GAMIFICATION,
DIGITALIZATION AND
PRACTICAL TOOLS FOR
DEVELOPING
CIRCULAR ECONOMY SKILLS

GAMIFICATION DIGITALIZATION AND PRACTICAL TOOLS FOR DEVELOPING CIRCULAR ECONOMY SKILLS

CIRCULAR ECONOMY - CE+ HANDBOOK

FOR YOUTH, YOUTH WORKERS AND BUSINESSES

Erasmus+ Programme KA2: Partnerships for Cooperation
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INTRODUCTION

The "Gamification, Digitalization and Practical Tools for Developing Circular Economy Skills" Erasmus+ project focuses on providing sectoral employment skills through non-formal learning activities, especially for young people with fewer opportunities (NEETs, migrant youth, etc.) to reduce youth unemployment.

The project addresses a critical need to equip youth, as well as youth workers and businesses, with green and circular skills essential for the transition to a sustainable economy. Recognising the growing urgency of environmental challenges, the project focuses on the following key needs:

- To address the urgent need for sustainable practices and circular economy concepts among the youth, youth workers and businesses
- To bridge the skills gap by developing non-formal educational resources for youth. By equipping youth with these skills, the project enhances their employability in a rapidly evolving job market that increasingly values sustainability.
- To engage youth in sustainability initiatives, as they are pivotal in driving long-term change
- To support youth workers and businesses with interactive activities, actionable steps, and digital resources
- To support the skill development of youth workers to have a deep understanding of green and circular practices so they can effectively educate and inspire the youth they work with.
- To innovate educational approaches, such as gamification and digital tools, to make learning about the circular economy and sustainability more accessible, engaging, and effective for youth
- To promote business adaptation to green practices, so they contribute to environmental sustainability, align with emerging global trends and regulations, and collaborate with youth and youth workers.
- To bridge EU policies, global sustainability goals and practices by translating them into actionable skills and practices.

Project partners:

- EFCC Estonian Fieldbus Competency Centre - Estonia
- Karavan Insan Kaynaklarini Gelistirme ve Genclik Dernegi - Türkiye
- Euroactiva - Belgium
- VsI Inovaciju biuras (Innovation Office) - Lithuania
- EDU 4 U - Slovakia
- Academy for International Science and Research (AISR) - Ireland

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

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CHAPTER 1

Introduction - Current Situation and Needs Analysis Report

The partners undertook a comprehensive research approach to lay the groundwork for this book. Recognising the dynamic nature of green skills, sustainability initiatives, and the circular economy within various countries, a two-pronged research strategy was employed: secondary and primary research.

The secondary research served as a foundational step, aiming to capture the latest developments in the realm of green skills. This included an exploration of current sustainability and circular economy initiatives, available courses for green skill development, and any government incentives promoting green innovations. This phase was crucial for understanding the existing landscape and identifying gaps and opportunities in green education and practice.

Building on this, the primary research phase involved direct engagement with key stakeholders: youth, youth workers, and businesses. Through carefully designed surveys, we sought to gauge their awareness and understanding of critical topics such as the EU Green Deal, circular economy principles, and the importance of green skills.

This first-hand insight was instrumental in tailoring the content of this book to meet the real-world needs and aspirations of those at the heart of the green transition.

The partners implemented three surveys to gather insights and opinions of the three target audiences of the CE+ project, which were distributed among youth, youth workers and businesses located in partner countries:

- Estonia
- Lithuania
- Ireland
- Slovakia
- Belgium

The partners strived to foster a better understanding of the challenges and opportunities associated with transitioning towards a more sustainable and environmentally conscious economy; and the responses contribute to the development of project results, namely fun and engaging non-formal learning activities linked to the circular economy and green skills.

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IRELAND

IRISH GOVERNMENT INITIATIVES: CLIMATE ACTION

The government is creating and implementing policies and strategies to achieve its long-term goal of transitioning to a low-carbon, climate-resilient and environmentally sustainable economy by 2050.

By 2030, the government aims to achieve the following:

- Cutting greenhouse gas emissions by at least 30%
- Reaching a target of at least 32.5% energy efficiency
- Delivering 70% renewable electricity

The government is building its policies around:

- A circular economy, where waste is minimised through greater waste prevention and recycling
- Promoting greater environmental awareness
- Engaging every aspect of society in the process: citizens, businesses, communities and organisations
- Supporting and funding environmental initiatives on a local and national level

The Climate Action Plan 2023 implements the carbon budgets and sectoral emissions ceilings; and it sets out a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050.

Regarding green skills, Skill Net Ireland carried out research and developed a report titled *Talent for Ireland's Green Economy 2022*. This research study examines current and emerging skill needs within Ireland's private enterprise sector to enable innovation and support the transition to a low-carbon economy. More specifically, this research provides novel evidence on:

- Business awareness of and exposure to climate change challenges;
- Skill needs in the medium term to support enterprise innovation activities and the transition to a low-carbon economy; and
- Existing upskilling programmes and future training needs to develop the necessary skill sets.

In summary, developing new skills within the enterprise workforce appears to be the top challenge from the implementation of Ireland's Climate Action Plan enterprises face in the medium term. The top skill sets needed in the medium term to support enterprise innovations with environmental benefits include:

- Climate change and sustainability strategy skills;
- Marketing skills; and
- Financial skills relating to investment and access to finance.

CURRENT SITUATION

IRELAND

The following patterns emerge for innovation skills that support green innovations:

- Climate change and sustainability strategy skills.
- Sector-specific technical skills;
- Software development;
- Web design;
- Marketing skills
- Engineering and applied science skills;
- Mathematics, statistics and data management skills;
- Organisational and leadership skills;
- Multimedia skills;
- Financial skills relating to investment and access to finance
- Design skills.

Skill Needs in the Medium Term to Support Enterprise Innovation Activities and the Transition to a Low-Carbon Economy:

- Waste management skills;
- Corporate sustainability strategy skills;
- Carbon management skills; and
- Sustainable finance skills

Table 3.4 Skill needs in the medium term to support the transition to a low carbon economy – by enterprise group

Green skills	SMEs	Large	Irish-owned	Foreign-owned	Industry	Services	Construction
Corporate sustainability strategy skills	82%	75%	79%	92%	84%	74%	100%
Carbon management skills	77%	92%	79%	77%	86%	74%	63%
Waste management skills	75%	75%	75%	77%	76%	76%	63%
Energy-efficiency design skills	76%	83%	77%	77%	82%	69%	88%
Water management skills	78%	50%	78%	54%	82%	69%	63%
Building and retrofits skills	65%	50%	63%	62%	70%	55%	63%
Sustainable transport and logistics skills	69%	58%	69%	62%	72%	64%	63%
Green procurement skills	65%	67%	66%	62%	76%	55%	50%
Sustainable finance skills	72%	67%	69%	85%	76%	60%	100%

Table 3.6 Demand for green skills: Medium term recruitment plans – responses by enterprise group

Green skills	SMEs	Large	Irish-owned	Foreign-owned	Industry	Services	Construction
Corporate sustainability strategy skills	73%	58%	71%	69%	78%	57%	100%
Carbon management skills	67%	58%	68%	54%	86%	43%	63%
Waste management skills	59%	42%	62%	23%	72%	43%	38%
Energy-efficiency design skills	66%	42%	66%	46%	76%	45%	75%
Water management skills	59%	42%	60%	38%	70%	43%	50%
Building and retrofits skills	56%	50%	55%	54%	62%	45%	63%
Sustainable transport and logistics skills	63%	50%	66%	31%	72%	48%	63%
Green procurement skills	60%	58%	59%	69%	76%	38%	75%
Sustainable finance skills	59%	75%	62%	54%	74%	45%	63%

Source: Skillnet Ireland 2022

CURRENT SITUATION

LITHUANIA

Lithuania's Climate Change Actions: Current Situation

Lithuania has been actively engaged in addressing climate change through various initiatives and policies. Here's an overview of the current situation regarding climate change actions in Lithuania:

- **Vilnius Named European Green Capital 2025:** Vilnius, the capital city of Lithuania, has been designated as the European Green Capital for 2025. This recognition highlights the city's efforts and achievements in promoting sustainability, environmental protection, and green innovation.

- **Commitment to Climate Action:** Lithuania is committed to addressing climate change and reducing greenhouse gas emissions. The country aims to achieve a 70% reduction in greenhouse gas emissions by 2030 and become climate-neutral by 2050. Renewable energy plays a central role in Lithuania's transition to a low-carbon economy. Also, currently, Lithuania has 19 European Commission's European Climate Pact ambassadors.

- **EU Environmental Policies:** Lithuania is actively implementing EU environmental policies and directives. In 2016, Lithuania signed the Paris Agreement, demonstrating its commitment to international efforts to combat climate change. Additionally, Lithuania participates in the EU Emissions Trading System, contributing to efforts to reduce carbon emissions.

- **Participation in International Climate Initiatives:** Lithuania is actively involved in international climate change initiatives. The country has joined seven international climate change initiatives, demonstrating its dedication to global cooperation in addressing climate challenges.

- **National Climate Change Actions:** Lithuania has developed national strategies and action plans to tackle climate change. These initiatives include measures to enhance energy efficiency, promote renewable energy sources, reduce emissions from transportation and industry, and improve waste management practices.

- **Investment in Green Technologies:** Lithuania is investing in green technologies and innovation to support its transition to a sustainable economy. The country is focusing on research and development in areas such as renewable energy, energy efficiency, green transportation, and sustainable agriculture.

- **Public Awareness and Engagement:** Lithuania is actively raising public awareness about climate change and promoting environmental education and engagement. Efforts are being made to inform and mobilize citizens, businesses, and communities to take action and adopt sustainable practices.

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LITHUANIA

Here's an overview of the current situation regarding climate change actions in Lithuania:

- Lithuania rises two places from 21st (2023) to 19th (2024) in the current CCPI, remaining among the medium performers

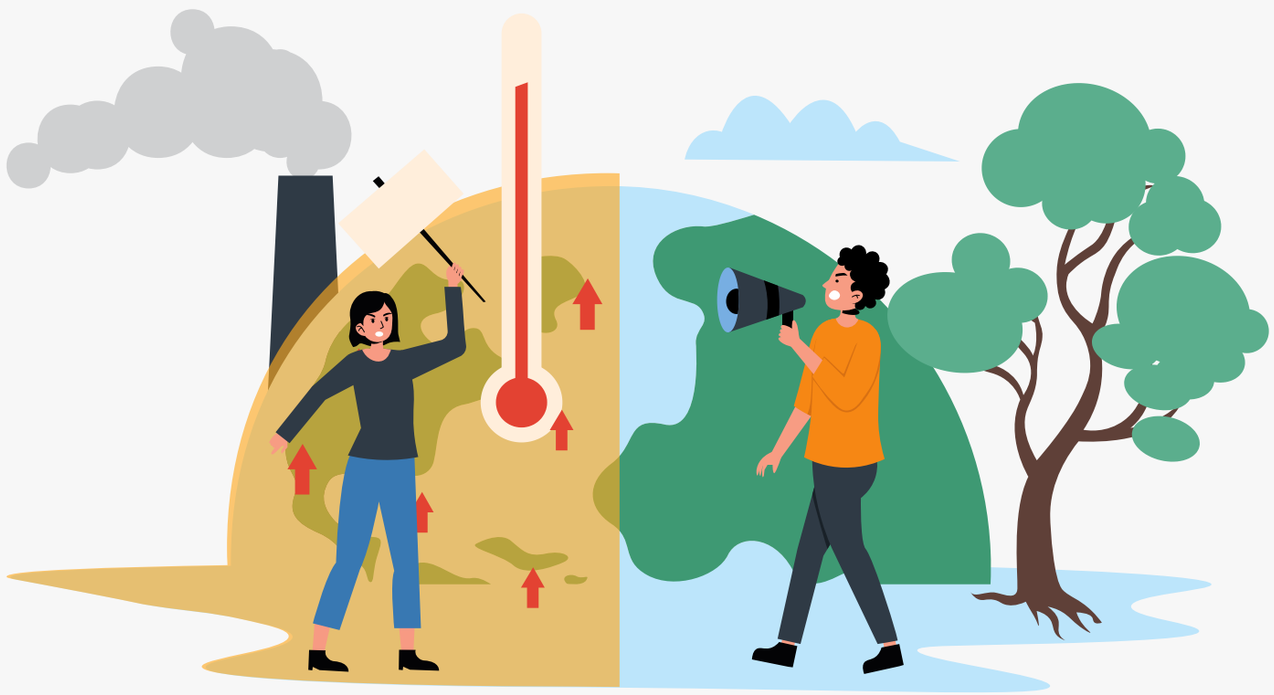
- The National Energy and Climate Action Plan of the Republic of Lithuania for 2021-2030 was renewed in 2022 using a participatory approach

- Key demands: more focus on implementation and a clear pathway towards net-zero emissions with sectoral ceilings

In summary, Lithuania is making significant strides in addressing climate change and promoting environmental sustainability. Through national policies, international cooperation, investment in green technologies, and public engagement, Lithuania is working towards a greener, more resilient future.

**You can find more information here*:

- https://ccpi.org/country/ltu/;
- https://climate-adapt.eea.europa.eu/en/countries-regions/countries/lithuania
- https://am.lrv.lt/uploads/am/documents/files/KLIMATO%20KAITA/%C5%A0ESD%20apskaitos%20ir%20kt%20ataskaitos/8th%20NC%20and%205th%20BR_20230105%20final.pdf



CURRENT SITUATION

ESTONIA

Baltic Sea wind and a brand new climate law

All European countries are on unique journeys - some fast, some slow - to reach climate neutrality. But Estonia is on a particularly unusual path. You might be surprised to learn that Estonia ranks third in the world for cumulative emissions per population - having pumped out 1,394 tonnes of CO2 by 2021, according to an analysis by Carbon Brief.

Our country's copious reserves of oil shale have been a mixed blessing; granting it a high degree of energy independence while embedding a deeply carbon-intense legacy. But Estonia is looking to leave its polluting ways behind. Estonia committed in 2021 to phase out oil sand production by 2040. And in 2022 it pledged to hit 100 per cent renewable electricity by 2030 - a first among Central and Eastern European countries according to clean energy think tank Ember - with a promise to reach carbon neutrality by 2050.

Environmental Issues

Estonia, like many other countries, is facing a variety of environmental challenges that threaten the well-being of its ecosystems and its inhabitants. These issues have been caused by a combination of factors, including rapid economic growth, urbanization, and climate change:

- Biodiversity loss: The loss of biodiversity in Estonia has been a result of overfishing, deforestation, and other human activities that have caused declines in populations of many of the country's unique species.
- Water pollution: Agricultural and industrial waste have contaminated many of Estonia's rivers and lakes, affecting the quality of the water and the health of local communities who rely on them for drinking water and recreation.
- Air pollution: Estonia's heavy dependence on oil shale as a source of energy has led to high levels of air pollution, which has contributed to respiratory and cardiovascular problems among its residents.
- Soil degradation: Intensive agriculture practices, deforestation, and urbanization have all led to soil degradation in Estonia, reducing its ability to support crops and vegetation.
- Climate change: Estonia is facing the impacts of rising temperatures and changing weather patterns, which are affecting its ecosystems and wildlife, as well as its agriculture and tourism industries.
- Littering and waste management: Improper waste disposal, particularly of plastic waste, has led to littering and pollution in Estonia's forests, parks, and waterways.

Estonia is launching a climate law

In 2023, Estonia began the process of introducing a climate law - parting company with the minority of European countries which don't yet have one. It's set to come into force on 1 January 2025, following a large public consultation and adoption by Parliament in 2024.

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The law will underpin the country's most challenging decisions, helping it to meet targets around the oil shale phaseout as well as much-needed investments in housing and transport. Recently, a Ministry of Climate was established, expanding the scope of the former Ministry of the Environment to create Estonia's "biggest" ministry. Crucially, it covers all important sectors - giving it responsibility for around 70 per cent of all greenhouse gas-related policies.

How Estonia is boosting renewables

Oil shale is an energy-rich sedimentary rock broken into fragments and heated to produce shale oil - a more carbon-intensive process than normal oil extraction. What is very clear now is that electricity produced from oil shale can never be competitive on the market, so it will always be more expensive. And it doesn't give us all the necessary energy security [needed after] the geopolitical developments in the neighbourhood.

Estonia can meet its clean energy targets thanks to domestic renewables. Estonia wants to rapidly adopt wind and solar energy. Energy businesses are interested in establishing wind parks after the ministry conducted a thorough audit to hasten their implementation. Estonia's largest wind farm in Tootsi, Pärnu County will start operations in 2024, meeting 8% of annual electricity consumption.

Moreover, Estonia is collaborating with its Baltic Sea neighbours to harness more offshore wind energy too. The 'EL-WIND' project co-developed with Latvia is a major example of this, aiming to deliver 1GW of capacity by around 2030.

How is Estonia decarbonising transport?

Cross-border collaboration is also raising Estonia's sustainable transport profile. The Rail Baltica project is set to link Tallinn with the capitals of Latvia, Lithuania, Poland and Finland, extending high-speed train travel across Europe by 2030. It will reduce the need for flights. The 870km railway should also cut congestion and air pollution in the region. Around 1,500 trucks currently cross the Latvian-Estonian border every day, placing a great burden on the roads and in terms of greenhouse gas emissions, a very heavy burden on the environment.

With renewables fuelling only 11 per cent of transport as of 2021, it's clear there's still plenty of room for improvement in this sector. Estonia plans to drive down its transport GHG emissions by further developing railways and public transport (free in Tallinn since 2013) and electrifying ferries and trains. An upcoming car tax will also tackle pollution from a different angle.

How is Estonia protecting its remarkable biodiversity?

For a country spanning a little over 45,000 square metres, Estonia is astonishingly nature-rich. Estonia has a thousand bears, 400 lynxes and 200 wolves. You wouldn't have those big animals present in the country if nature was in poor condition.

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In the forested meadows of Laelatu to the west, one square metre supports 76 plant species. Estonians are passionate about protecting nature and improving it. This love of nature has led the government to safeguard 30% of the landmass and 30% of the sea by 2030 (up from 20.5%) according to the Global Biodiversity Framework.

Compare Estonia's 1990s digital success, known as e-Estonia, to people's willingness to accept green chances now. At first, there were reservations about whether it was viable or practicable. Now we know that Estonia is a leader in digital and green transitions.

The vision and national target of climate policy

In 2050, Estonia will be a competitive economy with low carbon dioxide emissions. The preparedness and capacity of the state to minimise the negative effects and maximise the positive effects of climate change have been ensured. The transition to a low-carbon economy and society is developing into a global trend with one indicator being the reduction of greenhouse gas emissions.

The long-term target of Estonia is to reduce the emission of greenhouse gases by 2050 by 80% in comparison with the emission levels of 1990. As the country moves towards this target, emissions will be reduced by about 70% by 2030 and by 72% by 2040 in comparison with the 1990 emission levels. Estonia will be transformed into an attractive environment mainly for the development of innovative technologies, products and services that reduce the emission of greenhouse gases.

The export and global implementation of such technologies, products, and services will also help solve global challenges. Green growth zones with high export capacity and economic and ecological potential will be identified and prioritised, and their development will be encouraged by advantageous regulations and finance. For instance, the state's company support measures reflect climate policy targets and promote low-carbon dioxide options.

Increased understanding of climate change mitigation and adaptation will influence consumer and company climate-friendly choices. Climate change knowledge, skills, and attitudes will be emphasised in all education levels including non-formal environmental education. State entities that apply environmental management and procurement procedures will set an example. Best practice producers and users will be recognised.

Developing a resource-efficient circular economy aligns economic growth with sustainable development goals, including sustainable production and consumption. Using waste hierarchy, waste output will be reduced and waste collection will be more efficient. In production, primary raw material consumption will decrease, secondary raw material use will rise, and ecodesign and universal design principles will be utilised. Novel business concepts, including resource recovery, sharing, and renting, will be supported.

CURRENT SITUATION

Links:

https://www.euronews.com/green/2023/09/30/baltic-sea-wind-and-a-brand-new-climate-law-heres-why-estonia-is-our-green-country-of-the-month

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://ec.europa.eu/clima/sites/lts/lts_ee_et.pdf&ved=2ahUKEwjR3Jeb7_qEAxXqg_0HHQ6oAD8QFnoECD4QAw&usg=AOvVaw1mml0JziYeHeLn0p3neg48

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.globalroadwarrior.com/estonia/environmental-issues.html%23:~:text%3DSea%2520level%2520rise%253A%2520The%2520rising,of%2520habitats%2520for%2520coastal%2520wildlife.&ved=2ahUKEwjR3Jeb7_qEAxXqg_0HHQ6oAD8QFnoECD8QAw&usg=AOvVaw3VlMkSq17zBvwiynT4Zagn

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CURRENT SITUATION

BELGIUM

Belgian's Climate Change Actions: Current Situation

As of my last update in January 2022, Belgium has been actively working to address climate change through various actions and policies. Here's a summary of the current situation:

1. **National Climate Plan:** Belgium has a National Climate Plan aimed at reducing greenhouse gas emissions and transitioning towards a low-carbon economy. This plan includes targets for reducing emissions across various sectors, such as energy, transportation, industry, and agriculture.
2. **Renewable Energy:** Belgium has been investing in renewable energy sources, including wind, solar, and biomass. The country aims to increase the share of renewable energy in its total energy consumption to meet its climate goals.
3. **Energy Efficiency:** Efforts to improve energy efficiency in buildings, industries, and transportation are ongoing. This includes initiatives to retrofit buildings with better insulation, promote energy-efficient appliances, and encourage sustainable transportation options.
4. **Carbon Pricing:** Belgium has implemented carbon pricing mechanisms to incentivize businesses to reduce their carbon emissions. This includes participation in the European Union Emissions Trading System (EU ETS) and the implementation of carbon taxes.
5. **Transportation:** Belgium is working to promote sustainable transportation options, such as public transit, cycling infrastructure, and electric vehicles (EVs). Incentives and subsidies are often provided to encourage the adoption of EVs and the development of charging infrastructure.
6. **International Commitments:** Belgium is a signatory to international agreements like the Paris Agreement, committing to reducing its greenhouse gas emissions and contributing to global efforts to limit global warming.
7. **Climate Adaptation:** In addition to mitigation efforts, Belgium is also focusing on climate adaptation strategies to address the impacts of climate change, such as sea-level rise, extreme weather events, and changes in agricultural patterns.
8. **Public Awareness and Engagement:** Increasing public awareness and engagement on climate change issues is a priority. Education, outreach campaigns, and stakeholder consultations are conducted to involve citizens and businesses in climate action efforts.

However, for the most accurate and up-to-date information on Belgium's climate change actions, I recommend checking recent reports from Belgian government agencies responsible for environmental and climate policies, as well as updates from international organizations monitoring climate change progress.

CURRENT SITUATION

SLOVAKIA

SLOVAK REPUBLIC COUNTRY STRATEGY 2023 – 2028

The Slovak Republic's transition to a green economy must prioritise the **integration of ambitious sustainable energy** targets for 2030 and 2050, which should encompass waste management and air quality improvement.

The World Health Organisation (WHO) considers the nation's annual mean PM2.5 concentration to be moderately hazardous because it is about twice as high as the level recommended. The production of electricity, the heating of homes, the manufacturing sector, the food processing industry, and vehicular emissions are major causes of the bad air quality. The rate at which municipal waste is disposed of in landfills is far higher than that of the EU, indicating ongoing issues with **municipal waste management**. The three Slovak regions that have been designated for Just Transition Funding (JTF)—Trenčín, Košice, and Banská Bystrica—are impacted by the difficulties arising from the phase-out of carbon-intensive businesses.

Businesses are becoming more conscious of the impact of weather occurrences. Increased energy savings in the commercial and domestic heating sectors, quicker adoption of renewable energy sources, and a decreased dependency on imported fossil fuels are all necessary to increase energy security and boost resilience. The utilisation of other sources of finance is inadequate, and local capital markets continue to be thin. Household financial assets, which are primarily kept in bank accounts, indicate the limited participation of capital markets. The EU's private equity sector has one of the lowest GDP shares and lacks seasoned general partners who can draw in capital.

Changes in production and consumption are unavoidable when establishing the circular economy. Production and consumption progress is tracked in the following areas:
- EU self-sufficiency for raw materials
- Green public procurement
- Waste generation
- Food waste

The supply concerns for raw materials, especially crucial raw materials, are addressed through the circular economy. One of the primary obstacles to achieving the circular economy is supplying the economy with essential raw materials. Avoiding and reducing waste production suggests a shift in consumer behaviour and may point to a more efficient use of raw materials. Food waste has negative consequences for the environment, the economy and the climate. It is a major problem in Europe and food is wasted at every point along the value chain: during production, delivery, at stores, eateries, caterers and homes.

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SLOVAKIA

HOW DOES THE NEW ECONOMIC POLICY OF THE SLOVAK REPUBLIC REFLECT THE CIRCULAR ECONOMY PRINCIPLES?

The primary strategic objective is to make the Slovak economy more competitive, with a focus on the rise in productivity of all production elements through the use of priority key areas.
1. Technological changes in support for the innovative potential of the SR
2. Environmental and energy efficiency of the economy The SR Ministry of Economy does not particularly design any instruments for green investment, but those that are already in place are mostly focused on supporting research and development, introducing innovations and smart solutions, and electrifying the automotive sector. (Slovak Environment Agency, 2019)

SOME SLOVAK PROJECTS

A whole new perspective on food was introduced through the international project **"We eat responsibly"**, which was funded by the European Commission, the Slovak Agency for International Development Cooperation, and the foundation Tesco. Throughout the course of the project, students from 60 Slovak schools discovered solutions to a variety of issues, including excessive food consumption, support for local and regional products, the requirement to preserve biodiversity, and minimizing food waste. Some of these activities revealed shocking information about our food systems.

The e-shop **"Bez odpadu"** is a true package-free shop. The online store also gives customers the option to ship and have their purchases packed in their containers. Those are sent in reusable packaging or compostable pockets. The package-free sale of loose foodstuff after 18 months of e-shop operation was expanded by the company Actinidia, s.r.o., from Detva, in collaboration with a zero-waste bakery and a small shop in Bratislava.

ENVIIEOM – The Association of Producers of Electric Appliances has collected and recycled more than 1,000,000 old refrigerators and freezers over 13 years of its activity in Slovakia. Old refrigerators must be disposed of carefully because they contain the dangerous freon, if they were made before 1996. If such a fridge breaks accidentally or is improperly disassembled, the freon evaporates into the air, seriously harming the ozone layer.

PROGRAMS FOR SCHOOLS:
We **collect used batteries** with Šmudlo They have been educating kindergarten students in Bratislava and Trnava regions through an eco-educational program since March 2017 in collaboration with non-profit organization DAPHNE. Children learnt how to properly handle spent batteries from their favorite toys through games and hand-on learning, as well as what can be done with them once they are placed in proper container. Nearly 10 000 children were involved in collecting used batteries, more than 170 collection containers were distributed and over 7 000 tons of used batteries were collected.
Do not throw everything in one bag A seven-part audio-educational series for primary and secondary schools that explains how to properly sort the various types of municipal waste, including paper, plastics, glass, metals, e-waste, and old used batteries.

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SLOVAKIA

Fostering international cooperation on science and technology is crucial for countries to benefit from knowledge exchange and collaborative research efforts. This can lead to advancements in eco-innovation and research, which will contribute to boosting long-term competitiveness. Additionally, improving energy efficiency and utilizing Slovakia's strength in the car industry can further enhance economic growth. However, waste management still needs attention to address the challenges it poses. Overall, the main assets in these innovations are the impacts on employment and sales, as well as the availability of skilled human resources.

OPPORTUNITIES	THREATS
Fostering international cooperation on science and technology	Lack of financial support to research and development
Support for higher education focused on eco-innovation and research	Low commercialization
Boosting long-term competitiveness	Brain –drain
Energy efficiency is improving	Highly educated persons in the field of engineering and science present a very low share of the population active in the national workforce
Slovakia is one of the major producers in car industry	
Waste management remains a great challenge	
Main assets in the innovations are employment impacts, sales impacts and human resources	

STRENGTHS	WEAKNESSES
Help to limit biodiversity loss	The lack of necessary infrastructure in order to recycle and reuse diverse types of materials
Reduction of greenhouse gas emissions	
Slow down the use of natural resources	Expectations are too high
Reducing waste	The lack of qualified human capacities in the area of eco-innovations
Boost productivity	
Generate cost savings	Not many successful projects related to circular economy
Geographic location in the Central Europe which enables great export of goods	Low investment into the ecology and eco-technologies
Fastest growing Eurozone member during the past years	Slow progress in implementing measures supporting research and development
A resource efficient low carbon economy in one of the priorities in the environmental agenda	Insufficient finances in order to find out new eco-investors and innovations
Most of the companies with implemented eco-technologies noticed reduction of materials in production process	Private sector has been investing poorly in research and development
	Differences between regions

The lack of financial support to research and development, along with low commercialization, contributes to the brain-drain and a low representation of highly educated individuals in engineering and science within the national workforce. Without sufficient funding and opportunities for commercialization, talented individuals are more likely to seek better opportunities and support in other countries, leading to a loss of valuable human capital. This perpetuates a cycle where the country continues to lag behind in innovation and scientific advancements.

Morseletto, P. (2020). Targets for a circular economy . ELSEVIER.
Slovak Environment Agency. (2019). Circular Economy - Future of the development of Slovakia. Ministry of Environment of the Slovak Republic, Slovak Environment Agency.
The World Financial Review. (2020, January 10). Circular Economy, Sustainability and Business Opportunities. Retrieved from https://worldfinancialreview.com/circular-economysustainability-and-business-opportunities/
UNEVOC Network. (2019). Generic Green Skills. Retrieved from https://greenskillsresources.com

CURRENT SITUATION

TURKIYE

Policy About CE

Türkiye has taken important steps in reducing emissions and announced the "Intended National Contribution Declaration" on September 30, 2015, in which it is envisaged that greenhouse gas emissions will be reduced by 21% compared to the reference scenario in 2030.

In 2021, the "Law Concerning the Appropriateness of Approval of the Paris Agreement" by the Grand National Assembly of Turkey was published in the Official Gazette and entered into force. Studies to reduce greenhouse gas emissions continue with many projects carried out (ÇŞİDB, 2022).

It is important for Turkey, which carries out nearly half of its trade with EU countries, to closely follow the steps the EU will take in the field of circular economy to maintain relations with the EU and maintain international competitiveness. In this context, the "Green Agreement Action Plan" was prepared by the Ministry of Commerce in 2021. In the Action Plan,
In the Action Plan,
(1) carbon regulations at the border,
(2) a green and circular economy,
(3) green financing,
(4) clean, economical and safe energy supply,
(5) sustainable agriculture,
(6) sustainable smart transportation,
(7) combating climate change,
(8) diplomacy and
(9) Actions to be implemented to achieve the targets determined under the headings of European Green Deal information and awareness activities are included. Studies carried out with other relevant institutions and organizations continue with the aim of harmonizing the Turkish economy with EU perspectives and adapting the production structure to the circular economy model.

Organisations Related CE

Two organizations support the rapid progress of Circular Economy studies in Turkey. These are; Turkey Circular Economy Platform (Turkey Circular Economy Platform, 2021) and DCUBE Circular Economy Cooperative (d-cube, 2021).

Türkiye Circular Economy Platform; provides training, financial opportunities and consultancy services for companies that truly want to accelerate their transition to a circular economy. Sustainable Industry and Circular Economy group, one of the sub-groups of the Business World and Sustainable Development Association (SKD Turkey), supports this platform by meeting the information/resource needs, offering measurement mechanisms, providing technical grant support and creating cooperation opportunities (SKD Turkey, 2021).

DCUBE Circular Economy Cooperative; It works to ensure that efficient and sustainable development policies become widespread all over the world, especially in Turkey, as a result of the implementation of the Circular Economy Model, especially in the fields of "agriculture, food, energy, textile, water".

CURRENT SITUATION

TURKIYE

Most of the companies in Turkey exporting to Europe have started to prefer purchasing raw materials and materials from suppliers that comply with the Circular Economy. For this reason, some of Turkey's leading textile companies have implemented the Circular Economy application system under the name of sustainability.

Initiatives

In February 2021, the Circular Economy Symposium was held in partnership with Istanbul Sabahattin Zaim University, TÜBA-Sustainable Development, Finance and Environment Working Group, United Nations Sustainable Development Solutions Network, Ankara Yıldırım Beyazıt University and Istanbul Medeniyet University. Circular economy was discussed in five sessions with its different dimensions.

In Turkey, studies are being carried out to prepare scenarios for emission reduction. For example, Turkey's Decarbonization Road Map was published by Sabancı University Istanbul Policy Center; With the Net Zero in 2050 report, it is aimed to reveal the road map of what kind of economic transformation Turkey should undergo within the scope of combating climate change.

Projects

In Turkey, two important and large-scale renewable energy forecasting systems developed by TÜBİTAK Marmara Research Center (MAM) have been introduced for the prediction of renewable energy resources and energy production with artificial intelligence algorithms. The first of these systems was developed within the scope of the Wind Power Monitoring and Forecasting Center (RITM) Project, and the second within the scope of the Flow Forecasting and Basin Optimization Model (ATHOM) Project.

With the ATHOM project, which started to be carried out for the General Directorate of State Hydraulic Works (DSİ) in 2016, with the aim of optimal use of water resources and handling cascade dam systems with a holistic approach, a system that will be a national flow forecast and basin operation model has begun to be developed for the first time in our country.

Within the scope of Turkey's efforts towards the green economy, the Circular Economy and Resource Efficiency Platform Project was introduced by the Istanbul Development Agency (ISTKA) in April 2022. This project aims to contribute to increasing resource efficiency in the Istanbul industry, priority sectors and value chains. On the other hand, it is planned to implement green organized industrial zones and industrial zones and to implement a certification system for these regions. Studies carried out by universities also show the interest of the academy in this subject.

NEEDS ANALYSIS

CE+ BUSINESS SURVEY

The business survey results indicate that while most respondents are familiar with the Circular and Green Economy, as well as the EU Green Deal, and are implementing sustainable measures, there's a lack of deep knowledge and understanding in their application, especially in relation to the EU Green Deal. Businesses are embracing sustainability, but often without a clear adherence to regulations or comprehensive understanding, which can potentially hinder the efficiency and effectiveness of their actions.

The survey reveals a need for better information dissemination and education to enhance the understanding of sustainability practices, their significance, and how they can be more effectively implemented. It also highlights a gap in communication and transparency within organisations, particularly in finance departments, where there's a disconnect between financial practices and sustainability goals. Some businesses have integrated Environmental, Social and Governance (ESG) objectives into their decision-making, presenting a model for sustainable financial practices.

HR departments also need to focus on better communication about environmental strategies and fostering employee engagement in sustainability. Training and skill development in green practices are crucial for building a sustainable workforce.

Procurement practices vary among businesses, with a preference for local sourcing, but there's room for improvement in understanding supply chain impacts and increasing local procurement. The survey underscores the importance of a circular and green economy to businesses and society, but also identifies barriers like financial constraints, technological challenges, resistance to change, and a lack of understanding of these concepts.

Addressing these issues requires strategic solutions, including investing in R&D, promoting sustainability, enhancing awareness, and overcoming supply chain and legislative hurdles. Additionally, stakeholder engagement is vital for supporting the circular and green economy, with a need for incentives, grants, R&D, capacity-building, knowledge sharing, and partnerships from government agencies, industry associations, and sustainability-focused organisations.

For a comprehensive analysis of the survey results, please click here to access the full report in PDF format.

NEEDS ANALYSIS

CE+ YOUTH SURVEY

This survey is part of the Erasmus+ project titled "Gamification, Digitalization, and Practical Tools for Developing Circular Economy Skills" (Project Acronym: CE+; Project Number: 2022-1-EE01-KA220-YOU-000090946); and it was implemented to gather insights and opinions regarding the concept of a circular and green economy, with a particular focus on the European Green Deal.
The survey was distributed amongst youngsters living in partner countries: Estonia, Lithuania, Ireland, Slovakia, Turkey, and Belgium.
To develop more enjoyable and engaging non-formal learning activities related to the circular economy and green skills, the partners cooperate to promote a better understanding of the opportunities and challenges associated with moving towards a more sustainable and environmentally conscious economy.

The majority of respondents do not have enough knowledge about the concepts of circular economy, green economy and European green deal. The overall situation proves that there is a strong need to raise awareness and enhance knowledge about all three concepts. A positive finding is that even though the respondents are not very familiar with the concepts depicted, most of them show an interest in learning and gaining knowledge regarding the topics. Half of the respondents are very interested while the rest indicated that they were slightly or moderately interested in obtaining more information, especially in the field of green economy.
Educating youth about the benefits of reusable products and materials is considered to be a main role in promoting a circular economy by 75,3% of the respondents. More than half of the respondents think that the use of disposable products should be promoted.

The importance of teaching the circular economy to young people
1.) Sustainable thinking: Teaching the circular economy to young people instils a sustainable mindset from the start. This helps them understand the importance of reducing waste and saving resources, leading to greener habits in their daily lives.
2.) Problem-solving skills: Circular economy education promotes critical thinking and problem-solving skills. It teaches young people to find creative solutions to reduce waste, recycle materials and design longer-lasting products.
3.) Economic opportunities: Understanding circular economy concepts opens up economic opportunities for youth. They can explore careers in recycling, sustainable design and waste management, contributing to the growth of a more sustainable and prosperous future.
By educating young people about the principles of the circular economy, we allow them to become agents of change, thereby supporting a more sustainable and resilient society.

For a comprehensive analysis of the survey results, please click here to access the full report in PDF format.

NEEDS ANALYSIS

CE+ YOUTH WORKER SURVEY

The Youth Worker Survey section of the needs assessment report highlights the attitudes, practices, and challenges faced by youth workers regarding the integration of Circular Economy, Green Economy, and European Green Deal concepts into their educational practices. Key findings from this section include:

1-Demographics: The majority of youth worker respondents were from Lithuania, Slovakia, and Turkey, with most working in secondary schools, youth organizations, and higher education institutions.
2-Interest in Learning: A significant number of respondents expressed moderate to high interest in learning more about Circular Economy, Green Economy, and the European Green Deal, indicating a recognition of the importance of these concepts.
3-Teaching Practices: A considerable portion of youth workers reported that they do not currently include these concepts in their teaching, especially the European Green Deal, which was the least taught among the three.
4- Inclusion in Curriculum: About half of the respondents mentioned that sustainability issues were part of their curriculum, with various activities like composting and energy conservation being implemented. However, there is still a significant gap in the integration of circular and green economy principles.
5-Challenges: The survey identified several challenges in integrating these concepts, including a lack of resources (funding and staff), inadequate teacher training, difficulty in measuring impact, resistance from teachers and administrators, and limited student participation.
6. Project Work: Participants reported involvement in various projects related to recycling and circular economy, such as waste reduction challenges and community outreach projects. However, a notable percentage of respondents had not engaged in any such activities.
7. Integration into Non-Formal Education: There was uncertainty among respondents about how to integrate these principles into non-formal education, with suggestions including through education, local community activities, and projects.
8. Observation of Positive Examples: Many respondents have observed examples of circular and green economy practices in their communities, such as solar panels, electric vehicles, waste sorting, and recycling initiatives.
9. Importance for Future Generations: There was strong agreement among participants on the importance of future generations understanding and adopting circular and green economy principles.
10. Access to Quality Resources: A significant majority reported difficulty in accessing quality teaching resources related to these concepts, highlighting a need for improved materials and training. 11. Necessity for In-depth Training: A substantial percentage of youth workers believe that in-depth training is necessary or absolutely necessary to effectively incorporate these concepts into their teaching.
For a comprehensive analysis of the survey results, please click here to access the full report in PDF format.

CHAPTER 2

Methodological framework of circular and green skills AND Non-formal learning activities on circular and green skills Integration

METHODOLOGICAL FRAMEWORK

The methodological framework of circular and green skills revolves around promoting sustainable practices and developing the necessary skills to support a transition to a circular economy and a greener society. It encompasses a systematic approach to identifying, acquiring, and enhancing skills that align with the principles of circularity and environmental sustainability. The framework consists of six elements:

1. **Linear Economy:**
   - Comparison of the linear and circular economy models is essential because understanding the circular economy is intertwined with knowledge of the linear economic model. It is undeniably a significant alternative to current economic models.

2. Understanding the Circular Economy:
   - A comprehensive understanding of the circular economy concept, including its principles, goals, and key components such as resource efficiency, and waste reduction.

3. Green and Circular Skills:
   - Discussion of essential soft and hard skills required in green and circular sectors, providing examples of relevant jobs in these fields. The chapter includes practical, real-world examples of how these skills are applied across various industries. It also offers tips for individuals to develop and engage in these skills, particularly emphasising the role of youth entrepreneurship in promoting sustainable practices.

4. EU Green Deal
   - Introduction to the EU Green Deal and its initiatives.

5. Sustainable Practices:
   - Promoting sustainable practices is essential for fostering a green economy, which aims to prioritise environmental conservation, social equity, and economic prosperity.

6. Innovative teaching methods and approaches for green skills acquisition for youth workers and businesses:
   - This element delves into innovative teaching methods for instilling green skills, embracing eco-challenges, sustainability hackathons, and practical learning. Focused on real-world application, it encourages a sustainable mindset through hands-on activities and non-formal group exercises. The goal is to cultivate environmentally conscious practices and empower a new wave of leaders committed to a sustainable future.

LINEAR ECONOMY

Humans produce too much waste. We make products, consume them and then chuck them away, littering our planet in the process with every kind of trash: cans, bottles, old electronic equipment, plastics, etc.
In the natural world, there isn't any rubbish or landfill. Energy is provided by the Sun, the wind or moving water, one species' waste is another's food and when things die, their nutrients return to the soil — in a circle of life. Unfortunately, humans do things more linearly... and much of the wastes we produce can't be recycled or is not currently recycled.
When we want the latest phone or computer, we tend to bin the old one. When our dishwasher breaks, we buy a brand-new one. But this wasteful approach, known as the linear economy, isn't working anymore! We're running out of resources to make new things with, and we're producing too much toxic waste.

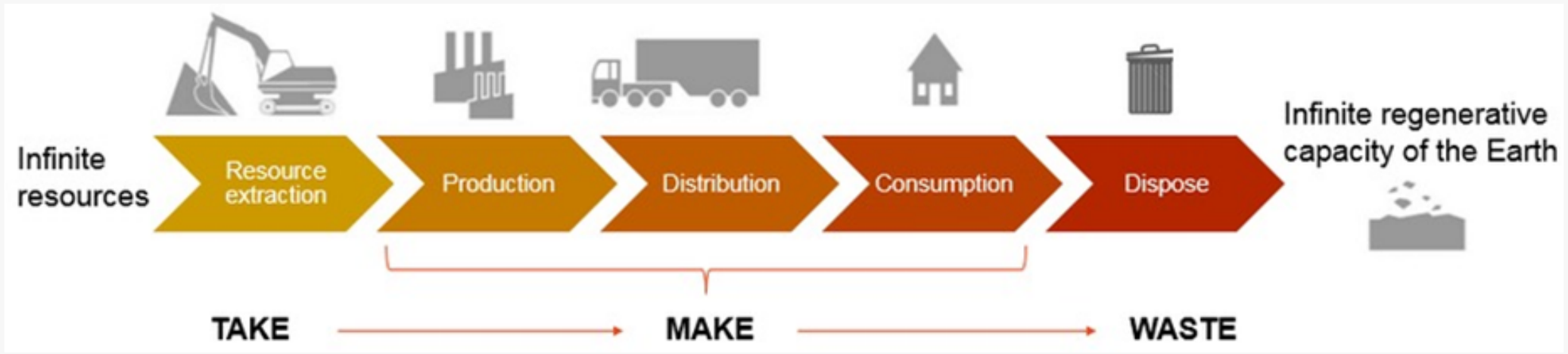
The Origins of Linear Economy

That's why we need to move to a circular economy, inspired by the natural world — where everything has value and nothing is wasted.
Instead of chucking away your broken things, why not fix them?! It can be much easier than you think! For instance, Repair Cafés all around the UK and Ireland provide tools, materials and advice to people who want to get mending, whether it's furniture, bicycles, electrical appliances, clothes, crockery or toys. Find one near you at repaircafe.org/en/
Or why not to use old stuff to create new, useful things?

Linear economy in detail

Between the mid-nineteenth and early-twentieth centuries, the Western world went through the so-called Second Industrial Revolution.

Inventions, discoveries, and the organization of factory labour allowed Europe and the United States to produce more goods at a lower cost. As living conditions also improved, the number of potential consumers grew exponentially, along with sales and subsequent requests to produce even more products. This economic system has been defined as “linear” and has three phases: “take,” “make,” and “dispose.”



Linear economy is the traditional model where raw materials are collected and transformed into products that consumers use until discarding them as waste, with no concern for their ecological footprint and consequences. It prioritizes profit over sustainability, with products made to be thrown away once they’ve been used. Like we did until now.

The linear model has been the primary one of advanced countries throughout the last century: a company’s value was based on how much it could produce and sell, and the higher its sales, the higher its profits. A UNEP (United Nations Environmental Program) report predicts that, if the current rates of growth and consumption stay the same, the demand for natural resources will double by 2050.

The problem is that, by then, those resources will not be available on our Earth. This path for economic growth and prosperity is depleting the earth’s ecosystems, which have been impacted substantially and irreversibly. .

A linear economy is no longer sustainable: the survival of our planet (and us) demands a radical shift. In this scenario, a circular economy can be the wave of the future.
Towards Circular Economy

Examples of the linear economy

Examples of linear economy implementation are fossil fuel-driven energy development, paper production without reforestation/afforestation, synthetic plastic production, chemical-based crop production, and disposable inorganic packaging.

Fossil fuel-driven energy is a classic example of linear economy, especially where fossil fuels are relied upon as the sole energy resource for economic development.
The main reason for this is the fact that fossil fuels are non-renewable, and must be continuously extracted to be used to provide energy for electricity generation and other purposes. Fossil fuel dependence also facilitates the negative effect that a linear economy tends to have on the environment. When used, most fossil fuels produce significant amounts of greenhouse gases like carbon dioxide (CO2), as well as toxins that contribute to air pollution. Coal, natural gas and petroleum all fit the take-make-waste linear economic model, because they occur in finite quantity and are bound to become exhausted and scarce.

Although paper production depends on renewable biomass from trees, it can fall into the modem of take-make-waste, unless adequate measures to regenerate raw materials and recycle used paper products are taken.

The main disadvantage of making paper from trees is the risk of deforestation. Because linear economies focus on maximizing instantaneous production and profit, it is not uncommon for large-scale production of paper to result in the eventual loss of forests.

A linear economic model of the plastic industry is one in which synthetic materials are used to manufacture plastics that are used by consumers and subsequently discarded as waste in landfills, incinerators, and other waste management media.

Often, linear plastic production goes along with fossil fuel-dependency challenges, because raw materials used in the manufacture of synthetic plastics can be derived from fossil fuels. The most prominent environmental consequence of synthetic plastic production in a linear economy is plastic pollution.

Marine pollution by discarded plastics alone is accountable for huge economic losses per year, on a global scale. The production and degradation of synthetic plastics cause environmental degradation by the release of toxins, gaseous by-products and microplastics into the environment.

The linear model of plastics involves a unidirectional pathway of production, usage and disposal.

One of the evidences of this is the popularity of disposable inorganic packaging.

Disposable inorganic packaging refers to packaging with materials that are not biodegradable and are designed for one-time usage. These materials constitute a large portion of inorganic waste, which is a major cause of aesthetic pollution by littering, in urban areas.

In addition to littering, the fact that these packaging materials are disposed of implies that their popularity in the market comes with a high risk of resource depletion, at least concerning the raw materials used in their manufacture.

The sustainability of any industry or business depends on the ability to conserve resources by recycling and reuse. This implies that it is recommendable to replace the disposable, take-make-waste model with a more circular one.

Finally, it is fairly common in a linear economy, for **agriculture** to be practised in a subsistent, intensive form which is characterized by the use of chemicals to enhance instantaneous yield.

Chemical fertilizers, herbicides and pesticides have the obvious benefit of rapid effectiveness, and fit the objective of mass production and maximum profit, in a linear economic scenario.

Linear economic production in agriculture also encourages intensive use of machinery and excessive consumption of water resources. These applications mount pressure on natural resources and are unsustainable in the long run.

What is the Circular Economy

Disadvantages of the current linear economy

The linear economy results from business practices that assume a constant supply of natural resources. This has resulted in the take-make-dispose mentality.

This mentality is based on the extraction of resources, the production of goods and services and the disposal of post-consumer waste. However, this approach is coming under increasing pressure because of its environmental and economic disadvantages.

Ecological disadvantages

The ecological disadvantage of the linear economy is that the production of goods is at the expense of the productivity of our ecosystems. Excessive pressure on these ecosystems jeopardises the provision of essential ecosystem services, such as water, air and soil cleaning.

All three steps of the “take-make-dispose” mentality affect ecosystem services in different ways. The collection of raw materials leads to high energy and water consumption, emissions of toxic substances and disruption of natural capital such as forests and lakes. Product formation is also often accompanied by high energy and water consumption and toxic emissions. Eventually, when these products are discarded, space is taken up from natural areas and toxic substances are often also emitted.

The plastic soup is an example.
A lot of plastic is only used for a short period, so you can quickly go through the take-make-dispose step-by-step plan.

As a result, more than 300 million tonnes of new plastic are produced worldwide each year.

Of this, 5 million tonnes end up in the oceans. This consists of plastic waste that is dumped on land, in the sea or in the sewer system. Most of this plastic is originally dumped on land but washes into the sea via rivers and canals. Another category is microbeads.

These are tiny granules of plastic that are used in care products, such as shampoos and scrubs. Eventually, the plastic is divided into smaller particles by degradation and fragmentation. Toxic substances may be released during this process. In addition, all kinds of animals see the plastic waste and the microbeads for food. In this way, the plastic disturbs the food chain of fish, which can also damage our health. In this way, the production of plastic in the “take-make-dispose” step-by-step plan harms the supply of fish as an ecosystem service for the oceans and seas (Plastic Soup Foundation, 2019).

Economic disadvantages

In addition to the damage caused by the linear economy to the provision of ecosystem services, this economic model also jeopardises the supply of materials. This uncertainty is caused by fluctuating raw material prices, scarce materials, geopolitical dependence on different materials and increasing demand. These problems are solved in a circular economy. The risks are explained below.

1. Fluctuating raw material prices

The level and fluctuation of raw material prices is significantly increasing. This not only creates problems for diggers and buyers of raw materials, but it also creates greater risks in the market.

This, in turn, discourages investments in the extraction and processing of materials, which can ensure that raw material prices continue to rise over time. In addition, these price fluctuations prevent companies from making price forecasts, which gives them a weaker competitive position than companies that are less material-dependent companies from making price forecasts, which gives them a weaker competitive position than companies that are less material-dependent.

2. Critical materials

Another disadvantage of the current linear economic system is that much is produced with scarce materials. Several industries make intensive use of critical materials for their production processes, such as indium and chromium. These materials are only available to a very limited extent. In particular, the metal industry, the computer and electronics industry, the electrical equipment industry, and the automotive and vehicle industries make use of these raw materials. In the Netherlands, these sectors make up a significant percentage of the economy.

3. Interdependence

As a result of the increase in trade, the geopolitical interconnectedness of products has become increasingly strong. For example: countries with water scarcity but a surplus of oil trade oil to buy grain. As a result, these raw materials are, as it were, linked to each other. In addition, the production process of many goods depends on water and fuels.

As a result of this interdependence, the scarcity of one raw material will have a widespread effect on the prices and availability of many more goods.

4. Increase in material demand

In addition to the limited supply of raw materials available anyway, a significant increase in demand for materials is also predicted. As a result of population and welfare growth, the number of middle-class consumers (with a higher demand for material consumption) will increase by three billion by 2030.

In addition, the lifespan of products has decreased dramatically in recent years. This is one of the driving forces behind the increasing consumption of materials in the Western world.

Product lifespan is still decreasing, because there is a process of positive feedback: consumers want new products faster and therefore use their “old” products shorter. This in turn means that less quality is needed in a product’s lifecycle, which in turn leads to consumers wanting new products even faster.

Conclusion

The traditional linear economy pattern follows the take-make-dispose scheme. This method of production is maximizing the uses of collected raw materials before it transforms them into products, eventually disposing of unusable material.

Linear economy value is created by mass production and the selling of products. Due to this scheme, which is similar to a flat line, the linear economy can be found under the name ‘open cycle.’ The main problem that arises with this production approach is the irrational usage of the available resources. During the process of production, resources are generally not implemented in the final product. Expectedly, this creates a double negative effect, because it negatively affects both the environment and climate changes.

Linear economy exhausts raw materials and energy, which results in CO2 emissions. Statistically, around 68% of input raw materials are of non-renewable nature which poses a grave problem and threat to the environment, given that these products are either detonated or burned. Besides the severe damage to the biosphere, the downfall of the linear economy is human exploitation as well.
This system emphasizes the on
the products themselves, and the
outcome of such an equation is –
mass production and consumption.
Yet, to supplement the markets’
needs, the economy exploits workers.

The linear economy is based on four main stages:

- Extracting raw materials and consuming energy;
- Transforming these resources into finished products;
- Distributing these products for consumption;
- Discarding (part of) these products when they reach the end of their life.

Main parts of the Linear Economy

This economic model developed considerably during the Industrial Revolution at a time when resources were abundant and mass consumption was in its infancy. With globalisation, the linear economy, based on the principle of "extract, manufacture, consume, throw away", has become considerably more widespread, resulting in a symptomatic and senseless phenomenon: planned obsolescence.
It now appears that this model is not sustainable in the long term. There are many reasons for this:

- Resource depletion;
- Global warming;
- Erosion of biodiversity;
- Increased waste;
- World population increase, etc.

If no effort is made to further preserve the world's ecosystems, humanity as a whole is at risk. Every year, humans are depleting the planet's regenerative capacity earlier and earlier. In 1970, this famous Earth "overshoot day" was on December 29th; in 2022, it was on July 28th.
Fortunately, there is a communal awareness of this issue among public authorities, citizens, and companies. It was after observing this that sustainable development and then the circular economy emerged.

From Linear Economy to Circular Economy:
Linear economy vs Circular economy

Learning through Play

Over the past few years, the concept of circular economy has become an important ambition in European policy strategies, with the objective to keep resource consumption and environmental impacts within planetary boundaries while boosting industrial competitiveness and job creation.
An increasing number of organisations, start-ups, as well as existing companies have started to show interest in developing new products and services that fulfil circular economy ambitions. While a multitude of successful case studies are reported on inspirational platforms, the implementation of circular business models in practice remains low.

Too often, the **circular economy** is merely regarded as an approach to improve **waste managemen**t, focused on increased recycling, while the implementation of more 'radical' forms such as reuse, product-service systems, or remanufacturing remains low in practice. Nevertheless, case study research has proven that **circular business models** help companies to **mitigate risks** (e.g., reduce resource supply dependence, protect against price volatility), **enhance competitiveness** (e.g., by differentiating offerings, strengthening customer relations), and **accelerate growth** (e.g., reducing operating costs and creating additional revenues).

This low adoption rate suggests that many companies still struggle to identify and realise circular business opportunities. Indeed, the **reshaping** of a traditional, linear business model into a circular business model requires a **fundamental change** in the way companies do business, i.e., how they create, deliver, and capture value. Although it is widely acknowledged that business model innovation is crucial, general awareness about the business opportunities of circular economy business models is still low. While a large body of research has focused on barriers related to lacking technology, and social, cultural, organisational, regulatory, financial, and market-related barriers, Kirchherr et al. pointed out that the impact of 'soft' cultural barriers such as a 'hesitant company culture' is greater than that of 'hard' technological barriers. This shows that there is **a need for awareness building and education on circular economy principles and opportunities at the company level.**

First of all, business leaders—especially among top management that have the power to allocate company resources —need to gain understanding of the competitive advantages and potential value generation opportunities of circular business models, as well as of their cost implications and potential risks. In addition, since business model innovation is an iterative process of piloting and eventually scaling up, companies need to be encouraged to engage in low-risk experimentation. However, a gap exists between the knowledge needed for the implementation of circular strategies in a business context and the means and availability of circular economy business education. Moreover, the lack of inclusion of circular economy education in business curricula also suggests that it is not seen as a 'serious business thing' by business schools.

Teaching about sustainability in general, and circular economy in particular, is challenging because it is a complex topic, building on multidisciplinary knowledge, and is rich in trade-offs, interdependencies, and feedback loops. Recently, a multitude of tools, education programmes, and online courses have been developed to educate students, entrepreneurs, and the wider public about circular economy principles and circular business model innovation. However, a review of existing **educational tools suggests that many tools lack a clear focus on circular business model innovation**, or—if they do have this focus—remain unused in practice because they do not succeed in meeting the needs of business developers due to inadequate empirical testing in a company context.

Game-based learning tools are attracting attention as effective ways of transferring knowledge on complex topics to a broad audience. Apart from transferring knowledge of concepts and principles, they are also able to **teach skills**, such as decision-making and problem solving. Contrary to many traditional educational settings in which learners sit back and listen passively to an instructor, educational games focus on **learning-by-doing**, engaging learners to explore and experiment under the guidance of a skilled facilitator or coach. While doing so, players get immediate feedback on their actions and decisions while operating in a safe environment. Many authors also indicate that the use of games in education **increases motivation and engagement** in comparison with traditional teaching methods. This makes games especially interesting to be used in the field of sustainability education. Although a few educational games exist in the field of circular economy, most are limited to raising awareness about resource challenges in general (why circular economy is needed), while the opportunities and implications of circular business models from a company perspective remain underexposed.

As an example, **Risk&RACE** is a serious game that was developed to educate students and professionals about circular economy. A review of existing games in the field of circular economy and sustainability suggests that these games predominantly focus on the overall resource challenges and sustainability issues that prompt the need for a circular economy, lacking any attention to the operational and financial implications of adopting circular strategies and circular business models at a company level. Targeting this gap, Risk&RACE is a simulation game, covering the topic of circular economy, including basic principles of company management with a special focus on the operational and financial opportunities and challenges related to the adoption of circular business models. Secondly, Risk&RACE is a **fully fledged, non-digital board game**, in contrast to most serious games in education that are digital games and videogames. While the use of board games in sustainability education has been hardly studied, some researchers have theorised that the handling of tangible game pieces on a physical game board has a positive effect on learning due to increased engagement, better understanding of game mechanics, and visualisation of the effects of player decisions, as well as encouraging social interactions and discussion around the game table.

Tips for gamification

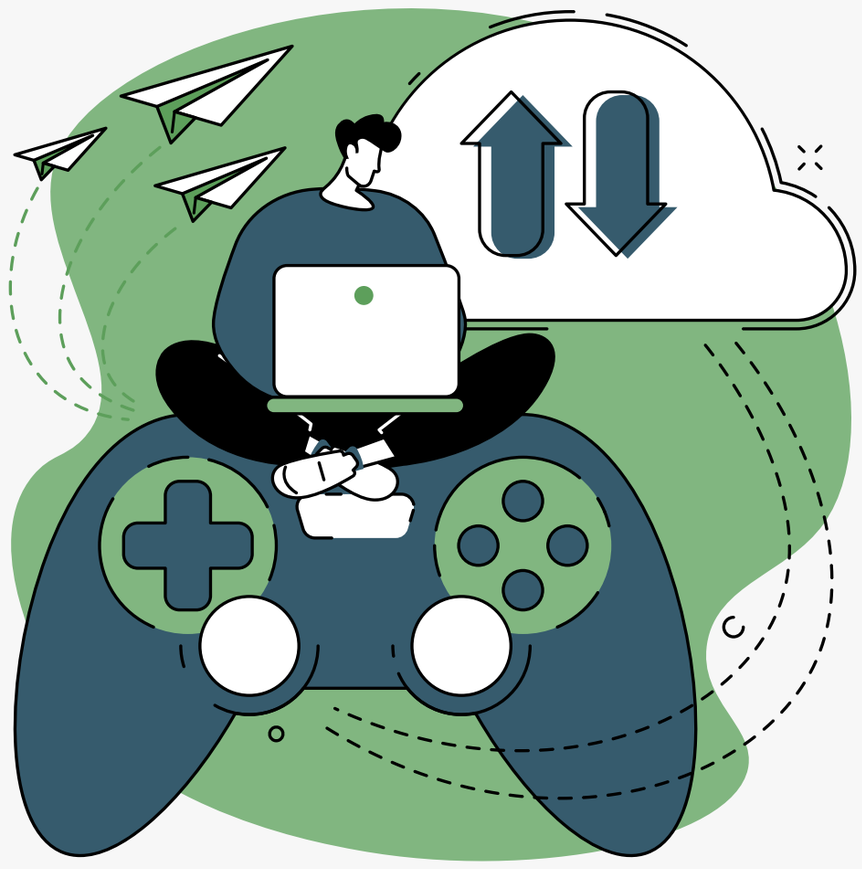
Gamification, in its nature, combines not only games but also the whole psychological environment. Thanks to this, a properly prepared implementation of gameplaying can encourage people to compete with others and achieve the set tasks and goals.

A person feels fulfilled that through his actions has performed a mission or reached a new level. It stimulates them to continue their activity and self-improvement to be better and beat their records. Its advantage is also that it does not have to be limited to one technology or method—it can be realized both through a simple scenario and a corkboard with results, it can also be embedded, e.g., in a virtual or augmented reality.

Although, at first glance, it may seem that games are a rather new phenomenon; they have been accompanying people since the beginning of time. The first board games found by archaeologists came from ancient Mesopotamia; in ancient times, people also played with dice—Claudius, the Roman Emperor (10 BC–54 AD) wrote a guide for players.
Gamification was widely disseminated in 2010, although it is not a new phenomenon. It transfers motivational techniques used by game designers and producers for many years to other fields, such as business, marketing, or education.

Gamification focuses on the use of a game mechanic—such as a badge system, points, scoreboard, or levels. Thanks to this, gamification participants start to perceive the tasks they face in the real world as challenges faced by the game hero. Participants tend to change their behavior to achieve their goals by competing with others or themselves.
Such a change of behavior makes the user consider certain activities to be a play, a game, or a mission leading to victory, and not a typical job or an unpleasant duty.

Treating a state of flow in which players are fully immersed and focused on the game is key to **motivating** them. This can be achieved by designing **challenges** that balance the difficulty of a task with the player's skill level. Clear **goals and feedback** should be provided so that the player knows what to do and how well they are doing it. To ensure an optimal challenge, the **difficulty should be adjusted dynamically** to match the player's skill level. Additionally, **variety and choice** should be offered, allowing the player to choose their preferred style and pace.



Motivating players is an important factor in game design, and **rewards** are a key component in this. Rewards come in two forms: intrinsic and extrinsic. **Intrinsic rewards** are those that come from the game itself, such as the enjoyment of the gameplay or story, whereas **extrinsic rewards** are those that come from outside the game, such as points, badges, or leaderboards. To design **engaging rewards** for players, you must consider how they align with goals, vary by type and frequency, and balance rewards with costs. Rewards should match the goals of the game and player, reflect their value and effort, offer different kinds of benefits, and be delivered at different intervals. They should also not be too easy or hard to obtain and should not outweigh the costs of playing.

A third factor that motivates players is a **story**, which provides the **narrative context** and **meaning** of the game. A story can create **emotional engagement** and **immersion** for the player, as well as a sense of **purpose and identity**. To design stories that motivate players, it is essential to create compelling characters with personalities, motivations, goals, conflicts, and relationships that make them believable and relatable. Additionally, a rich world should be built with history, culture, lore, secrets, etc., that make it interesting and immersive to explore. Moreover, the plot should have structure, tension, twists, choices, consequences, etc., that make it engaging and impactful for the player.

A fourth factor that motivates players is **feedback** - the information that the game provides to the player about their performance, progress, and state. Feedback can be **positive or negative, direct or indirect, explicit or implicit**, and should be designed to **help the player learn, improve,** and master the game. To design feedback that motivates players effectively, it should be **clear and timely** - easy to understand and relevant to the player's actions and goals - as well as **consistent and coherent** with the game's rules, logic, and aesthetics. Furthermore, feedback should be **meaningful and motivating** - providing value and incentive to the player rather than discouraging or punishing them.

A fifth factor that motivates players is **social**, which involves **interaction and communication** between the player and other players or the game's community. Social can create **a sense of belonging, cooperation, competition**, and fun for the player, as well as provide a **source of support, feedback, and recognition**. To design social features that motivate players, you need to enable **social interaction with chat, voice, video**, etc., support social identity by allowing players to express themselves and customize their avatar and profile, and encourage social participation by incentivizing engagement with the game's community and contribution to the game's development.

Designing fun games that motivate players requires understanding your audience, experimenting and iterating, and surprising and delighting them. To **know your audience**, you need to target a specific group of players, understand their needs, wants, tastes, etc., and design for them. Experimentation and iteration involves testing different ideas, prototypes, features, etc., and collecting feedback from the players to refine and improve them. Lastly, surprise and delight by offering unexpected and memorable moments, events, rewards, etc., that create positive emotions and impressions for the player. Fun is a subjective and personal experience of enjoyment and pleasure that the player derives from playing the game. It can be influenced by many factors such as genre, style, theme, mechanics or the player's preferences, mood or expectations. Fun can also be categorized into different types like hard fun, easy fun, serious fun or people fun depending on the player's goals, challenges, emotions or social interactions.

Gamification in non-formal education and youth work

As defined by Council of Europe, **youth work** is “a broad term covering a wide variety of activities of a social, cultural, educational, environmental and/or political nature by, with and for young people, in groups or individually. Youth work is delivered by paid and volunteer youth workers and is based on non-formal and informal learning processes focused on young people and on voluntary participation.

Youth work is quintessentially a **social practice,** working with young people and the societies in which they live, facilitating young people’s active participation and inclusion in their communities and in decision making”.

Educational systems exist to promote formal learning, which follows a syllabus and is intentional in the sense that learning is the goal of all the activities learners engage in. Learning outcomes are measured by tests and other forms of assessment. Adult migrants engage in formal learning when they take a course in the language of their host community. If the course is based on an analysis of their needs, it will follow a syllabus that specifies the communicative repertoire to be achieved by successful learners. The nature and scope of that repertoire should be reflected in whatever forms of assessment accompany the course.

Non-formal learning takes place outside formal learning environments but within some kind of organisational framework. It arises from the learner's conscious decision to master a particular activity, skill or area of knowledge and is thus the result of intentional effort. But it need not follow a formal syllabus or be governed by external accreditation and assessment. Non-formal learning typically takes place in community settings: swimming classes for small children, sports clubs of various kinds for all ages, reading groups, debating societies, amateur choirs and orchestras, and so on. Some non-formal learning arrangements become increasingly formal as learners become more proficient; one thinks, for example, of graded exams in music and other performing arts.

Informal learning takes place outside schools and colleges and arises from the learner's involvement in activities that are not undertaken with a learning purpose in mind. Informal learning is involuntary and an inescapable part of daily life; for that reason, it is sometimes called experiential learning. Learning that is formal or non-formal is partly intentional and partly incidental: when we consciously pursue any learning target we cannot help learning things that are not part of that target. Informal learning, however, is exclusively incidental.

These definitions and distinctions help us to understand the complexity of successful language learning. When children acquire their first language they do so not because they are taught. Their learning is an incidental result of their participation in family life, and the linguistic skills they develop and the concepts they master reflect the social practices of their immediate environment. Similarly, adults are said to learn a second or subsequent language "naturalistically" when they do so by living among speakers of the language and interacting with them on a daily basis. Their emerging communicative repertoire is shaped not by a conscious learning agenda but by their attempts to satisfy their social and material needs. These are both examples of informal learning. In either case informal learning may be supported by non-formal learning: intentional learning that is prompted, for example, by the explanations parents give to their children and adult learners receive from those with whom they interact.

When children learn to read and write in their first language, they generally do so as part of their formal education and as a result of conscious effort; and when adult migrants attend a course in the language of their host community, they are aiming to achieve a prescribed level of proficiency. In both cases, however, intentional learning is usually accompanied by incidental learning; and the effects of incidental learning in formal educational contexts are reinforced by informal and non-formal learning in the world outside. The literacy of young children benefits from their out-of-school engagement in the reading they undertake for pleasure or in pursuit of a special interest, and the proficiency of adult migrants in the language of the host community is likely to be enhanced when they have opportunities to interact informally with other speakers of the language.

These considerations prompt two questions. First, how can those responsible for organising language courses for adult migrants ensure that their learners have opportunities to use the language outside the classroom and thus benefit from informal/non-formal learning? One obvious answer is to arrange cultural visits and social activities that bring the learners into informal contact with members of the host community. Another is to encourage learners to participate in social activities, or to arrange such activities specifically for their benefit. Secondly, if adult migrants who have learnt the language of their host community "naturalistically" are required to demonstrate proficiency in that language in order to secure a residence permit or citizenship, can their informal/non-formal learning be recognised without requiring them to take a test? Any attempt to answer this question must consider alternative forms of assessment.

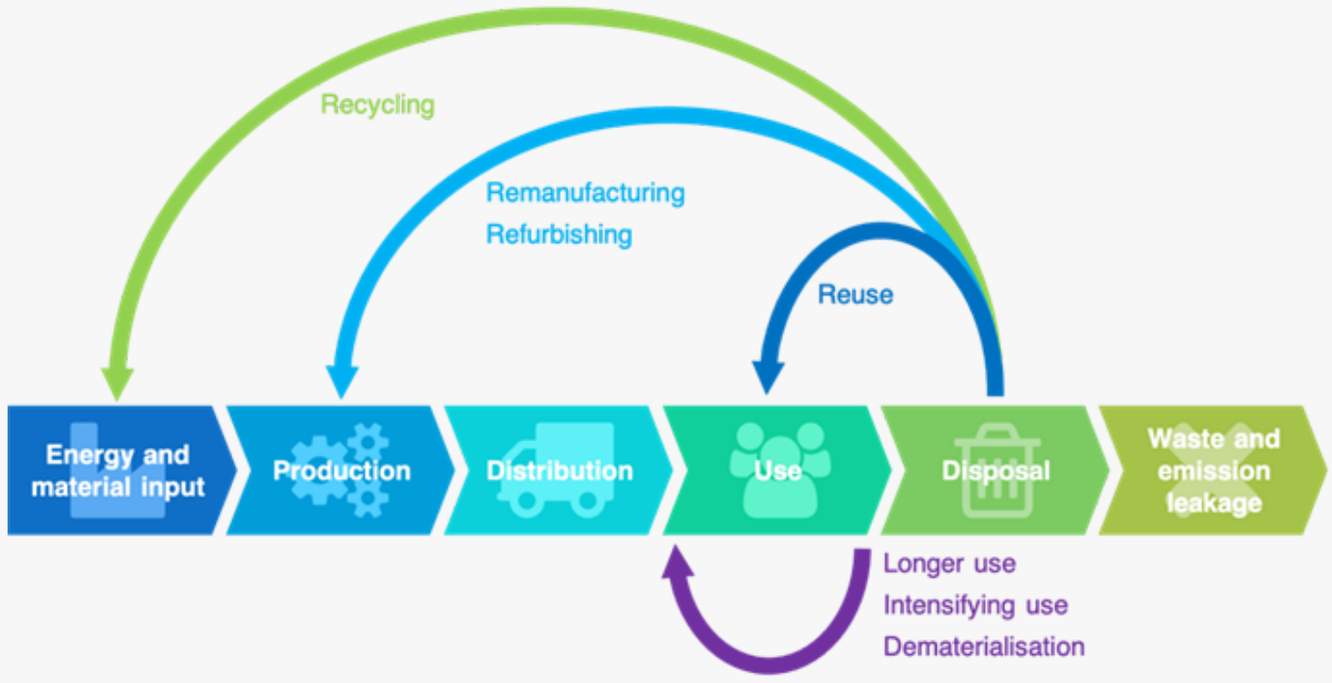
CIRCULAR AND GREEN ECONOMY

Understanding the Circular Economy

The circular economy is a sustainable economic model designed to maximize resource efficiency, minimize waste, and extend the lifespan of products and materials. It is in contrast to the traditional linear economy, which follows a "take-make-dispose" pattern. In a circular economy, products and materials are kept in use for as long as possible, and their value is retained, regenerated, or restored at the end of their lifecycle. (Ellen MacArthur Foundation)

Principles of the Circular Economy:

A) Design for Longevity and Durability: Products should be designed to last longer, with quality materials and construction.
B) Resource Efficiency: Maximize the use of resources and minimize waste throughout the product lifecycle.
C) Regenerate Natural Systems: Aim to restore and regenerate ecosystems and natural resources used in production processes.



D) Reduce, Reuse, and Recycle: Promote the reduction of waste through the reuse and recycling of materials, components, and products.
E) Closing the Loop: Create closed-loop systems where products and materials are continuously reused and recycled. (Ellen MacArthur Foundation)

Goals of the Circular Economy

A) Minimize Waste: Reduce the generation of waste by keeping products and materials in use for longer and recycling as much as possible.
B) Resource Conservation: Preserve and extend the availability of natural resources by using them efficiently and responsibly.
C) Environmental Impact Reduction: Lower the environmental footprint of production and consumption, including reduced greenhouse gas emissions.

D) Economic Benefits: Promote economic growth by creating new business opportunities, jobs and revenue streams in circular sectors.

Key Components of the Circular Economy

A) Resource Efficiency: This includes optimizing resource utilization by implementing sustainable practices across resource acquisition, manufacturing processes, and distribution networks. It necessitates minimizing resource waste throughout the product lifecycle.
B) Waste Reduction: A core tenet of circular economy principles, waste reduction encompasses strategies such as product design for durability, proactive repair and refurbishment initiatives, and a robust emphasis on recycling mechanisms to curtail the generation of waste.

C) Product Lifecycle Management: Central to circularity, this entails the comprehensive oversight of products from inception to obsolescence. It includes meticulous considerations spanning product design, production, utilization, and eventual end-of-life scenarios.
D) Closed-Loop Systems: Representing the linchpin of circularity, closed-loop systems are engineered to perpetually reincorporate materials and products into the economic cycle, thereby mitigating the requirement for brand-new resources while concurrently minimizing waste generation.
E) Circular Business Models: This transformative component encourages enterprises to transition from traditional product-centric models to service-oriented approaches, offering services such as leasing, sharing, and subscription models to extend the lifecycle of products and materials. (Ellen MacArthur Foundation)

Importance of Closed-Loop Systems

Closed-loop systems assume an indispensable role within the circular economy framework, underscoring a multiplicity of compelling advantages:
A) Resource Preservation: These systems are instrumental in conserving finite natural resources by perpetually reutilizing materials and products, thereby lessening the burden on increasingly scarce new resources.
B) Waste Minimization: A central facet of closed-loop systems is their pronounced role in minimizing waste generation. They manage a substantial reduction in waste production, resulting in a cleaner and more sustainable environment.

C) Economic Opportunities: Closed-loop systems foster a ground for economic opportunities, particularly within the recycling, remanufacturing, and reverse logistics sectors. These sectors, in return, yield job creation and revenue generation, contributing to economic prosperity.

D) Environmental Mitigation: Prioritizing material reutilization and recycling within a closed-loop system engenders a marked reduction in energy consumption. This energy efficiency translates into reduced greenhouse gas emissions, thereby mitigating the environmental impact associated with the production of materials from brand-new resources.

In summary, the circular economy's fundamental principles revolve around optimizing resource utilization, minimizing waste, meticulous product lifecycle management, the establishment of closed-loop systems, and the propagation of innovative business models.

Closed-loop systems, serving as the keystone play an indispensable role in resource preservation, waste reduction, economic advancement, and environmental mitigation. (Ellen MacArthur Foundation)

Understanding the Green Economy

The green economy has emerged as a pivotal paradigm in the contemporary discourse on sustainable development and economic growth.

The concept of a green economy revolves around the idea of creating an economic system that prioritizes sustainability, environmental protection, and social well-being. It seeks to balance economic growth with ecological responsibility, aiming for harmonious coexistence between human activities and the planet's finite resources.

Principles of the Green Economy

The Global Green Economy Coalition (GEC) defines the five principles of a green economy, which form the fundamental framework of this system:

1. Well-being: In a green economy, the focus is on the well-being of all people. It is centred on individuals and aims to generate prosperity. It provides opportunities

for green and decent livelihoods, businesses, and jobs to enhance the overall quality of life.

2. Justice: Equity is a core principle within and between generations. The green economy is inclusive and fair, striving for an even distribution of opportunities and outcomes while reducing disparities among individuals.

3. Planetary Boundaries: The green economy prioritizes the protection, restoration, and investment in nature. It acknowledges and nurtures the diverse values of nature, emphasizing the preservation, growth, and restoration of biodiversity, soil, water, air, and natural systems.

4. Efficiency and Sufficiency: Sustainability in consumption and production is at the heart of the green economy. It encourages low-carbon, resource-efficient, diverse, and circular practices to support a sustainable way of life.

5. Good Governance: A well-functioning green economy relies on integrated, accountable, and resilient institutions. It is evidence-based and supported by institutions that are collaborative, coherent, and inclusive. Public participation is encouraged, and decision-making is decentralized. (Meunier, 2021)

Business Opportunities in the Green Economy Transition

The transition to a green economy presents a profusion of business opportunities:

A) Renewable Energy: The renewable energy sector, encompassing solar wind, and hydroelectric power generation, is a fertile ground for investment and entrepreneurial growth. (IRENA International Renewable Energy Agency, 2022)

B) Energy Efficiency: The demand for energy-efficient products and services offers a substantial market for businesses seeking to reduce energy consumption.

C) Sustainable Agriculture: Sustainable agricultural practices, organic farming, and the cultivation of local food systems are gaining prominence within the green economy. (FAO, 2023)

D) Eco-Tourism: Sustainable tourism initiatives that prioritize local cultures and ecosystem preservation not only stimulate economic growth but also protect natural environments. (UNWTO)

E) Circular Economy Solutions: Embracing the tenets of the circular economy, which emphasizes waste reduction and sustainable product lifecycle management, can open avenues for innovative business models. (Ellen MacArthur Foundation)

Everyday Actions in the Green Economy

Individuals play a crucial role in contributing to the green economy through actions in their daily lives. These actions align with sustainability principles and have a positive impact on the environment and society.

Energy Conservation is a key practice that individuals can adopt. By implementing energy conservation measures at home and embracing energy-efficient appliances, a significant reduction in carbon footprints can be achieved. (U.S. Department of Energy)

Sustainable Transportation choices also make a substantial difference. Opting for sustainable modes of transportation such as public transport, carpooling, cycling, or electric vehicles helps reduce emissions. (International Transport Forum, 2023).

Recycling and Waste Reduction are essential components of the green economy. Responsible waste sorting and recycling, coupled with measures to reduce single-use plastics, align with the green economy principles. (WRAP, 2020-2021).

Sustainable Consumption is another way individuals contribute. Mindful consumer choices, such as supporting locally produced and eco-friendly products, contribute to the ethos of the green economy. (Sustainable Brands)

Water Conservation is crucial for resource conservation and sustainability. Implementing water-efficient fixtures and practices in households helps conserve their precious resource and aligns with green principles. (EPA, 2023)

The difference between Green and Circular Economy

A clear distinction exists between the Green and Circular Economies, each with its unique focus and objectives.

The Green Economy primarily concentrates on sustainability, low-carbon practices, and the adoption of renewable energy sources. It places a strong emphasis on the environmental aspect of economic transition.

The key objective is to achieve economic growth while minimizing negative environmental impacts.

- Sustainability – The Green Economy emphasizes practices and policies that promote environmental sustainability. It seeks to reduce the ecological footprint of economic activities through measures like energy efficiency, pollution reduction, and the use of clean and renewable energy sources.
- Low-carbon Practices – One of the central tenets of the green economy is the reduction of greenhouse gas emissions. This is achieved through the adoption of low-carbon technologies and practices, such as transitioning to clean energy sources like wind, solar, and hydropower.
- Renewable Energy – A hallmark of the green economy is the widespread adoption of renewable energy sources, such as solar and wind power, to replace fossil fuels. This -transition is driven by the need to combat climate change and reduce dependence on finite fossil fuel resources. (Altenburg & Assmann, 2017)

In contrast, The Circular Economy centres on waste reduction, resource efficiency, and the establishment of closed-loop systems where materials and products are continually recycled. This approach addresses both environmental and economic dimensions of sustainability.

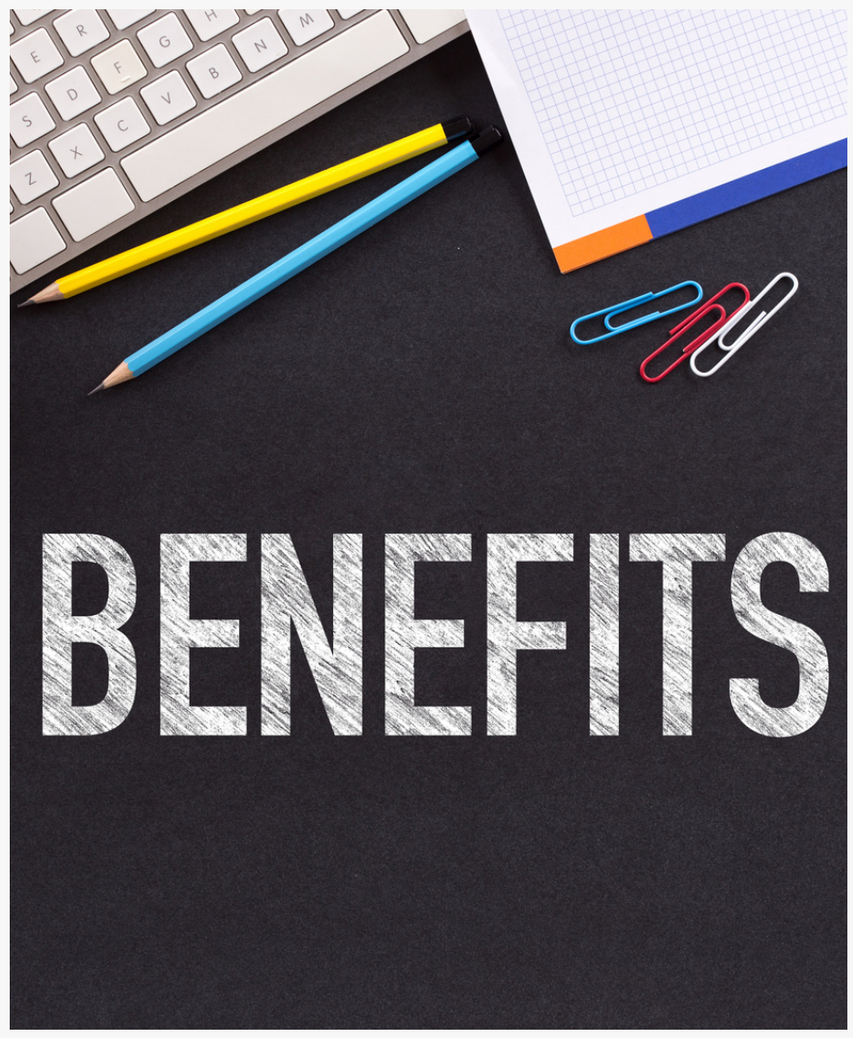
- Waste Reduction – The Circular Economy places a strong emphasis on reducing waste at all stages of the product lifecycle. This includes designing products for durability, repairability, and recyclability, as well as promoting practices like reusing and remanufacturing.

- Resource Efficiency – Is a core principle of the circular economy. It involves optimizing the use of resources, minimizing waste, and extracting maximum value from materials through strategies like recycling and upcycling.
- Closed-loop Systems – Circular economy principles envision a world where materials and products are continuously cycled back into the economy, reducing the need for new-based resources. This not only reduces environmental impact but also creates economic opportunities in recycling and remanufacturing. (Ellen MacArthur Foundation)

A nuanced comprehension of both Green and Circular Economies is imperative as societies navigate the path toward a sustainable and environmentally responsible future. While The Green Economy focuses on sustainable and low-carbon practices, The Circular Economy emphasizes waste reduction, resource efficiency, and closed-loop systems.

These approaches, when integrated into everyday actions and business ventures, foster economic growth, social equity, and ecological preservation. By adopting sustainable practices and making informed choices, individuals and businesses can contribute to a more sustainable and environmentally responsible world.

Benefits and Advantages of Adopting Green and Circular Practices



As the world struggles with environmental challenges and the need for sustainable development, adopting green and circular practices has become increasingly crucial. These approaches offer a multitude of benefits and advantages that extend beyond environmental protection,

encompassing economic, social, and even health-related advantages. In this section, we look at the significant advantages of green and circular practices.

Environmental Benefits

1. Reduced Environmental Footprint: One of the primary environmental advantages of green and circular practices is the substantial reduction in the ecological footprint. These practices prioritize resource conservation, waste reduction, and sustainable consumption, all of which contribute to lower environmental impact. By minimizing energy consumption, reducing emissions, and promoting sustainable resource management, these approaches help mitigate climate change and protect ecosystems. (UNEP, n.d.)
2. Biodiversity Preservation: Green and circular practices emphasize the protection and restoration of natural habitats. As ecosystems are restored and conserved, biodiversity is enhanced. This not only supports the survival of diverse species but also contributes to the overall health of ecosystems, ensuring their resilience against environmental threats. (European Commission, n.d.)
3. Resource Conservation: The circular economy is significant in conserving natural resources by perpetually reutilizing materials and products. (Ellen MacArthur Foundation)

Economic Advantages

1. Cost Savings: Implementing green and circular practices often results in cost savings for businesses and individuals. Energy-efficient technologies, waste reduction measures, and sustainable production processes can lower operational expenses. (European Environment Agency, 2023)

2. Job Creation: The transition to green and circular economies generates new employment opportunities. Sectors such as renewable energy, recycling, and sustainable agriculture create jobs and stimulate economic growth. (International Labour Organization, n.d.)
3. Innovation and Competitiveness: Businesses that prioritize sustainability are better positioned to meet changing consumer preferences, regulatory requirements, and global market demands. (IMD, 2022)

Social and Health Benefits

1. Improved Public Health: Reduced pollution and cleaner environments resulting from green and circular practices contribute to improved public health. Fewer emissions, cleaner air and water, and reduced exposure to harmful chemicals lead to better well-being. (European Commission, 2021)

2. Enhanced Quality of Life: Sustainable urban planning, green spaces, and sustainable transportation systems improve the quality of life for residents. Access to green areas, reduced noise pollution, and improved transportation options lead to healthier and happier communities. (Constantinescu, Orindaru, Caescu, & Pachitanu, 2019)

The adoption of green and circular practices offers benefits and advantages that span environmental, economic, social and health dimensions. These practices not only reduce environmental degradation and resource consumption but also stimulate economic growth, create jobs, and improve public health.

As societies strove to address pressing environmental challenges, adopting green and circular principles becomes a vital step towards a sustainable and prosperous future.

Circular and green economy ideas for businesses

Implementing circular and green economy practices in businesses in Europe can not only reduce environmental impact but also improve efficiency and competitiveness. Here are some suggestions for businesses:

Product Design for Sustainability: Design products with durability, reparability, and recyclability in mind. Use eco-friendly materials, reduce packaging waste, and incorporate renewable resources whenever possible.

Circular Business Models: Explore circular business models such as product-as-a-service, sharing platforms, and leasing arrangements that promote the reuse and sharing of products rather than ownership.

Collaboration and Partnerships: Collaborate with other businesses, government agencies, NGOs, and research institutions to share best practices, develop innovative solutions, and advocate for supportive policies that promote the circular and green economy.

Carbon Footprint Reduction: Set targets to reduce carbon emissions and implement measures to monitor, report, and offset emissions. Encourage employee engagement and behavior change initiatives to promote sustainability in the workplace.

Sustainable Sourcing and Supply Chain Management: Source materials from sustainable and ethical suppliers who adhere to environmental and social responsibility standards. Assess supply chain risks and opportunities to identify areas for improvement and collaboration.

Here are some specific tips for youth workers and businesses regarding the Circular Economy:

Education and Training: Youth workers can organise workshops, seminars, or training sessions to educate young people about the principles and benefits of the circular economy. This can include explaining concepts like resource efficiency, waste reduction, and sustainable consumption and production practices.

Engagement and Awareness: Encourage young people to actively participate in circular economy initiatives by raising awareness about the importance of recycling, upcycling, and responsible consumption. Businesses can engage with youth-led organizations and projects focused on sustainability to promote collaboration and knowledge exchange.

Support for Circular Start-ups: Encourage and support young entrepreneurs who are developing innovative business models based on circular economy principles. Provide mentorship, funding opportunities, and access to resources to help them scale their ventures.

Promotion of Sustainable Products and Services: Businesses can prioritize offering sustainable products and services that promote the circular economy. This can include eco-friendly alternatives, products designed for durability and reparability, and initiatives like product take-back schemes and rental services.

Collaboration and Partnerships: Foster collaboration between youth organizations, businesses, and other stakeholders to co-create solutions for a more circular economy. This can involve joint projects, research initiatives, and advocacy campaigns aimed at driving systemic change.

I**nnovation and Technology:** Encourage the development and adoption of innovative technologies and solutions that facilitate the transition to a circular economy. This can include advancements in recycling technologies, digital platforms for sharing resources, and circular design tools.

Policy Advocacy: Advocate for policies and regulations that support the transition to a circular economy at local, national, and international levels. Youth workers and businesses can work together to influence policy decisions and promote frameworks that incentivize circular practices and discourage wastefulness.

Measurement and Reporting: Businesses should track and report on their progress towards circularity, including metrics such as resource efficiency, waste reduction, and product lifecycle assessments. This transparency helps to demonstrate commitment to sustainability and can inspire others to follow suit.

Community Engagement: Engage with local communities to raise awareness about the circular economy and involve them in initiatives such as community recycling programs, repair cafes, and circular economy hubs. This grassroots approach can foster a sense of ownership and collective responsibility towards building a more sustainable future.

Continuous Learning and Improvement: Encourage a culture of continuous learning and improvement within both youth organizations and businesses. Stay informed about emerging trends, best practices, and case studies in the circular economy field, and be open to adapting strategies based on new insights and experiences.

Circular and green economy ideas for youth workers

Engaging youth workers in circular and green economy initiatives can empower young people to become active participants in sustainable development. By engaging youth workers in circular and green economy initiatives, organizations can cultivate a new generation of environmentally conscious leaders who are equipped with the knowledge, skills, and motivation to drive positive change in their communities and beyond.

Partnerships with Schools and Universities: Collaborate with educational institutions to integrate circular and green economy concepts into formal education curricula and extracurricular activities. Offer joint programs, workshops, and internships that enable young people to apply their learning in real-world settings.

Youth Exchanges and International Projects: Facilitate youth exchanges and international projects that promote collaboration and knowledge sharing on circular and green economy topics. Encourage young people from different countries to work together on joint initiatives, exchange best practices, and learn from each other's experiences.

Community Engagement Events: Facilitate community engagement events where youth workers can raise awareness about environmental issues and promote sustainable practices. This could involve organizing environmental fairs, eco-friendly markets, or sustainability-themed festivals to inspire action and dialogue.

Educational Workshops and Training: Organize workshops and training sessions to educate youth workers about the principles of circular and green economy. Provide resources and materials as well. Then they can empower young people to initiate and lead sustainability projects within their communities.

Non-formal learning activity on circular and green economy

Title: "Circular Economy Challenge: From Waste to Wealth"

Aim: To educate participants about the principles of circular and green economy through hands-on experience and creative problem-solving.

Duration: 1 full day

Target group: Youth aged 16-25 interested in sustainability, environmental conservation, and entrepreneurship.

Materials Needed:

- Various recyclable materials (paper, cardboard, plastic bottles, etc.)
- Art supplies (scissors, glue, markers, paints, etc.)
- Presentation materials (whiteboard, markers, projector)
- Workspace or classroom area
- Optional: Guest speakers/experts on circular economy, recycling facilities tour

Activity Plan:

I**ntroduction (30 minutes):**

- Welcome participants and introduce the concept of circular and green economy.
- Provide an overview of the environmental challenges posed by linear economies and the benefits of transitioning to circular models.
- Showcase examples of successful circular economy initiatives and their impact on sustainability and economic growth.
- Set the stage for the challenge: participants will work in teams to design and prototype innovative products or solutions using recyclable materials.

Non-formal learning activity on circular and green economy

Expert Talk or Interactive Session (30 minutes):

- Invite a guest speaker or facilitator with expertise in circular economy principles, recycling, or sustainable design.
- Conduct an interactive session or Q&A where participants can learn from the speaker's experience and ask questions about real-world applications of circular economy concepts.
- Share case studies or success stories to inspire participants and provide practical insights into implementing circular economy practices.

Team Formation and Brainstorming (30 minutes):

- Divide participants into small teams (3-5 members per team).
- Encourage teams to brainstorm ideas for their circular economy project, considering factors such as materials, target audience, market potential, and environmental impact.
- Provide guidance and support as needed, emphasizing creativity, innovation, and feasibility in project ideation.

Project Development (2 hours):

- Allocate time for teams to work on developing their projects. Provide access to recyclable materials, art supplies, and workspace.
- Encourage teams to collaborate, experiment, and iterate on their designs, considering practical aspects such as product functionality, durability, and aesthetics.
- Facilitate discussions on sustainable design principles, waste reduction strategies, and the circularity of materials throughout the product lifecycle.

Prototype Presentation Preparation (1 hour):

- Instruct teams to prepare a brief presentation (5-10 minutes) to showcase their project idea, design process, and potential impact.
- Encourage teams to create visual aids, sketches, prototypes, or digital presentations to enhance their presentations.
- Provide guidance on effective communication techniques, storytelling, and persuasive pitching to engage the audience and convey the value proposition of their projects.

Project Showcase and Feedback (1 hour):

- Invite teams to present their projects to the rest of the participants and facilitators.
- Encourage constructive feedback and questions from the audience to stimulate dialogue and critical thinking.
- Facilitate a reflection session where teams can share insights, lessons learned, and future aspirations related to circular and green economy principles.

Closing and Next Steps (30 minutes):

- Summarize key takeaways from the activity and reinforce the importance of adopting circular economy practices in daily life and professional endeavors.
- Provide resources, references, and further reading materials for participants interested in exploring circular economy topics in more depth.
- Encourage participants to stay engaged and take action in promoting sustainability within their communities, schools, or workplaces.

Non-formal learning activity on circular and green economy

Follow-Up Actions:

1.) Encourage participants to implement circular economy principles in their personal and professional lives, such as practicing waste reduction, supporting sustainable businesses, and advocating for policy changes.

2.) Facilitate networking opportunities for participants to connect with like-minded individuals, organizations, or mentors working in the field of circular economy.

3.) Monitor and evaluate the impact of the activity through participant feedback, testimonials, and follow-up surveys to inform future iterations and improvements.

By engaging participants in a hands-on challenge that integrates learning, creativity, and collaboration, this non-formal learning activity provides a dynamic platform for exploring circular and green economy concepts and empowering youth to become change agents in building a more sustainable future.

GREEN AND CIRCULAR SKILLS FRAMEWORK

Principles

Green and Circular skills are essentially the knowledge, skills and attitudes that help us achieve the goal of a more sustainable and renewable future for us all. We can look at green skills as the knowledge, abilities, values and attitudes needed to live, work and act in resource-efficient and sustainable economies and societies, whilst circular skills are tailored to address concepts such as cycling, extending, intensifying, and streamlining material and energy loops to minimise resource inputs, waste, and emission leakage within an organisational system.

These skills are crucial in achieving the goal of a circular economy, an economic system which prioritises sustainability and environmental preservation over production for profit. Developing Green and Circular skills will help us meet two of the United Nations Sustainable Development Goals (SDGs):

-Goal 9 - Upgrading infrastructure and retrofitting industries to make them sustainable, adopting clean technologies and processes, and increasing resource use efficiency.

-Goal 12 - Achieving sustainable management and use of natural resources by the year 2030

To achieve these goals, our skill sets must adapt because:

- As industries and institutions change to meet new sustainability goals, education and qualifications will change to pursue careers there.

- Changes to the structure of specific sectors or practices will impact the demand for different skill sets and job roles.
- As the demand changes, so does the economy, meaning learning Green and circular skills becomes more lucrative for the youth and those wanting to change careers.

Image source: A circular strategy for Scotland

The Green Skills Index has identified four skill sectors which are particularly important in achieving these goals:

Engineering and Technical Skills

Hard skills are required relating to developing, constructing and assessing technologies used for building eco-housing and renewable energy structures.

Science Skills

Fields such as physics and biology are crucial in helping us develop solutions to the issues we have with the utilities sector regarding climate change. Water supplies, sewage and waste management need to be improved and made more efficient, and science skills can help us achieve this.

Operational Management Skills

Skills in how to organise industries and institutions so that they can meet sustainability goals.

Operations management will analyse ways that these sectors operate from a technical perspective, as well as how they interact with the public, determining how all parties can be satisfied whilst also ensuring that they become more efficient.

Monitoring Skills

These skills relate to sectors that can oversee the performance of business or industry activities to ensure that they are compliant with rules or regulations put in place to achieve the Sustainable Development Goals (UNIDO, 2022).

GREEN AND CIRCULAR ECONOMY JOBS

Understanding the importance of career information is crucial for youth as you navigate the complexities of the modern job market. Informed career decisions empower young individuals to align their aspirations, skills, and education with the evolving demands of the workforce.

With the right career information, youth can identify emerging job trends, understand the qualifications and skills required in various fields, and plan their educational pathways accordingly. This knowledge not only enhances your employability but also enables you to make meaningful contributions to industries you are passionate about.

Additionally, being informed about career options helps in setting realistic goals, exploring diverse opportunities, and preparing for future challenges, ensuring a more fulfilling and successful professional life. Now let's look at a few jobs that require green and circular economy skills, including required experience and qualifications:

Green Skills Jobs

1. Renewable Energy Technician/Engineer

- Qualifications: Degree in engineering, environmental science, or related field.
- Skills: Knowledge of renewable energy technologies (solar, wind, hydro), analytical skills, problem-solving.
- Experience: Internships or work experience in renewable energy projects are advantageous.

2. Sustainable Agriculture Specialist

- Qualifications: Degree in agriculture, environmental science, or biology.
- Skills: Understanding of sustainable farming practices, soil science, and water conservation.
- Experience: Experience in farming, agricultural research, or related work.

3. Resource Management and Conservation Officer

- Qualifications: Degree in environmental science, natural resource management, or related field.
- Skills: Knowledge of conservation techniques, biodiversity, and ecological principles.
- Experience: Experience in conservation projects, research, or environmental NGOs.

4. Solar Panel Installer

- Skills Needed: Technical understanding of solar panel systems, physical fitness, and ability to work at heights.
- Experience: On-the-job training is often provided, though prior experience in construction or electrical work is beneficial.
- Qualifications: A high school diploma or equivalent is typically required. Technical school courses in electrical systems or solar energy can be very beneficial. Some employers may also prefer candidates with certifications from recognized solar installation courses.

5. Sustainable Landscaping Technician

- Qualifications: A high school diploma is often sufficient. Vocational training or certifications in horticulture or landscaping can give candidates an edge.

- Skills Needed: Knowledge of sustainable gardening practices, plant care, and basic design principles.
- Experience: Hands-on experience is crucial, which can be gained through apprenticeships, vocational training, or working under experienced landscapers.

Circular Skills Jobs

1. Circular Economy Analyst/Consultant

- Qualifications: Degree in economics, environmental science, or business with a focus on sustainability.
- Skills: Deep understanding of circular economy principles, strategic thinking, and stakeholder engagement.
- Experience: Experience in consulting, sustainability analysis, or related roles.

2. Product Designer for Circularity

- Qualifications: Degree in product design, industrial design, or similar.
- Skills: Skills in sustainable design, life cycle assessment, material science.
- Experience: Design experience, preferably in a setting where circular design principles were applied.

3. Supply Chain Manager (Circular Economy)

- Qualifications: Degree in supply chain management, business, or sustainability.
- Skills: Knowledge of supply chain logistics, circular economy models, and supplier management.
- Experience: Experience in supply chain roles, preferably with exposure to sustainability practices.

4. Repair and Maintenance Technician

- Qualifications: A high school diploma or equivalent is usually necessary. Technical or vocational school training in a specific area of repair (like electronics, appliance repair, or textile repair) can be highly advantageous.

- Skills: Technical skills in repair techniques, problem-solving abilities, and manual dexterity.
- Experience: Vocational training or apprenticeships in specific repair areas (like electronics or textile repair) can be advantageous.

5. Circular Supply Chain Coordinator

- Qualifications: A high school diploma is typically required. Courses or certifications in logistics, supply chain management, or related fields from technical schools can be beneficial.
- Skills: Good organisational skills, understanding of supply chain and waste management basics, communication skills.
- Experience: Experience in logistics, warehousing, or inventory management can be beneficial. Some roles may offer on-the-job training.

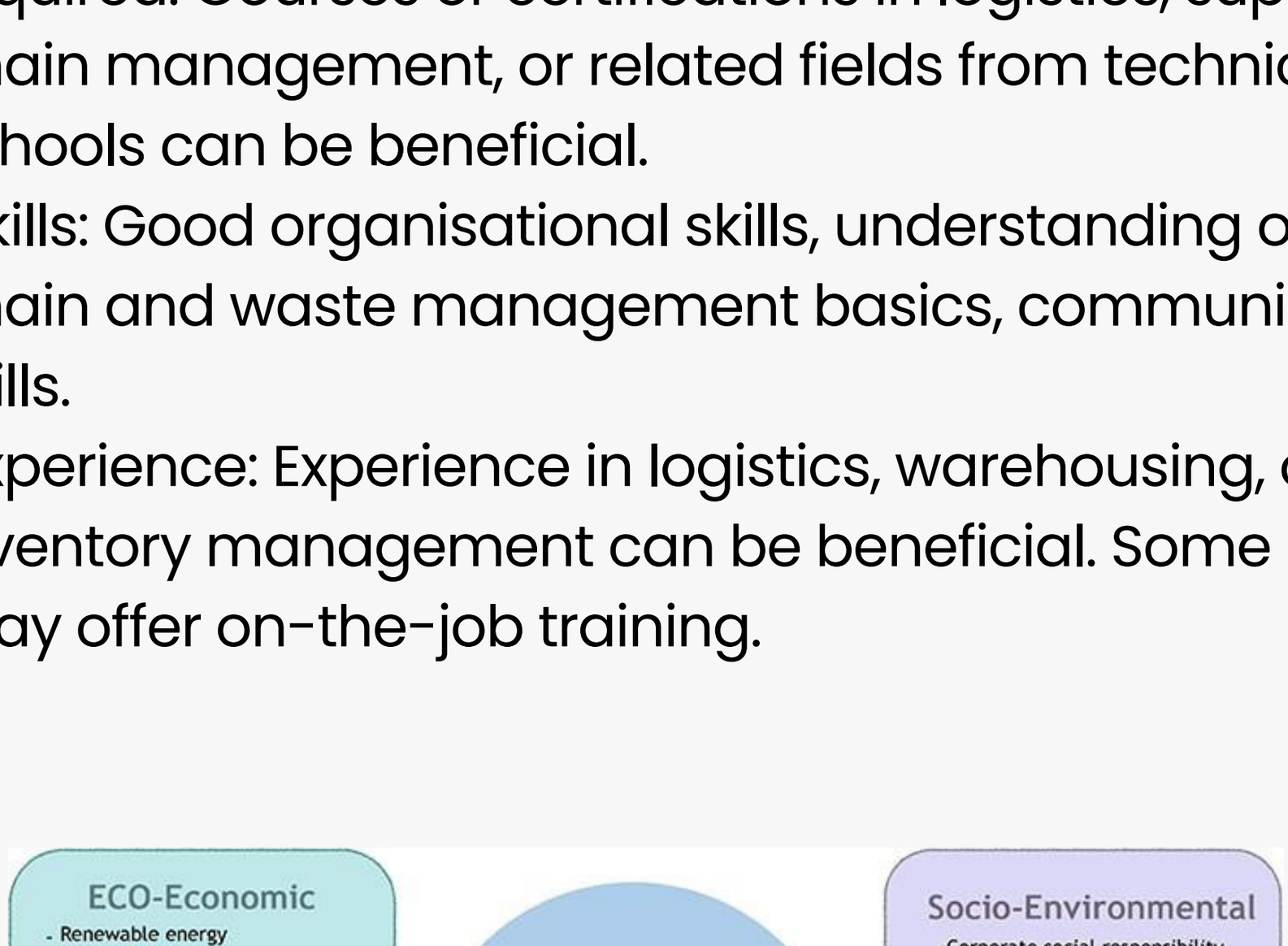


Image source: Generic Green Skills for Sustainable Development

For Youth Workers

Youth workers can integrate career information into their activities by organising workshops, inviting industry professionals for talks, and providing resources on vocational training and apprenticeship programs. They can also arrange field trips to companies operating in these sectors, offering youth first-hand exposure to potential career paths. Additionally, incorporating project-based learning that aligns with sustainable practices can help youth understand the practical aspects and relevance of such jobs. The growing demand for green skills and the importance of sustainability in the global job market should be emphasised thereby empowering youth with the knowledge and motivation to explore these fulfilling and future-oriented career paths.

For Businesses

Businesses can effectively reach out to youth and youth workers to inform them about job openings, apprenticeship programs, or internships by collaborating with educational institutions, vocational schools, and youth organizations. Hosting career fairs, workshops, or information sessions at schools and community centers can be a direct approach to engage with young talents. Creating partnerships with local educational bodies for internship programs offers practical experience to students while allowing businesses to showcase their work culture and career opportunities. Additionally, utilising social media and digital platforms tailored to younger audiences can increase visibility and attract tech-savvy youth.

The Benefits of Green and Circular Skills

By creating a society that is more aware of green and circular attitudes and has the knowledge to enact them, we can change the trajectory we are currently headed as a planet.

Governments and policymakers can make more informed decisions while considering the environment.

Business owners can operate within the remit of sustainable policies and thrive economically without producing excessive emissions.

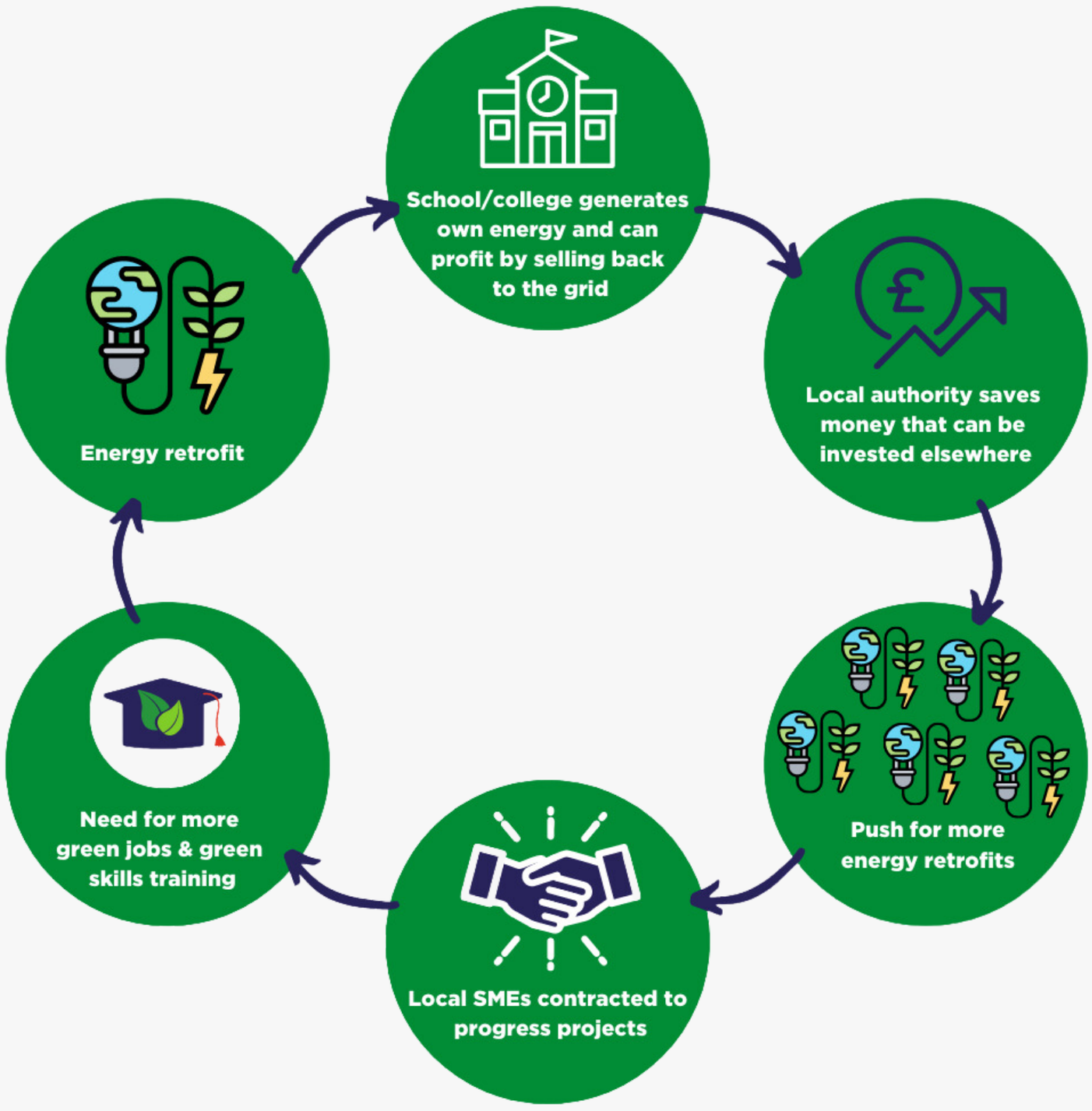
Builders and engineers can construct vehicles, buildings, and utility systems that are efficient in how well they function and how many resources they need to work.

From the surveys that the partners have conducted, respondents view these skills as important for the future of their business, whilst Financial constraints (22%), Technical Barriers (18%) and Resistance to change (17%) are viewed as the obstacles drawing their business back from adopting them. This suggests that the benefits of these skills are not as evident in the business world, making them hesitant to switch from what they know and trust.

There are secondary benefits aside from the obvious environmental ones, too. At present, the World Economic Forum estimates that there are over 1.47 billion jobs globally that are climate-dependent. Integrating green and circular skills into society can help protect jobs such as these, which are under threat due to climate change.

Whilst the shift towards green and circular thinking will come at the cost of many jobs currently reliant on the overconsumption of fossil fuels, it will also create a demand for emerging job roles to be filled, giving those displaced the opportunity to reskill (WEF, 2022).

One might assume that a greener society means less consumption and, therefore, less profit. As we have discussed, this is a concern of business owners at present, who see this as the largest roadblock to becoming greener. However, there are cyclical upsides to adopting greener practices. Take this example of a school undergoing an energy retrofit by installing more efficient lights, pipes and solar energy:



As the image shows, not only do the new fittings benefit the environment, but the school also has fewer outlays as it generates its own electricity and can sell some back to the energy grid. This creates more demand by other schools or businesses to do the same, giving SMEs more contracts and increasing the demand for these skills (NEU, 2023).

Practical Examples of Green and Circular Skill Implementation

From the research the project partners carried out, a staggering 75.6% of the businesses surveyed across all partner countries reported that they are not actively taking steps to align with the Green Deal.

However, most of them reported having some knowledge of its existence, and 71% believed green processes are the most important sustainable skill to adapt in the workplace. Does this figure come down to a lack of detailed knowledge of how to apply green skills?

Across the world, there are already examples of governments, organisations & businesses implementing green and circular skills into their operations. Let's look at some cases which organisations can look to for inspiration.

AMRC Cymru, the use of analytics and knowledge sharing – Wales

University of Sheffield Advanced Manufacturing Research Centre (AMRC) is a research institution which is part of the 'High Value Manufacturing Catapult'. This is a consortium of leading UK research centres.

AMRC is now partnering with the Welsh Government in a £20 million state-of-the-art research centre to help the Welsh manufacturing industry become more efficient and produce higher quality products.

The company research director, Andy Silcox, said:

"Our role is to react to industry and the challenges and manufacturing problems it needs to solve. We work with companies towards their specific goal through the use of digital technologies."

AMRC Cymru uses technology on the factory floor to analyse output and efficiency. This allows the team to see the strengths and weaknesses of the company's production and then devise a plan based on it.

AMRC Cymru then uses AI to examine the data and subsequently suggest solutions. Coach company Airbus was able to save a massive 4000kWh in electricity consumption within two months of working with AMRC Cymru. This is equivalent to 49,901kg in CO_2 emissions!

The company is determined to help give companies far and wide the skills to ensure that we can fight climate change, as Silcox states:

“Whatever the firm and whatever their size, our aim is the same. We want to equip a company with digital skills, the knowledge of how to use data and how to make improvements. But we need to attract more young people to become engineers. We are looking for people with the skill sets of data analysts or software developers. But yes, if you want to help save the planet, become an engineer.”

This is a fantastic example of not only hard Green skills, such as using technology to assess performance but also the soft skill of passing on knowledge to the rest of an industry. This attitude is very important if we are to be successful in our sustainability goals (AMRC, 2023).

Analysis of jobs using AI to develop green strategies - Sydney

The Sydney government has used AI to analyse the job market in the city, using its results to help make policy decisions. The first identified 12 sectors within the green economy, and the AI was able to show them there were just under 16,000 Green jobs in the city and that there were five sectors within these that were growing at a significant rate, those being:

1. Environmental Advisory
2. Green Buildings
3. Sharing Economy
4. Sustainable Finance
5. Green Research

These jobs account for roughly 2.5 - 3% of the jobs in the city. With this information, the City government now believes they must create clearer and consistent environmental policies to encourage these sectors to grow further. They plan to double the green sector share of jobs in the city to 5% by 2036, and work with the state government to develop these plans on a national level.

This is a great example of using Artificial intelligence to assess a current situation and then work out what needs to be done to improve. The ability to assess and coordinate is a crucial component of Green and circular skills (CISCO, 2019).

'Upcycled' Green cement from Ecocem – Ireland

Ecocem is a construction company from Ireland that uses Green attitudes and skills to promote sustainable solutions to what has always been an unsustainable industry. Construction has always required a lot of manpower, resources and emissions to function, but Ecocem wants to change this using innovative solutions.

Ecocem has developed what they call Ground Granulated Blastfurnace Slag (GGBS), but put simply, it's known as Green cement! This cement is made by taking a highly controlled by-product of the steel industry, rapidly dowsing it with water and grinding it. The company is not creating new material; instead, it is recycling existing by-products – this is referred to as 'upcycling'.

The company suggests that it can last twice as long as regular cement, with dramatically less emissions used to create it. They wish to help reduce the cement industry's emissions by 50% before 2030. Ecocems green thinking does not stop there;

however, they are an environmentally conscious company in all aspects. They only work with suppliers with green credentials in their office spaces.

The company's concrete has been used to build the Aviva Stadium in Dublin. It is being used in the athletes' village for the Parisian Olympics in 2024 & and the HS2 railway system between London and Scotland. The company is eager to work with the Irish Government to further the development of upcycling waste materials in construction, such as water. Ecocem also works with small firms to share knowledge and expertise (ECOCEM, 2023).

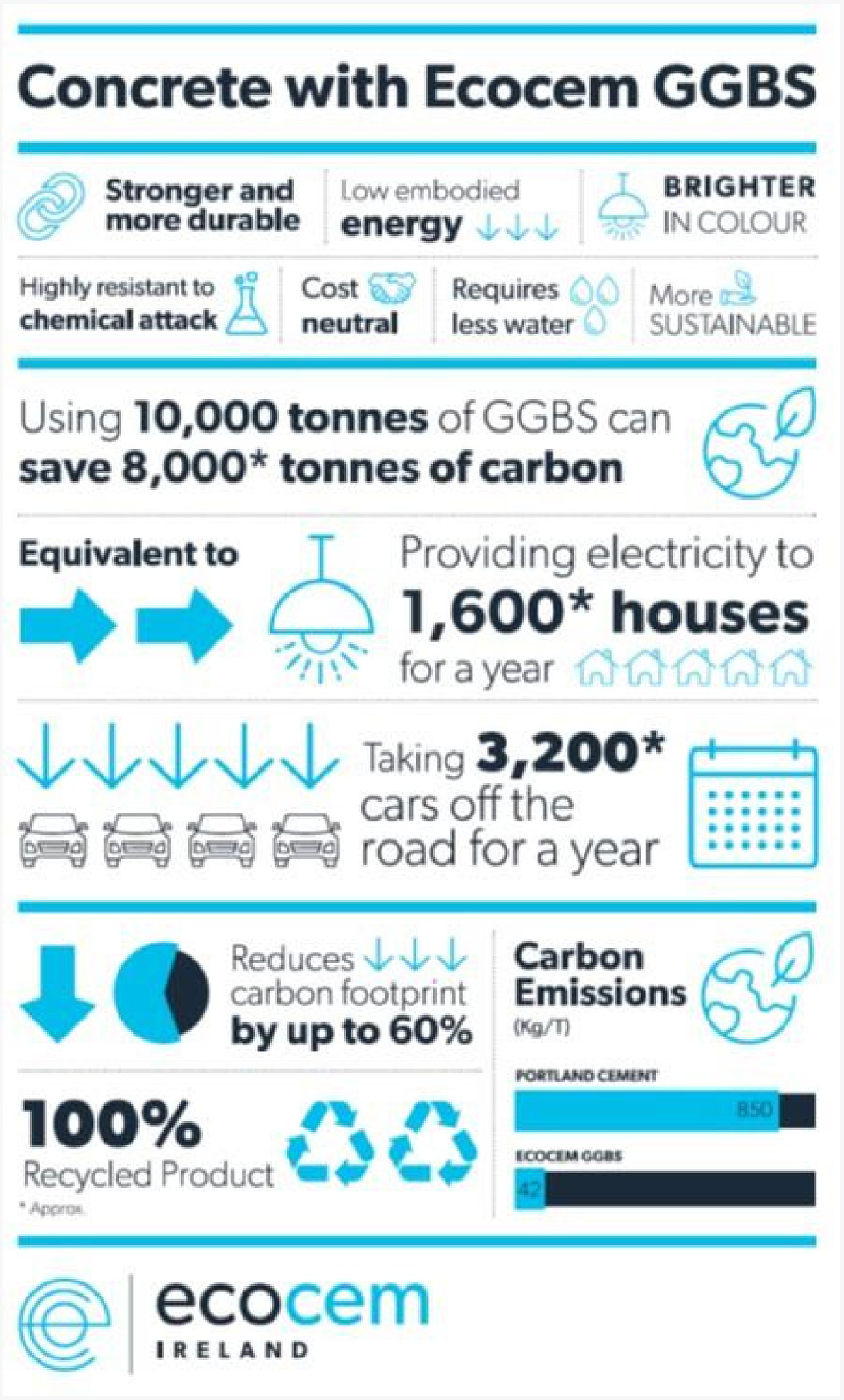


Image source: *Case Study: Upcycling waste by-products*

For Youth Workers

These examples serve as a valuable resource for youth workers to develop targeted programs and workshops that equip youth with skills pertinent to the green and circular economies. By integrating these examples into their educational content, youth workers can create more engaging and practical learning experiences. These skills are not only crucial for personal development but also enhance employability in sectors that are increasingly prioritising sustainability. Furthermore, youth workers can use these examples as a foundation to foster partnerships with local businesses and environmental organizations, providing real-world contexts and potential career paths for the youth under their guidance.

For Businesses

Businesses can use these examples to shape their training programs, ensuring that their employees are equipped with the latest knowledge and practices in sustainability. This not only aids in meeting regulatory requirements and corporate social responsibility goals but also positions these businesses as attractive employers for environmentally-conscious young professionals. Additionally, by understanding these practical examples, businesses can better align their operations with sustainable practices, potentially opening up new markets and innovation opportunities. Collaborating with educational institutions to offer internships or apprenticeships based on these skills can further bridge the gap between theoretical knowledge and practical industry needs.

CE+ Tips

The theories and ideas we have looked at so far are very exciting and innovative. Still, for the most part, these are big business or even Governmental policies, which feel detached from everyday life. What can we do as individuals to develop our Green and Circular skills?

Soft and Hard Skills

As we touched upon in the principles section, the first step to developing green and circular skills in our personal lives is adopting the correct attitudes. This would be considered a soft skill, more of a mindset change than an actual technique or ability.

You are making huge strides towards change by simply being more proactive rather than reactive in terms of waste management, energy consumption, recycling and methods of travel. Some specific soft skills for individuals include:

7th Generation thinking - Baring in mind how your actions would impact your family seven generations into the future

Cathedral thinking - Considering how long something might last before purchasing it, i.e. furniture, clothing, vehicles.

Hard skills require more specific knowledge and practice to acquire, but in the information age, they can still be easy to incorporate into your life. Let us look at some examples:

Growing food - Growing your own fruit and vegetables in your garden or living space reduces your dependency on supermarkets, in turn saving you money and reducing emissions.

Working with your community - Organisational skills can be used in community events and projects which promote sustainable practices. Being able to get large amounts of people on board is a great green skill.

By utilising both hard and soft skills in your own life, you can enact small changes which, when coupled with the changes made by others, can result in a huge change (Awan and Sroufe, 2022).

To learn more about Europe's Circular Economy and Its Pact for Skills, it is recommended to read the European Economic and Social Committee's study, published in the summer of 2023.

For Youth Workers

Youth workers can implement various activities, leveraging the concepts of soft and hard skills outlined above, to develop Green and Circular skills in youth. Here are a few examples:

Fostering Mindset Change through Soft Skills

Organise workshops and group discussions that encourage youth to think about the long-term impact of their actions, inspired by the concept of 7th Generation thinking. This can help them understand the significance of sustainability in their daily lives.

Run campaigns on Cathedral thinking to promote mindfulness in purchasing decisions. This can include creating forums where youth can share ideas on sustainable buying practices and their impact on the environment.

Facilitate activities that emphasise proactive approaches to waste management, energy consumption, and recycling. This could include challenges or competitions around minimising waste or optimising energy use in their daily routines.

Building Practical Skills

Initiate or participate in community gardening projects, teaching youth how to grow their own food. This develops their gardening skills and educates them about the importance of local food production and its environmental benefits. Collaborate with local experts to teach practical skills like basic gardening, composting, or DIY projects for sustainable living. You can also participate in community projects that promote sustainable practices such as community clean-ups, recycling drives, or local awareness events.

For Youth Workers

Integrating Skills into Everyday Life

Encourage youth to apply these skills in their everyday lives and share their experiences. For instance, they could start a small garden at home or lead a recycling initiative in their school or neighbourhood. Additionally, facilitate peer-to-peer mentoring where young individuals who have successfully adopted these practices can mentor others, creating a ripple effect of sustainable living habits.

For Businesses

It is recommended that businesses put in stronger effort to identify and develop circular thinking among their employees. By looking at the business from a holistic perspective has the potential to support innovative thinking about the circular and green economy and the employee skills needed for them. In return, this can promote understanding and recognition of circular skills among the employees.

By encouraging a mindset shift towards long-term impact and mindful consumption among employees, aligned with the principles of 7th Generation and Cathedral thinking, companies can foster a culture of environmental stewardship. They can also offer skill-building workshops focused on practical sustainability skills, such as efficient resource management and community engagement. Incorporating these skills into corporate training and development programs can lead to more sustainable business operations and a positive environmental impact. Additionally, businesses can support community projects that align with these principles, demonstrating their commitment to sustainable practices and strengthening their community relations.

Youth Entrepreneurship - What can the youth do in the future?

The youth of today are more proactive than ever when it comes to environmental issues. Greta Thunbergs activism has captured the imagination of millions within her generation. Fridays for Future, a youth-led activist group inspired by Thunberg, gathered a staggering 1 million young people to the streets of Berlin to protest against climate change policies proposed by the German Government, which has an engagement rate of 12.5% of their age category in the country.

Protests such as this by the group have occurred in almost 300 cities worldwide. So, in short, they are motivated, as we have discussed, and this is the first step towards developing our green and circular skills (Fridaysforfuture, 2023). But what next?

Education

From the project partners' research, the youth groups surveyed appear to be very much aware of the general principles of green and circular skills and economies. However, they feel that they are not getting the education on the technical aspects of these concepts. 54.1% of those surveyed are not taught about circular economy at school.

It is evident that there is an appetite from the youth to learn more, which is supported by the survey we conducted, where most respondents said they were interested in learning about circular and green skills. It is clear that the young generation wants to be given the resources and knowledge to take action.

Fortunately, more steps are being taken to provide our youth with these skills. In the UK, the education minister announced plans to introduce a natural history GCSE qualification, which complements the basic knowledge learned in Geography, with more of a focus on our environment and sustainability practices.

If our youth are equipped with soft and hard skills, they are then able to pursue careers that are beneficial to a green and circular economy (GOV UK, 2022).

Careers

As we have discussed, shifting to a circular economy will result in a shift in industries, meaning some jobs will evolve and others will cease to exist.

It is estimated that 2/3rds of primary school students today globally will have jobs that do not exist yet. The UN estimates that by 2030, as many as 375 million people worldwide will need to switch occupations and upgrade their skills.

Our youth will be the driving force behind shifting our economy to one concerned with sustainability over consumption.

The World Economic Forum produced a report in 2018 called 'The Future of Jobs' estimated that the skills that will be valuable in the future include **proficiency in new technology, creativity, critical thinking, persuasion, negotiation, emotional intelligence, leadership and social influence.**

We must ensure our young people develop these skills if we are to meet our goals as a global society (The Guardian, 2018).

Continued Activism and Politics

The work of Fridays for Future has been remarkable, and this is a positive sign that the next generation is prioritising the planet. This should be encouraged and continued into their adulthood.

We must ensure that there are opportunities for our youth to be able to voice their opinions on global issues. Eco Unesco is an environmental youth group from Ireland doing its best to ensure that local young people are well-informed and aware of the world around them.

They have launched an eco summer camp where young people can learn about sustainability, eco solutions for cities and more. These sorts of activities must be encouraged if we are to continue this mobilisation of the next generation.

Self Directed Learning

In this section, we have analysed Green and Circular skills in depth, understanding their principles, the reasons why they are so important, and examples of them being put into action.

We have also looked at what we can do as individuals to implement green and circular skills into our lives, as well as the need for our youth to take responsibility in the future and what needs to be done to ensure they have the tools they need to do this.

To further develop your understanding and know-how around Green and Circular skills, why not **incorporate some self-directed learning into your life?** Here are some ideas:

1. Get involved

There are a lot of Green initiatives, social groups and businesses that already exist today. Search some of the key buzzwords along with your area online, and you are bound to find a range of different communities.

Whether they are beach clean-up events, walking/cycling clubs or community gardens for growing produce, finding like-minded people and making positive changes will open up more learning opportunities.

Image source: The Dragon Trip

2. YouTube is your friend!

Do you want to learn some more practical green skills? Are you aiming to make your way of life more circular? Thankfully, with modern technology, learning very specific skills has become easier than ever. Whether you need advice on growing your own vegetables in the garden or you don't know what type of stitch you need to sew to fix a hole in some trousers, you can find the answers online. YouTube is an especially good resource for green skills as countless creators will make easy, step-by-step videos to walk you through and develop your knowledge.

3. Stay up to date.

It is important that we are aware of current affairs, politically and environmentally. Keeping up to date with current affairs is important, as the unfortunate truth is

many politicians and big businesses still have little regard for Green economies or sustainable practices. Find out what is going on in your country, lobby your politicians and hold them to account. If we take a leaf out of the book of the Fridays for Future group, we can make a big difference as a wider community.

For Youth Workers

Youth workers can establish a resource library with books, documentaries, and online materials on sustainability topics, making it easily accessible for youth to explore at their own pace. You can introduce monthly challenges focused on specific green skills, like minimising waste or sustainable living practices, encouraging youth to research and apply these concepts. Create social media groups where youth can discuss what they've learned, share resources, and brainstorm ways to implement green practices in their daily lives. Youth workers should act as role models and actively demonstrate green and circular skills in program activities, showing how these can be seamlessly integrated into everyday routines.

For Businesses

Businesses can incorporate green and circular skills into professional development programs, offering courses and workshops that employees can take at their own pace. They can establish internal green teams or sustainability committees that focus on implementing and learning about sustainable practices within the workplace. Developing incentive programs for employees who actively engage in self-directed learning about sustainability and apply these skills at work could be another excellent way to address beahviour change. Encourage departments to find ways to integrate sustainable practices into their daily operations, turning theory into practice.

Activity for Non-formal learning group

For Youth Workers

In this activity, the group will be divided into different teams. Each team will be given the role of a different key player involved in a scenario of your choosing. It should be one which can be argued from a variety of different perspectives, for instance - building a new apartment block over a park area in a city. Each team flash card will explain some perspectives which concern that specific group, for example:

Owner of apartment block: Our work will provide dozens of families with homes and help grow the local economy.

Builders: We are getting much-needed work after the impacts of the coronavirus

Families: These apartments are the only home we can get a mortgage for, as the rates for bigger homes have skyrocketed

Conservationists: This parkland has been an important part of the community as well as for local wildlife. It will destabilise the local ecosystem, and fewer people will socialise in the area with no parks to enjoy.

Council office: This will bring more people to the area, stimulating the economy, which was damaged during the pandemic

The groups will then debate in the class about their perspective, stimulating conversation and hopefully coming to some conclusions. The point of the exercise is not to come up with a specific solution but rather for the group to understand that despite our wishes for an answer that meets all of our needs, this is rarely possible. Different groups will always have different motivations and perspectives.

This will help develop the soft skills that we have already identified as crucial for the next generation in the jobs they will work in, such as communication, understanding, leadership, and compromise.

Gamification Ideas for Youth Workers

Incorporating gamification into activities for youth can make learning about green and circular skills more engaging and effective. Here are a few examples you can incorporate into your activities, including those activities mentioned in this chapter:

Sustainability quests: Create missions or challenges where youth must accomplish certain green tasks, like reducing waste or completing a recycling project. Points or badges can be awarded for each task completed.

Image source: ***Tech Report***

Eco-friendly competitions: Organise competitions or eco-challenges, such as who can create the most efficient compost system or who can upcycle materials in the most creative way. Prizes can be awarded for the best projects.

Digital badges and leaderboards: Use digital platforms where youth can earn badges for mastering certain green skills or knowledge areas. Display a leaderboard to encourage a friendly competition and track progress. You can set these up free of

charge by using Google Sheets, follow the steps described in this blog. Alternatively, you can opt for platforms, check out this blog about 12 learning gamification apps.

Interactive learning apps: Utilise mobile apps that turn learning about sustainability into interactive games. These can include quizzes, virtual world-building, or scenario-based challenges related to environmental topics. Here is a list of 10 eco-friendly apps for a cleaner and greener world.

Role-playing games (RPGs): Design RPGs where players take on roles that involve solving environmental challenges or building sustainable communities. This can be done through board games or digital platforms.

Virtual Reality (VR) experiences: Use VR to immerse youth in simulated environments where they can learn about sustainability. For example, a VR game could simulate the effects of pollution on a virtual ecosystem, challenging players to find solutions. Check out EcoMuve by Harvard University.

Eco-points system: Implement a point system for participation in sustainable practices. Points can be redeemed for rewards, such as eco-friendly products, additional game privileges, or special event access.

Sustainability storytelling: Create a narrative-based game where players progress through a story by making sustainable choices, learning about the impact of their decisions on the environment and society.

ONLINE RESOURCES

Online resources for youth:

- Free educational resources for youth by Greenpeace

- Young people are pioneering green economy solutions and programs in their communities and blazing a trail for the country to follow by Power Shift Network (YouTube video)
- Erasmus for your Entrepreneurs
- The European Union's Green Deal, Explained by Intro Europe (YouTube video)
- Exploring Sustainable Living Across the Globe | Eco-Friendly Lifestyles and Innovations by Story ScapeDocs (YouTube video)

Image source: *Shorter University*

Online resources for youth workers:

- Starting my own small business: a training module on entrepreneurship for students of technical and vocational education and training at secondary level; facilitator's guide by UNESCO
- The handbook of sustainable literacy by the University of Brighton
- Exploring Sustainable Living Across the Globe | Eco-Friendly Lifestyles and Innovations by Story ScapeDocs (YouTube video)
- Education resources for sustainable development by UNESCO
- Education for Sustainable Development Toolkit by ESDTOOLKIT
- Free open courses by Massachusetts Institute of Technology
- Green Skills Index
- Green Industrial Skills for a Sustainable Future

- The circular economy to step up skill needs and the importance of ‘thyroid occupations’ by CEDEFOP
- Interactive Green Skills information by Generic Green Skills for TVET

Online resources for businesses:

- Sustainability courses for SMEs by the Institute of Sustainable Studies
- How To Build A Green Economy: SUPPORTING SMALL BUSINESS by Green Economy Coalition (YouTube video)
- How to write a proposal by Funds for NGOs
- Compare Green Energy Technology by Ecopreneurist
- Green Business Network
- Exploring Sustainable Living Across the Globe | Eco-Friendly Lifestyles and Innovations by Story ScapeDocs (YouTube video)
- Green Industrial Skills for a Sustainable Future

EU GREEN DEAL

Understanding the EU Green Deal:

The European Green Deal is a comprehensive plan initiated by the European Commission to make the European Union (EU) more sustainable and climate-neutral by 2050. It was introduced in December 2019 as the EU's roadmap to tackle climate change and transform the region's economy into a more sustainable and resource-efficient model.

The main objectives of the European Green Deal include:

Climate neutrality: The EU aims to become the world's first climate-neutral continent by 2050.

Clean energy transition: The plan promotes the transition to a clean energy system, focusing on renewable energy sources such as wind, solar, and hydropower.

Circular economy: The European Green Deal aims to promote a circular economy where resources are used more efficiently, waste is minimized, and the lifespan of products is extended.

Biodiversity and ecosystem protection: The EU aims to protect and restore biodiversity and ecosystems, recognizing their vital role in maintaining a healthy planet.

Sustainable mobility: The European Green Deal promotes sustainable and smart mobility, aiming to reduce emissions from the transport sector.

Farm-to-fork strategy: The plan includes a farm-to-fork strategy that aims to ensure a sustainable and healthy food system.

Key Principles of the EU Green Deal:

Climate Neutrality: The EU aims to achieve net-zero greenhouse gas emissions by 2050, meaning the total amount of emissions released is balanced by the removal of emissions from the atmosphere.

Circular Economy: The EU Green Deal promotes a circular economy where resources are used sustainably and efficiently. It emphasizes reducing waste generation, recycling, and reusing materials to minimize environmental impact.

Sustainable Energy Transition: The EU seeks to accelerate the transition to clean and renewable energy sources, such as wind, solar, and hydropower. It aims to increase energy efficiency and reduce reliance on fossil fuels.

Biodiversity Protection: The EU Green Deal emphasizes the preservation and restoration of biodiversity, aiming to halt and reverse the loss of ecosystems, species, and genetic diversity. It recognizes the importance of ecosystems for climate resilience and human well-being.

Just Transition: The EU is committed to ensuring a fair and inclusive transition to a sustainable economy. It aims to address social and economic impacts, support affected regions and industries, and create new job opportunities in green sectors.

Guiding Principles of the EU Green Deal:

Policy Coherence: The EU Green Deal seeks to integrate environmental objectives into all policy areas to ensure a holistic and coordinated approach. It promotes coherence between environmental, economic, and social policies.

Science-Based Approach: The EU relies on scientific evidence and expertise to inform decision-making and policy development related to climate change and environmental sustainability.

Stakeholder Engagement: The EU aims to engage and involve stakeholders, including civil society, businesses, and regional authorities, in shaping and implementing policies and initiatives under the Green Deal.

Global Leadership: The EU aspires to lead globally in addressing climate change and promoting sustainable development. It aims to collaborate with international partners, promote sustainable practices worldwide, and encourage others to raise their climate ambitions.

Long-Term Vision: The EU Green Deal adopts a long-term perspective, looking beyond immediate challenges to foster sustainable development and secure a better future for current and future generations.

These principles guide the EU's actions and initiatives under the Green Deal, helping to drive the transition towards a sustainable, climate-neutral, and resilient Europe.

2. Climate Action and Energy Transition:

EU countries are committed to making the EU climate-neutral by 2050.

Shifting to a zero-emission society and economy is both an urgent challenge – given the increasing number of extreme weather events – and an opportunity to create new jobs and economic opportunities.

The green transition is also a necessary step towards reducing the EU's energy dependencies. Replacing fossil fuels with cleaner forms of energy will cut the EU's greenhouse gas emissions and also make the EU less dependent on Russian gas.

The Council is currently working on new rules which aim to reduce the EU's emissions by at least 55% by 2030 (compared to 1990), with the so-called 'Fit for 55' package.

Ambitions for reducing greenhouse gas emissions

The new Social Climate Fund will support EU citizens most affected or at risk of energy or mobility poverty. It will help mitigate the costs for those most exposed to changes, to ensure that the transition is fair and leaves no one behind.

It will provide EUR 72.2 billion over 7 years in funding for the renovation of buildings, access to zero and low-emission mobility, or even income support.

In addition to homes, public buildings must also be renovated to use more renewable energy and to be more energy efficient.

The Commission proposes to:

require Member States to renovate at least 3% of the total floor area of all public buildings annually and set a benchmark of 49% of renewables in buildings by 2030 require Member States to increase the use of renewable energy in heating and cooling by +1.1 percentage points each year, until 2030.

Renewable energy targets and initiatives

The Commission proposes to increase the binding target of renewable sources in the EU's energy mix to 40%. The proposals promote the uptake of renewable fuels, such as hydrogen in industry and transport, with additional targets.

Green innovation and research in the energy sector play a crucial role in driving the transition to a sustainable and low-carbon future. As the world grapples with the challenges of climate change and the need to reduce greenhouse gas emissions, the development and deployment of innovative technologies are vital for creating cleaner and more efficient energy systems.

Unleashing Clean Energy Potential:

Green innovation and research are unlocking the vast potential of clean energy sources. Through advancements in solar, wind, hydro, and geothermal technologies, researchers are making significant strides in harnessing renewable energy at scale.

Energy Efficiency and Smart Grids:

The pursuit of green innovation and research extends beyond renewable energy sources. It also focuses on enhancing energy efficiency and optimizing energy consumption. Researchers are devising innovative ways to improve the efficiency of appliances, buildings, and industrial processes, minimizing energy waste and maximizing energy productivity.

Technological Advancements and Electrification:

Green innovation and research are propelling technological advancements that facilitate the widespread adoption of electric vehicles (EVs) and the electrification of various sectors. EV battery technologies are rapidly evolving, offering greater range, faster charging, and improved affordability

3. Sustainable Mobility and Transport:

Transport EN allows people, services and goods to move freely within the European Union. It is a cornerstone of EU integration, connecting people across different regions and countries, and a major contributor to the economy. Demand for transport continues to rise as economies become more integrated.

This brings opportunities but also new challenges. In particular, transport represents almost a quarter of the EU's greenhouse gas emissions and is one of the main causes of air pollution in cities. Member States are looking for ways to develop smart, sustainable and efficient transport solutions. This requires putting users first and providing them with more affordable, more accessible, healthier and cleaner alternatives.

4. Circular Economy and Resource Efficiency:

One area embraces the EU action plan for the Circular Economy (CEAP) II: The Circular Economy Package has been adopted to boost global competitiveness, fostering sustainable economic growth and generating new jobs. It consists of two EU Action Plans for the Circular Economy (2015 and 2020), with measures covering the full life cycle of products: from production and consumption to waste management and the market for secondary raw materials.

Building on the work done on the circular economy since 2015, the CEAP II focuses on resource-intensive sectors where the potential for circularity is high. Aiming to keep resources in economic cycles as long as possible, the plan addresses key product value chains: electronics and ICT, batteries and vehicles, packaging, plastics, textiles and food.

5. Biodiversity Protection and Nature Conservation:

The new 2030 Biodiversity Strategy is a comprehensive, systemic and ambitious long-term plan for protecting nature and reversing the degradation of ecosystems.

It is a key pillar of the European Green Deal and of EU leadership on international action for global public goods and sustainable development goals. With an objective to put Europe's biodiversity to recovery by 2030, the Strategy sets out new ways to implement existing legislation more effectively, new commitments, measures, targets and governance mechanisms.

- Preserving and restoring ecosystems and biodiversity
- Promoting sustainable agriculture and land use practices
- Actions to combat pollution and promote a healthier environment

6. Sustainable Agriculture and Food Systems:

The Farm to Fork Strategy lays down a new approach to ensure that agriculture, fisheries and aquaculture, and the food value chain contribute appropriately to the objective for a climate neutral Union in 2050. Food systems remain one of the key drivers of climate change and environmental degradation.

The manufacturing, processing, retailing, packaging and transportation of food make a major contribution to GHG emissions, air, soil and water pollution, and have a profound impact on biodiversity. On the other side, consumers also need to be empowered to choose sustainable food. The creation of a favourable environment that makes it easier to choose healthy and sustainable diets will benefit consumers' health and quality of life, and reduce health-related costs for society.

TIPS

- Transitioning towards sustainable and regenerative agriculture
- Promoting organic farming and reducing chemical inputs
- Enhancing food security and reducing food waste
- Encouraging sustainable consumption and promoting local and seasonal produce

7. Just Transition and Social Dimension:

The transition to a sustainable economy brings about significant changes in industries and employment patterns. To ensure a just and inclusive transition, it is crucial to support workers and communities that may be affected by the shift.

By offering assistance, retraining programs, and community development initiatives, we can minimize the potential negative impacts, provide new opportunities, and foster a fair and sustainable society.

Social Dialogue and Participation: Engaging workers, unions, and community representatives in social dialogue and decision-making processes is vital.

Reskilling and Upskilling: Investing in reskilling and upskilling programs is essential to equip workers with the necessary skills for emerging green sectors. By identifying the skills gaps and providing training opportunities, workers can transition to new jobs that align with the sustainable economy.

Income Support and Social Safety Nets: During the transition, some workers may experience temporary or permanent job displacement. Income support measures, such as unemployment benefits and social safety nets, help provide a financial cushion during the period of adjustment.

Entrepreneurship and Business Support: Supporting entrepreneurship and business development in a sustainable economy can create new job opportunities and spur economic growth.

Regional and Community Development: Addressing the impacts of the transition at the community level is crucial. Implementing targeted regional development programs can help diversify local economies and create new employment opportunities.

Just Transition Funds and Financial Mechanisms: Establishing dedicated funding mechanisms, such as Just Transition Funds, can provide financial resources to support workers, regions, and communities affected by the transition.

These funds can be used for retraining programs, income support, infrastructure projects, and business development initiatives. Ensuring a fair distribution of financial resources and targeting the most affected regions and groups promotes social equity and helps alleviate the potential adverse impacts.

8. Funding and Investment Opportunities:

Financial instruments and mechanisms to support the EU Green Deal

To achieve the goals set by the European Green Deal, the Commission has pledged to mobilise at least €1 trillion in sustainable investments over the next decade. 30% of the EU's multiannual budget (2021-2028) and the EU's unique NextGenerationEU (NGEU) instrument to recover from the COVID-19 pandemic, has been allocated for green investments.

9. Youth Engagement and Participation:

Recognising the role of youth in shaping the EU Green Deal
The European Union (EU) Green Deal represents a transformative vision for a sustainable and climate-neutral future. Central to the success of this ambitious endeavour is the recognition of the indispensable role that youth play in shaping and implementing the Green Deal.

As the custodians of tomorrow's world, young people bring fresh perspectives, innovative ideas, and unwavering commitment to environmental sustainability. Acknowledging their potential and actively involving them in the decision-making process can unlock a wealth of opportunities and contribute to the effectiveness and longevity of the EU Green Deal.

Catalysts for Change:

Youth are the catalysts for change, mobilizing communities and driving environmental action. They have been at the forefront of global movements, demanding urgent climate action and a sustainable future. By recognizing and empowering their agency, the EU Green Deal can harness the enthusiasm and passion of young people to inspire broader societal engagement and support for sustainable practices.

Innovation and Creativity:

Young minds are often unburdened by conventional thinking and are more inclined to challenge the status quo. Their innovative and creative ideas can unlock breakthrough solutions to complex environmental challenges. By involving youth in research and innovation programs, fostering entrepreneurship, and providing platforms for collaboration, the EU Green Deal can tap into its potential to drive sustainable innovation across various sectors, from renewable energy to circular economy practi potential to drive sustainable innovation across various sectors, from renewable energy to circular economy practices.ces.

Long-Term Perspective:

The EU Green Deal aims to ensure a sustainable and resilient future for generations to come. Involving youth in shaping the Green Deal enables decision-makers to benefit from their long-term perspective.

Education and Empowerment:

Education and awareness play a vital role in nurturing environmentally conscious citizens. By integrating sustainability education into curricula and offering training programs, the EU can equip young people with the knowledge and skills needed to actively contribute to the Green Deal's implementation.

Partnerships and Collaboration:

Engaging youth in the EU Green Deal fosters meaningful partnerships and collaboration. By involving youth organizations, student networks, and youth-led initiatives, the EU can create platforms for dialogue, knowledge sharing, and joint action.

Interdisciplinary Solutions:

The challenges posed by climate change and sustainability require interdisciplinary approaches. Youth bring diverse backgrounds, skills, and perspectives from fields such as science, technology, arts, and social sciences.

SUSTANAIBLE PRACTICES

Sustainability principles are the foundation of what this concept stands for. Therefore, sustainability consists of three pillars: economy, society and environment. These principles are also used informally as profit, people and planet.

Sustainability principles aim to create a future culture as well as a peaceful life, especially for future generations. Sustainability principles are based on respecting the rights of all living things while producing and consuming. Here are some of the principles of sustainability that aim to create a better planet for all:

1. Buy and consume only as much as needed.
2. Take into account the needs of other living things while consuming.
3. Use energy efficiently and prefer renewable energy sources.
4. Use products that can be recycled.
5. Proceed, taking into account the consequences of your actions.
6. Reset waste generation or use the waste to generate a different benefit.

Sustainable Practices are discussed in the following topics.

1. ENERGY

Energy saving and efficiency may be related, but they have different definitions in the energy world. Energy conservation involves using less energy by adjusting your behaviors and habits. Energy efficiency, on the other hand, involves using technology that requires less energy to perform the same function. Energy-efficient light bulbs, large appliances, smart thermostats, and smart home hubs like Constellation Connect are examples of technology that can be energy efficient.

Is it important to reduce energy use?

Avoiding excessive energy consumption is good for your wallet. The less you use, the less you spend. And today you are not just saving money; You insulate yourself against possible future increases in energy costs.

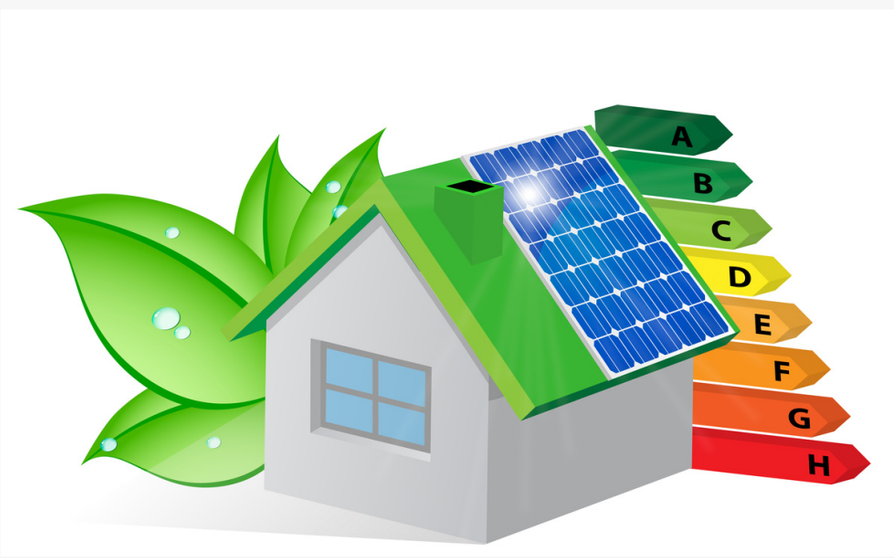
Looking beyond your monthly bill, using less energy makes it easier for us to be more energy independent, reduces the number of wells, refineries and power plants we need, and is good for the environment. Cleaner landscapes and cleaner air lead to greater health. As a result, reducing the amount of energy we use creates a cycle of benefits.

Practices for Energy Saving in Your Home

- Be sure to turn off the lamps you are not using.
- Use energy efficient electronics and lighting systems.
- Unplug electrical appliances that you don't need from the socket.
- Prefer technologies for energy efficiency in your building insulation. Use two or three layers of glass in your windows.
- Use your rooms to make the most of daylight.
- Do not hide radiators behind furniture.
- Do not leave the doors of your buildings open during the winter months and keep the rooms you do not use at low temperatures.
- Cover your hot water tank and pipes with insulation material.
- Prefer the hot water system using solar energy.

• Take care to keep the appliances you use in the kitchen, such as refrigerators and dishwashers, clean so that they can work more efficiently.

• Operate your refrigerator between 3-5°C.
• Wait for the food you take out of the freezer to thaw before cooking.
• Do not immediately put hot food in the refrigerator. Putting your food in the refrigerator without cooling causes your refrigerator to consume more energy and the production of bacteria in the food.
• If you prefer ceramic or glass materials for your oven dishes, reduce the temperature of your oven by 20°C. Since these materials conduct heat better than other materials, they will give the same result.
• Make sure that the width of your pot and pan is the same size as your stove to prevent the heat from being wasted.
• Keep the lids of the containers you use while cooking closed.
• Put the food on the upper shelves of your oven. Thus, reduce your cooking time by 20%.
• Do not check the food cooked in the oven by constantly opening the oven door, use the oven's lamp. Because every time you open the door of your oven, you lose a large part of the heat energy.

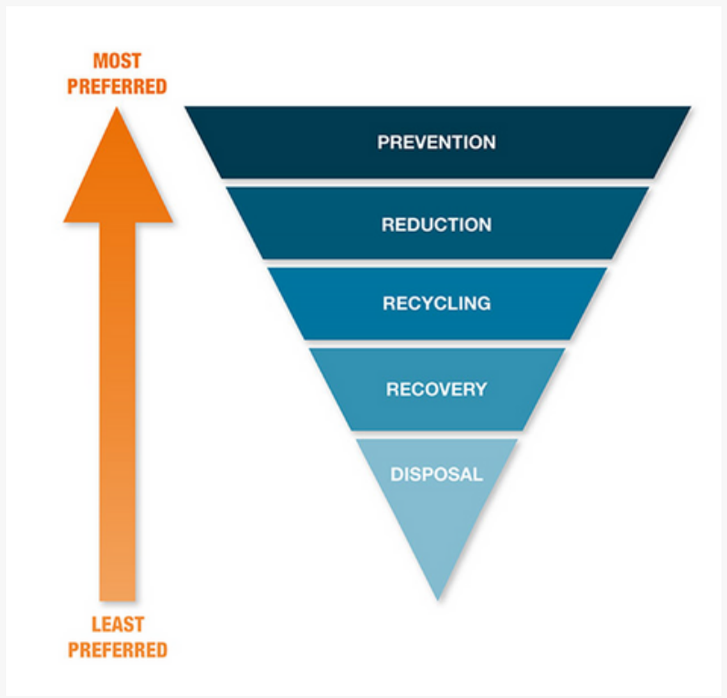


CE+ Tips: How to change your energy consumption habits?

1. Identify your current energy consumption habits
2. Identify the impact of your habits
3. Eliminate obstacles and triggers
4. Think about the reward you will get by changing your energy consumption habits
5. Develop new energy consumption routines
6. Don't be hard on yourself

2. WASTE MANAGEMENT

Waste management is the management style that constitutes the collection, storage and recycling of wastes by evaluating the substances that threaten human health and environmental health after waste management, production and application activities within the scope of waste.



General Principles Regarding Waste Management

• Development and use of clean technologies, where natural resources are used as little as possible,

• Ensuring the marketing and technical development of products designed in a way that will not harm the environment or cause minimal harm during production, use or disposal stages,

• Developing and applying appropriate techniques for the final disposal of hazardous materials remaining after recovery, preventing and reducing them,

• In cases where waste generation is unavoidable, recycling, reuse and other processes for obtaining secondary raw materials and recycling of waste or using it as an energy source,

• Separate collection of different types of waste at the source,

• Disposal of wastes in the nearest and most suitable facility, using appropriate methods and technologies,

• Use of environmentally compatible technologies that reduce waste generation at its source and ensure the recycling of wastes, to use natural resources and energy efficiently during all kinds of activities.

How Does Waste Management Benefit Us?

- Protects the environment
- Improves public health
- Protects natural resources
- Minimizes greenhouse gas emissions
- Creates job opportunities
- Increases energy efficiency
- Enriches the quality of life

CE+ Tips: Best Solutions for Sustainable Waste Management

1. Go Paperless
2. Burning Waste
3. Donate Anything That Helps
4. Reduce, Reuse, Recycle
5. Compost Your Lunch
6. Anaerobic Digestion of Waste
7. Waste Collection
8. Educating the Masses

3. WATER CONSERVATION

Water conservation is the practice of using water efficiently to reduce unnecessary water use. According to Fresh Water Watch, saving water is important because fresh clean water is a limited resource and also expensive.

As a home owner, you are probably already aware of the financial costs of inefficient water use. Conservation of this natural resource is critical for the environment and our wallets.

CE+ Tips: One of the best water-saving tips is probably the one that has the biggest impact: Take a shower instead of a bath. Bathing can be relaxing and enjoyable, but it takes more than 78 gallons of water to fill a tub. Showers are a more water-efficient way to take a bath. More tips on saving water while showering:

4. SUSTAINABLE TRANSPORTATION

Sustainable transport is the capacity of a society to support its mobility needs in a way that minimizes environmental damage and does not harm the mobility needs of future generations.

Among the principles of sustainable transportation;

- Bringing new regulations to public transportation and transportation infrastructure
- Making public vehicles environmentally friendly (such as electric buses)
- Reducing dependency on private vehicles
- Increasing mobility
- Reducing the carbon footprint.

Benefits of Sustainable Transportation

- Reduction in traffic congestion
- Reduction of related ailments and risks, such as asthma, through reduced air pollution
- Reduced greenhouse gas emissions
- Less dependence on non-renewable energy sources
- Low shipping costs

- Increased physical activity
- Increased social interaction
- Support for local businesses and a vibrant economy
- Healthier lifestyles and a better quality of life

What are the latest trends in sustainable transportation?

Electric cars, incentives, stations based on renewable energy...
Electric vehicles, which we are now familiar with, are key in the sustainable transportation sector.

There are also new trends rising with the demand for electric vehicles. First of all, we can say that mobility software using artificial intelligence will make progress.
Laws restricting the circulation of fossil fuel vehicles are expected to become more widespread.

Most electric vehicle owners charge their vehicles at night at home. Apart from this, they can also use the charging stations in public areas such as shopping malls and parking lots. Since the engines of battery electric vehicles get their energy from the fuel cell, they do not need external charging.

5. SUSTAINABLE AGRICULTURE

Sustainable agriculture is farming in a way that protects the environment, helps and expands natural resources and makes the most of non-renewable resources. Sustainable agriculture practitioners seek to integrate three main goals into their work: a healthy environment, economic profitability, and social and economic equity.

Everyone involved in the food system (growers, food processors, distributors, retailers, consumers and waste managers) can play a role in ensuring a sustainable farming system.

Despite the site-specific and individual nature of sustainable agriculture, several general principles can be applied to help growers choose appropriate management practices:

- Selection of species and varieties best suited to the site and farm conditions;
- diversification of crops (including livestock) and cultural practices to improve the biological and economic stability of the farm;
- Management of soil to improve and protect soil quality;
- Efficient and humane use of inputs; And
- Consideration of farmers' goals and lifestyle preferences.

Sustainability has many aspects. For example, environmental sustainability means good management of the natural systems and resources on which farms depend. This includes:

• Creating healthy soil and preventing erosion
• Managing water wisely
• Minimizing air and water pollution
• Storing carbon on farms
• Increasing resistance to extreme weather conditions
• Promoting biodiversity

Sustainable Agriculture Practices

1. To use crops in rotation and embrace diversity.
2. Cultivation of cover crops and perennials.
3. Reduction or elimination of tillage.
4. Implementation of integrated pest management (IPM).
5. Integration of livestock and crops.
6. Adoption of agroforestry practices.
7. Managing all systems and landscapes.

For Youth:

Education and Awareness: Participate in sustainability-related training programs and workshops. Learn about environmental issues and sustainable lifestyles.

Practice Green Habits: Adopt sustainable living habits such as recycling, saving energy (e.g. using LED bulbs, not leaving devices on standby), and saving water.

Sustainable Transport: Encourage the use of public transport, bike or walk. If possible, choose electric or hybrid vehicles.

Zero Waste and Minimalism: Avoid disposable products, and choose reusable or multi-purpose products. Embrace minimalism by avoiding unnecessary consumption.

Eat Local and Seasonal Produce: Support the local economy and reduce food miles by shopping at local markets.

For Youth Workers

Sustainability Education Programs: Organise sustainability awareness-raising education programs and workshops for young people.

Community Projects: Organise sustainability-themed community projects and volunteer events so young people can gain practical experience.

Internal Practices: Promote sustainable practices in youth centres and work spaces (e.g. energy-efficient lighting, recycling programs).

Networking and Collaborations: Help young people make a broader impact by collaborating with other organizations working on sustainability issues.

Digital Platforms: Raise awareness and share information about sustainability using social media and websites.

ACTIVITY: LET'S REDUCE OUR CARBON FOOTPRINT

Purpose of the event: Develop sustainable behaviours to reduce carbon footprint by expressing the harm caused by carbon dioxide released as a result of the activities of individuals in a concrete way.

The carbon footprint expresses the amount of all greenhouse gases (CO2), including carbon dioxide, emitted into the atmosphere by our activities and consumptions in daily life, in tons equivalent. In a simpler language, it can also be called the numerical equivalent of the destruction we cause to nature. Many factors, from transportation to the heaters we burn for heating, the food we cook and even the electricity we consume, have an impact on the formation of carbon footprints.

Calculate your carbon footprint by scanning the QR code below.

Questions	Answers
Summarize the damage your carbon footprint causes to the environment below. Compare with country and world average.	
Which of your daily activities do you think are sustainable?	
How can you change your unsustainable consumption habits to reduce carbon emissions?	

ACTIVITY: My Waste Management Plan

A waste management system or waste disposal is a streamlined process that organizations use to dispose, reduce, reuse and prevent waste. It is also an approach where companies implement comprehensive strategies to efficiently manage waste from its source to its final disposal. Possible waste disposal methods include recycling, composting, incineration, landfilling, biological remediation, waste-to-energy conversion and waste minimization.

To ensure that the implementation of the waste management plan is feasible, maintain a realistic perspective when setting goals. Once the objectives of the waste management plan are finalized, perform the following steps:

1. Identify the resources needed (containers, vehicles, etc.)
2. Clarify your daily tasks or responsibilities
3. Prepare a timeline for implementation

Remember to document everything and involve everyone in the organization during implementation. Document the organization's daily waste disposal and resource use, as well as retain all waste inspection results. Also, give everyone the tools they need to participate effectively in waste management. These tools can include training, introductory, toolbox talks, and even digital checklists.

A waste management plan is outlined below. As a group, prepare your waste management plan in a way that is suitable for your home, school or workplace.

Goals	Resources	Person in charge	Time	Amount Collected	Disposal Method

INNOVATIVE TEACHING METHODS AND APPROACHES FOR GREEN SKILLS

1. HOW TO DEFINE INNOVATIVE TEACHING METHODS AND APPROACHES AND WHAT ARE THE BENEFITS

Innovative teaching methods and approaches transcend traditional instructional techniques by incorporating creativity, engagement, and practical application. Innovative teaching methods play a pivotal role in shaping the way we learn, especially when it comes to acquiring green skills.

These methods not only transform education into a more engaging and interactive experience but also have far-reaching benefits that extend to individuals, communities, and the environment. Let's delve deeper into the advantages of incorporating innovative approaches for the acquisition of green skills among youth workers and businesses:

a. Enhanced Engagement:

Traditional lectures and passive learning often lead to disengagement and limited retention of information. Innovative methods, however, captivate learners' attention by presenting information in novel and interactive ways.

Whether through role-playing, hands-on activities, or immersive simulations, these methods create a dynamic learning environment that encourages active participation and curiosity.

INNOVATIVE TEACHING METHODS AND APPROACHES FOR GREEN SKILLS

1. HOW TO DEFINE INNOVATIVE TEACHING METHODS AND APPROACHES AND WHAT ARE THE BENEFITS

b. Practical Application:

One of the most significant advantages of innovative methods is their emphasis on practical application. Green skills encompass a range of knowledge and practices related to environmental sustainability. Innovative teaching methods bridge the gap between theory and practice, allowing learners to immediately apply their newly acquired knowledge to real-world scenarios. This not only solidifies their understanding but also equips them with the skills needed to make informed, eco-conscious decisions in various contexts.

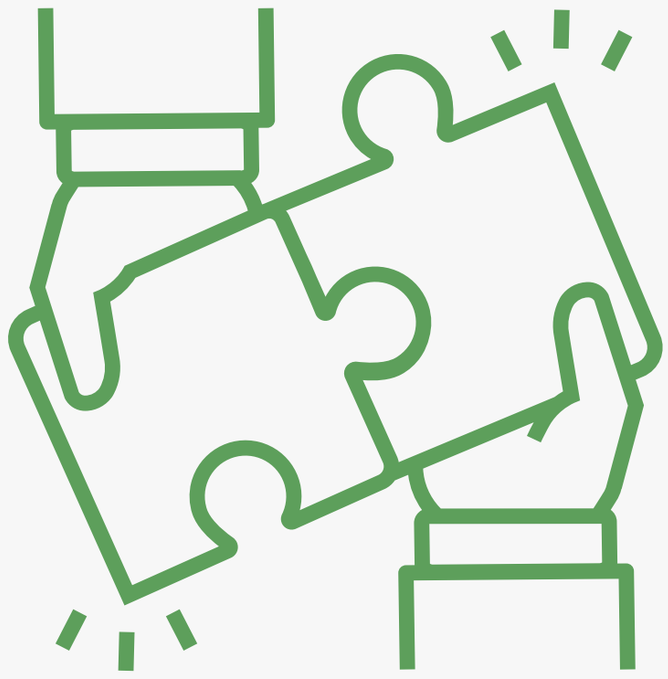
c. Critical Thinking:

Environmental challenges are complex and multifaceted. Innovative teaching methods cultivate critical thinking skills by presenting learners with open-ended problems that require thoughtful analysis and creative solutions. Through activities like problem-based learning and case studies, learners are encouraged to explore multiple perspectives, evaluate evidence, and develop well-reasoned conclusions—a crucial skillset for addressing the intricate issues of sustainability.

1. HOW TO DEFINE INNOVATIVE TEACHING METHODS AND APPROACHES AND WHAT ARE THE BENEFITS

d. Collaborative Learning:

In the realm of sustainability, collaboration is key. Innovative teaching methods often involve group projects, discussions, and cooperative learning activities. These experiences mirror real-world collaboration, where diverse perspectives and skills converge to devise holistic solutions. Learners develop teamwork, communication, and interpersonal skills that are essential for driving positive change both within organizations and larger communities.



e. Long-Term Retention:

Traditional passive learning often leads to short-term memorization, with knowledge fading over time. Innovative methods, on the other hand, facilitate active engagement and experiential learning, leading to deeper understanding and long-term retention of concepts.

Learners remember not only the information but also the experiences associated with it, fostering a more enduring commitment to green practices.

INNOVATIVE TEACHING METHODS AND APPROACHES FOR GREEN SKILLS

1. HOW TO DEFINE INNOVATIVE TEACHING METHODS AND APPROACHES AND WHAT ARE THE BENEFITS

f. Adaptability:

Every learner is unique, with distinct learning styles, preferences, and strengths. Innovative teaching methods cater to this diversity by offering a range of approaches that can be tailored to individual needs. Whether visual, auditory, kinaesthetic or a combination thereof, learners can engage with content in ways that resonate with them, maximizing their understanding and skill development.

In conclusion,

innovative teaching methods are not just tools for education but powerful catalysts for sustainable change. By integrating these methods into the acquisition of green skills among youth workers and businesses, we enable learners to not only comprehend the complexities of environmental sustainability but also to actively contribute to a more eco-conscious future. The benefits extend beyond the classroom, shaping individuals who are capable of making informed decisions, collaborating effectively, and driving positive environmental impact.

2. INNOVATIVE METHODS AND APPROACHES

Teaching green skills to youth workers and businesses requires innovative approaches that not only impart knowledge but also inspire action and foster a deep understanding of sustainability. Here are some effective methods tailored for this audience:

Eco-Challenge Competitions:

Eco-challenge competitions involve participants in solving real-world environmental problems. Participants form teams and work together to develop innovative solutions to issues like waste management, energy conservation, or sustainable transportation. These competitions encourage critical thinking, teamwork, and creativity while fostering a competitive spirit to address pressing green challenges.

Sustainability Hackathons:

Sustainability hackathons bring together individuals with diverse skill sets to brainstorm and rapidly prototype solutions to ecological issues. Participants, often including programmers, designers, and sustainability experts, collaborate intensively over a short period to develop tech-driven solutions such as apps, tools, or platforms for environmental monitoring and awareness.

2. INNOVATIVE METHODS AND APPROACHES

Green Apprenticeships:

Green apprenticeships provide participants with the opportunity to learn from experienced mentors in sustainability-related fields. Youth workers and businesses can be paired with mentors who guide them through hands-on experiences in areas like organic farming, renewable energy installation, or eco-friendly business practices. This approach ensures practical knowledge transfer and skill acquisition.

Green Role-Play and Simulations:

Role-play and simulations immerse participants in realistic scenarios that mirror real-world sustainable decision-making processes. For example, participants might take on roles as government officials, business leaders, or community members dealing with environmental issues. These scenarios encourage empathy, critical analysis, and an understanding of the complexities of sustainable choices

Outdoor Sustainability Retreats:

Outdoor retreats combine team-building activities with workshops on sustainability topics. These retreats provide a unique setting for participants to engage in discussions about green practices while connecting with nature. Activities such as eco-friendly camping, hiking, or wilderness survival exercises can be integrated with sustainability workshops.

2. INNOVATIVE METHODS AND APPROACHES

Green Skill Workshops with Experts:

Invite industry experts to conduct workshops on specific green skills. These experts can share practical insights, case studies, and hands-on demonstrations related to sustainable practices. For example, experts in renewable energy might lead workshops on solar panel installation or wind turbine maintenance.

Virtual Reality (VR) Experiences:

Virtual reality technology offers immersive experiences that allow participants to explore environmental challenges in simulated environments. Participants can experience scenarios like navigating a polluted city or managing a sustainable farm. VR experiences enhance engagement and provide a unique perspective on green challenges.

Reverse Classroom Approach:

In the reverse classroom approach, participants are provided with pre-learning materials before attending workshops. During workshops, the focus shifts to interactive discussions, problem-solving activities, and skill application. This approach maximizes engagement and interaction during face-to-face sessions

2. INNOVATIVE METHODS AND APPROACHES

Storytelling and Case Studies:

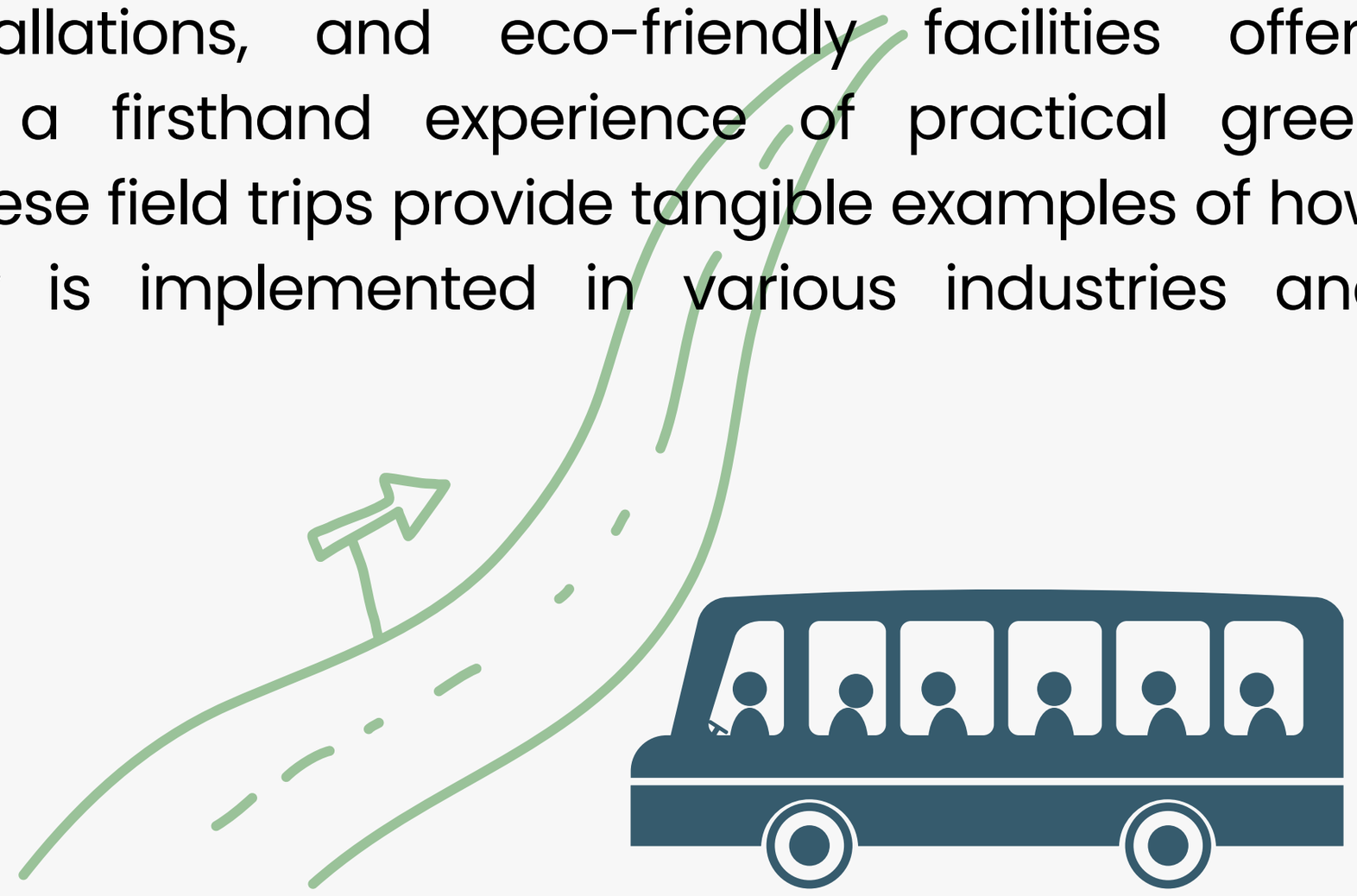
Sharing real-life success stories of businesses that have adopted green practices and analyzing case studies that demonstrate positive outcomes can inspire participants. These stories provide practical examples of how sustainability can be integrated into business strategies and practices.

Green Entrepreneurship Incubators:

Green entrepreneurship incubators provide a structured environment for participants to develop their own sustainable business ideas. These programs offer mentorship, business planning workshops, access to resources, and networking opportunities, enabling participants to turn their green business ideas into reality.

Green Tours and Field Trips:

Organizing visits to sustainable businesses, renewable energy installations, and eco-friendly facilities offers participants a firsthand experience of practical green practices. These field trips provide tangible examples of how sustainability is implemented in various industries and settings.



2. INNOVATIVE METHODS AND APPROACHES

Collaborative Art Projects:

Engaging participants in collaborative art projects related to sustainability allows them to express their understanding creatively. Art projects can communicate environmental messages, raise awareness, and inspire action through visual representation.

Social Media Challenges:

Utilizing social media platforms, organizations can design sustainability challenges that encourage participants to share eco-friendly practices, innovations, and tips. These challenges foster a sense of community engagement and raise awareness about green practices.

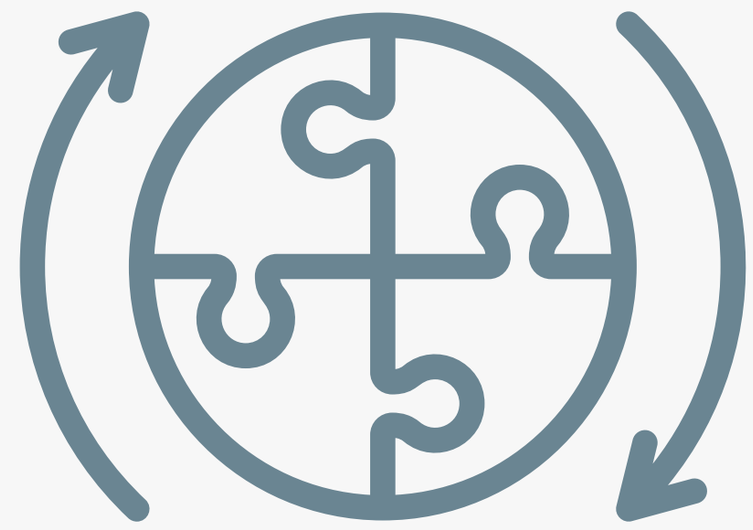
Peer Learning Circles:

Peer learning circles facilitate small group discussions where participants share their own experiences, challenges, and successes related to green skills. These discussions promote knowledge exchange, provide diverse perspectives, and foster motivation among peers.

2. INNOVATIVE METHODS AND APPROACHES

Cultural Integration:

Incorporating indigenous knowledge, traditional practices, and local wisdom related to sustainability respects cultural heritage while emphasizing the importance of environmental stewardship. This approach adds depth and relevance to the learning experience.



These innovative teaching methods and approaches offer dynamic ways to educate and inspire youth workers and businesses in the acquisition of green skills. By engaging participants through experiential learning, practical activities, and interactive experiences, these methods contribute to a more environmentally conscious workforce and business landscape.

3. GOOD PRACTICES

Cisco Global Problem Solver Challenge

Cisco annually hosts the Global Problem Solver Challenge, inviting students and recent graduates to develop technology solutions that address social and environmental challenges. This competition encourages young innovators to tackle issues like water scarcity, energy efficiency, and sustainable agriculture. The challenge fosters creativity, collaboration, and practical application of green skills in solving real-world problems.

Sustainable Farming Apprenticeships

Many sustainable farming organizations offer apprenticeship programs for individuals interested in learning about organic and regenerative farming practices. For example, organizations like WWOOF (World Wide Opportunities on Organic Farms) connect aspiring farmers with established farms for hands-on learning experiences in sustainable agriculture. Participants learn about soil health, crop rotation, and holistic land management.

3. GOOD PRACTICES

Eco-Sim

"Eco-Sim" is an interactive simulation developed by the World Bank that allows players to manage a virtual city while balancing economic growth, social development, and environmental sustainability. This simulation encourages players to make decisions related to energy consumption, waste management, and urban planning, providing insights into the complexities of sustainable development.

GreenBiz's VERGE Adventure Retreat

GreenBiz, a sustainability-focused media company, hosts the VERGE Adventure Retreat, a four-day immersive experience that combines outdoor activities with sustainability discussions. Participants engage in activities like kayaking and hiking while also attending workshops on topics like renewable energy, circular economy, and sustainable business practices.

3. GOOD PRACTICES

The Solar Energy International (SEI) Training Program

Solar Energy International (SEI) offers comprehensive training programs in solar energy installation and design. These workshops provide participants with hands-on experience in installing solar panels, configuring systems, and troubleshooting issues. Participants gain practical skills that are directly applicable to careers in the renewable energy industry.

Conservation International's Virtual Reality Initiatives

Conservation International has developed virtual reality experiences that immerse viewers in various ecosystems around the world. For example, their "Valen's Reef" VR experience transports viewers to a vibrant coral reef, promoting awareness about marine conservation. These VR experiences offer a unique way to engage participants in understanding and appreciating nature.

3. GOOD PRACTICES

Sustainable Procurement Training by EcoVadis

EcoVadis, a sustainability ratings company, offers training programs on sustainable procurement. Their training modules provide participants with pre-learning materials and interactive workshops that focus on sustainable sourcing, supplier assessment, and ethical procurement practices.

Patagonia's Sustainable Business Model

Patagonia, an outdoor clothing company, is known for its commitment to sustainability. Their business model emphasizes environmental responsibility, fair labor practices, and product durability. Patagonia's success story serves as a compelling example of how a business can integrate green values into its operations and marketing strategies.

3. GOOD PRACTICES

ClimateLaunchpad

ClimateLaunchpad is the world's largest green business ideas competition, offering participants a three-stage program to develop and refine their sustainable business concepts. Participants receive training, mentorship, and opportunities to pitch their ideas to investors. The program supports the development of innovative green start-ups.

These real-world examples demonstrate the effectiveness of various teaching practices in imparting green skills to youth workers and businesses. By drawing inspiration from these successful initiatives, educators and organizations can design impactful learning experiences that empower participants to contribute to a more sustainable and environmentally conscious future.

4. TIPS

1. Sustainable Lifestyle Practices:

Adopt habits such as waste reduction, energy conservation, and eco-friendly product usage.

- Waste Reduction: Implement the "3 Rs" – Reduce, Reuse, Recycle. Reduce single-use plastics by using reusable bags, containers, and water bottles. Embrace composting for organic waste, reducing landfill contributions.
- Energy Conservation: Conserve energy by using energy-efficient appliances, LED lighting, and turning off electronics when not in use. Set thermostats to energy-saving temperatures and consider investing in renewable energy sources like solar panels.
- Eco-Friendly Transportation: Opt for sustainable transportation options such as biking, walking, carpooling, or using public transit. If feasible, consider electric or hybrid vehicles to reduce carbon emissions.
- Water Conservation: Reduce water waste by fixing leaks, using water-saving fixtures, and practising mindful water usage. Collect rainwater for gardening and landscaping purposes.
- Minimalism and Conscious Consumption: Embrace minimalism by purchasing items mindfully and focusing on quality over quantity. Avoid overconsumption and fast fashion, which contribute to resource depletion and environmental degradation.

4. TIPS

2. Continuous Learning and Skill De Learning and Skill Development:

Enrol in courses, workshops, and readings to expand your understanding of green concepts.

- Online Green Courses: Enrol in online courses or webinars focused on sustainability, environmental science, renewable energy, or sustainable business practices. Platforms like Coursera, edX, and Khan Academy offer a variety of free and paid courses.

- Local Workshops: Attend workshops organized by local environmental organizations, universities, or community centres. These workshops provide hands-on learning experiences and opportunities to connect with experts and like-minded individuals.

- Sustainability Books and Publications: Read books, articles, and reports on sustainability, climate change, and eco-friendly practices in the field.

- Podcasts and Documentaries: Listen to sustainability-focused podcasts and watch documentaries that explore environmental issues, conservation efforts, and innovative solutions.

4. TIPS

3. Raising Awareness and Advocacy:

Share eco-initiatives, knowledge, and experiences to drive positive change in communities.

- Social Media Engagement: Use social media platforms to share information, resources, and success stories related to sustainability. Raise awareness about environmental issues, promote eco-friendly practices, and engage with a broader audience.

- Community Workshops and Talks: Organize or participate in community workshops, talks, and panel discussions about sustainable practices. Share your knowledge and experiences to inspire others to adopt green habits.

- Volunteer for Environmental Initiatives: Join local environmental groups, clean-up events, tree planting campaigns, and conservation projects. Actively participating in community efforts demonstrates your commitment to positive change.

- Lobby for Change: Engage with local governments and policymakers to advocate for environmentally friendly policies and regulations. Write letters, attend town hall meetings, and join advocacy groups to amplify your voice.

- Sustainable Networking: Attend sustainability conferences, trade fairs, and networking events to connect with professionals and enthusiasts in the field. Collaborate on projects, share ideas, and exchange experiences.

4. TIPS

By incorporating these additional tips and details into sustainable lifestyle practices, continuous learning, and advocacy efforts, individuals can enhance their commitment to green living and contribute to a more environmentally conscious world.

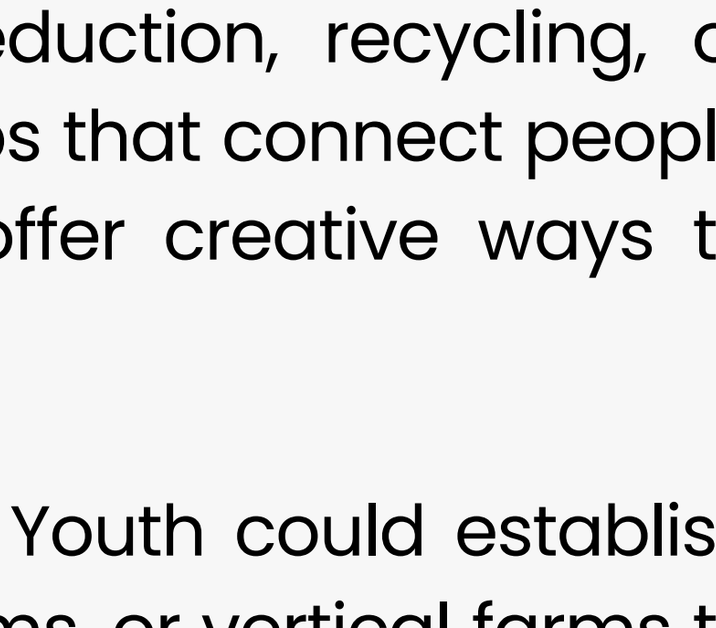
5. YOUTH ENTREPRENEURSHIP – WHAT COULD BE DONE BY YOUTH IN THE FUTURE

- Eco-Friendly Product Innovation: Youth can create innovative products that address environmental challenges. This might include developing biodegradable packaging, energy-efficient gadgets, sustainable fashion, or eco-friendly cleaning products.

- Renewable Energy Ventures: Start businesses centred around renewable energy solutions, such as solar panel installation, wind turbine maintenance, or creating portable solar chargers for electronic devices.

- Waste Management Solutions: Create platforms or services that focus on waste reduction, recycling, or upcycling. Youth could design apps that connect people with local recycling facilities or offer creative ways to repurpose materials.

- Sustainable Agriculture Initiatives: Youth could establish urban gardens, hydroponic systems, or vertical farms to provide locally grown, organic produce. They might also develop technologies to optimize water usage and enhance crop yield.



5. YOUTH ENTREPRENEURSHIP – WHAT COULD BE DONE BY YOUTH IN THE FUTURE

- Green Transportation Services: Launch bike-sharing programs, electric vehicle charging stations, or carpooling apps to reduce carbon emissions and promote sustainable transportation options.

- Circular Economy Ventures: Develop business models that emphasize circular economy principles, such as repairing, refurbishing, or repurposing products to extend their lifespan and reduce waste.

- Carbon Offset Platforms: Create platforms that allow individuals and businesses to calculate their carbon footprint and invest in carbon offset projects like reforestation or clean energy initiatives.

- Eco-Tourism and Responsible Travel: Establish sustainable tourism companies that promote responsible travel, support local communities, and minimize environmental impact.

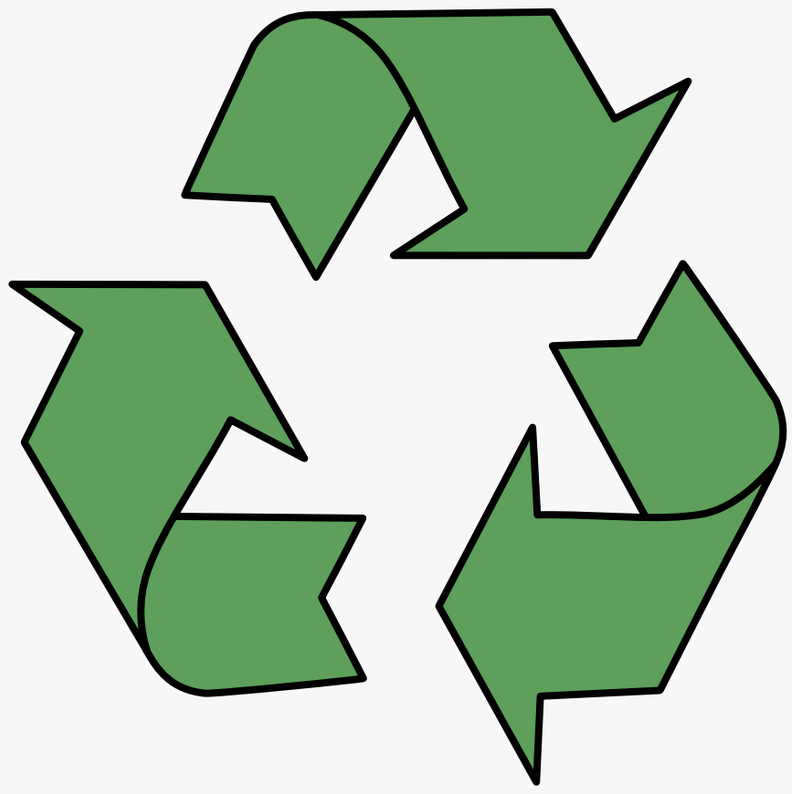
5. YOUTH ENTREPRENEURSHIP – WHAT COULD BE DONE BY YOUTH IN THE FUTURE

- Tech Innovations for Conservation: Develop apps or devices that contribute to environmental conservation efforts, such as wildlife tracking, monitoring air quality, or mapping plastic pollution.

- Green Consulting Services: Offer consultancy services to help businesses adopt sustainable practices, reduce their environmental footprint, and achieve green certifications.

- Upcycled Fashion Brands: Create fashion brands that repurpose discarded materials into stylish clothing, accessories, and home goods, promoting sustainable fashion choices.

- Zero-Waste Grocery Stores: Establish grocery stores that minimize packaging waste by offering bulk items and reusable containers, encouraging consumers to adopt zero-waste shopping habits.



5. YOUTH ENTREPRENEURSHIP - WHAT COULD BE DONE BY YOUTH IN THE FUTURE

- Green Building and Architecture: Specialize in designing and constructing energy-efficient, eco-friendly buildings that prioritize sustainable materials and practices.

- Social Enterprises for Environmental Causes: Start social enterprises that allocate a portion of profits to support environmental initiatives, contributing to causes such as reforestation, wildlife conservation, or plastic waste reduction.

These suggestions highlight the diverse opportunities available for youth entrepreneurs to create businesses that promote sustainability, address environmental challenges, and contribute to a more eco-conscious future. The key lies in identifying areas of passion and interest and aligning them with the pressing needs of our planet.

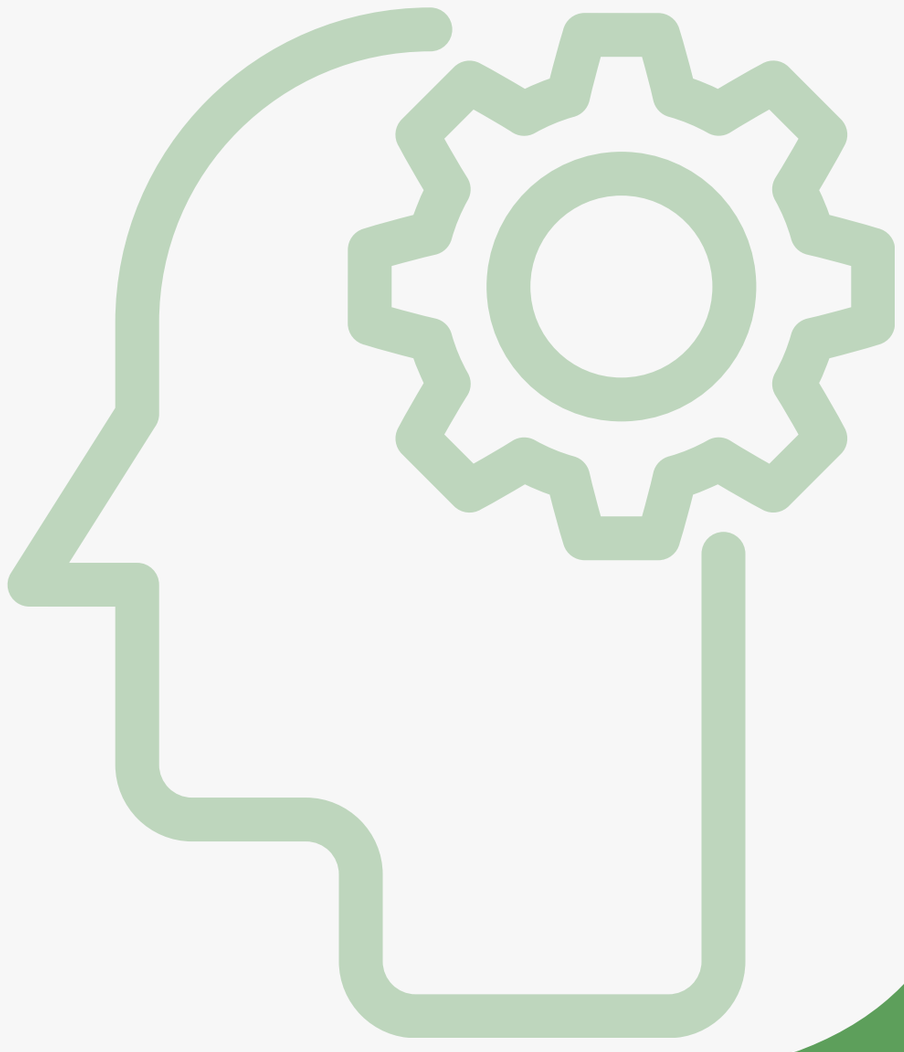
6. SDL - INDIVIDUAL EXERCISES

1. Personal Green Skills Assessment:

Objective: Evaluate the individual's current level of green skills and identify areas for improvement.

Steps:

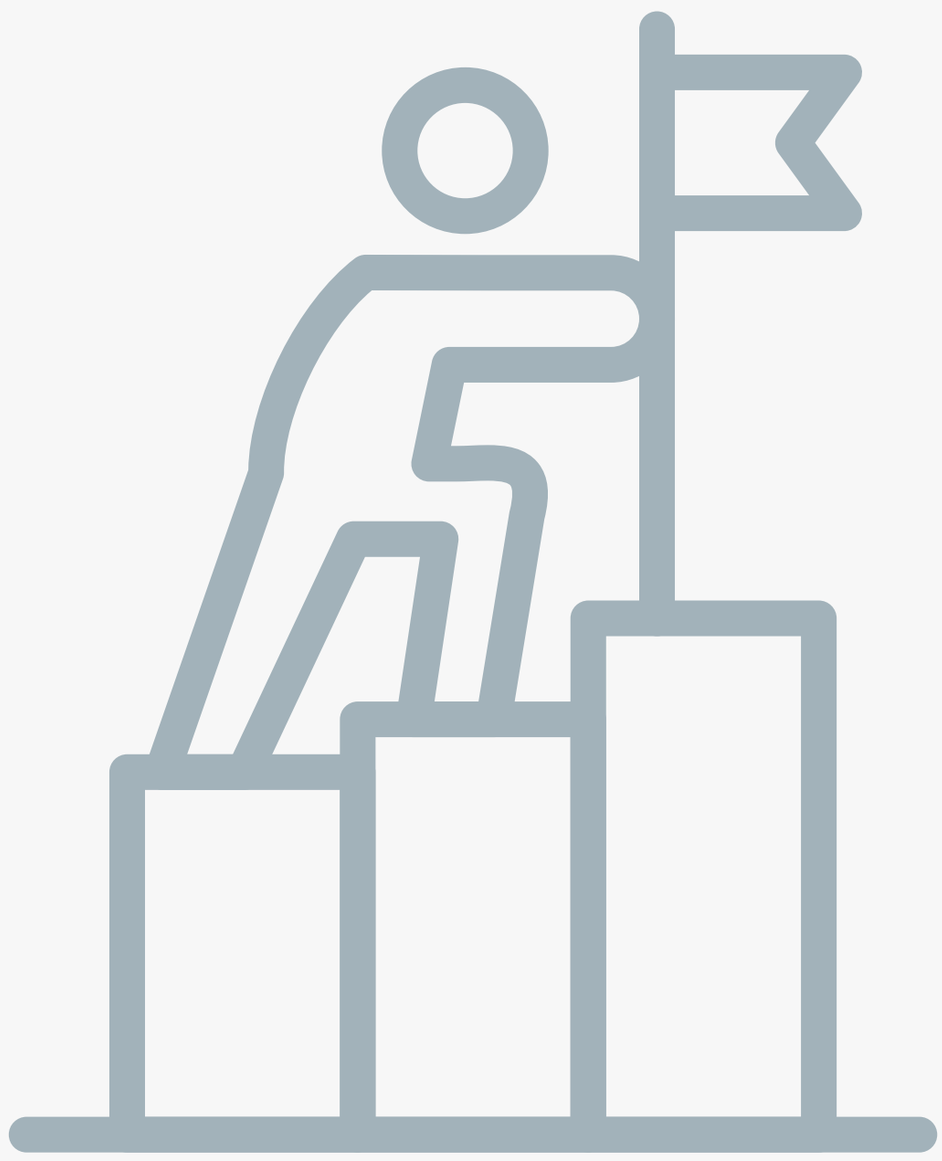
1. Self-Reflection: Have participants reflect on their current knowledge and practices related to sustainability and green skills.
2. Skills Inventory: Provide a list of common green skills, such as waste reduction, energy conservation, sustainable transportation, and eco-friendly product usage. Participants should rate their proficiency in each skill on a scale from 1 to 5.
3. Environmental Impact: Encourage participants to reflect on their daily habits and choices that impact the environment. Ask them to consider their energy consumption, waste generation, and carbon footprint.



6. SDL - INDIVIDUAL EXERCISES

4. Identify Strengths and Weaknesses: Based on the skills inventory and environmental impact assessment, participants should identify their strengths and areas where they need to improve.
5. Goal Setting: Have participants set specific and achievable goals for improving their weaker green skills. These goals should be measurable and have a timeframe

Outcome: Participants gain a clear understanding of their current green skills level, recognize areas for improvement, and establish goals for enhancing their sustainability practices.



6. SDL - INDIVIDUAL EXERCISES

2. Designing a Green Action Plan:

Objective: Guide individuals in creating a personalized plan to acquire and apply new green skills effectively.

Steps:

1. Identify Priority Skills: Based on the assessment, participants should choose a few green skills they want to develop further. These skills should align with their interests and contribute to environmental sustainability.
2. Research and Resources: Have participants research resources for learning and acquiring the chosen green skills. This could include online courses, workshops, books, and community events.
3. Set Learning Goals: Participants should define specific learning goals for each chosen skill. For example, if focusing on energy conservation, a goal might be to learn about home energy audits and implement energy-saving practices.
4. Action Steps: Break down the learning goals into actionable steps. If the goal is to reduce waste, the steps might involve setting up a home composting system, using reusable containers, and minimizing single-use plastics.

6. SDL - INDIVIDUAL EXERCISES

5. Timeline: Establish a realistic timeline for achieving each goal and completing the action steps. This helps participants stay accountable and motivated.
6. Monitoring and Reflection: Encourage participants to regularly monitor their progress, reflect on their experiences, and make adjustments as needed.
7. Sharing and Accountability: Participants can choose to share their action plans with friends, family, or a support group. This accountability can help them stay committed to their goals.

Outcome: Participants create a detailed plan for acquiring new green skills, including actionable steps and a timeline, fostering a proactive approach to sustainable living.

These exercises empower individuals to assess their current green skills, set achievable goals for improvement, and create actionable plans to actively integrate sustainable practices into their daily lives.

7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

Objective: Engage participants in a hands-on, interactive activity that promotes the acquisition and application of green skills while fostering teamwork and creativity.

Duration: 2-3 hours (adjustable based on group size and complexity).

Materials Needed:

- Various sustainable materials (recyclables, reusable items, organic materials)
- Art supplies (markers, glue, scissors)
- Presentation materials (poster boards, markers, etc.)
- Timer or clock

7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

Instructions:

- Step 1: Introduction

(15 minutes)

- Welcome the participants and introduce the concept of green skills and their importance for environmental sustainability.

- Explain that the activity is a "Green Skills Challenge" that will require them to work in teams to design and create a sustainable solution to a given environmental problem.

- Step 2: Team Formation

(10 minutes)

- Divide the participants into small teams of 4-6 members each.

- Encourage diversity in each team by mixing individuals with different backgrounds, skills, and perspectives.

7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

- Step 3: Environmental Problem Presentation

(15 minutes)

- Present a specific environmental challenge to the participants. For example, the challenge could be to design a waste reduction solution for a local event or create an energy-efficient transportation model for their community.

- Provide background information about the problem, its significance, and potential solutions.

- Step 4: Brainstorming and Idea Generation

(20 minutes)

- Each team brainstorms and generates ideas for their solution. Encourage innovative thinking, creative solutions, and consideration of sustainable practices.

- Provide a range of sustainable materials for teams to use in their projects.

7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

- Step 5: Design and Creation

(60 minutes)

- Teams design and create their solutions using the provided materials and art supplies.

- Encourage teams to think about functionality, aesthetics, and sustainability in their designs.

- Step 6: Presentation Preparation

(15 minutes)

- Each team prepares a short presentation (5 minutes) to showcase their solution, explaining its purpose, sustainability features, and how it addresses the given challenge.

- Teams can create posters, prototypes, or any visual aids to support their presentations.

- Step 7: Solution Presentations

(20 minutes)

- Each team presents their solution to the rest of the group.

- After each presentation, allow a brief Q&A session for other teams to ask questions and provide feedback.

7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

Step 8: Reflection and Discussion

(15 minutes)

- Facilitate a group discussion about the various solutions presented.

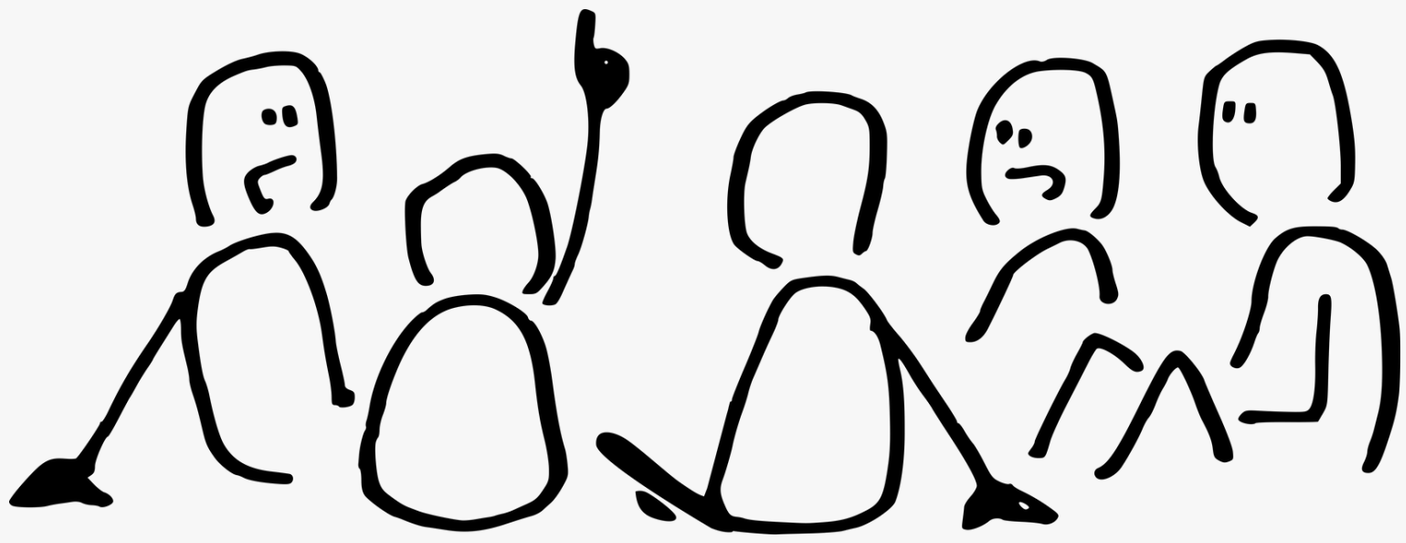
- Discuss the innovative approaches, sustainability aspects, and potential real-world applications of the solutions.

Step 9: Award and Recognition

(10 minutes)

- Acknowledge each team's efforts and creativity.

- Consider awarding prizes or certificates for categories like "Most Innovative Solution", "Best Sustainability Practices", or "Effective Presentation".



7. ACIVITY FOR NON-FORMAL LEARNING GROUP: GREEN SKILLS CHALLENGE

Step 10: Conclusion and Takeaways

(10 minutes)

- Summarize the key learnings from the activity, emphasizing the importance of green skills and creative problem-solving for environmental sustainability.

- Encourage participants to apply the skills and knowledge gained in their daily lives and communities.

Outcome:

The Green Skills Challenge provides participants with a practical and engaging experience in applying green skills to real-world environmental challenges. It promotes teamwork, creative thinking, and a deeper understanding of the impact of sustainable solutions. Participants leave with increased awareness of green practices and the motivation to continue their journey towards more sustainable living.

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GAMIFICATION, DIGITALIZATION AND PRACTICAL TOOLS FOR DEVELOPING CIRCULAR ECONOMY SKILLS

This handbook of principles, research and activities related to the circular economy was developed for youth, youth workers and businesses as part of the "GAMIFICATION DIGITALIZATION AND PRACTICAL TOOLS FOR DEVELOPING CIRCULAR ECONOMY SKILLS" Erasmus+ project, number 2022-1-EE01-KA220-YOU-000090946.

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