

2. Climate Change: Adaptation

Refer to Section 2.2 of the Guidance Note

2A. Present Situation

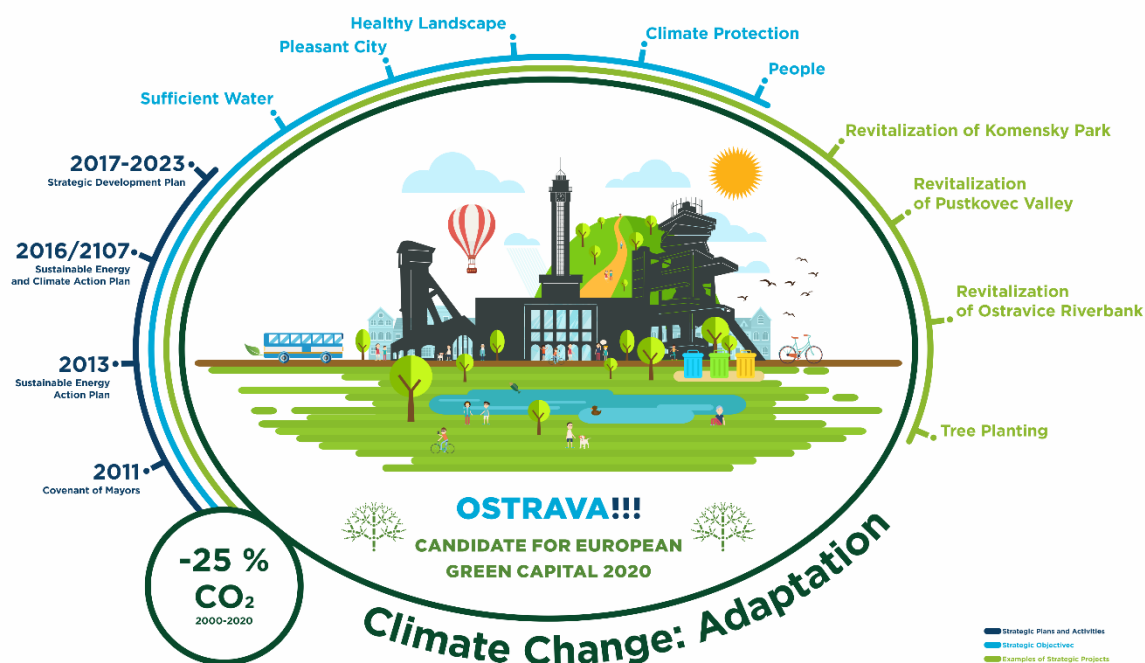


Image 1: Summary of Plans, Key Objectives and Example Projects in Adaptation

Ostrava is one of the first Czech cities to have drawn up a Climate Change Adaptation Strategy addressing the risks and impacts of climate change (“Adaptation Strategy”); this follows on from previous mitigation-related activities and projects (membership of the Covenant of Mayors, the City’s SEAP/SECAP, Smarter City activities). The creation and implementation of the Adaptation Strategy is one of the key activities in the Ostrava City Strategic Development Plan 2017–2023. All it began in 2016, involving experts from the academic sphere (University of Ostrava) and other expert institutions (Czech Academy of Sciences - CzechGlobe, Czech Hydrometeorological Institute, etc.).

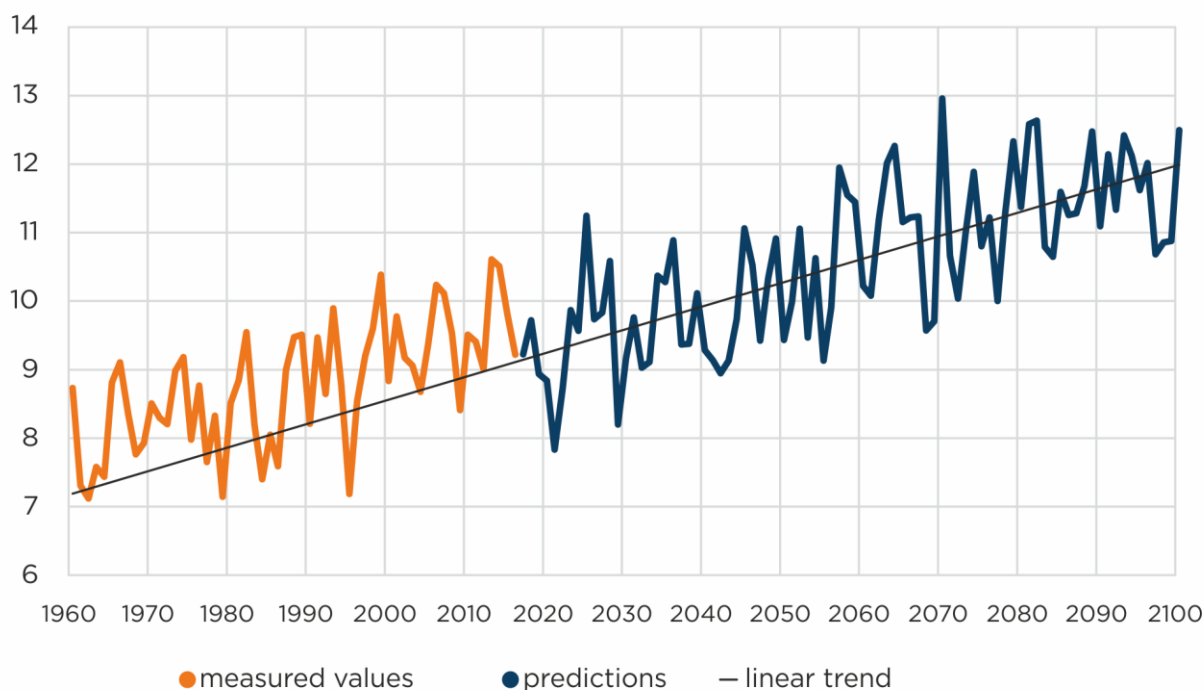
The Adaptation Strategy consists of two parts – analysis and proposals. The analytical part contains a detailed description of possible climate change scenarios for Ostrava (see Graph 1) including an evaluation of the risks associated with the predicted changes (Table 1). It also evaluates the phenomenon of heat islands within the city, identifying local climate zones which depend on the type of buildings, greenery and other parameters. Climate characteristics are then assessed in the context of socio-economic indicators and trends; this enables a more detailed identification of problem locations in the city, depicted in the vulnerability map (Figure 1) which is one of the outputs that form a basis for the proposed measures.

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The Adaptation Strategy is based on the City's vision, which sets out 5 strategic goals for adaptation to climate change (see Future, tab. 2)

Each of these strategic goals incorporates individual measures (Table 2) which should eliminate or significantly reduce the risks identified.

In addition to this key activity, Ostrava is involved in the implementation of the Horizon 2020 programme 'The Pan-European Urban Climate Service', which processes the best available scientific climate data and presents the data in a comprehensible form for use in spatial planning, helping end users (in both the public and private sectors) to address the consequences of climate change on a local level. The project involves a total of 14 partners from 6 European countries. For the City of Ostrava, the project is useful not only in terms of strengthening cooperation with partners, but also due to its use of a mathematical model of temperature changes in the city and as a basis for monitoring indicators of climate change impacts.



Graph 1: Observed and predicted mean annual temperatures in Ostrava (°C) 1961–2100.

Area	Main problems and risks
Forests	Risk to spruce populations – deteriorating health, pest damage, meteorological phenomena
Agricultural land	Erosion and degradation of agricultural land due to torrential rain Drought – depletion of water sources, reduced surface water quality, lack of water for agricultural use
Transport	Transport as a source of greenhouse gases

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	Overheating in vehicles
Buildings and energy	<p>Heating as a source of greenhouse gases</p> <p>Deterioration of living conditions due to high temperatures and heatwaves – deterioration of public health</p> <p>Buildings as part of the urban environment – heat sources, surfaced ground, rainwater wastage – drought</p>
Health and hygiene	<p>Threats to public health due to high temperatures and heatwaves</p> <p>Deterioration of air quality in summer – dust, ozone</p>
Greenery and biodiversity	<p>Reduced access to greenery at some locations</p> <p>Deterioration of landscape ecostability</p>
Water management	<p>More frequent occurrence of torrential rain and flooding</p> <p>Longer and more frequent droughts – lack of water, deterioration of water quality</p>

Table 1: Problems and risks associated with climate change impact in Ostrava

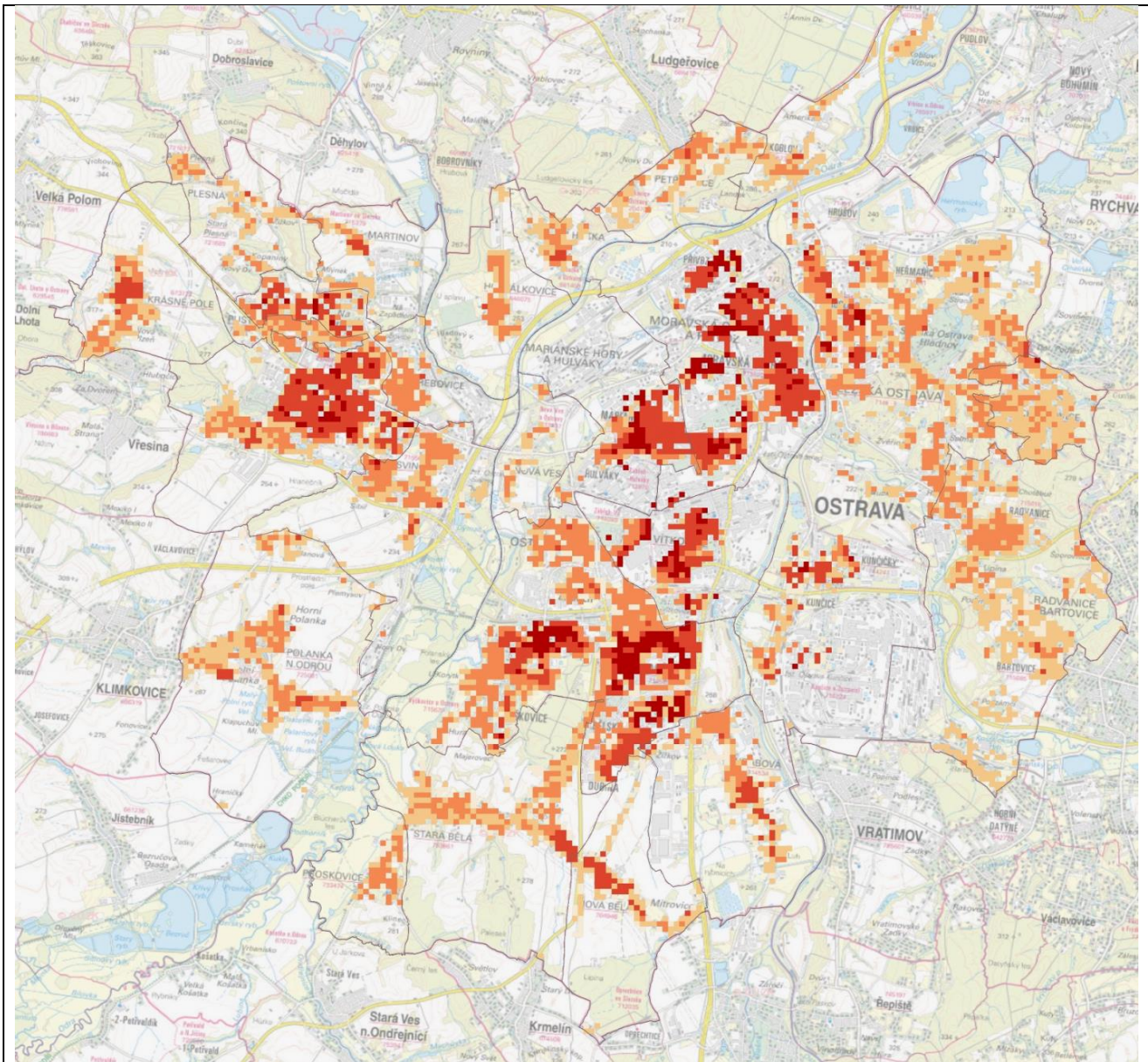


Figure 1: Vulnerability map

The vulnerability map of Ostrava is one of the outputs of the City's Adaptation Strategy, and it enables adaptation measures to be targeted at key locations according to the intensity of climate change impacts and the expected response of the urban ecosystem.

2B. Past Performance

Adapting to climate change is not an entirely new topic for Ostrava, though the city (like other Czech cities) has only recently begun to address this issue in a systematic manner. In 2011 Ostrava became the first Czech city to join the Covenant of Mayors. The purpose of this initiative is to help coordinate members' implementation of specific selected projects bringing reductions in CO₂ (greenhouse gas) emissions and improving quality of life for citizens. By joining the Covenant, Ostrava accepted a commitment to draw up a

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Sustainable Energy Action Plan (SEAP), which includes:

- benchmarking of greenhouse gas emissions and plans for specific activities and measures to reduce greenhouse gases, including a long-term vision up to 2030;
- a commitment to reduce CO₂ emissions.

The SEAP was drawn up in 2013 and updated in 2016. In 2017, the City of Ostrava – working in conjunction with experts – produced an updated version of its action plan with a stronger emphasis on climate-related issues (SECAP – Sustainable Energy and Climate Action Plan).

The City has also addressed the need for climate change adaptation via the Ostrava City Strategic Development Plan 2017–2023 (drawn up in 2016). Adaptation forms part of Strategic Goal no. 7, which commits the City to respond to predicted climate change and implement appropriate adaptation strategies.

Examples of adaptation measures implemented in Ostrava



Image 2: Green roof – World of Science, Lower Vitkovice area (www.zelenestrechy.info)



Image 3: Support to urban gardening and food production – Community Garden „Markt Place“



Image 4: Parking lots with soaking surface – Ostrava-Poruba



Image 5: Drinking water at the main Ostrava square (Masaryk square) (www.moravskoslezsky.denik.cz)



Image 6: Municipal forest park Bělský les (www.lesopark-ostrava.cz)

Ostrava organized the 6th Ministerial Conference of the World Health Organization in June 2017, when Ostrava and the Moravian-Silesian Region hosted a great range of events related to health and the environment, taking into consideration also negative impacts of climate change to public health. Accompanying programme – Health Week – took place at different locations throughout the city and the

region, offering a wonderful mix of education and entertainment for free.

2C. Future Plans

Key measures addressing adaptation to climate change are set out in the Ostrava City Strategic Development Plan 2017–2023 and elaborated in a detailed list of activities forming part of Ostrava's Climate Change Adaptation Strategy. The key measures planned for the upcoming years are:

Strategic goals	Measures
1) SUFFICIENT WATER – sufficient high-quality water, protection against drought, improvements in water use and management	1.1 Utilization and retention of rainwater in the city
	1.2 Support for the utilization and retention of rainwater in the landscape
	1.3 Provision of an adequate supply of high-quality drinking water
	1.4 Ongoing improvements in waste water treatment
2) A PLEASANT CITY – improvements in Ostrava's public greenery and public space	2.1 Creation of new areas of high-quality public greenery and appropriate maintenance
	2.2 Integration of water features into the system of urban greenery
3) A HEALTHY LANDSCAPE – improvements in the health of the landscape	3.1 Improvements in ecostability and landscape permeability
	3.2 Improvements in flood defences and anti-erosion measures to protect against the effects of torrential rain – near-natural measures
	3.3 Flood defences on water courses
	3.4 Support for natural forest functions and adaptation measures in forested areas
4) CLIMATE PROTECTION – reduction in greenhouse gas production, improved energy efficiency, support for the adaptation of buildings to climate change	4.1 Reductions in energy consumption and appropriate use of renewable energy resources
	4.2 Support for the implementation of adaptation measures in buildings
	4.3 Support for eco-friendlier forms of transport and introduction of air conditioning in public transport vehicles
5) PEOPLE – public health, education, prevention, care of vulnerable groups	5.1 Improvements in conditions targeted specifically at vulnerable groups
	5.2 Development of warning/information systems and the Integrated Rescue System
	5.3 Public education on climate change issues

Table 2: Planned measures in Ostrava's Climate Change Adaptation Strategy

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The City of Ostrava will continue to develop tools that will make an important contribution to adaptation.

In the short term (up to 2019), Ostrava will focus on these goals:

- The City will draw up a Climate Change Adaptation Action Plan based on its existing Adaptation Strategy. The plan will identify specific high-priority projects, set out a schedule for their implementation, and specify responsibility at the level of the City authorities and City organizations. The plan will also include details of funding sources for these projects.
- The City will launch the implementation of specific pilot projects aiming to improve the quality and functionality of public greenery and rainwater management in Ostrava.
- Preparatory documentation will be drawn up to support changes in legislation – especially the City's building regulations – in order to ensure that new buildings (or reconstructed existing buildings) respond to adaptation needs, thus making maximum use of Ostrava's adaptation capacity, especially in the most vulnerable areas. Binding requirements will also be drawn up for investment projects, to ensure that new investments incorporate adaptation principles.
- The City will ensure that its employees gain the necessary expertise in issues related to climate change adaptation (in the form of ongoing training programmes).

The following examples can be included into the Adaptation Plan:

- Study on rain water use
- Study on retention capacity of Ostrava area
- Revitalization of ponds in south part of the City
- Revitalization of the Benátky forest park
- Environmental education in schools focused on climate change



Image 7: Vizualization of planned revitalization of the Benátky forest park (MS architektura)

In the mid term (up to 2023), the City must make use of available tools to continue promoting a change in public attitudes and encouraging citizens to undertake their own activities supporting the adaptation process (also with regard to their own private property). This essential requirement is dependent on the application of key principles in the area of Good Governance (see Chapter 12 of the EGC application), i.e. the concept of open government and the strengthening of participative approaches to the creation of the City's strategies (and City government in general). Without increased resilience to the impacts of climate change on life within Ostrava, it will not be possible to function as a truly modern city acting to support and benefit green investments in order to become a highly attractive place to live with a healthy environment.

Climate change adaptation measures place major financial demands on the City. Nevertheless, these measures are not self-serving or isolated from funding for other goals and needs addressed by similar measures and projects. For this reason, many of the adaptation projects also contribute to the achievement of the City's goals in other areas of development, and can be funded as such. Examples of planned projects to be funded from multiple sources include:

The LIFE Tree Check project, which focuses on education and training among City employees and the implementation of pilot projects related to urban greenery and urban planning.



Image 8: Clean-up Ostrava snapshot

2D. References

EGC Ostrava: <https://egc.ostrava.cz/>

Strategic Development Plan of Ostrava: <http://fajnova.cz/wp-content/uploads/2017/03/Strategicky-plan-Ostrava.pdf>

SEAP: http://mycovenant.eumayors.eu/docs/seap/3583_1389271923.pdf

Covenant of Mayors: <https://www.ostrava.cz/cs/podnikatel-investor/projekty-mesta-ostravy/projekty-financovane-eu/ucast-statutarniho-mesta-ostravy-v-paktu-starostu-a-primatoru>

Adaptation to Climate Change: <http://www.ostrava.cz/cs/o-meste/tiskove-zpravy/v-priprave-adaptace-mesta-na-zmenu-klimatu-pomuze-i-pocitova-mapa-horka>

Adaptation of Ostrava to the Climate Change: <http://www.ekotoxa.cz/blog/adaptacni-strategie-ostrava/>

World Health Organization. Urban green spaces: a brief for action:

https://www.dataplan.info/img_upload/5c84ed46aa0abfec4ac40610dde11285/who-urban-spaces.pdf

Ostrava Environmental Bulletin: <http://jitrocel.ostrava.cz/>

Health Week in Ostrava: <https://healthweek.ostrava.cz/>

Call for public feedback on revitalization projects: <https://www.ostrava.cz/cs/o-meste/tiskove-zpravy/ostrava-pripravuje-strategicke-projekty-zamery-sbira-i-od-verejnosti>

<http://env-health.org/news/latest-news/article/heal-highlights-from-the-sixth>

Sixth Ministerial Conference on Environment and Health in Ostrava (WHO): <http://www.ostrava.cz/en/o-meste/aktualne/sixth-ministerial-conference-on-environment-and-health-2013-welcome-to-ostrava>