

CLIMATE AND ENERGY TRANSITION

The study was prepared as part of the project "Visions, innovations and initiatives of Baltic youth for the Green Deal in local communities" implemented by PKE Pomeranian District as the leader and co-financed by the Project Support Facility (PSF) of the Council of the Baltic Sea States (CBSS).

As assumed in the project, the basis for the young people in taking initiatives and innovations in their local environment should be multidisciplinary knowledge on the European Green Deal strategy. It's been divided into four modules, corresponding roughly to the policy fields to which this strategy is addressed. The following study aims to approximate the scope of the field defined by the title.

1. INTRODUCTION AND DEFINITIONS

The basic human need is the appropriate local climate and the microclimate of the housing estate (urban interiors) and the buildings interiors. People are able to adapt to some features of the local climate and their changes (through clothing, buildings), but such rapid climate changes that are taking place at the turn of the 20th and 21st centuries (and are forecasted for the years to come) give rise to negative consequences on a large scale - in some regions of the world even posing a threat to human existence. *Climate change* and actions limiting its causes on the side of man and adaptation activities to changes and effects that cannot be avoided are considered to be among the main challenges of modern civilization.

Climate is the totality of physical factors that characterise the state of the atmosphere over a long period of time: air temperature and pressure, its composition (including water vapour and pollutants emitted into the atmosphere), as well as air mass movements and atmospheric precipitation. The active factor is the incoming energy of solar radiation (insolation). Of course, the geographical location (in the Earth's or country's climate zone) is of fundamental importance for climate characteristics, but the type of landscape is also strongly influencing the climate, especially such elements as: height and relief of a given area, existing surface water, vegetation cover, and buildings. The climate is shaped by circulation in a macro scale level (e.g. continent, country) but also on the scale of regions and localities (e.g. cities).

The second term in the title is energy transition – the main direction of actions to reduce the causes of contemporary global climate change. It means profound changes in the use of energy, leading to a radical reduction or even elimination of the combustion of energy resources and the production of carbon dioxide in these processes. It means a *transition* to the maximum use of renewable energy sources and, as a priority, the improvement of all energy processes so that the input of externally supplied energy is as low as possible. It refers to all energy expenditures in various phases of the "life cycle", including those related to, for example, the manufacturing and installation of good thermal insulation of the building or the production of household appliances or equipment, including, for example, an electric car and its batteries.

2. THE MAIN CAUSES OF CLIMATE CHANGE AND THEIR EFFECTS

The main cause of climate change is excessive emissions of CO₂ and several other so-called greenhouse gases. Some of these gases also come from natural sources and, together with those from energy sources, are assimilated ("absorbed") by the living environment or emitted to the atmosphere without causing any harm to the climate system. However, during the 20th century and today, there have been large emissions related to human activities that cannot be absorbed and are increasingly concentrated in the atmosphere. The resulting balance of CO₂ (and, for example, methane from waste and agricultural production) means that the so-called "greenhouse effect", which has been stable and beneficial so far, is amplified and the Earth's temperature is rising in a way that is difficult to control, and it is not only the "average" annual temperature that's matter, but the occurrence of extreme temperatures in certain regions of the world and for longer and longer periods.

The main effects of climate change are currently occurring (and predicted to be more and more dangerous) phenomena such as: heat waves, soil droughts, heavy rains and flash floods, cyclones and tornadoes, etc. On a global scale, they entail many thousands of human victims (deaths and diseases) as well as material and ecological losses, e.g. to biodiversity, ecosystems, as well as food production. In addition to the pollution of the environment by the "by-products" of civilisation, this is the greatest challenge for the whole world (*global challenge*), especially in the most vulnerable regions, where – due to the overlap of other factors – the problems of resource wars and human migration to other regions will grow.

3. WHY THE GREEN DEAL AND THE ENERGY TRANSITION?

Globally, greenhouse gas emissions have not yet been significantly reduced. That's why the Paris Agreements (of 2015) motivated the European Union to adopt a more radical strategy with a name of European Green Deal referring to the known from US Green Deal (and in the 1930s - the New Deal). Its *overarching* goal is to achieve climate neutrality by 2050, and the main component are the measures for energy transition. It means a process of deep modification of the energy economy into a highly efficient one that is completely free of burning fossil fuels. It should be carried out both on the part of energy suppliers and its end users, including households and individual citizens. This means full inclusiveness – it should be fair and should leave no one behind.



4. HOW THE EUROPEAN GREEN DEAL SUPPORTS THE ENERGY TRANSITION

Formally, the European Green Deal (EGD for *short*) is an EU package of legal regulations and guidelines addressed to many areas of the economy and public life. The fundamentals are covered by the Climate Law of the European Union. With regard to the directions of the energy transition, detailed regulations establish three directives on: (1) the general framework for the energy efficient processes and products, (2) the required energy performance of buildings and (3) on the promotion of renewable energy sources. The objectives set out in them concern quite long periods of time - the horizon of 2040 and 2050. However, it depends on the legislation of individual countries at what pace and in what way these directions will be implemented. First of all, those defined by the European Union's document on goals and actions to be achieved in the next 6 years, by 2030, and known as "Fit for 55", because it concerns the reduction of the annual level of CO₂ emissions by 55% net (i.e. after deducting absorbed emissions) compared to the emissions from 1990.


However, EGD is not only a political strategy, but also a **program vision** addressed to all communities and citizens, in principle motivating them (by a beneficial "deal") to engage in gradual and multidirectional actions to achieve the ambitious goal of climate neutrality, including through energy transition - a significant reduction in energy demand and the extended use of renewable energy, e.g. solar.

It is worth noting that the issues of climate and energy transition - a radical change in the use of energy, its generation, etc. is strongly linked to the other three main areas of the EGD strategy that we have described, concerning:

- Circular economy, primarily of industrial products, with high energy and ecological quality measured by the so-called "carbon footprint" and their durability (time of remaining in circulation),
- The development of cities (and other human settlements) with a balanced structure guaranteeing easy access to services (without the need to use individual motor transport) and the spatial symbiosis with nature,
- Biodiversity of nature complexes (including forests and urban greenery) ensuring a high level of ecosystem services (e.g. in terms of climate-forming function and reducing energy demand) and, in the case of agroecosystems, ensuring food security (in terms of quantity and quality) and so to reduce the food waste, on the other hand.

5. HOW YOU CAN MITIGATE THE CO₂ EMISSION AND ITS IMPACTS IN CLIMATE

The CO₂ emissions come mainly from the combustion of fossil fuels for energy purposes, and methane from the storage of biogenic waste and from livestock production. Thus, it might be obvious that the scope of these processes could be influenced by your fundamental life-long decisions (e.g. regarding the purchase of an apartment or the construction of a house) and everyday choices regarding the volume of energy and domestic water used, the consumer purchases (resulting in "production" of waste). When it comes to food, the key aspect is the



volume of meat consumption and all highly processed products, especially those requiring transport from distant regions.

In terms of energy needs in a strict sense, an important part of them concerns the energy used for heating (and cooling) our houses and apartments, heating domestic water and the energy we use for mobility, etc. **According to international statistics, more than 50% of all energy consumed in Poland is used¹ for these needs alone!** In the light of management sciences and knowledge of modern technology, *about 2/3* of this energy is an unjustified waste, so we can see how much depends on us.

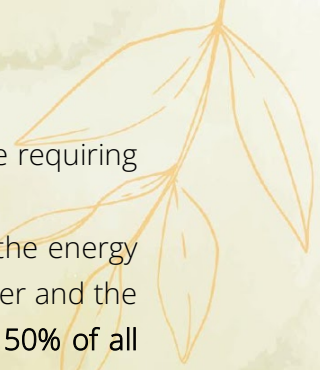
The field of possible actions concerns our "life-long" decisions, e.g. the choice of a place of residence, the size and type of apartment (or house), or the purchase of a means of transport, but also many everyday decisions and habitual consumption behaviors, which could be based on a re-evaluation of needs and a change in lifestyle to a more "green" one (some of them just as a more consistent application of the already known rules).

Many practical tips on beneficial changes in one's environment in order to reduce energy consumption, especially from non-renewable, emission-intensive sources, can be found on the websites of the Ministries of Climate and Environment or National Education and local government administration, as well as portals of non-governmental organisations, including PKE OP such as EkoAgora. Some directions of preferred behaviour changes are also indicated by our partner AirClim².

Counteracting negative climate change (CO₂ mitigation) and limiting the negative effects through the adaptation processes is the subject of local Climate Adaptation Strategies. Every country and almost every local government unit develops such a strategy. In addition, municipalities are obliged to develop documents called: The assumptions for heat and energy supply plans and Environmental Protection Programs. Regardless of the individual decisions and methods of adaptation - it is worth getting involved with your ideas at the stage of creation and consultation of the above-mentioned studies.

¹ www.iea.org/countries/poland/emissions

² www.airclim.org/do-your-bit





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