Aleksandra Kazmierczak, 19 June 2017,
Cohesion Policy and climate change workshop, Brussels

Adaptation to climate change in cities

Climate change impacts in Europe

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

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

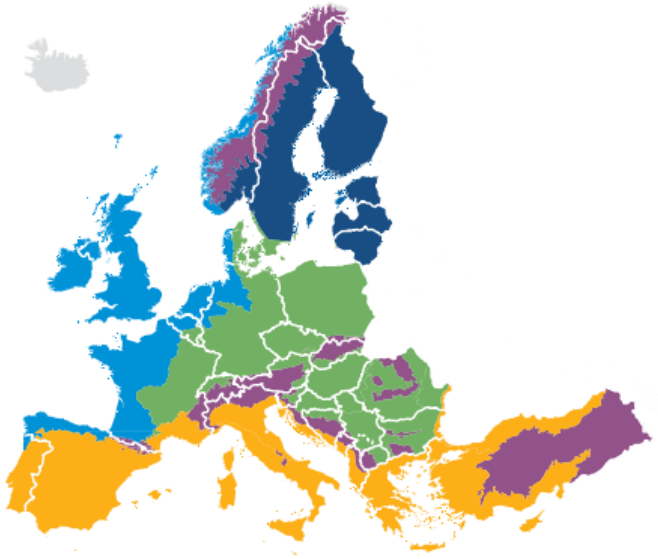
Mountain regions
- Temperature rise larger than European average
- Decrease in glacier extent and volume
- Upward shift of plant and animal species
- High risk of species extinctions
- Increasing risk of forest pests
- Increasing risk from rock falls and landslides
- Changes in hydropower potential
-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

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

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

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



European Environment Agency

https://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016

Climate change impacts in cities

- Climate impacts are magnified by the qualities or urban areas
  - Sealed surfaces raise temperatures and increase water runoff
  - High concentration of people and assets

- Examples of damages and losses
  - **Heat wave, August 2003**: 70,000 additional deaths across 16 European countries (Robine et al., 2008)
  - **Genoa, 2014: flash flood** caused damage to buildings and their contents of approximately EUR 100M (EEA, 2016)
  - **Copenhagen, 2011: 'cloudburst'** event caused damages of EUR 800M (City of Copenhagen, 2012)

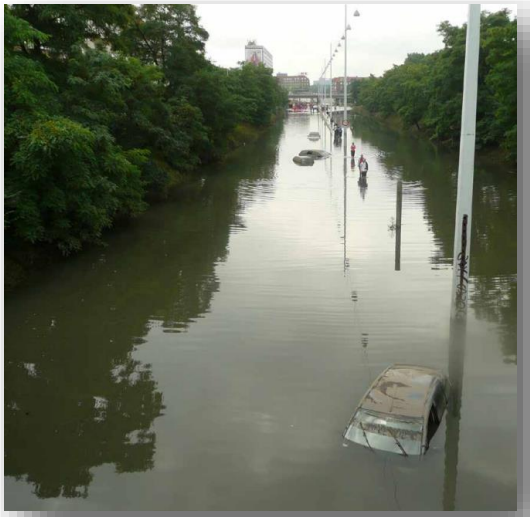


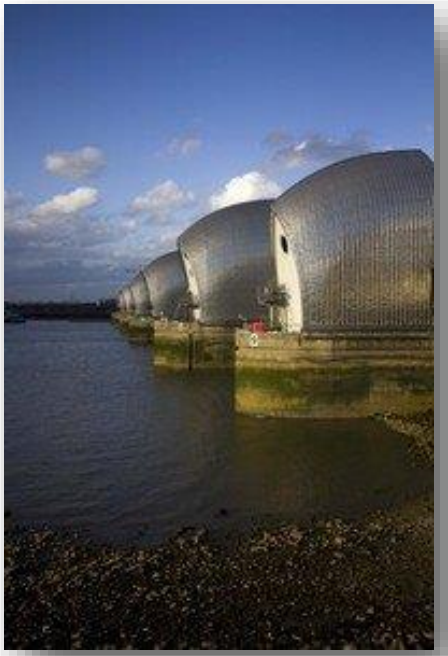
Image: City of Copenhagen, 2012

Image: Sekkha

European Environment Agency

Urban adaptation to climate change

- **Adaptation**: adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC 2014)



- Well-adapted and climate-resilient **cities are the foundation of a climate-resilient Europe**

- **Adaptation solutions**
  - 'Grey infrastructure'
  - 'Green infrastructure'
  - 'Soft' approaches

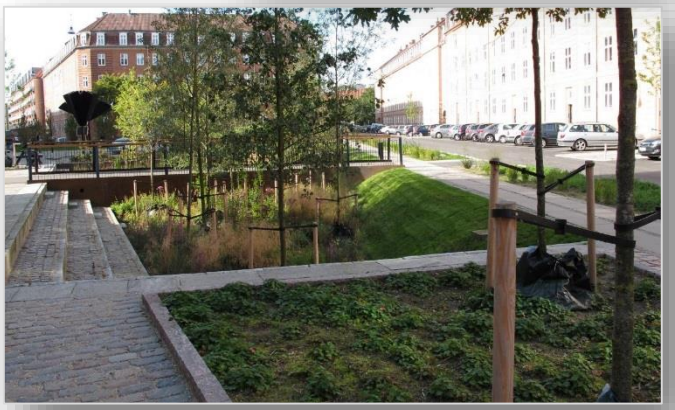


Image: Birgit Georgi

Adaptation to climate change in Europe

- **EU Adaptation Strategy 2013**
  - Promoting action by Member States
  - Promoting better informed decision-making
  - Promoting adaptation in key vulnerable sectors
- **Adoption of National Adaptation Strategies** (23 EU MSs)
- **Covenant of Mayors for Climate and Energy**
- At least **20% of all EU funding reserved for tackling climate change**, including ESIF 2014-2020
- **Horizon 2020**: 35% of funds dedicated to climate-related research
- **LIFE 2014-2020**: About € 800 million for climate action projects in 2014-2020

EEA products and services

Climate-ADAPT: the European Climate Adaptation Platform

Management and maintenance: EEA joint with DG CLIMA

Scope: Supports adaptation strategies, policies and actions; Complementary to national platforms

Intended Users: Experts and decision makers, researchers

Dissemination and sharing: Newsletter; Webinars; Conferences, workshops

- Over 2,200 reference items
- 39 urban adaptation case studies
- Urban Adaptation Support Tool
- ~100 city profiles of Covenant of Mayors signatories

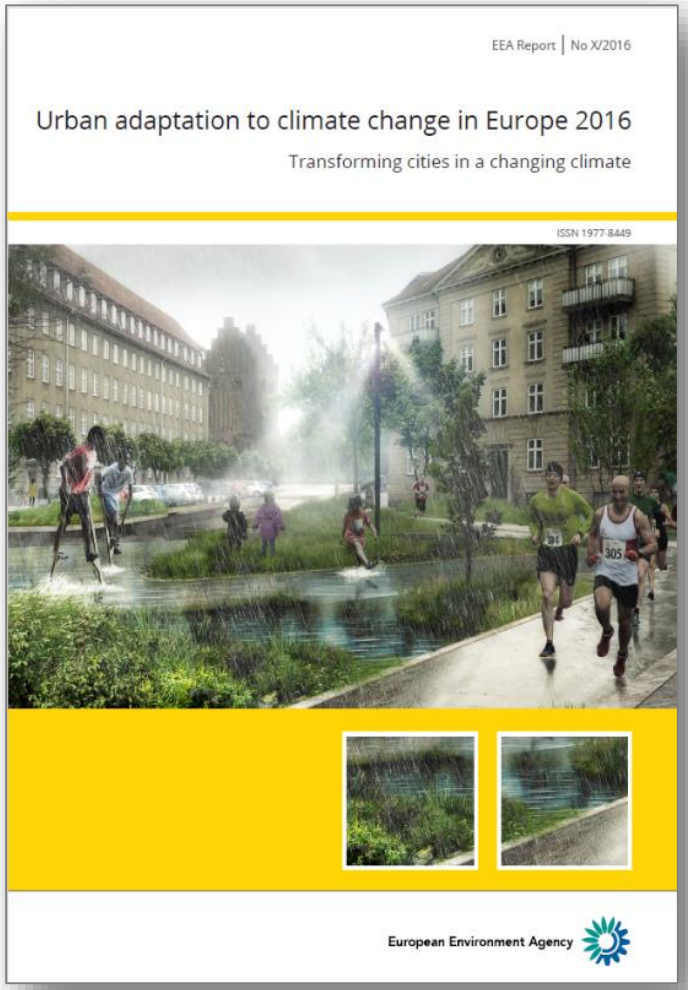
Urban Adaptation Support Tool
Covenant of Mayors for Climate & Energy

European Environment Agency

http://climate-adapt.eea.europa.eu/

“Urban adaptation to climate change in Europe 2016”

Analyses on various topics: (multi-level) governance, knowledge base, awareness, planning, economics, monitoring and reporting.



Key messages:

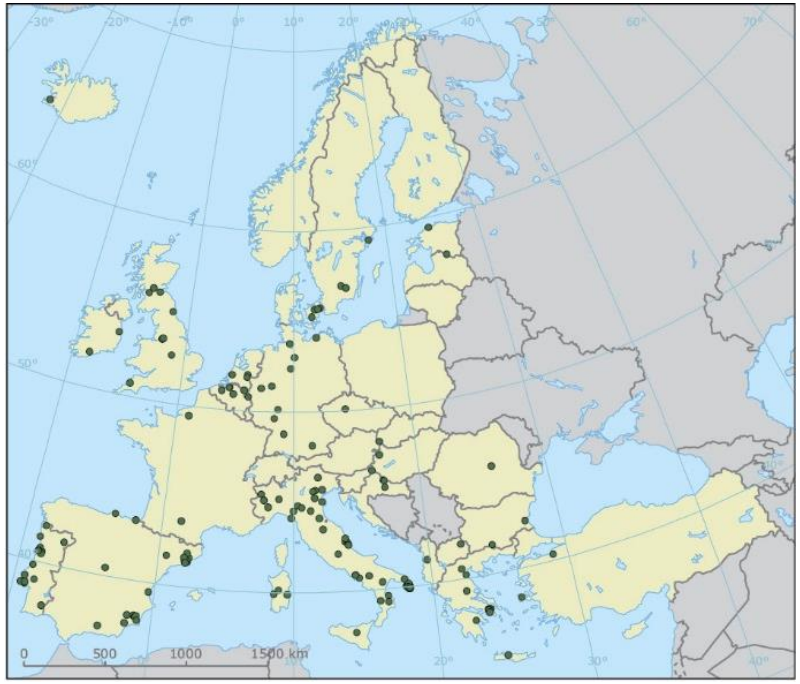
- **Adaptation has started** in European cities
  - Mainly at planning stage
  - Implementation by front-runner cities
- **Low cost and ‘soft’ solutions** are predominant
- Emphasis on **nature-based solutions** (green infrastructure)
- **Need for transformative adaptation**
  - Long-term, systemic approach

European Environment Agency

https://www.eea.europa.eu/publications/urban-adaptation-2016

Cities have started to act on adaptation

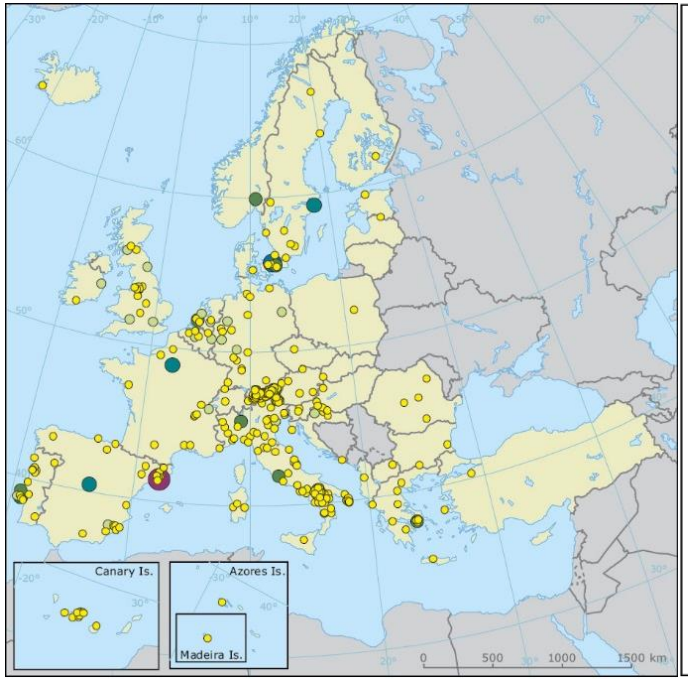
Mayors Adapt / Covenant of Mayors signatories

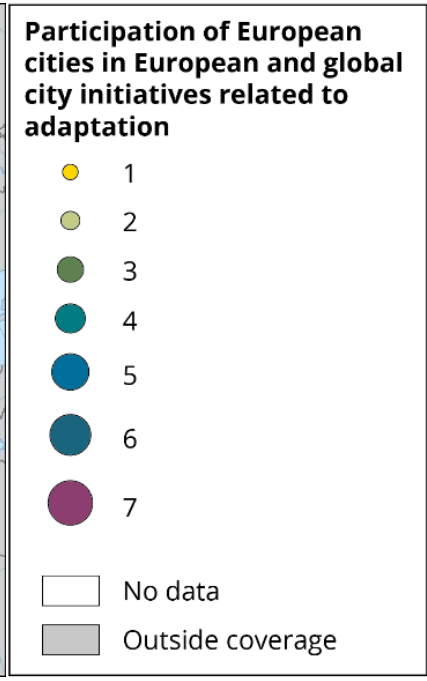


- End of 2015: 148 cities
- June 2017: over 700 LAs in the EU are signatories to Covenant of Mayors on adaptation

Source: EEA, 2016

Participation of cities in various initatives





Initiatives included:

- Compact of Mayors
- C40 with adaptation action
- Making Cities Resilient (UNISDR)
- European Green Capital Award
- European Green Leaf
- Metropolis no regret charter
- 100 resilient cities (Rockefeller)

Example of urban adaptation in Copenhagen

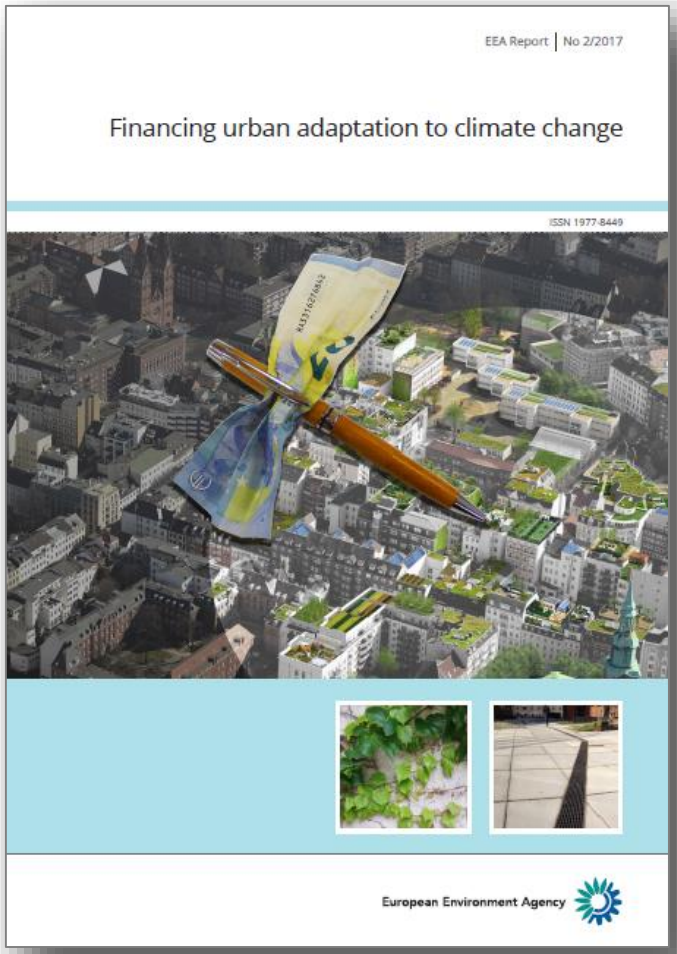
- The climate-resilient neighbourhood of Østerbro
- Tåsinge Plads - the first climate change-adapted urban space in Copenhagen (2014)
- Adaptation to larger volumes of rain and downpours following the cloudburst event of 2011
- Use of green infrastructure to reduce the load on drainage
- Recreational and social purposes

European Environment Agency

Source: http://klimakvarter.dk/en/

“Financing urban adaptation” (February 2017)

- **Case studies** that analyse 11 cities across Europe – inspiration for other cities
- **Key messages**
  - **Public funds** for adaptation measures can be **difficult to find**
  - **Cities may lack the capacity** to find funding sources and apply for money
  - **Integrating climate adaptation** in requirements for new investments or redevelopments **will save money** in the long term
  - Demonstrating **multiple benefits of adaptation solutions** (e.g. green infrastructure) can increase the chance of securing funding



European Environment Agency

https://www.eea.europa.eu/publications/financing-urban-adaptation-to-climate-change

Key challenges for urban adaptation in Europe

- **Closing the gap** between front-runners and cities just starting to work on adaptation
  - Exchange of knowledge
  - Funding: sources and support to access them

- **Taking transformative approach to adaptation** – moving beyond coping and incremental changes

- Developing and maintaining **supportive governance framework** at all levels: EU, national and local

- **Mainstreaming adaptation** into various municipal work areas

- Providing **guidance on adaptation**

aleksandra.kazmierczak@eea.europa.eu