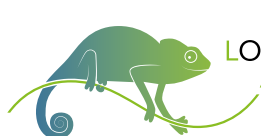




LAYMAN'S REPORT  
**LIFE LOCAL ADAPT**

**INTEGRATION OF CLIMATE CHANGE ADAPTATION  
INTO THE WORK OF LOCAL AUTHORITIES**



LIFE  
LOCAL  
ADAPT

Integration of climate change adaptation  
into the work of local authorities



# Adaptation to climate change - challenges for small and medium-sized municipalities

Climate is changing. Heat waves, droughts, extreme precipitation events and wind storms cause human and economic losses. Despite all efforts, climate change will continue in the following decades and the negative impacts will increase in frequency and severity.

Urban agglomerations as well as smaller communities are important actors in fighting climate change as they are contributing to carbon dioxide emissions, but they are also particularly vulnerable to the impacts of climate change. Therefore, it is necessary to adapt to already existing and upcoming climate changes.

In many European countries, adaptation is the task of local authorities, being responsible

for services of general interest, e.g., planning, construction and maintenance of local infrastructure. However, adaptation to climate change is also particularly demanding for smaller municipalities or for regional authorities. The legal framework is not appropriate, specially trained personal is missing and finances are not sufficient to integrate climate change adaptation into administrative practice.

Therefore, the main goals of the five-year EU project LIFE LOCAL ADAPT were to identify the specific challenges of small and medium-sized municipalities, to develop and test solutions to improve their capacities to adapt to climate change and to minimize impacts.

*Flooded streets after a heavy rain event.*  
© Bert Schwachheim



# Our approach - learning from best practice

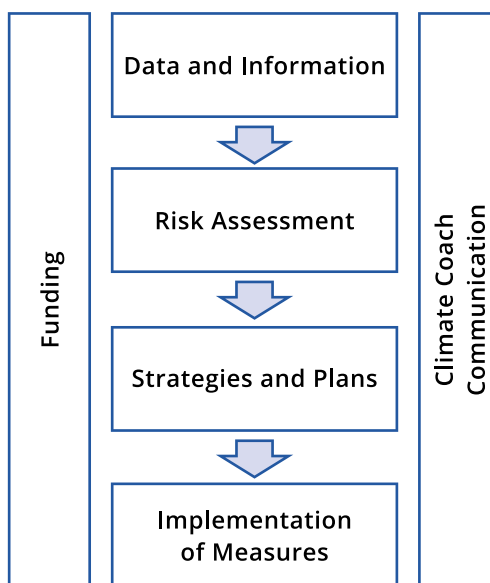
To learn from the European perspective, the project was implemented in four regions with different framework conditions in terms of environmental and climatic conditions as well as administrative structures. Over 40 small and medium-sized municipalities in Saxony/Germany, Styria/Austria, Severozápad (Northwest region) of the Czech Republic and the community Valka/Latvia (Vidzeme region) were actively involved in the project.

In order to focus on important challenges of climate change adaptation for local authorities, we looked primarily at “heavy impact events” – heavy rain and heat waves. By now, 16 municipalities have started with planning and implementation of practical adaptation measures.



*Project regions of LIFE LOCAL ADAPT: Styria (Austria), Saxony (Germany), Northwest region of Czech Republic and Valka (Latvia)*

Generally, we used the following four steps of climate change adaptation:



**Data and information** for risk evaluation, like ‘natural conditions’ (recent and future climate, topography, rivers and lakes etc.) as well as ‘anthropogenic conditions’ (demography, infrastructure, land use, industry, businesses etc.)

**Risk and vulnerability analyses** to identify threats, impacts, and vulnerabilities on the local level

**Adaptation plans and strategies** to find appropriate adaptation measures, and finally

**Implementation of measures** to protect human life, material goods and the environment.

These four steps were accompanied by intensive **communication**, advice and technical support through **climate coaches** and information on **funding opportunities**.

In this report, we present the main project outcomes. Interested in more detailed information? **Try the QR-codes**. They establish a link to the respective content on the LIFE LOCAL ADAPT and relevant web-sites of the project partners.

# Fostering climate change adaptation - our activities

It was an important cornerstone of our concept to install **Climate coaches** to support local authorities. Climate coaches accompany municipalities through the climate adaptation process. They support communication and knowledge transfer between adaptation experts and municipal authorities, for instance, by organising and moderating workshops or by providing technical support. Climate coaches are climate adaptation experts. They explain the regional and local climatic situation, guide through the risk and vulnerability analyses, help to develop locally tailored adaptation measures and provide information on funding opportunities for the activities related to climate change adaptation.

climate change adaptation. Still, many communities are interested to incorporate this adaptation, e.g., into regional planning. To support these communities, contests for climate change adaptation were organised in Saxony and in Styria. The successful competitors received the necessary funding to plan and, sometimes to implement specific measures. These measures served as **examples of best practice** for climate change adaptation, lowering the subjective and objective hurdles to get involved with climate change adaptation.

**Fact sheets about national and European funding** help to identify financial support and potential partners. They provide an overview of funding opportunities to finance adaptation measures or other adaptation related actions for the four regions involved in the project, but also generally for any suitable European region.

**Climate coaches** were established in two regions of LIFE LOCAL ADAPT (Styria and Saxony) during the project. They are now on permanent positions and can help with the complex steps of climate change adaptation and its potential funding on a continuous basis.

A **guidance document** was developed to support the work of the climate coaches, municipalities and regional authorities. It provides easy-to-follow step-by-step descriptions on how specific outcomes of LIFE LOCAL ADAPT such as the climate fact sheets, risk analysis or adaptation strategy can be transferred to other municipalities or regions.

The lack of financial resources is amongst the most important barriers to many small and medium-sized municipalities dealing with

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Guidance  
Document:



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*Workshop on risk  
analysis in Ústí  
nad Labem  
(Northwest region,  
Czech Republic)  
© Adam Emmer*



# Setting the base - data and information

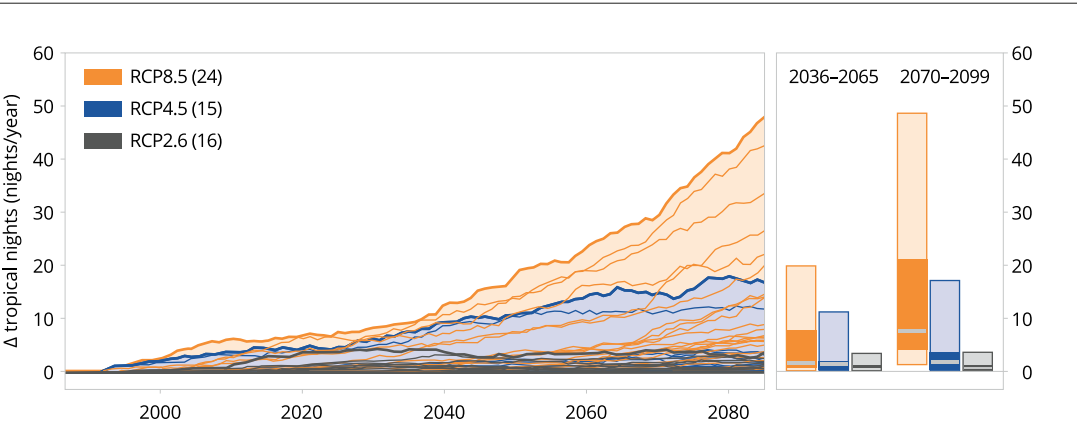
Any adaptation to the expected impacts of climate change needs data and information on current and future climate as well as on related adaptation capacities. Climate data can be provided for different temporal and spatial scales. Uncertainties in future climate data due to necessary simplifications in climate models and socio-economic assumptions are taken into account by using different modelling and study approaches. It is strongly recommended to use a range of potential future climates as a sound basis for adaptation decisions.

As the project covers different regions of Europe with somewhat different climate, **Regional climate fact sheets** have been developed based on a set of climate model outputs. They provide a concise source on a variety of temperature- and precipitation-

based indicators. They show regionally different changes, like a higher risk of extreme precipitation for Styria than for Latvia, while Saxony and the Northwest of the Czech Republic are in between. Duration of heat waves will increase in all project regions, while intensities might vary between regions.

Regional climate fact sheets reflect different possible pathways of future climate change - from strong reductions of carbon dioxide emissions to business-as-usual scenarios. For a proper assessment of the information an expert judgement on the robustness of the projections of future climate change was included. The stakeholders at municipality level should consider carefully which of the scenarios they use as a baseline for their specific adaptation strategies.

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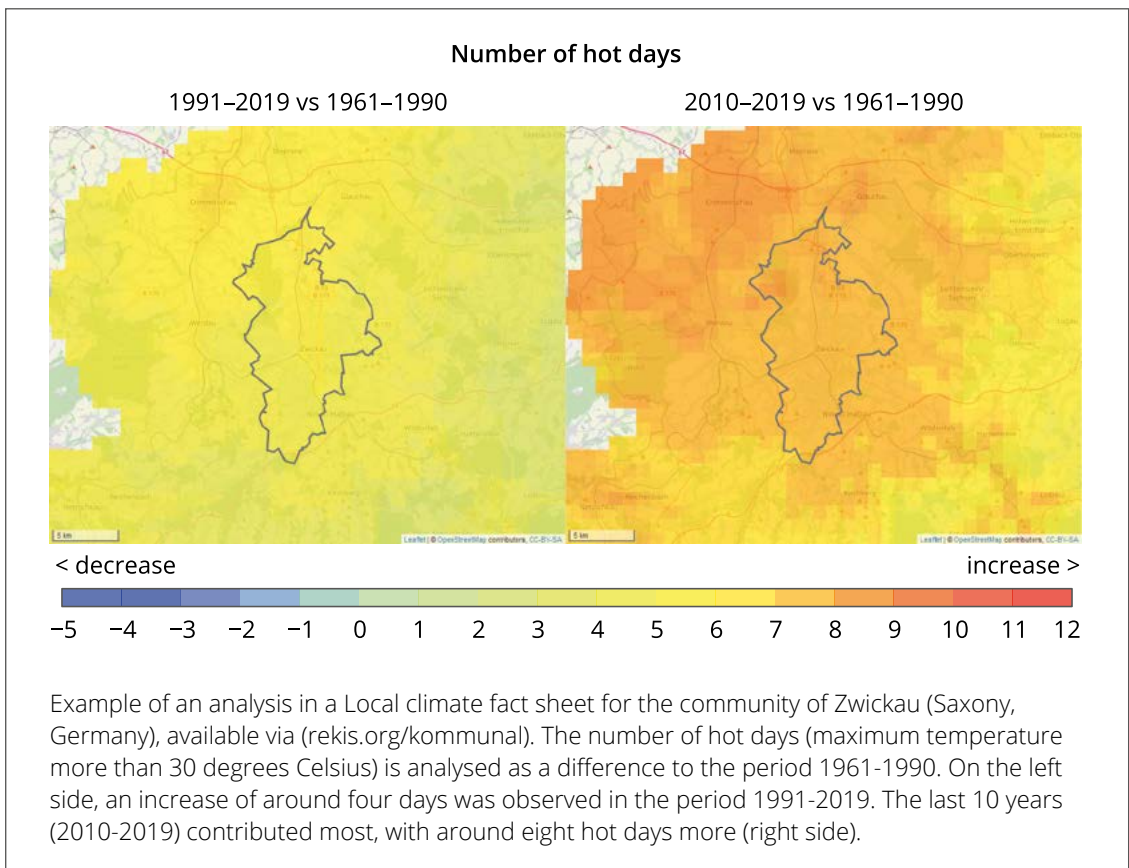
Result of climate model simulations for three emission scenarios: RCP2.6 – high ambitions in reductions of carbon dioxide emissions, RCP 8.5 - business-as-usual scenario and RCP4.5 as an intermediate scenario. Various model simulations exist for each scenario and are analysed regarding the number of tropical nights per years (night time temperature does not fall under 20 °C). The graph shows the future increase of the number of tropical nights for Styria compared to the period 1971-2000. On the left side it is shown as time series, and on the right side as mean change for two time periods. For the end of the 21st century and the business-as-usual scenario, the projected annual increase is between 0 and 46 tropical nights per year. The expert judgement on the robustness of the projections was: the majority of the simulations showed significant increases in tropical nights.

Download  
Fact Sheets:



Data and information on local climate should be considered when planning adaptation measures at a specific site. These can amplify or weaken the regional climate change patterns if, for example, the specific site is in the precipitation shadow of a mountain range. For this purpose, highly localised climate information was prepared for the production of the **Local climate fact sheets** at the municipality level. They are based on pre-processed, multi-model and

multi-scenario data. In Styria, climate indices such as heavy rain days, hot days, tropical nights, etc. were selected in agreement with municipal stakeholders. In Saxony, a fixed set of temperature and precipitation indices is analysed and presented in tabular and graphical form for all Saxon municipalities. The interactive web portal ReKIS provides the opportunity to municipal authorities to retrieve this local climate information for their municipality.



# Setting priorities - risk assessment

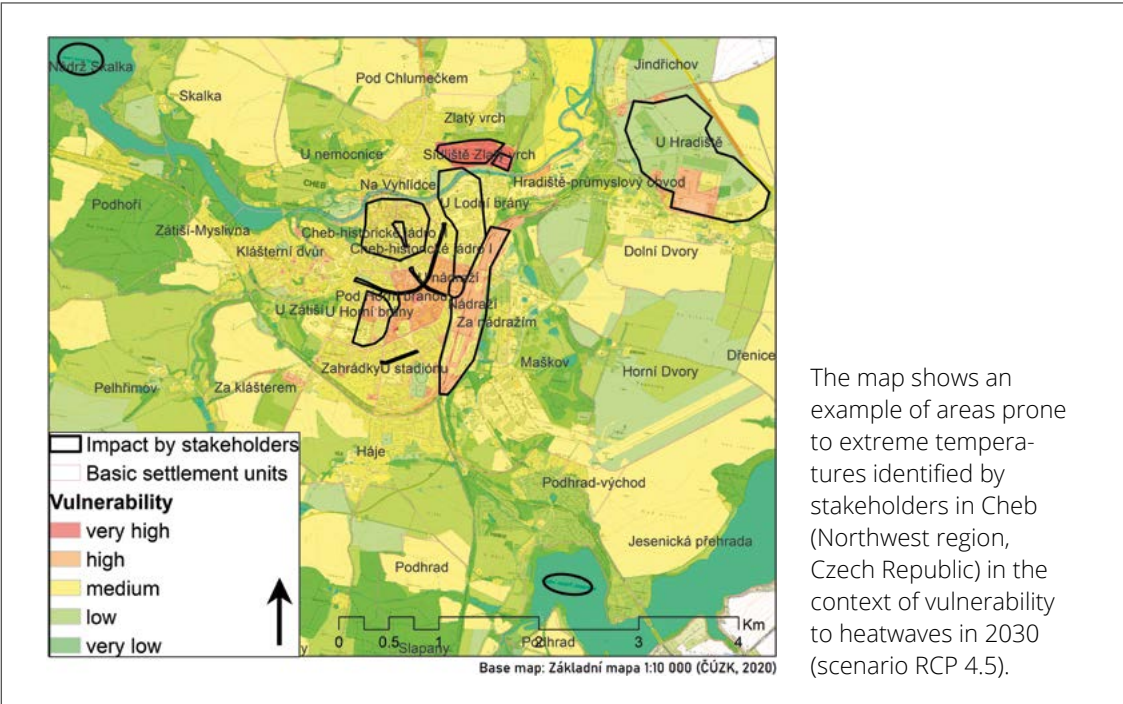
To increase municipal resilience to expected impacts of climate change, analysis of climate information alone is not sufficient. Just because it gets warmer, dryer or wetter does not necessarily lead to a risk and the need to take action. In order to assess the expected local risks, climate information need to be combined with local data and information such as demography, land use, topography, etc., as they play a decisive role in this process. It is important not only to use the available data to identify the areas most affected by the impacts of climate change, but also to integrate the local knowledge of stakeholders.



Stakeholder workshop in Deutschlandsberg (Styria, Austria)  
© Willy Loseries

In the Czech **pilot municipalities**, the risk assessments were carried out in two ways, data-based and stakeholder-based. While the data-based risk assessment can be conducted by the climate coaches, external consultants or research centres, the

stakeholder-based risk assessment should be organised and moderated by the municipality itself at best with support of climate coaches. The results of both steps can be visualised on maps, which display the most vulnerable areas of a community.



The map shows an example of areas prone to extreme temperatures identified by stakeholders in Cheb (Northwest region, Czech Republic) in the context of vulnerability to heatwaves in 2030 (scenario RCP 4.5).

# From problem to solution - adaptation strategies and plans

Climate change adaptation strategies and plans support **stakeholders and policymakers** to direct and carry out adaptation actions in a structured and organised way. They are designed to increase the municipality's resilience to climate change and provide solutions to current and future climate-related impacts. A crucial part of an adaptation strategy or a plan is to actively involve local stakeholders. This ensures that local knowledge and interests are considered and improves the acceptance and robustness of planned measures and actions.

Download Fact Sheets:



The selection of **adaptation measures** needs to be context-specific since not all available measures are suitable and effective in complex urban and rural areas. To determine the effectiveness of measures, their synergies, benefits, co-benefits or possible



*Regional adaptation strategy for the Austrian community Deutschlandsberg.*

*Erosion Workshop in Nossen (Saxony, Germany)  
© Dominic Rumpf*





disservices and trade-offs need to be considered. Besides the evaluation of a measure's effectiveness in terms of lowering climate change impacts and increasing resilience, it is also important to assess its implementability and costs, for example, by cost-benefit or multi-criteria analyses.

In order to increase knowledge on specific possible adaptation measures, several **fact sheets** on adaptation measures to improve resilience to **heavy rain, heat stress, drought** and **health risks** have been developed. They provide a quick overview, are easy to read and are intended to facilitate the start of climate adaptation planning. These fact sheets give short information on the respective climate change impacts and why and how municipalities should adapt to these threats. The fact sheets list possible

measures and recommendations for municipalities in a brief and understandable manner and are available in different national languages.

In several regions of the project, additional printed material is available in the respective languages. For instance, in Saxony four **brochures** provide local authorities with information regarding climate backgrounds, risk analysis, communication strategies and adaptation measures in German on about 20 pages each. Thematically they provide an insight into the need for municipal climate adaptation with special regard to heat, heavy rain and soil erosion.

Download  
Fact Sheets:



Download  
brochures:



Fact sheet on heat stress measures and recommendations.



First brochure giving an introduction into the need for municipal action for climate adaptation.

ReKIS KOMMUNAL:



Alternatively, this and **more information is available online**, via very well developed and sustainable websites in the Czech Republic ([www.klimatickazmena.cz/en](http://www.klimatickazmena.cz/en)), in Austria ([ccca.ac.at/wissenstransfer](http://ccca.ac.at/wissenstransfer)) or in Saxony ([www.rekis.org](http://www.rekis.org)). Such internet platforms spread important news on climate changes, its impacts, possibilities to adapt, participation formats, assistance for action, networks, etc. to a wider public. Often interactive maps are applied.

The interactive web portal ReKIS provides data, information and tools to analyse climate change and climate change impacts for the German Federal States of Saxony, Thuringia and Saxony-Anhalt. The additional pillar **“ReKIS Kommunal”** was set up in this project to provide fact sheets, best-practice examples for adaptation measures and further information for municipal stakeholders.

*ReKIS Kommunal offers the possibility to download climate fact sheets on recent and future trends of temperature and precipitation indices for Saxon municipalities via interactive maps.*

# Leaving a mark - implementation of measures

To promote climate change resilient urban and landscape planning in municipalities via implementation of adaptation measures, state agencies could provide seed money through the organisation of a contest as it was organised in Saxony. Municipalities apply for funds to implement measures, of which the best ideas will be funded. Winning municipalities will officially be awarded and can use the ceremony as promotion to showcase their climate activities.

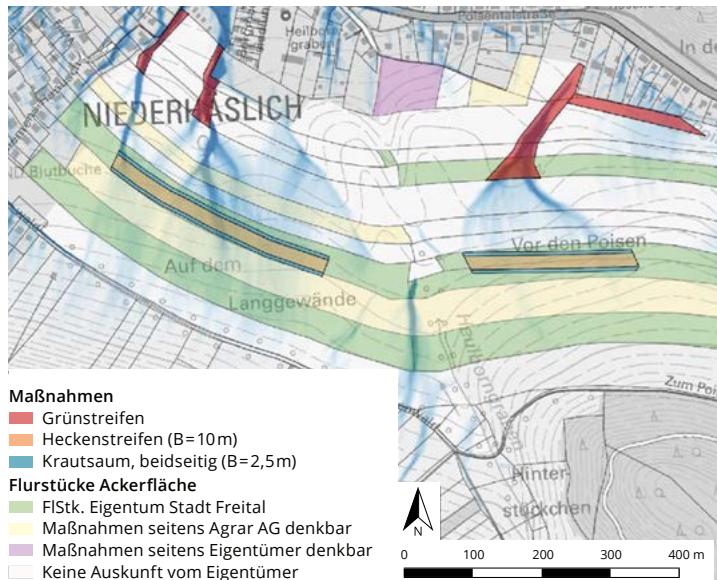
Many positive aspects result for the municipalities from a participation in such contests. They get expert guidance and support, which is specially tailored to their local problems. This concerns technical, organisational as well as financial aspects. The latter reduces temporarily personnel and financial burdens of the municipalities. Furthermore, the municipalities become part of a network, which may be useful for similar future challenges.

For example, Freital (a medium-sized town in Saxony) successfully participated in both competition rounds to support the analysis of soil erosion on the slopes of the Poisenbach valley.

During heavy rain events, surface water runoff leads to erosion of agricultural soil. This material is re-deposited on downhill private property and pollutes the brook Poisenbach. Water and particle flow of the affected field were simulated with a three-dimensional erosion model for a rain event which may happen every two years statistically. The results were the basis for the development of a catalogue of potential measures, which improve water retention and drainage of surface water and henceforth reduce soil erosion. These measures include green strips, hedges and embankments. The adaptation process in Freital was characterised by intensive, continuous and



*Winner of the second contest "Municipal Climate Adaptation in Saxony" 2019  
© Burkhard Lehmann*



In order to prevent or reduce erosion and their effects on nearby buildings and infrastructure, measures have been planned at an inclined agricultural field in Freital (Saxony, Germany): 10 m wide hedges (ochre) with shrub borders on both sides (blue) and green strips (red).

*Green roof and green façade of the Weiz town hall in Styria (Austria)*  
© Dominika Wohlmuth



cross-level participation of all stakeholders, especially flood-affected residents, the municipality and farmers. This active involvement accompanied by a mediation process has created a consensus and supported the implementation of the proposed measures.

The analysis of regional and local climate as well as the risk assessments showed that heat stress and heavy precipitation events are also the dominant climate risks in the **five pilot municipalities in Styria** (Austria). **Heat stress** has negative effects on human, animal and plant health and can cause damage in agriculture, especially, when it occurs together with periods of drought. In order to avoid outdoor heat stress and to improve indoor climate conditions, a variety of adaptation measures exists. A green roof and green façade were implemented as a showcase project at the Weiz town hall in Styria in order to raise awareness and encourage imitation in dialogue with private individuals, businesses and public sector representatives. Another example to alleviate heat stress in Frautal/Deutschlandsberg,

which is located in the south-western part of Styria, was the installation of a drinking fountain in a park.

### Heavy precipitation

events can cause flooding which may damage infrastructure and buildings, but also agricultural areas. Complete protection from such extreme event is not possible. However, measures can be implemented to reduce the risk of harms.

In Lower Austria, for example, surface drainage capacities are increasingly exhausted during heavy rainfall events. In order to delay runoff during heavy rainfall and create sufficient retention area, a system of swales and ditches was constructed for a newly developed residential area. The up to 15 m wide ditches serve as recreational space and playground and form



*Inauguration of a drinking fountain in Fraul/Deutschlandsberg (Styria, Austria)  
© Strohmeyer*

natural habitats for animals and plants. The troughs are linked to an eco-belt - a transition zone between the settlement area and the surrounding agricultural landscape. The costs for this natural solution were not higher than a rainwater channel, and maintenance effort for the ditches is low. © Good practice brochure of the Federal Environment Agency, 2016.



*Rain retention area.  
© Leopold Bösmüller, from  
"Our communities in climate change – Good practise brochure", Ministry for a Livable Austria*

# Final conclusive statements

LIFE LOCAL ADAPT focused on climate change adaptation due to the increased risk of heavy rainfall and heat waves in the future. Adapting to climate change is a major challenge for local authorities, as it is their responsibility to protect citizens and the environment from potentially harmful impacts and to reduce the risk of economic losses.

Four regions in Europe worked together to improve communication at all levels of governance and research and to identify best practices for implementing measures. The offer was very much welcomed by the municipalities. In the course of the project,

about one third of the more than 40 participating municipalities in Austria, the Czech Republic, Germany and Latvia have already implemented adaptation measures.

Without neglecting climate protection, adaptation to climate change needs financial and technical support at the municipal level, ideally through the introduction of climate coaches who help to understand and implement the complex process and finally to prioritise the necessary measures. A great success is the permanent establishment of climate coaches beyond the project in Saxony and Styria.

# Acknowledgments

We would like to thank our pilot municipalities for their cooperation with LIFE LOCAL ADAPT:

Region North-West in the Czech Republic:

→ Cheb, Kadaň, Litoměřice, Ústí nad Labem

Saxony in Germany:

→ Bad Dübén, Coswig, Freital, Lauta, Leipziger Muldenland, Zittau, Zwickau,  
Districts: Mittelsachsen and Sächsische Schweiz-Osterzgebirge

Styria in Austria:

→ Deutschlandsberg, Gleisdorf, Hartberg, Mariazell, Weiz

Vidzeme region in Latvia:

→ Valka

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