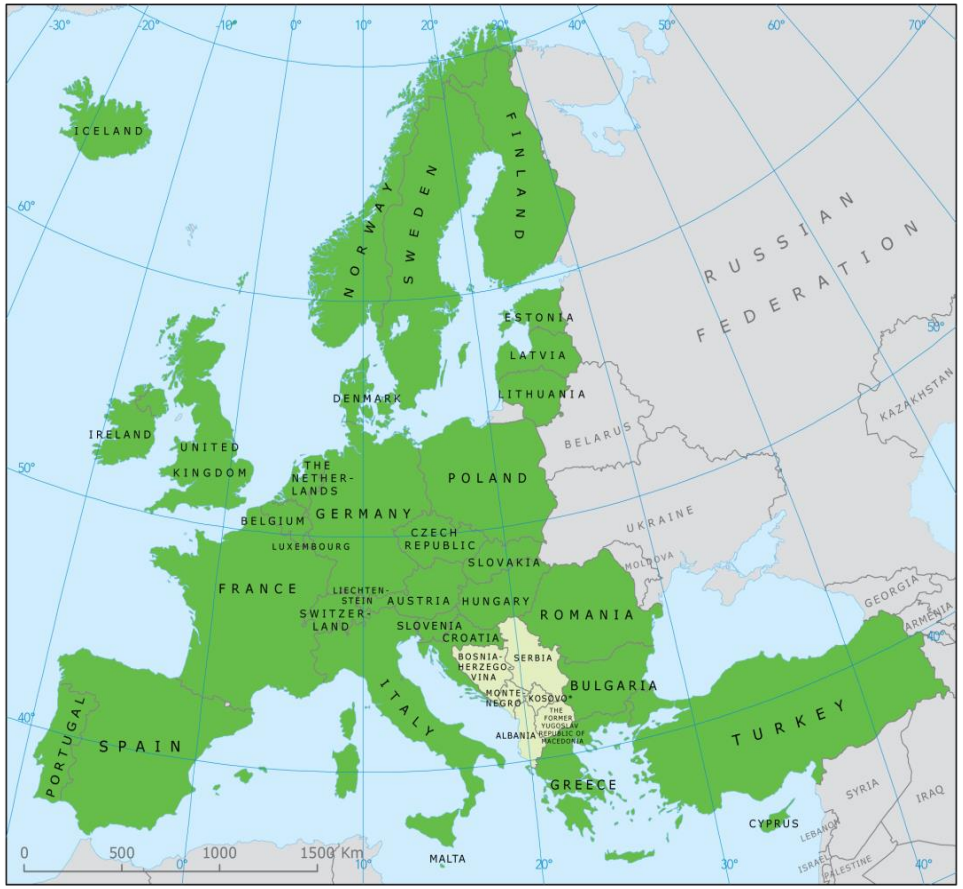
André Jol, EEA Head of Group climate change adaptation and LULUCF
International conference ‘Climate change 2019, challenges and solutions’

Climate change impacts and adaptation in Europe

25 1994-2019
European Environment Agency

EEA role and activities



EEA coverage

Member countries

Cooperating countries

*Kosovo under UNSCR 1244/99

"The EEA aims to support sustainable development and to help achieve significant and measurable improvement in Europe's environment through the provision of timely, targeted, relevant and reliable information to policy makers and the public"

- **33 member** and six collaborating **countries**
- Main target audience: **policymakers**
- **Networking:** Eionet workshops, consultations
- Supported by **European Topic Centres**
- Developing a **new strategy 2021-2030**

European Environment Agency

Responding to policy needs and using global knowledge

Global

UNFCCC **Paris Agreement**

Sendai Framework for **Disaster Risk Reduction**

Convention on **Biological Diversity**

Sustainable Development Goals

Knowledge: IPBES report on biodiversity, IPCC 1.5 C report and special reports on land and on oceans

European

Mitigation: climate neutral Europe by 2050; EU Regulation on governance of the **Energy Union and Climate action**

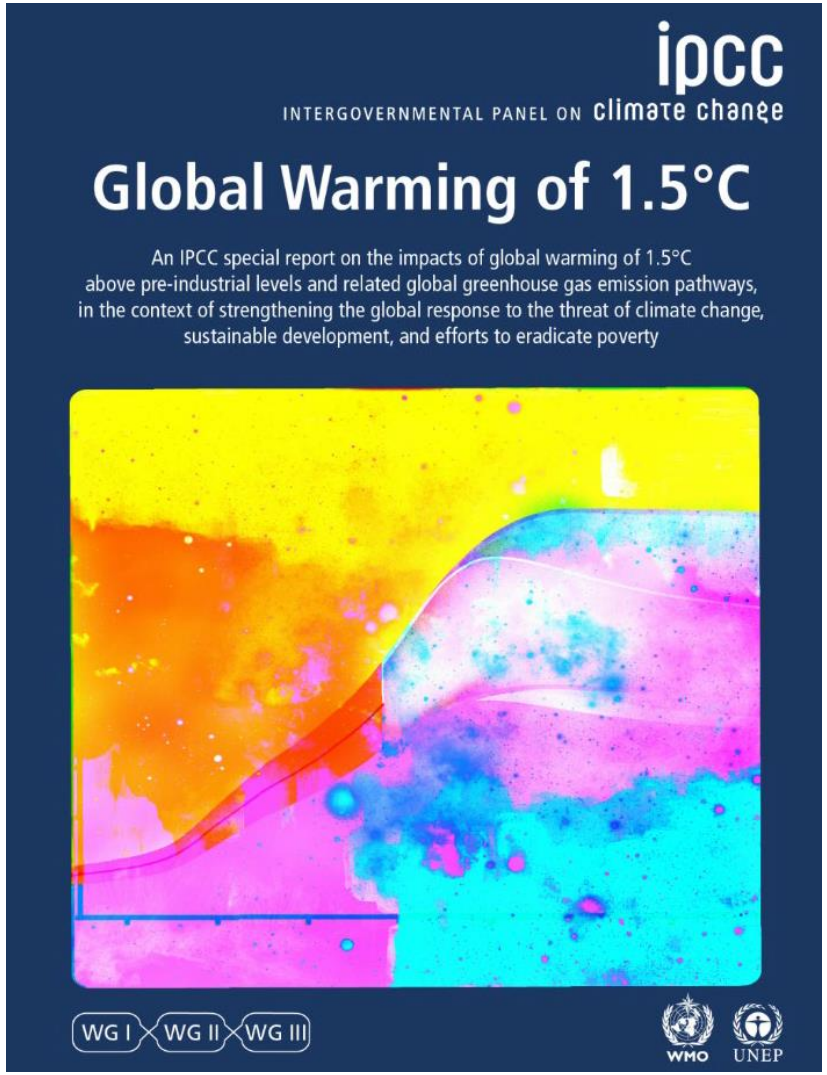
Climate Adaptation Strategy (evaluated in 2018)

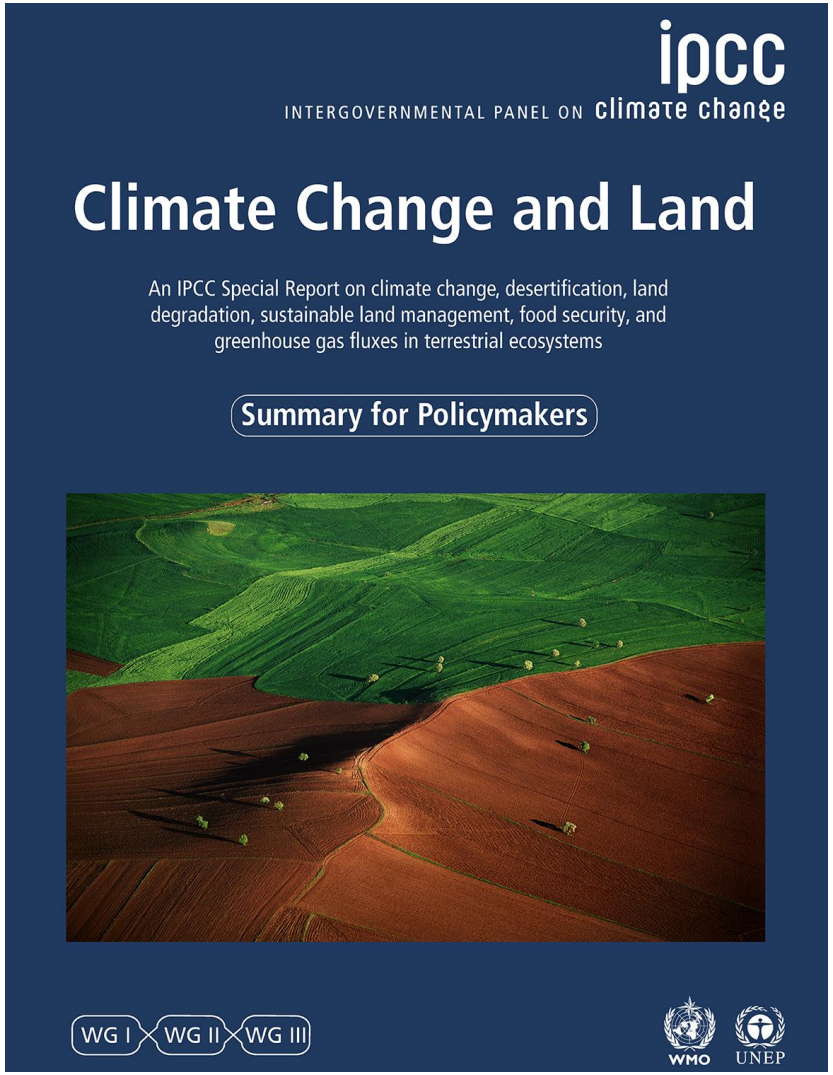
Sectoral: Common Agricultural Policy, etc

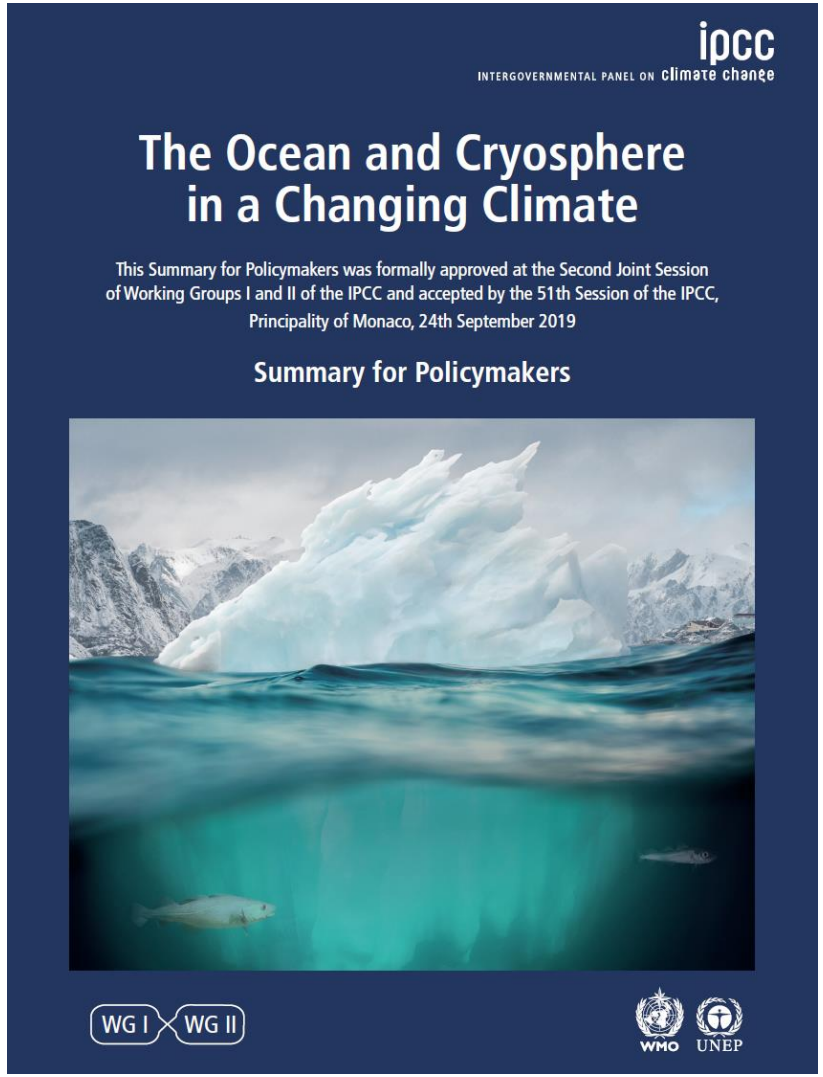
Environmental: Biodiversity strategy, Water Framework Directive, Floods Directive, etc

New Commission: A European Green Deal

Further increased global knowledge on climate change







European Environment Agency

Key ambitions of the new Commission

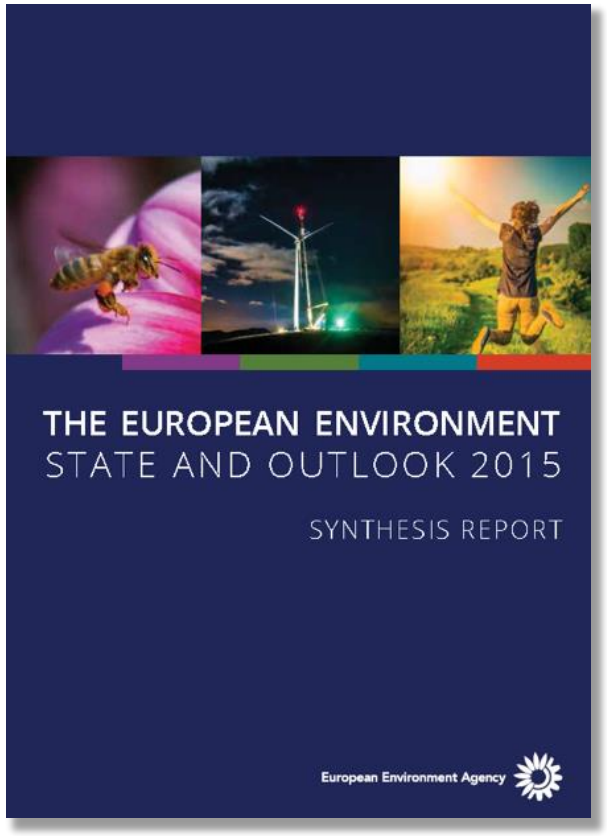
'Europe must lead the transition to a healthy planet and a new digital world. But it can only do so by bringing people together and upgrading our unique social market economy to fit today's new ambitions.'

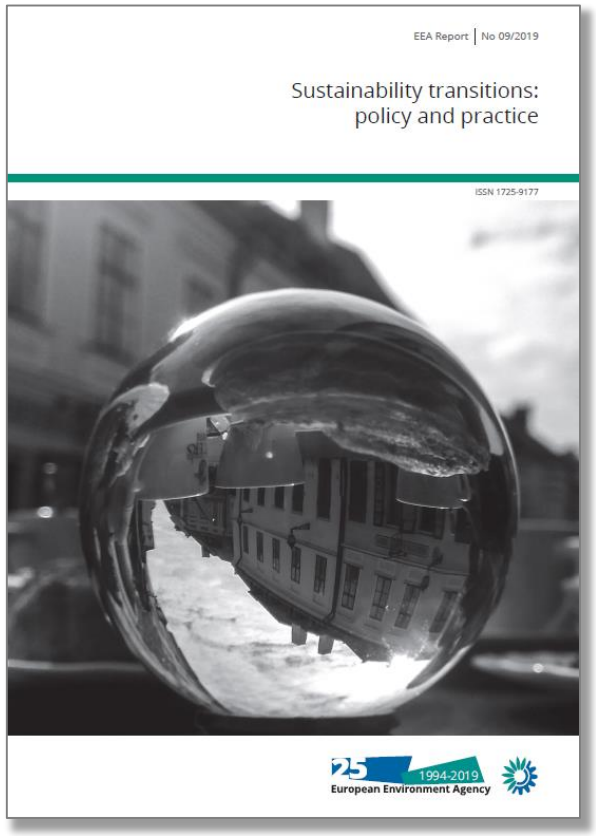
Ursula von der Leyen, *Political guidelines for the next European Commission 2019-2024*

Headline ambition 1: A European Green Deal

- Global leadership: world's first climate-neutral continent
- Biodiversity Strategy 2030
- New Circular Economy Action Plan
- Just transition: Cohesion Funds supporting regions in transition, Just Transition Fund
- Sustainable European Investment Plan
- Future ready economy – new industrial strategy

EEA state of the environment and outlook report, addressing sustainability challenges





Report **'Sustainability transitions – policy and practice'**: 10 sets of messages for policy, outlining how governments and other actors can enable systemic change towards long-term sustainability goals

EEA State of the environment and outlook report 2020, forthcoming 4 December 2019

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Copernicus and role of EEA and Eionet

Coordination of in situ EIONET data across services

Implementation of European and local land monitoring

FULL, FREE AND OPEN ACCESS TO DATA

- ATMOSPHERE MONITORING
- MARINE ENVIRONMENT MONITORING
- LAND MONITORING
- CLIMATE CHANGE
- EMERGENCY MANAGEMENT
- SECURITY

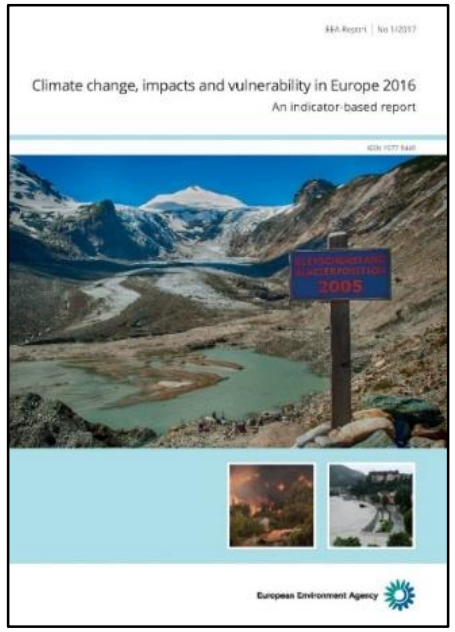
Key user of Copernicus data, working closely with climate change service

Copernicus
Europe's eyes on Earth

Copernicus climate change service providing information

European Environment Agency

Climate change is affecting all European regions – adaptation needs differ across regions



Arctic region
- Temperature rise much larger than global average
- Decrease in Arctic sea ice coverage
- Decrease in Greenland ice sheet
- Decrease in permafrost areas
- Increasing risk of biodiversity loss
- Some new opportunities for the exploitation of natural resources and for sea transportation
- Risks to the livelihoods of indigenous peoples

Coastal zones and regional seas
- Sea level rise
- Increase in sea surface temperatures
- Increase in ocean acidity
- Northward migration of marine species
- Risks and some opportunities for fisheries
- Changes in phytoplankton communities
- Increasing number of marine dead zones
- Increasing risk of water-borne diseases

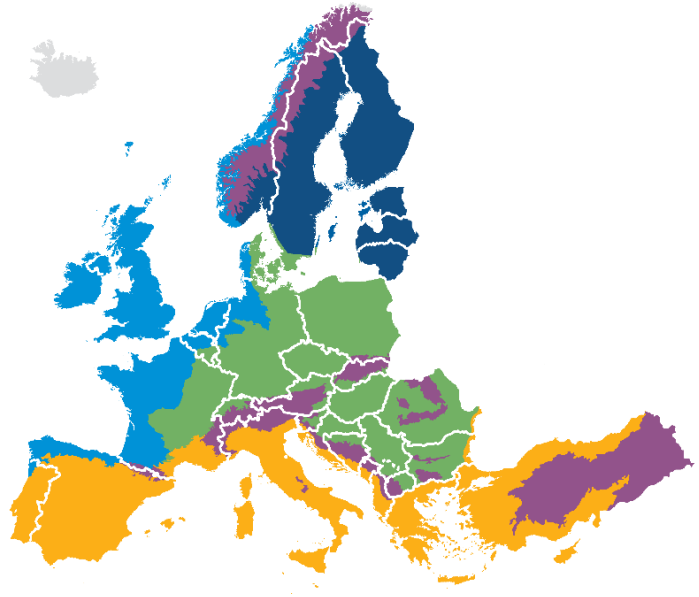
Atlantic region
- Increase in heavy precipitation events
- Increase in river flow
- Increasing risk of river and coastal flooding
- Increasing damage risk from winter storms
- Decrease in energy demand for heating
- Increase in multiple climatic hazards

Boreal region
- Increase in heavy precipitation events
- Decrease in snow, lake and river ice cover
- Increase in precipitation and river flows
- Increasing potential for forest growth and increasing risk of forest pests
- Increasing damage risk from winter storms
- Increase in crop yields
- Decrease in energy demand for heating
- Increase in hydropower potential
- Increase in summer tourism

Mountain regions
- Temperature rise larger than European average
- Decrease in glacier extent and volume
- Upward shift of plant and animal species
- High risk of species extinctions
- Increasing risk of forest pests
- Increasing risk from rock falls and landslides
- Changes in hydropower potential
- Decrease in ski tourism

Continental region
- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods
- Increasing risk of forest fires
- Decrease in economic value of forests
- Increase in energy demand for cooling

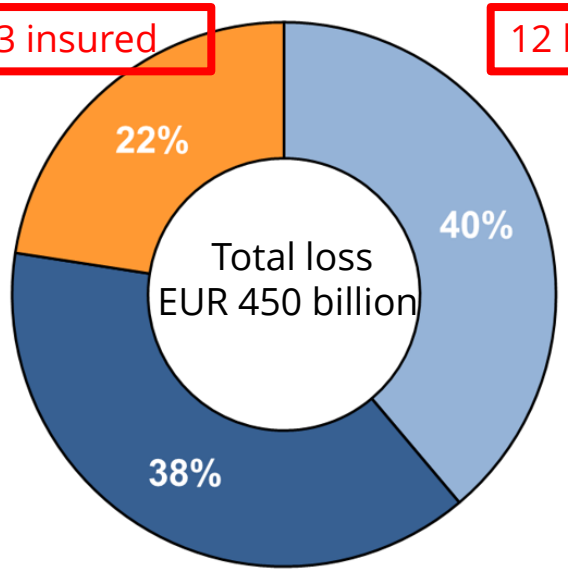
Mediterranean region
- Large increase in heat extremes
- Decrease in precipitation and river flow
- Increasing risk of droughts
- Increasing risk of biodiversity loss
- Increasing risk of forest fires
- Increased competition between different water users
- Increasing water demand for agriculture
- Decrease in crop yields
- Increasing risks for livestock production
- Increase in mortality from heat waves
- Expansion of habitats for southern disease vectors
- Decreasing potential for energy production
- Increase in energy demand for cooling
- Decrease in summer tourism and potential increase in other seasons
- Increase in multiple climatic hazards
- Most economic sectors negatively affected
- High vulnerability to spillover effects of climate change from outside Europe



Extreme climate events are costly and life-threatening

Economic losses

Only 1/3 insured

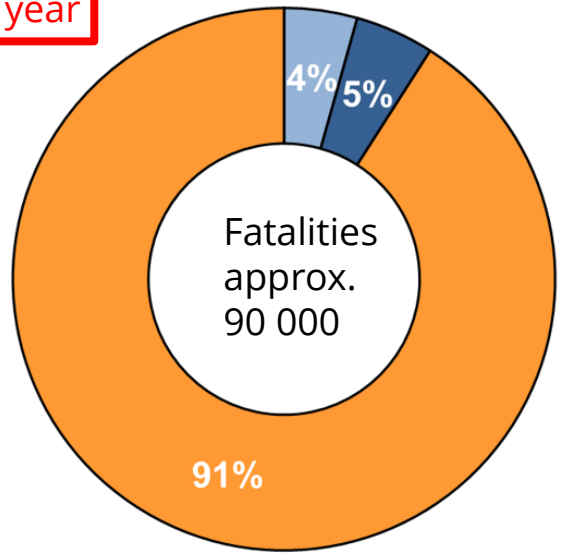


Source: Munich Re, 2017

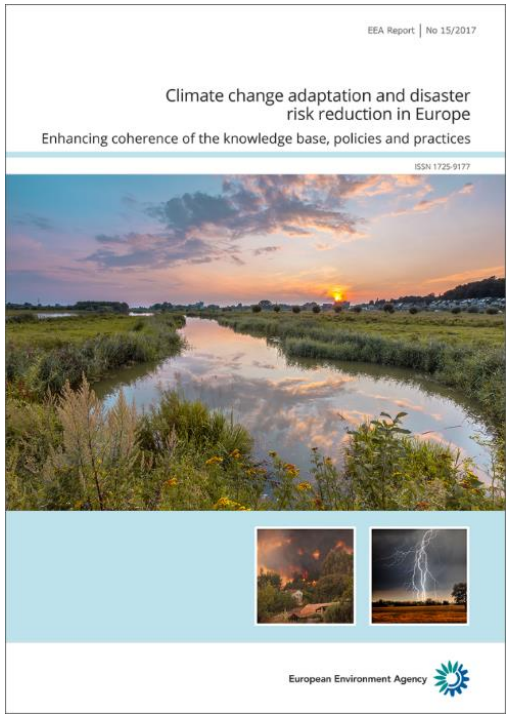
- Storms, heavy precipitation, hail
- River floods, landslides, avalanches
- Heatwaves, droughts, forest fires

Fatalities

12 billion per year



EEA member countries
1980-2016



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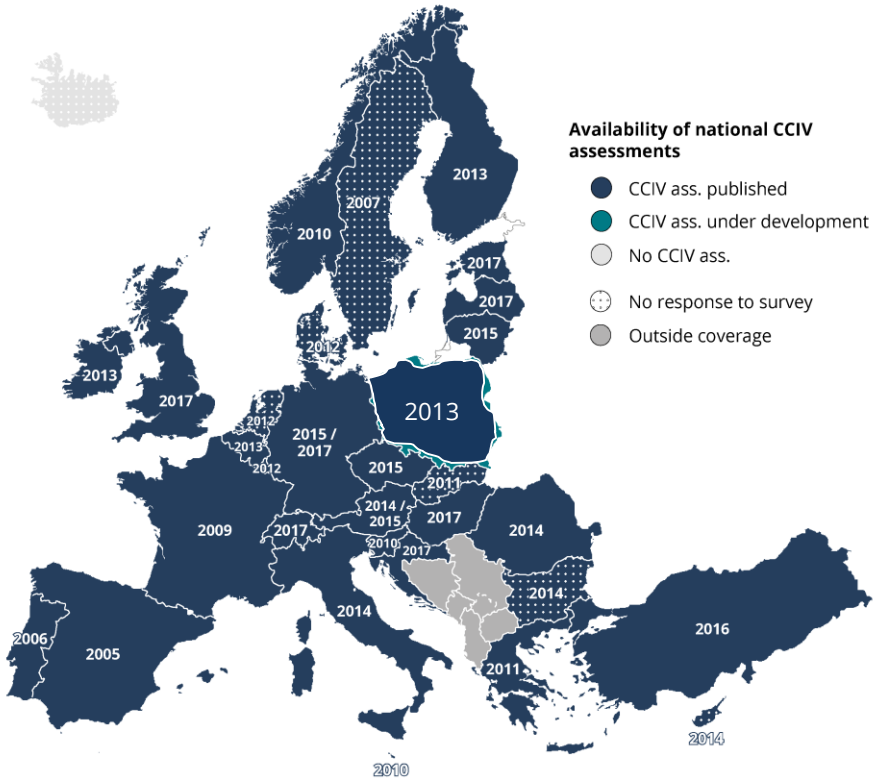
National climate change vulnerability and risk assessments in Europe

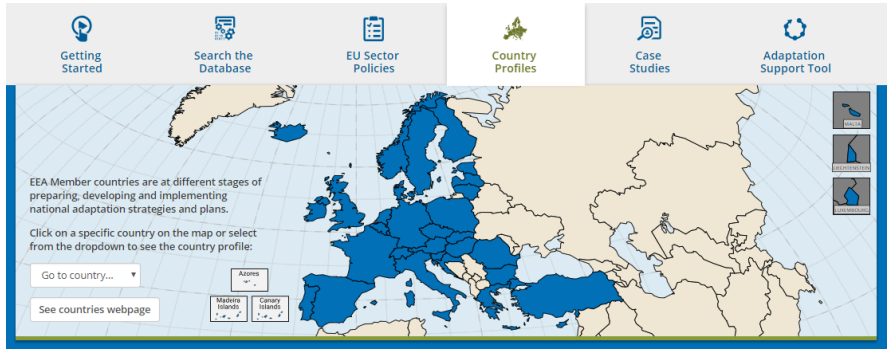


Source: EEA, 2018 'National climate change vulnerability and risk assessments in Europe'

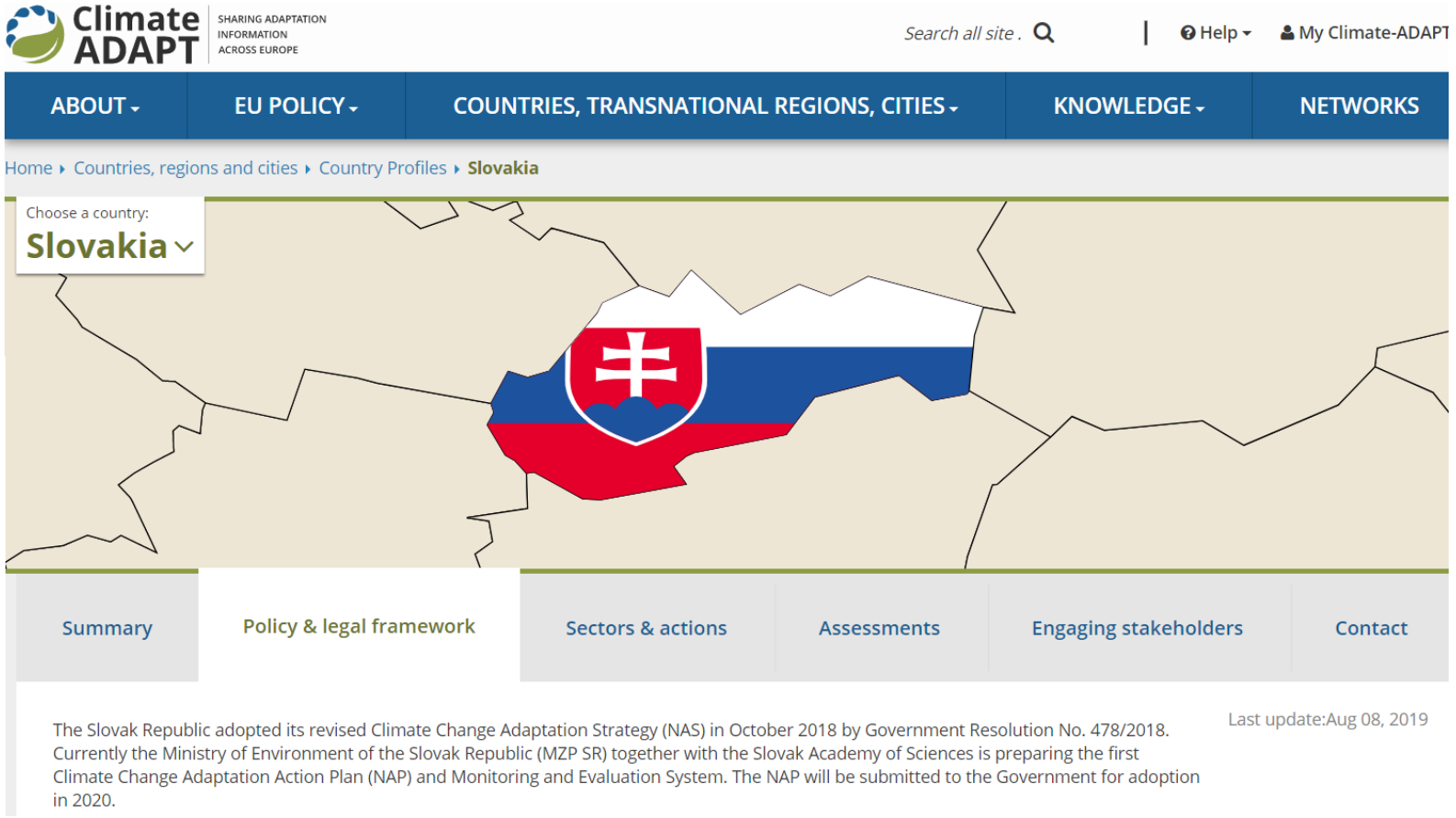
- Based on a **survey** and other information (e.g. Climate-ADAPT)
- **Almost all European countries** have conducted national climate change vulnerability and risk assessments
- Key contribution to national **adaptation policies**
- **Themes** most frequently covered: water and agriculture, followed by biodiversity, energy, forestry and human health
- **Key knowledge gaps and challenges:**
  - common assessment methods, scenarios and metrics with disaster risk assessments;
  - cross-sectoral interactions; cascading effects; high-end CC and impact scenarios
  - effects from climate impacts outside Europe

European Environment Agency

Reporting on adaptation by EU member states



- Until 2019 under the **Monitoring Mechanism Regulation**, from 2021 onwards under the **Energy Union and Climate Action governance regulation**
- **EEA supports** MS and presents the information on Climate-ADAPT
- Almost all EU MS have a **National Adaptation Strategy** in place, focus shifts **towards action plans and implementation**



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Transnational regions in Europe have also started to act

Europe's border regions and maritime areas, like its Arctic and the Mediterranean regions, are facing negative impacts due to climate change. Countries responsible for these transnational areas are already taking action to adapt to changes in weather and climate extreme events (e.g. increased heat waves or heavy rainfalls). This briefing gives an up-to-date overview of how European countries are working together to adapt to climate change impacts in these shared regions, some of which are considered climate change 'hot spots' because they are most vulnerable to dramatic changes.

ABOUT | EU POLICY | COUNTRIES, TRANSNATIONAL REGIONS, CITIES | KNOWLEDGE | NETWORKS

Home ▸ Countries, regions and cities ▸ Transnational regions

Transnational regions

There are 12 regions in Europe for transnational co-operation. In addition, specific EU agreed strategies exist for four macro-national regions: Baltic Sea, Danube, Alpine, and Adriatic and Ionian regions. This section provides information on strategies and actions that have been developed or are currently under development for the EU transnational regions and for other regions and countries.

To go to one of the region's pages, choose a region from the drop-down list or click on its map. To see **Other regions** click here.

Choose a region

Danube Basin + | ICPDR + | Issues + | Activities & Projects + | Publications +

Home // Activities & Projects // Climate Change Adaptation

Climate Change Adaptation

Climate change poses a serious threat to our ability to manage our water resources in the Danube River Basin. In response, the ICPDR updated its Strategy on Adaptation to Climate Change in 2018 based on the most recent research in the field.

Follow us!

Save our Danube Sturgeon

Cities are increasingly active, supported by the Covenant of Mayors

MITIGATION

Accelerating the decarbonisation of their territories

ADAPTATION

Strengthening their capacity to adapt to unavoidable climate change impact

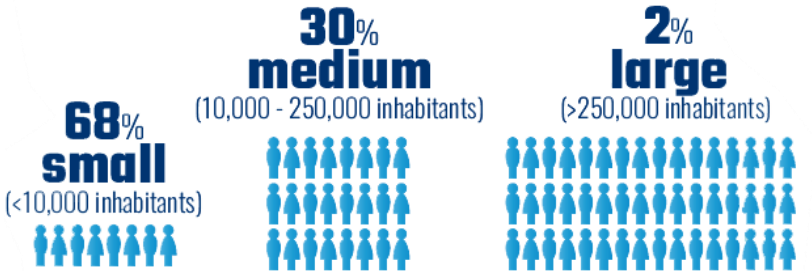
ENERGY

Allowing their citizens to access secure, sustainable and affordable energy

'-40% by 2030' + 'more resilient cities' + 'address Energy Poverty'

AN INCLUSIVE MOVEMENT

Gathering local governments of all sizes

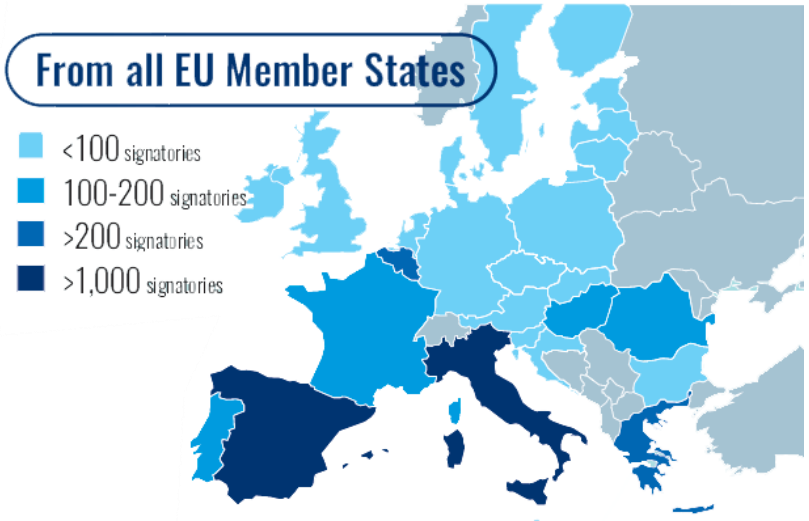


8,800+
European cities committed

Out of which 2,200+ commited to adaptation

230+
million inhabitants covered =
almost half of the EU population

From all EU Member States



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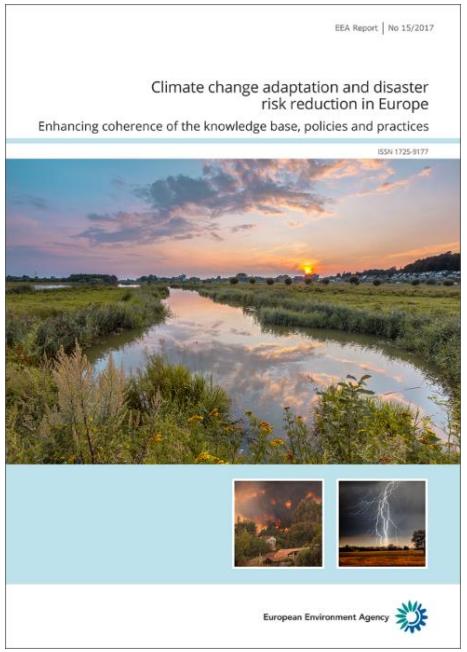
Benefits of enhancing coherence of climate change adaptation and disaster risk reduction

Benefits

Enhanced knowledge base
More effective and efficient policies
Stronger collaboration
More efficient use of resources
Better prevention and preparedness

Climate change adaptation and disaster risk reduction : good practice

- Combining risk transfer using **insurance**
- **National** agenda and **local** implementation
- **Developing** national risk assessments
- **City networks** promoting urban resilience
- Financing **nature-based solutions**
- Long-term **programmatic approach**



Programmatic approach, adequate funding, long-term strategy, effective CCA and DRR integration, new adaptive planning approach "Adaptive Delta Management" to reduce risk of overspending or underinvestment'

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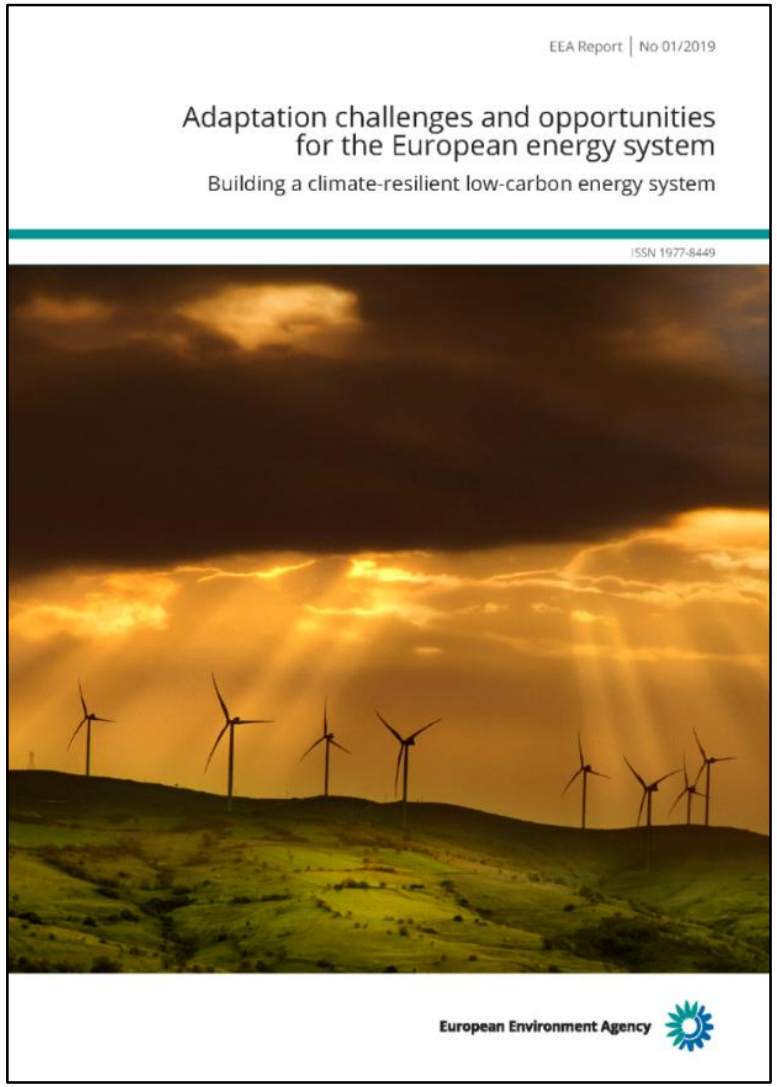
Adaptation in the EU energy system



- All parts of Europe's **energy system** are **vulnerable** to climate change and extreme weather events
- There are **large regional differences** of adverse impacts
- To secure reliable **supply and use of clean energy** and achieve a climate neutral Europe, Europe's **current and future energy system needs to adapt** and become more climate resilient

eea.europa.eu/publications/adaptation-in-energy-system

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Key climate change risks for the European energy system

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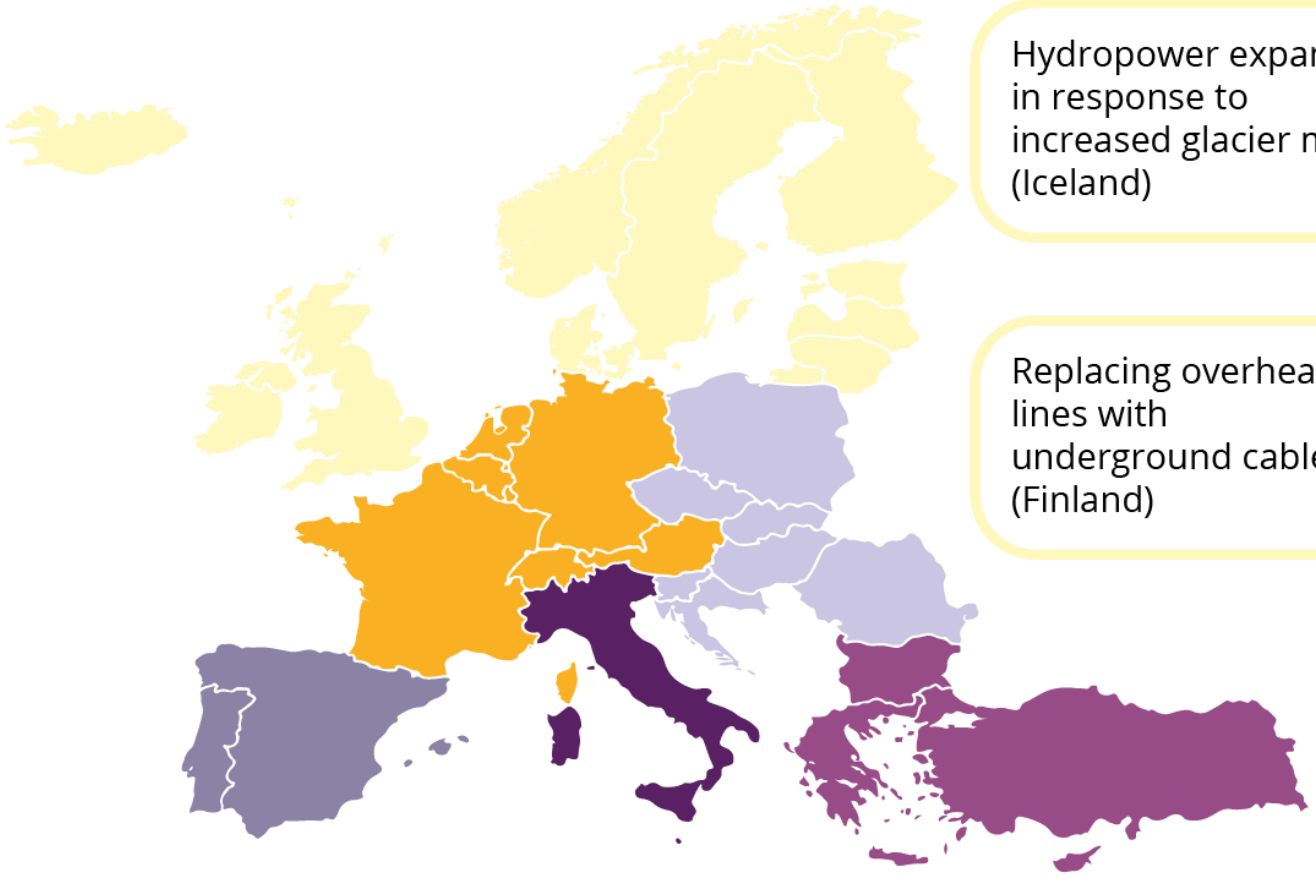
Some knowledge on how energy companies and network providers are adapting

Cases in Climate-ADAPT

Adapting overhead lines to increasing temperatures (United Kingdom)

Improved resilience of biomass fuel supply chain (United Kingdom)

Flood risk management for hydropower plants (France)



Hydropower expansion in response to increased glacier melt (Iceland)

Replacing overhead lines with underground cables (Finland)

climate-adapt.eea.europa.eu/knowledge/tools/case-studies-climate-adapt

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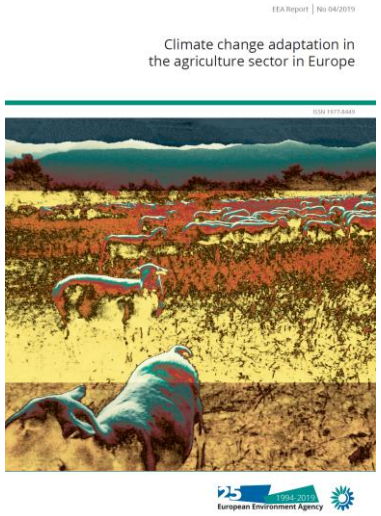
Main climate change impacts on agriculture in Europe



Boreal regions

Increase in heavy precipitation
Increasing damages from windstorms
Increasing risk of forest fires
Warmer temperature affecting reindeer husbandry

Continental region

Increase in heatwaves and droughts
Increasing risks of river and flash floods
Increasing risk of forest fires

Atlantic region

Increase in heatwaves and droughts
Increasing risk of coastal floods
Increasing risks for livestock production
Increasing damages from windstorms

Mountains

Upward shift of plant species
Increasing risk of landslides
Risk of hail storms
Risk of frost

Mediterranean region

Increasing demand for irrigation
Decrease in crop yield
Increasing risks for livestock production
Agriculture affected by spillover effects from outside Europe

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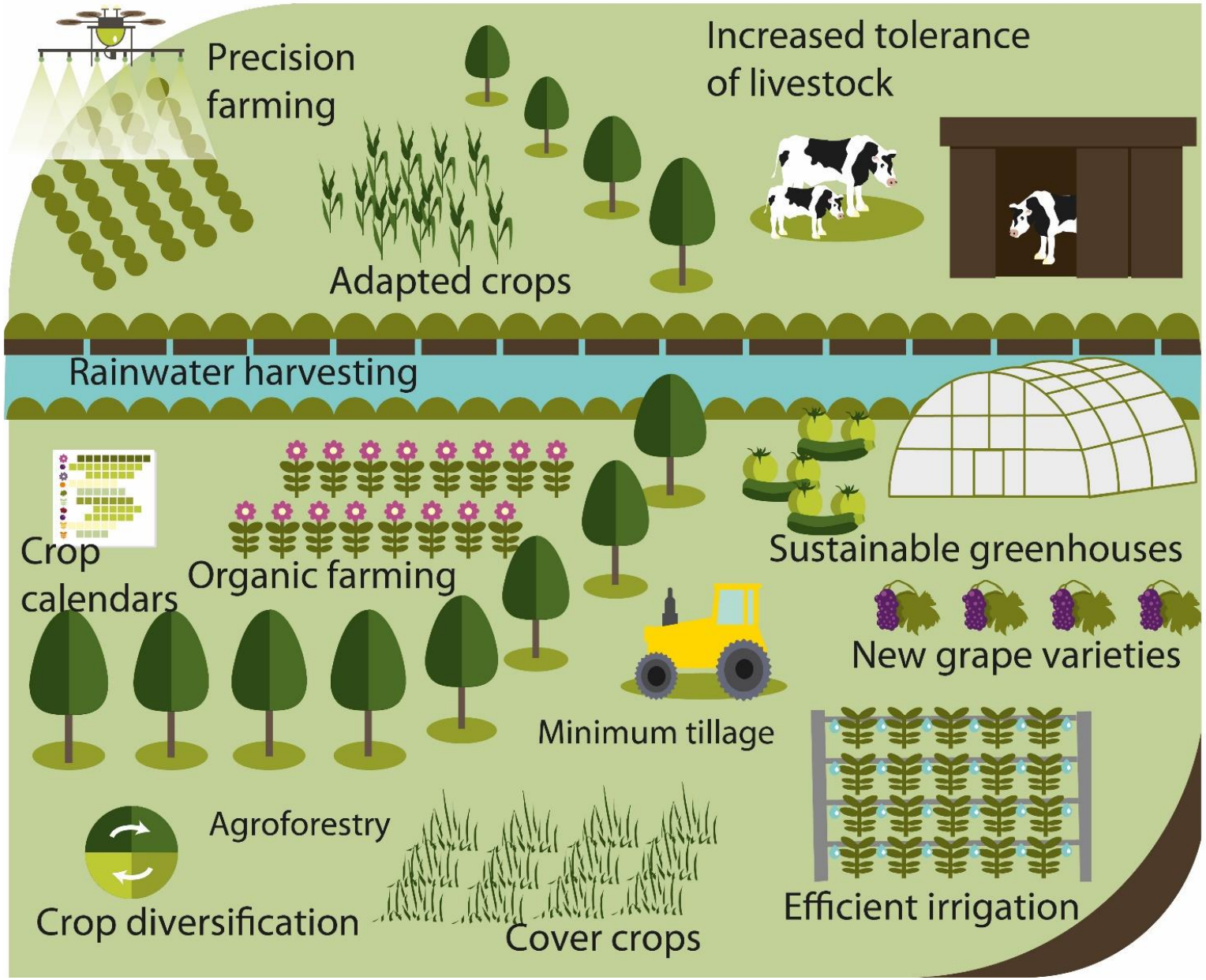
Adaptation solutions at farm level are available but complex and not yet widely used



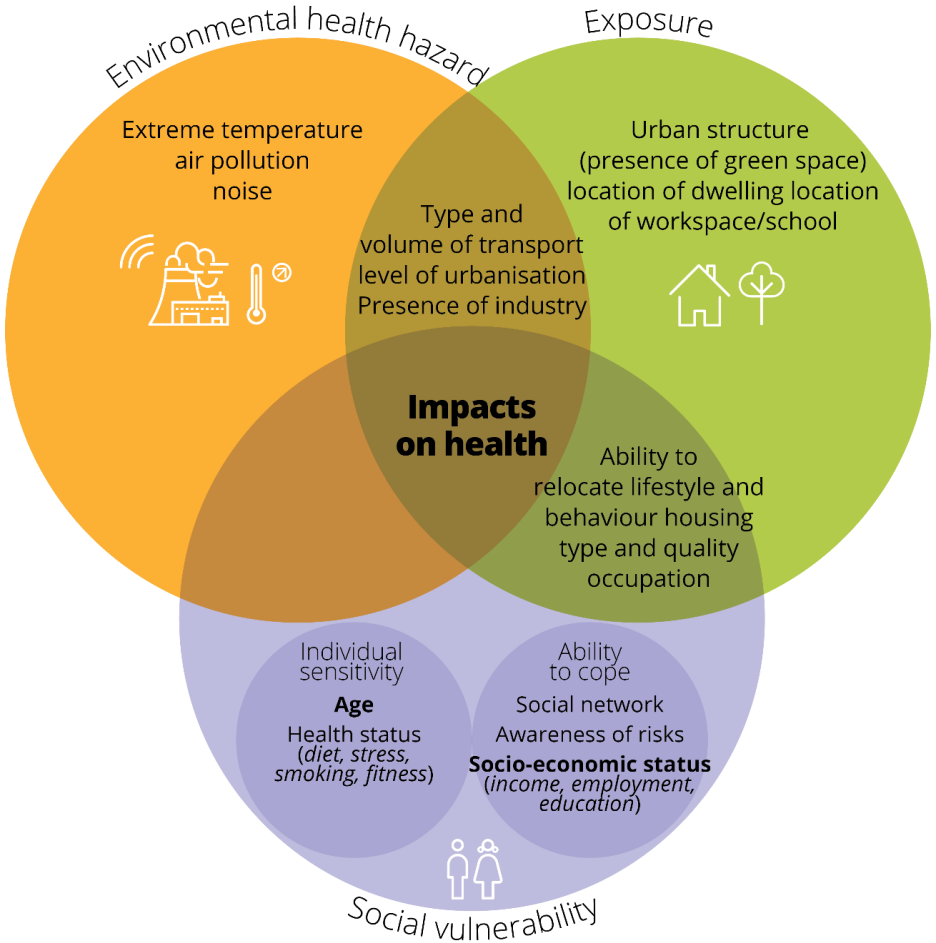
Adaptation at farm level needs to:

- Reduce impact of climate hazards

but also:

- Sustain resilient production
- Conserve soil and water resources
- Preserve biodiversity
- Reduce GHG emissions
- Increase sink of CO_2
- Be economically viable
- Increase the quality of rural life

Emerging focus on social inequalities and fair sustainable transitions



- **Disadvantaged people worst affected** by environmental hazards
- **Stark regional differences** in both socio-economic conditions and environmental quality
- **EU policy** acknowledges exposure of vulnerable groups – to an extent
- Addressing environmental inequalities requires **targeted policy interventions**

European Climate Adaptation Platform Climate-ADAPT

Scope and aim:

- Supports developing and implementing **adaptation strategies, policies and actions**
- **Complementary** to national, sectoral platforms
- **Fully updated**, re-launched mid **Jan. 2019**

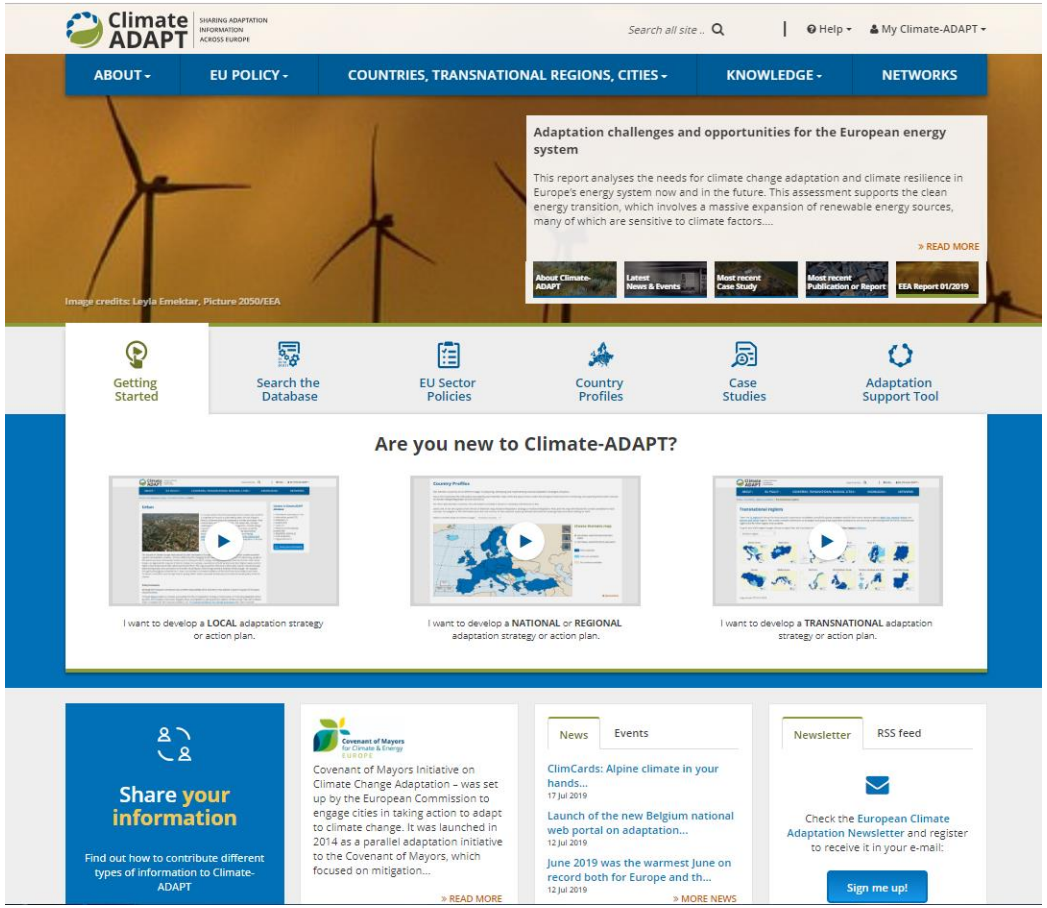
Intended Users:

- Policymakers and supporting experts

Dissemination and sharing:

- Quarterly newsletter
- Webinars, Conferences, workshops

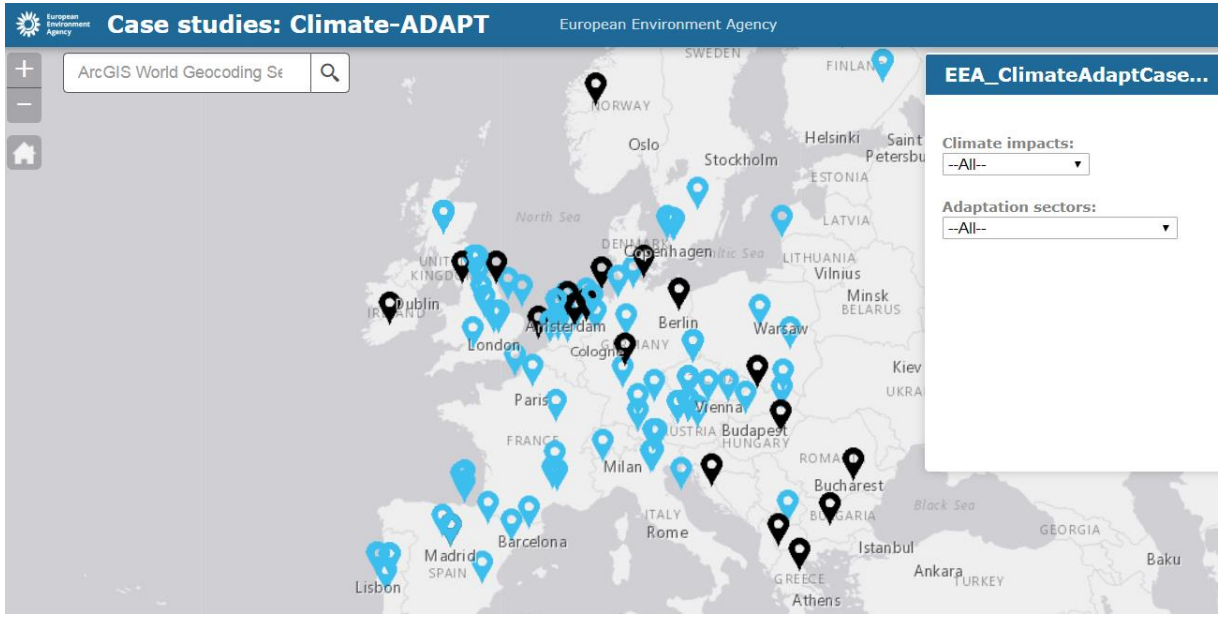
Evaluated in 2018



http://climateadapt.eea.europa.eu

European Environment Agency

Climate-ADAPT case studies



Climate ADAPT
SHARING ADAPTATION INFORMATION ACROSS EUROPE

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Home ▸ Database ▸ Case studies ▸ **Social vulnerability to heatwaves – from assessment to implementation of adaptation measures**

Case studies

Social vulnerability to heatwaves – from assessment to implementation of adaptation measures in Košice and Trnava, Slovakia (2018)

© Carpathian Development Institute

High temperatures and heatwaves in the summer pose increasing risks to people living in Slovakian cities. In particular older people and children, those living on top floors in poorly insulated buildings, and those relying on facilities such as nurseries, schools or care homes are prone to heat stress. The Carpathian Development Institute, in collaboration with local authorities in Trnava and Košice, carried out an assessment of vulnerability to high temperatures and heatwaves in residential environment, taking into account the social aspects. Factors such as presence of older people, children and location of facilities serving these vulnerable groups were considered.

Based on the results of the assessment, adaptation strategies are being implemented in both Trnava and Košice, including measures such as thickening of tree stands in parks, building and restoration of water elements (blue infrastructure) and fountains in most vulnerable places, actions aiming at changing citizen behavior during heatwaves, etc., Moreover, a neglected public open space in a vulnerable area in Trnava was redesigned to provide shading through planting of trees and other vegetation.

- Case Study Description

Ecosystem based adaptation provides multiple benefits

- Facilitate climate change **adaptation and mitigation**, improves **health and quality of life**, and favours **biodiversity conservation**
- **Multiple benefits**:
  - Reduced urban temperatures increasing resilience to heatwave events
  - Improved infiltration of storm water reducing the risk of floods
  - Carbon storage and sequestration
  - Air pollution improvement
  - Recreational services, improving physical and mental health and well-being
  - Enhanced quality and functioning of urban ecosystems and biodiversity

Case studies

Environment-friendly urban street design for decentralized ecological rainwater management in Ober-Grafendorf, Lower Austria (2017)

© Gerhard Gruber and Foto Durl

The municipality of Ober-Grafendorf is located at an elevation of 280 m in a typical pre-Alpine landscape in the Mostviertel region in the western part of the Austrian province Lower Austria. With 4,612 inhabitants on a municipal territory of 24.6 km^2, Ober-Grafendorf has a population size only slightly above the statistical average of Austrian municipalities, and it is among the 98% of Austrian municipalities with less than 20.000 inhabitants. In recent years, more frequent and more intense heavy precipitation events alternating with more pronounced drought periods have caused increasing challenges for municipal development. Excess surface water runoff from sealed surface areas has repeatedly caused small-scale flooding, overloading of the sewer and wastewater treatment system, and rising costs for its maintenance. On the other hand, during hot and dry periods the cost for irrigating and maintaining the urban greenery has been rising constantly. Based on observed climatic trends and climate projections, it is anticipated that these problems will be exacerbated by future climate change. The municipality has responded by implementing a smart, ecosystem-based rainwater management system that is incorporated into an environment-friendly street design. The adaptation solution helps to reduce public costs, delivers multiple benefits and holds considerable innovation potential for sustainable and climate-sensitive local road construction.

Planning of the adaptation measure was embedded in a regional pilot adaptation process conducted within the Interreg project C3-Alps. From 2011 to 2014, the process has succeeded in setting adaptation on local agendas, building adaptive capacities and triggering adaptation actions in seven municipalities in the Mostviertel region, including Ober-Grafendorf.

Case Study Illustrations (3)

Case studies Documents (1)

Good practice brochure

European Environment Agency

Conclusions

- Adverse **impacts and risks** of climate change for the environment, economy and people are **expected to intensify**.
- Strong **mitigation and adaptation** measures are **needed globally**, and **long-term adaptation challenges** depend whether the increase in global temperature can be kept to well below 2 °C.
- Climate change adaptation is increasingly **mainstreamed in EU policies, strategies and funding programmes**. The proposed **EU Green Deal** provides **opportunities for adaptation**
- Most EEA member **countries** and various **transnational regions** have **adaptation strategies in place**, and an increasing number of **cities** adopted local strategies, but **implementation can be enhanced**. Improved **monitoring** of progress and **evaluation** of effectiveness is needed.
- **Actions** are taking place in **sectors** and **ecosystem based adaptation actions**, providing multiple benefits, are emerging but **further upscaling and transfer of experiences** is needed.
- **Financing of adaptation** can be supported by new EU initiatives on sustainable finance.
- Knowledge can be enhanced through **research and innovation**, e.g. on cascading effects and impacts from outside Europe and high-end climate change and impact projections and Copernicus data can improve climate risk assessments.
- **Sharing of knowledge** can be improved through EU and national information platforms, science-policy-practice dialogues; and co-design of actions with stakeholders.

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