



” The eco-city conception

Karol Kacprzak

Maintenance and Development Junior Specialist

AMRON CENTRE ANALYSIS

November 2, 2021





Cities cover only 2% of the Earth's surface, but they have a significant impact on the climate crisis. They generate about 70% of the world's greenhouse gas emissions and have a large potential to gradually reduce this high number. Today, more than half of humanity lives in cities. This number is constantly growing - according to UN forecasts, by 2050 68% of the world's population will live in cities, areas that are very vulnerable to the effects of climate change. The environmental impact will also increase. City dwellers will increasingly experience the effects of global warming in the form of extreme weather events such as violent storms, heavy downpours, very strong winds or high temperatures, which will have an impact on the socio-economic situation. On one hand, cities contribute to amplifying the climate crisis, while on the other, due to their high density of population, construction and infrastructure, they are highly exposed to its effects. The application of appropriate solutions and proper management of the urban tissue, mainly in the area of energy efficiency, waste management, sustainable transport and urban greenery management, can reverse this trend. Polish city authorities face a difficult challenge - it is necessary to undertake activities limiting the development of the climate crisis and adaptive activities in order to prepare the cities to changes that are its consequences. In connection with the desire to transform cities into places more bearable to live in and closer to nature, ideas and concepts arise - one of them is the ecological city conception.

ECOLOGICAL CITY – DEFINITIONS

Due to the multidimensionality of the concept, the definition of an eco-city is not uniform. The origins of the concept and models can be found in Ebenezer Howard's idea of a garden city, which resulted from, among other things, paying more attention to the hygiene of urban life and consisted in creating a network of cities with a central unit, characterised by a high proportion of green areas and loose buildings, interconnected by a railroad line, thanks to which the distance between the centre and satellite towns could be covered relatively quickly. The concept of the layout of the cities with the central unit guaranteed the efficient functioning of the whole establishment, and thanks to the large green areas, it provided an opportunity for city dwellers to relax close to nature.

The ecological attitude in the field of architecture and urban planning has been popular for several years and the idea of creating environmentally friendly cities, in other words those which thanks to modern technological possibilities move towards maximum energy efficiency, has been created. The definition of an eco-city has been formulated, among others, by the Ecocity Builders organization, according to which an eco-city provides a healthy environment for its residents, without using more resources than produced, reusing treated sewage and water, without producing more waste than can be absorbed, with proper segregation and utilisation, and without toxic inhabitants' activities towards themselves and their neighbourhood. The urban greenery is also an important aspect. Currently, it is difficult to indicate a city that would meet all the requirements, however there are more and more cities that are getting closer to this definition. The idea of ZERO-E cities (zero-emission cities) aiming at zero CO₂ production is discussed more and more often. An example is the planned futuristic NEOM urban complex in Saudi Arabia.



ASSUMPTIONS OF AN ECOLOGICAL CITY

There are specific principles to follow when designing an ecological city. The basic principle and goal is to provide residents with the best possible conditions for living in the city. The expression "ecological" is often used interchangeably with the word "green" - that is why it is so important when organizing urban space to make it rich in green areas. With the growing effects of climate change, eco-friendly investments in the form of squares, boulevards and parks are becoming more and more popular - plants have the function of filtering the air from the excess of carbon dioxide, and due to the fact that they provide shade, they protect residents from the heat and surface heating. In addition, during heavy downpours, the soil in which the plants are planted has a greater capacity to absorb water, which translates into increased efficiency of sewer manholes. In addition to traditionally planted plants, a new trend has emerged, so-called vertical gardens, for example on the walls of buildings.

PHOTO 1. THE HALLES D'AVIGNON SHOPPING ARCADE IN AVIGNON, DESIGNED BY PATRICK BLANC



Source: Ogrodosfera.pl

One of the very important branches of eco-cities are investments in eco-transport, which favour the dominance of urban public transport, cycling and walking, with a reduction in individual transport. Solutions based on systematic restriction of individual transport in central parts of the city through provisions in local spatial development plans, obstructed parking or traffic bans, are becoming more and more popular. Public transport (especially with electric or hybrid drive using renewable energy sources), as well as cycling and walking are becoming priorities. Therefore, infrastructure related to these modes of transport should be treated as key and developed in a rational way. The shift away from car to public/ bicycle/ pedestrian transport gives a chance for changes in the emission of pollutants, as well as in shaping of public spaces. "Park and ride" zones are also an efficient solution, in other words an integrated system allowing to park a car near a bus/ tram/ metro station and to continue a journey by public transport.



Reducing the use of individual transport is also supported by another basic principle of eco-city idea – a compact city. It becomes pointless and unprofitable to move around the city by car if the pedestrian infrastructure is very well developed in central zones, distances are short, and neighbourhoods in intermediate and peripheral zones are well connected by public transport and cycling. Organizing development in a compact way also directly contributes to increased energy efficiency, because it reduces human interference with the environment and pollutant emissions. It should be emphasized that the goal is to increase the quality of life of urban residents, so minimizing built-up space should be done in a sensible manner. In addition to compact development, self-sufficiency and diversity of functions to meet basic needs should also be kept in mind. The coronavirus pandemic also had an indirect influence on the development of this concept. Residents did most of their errands close to home or online, which was associated with an increase in the importance of the immediate neighbourhood and pressure to buy or rent a larger house. In the near future, this may translate into the development of local services, resulting in a reduction in the need to travel long distances.

A frequent pro-ecological practice to maintain compactness of development is the "recycling" of brownfield or degraded land, which is most often located in the central zones of cities. Abandoned/ unused buildings are adapted for housing, services, culture or other city-forming investments. Apart from preventing urban sprawl, the advantages of such a solution are, among others, the buildings' access to the existing urban infrastructure, developed public transport and limited expansion of the road network. This is an approach that fits in with the 'zero waste' trend - buildings that are not in use, but have a durable structure, should be revitalised. Demolishing and building new facilities to replace old ones leads to increased waste production, which is inconsistent with an environmentally friendly attitude. Renewable energy sources are not only popular in transport – more and more often, such solutions are used in buildings that obtain energy from natural sources and are equipped with, for example, heat pumps and photovoltaic panels. This is very important in the context of maintaining the principle of covering energy needs with renewable energy sources.

An effective system of waste segregation and disposal is also a very important determinant of an eco-city. Actions in this regard should be taken at many levels, starting with educational programs for residents and ending with a well-developed urban infrastructure. Efforts should be made to minimize the production of waste and sewage, while the waste created should be recycled while obtaining biogas and compost.

EXAMPLES OF POLISH CITIES FOLLOWING THE ECO-CITY PRINCIPLES

Many Polish cities still have environmental problems, although there are a few examples that set standards for others and become an inspiration for other local governments. In the seventh edition of the Eco-city project several cities were awarded. The project is run by the French Embassy in Poland and the UNEP/GRID-Warsaw Centre, co-organised by Teraz Środowisko (Now Environment), the main objective of which is to exchange experiences between cities and promote best solutions.



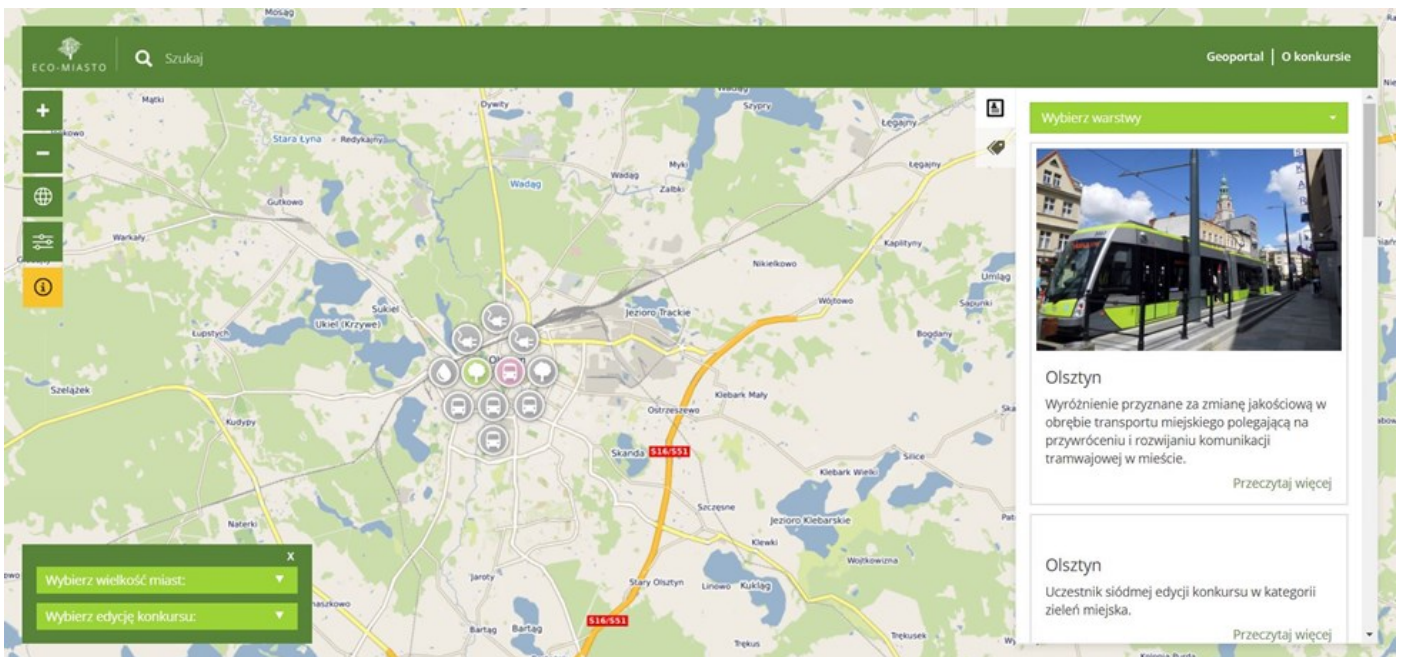
One of the examples is Słupsk, where the local authorities have enriched neglected backyards located near multi-family buildings with greenery matching the surroundings in form of lawns or trees. The spaces were also equipped with street furniture supporting social integration, LED lighting and monitoring. The introduction of changes had a positive impact in the form of the possibility to use rainwater, thanks to the installation of a rainwater reservoir. More greenery also contributed to air quality.

The city that was awarded in the project is also Gdynia, where the local government has introduced solutions to manage energy consumption in public buildings. Since 2017, the city has an InvisoLite energy consumption system that monitors around 450 buildings. The application allows for collection of information on electricity, gas and district heat consumption, what is more - it allows to detect and quickly react to losses and excessive energy consumption. Thanks to this solution, carbon dioxide emissions into the atmosphere have been reduced.

The Olsztyn municipal authorities have done a great job of expanding the public transport system. After 50 years trams returned to Olsztyn - the city restored a seven-kilometre long tram line with three branches and bought 15 trams. To ensure the comfort of the residents, the local government also built sidewalks and bike paths to allow efficient and convenient access to the bus stops. Due to the development of a sustainable transport system, air pollution and fumes emissions have been reduced in Olsztyn.

An interesting tool is the Eco-City Geoportal (www.mapa.eco-miasto.pl). It is an interactive map which shows the location of the best ecological solutions. It is a collection of good practices from Polish cities in the scope of implementing ecological changes which can be an inspiration for others.

PHOTO 2. ECO-CITY GEOPORTAL

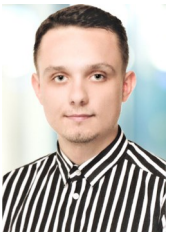


Source: www.mapa.eco-miasto.pl



SUMMARY

The negative effects of climate change contribute to the popularization of the idea of ecological cities. Progressive environmental pollution affects the quality of life in cities, so moving towards eco-cities seems to be a very rational approach. Transforming cities from their current form into ecological, referring to the "zero waste" concept, is a very time-consuming challenge, although it is necessary to plan and implement concepts according to this idea as soon as possible. In addition to the expansion and protection of green spaces, research and modern technology make it possible to apply pro-ecological solutions. Thoughtful and sensible spatial policy is also an important aspect, because it has a direct impact on the quality of life of all residents.



KAROL KACPRZAK

Maintenance and Development Junior Specialist

e-mail: karol.kacprzak@amron.pl

AMRON Centre

AMRON Centre is a professional analytical and research center, specializing in issues relating to the real estate market analysis and monitoring. Since over 10 years we provide our clients and partners with reliable information on real estate market, we explain phenomena recorded on that market and we assure the access to dependable economic information. Our expertise and experience covers assessing the influence of transaction prices changes on Polish housing market perspectives – as the only market researches provider, we analyze changes on housing loans market, due to access to the data gathered in System for Analysis of Real Estate Financing Market (SARFiN System). Unlike publications of other housing market consulting companies, our reports express the actual picture of the market, based on transaction prices. We guarantee comprehensive approach to the real estate market issues, including the complex analyses of micro- and macroeconomic factors and long-term perspective grounded on historic data, current market prices and prognoses.

LEGAL NOTE

AMRON Centre states that the Report was prepared with due diligence in purpose to assure the accuracy of the presented information. Nevertheless, AMRON Centre reserves that the Report shall be of a general nature and may not be concerned as advisory service or any kind of service. AMRON Centre shall not bear responsibility for any consequences of using the information included in the Report, in particular any consequences of decisions or actions undertaken or abandoned on the basis of included information.

Contents of the Reports is legally protected due to the regulations of Act on copyrights and other related rights and use of it entirely or in part requires a disclosure on presented data source.

AMRON Centre acts in the name of and on behalf of Polish Banks Association, owner of the AMRON System.