifecycle of shoes reduces harmful environmental effects. A professional cobbler or leather worker can extend a shoe's life considerably – with a low cost.

PROBLEM

New shoes are nowadays mass produced, and the quality is poor. The larger proportion of the shoe industry and leather tanning plants are located in developing countries. However, only a few shoe importers are aware of the production chain of their products and from where their leather originates. The biggest environmental impact of the shoe industry is caused by materials, especially leather tanning, which is a slow process consuming a large amount of water and chemicals. The waste water from leather tanning is high in chemicals and the process produces great amounts of waste.

SOLUTION

Many people fall in love with shoes that they have worn for years. Cobblers are small entrepreneurs, who ensure the long term use of shoes. Cobblers can also custom make unique shoes, which is both ethical and sustainable. The service and repair of shoes extends the life of a shoe by many years.

BENEFITS

Cobblers get their income from repairing and servicing shoes as well as making new shoes. A cobbler's work is two fold: a quick service in which the required repairs are made while the customer waits, mostly focusing on heel tags and soles. In more traditional function, a cobbler repairs or upgrades leather products according to the customer's wishes. In addition, a leather worker can make shoes, bags, belts and other leather products custom made.

CE PRINCIPLES

By repairing old shoes and leather products, customers can use them and save money from acquiring new products. The customers can also order unique products specially made according to their wishes. Professional cobblers can make durable, unique, high quality shoes for their customers.

BUSINESS MODEL

SHARING PLATFORMS

You don't need to own everything! Sharing platforms are digital services, through which seldom used items can be rented and borrowed to others. This way the existing products are used more efficiently: they are in use a better part of the time and serve a larger amount of people.

Many consumers and companies possess items which are used rarely. For instance, a cordless drill is used in a household on average only eight minutes throughout its lifecycle – as in ever! A car is used altogether 15 days a year, otherwise it is parked.

Could the money – and resources! – invested in these items be used in a better way?
The consumers benefit from sharing platforms because they do not have to buy a new product to every situation but instead they can acquire a suitable product for a temporary need with a lower cost. This way less products are needed. The production consumes less natural resources and causes less harm for the environment.

Sharing platforms can be used, for instance, for second hand shopping, renting and exchanging between users. A company can specialise in offering a platfrom for others to share their products. This way the company won't have to produce anything itself. It claims service charges for using the platform or sells advertising space. This is the revenue model of Airbnb, through which people can rent apartments for holiday homes.
Source: Sitra

LEILA

HTTP://LEILA-BERLIN.DE/

Leila is Berlin's first borrowing shop. Founded in 2010, it fills the themes of commons, shared goods and community of goods with practical life. "Sharing things" is the guiding idea that leads against social division. Reuse instead of throwing away. Using instead of owning and hoarding. Leila is participatory shop that take part of the giving and lending movement.

Location: Haus der Materialisierung
Berolinastraße, Berlin, Germany

PROBLEM

The average household in Germany owns many items which are hardly used or are needed just a couple of times during the life of the consumers. Still those items, might it be a ladder or a driller are in specific situations essential.

SOLUTION

Leila is a place where members can bring things they have but hardly use. Those items become available to be lent to other members. Leila does not buy the items but is administrating the lending process.

BENEFITS

The member benefit directly from saving money, time and space for items they do not have at home and do not need permanently. They have access to more than 200 items. Mostly shared are beside tools, kitchen equipment. The availability of those items helps not just members who want to have a more circular lifestyle, but even more social disadvantaged groups, like refugees or unemployed, who could not afford to buy such items.

CE PRINCIPLES

Leila is a non-commercial project and was copied by public libraries across Germany. The revenue is the social interaction and the sense of community among the members. While sharing "things" people get in touch, share DIY tips and help by repairing the items.

PODZIELNIA

HTTPS://PODZIELNIA.PL/IN-ENGLISH/

How much waste do we produce? We buy things we don't need to, with money we don't have, to impress people we don't like. Therefore, Podzielnia and givebox its common idea elaborated with local communities were created. To sum up: We share because we care.

PROBLEM

People in the world generate to much waste. This economic model should be changed to an economic model based on assumption that the value of products, materials and resources is to be maintained in the economy as long as possible to ultimately reduce waste generation to a minimum.

SOLUTION

Podzielnia is the first freeshop in Poland of this kind. Everything is for free, for the customers and the environment. The main idea is to reduce the waste by sharing of various material goods or services, to promote the upcycling process or reworking the old one by giving new quality. Giveboxes are the lead products which were built with the local community during the workshops.

BENEFITS

It has several hundred visitors and customers every day, the nature of getting incomes comes from local communities, local funding, crowd-funding, organizing trainings and workshops, tendering application to the different bids.

CE PRINCIPLES

Targeting the zero waste idea, the least amount of waste that can't be further processed, the essence of circular economy on local level. It also helps the poor and raise environmental awareness in society at all.

KNIŽNICA VECÍ

HTTPS://WWW.GOETHE.DE/INS/SK/SK/KUL/SUP/AJN.HTML

"If you buy what you don't need, you will soon sell what you need."
Georgian proverb

PROBLEM

One needs to live somewhere, somehow to move, one needs different things, for work or entertainment. Thanks to the rising standard of living and the vision of living in prosperity that the world of advertising shows to one, one desires to have more and more. Over the last 20 years, the amount of waste per capita has almost doubled, while indebtedness has doubled. We want to own, and we do not hesitate to get into debt. However, we do not use all things all the time.

SOLUTION

TThe idea of setting up an object library and offering workshops based on sharing objects and knowledge was a challenge that aimed to unite people and make them understand the importance of a careful approach to ownership and exchange of ownership, sharing and exchange. The existing concept was extended to the exchange and sharing of books, textbooks and audiovisual materials in exchange for a library fee. These are often more valuable items, which we like to use, but not often enough to have to own and buy them.

BENEFITS

Added value community building programme, absolutely innovative environmental activity to the traditional portfolio of activities traditional for libraries and foreign promotion of language institute around the world. Empowerment of German speaking community in the Slovak capital in respect of attracting to study German as foreign language for lectors, craftsmen which usually does not enter the community of high-profile foreign language users. Increasing the self-confidence of Slovak handymen and craftsmen in using foreign language. An innovative fund-rising activity for language institute as the Library of Things renting gives additional income for traditionally educational institution.

CE PRINCIPLES

Sharing circular information, raise public awareness for circularity, deliver circular knowledge and competence. Within the Library of Things, it offer several interesting workshops focused mainly on objectsthat can be borrowed. It give to people the opportunity to find out how the things we offer work and with their help people can create something under the supervision of experienced lecturers.

SMARTA KARTAN

HTTPS://WWW.SMARTAKARTAN.SE/

Smarta Kartan (The smart map) is a platform that shows where it is possible to find second-hand wares, rent or borrow tools and equipment for different scopes, pick-up fruit and vegetables for free, and much more.

PROBLEM

A large part of the tools and equipment owned by a household is used just a few times during their entire life.

SOLUTION

The Smart Map wants to make it easier for people to live more sustainably, by encouraging community, new meetings and access over ownership. It shows initiatives and networks. On the map you can, among other things, find bike kitchens, swap groups, clothing swap days, free shops and digital platforms. Everybody can suggest what we should show on the map. The selection of initiatives takes place in consultation between the editors locally.

BENEFITS

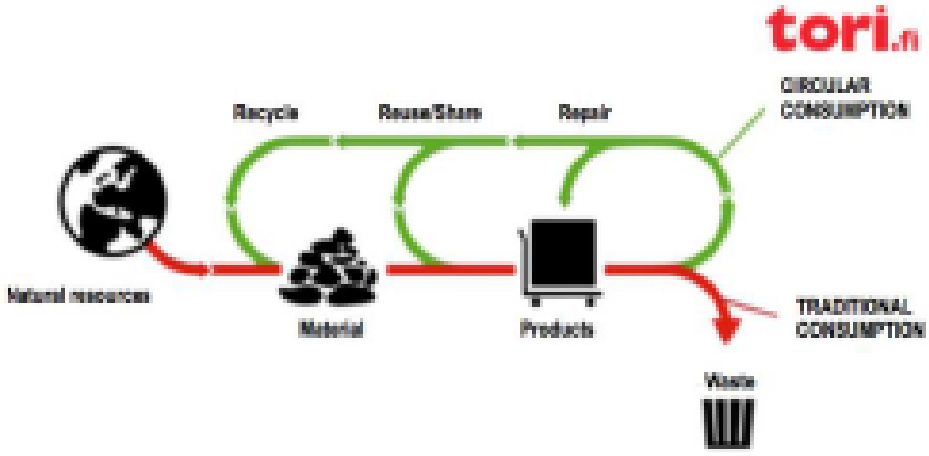
Smart Map version 3.0 was launched in the spring of 2020 and has been funded by the City of Gothenburg and the national programme Sharing Cities Sweden, SCS is part of the strategic innovation programme Viable Cities, jointly funded by Vinnova, the Swedish Energy Agency and FORMAS. Sub-projects have also been funded by Business Region Göteborg.

CE PRINCIPLES

Having in a one and same place the map of places where it is possible to borrow, rent, repair instead of buying new stuff.

TORI.FI

Online flea markets extend the life cycle of used products. This is a way to reduce the need to produce goods and a way to conserve pristine natural resources. Tori.fi is a major player in this market in Finland.



PROBLEM

Goods ending up at landfills before the end of their useful lives is putting a strain on theenvironment. However, the sale of unwanted but still usable products can be cumbersome without a functioning aftermarket. Without one, companies are not able to effectively evaluate the pricing of their products. Consumers, in turn, are directed to buy less sustainable products if there is not a marketplace available for buying and selling recycled products.

SOLUTION

Tori.fi offers buyers and sellers an online platform where they can sell goods that they no longer need or buy used goods at more affordable prices than new ones. For companies, the service offers the ability to monitor the pricing of their products on the aftermarket an advertise their products and services in suitable contexts.

BENEFITS

Tori.fi's revenue logic is based on services offered to three customer groups. For consumers, the service uses what is known as a freemium model, which allows the service to be used free of charge. If the consumer wants to, they can buy additional services that make trading easier. For small companies and communities, Tori.fi offers different types of online store concepts, which can serve as the company's website or as a gateway to a broader media audience. The third customer group is large companies to which Tori.fi sells advertising space.

CE PRINCIPLES

To consumers, the service offers the ability to buy and sell used or new products. Sellers are able to make a profit and recycle their products using the service. Buyers save money and effort, as they are able to buy used goods through a simple channel. Small companies are able to increase their online presence, while large companies are able to advertise to those Tori.fi users already intending to make a purchase.

SHAREIT BLOXCAR

HTTPS://SHAREIT.FI/

The Shareit Blox Car service enables people to rent out their cars for extra cash in the name of more efficient use of resources. The service includes peer-to-peer rental car insurance, which makes it particularly appealing.

PROBLEM

Many sparsely populated areas and smaller localities offer limited or infrequent public transport. Shopping trips and weekends away can be impossible without a private car. On the other hand, cars come with high ownership costs, and they can end up being parked up to 92% of the time. Occasional car users have had limited affordable options until now.

SOLUTION

The online service enables people to rent their car out on an hourly, daily or weekly basis. In order to ensure trustworthiness and safety, all users must register for the service so that their identity and ability to pay can be verified. The cars are covered by the Shareit insurance of If Insurance, the first peer-to-peer car rental insurance available in the Nordic countries. As it becomes more widespread, this model is likely to reduce the number of cars and have a positive impact on living environments. The rates of public transport usage and purposeful exercise will increase, as car ownership becomes less popular.

BENEFITS

The Shareit service charges a fee of 30% of the rental price. Car owners receive the remaining 70% minus the insurance fee of a few euros. This is likely to become a growing market: according to surveys, Finland alone has hundreds of thousands of car owners who could potentially get involved in peer-to-peer rental.

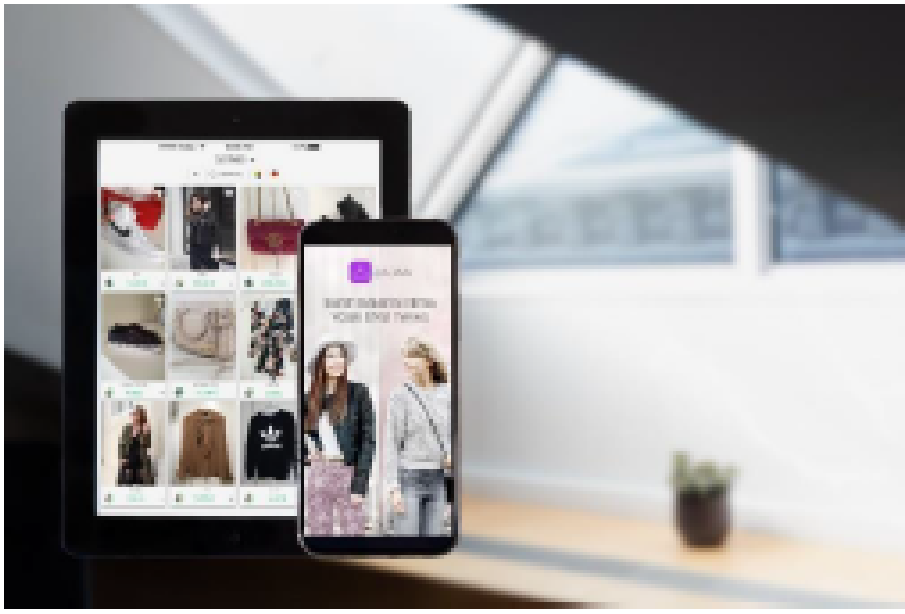
CE PRINCIPLES

Users have flexible access to rental cars and cost savings compared with owning a car. Renting is easy and safe. Car owners get extra cash when not using their cars; the rental price and period are decided by the owner. Introduction of the service as a part of regional mobility services does not require any additional acquisitions by local authorities.

ZADAA

HTTPS://ZADAA.COM/DE-EN/

Zadaa's application encourages people to sell those unused clothes that gather dust at the back of wardrobes. Reusing the clothes extends their life cycle, and in a mobile marketplace distance is no obstacle to finding the right size and style of clothing.



PROBLEM

A significant amount of our clothing is laying around in closets, virtually unused. The unnecessary purchase of clothing uses up natural resources and overloads the environment. A huge amount of clean water is used in the production of one kilo of fabric. Litres and litres of various chemicals are used in the production process. However, the recycling of used clothing can be difficult as it may be difficult to find anything to one's liking or in the correct size from a traditional flea market. It is also difficult to determine the fit of clothing purchased from online shops.

SOLUTION

Zadaa's mobile app searches for suitable clothing for the buyer according to his or her measurements and information, or searches for suitable buyers for clothing a user is selling. The buyer can see clothing sold by people of the same size. The products can be purchased directly through the app. The person selling clothing receives a notification of the purchase and a code with which he/she can send the product easily via Matkahuolto, DHL or PostNord (Finnish delivery services). The money is transferred to the seller once the buyer has received the clothing.

BENEFITS

Zadaa charges a fee for payment transactions. This means the company does not need to purchase clothing for itself and thus tie down its capital in a warehouse. Additionally, the commission-based revenue model lowers the risk and cost for both sellers and buyers because a commission is only charged for sold clothing. A larger number of users will, in turn, increase the appeal of the app..

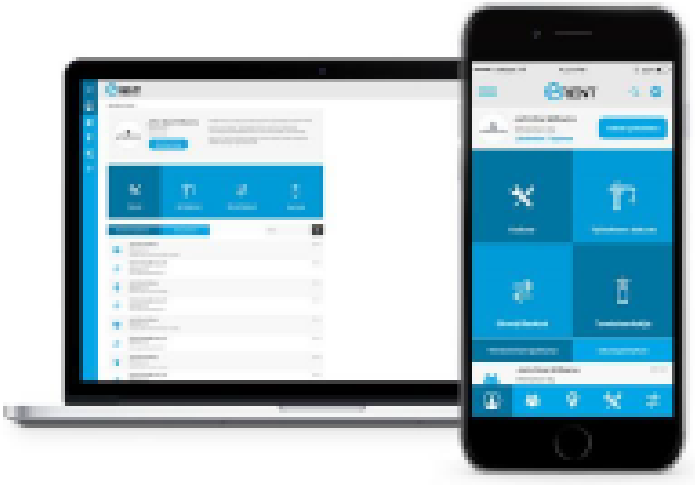
CE PRINCIPLES

The buyer can trust that the clothing purchased through Zadaa will fit, as the buyer knows that the person selling the clothing is the same size. The person selling their clothing benefits financially from selling their clothing. The mobile app means that the range of clothing on offer is not limited by the buyer's location. If a product does not meet with the given information, the buyer can get their money back via the company.

ERENT

HTTPS://WWW.ERENT.FI/EN/

Different companies own plenty of similar equipment whose rates of usage are often low. Now eRENT offers a platform for the digital sharing and tracking of machines, devices and other goods. In the long term, a culture of industrial sharing can reduce the need to manufacture new devices.



PROBLEM

Many companies own a large fleet of equipment of a variety of machines. But their usage rate is often very low. Equipment such as cleaning machines are typically only used 10-20% of the time. At the same time, the costs of purchasing and servicing the equipment are high. Due to a lack of data, there is a lot of overlapping in the equipment owned by companies within the companies themselves and between companies. Good solutions for more efficient management and follow-up of equipment have not been available.

SOLUTION

Through the eRENT service platform, the customer can follow up and manage its fleet of equipment efficiently, flexibly rent out its own machines and rent machines from others. Follow-up is based on NFC/QR identifiers and GPS trackers that can be used, for example, to update the location and status of the fleet on the service platform with the help of a mobile phone. Customers can also attach their followed-up equipment to eRENT's rental service, bringing them all to the same platform. Improving the usage rate of the equipment on a large scale may in the long run reduce the need to manufacture and acquire new equipment.

BENEFITS

The company receives commission on the rental transactions carried out through the portal and monthly service charges from the equipment follow-up service. Cost-efficient follow-up of the equipment is a prerequisite for flexible rental which can speed up the culture of the industrial sharing economy.

CE PRINCIPLES

eRENT's clients include equipment rental agencies, construction firms and companies from different sectors. The service enables rental agencies to have "real-time inventories" and to receive higher return for the capital tied to the equipment. The service will also include an electronic maintenance book. With the new rental channel, equipment can also be shared between competitors. The service reduces the workload of construction firms when the platform can be used to request tenders from several operators at the same time.

VENUU

HTTPS://VENUU.FI/EN

There is a lot of office and event space, that stands largely empty, and information about the availability of these venues is scattered. Venuu's service helps customers source available premises by compiling and publicising details on the various types of space available. In the long run, efficient marketplaces such as this can reduce the need to build new premises.

PROBLEM

Globally, there is an abundance of venues that have low usage rates. These include cafes, restaurants and conference facilities that are only open during the day. For example, the usage rate of conference rooms at hotels is typically around 30%. Event organisers may find it difficult to find appropriate and interesting venues since many venue owners who rent out facilities do not necessarily invest in making venues easy to find. The underuse of venues can lead to a wasteful use of resources and a rise in rents.

SOLUTION

Venuu lists venues offered for booking by various venue providers on its website. Venues can be booked for parties, conferences, weddings and other events. Potential bookers can search for facilities on the company's website on the basis of the type of event they are arranging, the location of the venue and the number of people who will attend the event. Venuu also offers personalised customer service for corporate clients to help them find suitable facilities. The efficient marketplace cuts down on the need for building new facilities, increases the use of existing venues and thus decreases the venues' environmental load over their life cycles.

BENEFITS

The use of the service is completely free for parties that book venues. Venuu charges a commission only for realised bookings from the parties who are providing their facilities for booking. This lowers the risks and costs of the facility owner for advertising free facilities which, in turn, can increase the range of venues offered.

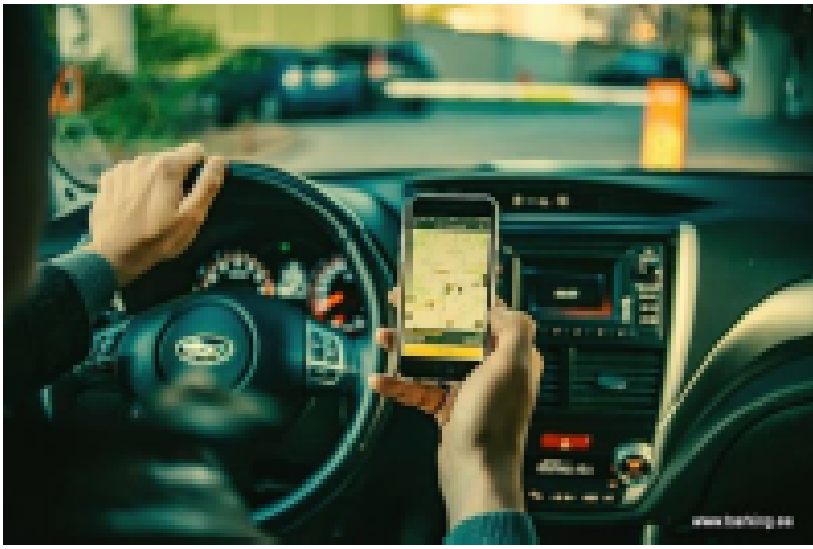
CE PRINCIPLES

For customers it is simple to find venues for different types of use and to compare these with others because the prices and availability of venues are clearly listed. The booking process has also been made as simple as possible. The company also indirectly helps prevent rents for venues from rising drastically.

BARKING

HTTPS://BARKING.CITY/

Private car ownership should be overtaken by flexible transportation services and public transport. However, this will not happen instantly and driving needs to be made more efficient through all available means. As a remedy for this, Barking is offering parking space -sharing platforms. This can reduce unnecessary driving and the needless construction of car parks.



PROBLEM

Parking a car can be time consuming. It is estimated that a third of urban traffic in the Helsinki metropolitan focuses on looking for parking spaces. Yet, most parking spaces remain empty for most of the time. For example, companies may reserve 24-hour parking spaces for their employees and some people reserve a parking space at their housing unit. In Helsinki alone, there are three times as many parking spaces as there are cars.

SOLUTION

Barking provides available parking spaces to those in need of one. The owner of a parking space can register their spot with the service, and anyone who needs a space can rent it for the desired duration. The checking of availability, reservation, renting and payment processes are all done using an online service. Barking's management system shows the reservation status and parking situation in real time. A user can use Barking's mobile app to find their destination and open the door of a locked parking hall, as these locks can be connected to the service as well.

BENEFITS

The revenue model is based on a commission that is included in the rental cost. The online model makes it easy to register and rent parking spaces.

CE PRINCIPLES

Users do not have to waste time searching for parking spaces since they can reserve one in advance online. This helps to save both time and fuel, reduce emissions, traffic and congestion, as well as increase the habitability of cities. In addition, reserving a spot through a service can be less expensive than paying for a typical parking space. Increased efficiency of parking space use means that fewer new parking spaces need to be built, which releases urban space for other uses.

SKIPPERI

HTTPS://WWW.SKIPPERI.COM/

Boats cost a lot of money and they still are located mostly in the harbour. With Skipper's service anyone can rent a boat. The service makes it easier to try sailing and the boat owners can earn some extra money.

PROBLEM

Boats stand idle for most of the time. According to statistics, Finnish boaters spend only 17 days a year boating, meaning that the boats sit in docks for over 90% of the boating season. In addition, the time spent boating has fallen. Buying, owning and maintaining a boat is expensive and time-consuming and the threshold for starting boating is high. Sitting continuously at the dock is also not good for the boats. Renting boats in Finland has relied largely on rental firms.

SOLUTION

BSkipperi gives boat owners the opportunity to rent out their boats to others when they are not using them themselves. The service allows boaters and those interested in boating to start more cost efficiently without having to own a boat. A boat can be rented by logging in to the online service, completing a boating CV and submitting a booking request to the owner of the boat.

BENEFITS

Skipperi's revenue logic is based on commissions charged from the rental transactions. Placing a boat for hire and registering as a rental user is free of charge. This revenue logic ensures that sufficiently large numbers of both individuals listing their boats and rental users are obtained for the service. In addition, percentage-based commissions for longer rental periods make the operations more transparent and profitable than by assessing service charges, for example. Skipperi is a profitable operational model, as it does not need to own the boats it rents out.

CE PRINCIPLES

Boat owners can cover the costs incurred from the boat by renting it out to others. The rental customer, in turn, can go boating at a lower cost and is able to easily try different types of boats. Skipperi is responsible for handling payment traffic, confirmations, marketing of the service and the boats, and secure identity verification practices, which makes the service easy to use for both the boat owners and the rental customers. 1% of Skipperi's revenue is directed to conservation efforts in the Baltic Sea, in an effort to increase its recreational use.

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