HUMAN RESOURCE DEVELOPMENT CENTRE

Co-funded by the Erasmus+ Programme of the European Union

REPORT

WITH GOOD PRACTICES IN THE FIELD OF SOCIAL ECOLOGY AND ENVIRONMENTAL PROTECTION

"Social ecology - a model for sustainable European development in the 21st century",

Erasmus + Project [2020-2-BG01-KA205-079309]

BULGARIAN MEMORY FOUNDATION

ECOcenter

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ABSTRACT

The Report with Good Practices in the field of Social Ecology and Environmental protection is the first Intellectual Output within the framework of the Erasmus+ project: "Social ecology - a model for sustainable European development in the 21st century", [2020-2-BG01-KA205-079309], implemented by the Bulgarian Memory Foundation, Bulgaria – Project Coordinator, and the Association for Macedonian-Bulgarian Friendship, Republic of North Macedonia & Ecocenter Alapítvány, Hungary – Project Partners.

The main objective of the project is, through an interdisciplinary approach, to develop an innovative methodology for building socio-environmental and eco-entrepreneurial knowledge and skills, to be developed and tested with 15 youth workers and 60 young people (50% of them in disadvantaged position), *contributing to their socio-educational and personal development and active civic participation, and *becoming an educational resource with free access.

Specific project objectives are:

- Analysis and synthesis of good European practices on social ecology and revealing the horizontal nature of eco-challenges, linking them to the social component;
- Development of an innovative methodology for social ecology applicable in formal and non-formal education;
- Incorporating digital tools into non-formal education through the creation of an online platform (in accordance with the methodology) with activities and practical exercises for positive environmental impact, which will be an Open Educationa Resource;
- Testing the methodology among young people, youth workers, students, teachers & stakeholders, encouraging their involvement & civic participation;
- Improving the level of key competences & transversal skills of the participants in the project activities, incl. future-oriented skills, initiative and creativity;

- Development of eco-entrepreneurial mindset and skills;
- Development of civic & intercultural competences;
- Stimulating the connection between research & practice in the field of social ecology;
- Enhancing the international dimension of partner organizations' activities.

The project idea and thematic scope were determined on the basis of:

- ✓ the Von der Leyen Commission's strategic vision for the climate neutrality of Europe by 2050;
- ✓ the Paris Global Climate Agreement and the EU's leading role in it;
- ✓ the EU Youth Strategy 2019-2027;
- ✓ the Erasmus+ Programme KA2 objectives for modernizing education, training & youth work;
- ✓ the strategies for internationalization of the activities of the three project partners;
- ✓ the shared vision that the only way of dealing with environmental challenges is to rethink men's attitude to nature - with a strong personal commitment to this global cause: avoiding consumerism, pollution and waste of resources.

The report contains three chapters: Chapter I. Basic Concepts of Social Ecology, Chapter II. Environmental trends in Central and Eastern Europe, and Chapter III. Successful examples of sustainable business practices in all 27 Member States of the European Union.

The three project partners will use the key findings, statistical data and visualisations of this Report in the elaboration process of the Innovative Socio-ecological Methodology - the second Intellectual Output within the framework of the project.

CHAPTER I. BASIC CONCEPTS OF SOCIAL ECOLOGY

➢ Biodiversity and Social Ecology

Biodiversity means **the number, variety and variability of living organisms** and how these change from one location to another and over time. It is important in all ecosystems – both "natural" ones and those managed by humans. Biodiversity is also **the basis of many natural benefits provided by ecosystems** ("ecosystem services"), such as water recycling, soil retention, pollination of plants, regulation of climate, and pest control. The **World Economic Forum has recognized the loss of biodiversity and collapse of ecosystems as one of the top 10 threats facing the world, in terms of likelihood and impact.**

Biodiversity **encompasses the variety of ecosystems, habitats and species on which human beings are dependent. It also has social and economic value.** The Economy depends on Biodiversity as half of global GDP or EUR 40 trillion depends directly on nature.

Biodiversity is people's lives support system and their greatest ally in solving today's major challenges: climate change, health issues, and food and water security. Biodiversity in the EU is in a continuous, strong decline. If people take care of nature, nature will take care of them.

In this regard the **EU Biodiversity Strategy** aims t**o preserve and restore European ecosystems through a series of commitments to be fulfilled by 2030.** It is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. This strategy, endorsed by the EU Council, lays the foundation for the EU's contribution to the post-2020 global goals on biodiversity to be agreed at the UN biodiversity conference COP15 in China in 2021.

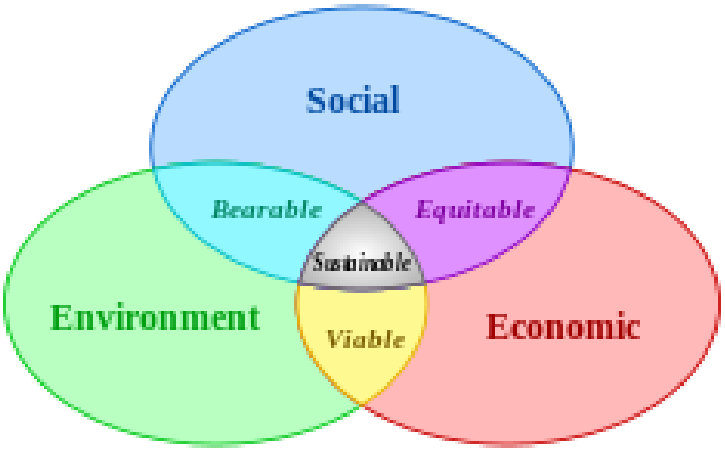
This is Europe's opportunity to lead the way and help the world to adopt a robust global framework to halt biodiversity loss. The Strategy outlines what the EU aims to achieve

and is ready to commit to: *Overarching long-term goals for biodiversity ensuring that by 2050 all of the world's ecosystems are restored, resilient, and adequately protected; *Ambitious global 2030 targets in line with the EU commitments proposed in the new Biodiversity Strategy; *Improved means of implementation in areas such as finance, capacity, research, know-how and technology; *A far stronger implementation, monitoring and review process; *A fair and equitable share of the benefits from the use of genetic resources linked to biodiversity and a principle of equality.

The unsustainable human activities have brought the biodiversity under threat: *the global population of wild species has fallen by 60 % over the last 40 years; *around 75% of the Earth's land and 40% of its marine environments have been drastically changed; *unsustainable use of land and sea, overexploitation of natural resources, climate change, pollution and invasive alien species play the biggest role in biodiversity loss; *damaged ecosystems are more fragile, making our societies more vulnerable to extreme events and new diseases. Humans impact the physical environment in many ways: overpopulation, pollution, burning fossil fuels, and deforestation. Changes like these have triggered climate change, soil erosion, poor air quality, and undrinkable water.

In this regard, **Social Ecology has an important role to play** by helping people, especially the young ones to be part of the solution, not of the problems related to climate crisis. The **green and innovative mindset** is an established set of attitudes and/or beliefs about going green or becoming more eco-friendly. Furthermore, adopting a green mindset means you are committed to making decisions that lead to an eco-friendly lifestyle. In addition, **Social Ecology contributes to the different sectors' transformation in a way to be taken more eco-friendly and responsible decisions, considering the human fingerprint in global warming**. For example agriculture is the largest contributor to biodiversity loss. Nevertheless it could be part of the solution through regenerative practices designed to reduce carbon in the atmosphere and restore the soil that gives our planet life.

➢ The Social Ecological Model



The Integrative conceptual model below illustrates the dynamic interrelation between ecosystems (1), their benefits to people (2), well-being (3), and people's values and actions (4–5) that affect the condition of ecosystems. On the right hand side (2), three main mechanisms by which benefits from ecosystems are derived make up a 'benefit basket' and contribute to ecosystem-supported constituents of well-being. Three key components of the benefit basket are highlighted: direct use, exchange for money and experience. In reality they are not distinct but interacting and interdependent. Illustrated on the left hand side, is how the well-being derived from these benefits, and people's perception thereof, influence individual and collective attitudes and values towards nature (4), and ultimately the behaviours and actions (5) taken in relation to ecosystems to maintain or enhance benefit. The scattered indications of the benefit basket components illustrate that ecosystem-derived benefits become part of a broader mix of well-being factors that influence values and action. Agency and institutions (red circles) on the right side of the loop refer to factors that mediate the benefits from ecosystems, such as allocation of, and access to resources (which can be restricted by gender, class, race and historical inequities), as well as capacity and willingness to acquire the benefits. On the left hand side, agency and institutions relate to what actions are possible and for whom.

Source: Cambridge.org
Illustration by J. Lokrantz/Azote.

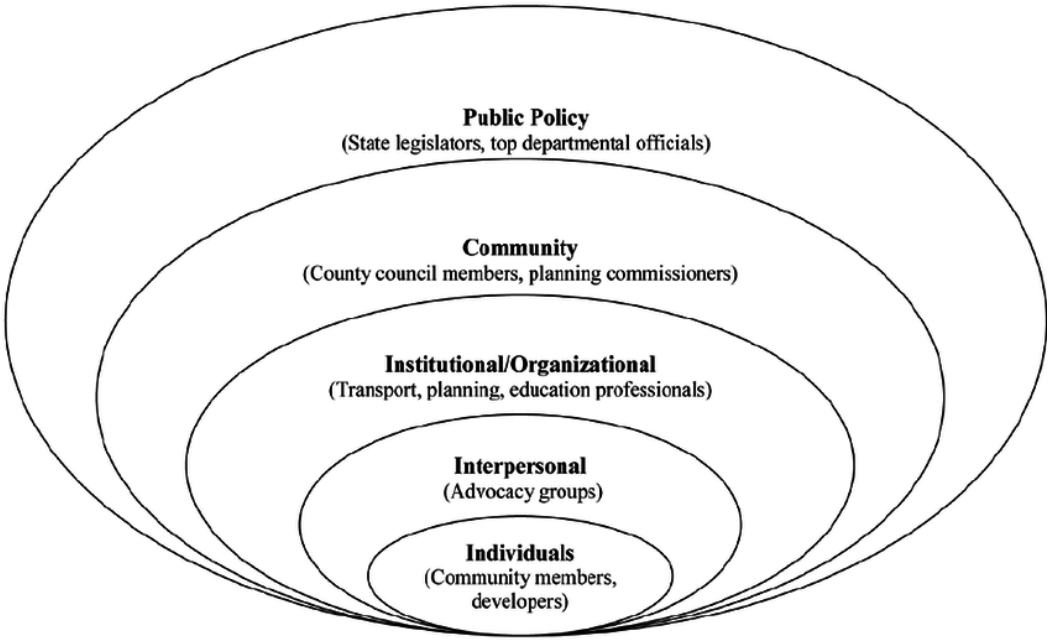
The direct interactions between people and nature are critically important in many ways, with growing attention particularly on their impacts on human health and wellbeing (both positive and negative), on people's attitudes and behaviour towards nature, and on the benefits and hazards to wildlife. A growing evidence base is accelerating the understanding of different forms that these direct human–nature interactions take, novel analyses are revealing the importance of the opportunity and orientation of individual people as key drivers of these interactions, and methodological developments are increasingly making apparent their spatial, temporal and socio-economic dynamics. There are several key challenges, including the need to characterize individual people's nature interactions through their life course, to determine in a comparable fashion how these interactions vary across much more diverse geographical, cultural and socio-economic

contexts that have been explored to date, and to quantify how the relative contributions of people's opportunity and orientation vary in shaping their nature interactions (Masashi Soga and Kevin J. Gaston. The ecology of human–nature interactions, 2020).

Urgent environmental issues are testing the limits of current management approaches and pushing demand for innovative approaches that integrate across traditional disciplinary boundaries. Practitioners, scholars, and policy-makers alike call for increased integration of natural and social sciences to develop new approaches that address the range of ecological and societal impacts of modern environmental issues. In view of the above, the Social-Ecological System has been elaborated (Arika Virapongse, Samantha Brooks, Elizabeth Covelli Metcalf, Morgan Zedalis, Jim Gosz, Andrew Kliskey, Lilian Alessa. A social-ecological systems approach for environmental management, 2016). It is aimed at integrating, on the one hand, social processes and human components, and, on the other, ecological processes and ecological components.

Social-ecological system
Source: ScienceDirect.com

The Social Ecological Model shows that it is not sufficient to simply educate and encourage individuals for behavior change at the population level (eg, community workshops with residents). Rather, it is more effective to make changes from the top down, where policy changes can have the broadest impact. By focusing on multiple levels, simultaneous changes can lead to system-wide changes supporting environmental improvements.



Social Ecological Model framework
Source: Researchgate.net

- **Initiatives within the EU Green Deal**

Making nature healthy again **is key to people's physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks.**

For this reason the **EU Green Deal** includes a number of initiatives to halt biodiversity loss such as the:

- **EU Biodiversity strategy** to protect and restore nature, which aims to:

- **Farm to Fork Strategy** to move to a more sustainable food system.

The Farm to Fork Strategy is at the heart of the European Green Deal aiming to make food systems fair, healthy and environmentally-friendly, which means to: *have a neutral or positive environmental impact; *help to mitigate climate change and adapt to its impacts; *reverse the loss of biodiversity; *ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food; *preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.

- **Zero Pollution Action Plan** to reduce the pollution of our air, water and soil.

The pollution is the **largest environmental cause of multiple mental and physical diseases and of premature deaths**, especially among children, people with certain medical conditions and the elderly. In addition to **affecting people's health, pollution is one of the main reasons for** **liversity**. It reduces the ability of ecosystems to provide services such stration and decontamination.

- **EU Forest Strategy** to ensure healthy, diverse and resilient EU forests. It aims to cover the whole forest cycle and promote the many services that forests provide. The strategy will also be aimed at ensuring healthy and resilient forests that contribute significantly to biodiversity and climate goals, reduce and respond to natural disasters, secure livelihoods and support a circular bio economy and rural communities.

The **European Green Deal is about improving the well-being of people.** The EU targets to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. This objective is **at the heart of the European Green Deal** and in line with the EU's commitment to global climate action under the Paris Agreement.

The Green Deal includes measures such as:

- investing in environmentally-friendly technologies;
- supporting innovation;
- helping the development of cleaner forms of transport;
- decarbonising the energy sector;
- ensuring buildings become more energy efficient;
- working internationally to improve standards around the world.

Making Europe by 2050 digitally positive and climate-neutral, as well as **protecting the natural habitat will be good for people, planet and economy**. At the same time no one will be left behind.

Recognizing the need to go green is one thing; but going green is a totally different matter. Being environmentally responsible in our daily activities is the act of living with the intent to not harm the environment and to prevent ecosystems by actual non-eco-friendly practices. It is about changing the way we consume, use and reuse products and resources, changing our lifestyle.

- **Social Ecology and Education**

The social ecology and the education have a key role to play in forming green mindset and behavior among youth. **Environmental education has a real added value to the development of:** *imagination, creativity and enthusiasm of young people; *critical and creative thinking skills; *tolerance of different points of view; *sensitivity, appreciation, and respect for the environment; *healthy lifestyles; understanding how people's decisions and actions affect the environment, by building knowledge and skills necessary to address: *complex environmental challenges, as well as the needed actions to keep the environment healthy and sustainable for the future; *active learning, citizenship, and young leadership.

In this regard, the **Education for Climate coalition** is a timely initiative which aims at engaging **Europe's education community to achieve climate neutrality**. It seeks to co-create a participatory education community to support the changes needed **for a climate neutral, sustainably developed Union by 2050. The initiative focuses on:**

- **promoting sustainability awareness and climate ambassadorship;**
- **reducing carbon footprints;**
- **air quality;**

- **waste, pollution, recycling and the protection of the environment;**
- **climate change and energy efficiency.**

The Education for Climate coalition was launched in December 2020 to mobilise the education and training community to work together towards a climate neutral and sustainable European society through concrete actions. The project partners became part of the community.

➢ The European Climate Law

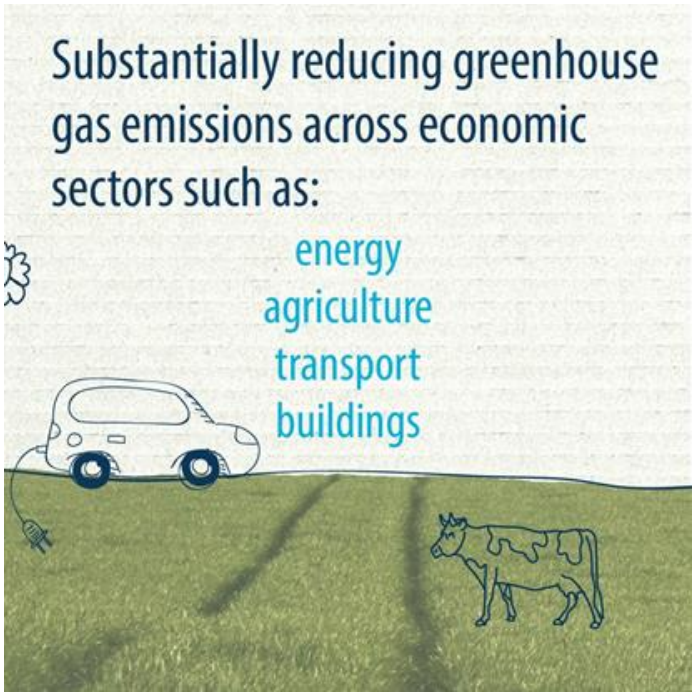
On June 28, 2021 the EU Council adopted the European Climate Law. With the new EU Climate Law, the EU is committed to:

- **reaching climate neutrality by 2050;**
- **reducing greenhouse gas emission by at least 55% by 2030;**

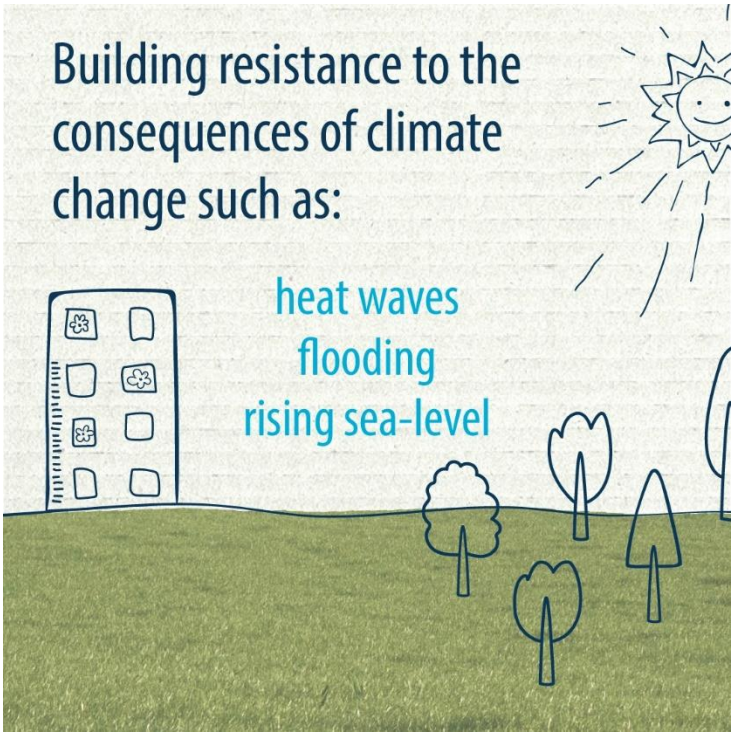
- **increasing carbon sinks.**

According to the Council of the EU, a climate neutral EU by 2050, means:

- Substantially reducing greenhouse gas emissions across economic sectors, such as energy, agriculture, transport and buildings.



- Building resistance to the consequences of climate change such as: heat waves. Flooding and rising sea level.



- Encouraging and supporting others in fighting and adapting to climate change

Becoming 'climate neutral' means **reducing greenhouse gas emissions as much as possible, but it also means compensating for any remaining emissions**. This is how a net-zero emissions balance can be achieved.

A net-zero emissions balance is achieved when the amount of greenhouse gas released into the atmosphere is neutralised. This can be done by carbon sequestration, i.e. by removing carbon from the atmosphere, or through offsetting measures, which typically involve supporting climate-oriented projects.

Emitting less

All economic sectors can and must contribute to reducing greenhouse gas emissions. For example, industry needs to continue to modernise and pollute less. The aviation and maritime sectors, which are among the fastest-growing sources of greenhouse gas emissions, should become more energy efficient and shift towards alternative, greener fuels.

To reduce emissions from energy-intensive industries, the EU has set up an emissions trading system. The EU ETS is a market for carbon permits establishing the amount of emissions which power stations, industrial plants and airlines can release into the atmosphere. Permit levels are gradually reduced to cut the emissions of the participating industries.

We, as consumers, can also reduce our environmental footprint through our behaviour and choices.

Absorbing more

Despite reductions, some emissions will be unavoidable. So how can the remaining emissions be neutralised?

The oceans and soil both absorb carbon dioxide from the atmosphere, but forests represent the most effective way to make a difference.

Natural ecosystems which have the ability to absorb more carbon than they emit are called 'carbon sinks'. Actions to protect oceans, soil and forests are vital for absorbing emissions.

In 2008, EU leaders agreed that by 2020 the EU would cut its greenhouse gas emissions by 20% from the 1990 level. This goal was achieved three years ahead of schedule. In 2014, leaders endorsed the objective of cutting greenhouse gas emissions by at least 40% by 2030. In December 2020, the European Council agreed to step up the EU's ambition. EU leaders endorsed a binding EU target of a net domestic reduction of at least 55% in greenhouse gas emissions by 2030 compared to 1990.

The EU aims to spend 30% of its overall budget for 2021-2027 on tackling climate change and its effects

What is truly new about the EU's climate-neutrality goal and the Green Deal is that they require **action from all sectors of the economy and integrate climate and environmental considerations across all EU policy areas.** This is known as climate mainstreaming. The energy sector in particular is one which requires substantial transformation.

➢ The Just Transition Mechanism

The EU has introduced a **'Just Transition Mechanism'** to provide support for regions which will require greater investment to achieve the goals. The mechanism targets three areas:

- People and communities most vulnerable to the transition: facilitate employment opportunities and offer reskilling while improving energy-efficient housing and fighting energy poverty.

- Companies and sectors in carbon-intensive industries: help make the transition to low-carbon technology attractive to investment and provide loans and financial support, while also investing in research and innovation and in the creation of new firms.
- Member states or regions which have a high dependence on fossil fuels: invest in new green jobs, sustainable public transport, renewable energy, digital connectivity and clean energy infrastructure.

The EU has more than 450 million inhabitants. But climate change affects every single one of the 7.5 billion people living on our planet. And it makes no distinction based on borders. This is why the EU is determined to use its position to lead global action on climate.

By becoming climate neutral, the EU will be the first continent to reach a net-zero emissions balance. Our ambitious goals will be a model for others.

The EU has worked together with global partners to encourage and strengthen international engagement on climate. It has been key in negotiating and upholding the landmark international agreements on the environment – the UN Climate Convention, the Kyoto Protocol and the Paris Agreement – and it continues to support the goals and aspirations represented by those agreements.

Energy production and use is currently responsible for 75% of EU greenhouse gas emissions. It is a part of every aspect of our lives, from our walls and windows and our electrical appliances to the way we travel and methods of production.

For the EU economy, it is important that the climate-neutrality objective is achieved in a way that preserves the EU's competitiveness. This includes developing effective measures to shield it from the competitive disadvantage compared to other countries which do not have such ambitious climate policies.

For this purpose, the Commission intends to propose a WTO-compatible carbon border adjustment mechanism as part of the European Green Deal, which, when submitted, will be discussed by EU member states within the Council.

Shifting towards a greener economy is a major element of the transition to a net-zero emissions society, and it requires action on all fronts. For example:

- **our buildings should be renovated** to make them more energy efficient
- **the ways we travel** – by road, air and sea – need to become drastically more environmentally friendly
- **our food production**, which too often relies on pesticides and fertilisers that are damaging for air, soil, water and wildlife, needs to become more environmentally friendly
- **our carbon sinks**, such as forests, are declining and the trend should be reversed, including by managing forests in a more sustainable way investments should increasingly help sustainable and climate-friendly projects to develop
- **the way we produce goods must adapt to a circular-economy model** where, for example, textiles, construction materials and electronics are recycled or re-used in order to decrease the use of primary raw materials

It is vital that EU citizens and stakeholders play a role and have a say in making the transition to climate neutrality a reality. This is why the EU Green Deal includes a European Climate Pact. The pact aims to foster engagement and co-operation between individuals, communities, and organisations, which will encourage people to commit to concrete actions to reduce their own greenhouse gas emissions. [Source: Council of the EU: 5 facts about the EU's goal of climate neutrality.]

➢ Climate Emergency

Climate emergency is Oxford Dictionary's 2019 Word of the Year. It is defined by the Oxford dictionary as a situation in which urgent action is required to reduce or halt climate change and avoid potentially irreversible environmental damage resulting from it. According to the Cambridge Dictionary, serious and urgent problems that are being caused or likely to be caused by changes in the world's weather, in particular the world getting warmer as a result of human activity increasing the level of carbon dioxide in the atmosphere.

Human-made climate change has been recognized as a serious threat to the global ecosystem, as well as human life and society, by the scientific community and by most global political institutions, including the UN. Why is it an emergency? Because the effects we already experience are life threatening. Partially they have nothing to do with weather events anymore. There is a rise in droughts, dust storms, floods, heat waves, tropical storms, tornadoes, sea level, wildfires, glacial meltdown, refugees, shrinking lakes, desertification, ocean acidification, extinction, tropical diseases, food poisoning and shortages.

The global system is very complex, however we know there are several tipping points that are one-way-streets. The melting of the Greenland Icesheet is one of those. We cannot allow more tipping points to be activated, as the effects will cause unforseen changes, that can have dramatic effects.

- **The European Citizens' Initiative (ECI)**

(https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02011R0211-20150728&from=EN)

In a nutshell, it is a petition to directly address the European Commission, allowing to push for solutions to topics the Commission has a say on. An ECI is the most direct way into the European politics.

It is different than a petition as, if we manage to collect the 1 million signatures, the European Commission will be forced to take position and publish a communication and the European parliament will hold a public hearing on the topics. Furthermore, it is not only symbolic because it can become a law on a European wide scale.

The four objectives for the ECI are:

1) The EU shall adjust its goals under the Paris Agreement to an 80% reduction of greenhouse gas emissions by 2030, to reach net-0 by 2035 and adjust European climate legislation accordingly.

The first objectives is asking the European Union to change its Paris Agreement goals to an 80% reduction of greenhouse gas emissions by 2030 and net-0 by 2035 for all member states. The European climate legislation needs be adjusted accordingly.

Reaching net-0 by 2050 as proposed by new head of commission Ursula von der Leyen is not ambitious enough to stay beneath 1.5°C. This is also backed by numerous studies and scientists for future.

2) An EU Border Carbon Adjustment shall be implemented.

The second objective aims at a charge, called Border Carbon Adjustment (BCA) to be put in place. This means that imported products will be charged according to the amount of greenhouse gasses emitted during the production. That way, a European industry shifting towards a more sustainable production will still be on equal basis with countries who do not respect the 1.5° goal.

3) No free trade treaty shall be signed with partner countries that do not follow a 1.5° compatible pathway according to Climate Action Tracker.

The third objective is linked to the second one, asking the member states of the European Union not to sign any free trade treaties with countries who are not on a 1.5° compatible pathway. To decide whether a country is on a 1.5° compatible pathway or not, a neutral entity is needed. The Action Climate Tracker has appeared to be an adequate choice, however, suggestions of other entities or even new EU-bodies can be made.

4) The EU shall create free educational materials' for all member curricula about the effects of climate change.

The fourth objective concerns education. We are asking for free educational material, available to every citizen and adjustable into the school programs of every country of the European Union. It needs to teach not only about the effects but also the causes and solutions to climate change.

- **10 tips on how to be less wasteful:**

Think before you buy!

1. Is the product recycled or recyclable? This will reduce the environmental impact as a new product has not had to be made from raw material.

2. Avoid packaging waste: food packaged into separate compartments or presented as a mini-kit is not only more expensive but also produces more waste.

3. Buy the amount of fresh food you will use and enjoy your leftovers by turning them into exciting new dishes.

4. Use reusable and high-quality batteries which last longer and produce less waste. Spent batteries in the household rubbish contain harmful chemicals that can leak into the earth and water. Collect them separately! Your local authorities, supermarkets or electronic retailers can dispose of them safely.

5. Reusable products are better than disposable products such as paper napkins, plastic razors and plastic cups which use more resources and energy than their reusable counterparts and quickly end up in landfill.

Think before you throw!

6. Old clothing has all sorts of innovative uses. As well as raising money for charity, clothing can also be shredded and turned into packaging, insulation or raw material for textiles.

7. Paint and other waste can be taken to a specialised recycling centre. If you do not have access to one then let the paint dry, add sawdust or cat litter, and place it in the dustbin.

8. Non-meat kitchen scraps can become fertile soil. Build a compost bin either in your garden or even a small one in your house. A good 'recipe' is to layer carbon materials (dry leaves, shredded paper, dead plants) with nitrogen materials (green weeds, grass, non-meat kitchen scraps) in a 3 to 1 ratio.

9. Recyclable glass can be taken to your local bottle bank, but do not leave it in your car until your next trip as the added weight will increase both fuel use and emissions.

10. If you cannot give away or sell your old furniture, recycle it. Check if your local authority collects furniture for recycling or perhaps there are charities in your area that will be happy to take it off your hands. [Source: Being wise with waste: the EU's approach to waste management, European commission]

- **The top 8 ways to save energy**

1. Adjust your day-to-day behaviours

To reduce energy consumption in your home, you do not necessarily need to go out and purchase energy efficient products. Energy conservation can be as simple as turning off lights or appliances when you do not need them.

You can also use energy-intensive appliances less by performing household tasks manually, such as hang-drying your clothes instead of putting them in the dryer, or washing dishes by hand.

The behaviour adjustments that have the highest potential for utility savings are turning down the heat on your thermostat in the winter and using your air conditioner less in the summer. Heating and cooling costs constitute nearly half of an average home's utility bills, so these reductions in the intensity and frequency of heating and cooling offer the greatest savings.

2. Replace your light bulbs

Traditional incandescent light bulbs consume an excessive amount of electricity and must be replaced more often than their energy efficient alternatives.

Halogen incandescent bulbs, compact fluorescent lights (CFLs), and light-emitting diode bulbs (LEDs) use anywhere from 25-80 percent less electricity and last 3 to 25 times longer than traditional bulbs.

3. Use smart power strips

The electricity used by electronics when they are turned off or in standby mode, are a major source of energy waste. In fact, it is estimated that 75% of the energy used to power household electronics is consumed when they are switched off, which can cost you up to $200 per year. Smart power strips, also known as advanced power strips, eliminate the problem.

4. Install a programmable or smart thermostat

A programmable thermostat can be set to automatically turn off or reduce heating and cooling during the times when you are asleep or away.

5. Reduce your water heating expenses

Water heating is a major contributor to your total energy consumption. Other than purchasing an energy efficient water heater, there are three methods of reducing your water heating expenses: you can simply use less hot water, turn down the thermostat on your water heater, or insulate your water heater and the first six feet of hot and cold water pipes.

6. Install energy efficient windows

Windows are significant source of energy waste - they can add up to 10-25% of your total heating bill. To prevent heat loss through your windows, you can replace single-pane windows with double-pane products instead.

7. Insulate your home

Insulation plays a key role in lowering your utility bills through retaining heat during the winter and keeping heat out of your home during the summer.

Energy conservation is important and beneficial for many reasons. You can:

*save money,

*increase your property value, and

*protect the environment all through simple energy-saving measures. [Source: Energy usage; Smarter energy decisions]

- **Best practices in waste prevention**

Best practices in waste prevention

Successful waste prevention strategies are operating across the EU helping to reduce Europe's environmental impact and improve its resource efficiency. Below are some examples of the variety of measures at work across Europe.

National Industrial Symbiosis Programme (UK)

The National Industrial Symbiosis Programme has created a market which puts together those producing waste with those who can use it, and are willing to pay the most for it. By turning pastry waste into electricity, converting fatty acids into biodiesel, and so on, they estimate that the whole programme has boosted the UK economy by as much as €3 billion.

Eco-point initiative (Italy)

Dry food sold in bulk through dispensers at Italian supermarkets reduces packaging and allows customers to buy the amount they want. This is not only good for the environment but saves shoppers money – between 10 and 70% compared to the price of packaged goods. The 30 Eco-points in Italy and Switzerland prevent the use of an estimated 1 million packages per year.

Vienna waste prevention programme (Austria)

The focus is on spending public money on green products and services (green public procurement), helping small firms become more eco-efficient, the promotion of re-use and repair of goods, and awareness-raising for cultural services. As a result, citizens can buy and sell used appliances through an online flea market, preventing around 1,000 tonnes of waste annually. Around 400 tonnes of appliances are repaired annually at local repair and service centres, while eco-efficiency advice has helped save businesses around €34 million since 1998 and prevented over 100,000 tonnes of waste.

Menu Dose Certa (Portugal)

The pioneering Menu Dose Certa or Right-Sized Menu project aims to support restaurants in creating menus that generate less food waste. Porto's waste management organisation LIPOR aims to reduce food waste by 48.5 kilos per year per restaurant client by 2011 by promoting a balanced diet raising awareness of food waste. That means changing attitudes and behaviour to eating and encouraging restaurants to cut portion sizes and serve better-balanced meals.

Stop-Pub (France)

French households receive an average of 15 kg of junk mail each year, adding up to almost a million tonnes of waste. Operation 'Stop Pub' was launched as part of France's national waste prevention plan. The Ministry of Energy and Environment produced a postbox sticker expressing the resident's wish not to receive unaddressed mail. The stickers have led to a significant reduction in the amount of junk mail in household waste.

Kringloop Re-use Centres (Belgium)

Kringloop Re-use Centres extend the useful life of discarded clothes, appliances, kitchenware, furniture, books records and bicycles. Almost 50,000 tonnes of discarded items were collected in 2008, a 10% increase on 2007. Launched in 1992, the long-term aim is to achieve an annual re-use volume of 5 kg per inhabitant.

Details of good waste practices across the EU and beyond are available at: http://ec.europa.eu/environment/waste/prevention/practices.htm

Being wise with waste: the EU's approach to waste management

➢ Ecopreneurship

Ecopreneurship is providing new opportunities for making new business definitions and establishing new businesses based on green principles.

Ethical aspects of ecopreneurship are of key importance. Because, as the concept's popularity increases ecopreneurship is facing an increasing ethical challenge that is a threat to transform the concept into a greenwashing practice.

The overlap between entrepreneurship and sustainability has become a key research area. Part of this trend is the emergence of ecopreneurial businesses. These businesses are pioneers in using innovation to achieve sustainable growth by exploiting market opportunities.

The primary conclusion is that there is a need for collective collaboration between ecopreneurs, consumers, and producers to achieve long-term sustainability

➢ Social Circular Economy

The *social circular economy* combines the two archetypes described above i.e. where organisations operate commercially within the circular economy and also have a social mission.

A potential example for social circular economy is transforming corporate uniform 'waste' to bags made by economically-disadvantaged people and providing them with a decent income in good working conditions.

Social circular economy posits that there are ways to enhance personal wellbeing whilst improving society and environment. It is a principles-based approach, marrying circular economy and social enterprise together to 'fill in the gaps' potentially created when they operate on a standalone basis.

In essence, social circular economy is an operating model to ensure that the economy does not harm society or environment and in fact benefits both society and environment

the more of it that takes place. [Social circular economy opportunities for people, planet and profit]

- **Main challenges related to the negative impact of human activities on the environment**

Today, over 95% of the world's population does not understand the long term consequences of the negative impact humans have on environment. The future generations are at risk, related to global depletion of natural resources and progressive loss of resilience of the planet's ecosystems. As a result of anthropogenic activity, there have been profound irreversible changes in the biosphere, leading to disturbance of the natural balance, deterioration of human health, degradation of flora and fauna, etc. The number of extinct animal species is estimated at hundreds. Fertile lands and forests have been turned into deserts.

It was at the beginning of the 20th century that changes in the chemical parameters of the environment were registered for the first time - above all an increase in CO2 and other greenhouse gases in the atmosphere. Since the 1950s, environmental pollution has affected the human health: the number of congenital anomalies, cardiovascular, endocrine and oncological diseases has increased. The spread of immunodeficiency and immunoaggressive diseases is dangerous.

According to statistics, at the end of the XXI century the number of inhabitants of the planet will reach 10-12 billion, and this is a global problem, given that for a period of 25 years (1970-1995) humanity has destroyed 1/3 of natural resources.

To date, according to UN data, 80% of the world's forests have been destroyed. By the 1980s, forests had successfully absorbed excess CO2. Today this is impossible and therefore the amount of excess CO2 is large. This leads to earlier development of plants in the spring, i.e. to biological processes, when there is no photosynthesis, and this is associated with the depletion of the accumulated reserve of substances due to which

trees actively breathe - CO2 is released into the atmosphere but no O2 is produced. This situation is repeated in the fall, but in reverse order. The leaves fall off, but the high temperature keeps the biological processes active without photosynthesis.

It was found that when the average annual temperature increased by 1 degree, the tundra retreated 70-120 km to the north and the huge amount of natural carbon preserved in it entered the atmosphere.

The largest island on earth - Greenland in recent years is losing more and more of its ice cover. According to experts, in the last 10 years the temperature in winter has risen by 5 degrees, and in spring and summer - by about 3 degrees. Every year, Greenland loses between 100-150 km3 of its ice. It will take many years, maybe centuries, for the glaciers to completely melt, but when that happens, the world's ocean level will rise by more than 7 meters and hundreds of coastal cities - including New York, Venice, St. Petersburg - will fall under water. The warming will affect the entire planet and hhole countries will have to be evacuated. The Netherlands and Bangladesh will go completely under water. The melting of Greenland's glaciers is cooling the Gulf Stream, and this is associated with gigantic changes in the circulation of the atmosphere, resulting in unusual droughts and floods. According to some estimates, 11 hectares of forests are being cut down every minute on a global scale, which means that by 2030 the world's rainforests will be completely destroyed.

Acid rains fall increasingly often in the Northern Hemisphere, with juniper forests being the most affected. Two-thirds of the world's arable land has been destroyed and pastures have been eroded. 80% of the arable land consists of low fertile soils. In the last 50 years alone, humanity has lost 1/5 of the world's upper fertile soil layer, 1/5 of all agricultural lands and forests. This leads to the accumulation of pollutants, to an increase in the acidity and salinity of soils, and to a decrease in fertility. Due to human activities, such as intensive agriculture and deforestation, 11% of all land vegetation has almost completely lost its biological productivity.

While European environment and climate policies have helped to improve the environment over recent decades, Europe is not making enough progress and the outlook for the environment in the coming decade is not positive, according to the 'European environment — state and outlook 2020 (SOER 2020)' report.

After four billion years of evolution based on the technology of DNA and proteins, one species started to use other technologies in order to gain ecological advantages (survival, proliferation) against the limitations of the physical environment, against other species and to gain military power against other human populations. This resulted in an accelerated expansion of human population, domesticated species and some other species (living in symbiosis with them or their parasites) and of technological systems. These elements form a system (which can be called the 'technosphere'), which is usually not restricted or controlled by the much more complex system of the biosphere. The development and behaviour of the technosphere is dominated by the interests of technology, because this part of the technosphere provides the power to rule over the biosphere. In the 21st century, with global climate emergency and progressive loss of biodiversity, the social-ecological model aims at using the technosphere not to rule over but rather to protect the biosphere.

CHAPTER II. ENVIRONMENTAL TRENDS IN CENTRAL AND EASTERN EUROPE

➢ Historical Background of the European Socio-Ecological Model

Social conflicts during the last century were the first serious problem of the European model. Two main types of solutions were suggested: the evolutionary (social democratic) and the revolutionary way of changing the European model. However, both types were based on the continuous development of technology and further economic growth.

Two kinds of the European model ruled the world after the Second World War: the Western (usually described as a parliamentarian democracy and market economy) and the Eastern model (usually described as a totalitarian system and centrally planned economy). The evolution of technology in the Eastern model was slowed down by the economically unreasonable operation of the totalitarian political systems based on state property, central planning and central redistribution. This resulted in the development and extension of industrial and agricultural systems consuming more resources per production unit and producing lower quality products than the technologies developed within the much more flexible Western model, which produced more products of higher quality. However, the competition of these systems forced them both to grow. The main fields of the competition were the armaments and the world economic market.

Expansion of the technosphere caused deterioration of the environment within the central units of both systems as well as in the Third World, which was controlled by them and provided resources to supply the high demand of the core areas. These impacts are directly related to the purposes of the technologies, that is, to gain advantages over others.

The responses of the systems were very diverse. The Western model allowed the increase of public concerns and the organisation of grassroots activities to pressurise states to accept certain control of technology in order to protect the environment. (Social

movements similarly had achieved the introduction of social policies.) Features of the Eastern model did not allow such a response, which resulted in an increasing environmental impact, especially on human health.

The development of technological monopolies (mining, energy, metallurgy, machine industry, military-industry, etc.) in the Central and Eastern European economies has been directed by oligarchies which have gained extremely strong political influence. These groups, in cooperation with state administration, controlled almost all parts of society. In spite of their inability to operate the economy effectively, they were able to keep their power for a long time. Thus, the periodically emerging economic and political crises were solved without changes in the system itself, but led to increased exploitation of resources and a deteriorating environment. As a consequence, the Eastern model achieved the limits of resources earlier than the Western model, which was also more effective in controlling resources in the Third World.

The weakening of the political power of the Eastern model recently led to the development of environmental movements. Public opinion in Eastern Europe has linked the crisis of the environment with the political system. This view created among the public the hope that a change of the political system would solve ecological problems almost automatically. People in Central and Eastern Europe became fascinated by the economic and military success of countries of the Western model. Improving air quality in London, improving the water quality of the Rhine and the use of unleaded petrol and catalytic converters suggest that basic environmental problems can be solved radically by market economies.

Dramatic political changes in 1989 terminated one-party political systems. The totalitarian political model lost the armaments race and economic competition in the world market, due to the low efficiency of technologies developed within this model. The younger generation of the political elite realised the unavoidable defeat just in time, which allowed for the basically peaceful start of the transition. At the start of this process, environmental movements seemed to play an important role in the political scene. According to a

Western observer, 'One of the distinguishing features of the Eastern European revolutions of 1989 is their strong environmental movement in the pre-revolution days, which served as a rallying point from which broader demands for political change emerged. Initially perceived as relatively benign by the region's Communist governments, environmental movements soon acquired unstoppable momentum'. It was assumed that newly formed political parties, unanimously aimed towards the market economy based on privatisation, would incorporate ecological principles into their programmes.

This assumption is reflected by the environmental programmes of new governments. A brief overview of such programmes of the Hungarian, Polish and Czech governments illustrates the environmental concepts of new political forces in Central and Eastern Europe. There was a strong environmental movement in Hungary during the final years of the totalitarian system.

The most important principles which can be deduced from the environmental programme of Hungary in its transition to market economy are:

- development and operation of the economy in harmony with the environment;
- environment-friendly change of the production structure;
- establishment of the market economy;
- improvement of the 'owner's attitude';
- change of priorities with an increase in environmental consciousness;
- the right to a clean and healthy environment;
- the general use of environmental impact assessment;
- environmentally oriented credit, tax and customs policy;
- cooperation with the environmental institutions of the European Community;
- the separation of the issue of environment from the direct interests of production.

The programme of the Polish environmental ministry, mentions that the new environmental policy departs from what was once a narrow understanding of environmental protection to a broader goal of sustainable development. The concept of

sustainable development is defined by the programme as 'the attainment of a balance between social, economic, technical and environmental conditions in the process of development'. The basic principles of this policy are listed as follows:

- control at the source (choice of preventive measures);
- compliance with the law (no opportunities for circumvention of the law for reasons such as circumstances outside one's control, public interest or impossibility);
- the principle of common good;
- an economisation principle (taking the greatest possible advantage of market mechanisms);
- the polluter pays principle;
- the principle of regionalisation;
- the principle of common solution (for example, international cooperation);
- the principle of staging (selection of priorities for each particular stage of a long-term policy).

The 'Rainbow Programme' of the Ministry of Environment of the Czech Republic, also gives a list of principles and basic approaches:

- the concept of sustainable development (in contrast to the various economic strategies aimed at a high consumption of natural resources);
- economic, legal and social conditions facilitating an ecologically friendly lifestyle in various forms;
- the distribution of information concerning ecologically friendly processes in the production sector and among consumers;
- renewal of the people's contact with nature, especially in urban zones;
- the principle of real effect (trying to restrict the growth of disorderliness of the systems in the planning of all activities);
- the principle of reasonable consumption;
- the precautionary principle;

- the principle of consideration for other people;
- the principle of respect for life;
- the principle of citizenship of the planet Earth.

➢ Central and Eastern European environmental challenges

It seems that the Central European governments are looking for effective environmental policies by the application of the Western economic model. The new concepts generally accept that the introduction of market mechanisms will also improve environmental conditions, and their undesirable impacts can be limited effectively by legislation and state control. Unfortunately, there are large gaps between the programmes and the real policies of the governments. General political difficulties are usually explained by the high costs of the political and economical transition and the resistance of old institutions. Deficiencies in the conditions for an effective environmental policy exist in many fields, such as environmental legislation and enforcement, economic mechanisms, environmental management, public participation, environmental research and education.

External determination plays an important role in the domestic affairs of Central and Eastern European countries. In the past, external determination resulted in the establishment of communist systems closely dependent from the USSR. After the breakdown of the Eastern block, the Central and Eastern European countries turned back to the 'European Common House'. This reproduces the decisive role of external determination, because these countries are not able to transform their economies and political systems without Western assistance.

In addition to the positive results, the possible impacts of Western assistance may be determined by negative factors, such as considering Central and Eastern Europe as a new market for technologies which have proved to be inefficient in the Western economies and/or dangerous for the environment.

From a global point of view, the adoption of the Western model of development does not necessarily mean that the Central and Eastern European region will automatically become an integrated part of the Western European core area of this model. These core areas (the highly industrialised countries) use most of the resources of the world and continue their economic growth, which means that the sustainability of the Western model involves the asymmetry of the global order. The ideology of continuing economic growth has been developed by the Brundtland Report as 'sustainable development'. Specific resource demands of the core areas determine a minimal level (and probably a certain pattern) of asymmetry. If the upgrading of Central and Eastern European countries changes these conditions too much, their membership of the central unit as full partners will certainly be ruled out. In this case, the region would operate as an outside territory under strong control, just like many countries of the Third World. In some of them there has been a pressure from Western companies to build power plants and "dirty" industries that cause ecological problems to their air, water and soil. Such actions may inhibit efforts to improve the domestic environmental politics of Central and Eastern European countries. This means that the successful implementation of their new environmental programmes depends essentially on the success of the transformation of the global order itself.

Political support for old, inefficient and environmentally unsound technologies in opening up the markets of the Central and Eastern European countries, thereby gaining advantages of low labour costs and poor environmental regulations, slows the transformation of the Western model itself. It will also contribute to the exploitation of global resources, delaying the necessary transition from a growing system to a homeostatic one. This means that, in the long term, Western societies also have an interest in an effective control of technology transfer. Support for the development of grassroots activities (the 'civil society') should have priority in order to create a balanced society. Taking into consideration the limits of resources and the space suitable for life, the technosphere in a sustainable global order should be homeostatic, as the biosphere.

The EU membership of the Central and Eastern European (CEE) Coutries has been a step in the right direction, putting ecological issues at a new supranational level.

Probably the most important factor behind the poor environmental policies is the weakness of the civil society and of grassroots activities. The pluralisation of politics did not put an end to the monopoly of politics as a whole within society. The development of grassroots activities is a slow process requiring not only instruments such as the right to information, the right to associate, the right to participate, but also capacities in the processing of information, organising activities, free time and free energy for voluntary work.

An essential step towards a better future for the region would be the change of the ruling paradigm. Instead of the passive adaptation of the Western model, another concept of the active selection and integration of the environmentally most advanced strategies and technologies is essential in fields such as energy, transport and agriculture. Priorities of governmental activities should be changed, the economy should be privatised as much as possible and the role of the state should be focused on social, cultural and environmental issues as the most important public affairs. Development of common strategies in energy, transport, trade and banking and the strengthening of transboundary regional cooperation at the level of grassroots movements and municipal governments are among the most important tasks.

- **Impact of political, institutional, and socioeconomic changes in the CEE region on its biodiversity**

It is well established that in current human-dominated world, environmental change is closely coupled with socioeconomic factors, and this is reflected in conceptual frameworks of important policies. Humans are adversely affecting biodiversity and climate change on a planetary scale. Anthropogenic transformation of ecosystems has been driven by rapid social and economic changes, manifested by direct drivers such as land use change and climate change. Central and Eastern Europe (CEE) has been a rapidly transitioning region

in terms of economic growth and political changes. Following the collapse of former Eastern Bloc and revolutions in several CEE countries after 1989, CEE countries have been undergoing political and economic transformation toward democracy and free market. Continuous accession to the European Union also brought in changes of political environment and ecosystem management possibilities and outcomes. Profound socioeconomic changes have influenced environmental condition and ecosystem management in this region, with changing pressures on biodiversity and ecosystem services. Environmental changes in Central and Eastern Europe have been closely linked especially to agricultural policy. For example, inorganic fertilizer use in several CEE countries dropped in a single year to 25% of its former level after the collapse of socialism. This, in turn, had an enormous impact on farmland biodiversity.

Moreover, they are certain risks and opportunities to achieve biodiversity conservation and sustainable ecosystem services in the region with consideration of global change and socioecological transformation. Therefore, the perspective of socio-ecological system dynamics and ecosystem services under the changing environment should be further analysed.

Several major topics related to the CEE social-ecological development are in the focus of attention, including analyses of the impacts of long-term land use changes on ecosystem services, scenarios, and visions for future development of ecosystems under land and climate change, changes in biodiversity in these less explored regions, how biodiversity governance through institutional transitions navigates social–ecological systems, and how the combination of traditional knowledge with that of conservation professionals would benefit the maintenance of biodiversity.

Knowledge from Central and Eastern Europe has at least two important values:

First, decades of dramatic political change have been accompanied by significant changes in the economy and governance structure. Knowledge on the operation of systems during these changes may provide information to guide similar big events in the future.

Considering the recent environmental state of biosphere and the change of climate and socioeconomic development, such information is badly needed for mitigation and adaptation to the effects of upcoming changes.

Second, restoration of degraded ecosystems is a key priority for the EU. However, the properties of the target systems are often unknown, as many ecosystems have already disappeared due to intensive environmental change.

Data from the low-intensity Central and Eastern European landscapes where sustainable use of resources still exists in some regions can provide necessary baseline information to set restoration targets. Such data will also provide opportunities for improving synergies in the effective delivery of ecosystem services and biodiversity conservation.

There is still much to be learnt about conservation of biodiversity and ecosystem services in Central and Eastern Europe. Compared to Western Europe, the available research is limited, as is the willingness and possibilities of authorities to apply that research. Nevertheless, biodiversity and the health of ecosystems are still relatively high. These differences are not fully acknowledged in regional or mainly in the EU policies. For example, farmland biodiversity is dramatically declining in the Western Europe, and the investments through agrienvironment programs to halt this decline are not effective. However, these agri-environment schemes are more effective in less intensively managed regions, like many of Central and Eastern Europe. These results are not reflected in the EU's support for high biodiversity value farmlands.

With a view to the above, there is a need for formulating a vision for sustainable governance and management of ecosystems, biodiversity, and landscapes in the Central and Eastern Europe. Such a vision should integrate scientific evidence with traditional knowledge. Therefore, to better navigate socio-ecological systems to sustainability in the Central and Eastern Europe, ecosystem management in transition should incorporate ecosystem service perspective as an indispensable link between nature and humans. Socio-ecological approaches to conservation should be promoted. They include

consideration of interactions between nature and people (social and ecological systems), multiple governance systems, development of a common language addressing ecosystem management problems, and integration of stakeholder's objectives. Socio-ecological approaches to management of ecosystem services can provide an integrative basis for the conservation of Central and Eastern Europe's valuable natural capital.

- **The European Green Deal and its implication of CEE countries**

A growing number of citizens in Central and Eastern Europe want increased climate action. Civil society actors, business, institutes, academia and local communities representatives call on their governments to catch the wave of the European Green Deal, ahead of the European Council next week where EU governments will start discussing the new EU 2030 climate target.

According to the latest available science, Europe needs to strive for at least 65% greenhouse gas emission reductions by 2030 in order to avoid dramatic impacts of climate change and honour its equitable fair share of the commitments made under the Paris Agreement to limit global temperature rise to 1.5°C.

The recent proposal of the European Commission to increase the EU's climate target to at least 55% emission cuts, from the current 40%, has sent clear signals about Europe's determination to strengthen climate action to the international community.

Some say the transformation needed to reach the goal will be costly and challenging – not only for Central Eastern Europe, but ignoring or downplaying the science and the voice of youth will cost even more.

There is growing support for more climate ambition among European citizens: thousands of youth activists go on strike regularly, also in Central European capital cities, and are calling for science-based climate action.

Corporate leaders, cities and regions are becoming drivers of change. We know what to do, and there are already comprehensive visions on how to do it.

If Central and Eastern European countries and societies want to co-shape the future of Europe, they cannot stay behind anymore in this transformation process: the region belongs to one of the richest parts of the world and must take its share in the global efforts against climate change, which hits the most vulnerable countries and communities the hardest.

Central Eastern Europe is already strongly impacted by climate change such as extreme weather events, floods, droughts, shortages in water, and particular regions being threatened by desertification, which translates into massive economic constraints.

Never in its history has the EU mobilised so much public money through its multiannual budget and recently agreed recovery funds to help the EU as a whole to become climate neutral by 2050 and to transform carbon-intensive regions, in particular to leapfrog fossil fuel use to healthy and clean energy systems and economies.

A rapid decline in air pollution and the huge potential of new, safe and green jobs will benefit everyone. But this requires Central Eastern European politicians to adopt a forward-looking vision, by using the experiences and lessons learned from the past transformation processes and putting solidarity in the centre.

Now is the time to use the recovery and EU funds as a tool to transform the economies and societies faster and understand this process as an opportunity.

The Renovation Wave, action on Circular Economy, the Farm to Fork Strategy, sustainable mobility – all these policies set clear responses to many of the economic and social challenges still present in Central and Eastern European countries and are a chance to improve their environment, health, the competitiveness of their economy, quality of their jobs and lives.

A majority of citizens of CEE countries perceive climate change as a very serious problem, express broad support for the European Green Deal and for the green recovery – and the politicians should offer adequate answers and actions to these expectations. Coal

communities in Bulgaria, Poland and Slovakia actively discuss joint visions for the future of their regions.

Citizens of Bucharest, Budapest and Krakow are demanding policies and measures to improve air quality. Climate change and its impacts are at the core of everyday discussions.

The climate crisis does not wait. The more CEE leaders would delay necessary action to fight climate change, the more severe and costly the climate change impacts will be. Inclusive and transparent dialogue, solidarity and trust are crucial to create a vision of a just energy and economy transformation – and to make this vision a reality.

That is why a great number of civil society actors in Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia, are calling on their governments to act in a responsible way. They should use the recovery strategies and funds to raise the EU's 2030 climate ambition to at least 65% emission cuts and speed up the transition towards climate neutrality by linking climate action with the increase of social justice and improvement of the state of the environment, economy and human health.

- **Individual Eco - contribution and attitudes of European citizens towards the environment**

According to Eurobarometer 2020 survey, 94% of citizens in all EU Member States say that protecting the environment is important to them.

In addition, 91% of citizens stated that climate change is a serious problem in the EU. European legislation is necessary to protect the environment, according to 83% of those surveyed.

The citizens want more to be done to protect the environment, and that they believe responsibility should be shared by big companies and industry, national governments and the EU, as well as citizens themselves.

European Commission

Attitudes of European citizens towards the environment

94%

OF THE EUROPEANS SAY THAT
PROTECTING THE ENVIRONMENT IS **IMPORTANT TO THEM PERSONALLY**

53%

SAY IT IS **VERY IMPORTANT**

41% SAY IT IS FAIRLY IMPORTANT

78% agree that environmental issues **have a direct effect on their daily life and their health**

CLIMATE CHANGE IS PERCEIVED BY EUROPEANS AS A
VERY SERIOUS PROBLEM IN THEIR COUNTRY (76%) AND IN THE EU (77%)

Respondents consider the **most important environmental issues** to be

53% Climate change

46% Air pollution

46% Growing amount of waste

Large majority of Europeans use **Facebook** (76%) to get most of their information about the environment.

Followed by...

YouTube 35%

30%

17%

Source: Eurobarometer Special 501. At the time of fieldwork, the United Kingdom was still a member of the European Union, and therefore the UK results are included in the EU average

The interviewed citizens considered that the most effective ways of tackling environmental problems are 'changing the way we consume' and 'changing the way we produce and trade'.

Climate change, air pollution, and waste are the three most important environmental issues, according to the findings of the survey.

Over three-quarters (78%) of respondents believe that environmental issues have a direct effect on their daily life and health.

More than eight in ten citizens are worried about the impact of chemicals present in everyday products.

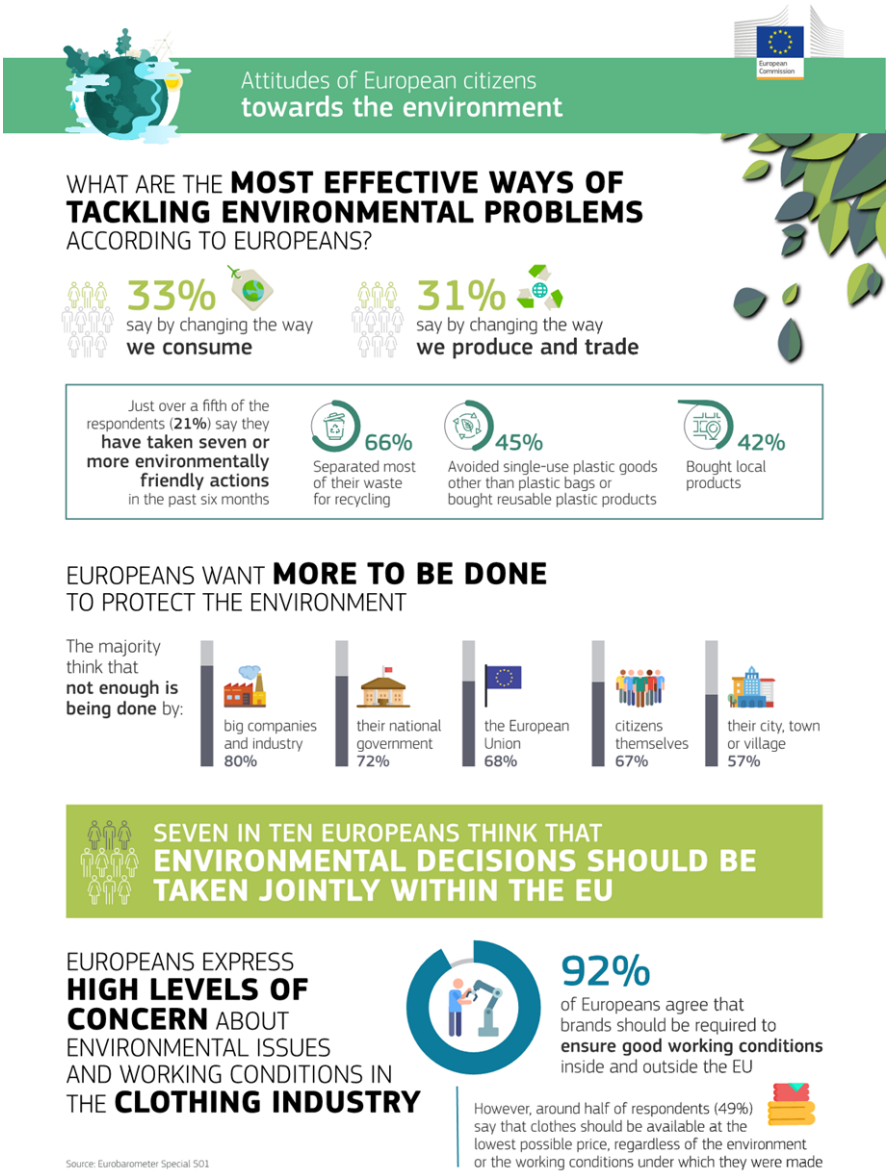
There is an acknowledgement that fundamental changes may be required. Amongst the more than 27,000 people interviewed, there is solid support for policy measures aimed at reducing plastic waste and littering.

The findings also show that citizens believe:

- products should be designed in a way that facilitates recycling of plastic;
- industry and retailers should make an effort to reduce plastic packaging;
- people should be educated on how to reduce their plastic waste; and
- local authorities should provide more and better collection facilities for plastic waste.

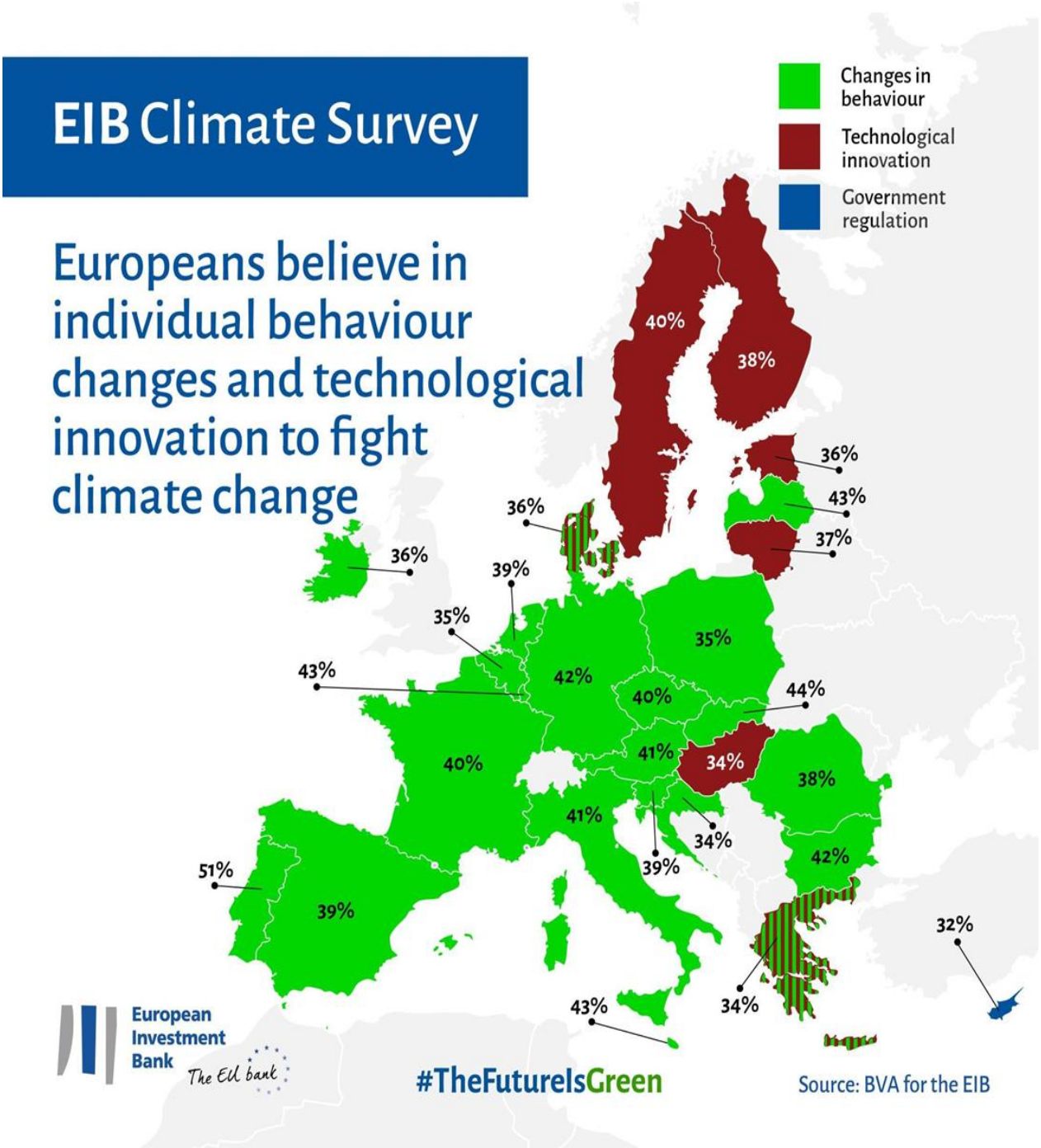
The survey also examined attitudes towards the clothing industry, and found high levels of concern about environmental issues and working conditions.

Respondents express a desire for clothing that lasts longer and is made of materials that can be recycled.



According to EIB, views within Europe vary on the best way to tackle the climate crisis. People in Portugal (51%), Slovakia (44%), Luxembourg (43%) and Germany (42%) believe that radical behaviour changes will have the biggest impact in fighting the climate crisis. But citizens in the Nordic and Baltic countries have more confidence in technological innovation (40% in Sweden, 38% in Finland, 36% in Denmark, 36% in Estonia, 37% in Latvia, 37% in Lithuania). The data about the project countries is as follows: Bulgaria -

42%, Hungary - 34%, Republic of North Macedonia (according to its State Statistical Office) - 31 %.

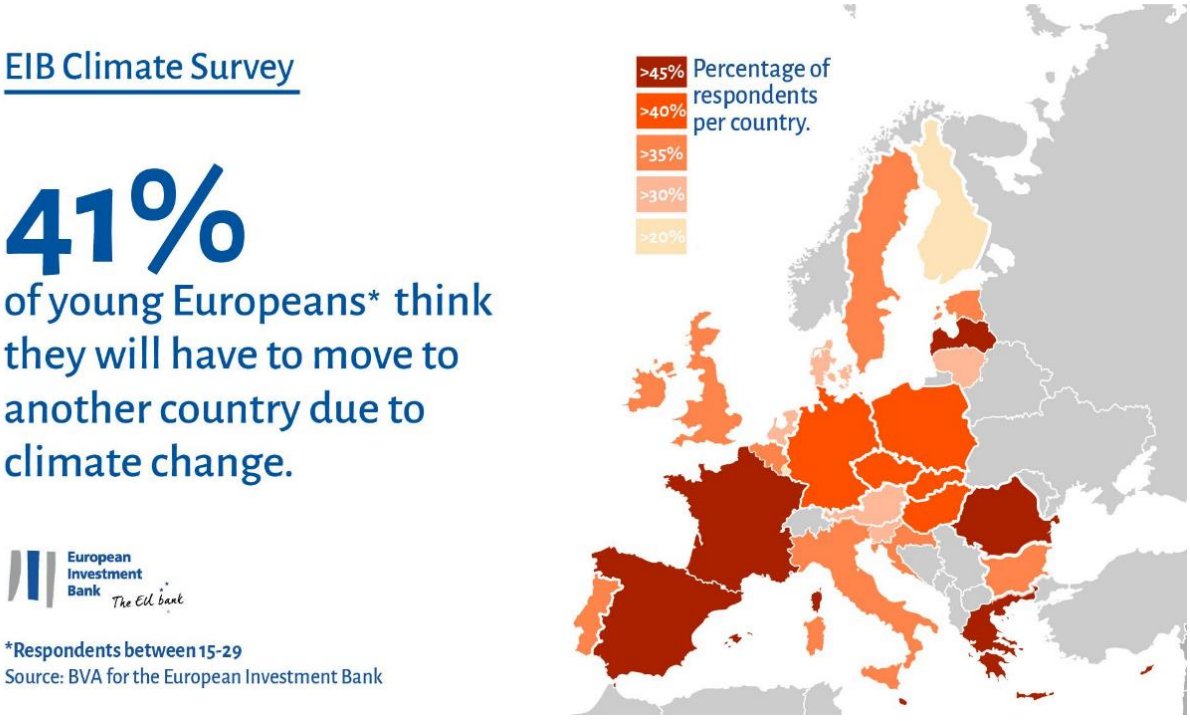


➢ Views on climate change differ by generation and countries

The EIB climate survey reveals that environmental migration is seen as a strong reality in Europe, where 82% of respondents anticipate climate change will force people to leave their country of residence to escape extreme weather conditions.

At the same time, 24% of Europeans also foresee moving to another country because of climate change. This number is significantly higher among the younger generations, where 41% are seriously considering the option of moving abroad.

An important divide can also be seen between European countries: as a comparison, 33% of Austrians aged 15-29 years anticipate moving to another country, a percentage that goes up to 51% among young Spaniards.



Europe strives to be seen as a global leader in tackling the climate change crisis, but perceptions on the level of action the group of countries is taking are split, according to data from the 2020's Best Countries report.

Opinions on how well Europeans view their nations, which are some of history's biggest greenhouse gas emitters, are addressing climate change range from highs in Finland to lows in Central and Eastern Europe - Hungary and Poland, according to the data.

Over 80% of respondents from Finland say their government is working to address the effects of climate change. Denmark, Sweden and Norway also receive high marks, with Sweden coming in the lowest at 65%.

Fewer than 45% of Best Countries survey respondents in Poland and Italy thought their governments were adequately addressing the effects of climate change.

Coal powers about 80% of Poland's electricity. The Polish government is reluctant to act on climate goals because of its link to fossil fuels.

The same tendencies are in other Central and Eastern countries, such as Bulgaria, Hungary and countries from Western Balkans region.

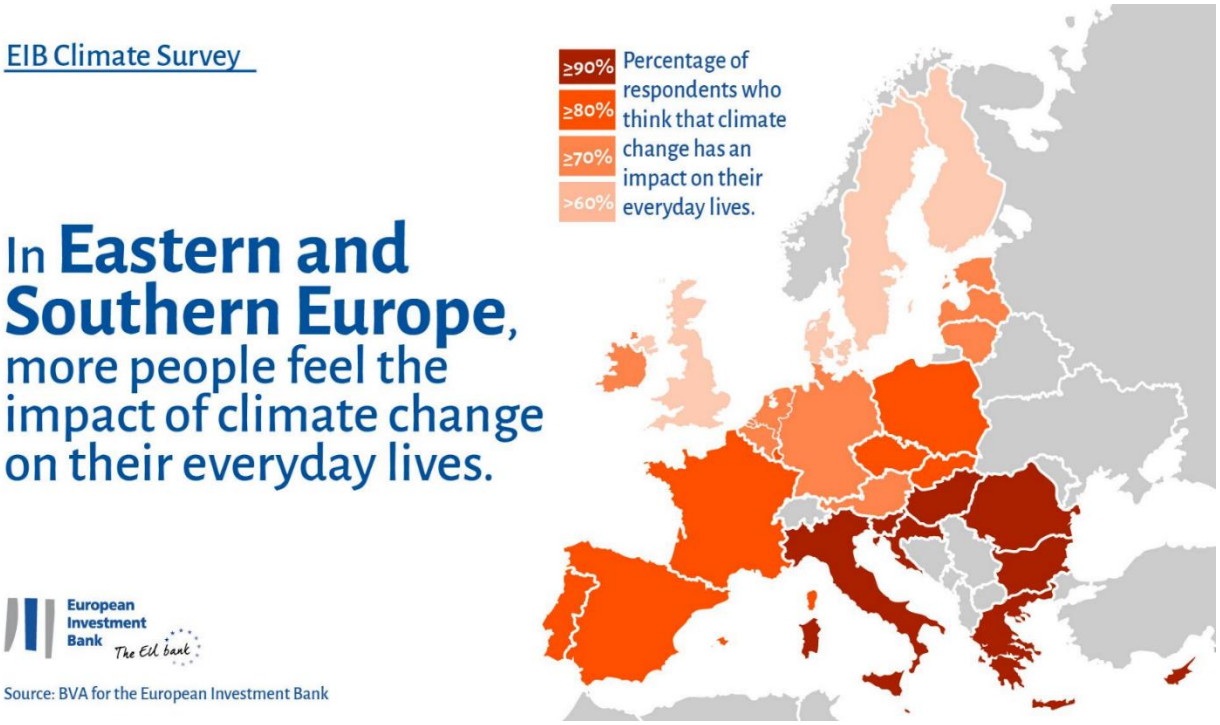
Interestingly, a geographical difference exists between Southern and Northern European countries. Southern Europeans see unemployment as the biggest problem facing their respective countries: 72% of Spaniards and 69% of Italians put it among their top three challenges.

Northern European countries such as Denmark, the Netherlands, Germany and Austria actually see the climate crisis as the biggest threat.

This contrast in opinion between Southern and Northern European countries is also reflected in the perceived impact of climate change: people in Mediterranean countries report a higher impact on their everyday lives, with figures of 94% for Italy and 87% for Spain, while the share is 63% in Denmark and 66% in Sweden.

Overall, 82% of Europeans report that climate change has an impact on their everyday lives, a perception that goes up to 98% in China but down to 76% in the United States.

In Eastern Europe more than 90 % of the people feel the impact of climate change on their everyday lives.



In addition around 76% of older millennials, ages 33 to 40, think climate change poses a serious threat to society, according to a survey conducted by The Harris Poll on behalf of CNBC Make It in March that surveyed 1,000 U.S. adults on a variety of topics.

Many members of the generation have grown up viewing climate change as an existential threat, worrying about global sea level rise, and witnessing one ecological disaster after another. Now as they settle into careers and family life, climate concerns are influencing how they spend their money, from investing to home buying to the products they use and companies they support.

Climate change is a top issue millennials consider when they pick investments or look into buying real estate, says Dann Ryan, a certified financial planner at Sincerus Advisory in New York City who advises millennial clients. It can impact small habits, like consuming

less or preferring sustainable brands, and big life choices, like whether or not to have children, he says.

Millennials are carrying a "transitional burden" between the unsustainable habits of baby boomers and Gen X, like increased consumption, and the more socially and environmentally conscious Gen Z. Older millennials feel they need to atone for the mistakes of previous generations, while leading the way for the next generation and setting up a sustainable future for themselves and their children.

"The climate change generation is a generation of young people born into a warming world, who will be alive to see which climate model scenario plays out, and who have spent—and will spend—essentially our entire adult lives fighting for a just and stable future," says Geoffrey Supran, a postdoctoral fellow at Harvard. He goes on to point out that many of the younger members of the "climate change generation" will outlive the climate projections that scientists have created through 2100.

With the extremely high likelihood that members of the Millennial and Gen Z generations will witness the most severe impacts of climate change within their lifetime, and given the uncertainty about what the next two decades will bring.

CHAPTER III. SUCCESSFUL EXAMPLES OF SUSTAINABLE BUSINESS PRACTICES IN THE EUROPEAN UNION

In order for a company to be considered eco-friendly, sustainability is central every step of the way: from transparent and ethical sourcing of raw materials, to environmentally-friendly practices in manufacturing, to packaging and shipping, to diverting landfill waste at the end of their product's life. Eco-friendly companies go beyond their products in their fight against climate change. They each continue the fight in their own unique way as well. They take action to preserve the planet through environmental policy advocacy, promoting environmental awareness and local participation in conservation efforts, partnering with other movements and organizations.

In today's reality, businesses' environmental contribution could not be ignored or downplayed. Businesses that are truly environmentally friendly not only acknowledge this reality, but they are redefining what "environmental contribution" means. For these companies, negatively affecting the environment is out of the question—that discussion, for them, is how substantial their positive contribution is.

There are many ethical and practical reasons companies must be committed to being leaders in the environmental space. First and foremost is the reality that we only have one planet, and we all share it. All businesses have an impact on the planet, and that impact affects all of us.

Companies use huge amounts of our planet's resources, and they in turn have huge impacts. It's critical that sustainability be at the core of their sourcing, production, and distribution to make sure the world we live in continues to be habitable for the people these companies benefit from.

In addition to the ethical demands, businesses should be eco-friendly for practical reasons as well. Consumers are increasingly seeking to engage with eco-friendly products and companies. In a recent report from Nielsen, 81% of consumers said it is "extremely" or

"very" important that companies "implement programs to improve the environment" and 30% of consumers said they are "willing to pay a premium for products that deliver on social responsibility claims."

Millennials and Generation Z are a major factor in consumer-driven sustainability. Millennials have been a driving force in socially-conscious shopping, and Gen Z isn't far behind. In one study, 90% of Gen Z respondents "believe companies must act to help social and environmental issues." These generations are voting with their purchase power, and companies are heading their demands as they try not to alienate two high-spending consumer groups.

Furthermore, becoming an eco-friendly company is also a great way for the companies themselves to save money. Reducing energy consumption and increasing energy efficiency save on utility costs. Some of the companies recycle or reuse their old products to turn into new ones, which saves on materials. Combined with an increase in sales, becoming an eco-friendly business brings a host of positive benefits in the immediate and that reach far into the future.

Having in mind the above, Chapter III presents in alphabetical order 27 successful examples of eco-friendly companies and organisations – one from each Member State of the European Union.

AUSTRIA

SEIBOLD is an Austrian-based company, specialised in development and production of process analysers for measurement and analysis of heavy metals and cyanide in water. Its products are of highest quality and guarantee for supreme accuracy and repeatability of measurement results. SEIBOLD Online-Analysers are used in industrial applications, e.g. sewage treatment plants, potable water supply and a great variety of industrial processes.

The company was founded in 1934 in Vienna and became an important player in the field of measurement engineering over the years. Since the beginning, research and development was one of the utmost concerns of SEIBOLD. Until today, intensive internal research is the key to its success and ensures the ongoing improvement of its products.

SEIBOLD is proud of having excellent skilled and highly motivated experts in its team, who develop analysers of highest precision with great passion and gratification. Its cooperation with a great number of successful companies and organisations further ensures ongoing enhancement of the quality of its products and services.

Based on more than 70 years of expertise in the fields of chemical, mechanical and electronical engineering, SEIBOLD is perceived and highly valued as reliable partner and manufacturer of innovative products and solutions for the highest demands of its content customers all over the world.

BELGIUM

PU Europe was founded in 1981 as BING to become the single European voice for the polyurethane (PUR/PIR) insulation industry. Today, PU Europe represents insulation producers, raw material suppliers and component manufacturers from twelve countries with activities covering the entire continent.

Vision

Innovative building products and design solutions supported by ambitious policy frameworks and well-thought financing solutions transform Europe's building stock into energy savers. About 3 % of buildings undergo (staged) deep renovation every year reducing the energy demand of its buildings by an average of 80 % by 2050. PUR/PIR high performance insulation plays a key role in this transition process.

Mission

PU Europe's mission is to demonstrate the benefits and support the introduction of low energy building solutions for new constructions and renovation projects across Europe, and develop sustainable and cost efficient solutions using PUR/PIR high performance insulation to support the societal shift towards the 2050 goal.

To this end, the association proactively contributes to the European political and technical decision making process in areas such as energy efficiency, sustainable construction and health & environment. Messages are underpinned by independent research to which PU Europe dedicates a substantial part of its overall budget.

BULGARIA

Cupffee: the first edible and customizable coffee cups! Accompanying coffee with a sweet, eco-friendly, light and original snack? Today you can with Cupffee, the first edibles coffee cups in the world! Made with cereal-based flours, they are 100% edible, but also intelligent: they do not alter the flavor of the coffee, they can contain hot or cold drinks while remaining crunchy for up to 40 minutes, and are coated with an elegant paper package that guarantees comfort and hygiene.

The waffle of Cupffee edible cups is made entirely with natural ingredients, without the addition of sugars or preservatives. This makes the cups naturally sweet, without however altering the taste of the drinks, thanks to the absence of glazes or coatings. And once your drink is finished, the Cupffee cup can be eaten without feeling guilty: in fact, each pod weighs only 14 grams and provides less than 60 calories!

The Cupffee edible cups are capable of holding up to 110 ml of liquids, therefore excellent also for a long coffee, a tea or a cappuccino. Waffles are meant to hold cold and hot drinks, they can keep hot liquids up to 85 degrees, and keep theirs crunchiness for 40 minutes. All without burning your fingers! Around the edible coffee cups there is in fact an elegant customizable label that guarantees greater ease of handling, and isolates them from contact with external surfaces, so that they can be held in hand or placed on a table or counter without problems.

Being made with 100% natural ingredients, the Cupffee edible cup pods are entirely ecological, and biodegrade in a few weeks without leaving any trace. Of course, the protective label is also made with recycled paper. For an original coffee break and full respect for the environment. Furthermore, since they are made with completely natural ingredients, they can also be used for children's drinks.

CROATIA

Company GEOS from Rovinj has been active since 1990 as a private society for geological research, project and engineering.

It has at its disposal numerous modern and computerized equipment, among which: the georadar instruments for geophysical field work: pulsEKKO PRO and pulse EKKO IV of Canadian production, the seismograph ES-3000 of American production, electrical instrument Syscal Kid Switch 24 and drilling equipment GDR-150 for all sorts of soil drilling up to the depth of around 100m.

All activities within the geological research, projects and data processing are computerized with the help of variety worldwide licensed programs.

Its expert crew, numbering seven co-workers, solves even the most complex problems.

A combination of top-notch knowledge and long years of practical knowledge, teamwork and complete information equipment are a guarantee to success. In its work the company has cooperated, and is still cooperating with numerous expert and scientific institutions and companies around Croatia and the world.

GEOS possesses a great deal of practical experience and a rich reference list of successfully solved tasks.

CYPRUS

Masdar is a leading company specialized in the field of green investments. It provides several green investment solutions for its clients from all over the globe.

Masdar aims to work to its highest potential and to invest all its efforts in order to provide a set of comprehensive and outstanding investment solutions, by convoying the technical evolution in the field of investment into the international green markets.

The company's fundamental vision is to help investors identify what`s new about green products in the international markets, and by clarifying all concepts and terms regarding this kind of investment.

Founded in 2009, this company also provides solutions for other industrial applications:

- Solar Street Lighting Systems
- Solar Irrigation Systems
- PV Inverters
- Solar Garden Lights
- Model WS-MPPT60 60A - Solar Charge Controllers

CZECH REPUBLIC

Cypher Environmental is a leading global environmental solution provider for dust control and road stabilization. With ESG (Environmental Social Governance) and CSR (Corporate Social Responsibility) principles at the core of every decision they make, they proudly boast the tag line, "Always do what's right." This is the philosophy that guided the company to be founded on the idea of only creating sustainable solutions for common problems found in the environment today, and has lead them to engaging in several philanthropic endeavours and programs around the world, with the ultimate focus on making it a better place. They help their clients in a wide array of industries simultaneously reduce their OPEX (operational costs) and environmental footprint by using their dust control and soil stabilization solutions, known as Dust Stop and EarthZyme, and they have successfully completed projects in over 50 countries around the world. They continue to innovative and make strides in their mission to remove road-salts, and other toxic products from the earth and stand behind their promise: Better Roads. Better Bottom Line. Better Planet.

An industry pioneer in eco-friendly road treatment, Cypher Environmental is constantly innovating and delivering greater performance through products for companies, communities and industries that need to comply with evolving environmental standards. Cypher products are non-corrosive, non-toxic and environmentally friendly. Highly concentrated formulations mean economical shipping, which enhances overall cost-effectiveness. Thier long-lasting solutions provide operational efficiencies and potentially significant cost savings while protecting the earth and keeping the world green.

DENMARK

Green Instruments is a global company that specializes in measurement and analysis technologies for both marine and land based industries. They develop and manufacture monitoring and measuring equipment for emission control, water and gas analysis, hazard detection, and machinery protection. The company was founded in 1999 under the name of SBS Technology in Pandrup, Denmark. In 2008, they changed their name to Green Instruments. Today, they have their head office and production facilities located in Brønderslev, Denmark together with a regional sales and service office in Fort Lauderlade, USA. They are the leading supplier of inert gas oxygen analyzers, smoke density monitors, oil mist detectors, and boiler protection systems for the marine industry. They have more than ten years of experience in monitoring and analyzing exhaust gasses on ocean going vessels. Besides, they are the pioneer in monitoring wash water after exhaust gas cleaning systems.

Mission: To provide their customers with innovative and reliable products that help the customers to operate their assets in a safe, more efficient, and environmentally sound way. The company mission is Perfecting Sensible Technology.

Vision: To keep their position as a market leader with a high level of end-customer satisfaction within their core business. In order to achieve that, they constantly improve their existing products, develop new solutions as well as expanding their sales/service effort and distribution network.

Core Business: Green Instruments' core business is to develop, adapt and integrate monitoring systems for the global market. Their monitoring systems are to meet the market requirements for environmental compliance, hazard detection and protection, and process optimization.

ESTONIA

The Estonian Environment Information Centre (EEIC) aims to collect, process and generalise data on Estonian nature, state of environment and the factors influencing it.

The Information Centre provides reliable environmental information for Estonia's decision-makers, public both in Estonian and abroad, and for various organisations.

The Estonian Environment Information Centre (EEIC) was established on April 1, 2010 when two environmental organisations were joined together after the reorganisation.

The new agency consolidates former Estonian Environment Information Centre and Centre of Forest Protection and Silviculture into a single organisation.

The Estonian Environment Information Centre is a state agency administered by the Ministry of the Environment. EEIC collects, processes, analyses and distributes information about the nature in Estonia, the state of the environment and the factors that impact them.

Their aim is to provide reliable environmental information for Estonian decision-makers as well as wider public and organisations both in Estonia and abroad.

FINLAND

Brightplus is a leading Finnish biosourced materials company. They create reusable, recyclable and biodegradable side stream material solutions with their deep tech visionary chemistry. Their unique offering ranges from liquid coating solutions to plastic replacement materials.

Brightplus with its accountable arctic spirit supports leading global manufacturers and major brands in packaging, consumer goods, agriculture, architecture and leisure to achieve their sustainability goals. Their highly experienced team works closely with customers to co-create innovations that seamlessly comply with their existing processing methods and requirements. Their side-stream solutions reduce the circularity gap and meet the EU Green Deal 2030 targets.

How it started: A group of enthusiastic scientists and founders was innovating in a frozen Lappish van—winter jackets tightly on—with a shared world saving mission. They wanted to prevent global warming, reduce pollution by removing harmful substances and recycling waste from industries and preserve the planet for the future generations. They developed multiple business models, received grants from the European Union, and experimented with many inspiring innovations, never forgetting friendship, joy, and good spirit. They wanted to create truly disruptive technological innovations in the merge of materials science, green chemistry, synthetic biology, sustainability, and recycling, working first with all subjects separately and then little by little combining and shaping up their mission to a total solution.

Brightplus will continue to develop its BrightBio platform further into global environment and to respond the growing need of circular economy solutions.

FRANCE

Cimel is a French manufacturer of meteorological and atmospheric observation systems for all climate-sensitive activities. From its creation in 1966 in Paris to nowadays, Cimel's instruments have always been designed and built by exceptional people using only advanced technologies with high quality materials.

Cimel has developped a large expertize covering meteorology, atmospheric monitoring, design of integrated systems, software solution development and industrialization. Through its policy of constant Research & Development with leading worldwide scientific partners (Scientific institutes and laboratories, universities).

Cimel innovates continuously and provides turnkey solutions to match the needs of its customers. Its mission is to be the link between the Scientific Research Community and the Industrial World, by developing innovative technologies and operational solutions, especially in Research and Air Quality markets.

Cimel's customers are operationnal and scientific organisations and companies that demand high quality, relaible and durable systems to acquire environmental data.

Cimel's philosophy is based on quality: it starts right from product design and covers production control, turn-key and after sales services. An international network of partners ensures local contacts to satisfy customers' needs on the field.

Cimel's customers' loyalty on the long term and in more than 100 countries attest the exceptional quality of the solutions offered.

GERMANY

With the motto `celebrate change`, GREENTECH FESTIVAL brings people from all over the world together to be inspired by green, innovative technologies that facilitate a sustainable lifestyle. As the first festival of its kind, it combines the largest exhibition of green technologies to date, a conference featuring sustainability pioneers and forward-thinkers, the GREEN AWARDS presentation gala and the GREEN VIBES concert.

Back in October 2018, GREENTECH FESTIVAL was just an idea conceived by former Formula 1 World Champion Nico Rosberg and the two engineers and entrepreneurs Marco Voigt and Sven Krüger.

Launched in 2006 to critical acclaim, the International Green Awards™ were set up to recognise strategies that use creativity in an engaging and effective manner, leading to more sustainable outcomes. It is now an established event on the global sustainable business-calendar.

By showcasing "best in class" examples of effective, innovative and creative approaches to sustainability, the International Green Awards™ aims to be an agent of change. To this end, the Awards team searches the globe every year to find true influencers, leaders, entrepreneurs and innovators, identifying worldwide sustainability success stories that inspire and motivate others. It is no exercise in fluffy back-patting.

The awards are aligned with the Brundtland Commission's definition on sustainable development, stated as: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

GREECE

SustChem Engineering is a "living" organism that offers services, surrounded by high-level scientists & which has gained the capability of responding on the constantly changing framework of companies' operation. They constantly invest on the evolution of their employees' cognitive skills, as it's the only way in order to monitor not only the constant changes but also to reassure our quality. They observe the constant developments & have as our primary goal the information of their customers, while suggesting solutions for the timely and complete compliance & urging them to take voluntary initiatives. They offer a wide range of services that concern industry, starting from the basic and detailed planning, the licensing of operation and the implementation of management systems, up to energy saving, protection of the environment and its products' certification. They develop the culture of a complete and designed handling of challenges, according to each customer's demands and special characteristics.

SustChem Engineering was founded in 2007 by the Chemical Engineers Dr. Panagiotis Braimiotis and Mr. Panos Scarlatos. The vision of the founders is to provide complete and integrated services to enterprises towards the challenge of sustainable growth in the globalized environment.

The Company is a member of the Hellenic Association Chemical Industries (HACI) and has adopted the Responsible Care initiative.

HUNGARY

SOLTUB is a Hungarian consulting and research SME operating in the area of sustainable production and consumption. The company help its partners to convert their sustainability issues into opportunities, in reaching the balance between the environmental –economic and social aspects.

SOLTUB provides services tailored to the clients specific needs focusing on developing carbon footprint schemes for products/ services and organisations, and reviewing the carbon footprint schemes,

SOLTUB helps you to identify your major input sources in the system e.g. raw material procurement, energy consumption, transport and the outputs e.g. carbon emissions and in choosing the scope of accounting and reporting. For the assessment of the carbon footprint (CF) for products/services they use the Life Cycle Analysis (LCA) and the available primary and/or secondary data according to the requirements of the internationally accepted standards as the GHG Protocol and PAS 2050:2008. Determining the carbon footprint companies and institutions has the opportunity to formulate their carbon management strategies.

The carbon footprint helps to:

- reduce energy and production costs,
- identify opportunities for carbon emission reduction,
- select low carbon products/services,
- participate in the green market and
- comply with different agreements and legislation e.g the EU Communication to the Commission: A Roadmap for moving to a competitive low carbon economy in 2050, COM(2011) 112 final.

IRELAND

Slick Solutions is a specialist oil spill company founded by CEO Francis Fullen in 2015. From its operational base in Dublin, Ireland the team offers expert consultancy and a full bioremediation service. The Slick Solutions mission is to restore and renew environments tainted by oil and diesel spills in an ecologically responsible way – entirely without the use of problematic detergents or chemical additives. They eradicate oil, petrol and diesel spills in soil, on water, on roads and railways. But it's their approach that really sets them apart from other consultants. Scientifically innovative and reassuringly eco-friendly it uses microbiology to harness the power of nature's own cleaning agents. This proven process is also remarkably effective and very simple to apply. Slick Solutions provides expert, comprehensive oil spill response – locally and internationally.

Slick Solutions is the agent for Nanobite products, the European brand name for two popular American remediation treatments called PRP and S-200. Both products were developed to eradicate hydrocarbon spills, without resort to harmful substances.

Thanks to this game-changing breakthrough, oil contamination can be now treated in situ, utilising 100% environmentally friendly solutions, with completely natural, non-toxic liquid or powder treatments. It's a process they call "bioremediation".

Hydrocarbons – oil, petrol and diesel – are naturally constituted products made from a combination of carbon, hydrogen and oxygen. So, Slick Solutions uses only natural products to treat them safely and effectively. Nanobite Liquid and Oil Blitz are made from a base of fish oils, while Nanobite Powder is made from beeswax.

The Nanobite products act like a greenhouse by stimulating naturally occurring microbes harvested from the air and the environment. Then, the microbes trapped in this matrix actually 'eat' the oil, breaking down the hydrocarbons to their harmless constituent parts – H2O (water) and CO2 (carbon dioxide).

ITALY

Representing an International leading producer, Altair Chimica, a Company of Esseco Group, gives absolute importance to the relationship between industrial activity and environment by producing through the new mercury-free chlor-potash plant using membrane cell technology, the most advanced in the world.

Considering the high quality of the products manufactured by the plant located in Saline di Volterra (Pisa) - Italy, Altair Chimica is increasingly more appreciated in those applications where the attention to particular parameters and details is very important, the same attention Altair Chimica applies in its production chain.

Altair Chimica is the only membrane plant in Europe really granting 0 Mercury since built on green field.

Due to the nature of the products manufactured using derivatives of the electrolysis, there is potential risk for elevated mercury levels on land, in water, and even on people. As a consequence, it's extremely necessary for Altair Chimica to guarantee the maximum purity and granting to the market a product in which the Mercury is completely absent.

This sensibility towards environment, efficiency, production, long-term strategy is demonstrated also by the start up in 2012 of the cogeneration plant (4,5 MW) which gave Altair Chimica the possibility of producing 1/3 of its energy consumption by itself and to increase its presence in the International markets.

As a commitment to sustainability Altair Chimica has joined also the Responsible Care Program.

LATVIA

VentEko is one of the leading companies in Baltic States providing a wide range of environmental consultations, trainings and engineering services.

Since 1997, VentEko implements local and international projects of various complexity levels. Essential part of the implemented projects take up projects financed by the Cohesion Fund of EU (CF), European Regional Development Fund (ERDF), United Nations Development Programme (UNDP), the European Bank for Reconstruction and Development (EBRD), World Bank and Trans-European transport networks (TEN-T). VentEko has established a stable circle of clients, including both state sector institutions as well as private companies, both in Latvia and abroad.

Quality, stability, professionalism and dynamic growth are the guarantee for achieving common goals. Geological, hydrogeological and geoecological investigation, geotechnical investigation, environmental impact assessment, ecological risk assessment, environmental planning, management and consultations, soil, surface water and groundwater contamination remediation, hydrocarbon spill emergency clean-up, design, construction, and operation of oil-polluted soil treatment plants, handling of hazardous waste, design of environmental technologies, water supply and wastewater system projects, Environmental Due Diligence, Detection of Hydrocarbons in the Soils by LIF Method (laser induced fluorescence system (LIF) (UVOST®).

VentEko mission is to implement significant large scale environmental projects in Latvia and beyond its borders, ensuring an excellent service quality by its professional, skilled and motivated team and on the basis of world-class material and technical resources.

LITHUANIA

AILIT UAB accepts for purchase and processing waste containing: Gold, Silver, Palladium, Rodium, Ruthenia, Rhenia, Tantalus, Nickel. Vanadium and other metals contained in electronic scrap, boards, slags, production residues, automobile converters (catalysts).

The head of the company has 27 years of experience working with Tuesday waste containing precious and non-ferrous metals throughout the Continent of Eurasia.

The company AILIT UAB is young, ambitious and sets great principles for itself. The company was founded in 2020.

AILIT UAB has a number of direct contracts with leading Eurasian refineries, which allows AILIT to offer its partners and customers conditions and prices at the world level.

The AILIT UAB company has developed and introduced into production a high-precision line for sampling both bulk and fractional materials that meet international sampling standards.

They accept personally at the point of reception and you can also send them parcels from any country and transport companies.

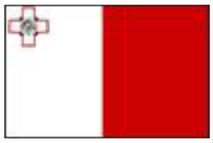
LUXEMBOURG

RTC4Water has developed a product called the Global Predictive Controller. The purpose of our system is to automatically and continuously optimize a water distribution or wastewater sewer system. Once configured, the system monitors the control systems to ensure that tanks or basins are always fully utilized – think of an orchestra conductor that continuously evaluates and makes adjustments that optimize resources, power expenditures, etc. It has predictive capabilities which allow it to adjust the entire network to respond to future demand – and all of this is done without the need for operator intervention or adjustments. Most engineering firms will only offer this level of control for large scale, costly projects. RTC4Water has already brought this level of efficiency to very small towns, villages or cities and want to do more in this domain.

Artificial Intelligence Software for Water Infrastructure Administrators: Intelligent software that automatically and continuously optimizes your water distribution or wastewater collection system. Once configured, the system monitors your SCADA systems to ensure that your tanks or basins are fully utilized.

Reduce Operational Workload: Reduces operational tasks and handles data communication issues. The Global Predictive Controller™ ensures that your network automatically adapts to maintenance or emergency events.

Lower Operating Costs and Improve Water Quality: Unplanned purchases from your water supplier costs money. Pumping costs money. Pressure fluctuations endanger integrity. Their system will help reduce these operational costs as well as wear and tear on equipment.



MALTA

Founded in 2010, Cavitcleaner Ltd. is a Maltese company, offering unique cavitation cleaning system which enables crew to clean a yacht's hull and underwater parts without placing the vessel in dry dock, saving both time and money. An intense shockwave of microscopic bubbles quickly and effectively removes fouling material without damaging the surface being cleaned. Improve your yacht efficiency and crew safety with Cavitcleaner.

Efficiency, rapidity and cost-effectiveness: are the qualities of the new Cavitcleaner, the underwater cleaning machines in cavitation.

They allow to clean the hulls, propellers, rudders and all submerged surfaces of any material and size, avoiding the cost of traditional dry dock, and avoiding or reducing the stop time ship.

Cavitcleaner® does not remove the anti-fouling paints, guaranteeing the respect for the environment, thanks to innovative patent on cavitation cleaning, which allows to operate underwater marine environment and on the surface.

Cavitcleaner - Stingray Evo Cavitational Plate is perfect for the cleaning of flat surfaces, it is studied to clean easily and fast, areas covered with medium fouling and its perfect combination is with other of the company's machines. It has a cleaning area of 38/40 cm and creates its own suction that ensures an unbelievable lightness and easiness of use.

NETHERLANDS

The Aqana team that represents top level experience in industrial anaerobic wastewater treatment. For many years the team members shared wastewater solution integrated in processes. From the Netherlands or through their local partners they can build a complete wastewater treatment plant. Or they can even send a complete installation out packed in shipping containers.

An anaerobic process is a beautiful and simple natural occurrence. With the absence of oxygen waste is converted to biogas and only a small amount of sludge. But as in most cases, a human synthesis of a natural process ends up very complicated. Aqana® takes advantage of the bacterial property to attach to surfaces. The anaerobic bacteria are grown on a floating carrier. This is where Aqana could makes the difference. By using a floating carrier bed the reactor design is that simple it fits in any tank. Three concepts are the product of the research and collaboration with launching customers.

From their company in the Netherlands they operate worldwide in wastewater treatment, continuously expanding their partnerships to share their technology and realize local projects.

In their specially developed Aqana's partnership program, they closely collaborate with license partners and share the possibilities of the Aqana system.

They are focused on companies active in wastewater treatment, who are missing the anaerobic technology in their portfolio.

POLAND

The Eko – Systemy Sp. z o.o. company has been founded in 2004 and was based on the experience gained in a family business in operation since 1980 which had been dealing with manufacturing of concrete and reinforced concrete elements for sewage systems and highway construction. Nowadays, the main manufacturing plant is located in Tarnobrzeg, whereas the registered office and the board are operating in Warsaw. In the majority of cases sewage from one or more households flows down directly to the intermediate pumping station tank and then, using a system of submersible pumps, is pumped to a collecting well situated on the main intercepting sewer or directly to a water treatment plant. The following types of pumping stations can be distinguished with respect of their intended use: network, household, municipal, industrial, zone and those working within the water treatment plant technological system.

The main business of the company includes manufacturing and supply of equipment of environmentally friendly external water supply and sewage system. Moreover, in 2008, meeting the demand of the market, the Eko – Systemy Sp. z o.o. company launched a PE and PEHD plastics rotational molding processing department in the Tarnobrzeg Special Economic Zone.

Until now, the company has been dealing mostly with intermediate pumping station construction all over Poland. Sewage intermediate pumping stations are comprehensive tank and pump systems equipped in hydraulic fitting and a control system. The goal behind the pumping station is to transport the industrial and municipal sewage, drain water and other water across large distances or altitude levels (e.g. to another tank).

PORTUGAL

Bluegrowth provides knowledge services and technological solution to engage public and private organisations on smart and sustainable production processes that make the economy thrive while mitigating the impacts of anthropogenic activities in the world.

They are a multidisciplinary team, with competences from social sciences to engineering, linked by an attitude of transformation based on knowledge, beliefs and moral that they call 'Ocean's Culture'.

The sustainable exploitation of the oceans it is crucial to break the collapse of the natural resources and create new concepts of well-being and happiness for humans and other species with whom we share the planet.

The company aims to contribute for the construction of a conscious society - awaken to risks and threats, insightful in actions, aware of its resources, and responsible for its impacts.

They fight against potential threats, working together with the economic and scientific communities, developing and democratizing technological innovations that, from space to the depths of the ocean, enable them to aspire progress by mitigating impacts and combating asymmetries.

The company is driven by the values of Curiosity, Imagination and Engineering. Curiosity stimulates knowledge, Imagination promotes innovation and together they raise Engineering to overcome the complexity of the different shades of blue that cover the Planet.

ROMANIA

Carbon Expert offers its clients deep understanding of international carbon market mechanisms and trends, as well as market opportunities of ETS trading and voluntary emissions markets. They can help you reduce the carbon footprint generated by the activities you undertake and offset your emissions.

Anticipating the trends in the energy market and the international carbon market, a complex knowledge of objective and subjective factors that influence energy and carbon prices ups and downs, an accurate understanding of the EU legislation and of the international climate targets set by 2050 – are just few competitive advantages that recommend the company.

Being the only Romanian consultants in the last five years in the United Nations Convention on the Climate Change (UNFCCC), recommends them in assisting Romanian partners who want to trade greenhouse gas emissions or voluntary carbon credits, as well as foreign partners who wish to address the Romanian market.

The company constantly studies national and international legislation, international market evolution (greenhouse gas emissions, the energy market, the voluntary carbon market), analyzes the needs of market operators and recommend to their customers, according to their specific needs potential internal and external partners according to their needs. They trade greenhouse gas emissions credits or CO2 allowances (EUAs, EUAAs, CERs and ERUs) and voluntary carbon credits.

SLOVAKIA

HydroGEP, s.r.o. is a family owned company since 1994, transformed to Ltd. since 2011, based in the central part of Slovakia. Leading contractor for hydrogeological, engineering geological surveys and environmental services in Czech Republic and Slovakia. Providing drilling of groundwater wells, heating pump wells and engineering geological probes including DPT tests from projection until reporting.

They provide environmental audit before or during buying process of old industrial sites (brownfields) to avoid problems with environmental authorities in future. During audit they perform survey of soil, groundwater and construction materials considering chemical properties, focused on old contamination from performed activities on site.

The company also provides:

- Professional engineering geological survey for geotechnical properties under future construction site to ensure best data for projection of foundation,

- Pumping tests on groundwater wells for ensuring amount of quantity of groundwater on well or dimension of dewatering system for foundation pit,

- Certificated monitoring of groundwater and waste water from sampling and transport samples until reporting to authorities, and

- Groundwater treatment in - situ, monitoring of groundwater treatment and reporting to authorities.

SLOVENIA

The company Konus Konex is head-quartered in Slovenske Konjice, a town in the north-eastern part of Slovenia, which was founded back in 1894, more than one hundred years ago. The main production programmes of the company Konus Konex are the production of non-woven materials made of synthetic fibers and production of conveyor and power transmission belts. Konus Konex represent on all markets as a high quality manufacturer, their production and sales programs are designed mainly industry, to a lesser extent for general consumption – a program of cleaning cloths and brand Tipi Top.

Konus Konex is the only Slovene producer of filter material for industrial, liquid and HVAC filtration, made of non-woven materials. Konus Konex operates in more than 50 countries all over the world and offers a wide range of materials and filters. They offer the right material for one's requirements and adjust it to their wishes already in the stage of material production.

In accordance with the modern trends of ventilation and air conditioning of various facilities they produce materials and products for air purification. From simple to highly demanding, for various purposes and complexity of use. The production covers the field of manufacturing of filter materials from G3 to F9, as well as the production of finished products intended for installation.

They also offer synthetic, used in shoe industry for heel grip as well as for reinforcement in leather industry and for lining in belt production. Characteristics of synthetic leather are similar to natural leather in look and quality and are distinguished by high durability and use resistance. Synthetic leather is environment and health-friendly.

SPAIN

PEVASA is a company, based in Terrassa – Barcelona. They manufacture ECO-PA pressure tanks and housings for cartridge filters and bag filters. All tanks and housings are manufactured in polyamide 6 with internal recovery of polyethylene (own technology).

Tanks and housings are designed for 10 bar working pressure and can be used as water softener tanks, demineralisation tanks, sand filter housing, active carbon filter housing, mixed bed filter housing, high flow filters (HFU), microfiltration or ultrafiltration units.

The properties and robustness of polyamide tanks made it recommended also for hot water systems, and portable plants. The nature of polyamide used make their tanks environmentally green product, and are 100% recyclable.

The product mix of the company includes Model ECO-PA Series - Water Treatment Tanks; Eco-PA - PolyAmide Water Treatment Pressure Tanks; Eco-PA - Pressure Vessels; Eco-PA - Model Plus - Pressure Tanks for Water Treatment, etc.

To each of their tanks, dome openings, lateral opening, manholes, flanged or threaded connections can be used, allowing more than 1500 configurations which make their systems fit to any specific demand (tailor-made). The company has 35 years of experience and can deliver within 2 – 10 days to all over the world.

SWEDEN

World Ecological Forum is an independent international platform for addressing ecological concerns. Create global crossover networking between corporations, governments, non-governmental organisations, market areas, universities, and various institutions and organisations to influence strategic direction, future legislation, standards, regulations, and norms. Facilitate and market constructive and commercially viable ecological solutions and business applications.

The eco-municipality of Gotland, under the direct administration of the Swedish state, supports the organisation financially. It aims to: enable and promote innovation and collaboration for green business and thus sustainable development; analyse and communicate pertinent research results and act as a catalyst for interaction, new applications and crossover solutions; communicate pertinent research results and act as a catalyst for interaction, new applications and crossover solutions; initiate and support green business entrepreneurship; boost awareness for ecological issues, grass roots to decision makers; increase environmental and social awareness through an educational platform for students and other youth groups; support environmental protection activities to slow down climate change and to protect biodiversity; tackle humanitarian issues such as environmental refugees; boost climate strategy development to minimise emissions of greenhouse gases; consult and help implementing paradigm shifting change.

The World Ecological Forum vision is: 'To create environmental and economic balance in order to achieve sustainable growth, welfare and social justice for all.'

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