



European Committee
of the Regions

Commission for
the Environment,
Climate Change and Energy

ENVE

GDGL Campaign: Handbook



Green Deal
Going Local

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What is the Green Deal Going Local Handbook?

Giving LRAs Guidance for the Green Transition

The Green Deal is the **new growth strategy for the EU**, aiming to move Europe towards a more sustainable and resilient way of life. In essence, it is a roadmap launched by the European Commission in response to the EU's obligations to tackle climate change and other environmental issues.

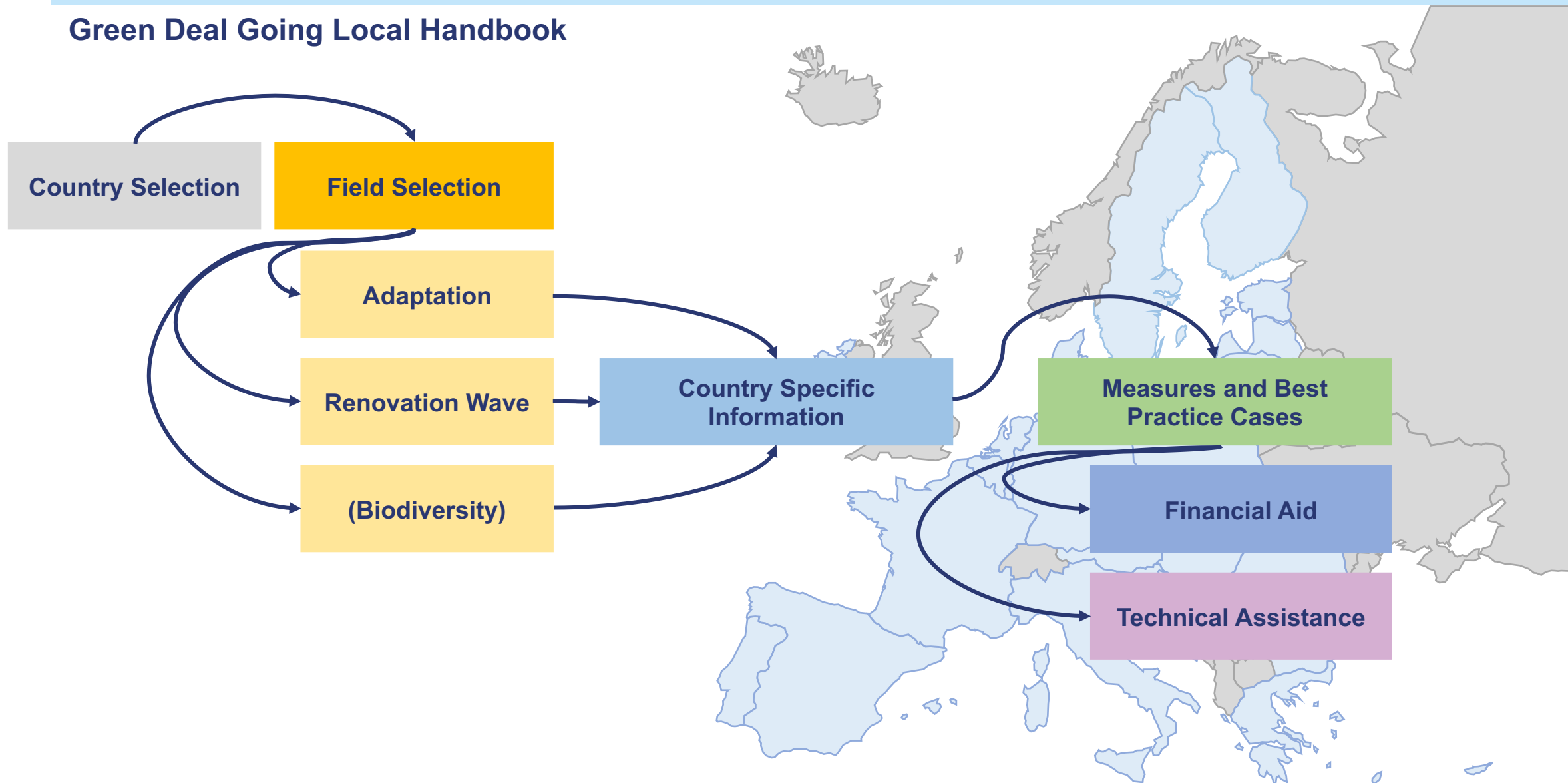
Relevant targets and objectives:

- integrate the 2050 **climate neutrality** objective in the European Climate Law;
- reduce **greenhouse gas emissions** to at least 55% below 1990 levels by 2030;
- stimulate the creation of **green jobs** and maintain the EU's record of cutting greenhouse gas emissions while **growing its economy**;
- ensure that the transition is **fair and leaves no-one behind**;
- protect the **health and well-being** of citizens from environment-related risks.

This **Handbook** gives local and regional authorities (LRAs) guidance in **implementing the Green Deal on a local and regional level**. It provides assistance in **finding the right measures** to deal with the hazards of climate change. It offers guidance regarding **case studies, financial aid** and **technical assistance** in the fields of **adaptation, renovation wave** and **biodiversity**.

How it Works: Clicking through the Handbook

Green Deal Going Local Handbook



Austria

Do you want to become more resilient? Discover climate change [adaptation](#) and the various measures applicable for your climate area.

Do you want to learn more about how to renovate your buildings? Discover the measures of the renovation wave!



Austria

The Importance of Adaptation for LRAs

Adaptation is...

- ... the process of **adjustment to actual or expected climate extremes** and their effects.
- ... applicable to natural and urban environments, implemented by human intervention.
- ... important for minimising harm.
- ... seeking to **find a solution for living with possible changes to climate**.
- ... different from mitigation, which intends to slow the harm caused by climate change.

It is important for **LRAs**, since...

- ... physical impacts and the associated socio-economic effects of climate change differ significantly on a regional level.
- ... there is **no one-size-fits-all solution: adaptation is context-dependent!**

LRAs should opt **for tailor-made adaptation measures**, since...

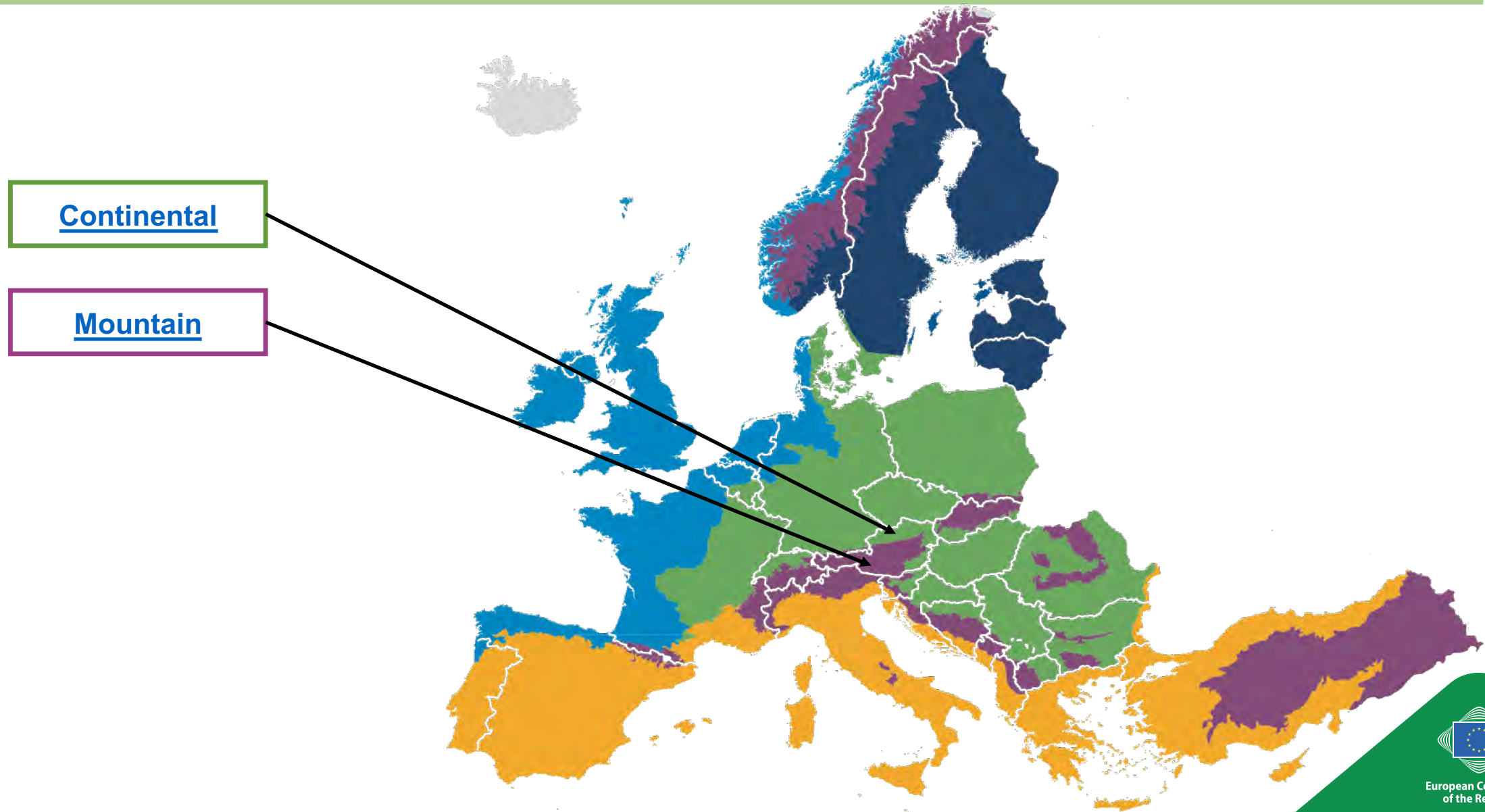
- ... the impacts of climate change can already be felt, on a global, national and regional level.
- ... national measures might not be perfectly applicable for local and regional circumstances.

Regional policy makers are requested to develop tailor-made adaptation measures that **fit the particular needs of their communities**. They can choose between **grey, green and soft measures**, which belong to either...

- ... **incremental adaptation**, which maintains the essence of a system; or
- ... **transformational adaptation**, which changes the fundamental attributes of a socioecological system.

Find out about adaptation measures and
best practices in [Austria!](#)

Austria – Choose a Climate Area



Continental Region

Discover how to...

... [manage higher temperatures](#)

Average global temperatures have increased since the 19th century around the globe, raising the number of warm days and nights per year. Especially in the Continental region, temperatures are expected to rise largely, resulting in, for example, an increased demand for cooling and medical assistance for those affected by heat stress, dehydration and heat strokes.

... [protect forests](#)

Especially in areas with many trees or grass/bushes in the countryside, forest fires can spread quickly. This can result in a decrease in the economic value of forests and neighbouring industries.

... [secure stable water levels of rivers](#)

Periods of stronger precipitation are to be expected in the Continental region, which can in turn result in possible flooding and an increase in river flow. Being prepared for these events, especially when it comes to buildings and infrastructure, is crucial.

... [manage water supply](#)

Higher temperatures accompanied by a decrease in summer precipitation can result in droughts and eventually lead to extreme heat and to competition for water resources.

Mountain Regions

Discover how to...

... manage higher temperatures

Especially in the mountain regions, temperature rise is going to be higher than the European average. For the mountain regions, higher temperatures result in other climatic shocks that need to be taken into account carefully.

... deal with the effects of melting

As a result of higher temperatures, a decrease in snowfall, ice coverage and glacier extent and volume is likely to affect the mountain regions. Though this mostly carries along negative effects, the regions' hydropower potential might be affected positively.

... prepare for landslides

Due to higher precipitation and moving water, landslides and falling rocks are expected to occur more often in mountain regions.

... protect biodiversity

The spread of non-native species, which threaten ecosystems, habitats or other species, is most likely to happen in the mountain regions due to rising temperatures. This also results in an upward shift of plant and animal species and an increased risk of biodiversity loss.

Discover How to Manage Higher Temperatures

- [Improving thermal insulation](#)
- [Vertical greenery](#)
- [Increasing shaded areas](#)
- [Green / reflecting roofs](#) and areas
- [Improve irrigation systems in agriculture](#)
- [Increasing and revitalising green areas](#)
- [Parks and fountains](#) in cities
- [Vulnerability Assessment](#)
- [Heat-wave action plans](#)

Discover How to Deal With the Effects of Melting

- (Mountain) [cliff stabilisation](#)
- [\(Mountain\) cliff strengthening](#)
- [Increasing and revitalising green spaces](#)
- [Permafrost and glacier monitoring](#)
- [Vulnerability assessments](#)
- [Early-warning systems](#)
- [Promotion of insurance for](#)
- Car-free tourism / [sustainable tourism](#)

Discover How to Secure Stable Water Level of Rivers

- [Sustainable drainage system](#)
- [Dikes and dams](#)
- [Widen roadside ditches](#)
- Reduce and Open [sealed surfaces](#)
- [Green / reflecting roofs and areas](#)
- [Floodplain restoration and maintenance](#)
- [Wetland restoration and maintenance](#)
- [Early-warning systems](#)

Discover How to Manage Water Supply

- Improve [irrigation systems](#) in Agriculture
- [Water retention spaces](#)
- [Increase green areas in cities](#)
- [Early-warning systems](#)
- [Awareness raising on water consumption](#)

Discover How to Protect Forests

- [Agroforestry](#)
- [Vulnerability assessments](#)
- [Early-warning systems](#)

Discover How to Prepare For Landslides

- [Vulnerability assessments](#)
- [Early-warning systems](#)

Discover How to Protect Biodiversity

- [Underwater suction devices](#)
- [Crop rotation](#)
- Introduction of [natural predators](#)
- Identify the most [problematic species](#) and track their movements

Improving Thermal Insulation

Grey Measures

Adaptation

Improving thermal insulation

There are several options to implement climate-proofing of buildings with respect to excessively high temperatures. These options relate to building design – including the use of IT technologies to optimise thermal comfort – and building envelopes. Thermal insulation is an important technology to reduce energy consumption in buildings by preventing heat gain and loss through the building envelope.

Best practice:

- Living in a tree house in [Torino](#): combining adaptation and mitigation measures to improve comfort (Italy)
- [Climate proofing](#) of buildings against excessive heat

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Find out more about [Technical Assistance](#)

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Vertical Greenery

Grey Measures

Vertical greenery

Adaptation

With the increase of urban density and the decrease in the availability of land, vertical greenery has intensified in order to foster the use of vegetation in urban areas. Vertical greenery has various positive implications: it can be used for cooling, water management and also for securing food supply.

Best practice:

- [Berlin Biotope Area Factor](#) (Germany)

Find out more about [Funding Programmes](#)

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Increasing Shaded Areas

Green and Grey Measures

Adaptation

Increasing shaded areas

Increasing the amount of shaded area is regarded as one of the most efficient strategies to improve thermal comfort in summer. Urban design strategies can be used to create better thermal comfort for pedestrian areas in a city during the summer months. Some of these strategies include installing sun shelters on buildings, planting trees and increasing shade in order to combat the heat island effect.

Best practices:

- Social vulnerability to heatwaves – from assessment to implementation of adaptation measures in [Košice and Trnava](#) (Slovakia)
- [Barcelona](#) trees tempering the Mediterranean city climate (Spain)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Green / Reflecting Roofs and Areas

Grey / Green Measures

Adaptation

Green / reflecting roofs

A green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly-sloped roof. Green roofs are also known as vegetative or eco-roofs. They help to control storm water run-off and retention, absorb excess water, reduce the urban heat island effect, improve air quality and insulate buildings.

Best practice:

- Green Roofs in [Basel](#): Combining Adaptation and Mitigation Measures
- Four pillars to [Hamburg's](#) Green Roof Strategy: financial incentive, dialogue, regulation and science

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Find out more about [Technical Assistance](#)

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Increasing and Revitalising Green Areas

Green Measures

Adaptation

Increasing and revitalising green areas

Green spaces in cities mitigate the effects of pollution and can reduce a phenomenon known as the urban heat island effect, which is heat trapped in urban areas. This effect appears in towns and cities as a result of human activity. Urban green spaces, such as parks, playgrounds and residential greenery, can promote mental and physical health and reduce morbidity and mortality in urban residential areas by providing psychological relaxation and stress alleviation. Greening the living environment benefits more than just health and well-being. It also facilitates water management and promotes biodiversity in built-up areas, and can help reduce the effects of noise pollution.

Best practice:

- Environment-friendly urban street design for decentralized ecological rainwater management in [Ober-Grafendorf](#) (Austria)

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Parks and Fountains in Cities

Green Measures

Adaptation

Parks and fountains in cities

Parks and fountains as recreational spaces are important aspects in reducing the heat island effect. Repairing historic drinking fountains and installing new ones can help people experiencing the negative effects of heat in the city as they can use the water to cool down or for drinking. Open water can decrease the air temperature by evaporation, absorption of heat and transport of heat since the cooling effect of flowing water is greater than that of water that is standing still. Water spray from a fountain has an even greater cooling effect because of the large contact surface between the water and the air, which stimulates evaporation. Wetting the streets also has a cooling effect. This is best done in the morning and afternoon in direct sunlight. Fountains can decrease surrounding air temperatures by 3°C and its cooling effect can be felt up to 35 meters away. Fountains also have a social impact, since they can be used by children as playgrounds and they can serve as meeting places in parks and squares.

Best practice:

- [Stuttgart](#): combating the heat island effect and poor air quality with ventilation corridors and green-blue infrastructure (Germany)

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Find out more about [Technical Assistance](#)

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Heat-Wave Action Plans

Soft Measures

Heat-wave action plans

Adaptation

In order to improve the public health response to extreme temperatures and heatwaves, the [EuroHEAT](#) project has quantified the health effects of heat in cities in the European Region and has identified options for improving the preparedness of health systems and their responses to protect health. The key message of the project is that heat threatens health and climate change is increasing the occurrence of heatwaves. The health effects of hot weather can be prevented and public health strategies and measures can be adopted. Prevention requires a portfolio of actions at different levels, including: meteorological early warning systems; medical advice; health services targeted to particularly vulnerable groups; toll-free information and assistance numbers; meal delivery and home care.

Best practices:

- Operation of the Portuguese [Contingency Heatwaves](#) Plan
- Heat-Wave [Action Plan](#) for England
- Austrian [Heat Protection](#) Plan

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Sustainable Drainage Systems

Grey Measures

Adaptation

Sustainable drainage systems

Sustainable drainage systems provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses. They are especially good for reducing flooding, enhancing water quality, reducing pollution and providing habitats for wildlife.

Best practices:

- Urban stormwater management in [Augustenborg](#), Malmö (Sweden)
- Storm water management in Växjö – the Linnaeus canal and [Växjö](#) lake lagoons (Sweden)

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Widen Roadside Ditches

Grey Measures

Adaptation

Widen roadside ditches

One of the purposes of a roadway drainage ditch is to prevent unsafe accumulations of rain water on the roadway surface. An open ditch allows water to move fully away from a road surface. It also continuously intercepts rain water flowing toward the roadway from adjacent land. For these reasons, a roadway drainage ditch is less likely to allow the accumulation of water on or near a roadway surface. Widening these ditches helps to accumulate the water.

Best practice:

- Mainstreaming adaptation in water management for flood protection in [Isola](#) Vicentina (Italy)

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Find out more about [Technical Assistance](#)

Reduce and Open Sealed Surfaces

Grey Measures

Adaptation

Reduce and open sealed surfaces

Sealed surfaces, such as artificial, impenetrable surfaces like tar, may cause local water nuisance if more frequent extreme rain events occur. A distinction is hereby made between water nuisance from sewers after extreme summer precipitation and water nuisance from waterways after extended precipitation, a phenomenon more typical in winter months. Opening already existing sealed surfaces and reducing the existence of these sealed surfaces can prevent from city flooding and help absorb water.

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Improve Irrigation Systems in Agriculture

Grey Measures

Adaptation

Improve irrigation systems in agriculture

In areas where rainfall is not regular or frequent enough, there is a need for agricultural technology innovations such as additional irrigation to keep crops healthy. An irrigation system is the artificial and systematic way of applying water to the soil through various networks of tubes, pumps and sprays. There are various methods of irrigation in agriculture, encompassing drip irrigation systems, sprinkler irrigation, centre pivot irrigation, furrow irrigation systems and terraced irrigation. Improving irrigation systems in order to use water more effectively and sustainably is crucial in saving water. More information can be found [here](#).

Best practice:

- Improving soil structure of an arable crop farm in the district of [Heilbronn](#) (Germany)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Maintenance and Restoration of Mountain Cliffs

Grey Measures

Maintenance and restoration of mountain cliffs

Adaptation

Mountain cliffs are mostly hard, made of limestone, sandstone, granite and other rocks. Rocky cliffs are characterised by rockslides or block fall. Cliff erosion is almost always the result of structural erosion, resulting in a gradual retreat of the coastline because the amount of sediment that gets eroded (rocks, cobbles or sand) exceeds the amount of deposited sediment. To reduce cliff erosion and its consequences – landslide, collapse, falling of rocks – cliff strengthening techniques aim to increase the strength and overall stability of the slope by minimising landside pressures. Some techniques also protect the foot of the cliff against marine erosion, a key factor in strengthening cliffs. Techniques include cliff reshaping, cliff drainage, rock bolting or reinforced geogrids and pinned nets.

Best practice:

- Addressing coastal erosion in [Marche region](#) (Italy)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Permafrost and Glacier Monitoring

Soft Measures

Adaptation

Permafrost and glacier monitoring

The overall objective of monitoring permafrost and glaciers is to contribute to the mitigation of natural hazards that result from climate change impacts on alpine permafrost and glaciers. Through the creation of monitoring and by developing a common strategy for dealing with permafrost-related hazards, monitoring can contribute to sustainable development and the implementation of good governance practices. The results can provide decision-makers and responsible authorities with the necessary decision bases and strategies to deal with permafrost-related hazards.

Best practice:

- Climate adaptation strategy for the [Grimsel area](#) in the Swiss Alps (Switzerland)
- Permafrost Long-Term Monitoring Network ([PermaNET](#))

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Car-Free Tourism / Sustainable Tourism

Soft Measures

Adaptation

Car-free tourism / sustainable tourism

Sustainable tourism refers to sustainable practices in and by the tourism industry. It aims to minimise the negative impacts, such as economic leakage, damage to the natural environment and overcrowding, and maximize the positive ones, e.g. job creation, cultural heritage preservation and interpretation, wildlife preservation and landscape restoration. The UN Environment Programme and the UN World Tourism Organization define sustainable tourism as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities.”

Best practices:

- [Sustainable tourism planning and climate change adaptation in the Alps](#): a case study of winter tourism in mountain communities in the Dolomites (see also [here](#))
- Promoting co-evolution of human activities and natural system for the development of sustainable coastal and maritime tourism ([CO-EVOLVE](#))

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Cliff Strengthening

Grey Measures

Adaptation

Cliff strengthening

Coastal cliffs can be differentiated according to their morphology and structure: cliffs can be loose – sand, silt, clay, marl and chalk – or hard, made of limestone, sandstone, granite and other rocks. Loose cliffs are more prone to erosion and landslide than rocky cliffs and are more characterised by rockslides or block fall. Cliff erosion in coastal areas is almost always the result of structural erosion, resulting in a gradual retreat of the coastline because the amount of sediment that gets eroded (rocks, cobbles or sand) exceeds the amount of deposited sediment. To reduce cliff erosion and its consequences – landslide, collapse, falling of rocks – cliff strengthening techniques aim to increase the strength and overall stability of the slope by minimising landside pressures. Some techniques also protect the foot of the cliff against marine erosion, a key factor in strengthening cliffs. Techniques include cliff reshaping, cliff drainage, rock bolting or reinforced geogrids and pinned nets.

Best practice:

- Addressing coastal erosion in [Marche region](#) (Italy)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Cliff Stabilisation

Green Measures

Adaptation

Cliff stabilisation

Coastal cliffs can be differentiated according to their morphology and structure: cliffs can be loose – sand, silt, clay, marl and chalk – or hard, made of limestone, sandstone, granite or other rocks. Loose cliffs are more prone to erosion and landslide than rocky cliffs and are more characterised by rockslides or block fall. Cliff erosion in coastal areas is almost always the result of structural erosion, resulting in a gradual retreat of the coastline because the amount of sediment that gets eroded (rocks, cobbles or sand) exceeds the amount of deposited sediment. Coastal cliff stabilisation techniques reduce cliff erosion and its consequences – landslide, collapse, falling of rocks. In practice, cliff stabilisation and cliff strengthening are often combined. Stabilisation techniques include methods to increase the stability of the slope and measures to reduce marine erosion at the foot of the cliffs.

Best practice:

- Addressing coastal erosion in [Marche region](#) (Italy)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Floodplain Restoration and Maintenance

Green Measures

Adaptation

Floodplain restoration and maintenance

Floodplains cover 7% of the European continental area. However, the majority of it has been environmentally damaged. Developing strategies to preserve floodplains is essential, since restored floodplains provide an alternative to structural measures to handle the increased risk of flooding, meaning they can act as buffers. At the same time, floodplain restoration helps achieve higher quality ecosystem services like improved water quality, improved conditions for biodiversity conservation and improved recreational value.

Best practices:

- Urban river restoration: a sustainable strategy for storm-water management in [Lodz](#) (Poland)
- [Lower Danube](#) green corridor: floodplain restoration for flood protection (Bulgaria, Romania)
- Restoring the river dynamics: Room for the [River Regge](#) (Netherlands)

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Find out more about [Technical Assistance](#)

Wetland Restoration and Maintenance

Green Measures

Adaptation

Wetland restoration and maintenance

Coastal wetlands are saltwater and brackish water wetlands located in coastal areas. They provide natural defences against coastal flooding and storm surges by wave energy dissipation and erosion reduction, helping to stabilise shore sediments. In some locations, coastal wetlands can be used to absorb storm surge waters, attenuating flooding. Coastal wetlands are important habitats, for example providing a nursery function for fish and shellfish and a variety of services to birdlife and can contribute to water purification. The restoration of coastal wetlands and managed realignment are increasingly considered as measures for adaptation.

Best practices:

- Habitat restoration and integrated management in the [Ebro delta](#) to improve biodiversity protection and climate resilience (Spain)
- Adaptive restoration of the former saltworks in [Camargue](#) (France)

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Agroforestry

Green Measures

Adaptation

Agroforestry

Agroforestry systems include all land-use systems or forms of land management where woody perennials are deliberately used in the same land unit as agricultural crops and/or animals. Agroforestry exploits the complementarity between trees and crops, so that the available resources can be more effectively exploited. Efficient and modern versions of agroforestry allow the diversification of farm activity and make better use of environmental resources. Agroforestry can be implemented in both tropical and temperate regions, producing food and fibre for better nutritional security, sustaining livelihoods, alleviating poverty and promoting productive, resilient agricultural environments. Moreover, it can enhance ecosystems through carbon storage, prevention of deforestation, biodiversity conservation, cleaner water and erosion control, while enabling agricultural lands to withstand events such as floods and drought.

Best practices:

- Agroforestry: agriculture of the future? The case of [Montpellier](#) (France)
- Autonomous adaptation to droughts in an agro-silvo-pastoral system in [Alentejo](#) (Portugal)

Find out more about [Funding Programmes](#)

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Water Retention Spaces

Green Measures

Adaptation

Water retention spaces

Natural water retention measures are those that aim to safeguard and enhance the water storage potential of landscapes, soil and aquifers, by restoring ecosystems, natural features and characteristics of water courses and using natural processes. They support green infrastructure by contributing to integrated goals dealing with nature and biodiversity conservation, restoration and landscaping. They use nature to regulate the flow and transport of water so as to smooth peaks and moderate extreme events, such as floods, droughts, desertification and salination. They are a better environmental option for flood risk management, since they come in the form of decentralised lakes and ponds. Water retention spaces improve water quality and are relevant both in rural and urban areas.

Best practice:

- Natural water retention measures in the [Altovicentino Area](#) (Italy)
- The Cloudburst Management Plan: The economics of managing heavy rains and stormwater in [Copenhagen](#) (Denmark)

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Increase Green Areas in Cities

Green Measures

Increase green areas in cities

Adaptation

Green urban areas improve biodiversity and animal species dispersal within the urban landscape. If adequately designed, green areas can improve urban ventilation, allowing cooler air from outside to penetrate into the more densely built areas. Urban green areas also have positive effects for human health, they provide cooling through shading and enhanced evapotranspiration, thus reducing the heat island effect that occurs in many cities. Green areas are often threatened by expanding city structures, which have fragmented natural areas, creating small patches of green spaces in amongst buildings and roads. For example, patches of urban woodlands are generally separated from each other, which affects the ability of many woodland species to disperse, or to move among different locations with similar habitats. Ecological corridors or connections between urban woodlands, gardens or other green spaces are recognised as a way to limit the negative effects of fragmentation. The creation of green areas and corridors can be applicable in most urban areas.

Best practices:

- [Barcelona](#) trees tempering the Mediterranean city climate (Spain; see also [here](#))
- Mainstreaming climate change adaptation into urban planning: greyfield land redevelopment in [Jena](#) (Germany)
- [Stuttgart](#): combating the heat island effect and poor air quality with ventilation corridors and green-blue infrastructure (Germany)

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Awareness Raising on Water Consumption

Soft Measures

Awareness raising on water consumption

Adaptation

Especially in areas that are affected by heat and decreased precipitation, an adequate management of water supply for all different sectors is crucial. Drought management plans that reduce risk and economic, social, and environmental drought impacts are helpful. Water conservation plans aim to: limit water consumption; reduce loss and waste of water; improve water use efficiency; document the level of recycling and reuse of water; extend the life of current water supplies by reducing water demand. Furthermore, using existing water supplies more efficiently can diminish water demand and minimise the environmental impacts and costs associated with developing new supplies. Drought and water conservation plans include guidelines and requirements governing water conservation and drought contingency for public water suppliers but also through restrictions on water use, rationing schemes, special water tariffs or the reduction of low-value uses. The basic elements and contents of drought and water conservation plans can be found [here](#).

Best practices:

- [Zaragoza](#): combining awareness raising and financial measures to enhance water efficiency
- Securing future water supply on regional and local level in the [River Lavant Valley](#), Carinthia (Austria)
- Private investment in a leakage monitoring program to cope with water scarcity in [Lisbon](#) (Portugal)

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Find out more about [Technical Assistance](#)

Underwater Suction Devices

Grey Measures

Adaptation

Underwater suction devices

Underwater suction devices can be used to absorb invasive algae. These underwater vacuum devices suck up invasive seaweed and bring new life and breathe to, for instance, suffocated coral reefs. It is not yet extensively used, however it is applied to some areas such as the Hawaiian ocean.

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Crop Rotations

Green Measures

Adaptation

Crop rotations

Crop rotation is the practice of growing a series of different types of crops in the same area across a sequence of growing seasons. It reduces reliance on one set of nutrients, pest and weed pressure, and the probability of developing resistant pests and weeds. Rotating different crops each year adds various economic and environmental benefits. It is especially aimed at revitalising soils and preventing pest infection. It is therefore helpful in long-term soil and farm management.

Best practices, both in the framework of the [AgriAdapt](#) project:

- Crop diversification and improved soil management for adaptation to climate change in [Segovia](#) (Spain)
- Improving soil structure of an arable crop farm in the district of [Heilbronn](#) (Germany)

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Introduction of Natural Predators

Green Measures

Adaptation

Introduction of natural predators

Natural predators or enemies are organisms that kill or decrease the reproductive potential of another species. Most of them are introduced by people to reduce the numbers of another organism and to ensure biological control, such as introducing molluscs to control algae. Natural predators should always be introduced with caution due to the potential of unwanted negative consequences.

Best practices:

- Climate change: Back to the future for [marine predators](#)
- Habitat restoration and integrated management in the [Ebro delta](#) (see also [here](#)) to improve biodiversity protection and climate resilience (Spain)

Find out more about [Funding Programmes](#)

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Identify and Track the Most Problematic Species

Soft Measures

Adaptation

Identify the most problematic species and track their movements

Some species are highly affected by climate change, especially by higher temperatures. This can lead to species feeling the need to move and search for other natural habitats. This does not only affect the livelihood of the species itself, but also of the whole ecosystem. Identifying the species which are the most affected by climate change and tracking their movements is crucial to both saving the species and the whole ecosystem.

Best practices:

- [Assessing the Vulnerability](#) of Fish and Invertebrate Species in a Changing Climate
- Impacts of Climate Change on [European Invertebrates](#), with reference to the vulnerability of Bern Convention species (also [here](#))
- Global Observation Research Initiative in Alpine Environments ([GLORIA](#))

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Identify and Track the Most Problematic Vectors and Pathogens

Soft Measures

Identify the most problematic vectors and pathogens and track their movements

Adaptation

Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it to a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they are capable of transmitting the pathogen for the rest of their life during each subsequent bite / blood meal. Identifying and tracking the most problematic vectors and pathogens is crucial in order to prevent the transmission of harmful diseases.

Best practice:

- 'Reverse' identification key for [mosquito species](#)

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Promotion of Insurance

Soft Measures

Adaptation

Promotion of insurance

Especially for inhabitants of risk-prone areas, insurance is crucial to foster economic and social stability. Promoting insurance for individuals and small and medium-sized enterprises is important. They can act as risk management tools.

Best practice:

- Insurance company supporting adaptation action in small and medium size enterprises in [Turin](#) (Italy)

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Awareness Campaigns for Behavioural Change

Soft Measures

Adaptation

Awareness campaigns for behavioural change

Public awareness is important to increase enthusiasm and support and stimulate self-mobilisation and action, as well as mobilise local knowledge and resources. Awareness campaigns can address groups of people in a region affected by a particular climate threat, groups of stakeholders or the general public. Awareness raising requires strategies of effective communication to reach the desired outcome. The aim of awareness raising campaigns generally includes increasing concern, informing the targeted audience, creating a positive image, and changing behaviours. Large climate change awareness-raising campaigns are often a mixture of adaptation, mitigation, energy efficiency and sustainability measures.

Best practices:

- [Zaragoza](#): combining awareness raising and financial measures to enhance water efficiency
- Securing future water supply on regional and local level in the [River Lavant Valley](#), Carinthia (Austria)
- [Ghent crowdfunding platform](#) realising climate change adaptation through urban greening (Belgium)

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Early-Warning Systems & Vulnerability Assessments

Soft Measures

Early-warning systems & vulnerability assessments

Adaptation

Early warning systems and vulnerability assessments are key elements of climate change adaptation and disaster risk reduction. They aim to avoid and reduce the damages caused by hazards. The significance of an effective early warning system lies in the recognition of its benefits by local people. Early warning systems include detection, analysis, prediction and warning dissemination, followed by response decision-making and implementation. To be effective and complete, an early warning system needs to comprise four interacting elements: risk knowledge; monitoring and warning services; dissemination and communication; and response capability. They can be used to...

- ... assess vulnerability to high temperatures: EuroHEAT online heatwave forecast ([EuroHEAT](#));
- ... combat forest fires: European Forest Fire Information System ([EFFIS](#));
- ... assess decreases in summer precipitation and droughts: European Drought Observatory ([EDO](#));
- ... predict floods: European Flood Awareness System ([EFAS](#));
- ... assess melting ice coverage and permafrost reduction ([PermaNET](#));
- ... assess landslides and rock falls, such as in the [ProtectBio project](#) in Switzerland;
- ... assess and map future erosion;
- ... combat diseases: European Centre for Disease Prevention and Control ([ECDC](#)) & European Aeroallergen Network ([EAN](#)).

Find out more about [Funding Programmes](#)

Find out more about [Technical Assistance](#)

Info Section: What are Green, Grey and Soft Measures?

Grey measures...

... target physical infrastructure and rely on technological solutions to better equip people and places to the consequences of a changing climate. Grey measures include a wide range of interventions to transform the built environment. Some examples are interventions to vital infrastructure, making improvements to the infrastructure of critical buildings, as well as developing urban planning projects in a way to reduce the threats from climate events.

Green measures...

... make changes to the built environment by using nature-based solutions. These measures can be less costly to implement and can deliver other benefits, such as improved amenity or benefits for nature and biodiversity. These measures often represent “no or low-regret” solutions for improving the resilience of human systems, because they will continue to deliver benefits even if climate impacts do not occur or are less serious than anticipated. Such measures are often referred to as green infrastructure (or blue infrastructure if aquatic ecosystems are concerned) or ecosystem-based adaptation measures.

Soft measures...

... include policy, legal or administrative initiatives that aim to change behaviours, increase the adaptive capacity of people, businesses and public authorities, or build knowledge and know-how. These measures could include awareness-raising campaigns, early warning systems or providing relevant stakeholders with information tools such as climate change impact and vulnerability or risk assessments, taking insurance against damages from extreme weather events.

Funding Adaptation: Programmes

- [European Structural and Investment Funds](#) (ESIF)
 - European Regional Development Fund ([ERDF](#))
 - [Urban Innovation Action](#)
 - [European Territorial Cooperation](#)
 - Cohesion Fund ([CF](#))
 - European Social Fund+ ([ESF+](#))
 - European Agricultural Fund for Rural Development ([EAFRD](#))
 - European Maritime, Fisheries and Aquaculture Fund ([EMFAF](#))
- [LIFE](#) programme by CINEA
- [Just Transition Fund](#)
- [Invest EU](#)
- [Connecting Europe Facility](#)
- [EU Renewable Energy Financing Mechanism](#)
- [Horizon Europe](#)
- [Innovation Fund](#)



Funding Adaptation: ESIF

European Structural and Investment Funds

The European Structural and Investment Funds ([ESIF](#)) comprise the European Regional Development Fund, the European Social Fund, the European Agricultural Fund for rural development and the European Maritime and Fisheries Fund. Over half of the EU's funding is channelled through these funds. They focus mainly on five areas: research and innovation, digital technologies, supporting the low-carbon economy, sustainable management of natural resources, and supporting small businesses.



Funding Adaptation: ERDF

European Regional Development Fund

The European Regional Development Fund ([ERDF](#)) aims to strengthen economic, social and territorial cohesion in the European Union by correcting imbalances between regions. Between 2021 and 2027 it will enable investments in a smarter, greener, more connected and more social Europe that is closer to its citizens. The ERDF finances programmes in shared responsibility between the European Commission and national and regional authorities in the Member States. The Member States' administrations choose which projects to finance and take responsibility for the day-to-day management.



Funding Adaptation: ERDF

European Regional Development Fund

Within the ERDF, there are two other initiatives: [Urban Innovative Actions](#) and [European Territorial Cooperation Interreg](#).

Urban Innovative Actions is an initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Within the Interreg programme, the European Union promotes cooperation between regions and countries to help their economic and social development and tackle the obstacle of borders. It is organised under multiple strands, such as [Interreg A](#) for cross-border cooperation, [Interreg B](#) for transnational cooperation and [Interreg C](#) for interregional cooperation.



Funding Adaptation: CF

Cohesion Fund

The Cohesion Fund ([CF](#)) supports investments in the field of environment and in trans-European networks in the area of transport infrastructure. For the 2021-2027 period, it concerns Bulgaria, Czechia, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. 37% of its overall financial allocation are expected to contribute to climate objectives.



Funding Adaptation: ESF+

European Social Fund Plus+

The European Social Fund Plus+ ([ESF+](#)) invests in people, with a focus on improving employment and education opportunities across the European Union. The budget for the 2021-2027 period adds up to almost EUR 100 billion. It provides an important contribution to the EU's employment, social, education and skills policies, including structural reforms in these areas. Furthermore, it also aims to improve the situation of the most vulnerable people at risk of poverty.



Funding Adaptation: EAFRD

European Agricultural Fund for Rural Development

The common agricultural policy supports the vibrancy and economic viability of rural areas. Rural development is its second pillar. It contributes to the sustainable development of rural areas by fostering competitiveness, ensuring sustainable management of natural resources and climate action, and achieving a balanced territorial development of rural economies and communities. The European Agricultural Fund for Rural Development ([EAFRD](#)) amounts to EUR 95.5 billion.



Funding Adaptation: EMFAF

European Maritime, Fisheries and Aquaculture Fund

The European Maritime, Fisheries and Aquaculture Fund ([EMFAF](#)) helps fisheries to adopt sustainable fishing practices and coastal communities to diversify their economies, improving the quality of life along European coasts. It supports the EU common fisheries policy, the EU maritime policy and the EU agenda for international ocean governance. It provides support for developing innovative projects ensuring that aquatic and maritime resources are used sustainably. This leads to food security through the supply of seafood products, growth of a sustainable blue economy and healthy, safe and sustainably managed seas and oceans.



Funding Adaptation: LIFE

EU's Funding Instrument for Environment and Climate Action

The LIFE programme by the European Climate Infrastructure and Environment Executive Agency is the EU's funding instrument for the environment and climate action. It is aimed at supporting projects in the fields of [nature and biodiversity](#), [circular economy and quality of life](#), [climate change mitigation and adaptation](#), and [clean energy transition](#). It supports applicants and provides information on awards, publications and project initiation.

The [climate change mitigation and adaptation](#) subprogramme co-funds projects supporting the operation of the European Climate Pact, sustainable finance activities, awareness raising, training and capacity building, knowledge development and stakeholder participation in climate change mitigation and adaptation areas.



Funding Adaptation: Just Transition Fund

Just Transition Fund

The [Just Transition Fund](#) (JTF) is a financial instrument within the EU's Cohesion Policy 2021-2027, and is the first pillar of the Just Transition Mechanism in the context of the European Green Deal aiming at achieving EU climate neutrality by 2050. The fund supports the territories most affected by the transition towards climate neutrality to avoid growing regional inequalities, in line with the EU's Cohesion Policy's aim to reduce regional disparities and to address structural changes in the EU. The Commission has set up a Just Transition Platform (see Technical Assistance in this handbook) to help EU countries and regions to access the support available through the Just Transition Mechanism.



Funding Adaptation: InvestEU

InvestEU

The [InvestEU](#) Fund combines 13 centrally managed EU financial instruments and the European Fund for Strategic Investments into one instrument. It is a market-based and demand-driven instrument, with a strong emphasis on EU policy priorities. It supports projects in the fields of sustainable infrastructure, research, innovation and digitalisation, small and medium-sized businesses, and social investment and skills.



Funding Adaptation: Connecting Europe Facility

Connecting Europe Facility

The [Connecting Europe Facility](#) (CEF) supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. In addition to grants, the CEF offers financial support to projects through innovative financial instruments such as guarantees and project bonds. These instruments create significant leverage in their use of the EU budget and act as a catalyst to attract further funding from the private sector and other public sector actors.



Funding Adaptation: EU Renewable Energy Financing Mechanism

EU Renewable Energy Financing Mechanism

To better support renewable energy projects, and thereby encourage a greater uptake of renewable energy sources across the EU, the European Commission has established the [Renewable Energy Financing Mechanism](#). Its main objective is to enable Member States to work more closely together in the take-up and promotion of renewables, so that they can more easily achieve both individual and collective renewable energy targets. The mechanism will also boost renewable projects in line with the European Green Deal. It will facilitate a more cost-effective roll-out of renewables across the EU, particularly in areas that have greater access to natural resources or are better suited for it in terms of geography.



Funding Adaptation: Horizon Europe

Horizon Europe

[Horizon Europe](#) is the EU's key funding programme for research and innovation with a budget of EUR 95.5 billion. It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports the creating and better distribution of excellent knowledge and technologies.

It creates jobs, fully engages the EU's talent pool, boosts economic growth, promotes industrial competitiveness and optimises investment impact within a strengthened European Research Area.



Funding Adaptation: Innovation Fund

Innovation Fund

The [Innovation Fund](#) is a large funding programmes for the demonstration of innovative low-carbon technologies. Its goal is to help businesses invest in clean energy and industry to boost economic growth, create local and future-proof jobs, and reinforce European technological leadership on a global scale. This is done through calls for large and small-scale projects focusing on innovative low-carbon technologies and processes in energy-intensive industries, on carbon capture and utilisation, on the construction and operation of carbon capture and storage, on innovative renewable energy generation and on energy storage.



Technical Assistance for Adaptation

- [Climate Adapt](#)
- [Urban Adaptation Support Tool](#)
- [Copernicus Climate Change Service](#)
- [Biodiversity Information System for Europe](#)
- [Water Information System for Europe](#)
- [National Adaptation Platforms](#), such as in Austria, Finland, Hungary, Poland, Croatia, France, Ireland, Spain, Denmark, Germany, Netherlands and Sweden.
- CCIV assessments via the [EIONET](#) library
- [Transnational Exchange Platforms](#), such as the Climate Adaptation Platform for the Alps or the Pyrenean Climate Change Observatory
- [City Networks](#), such as Covenant of Mayors for Climate and Energy Europe, C40 Cities, Making Cities Resilient or Resilient Cities Annual Conference
- [JPI Urban Europe](#)
- [Connecting Europe Facility](#)
- [European Energy Efficiency TA](#)
- [InvestEU Advisory Hub](#)
- [Just Transition Platform](#)



Technical Assistance for Adaptation

Climate Adapt

[Climate-ADAPT](#) is the European Climate Adaptation Platform and a partnership between the European Commission and the European Environment Agency. Climate-ADAPT aims to support Europe in adapting to climate change by helping users to access and share data and information on: expected climate change in Europe; current and future vulnerability of regions and sectors; national and transnational adaptation strategies and actions; adaptation case studies and potential adaptation options; and tools that support adaptation planning.



Technical Assistance for Adaptation

Urban Adaptation Support Tool

The [Urban Adaptation Support Tool](#) aims to assist cities, towns and other local authorities in developing, implementing and monitoring climate change adaptation plans. It was developed as a practical guidance tool for urban areas in recognition of their importance in the European economy. The tool outlines all the steps needed to develop and implement an adaptation strategy. It is aimed at cities starting the process as well as at those more advanced in the process.



Technical Assistance for Adaptation

Copernicus Climate Change Service

The [Copernicus Climate Change Service](#) aims to support adaptation and mitigation policies of the European Union by providing consistent and authoritative information about climate change. It offers free and open access to climate data and tools based on available science.



Technical Assistance for Adaptation

Biodiversity Information System for Europe

The [Biodiversity Information System for Europe](#) is a single entry point for data and information on biodiversity in Europe. It provides detailed information on protecting biodiversity, green infrastructure, biodiversity policy and data and other fields connected to challenges and the future of biodiversity.



Technical Assistance for Adaptation

Water Information System for Europe

The [Water Information System for Europe](#) (WISE) is a partnership between the European Commission and the European Environment Agency. It was launched in 2007 providing a web-portal entry to water related information ranging from inland waters to marine. For users from EU institutions or other environmental national, regional and local administrations WISE provides input to thematic assessments in the context of EU water related policies. For water professionals and scientists WISE facilitates access to reference documents and thematic data, which can be downloaded for further analyses. For the general public, including private or public entities, WISE illustrates a wide span of water related information through interactive maps, charts and indicators.



Technical Assistance for Adaptation

Various National Adaptation Platforms, providing country-specific information

[Austria](#)

Klima | Wandel | Anpassung

[Finland](#)



[Hungary](#)



[Poland](#)



[Croatia](#)



[France](#)



[Ireland](#)



[Spain](#)



[Denmark](#)



[Germany](#)



[Netherlands](#)



[Sweden](#)

Klimatanpassning.se

Technical Assistance for Adaptation

CCIV assessments

The European Environment Information and Observation Network (EIONET) is a partnership network of the European Environment Agency and its 38 members and cooperating countries. Together they gather and develop data, knowledge, and advice to policy-makers about Europe's environment. It also offers climate change impact and vulnerability data for further analysis.



Technical Assistance for Adaptation

Transnational Exchange Platforms

The Climate Adaptation Platform for the Alps ([CAPA](#)) provides knowledge about adaptation to climate change in the Alps. It is aimed at political decision makers, public administrations, municipalities, entrepreneurs, researchers and experts. It is available in German, English, French, Italian and Slovenian.

The Pyrenean Climate Change Observatory ([OPCC](#)) is a cross-border initiative of territorial cooperation of the Working Community of the Pyrenees. It aims to monitor and understand the climate change phenomenon in the Pyrenees in order to help the territory adapt to its effects.



European Committee
of the Regions

Technical Assistance for Adaptation

City Networks

[The Covenant of Mayors for Climate and Energy Europe](#) is the world's largest movement for local climate and energy actions. It brings together thousands of local governments voluntarily committed to implementing EU climate and energy objectives, jointly moving towards a fairer, climate-neutral Europe for all its citizens. Among other things, it provides best practice cases, information on funding and on adaptation resources.

[C40 Cities](#) is a global network of mayors taking urgent action to confront the climate crisis and create a prosperous future. It provides information on raising climate ambition, engaging society and on scaling up climate action.

[Making Cities Resilient](#) is a cross-stakeholder initiative for improving local resilience through advocacy and establishing mutually reinforcing city-to-city learning networks. Through the delivery of a three-stage roadmap to urban resilience, providing tools, access to knowledge, and monitoring and reporting tools, this initiative will support cities on their journey to reduce risk and build resilience.



European Committee
of the Regions

Technical Assistance for Adaptation

JPI Urban Europe

[The Joint Programming Initiative Urban Europe](#) is the knowledge hub for urban transitions. Its task is to connect public authorities, civil society, scientists, innovators, business, and industry to provide a fruitful environment for research and innovation to contribute to urban transformation processes. The hub was created in 2010 to address the global urban challenges of today with the ambition to develop a European research and innovation hub. Local and regional authorities can contact the hub and collaborate on long-term strategies and joint projects.



Technical Assistance for Adaptation

Connecting Europe Facility

The [Connecting Europe Facility](#) (CEF) is a key EU funding instrument in delivering the European Green Deal and an important enabler towards the Union's decarbonisation objectives for 2030 and 2050. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. CEF investments fill the missing links in Europe's energy, transport and digital backbone. The CEF benefits people across all Member States, as it makes travel easier and more sustainable, it enhances Europe's energy security while enabling wider use of renewables, and it facilitates cross-border interaction between public administrations, businesses and citizens.



Technical Assistance for Adaptation

Europe Energy Efficiency TA

The [Europe Energy Efficiency Fund Technical Assistance Facility](#) supports public beneficiaries in developing bankable sustainable energy investment programmes. These projects relate to the energy efficiency sector, small-scale renewable energy and/or public urban transport. The facility aims to bridge the gap between sustainable energy plans and real investments by supporting all activities necessary to prepare investments in sustainable energy projects.



Technical Assistance for Adaptation

InvestEU Advisory Hub

The [InvestEU Advisory Hub](#) complements the InvestEU Fund by supporting the identification, preparation and development of investment projects across the European Union. Managed by the European Commission and financed by the EU budget, the hub connects project promoters and intermediaries with advisory partners, who work directly together to help projects reach the financing stage. The hub is a central entry point for project promoters and intermediaries seeking advisory support and technical assistance related to centrally managed EU investment funds.



Technical Assistance for Adaptation

Just Transition Platform

The [Just Transition Platform](#) (JTP) provides a single access point to support and knowledge on Europe's transition to a sustainable, climate-neutral economy. The platform is the EU's key tool to help Member States and regions access the support available through the Just Transition Mechanism, ensuring a fair and just transition that leaves no person or region behind.

