ENERGY TRANSITION
TOWN TWINNINGS

From Awareness to Action: Understanding Renewable Energy & Climate Solutions

Climate Change

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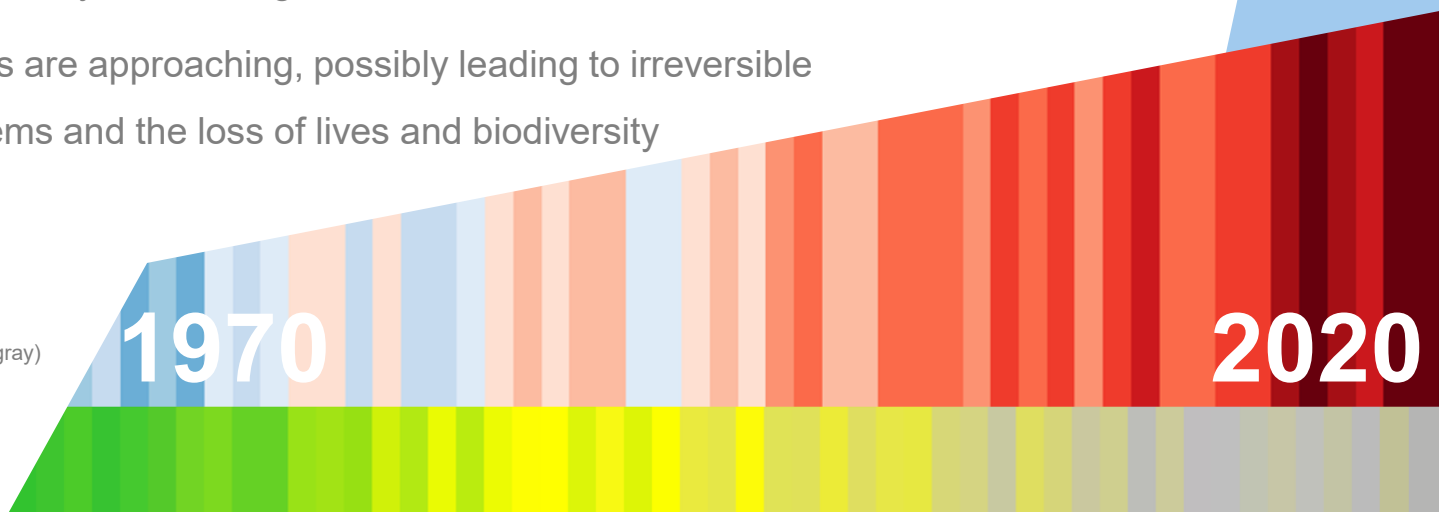
What Is Human-Made Climate Change?

- Scientists have been observing global warming for several decades
- The change is happening at an unprecedented speed, faster than any natural climate change in human history
- Greenhouse gases like CO_2 and methane, among others, accumulate in the atmosphere, trap heat and cause the planet to warm; what increases the frequency and intensity of extreme weather events
- Human activity, especially the burning of fossil fuels, is the main cause
- Critical tipping points are approaching, possibly leading to irreversible damage to ecosystems and the loss of lives and biodiversity



Global Warming (above: blue to red) and biodiversity loss (below: green to gray) 1970-2020

Climate Change

Observed Impacts

- Heatwaves, storms, and droughts are becoming more frequent and severe, they can trigger secondary hazards like wildfires and floods
- Sea levels are rising due to the melting of polar ice caps, threatening coastal regions worldwide
- Rising temperatures are causing biodiversity loss on land and in water; ocean acidification is endangering marine ecosystems
- Food and water security is declining, leading to increased poverty, malnutrition, diseases
- Weather-related events displaced 23.1 million people annually between 2010 and 2019, making millions more vulnerable to poverty

photo: © assets.science.nasa.gov

Climate Change

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Do you already have experiences like these in your community?

Climate Change

Conference of the Parties – COP

- Every year, members of the United Nations Framework Convention on Climate Change (UNFCCC) gather for the UN Climate Change Conference (Conference of the Parties – COP), to deal with global warming
- To avoid a climate catastrophe, scientists agree that global warming must stay below 2°C compared to pre-industrial levels
- 195 countries signed the Paris Agreement 2015 on keeping the rise of global temperature well below 2°C and pursuing efforts to limit the temperature increase even further to 1.5°C
- By 2024, the global temperature has already risen by 1.5°C

photo: © Mika Baumeister / unsplash

Renewable Energy

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Why Renewable Energy?

- It is an essential part of the global fight against climate change as extraction and usage of fossil resources are producing a large part of the global CO_2 emissions

Renewable Energy Types

- Photovoltaic uses the sun light to generate energy either in big solar power plants or decentralized e.g. on top of houses
- Onshore wind farms in the country-side and offshore turbines at sea provide wind energy
- Hydropower uses flowing water through rivers or dams to generate electricity

grafic: © Frederick Doerschem / istock

Renewable Energy

Renewable Energy Types

- Geothermal and environmental energy is won from the heat below the surface or the air
- Biomass energy is produced through burning organic material like wood or agricultural waste and can be turned into three types of bioenergy: heat, electricity, and transport fuels
- Another process, co-generation, produces electricity while using leftover heat for heating homes or industries
- Transport fuels, or biofuels, mostly come from energy crops, but newer biofuels made from waste and residues are also being developed

- Nuclear energy is not future-proof because of the dangerous radioactive garbage, dependence on authoritarian states, expensive subventions, and potential abuse
- Mining of uranium is not free of emissions

Renewable Energy

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How Renewable Power Can Heat Homes and Fuel Cars

- Sector coupling is important for making energy use more flexible. It connects sectors like electricity, heating and cooling, traffic, as well as industry and allows energy to be stored and used where it is needed
- Electricity can power heat pumps (power-to-heat), produce green gases like hydrogen (power-to-gas), or make fuels (power-to-fuel). Green hydrogen is produced by splitting water into hydrogen and oxygen using
- Green hydrogen is made by splitting water using electricity (electrolysis). It can be used in transport, heating, and power generation, but it is still costly to produce.

Renewable Energy

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Reasons for Renewable Energy

- Between 2010 and 2020, solar energy prices dropped by 85%, wind energy prices costs fell about 50%
- Burning fossil fuels causes $8 billion a day in health + economic damage (COP 24 report)
- Renewables could create up to 14 million jobs, and other energy-related industries could provide further 16 million. While about 5 million jobs in the fossil industry might be lost by 2030
- Fossil power plants waste up to 50% of their energy as heat, renewable electricity is more efficient
- Local renewable energy increases energy independence and supply security

photo: © Soonthorn Wongsaita / shutterstock

Renewable Energy

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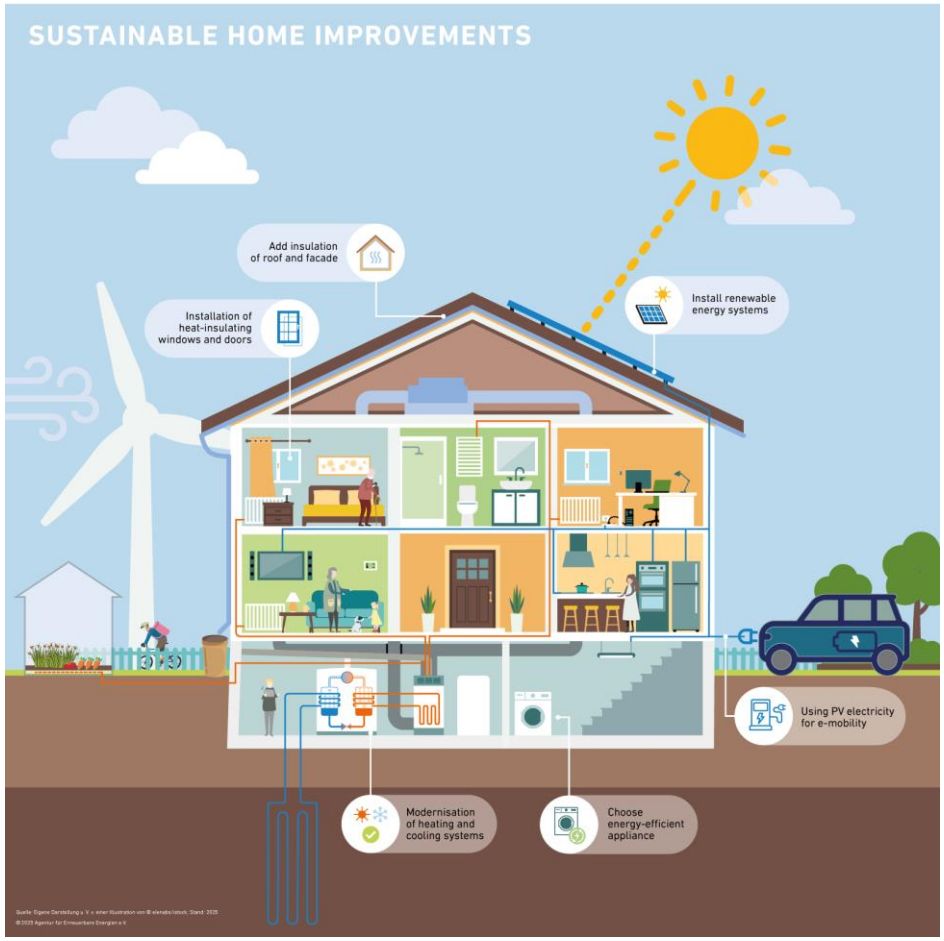
What Can You Do?

Energy Efficiency

Important and easy ways to reduce resources and costs in the consumption of **power and heating**



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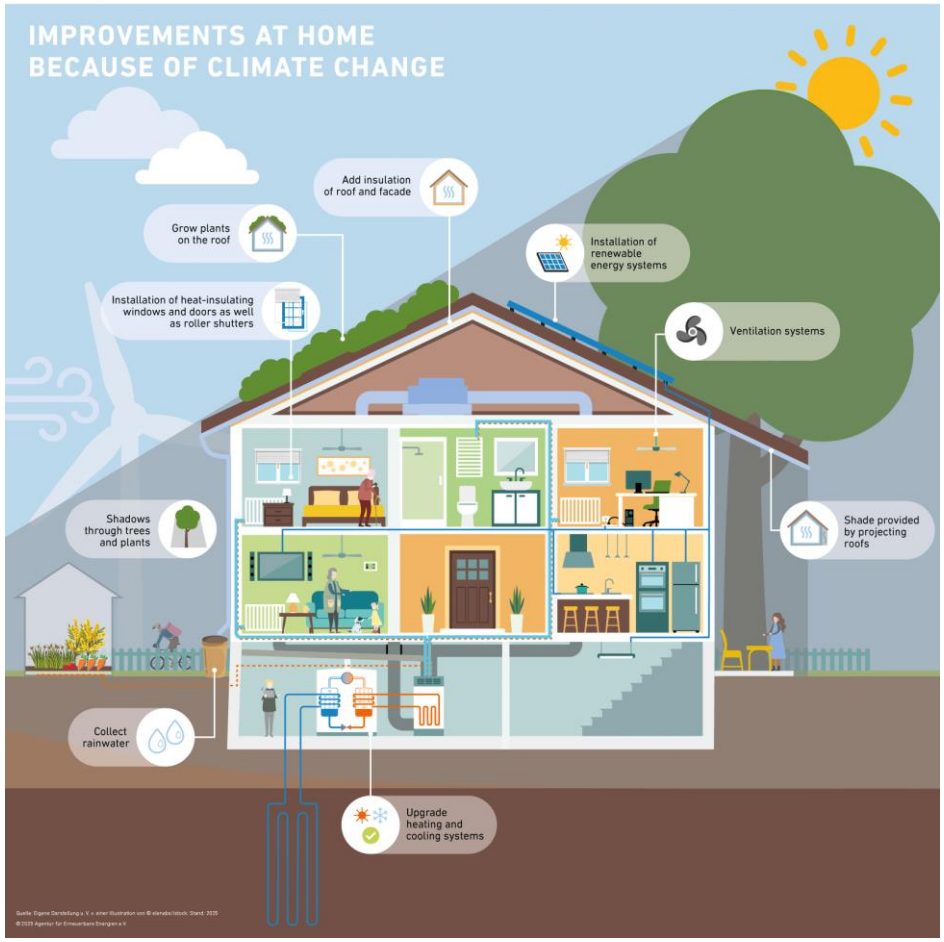
Energy Efficiency

Important and easy ways to reduce resources and costs in the consumption of **power and cooling**



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Energy-Efficient Refurbishment is:

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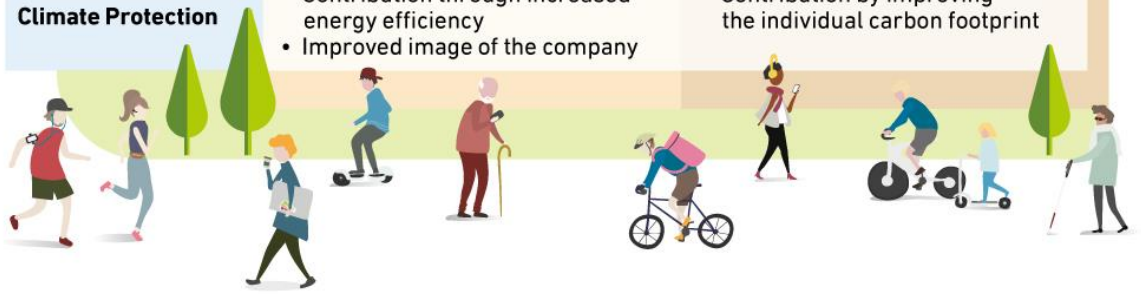
	From the Perspective of the ... Owner	Resident
Value Enhancement	• Increasing the property's value	• Higher prestige of the flat
Comfort Enhancement	• Improved lettability of the flat	• Increased thermal comfort • Better heat protection in summer if applicable
Health Protection	• Higher tenant satisfaction	• Health protection through better room climate and noise protection
Less Maintenance Effort	• Lower maintenance costs • Less tenant complaints • Lower fluctuation	• Less disruption to the building services • Less disruptions due to repairs
Climate-Resistant Buildings	• Less risk (compability with future standards e. g. regarding to climate protection) • Possibly higher creditworthiness or lower insurance premiums	• Protection against rising energy prices (e. g. due to CO_2 price) through lower heat demand
Climate Protection	• Contribution through increased energy efficiency • Improved image of the company	• Contribution by improving the individual carbon footprint



Local Perspective

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Ukraine

- The National Energy and Climate Plan (NECP) aims to cut greenhouse gas emissions by 35% by 2030 (compared to 1990), increase renewable energy to 27%, achieve climate neutrality by 2050, and phase out coal by 2035
- The full-scale Russian invasion of Ukraine has destroyed critical energy infrastructure causing energy shortages, high costs, and problems for industries like steel
- Post-war reconstruction will focus on renewable energy, as well as energy efficiency
- Ukraine's large agricultural sector offers great potentials to produce biomass
- Solar energy is key to meet climate and renewable energy targets

photo: © Raimond Spekking / Wiki

Local Perspective

Chernivtsi

- The city has an approved Sustainable Energy and Climate Action Plan as a strategic document that guides the municipality in its efforts to reduce energy consumption and CO_2 emissions by 2030
- The region has a high solar insolation rate, which makes it ideal for implementing projects using solar energy as a source of energy
- The city has already conducted the thermo-modernization of several old public buildings, improving energy efficiency and reducing energy consumption, and plans to continue this process

photo: © City of Chernivtsi

Local Perspective

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Chernivtsi

- Since the full-scale Russian invasion of Ukraine, the destruction of critical energy infrastructure has caused widespread energy outages in public and private buildings
- Chernivtsi focuses on ensuring a sustainable and autonomous energy supply as well as rebuilding renewable energy infrastructure
- The geographical location of Chernivtsi, in particular its proximity to the eastern borders of the EU, creates favorable conditions for development and European integration

photo: © City of Chernivtsi

Local Perspective

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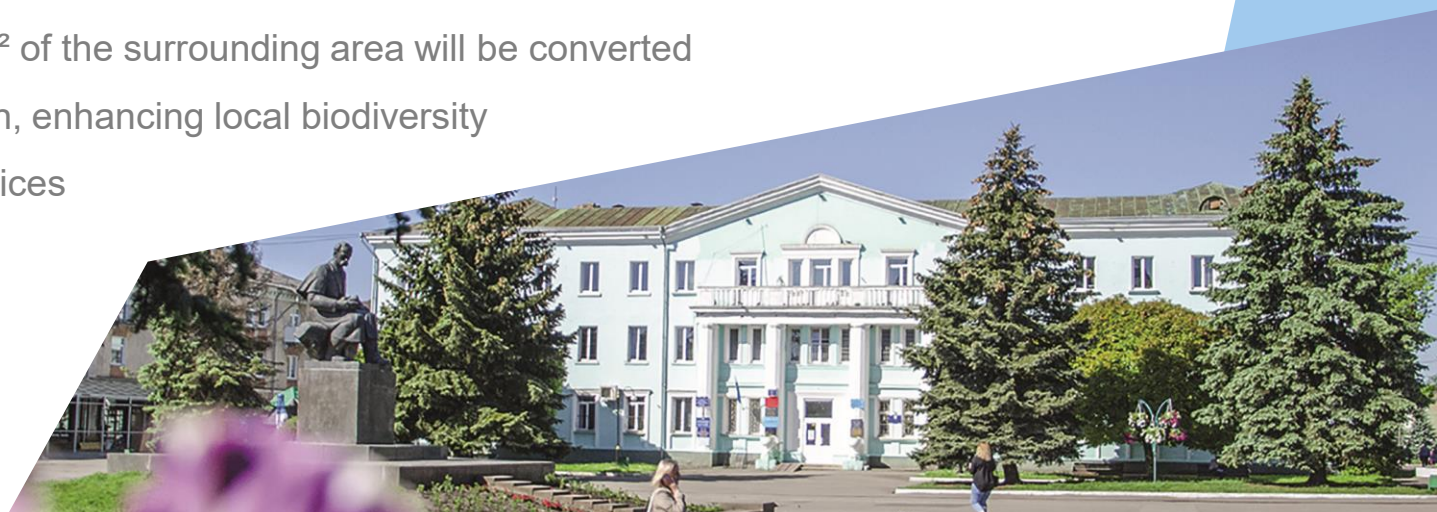
Novovolynsk

- Several projects such as: “Solar Panels at the Novo Business Support Centre”, “Hybrid Power Plant in the Maternity Ward”, or “Thermal Modernisation of Lyceum No. 7” have already been successfully implemented
- New project with GIZ: “Green Energy Complex: Eco-modernization of the Shakhtar Sports and Recreation Complex - Climate adaptation for sustainable development”
- The project wants to transform the façade of the Shakhtar Sports and Recreation Complex (SRC), covering 120 m², into a green wall
- An additional 427 m² of the surrounding area will be converted into an urban garden, enhancing local biodiversity and ecosystem services



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Local Perspective

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Novovolynsk

- Thermal modernization of 1,718 m² of the Shakhtar SRC will achieve annual energy savings of 73.7 MWh and financial savings of 386,600 UAH/year
- A 20 kW solar power plant and energy efficiency measures, will lead to an annual reduction of 102 tonnes of CO_2 emissions
- 900 kW of solar power plants at the critical infrastructure facilities of Vodokanal are planned
- A Sustainable Energy and Climate Action Plan has been developed
- Among goals by 2030 are the reduction of CO_2 emissions, and increase of the share of renewable energy sources

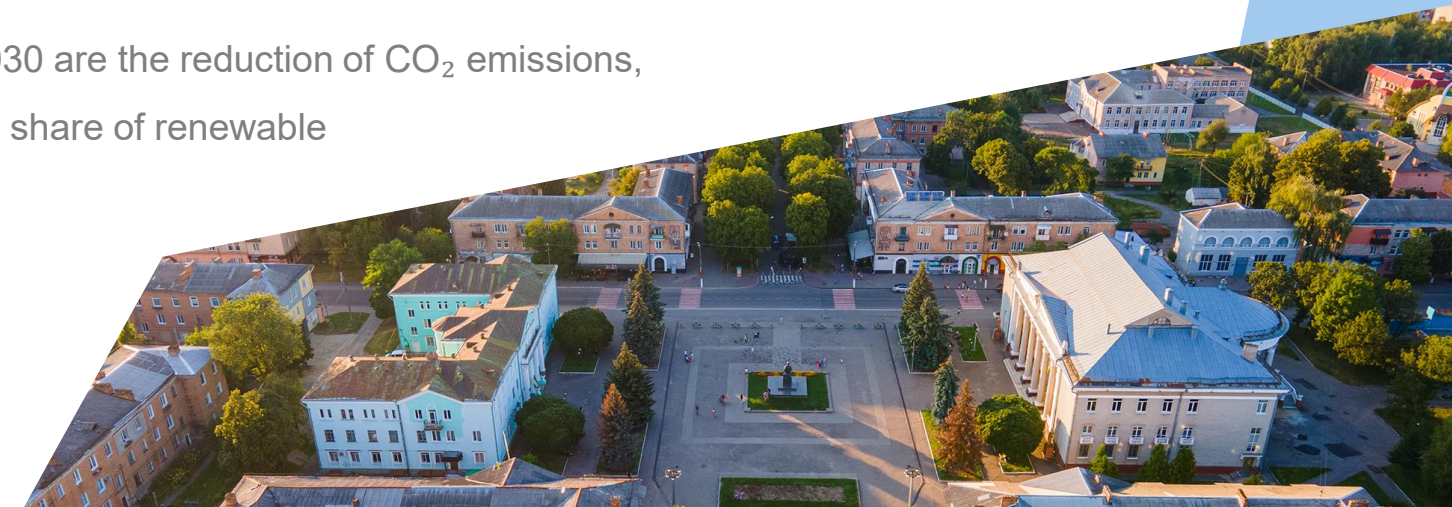

photo: © Myroslava Vlasiuk

Local Perspective

Bosnia and Herzegovina

- The National Energy and Climate Plan (NECP), is a chance to create a coherent and sustainable guideline for energy transition that aligns with the Paris Agreement and the Sofia Declaration of the Green Agenda for the Western Balkans
- Challenges are rising temperatures, extreme weather events, drought and water scarcity, hydropower dependency, and environmental degradation
- There is a remarkable potential in hydropower, biomass, wind, and photovoltaic
- The transition of the coal mining sector with thousands of workers is an important part of a sustainable and just transition
- Plans to focus on energy efficiency in buildings, industry transport, and the public sector

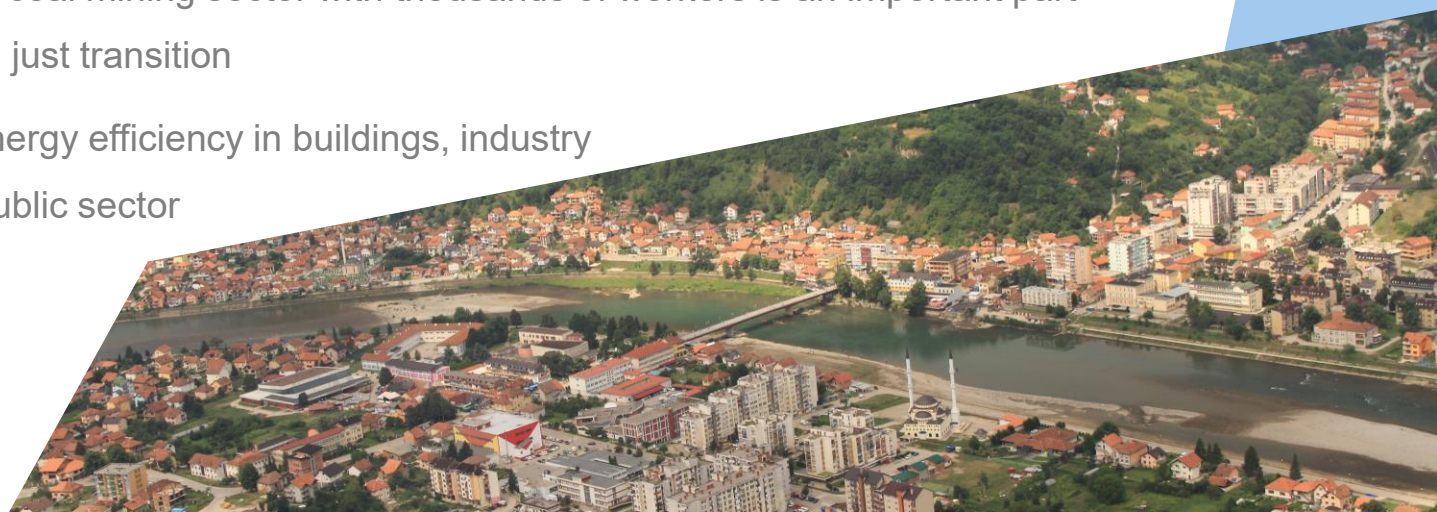

photo: © City of Goražde

Local Perspective

Goražde

- In 2010, the precipitation exceeded a 100-year record, causing floods in the Drina River Basin and Eastern Herzegovina; Goražde as well as other communities were inundated
- Goražde supports biodiversity, e.g. via associations like “Eko Habitat” and focuses on energy efficiency in buildings, as well as using renewable energy sources, such as small hydropower and solar energy, e.g. for an improved waste management
- Most of the population heats with firewood as there is no gas supply
- The Drina River provides significant opportunities for sustainable development initiatives
- The goal is to balance economic development with environmental protection, including promoting green energy projects

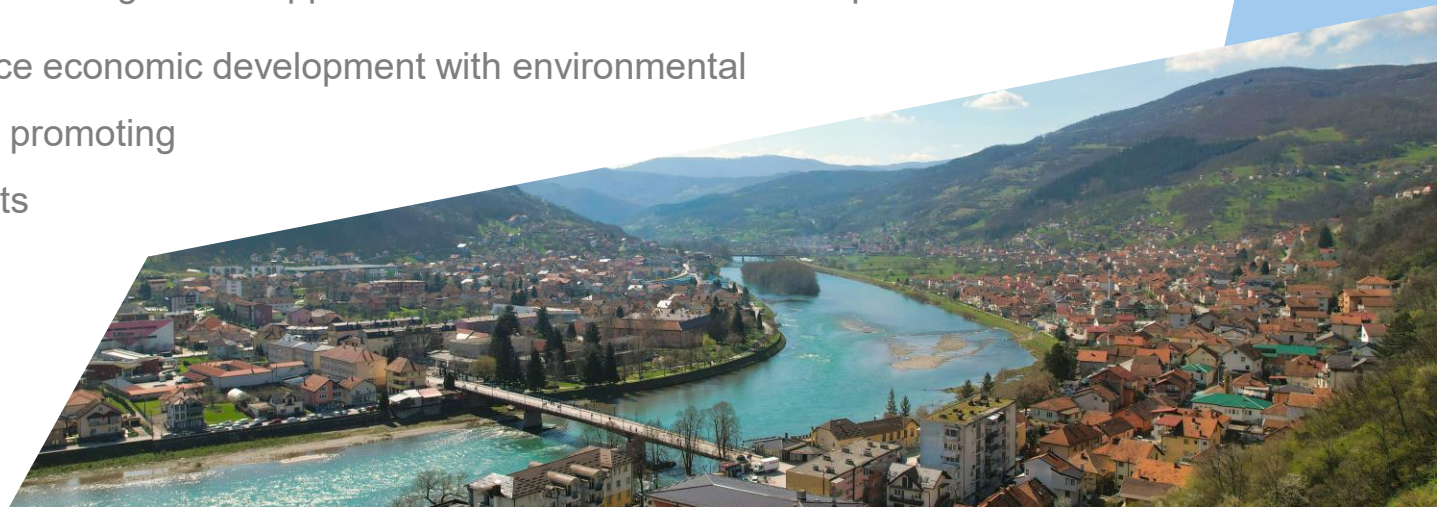

photo: © Markus Spiske/pexels

Local Perspective

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Republic of Moldova

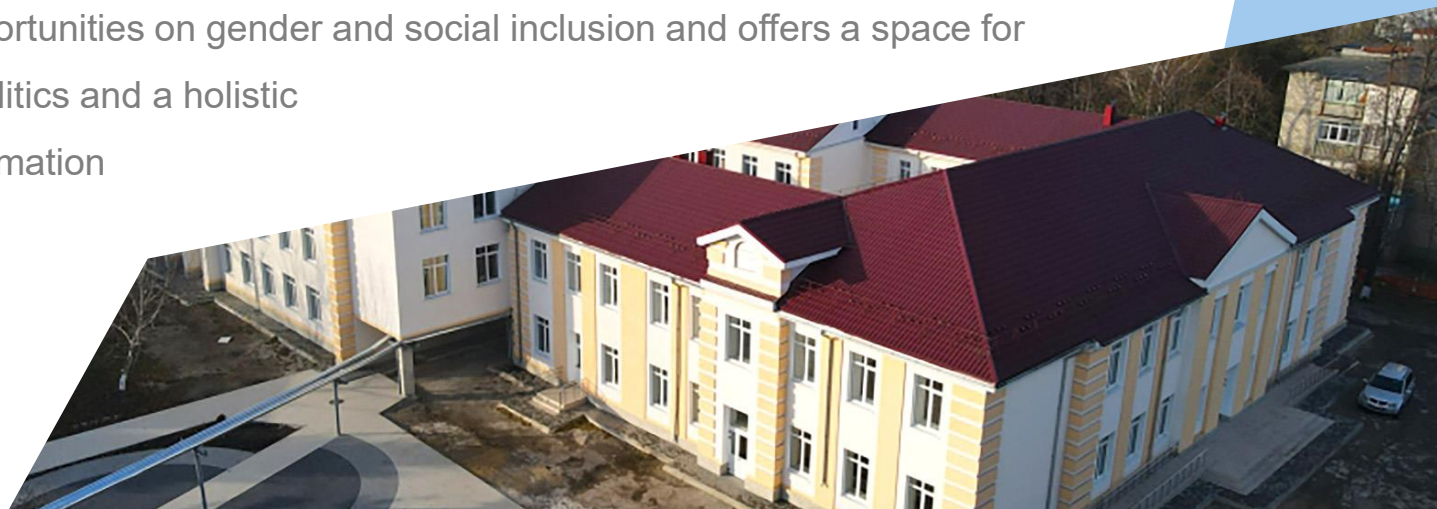
- Droughts are already a big problem in Moldova and climate change will make it worse
- Buildings account for more than 50% of the energy consumption and 45% of Moldova's energy is consumed in households, whereas only 15% in industry. In 2023, only 6% of the energy came from renewables
- Since the beginning of the full-scale Russian invasion of Ukraine, gas prices have strongly increased, → independence from imports of fossil fuels is important for self-sufficiency
- As part of the Integrated Energy and Climate Plan, Moldova plans to increase renewable energy up to 30% in 2030
- Net zero emissions should be reached by 2050

photo: © Balti City Hall

Local Perspective

Bălți

- 400 public buildings consume 35% of the local energy requirement (10% of the national energy requirement)
- The city's Green City Action Plan (GCAP) is a solid ground to improve seven sectors (land use, transport, water/wastewater, waste management, energy, buildings, and industry) with four main goals: reducing pollution and improving public health, scaling up clean and affordable energy, mainstreaming community- and knowledge-based development, and investing in resource efficiency and circular economy
- GCAP includes opportunities on gender and social inclusion and offers a space for feminist (foreign) politics and a holistic sustainable transformation



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