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Financing urban adaptation to climate change

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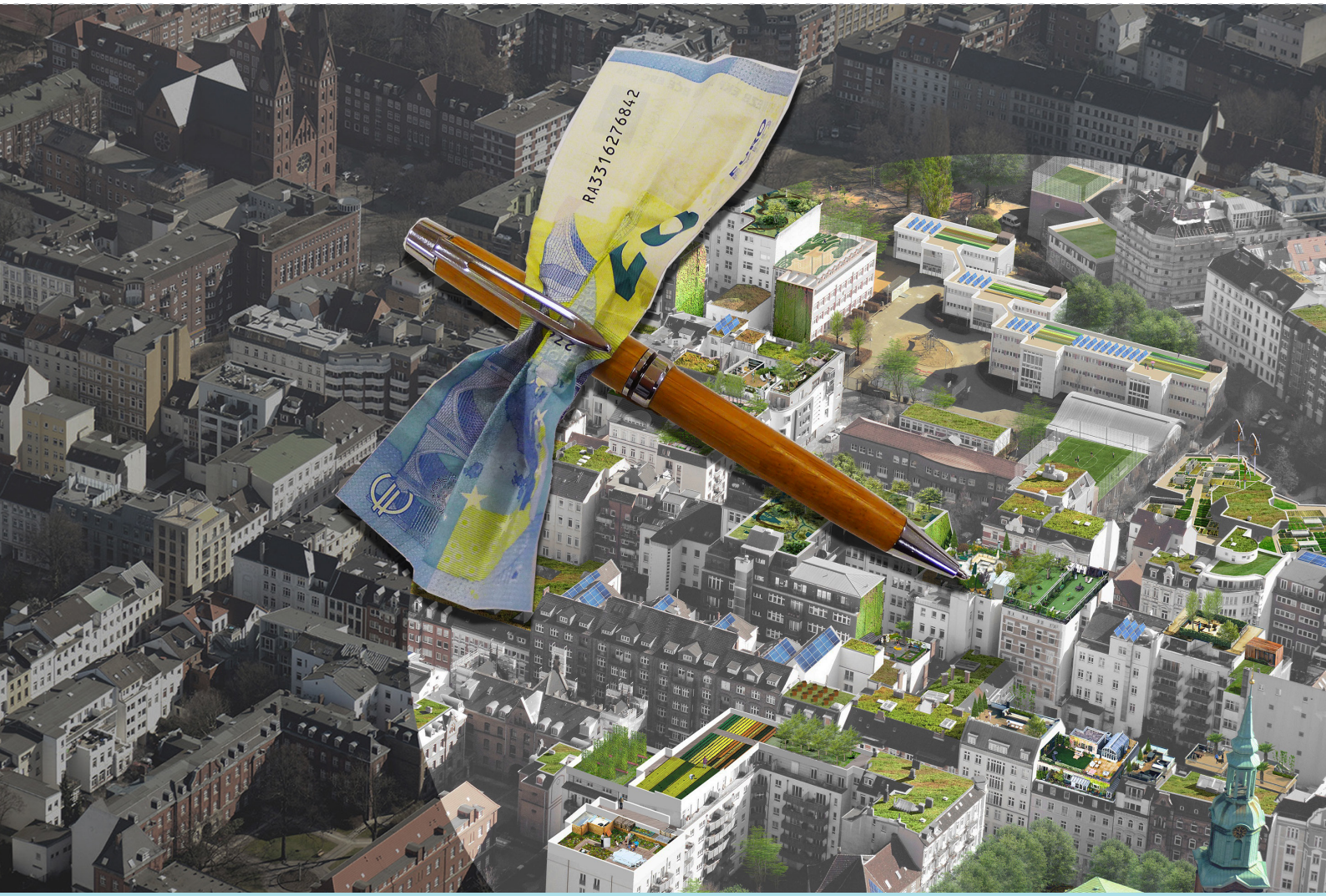

European Environment Agency

Financing urban adaptation to climate change

European Environment Agency

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Acknowledgements

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Key messages

Despite the global signals, and European and national efforts to unlock climate finance, meeting the costs of adaptation measures for climate change is a major challenge for relevant authorities and private stakeholders. However, municipalities across Europe — cities, towns and smaller districts — have found various innovative ways to overcome the challenge of financing their adaptation measures. The 11 city case studies presented in this publication, and the lessons they provide, can inspire other cities and smaller municipalities to reproduce these measures.

There are a variety of financing options, ranging from governmental sources, banks and private investors, including both grants and loans, to mainstreaming measures into the existing budgets of other sectors. Funding sums can range from thousands to millions of euros. Some projects might require only one financing source, while others combine different sources.

To advance adaptation measures in municipalities, it is important to develop the capacity to find these sources, apply for funding and negotiate the various financing streams — often in parallel. These steps require human resources and expertise, which for smaller municipalities with fewer staff are often unavailable. They might require regional-, national- or European-level support, or support from foundations and networks, to build these capacities; some institutions, including the European Investment Bank, have established technical assistance programmes.

Obtaining loans poses even greater challenges, as projects — unless they are grant funded — need to be 'bankable'. The applicants need to demonstrate that their projects are technically and financially viable and have the potential for financial return, and that the managing organisation has an appropriate level of competence. However, not all adaptation measures generate a direct financial return, particularly in the short-term horizon of most investors.

Cities, towns and smaller municipalities have various adaptation options and approaches to hand. They can cope with the damage caused by extreme events, incrementally improve existing and well-known protection measures or transform the way the city is built and organised. All of these can be meaningful ways to achieve climate resilience. To choose the most (cost-) effective solution, it is crucial to first make an economic analysis of the various options, from the broad perspective of integrated sustainable development of the municipality as a whole, before looking for funds for specific measures. Such an approach might reduce the amount of funding needed for adaptation measures.

Financing transformational adaptation measures, measures that change the way a city is built and organised, can be easy or difficult to implement. Measures often fall under the responsibility of other sectors, including water management, transport, nature conservation/protection and health. If silo thinking — an unwillingness to collaborate across sectors — is prevalent, attempting to integrate additional adaptation requirements can face resistance. However, taking the comprehensive perspective of integrated and long-term urban development, and considering the municipality as a whole, can result in lower overall costs and many additional benefits.

Demonstrating these multiple benefits beyond the primary adaptation benefits (e.g. green urban areas reduce stormwater burden and reduce temperatures, but also provide space for nature and recreation) increases the chances of obtaining funding. These additional benefits often materialise immediately.

Some 'seed money' from a municipal government or other funding bodies can leverage adaptation measures by mobilising much higher contributions from other public or private stakeholders. This can come in the form of both investment and in-kind contributions, which, for example, might include staff dedicated or space offered to the measure.

Finally, one needs to consider that the successful implementation of measures needs more than financial resources. It also requires sufficient awareness and support by decision-makers in the public and private sectors, citizens and other stakeholders.

1 Why this publication?

Municipalities across Europe, in particular larger cities and towns but also smaller municipalities, increasingly acknowledge the need to adapt to climate change and have begun to adopt various measures. For example, a growing number of municipalities — more than 600 cities in Europe as of December 2016 — have signed the Mayors Adapt initiative or have joined the new Covenant of Mayors for Climate and Energy ([1]) (now integrating the Mayors Adapt initiative). Municipalities within the Covenant voluntarily commit to adapting to climate change impacts while obtaining wide-ranging support. The Covenant supports creating awareness, starting to take action and exchanging experiences in identifying financing options, for example. More municipalities also take adaptation action outside this initiative, with or without national and regional support programmes.

Meeting the costs of adaptation measures for climate change is, however, a major challenge for most local authorities and other stakeholders. The financial crisis, reduced incomes from taxation, the arrival of many refugees and other factors can put pressure on municipal budgets. In many cities, an old infrastructure for basic services and transport needs to be replaced in the next 10 years ([2]), requiring significant investments. In the face of these challenges, it might seem that there is little room for financing adaptation measures. However, integrating adaptation needs into investment for long-term developments, such as technical infrastructure and buildings, would save money in the long term. Beyond this, many conventional approaches to dealing with the serious and complex impacts of climate change will no longer be sufficiently effective in the future. Cities need to find innovative solutions and transform the way they are built and the way services are organised. However, the innovative character of such solutions and related uncertainties can make finding financial resources difficult; they do not fit in any known box.

Lack of finance has been cited by mayors, city managers and planners as one of the main reasons that adaptation is being taken up more slowly in European urban areas ([3]). Nevertheless, municipalities across Europe have found innovative ways to overcome the challenge of financing adaptation and they have started implementing measures. These solutions could be relevant for other cities, towns and smaller municipalities too, and examples are collected and presented in this publication as an inspiration.

This publication is likewise a useful resource for adaptation financing providers and financing programme developers from international, national or regional public bodies and private institutions. It offers insights into lessons learned on the ground regarding the most successful approaches, the difficulties encountered and overcome and the key success factors in financing local adaptation action.

The purpose is to demonstrate practical, implemented examples and to present a broad range of measures that stem from various funds and investments, providing funding ranging from thousands to millions of euros. They range from classic funds to more innovative financing mechanisms, including crowdfunding and green bonds. More details on each case study can be found on the Climate-ADAPT web portal ([4]) or by contacting the relevant city directly ([5]).

We strongly encourage the reader who wants to make use of the experience of a specific case study to get in direct contact with the relevant municipality, and eventually to set up a peer-to-peer learning process. Such a short publication cannot capture all the knowledge generated by city managers that have successfully implemented adaptation measures in urban areas. Interested stakeholders can access more knowledge in personal discussions.

([1]) http://www.covenantofmayors.eu.
([2]) For further reading on challenges and solutions in urban adaptation, please see Annex 2, 'Further information'.
([3]) A survey among Mayors Adapt cities in 2015, and results of the Resilient Cities Open European Day (http://resilientcities2016.iclei.org/open-european-day) and other stakeholder events.
([4]) http://climate-adapt.eea.europa.eu/knowledge/tools/sat.
([5]) Contact details are provided for each case.

2 Urban adaptation financing mechanisms

Even if municipalities often claim a lack of funding, financial resources from many different sources are available. At the global level, the 2015 Paris Agreement set the objective to 'make all financial flows consistent with a pathway towards low-emissions, climate-resilient development'. Countries confirmed this objective also at the Marrakech Climate Change Conference in 2016. In this spirit, the EU has earmarked at least 20 % of all its expenditures in the Multiannual Financial Framework 2014-2020 for climate change action, for both mitigation and adaptation. Further national and regional financial streams are available. The current challenge for municipalities and other stakeholders is often rather to gain awareness of all available financing options, find the options matching their case and then access them (see also Chapter 3).

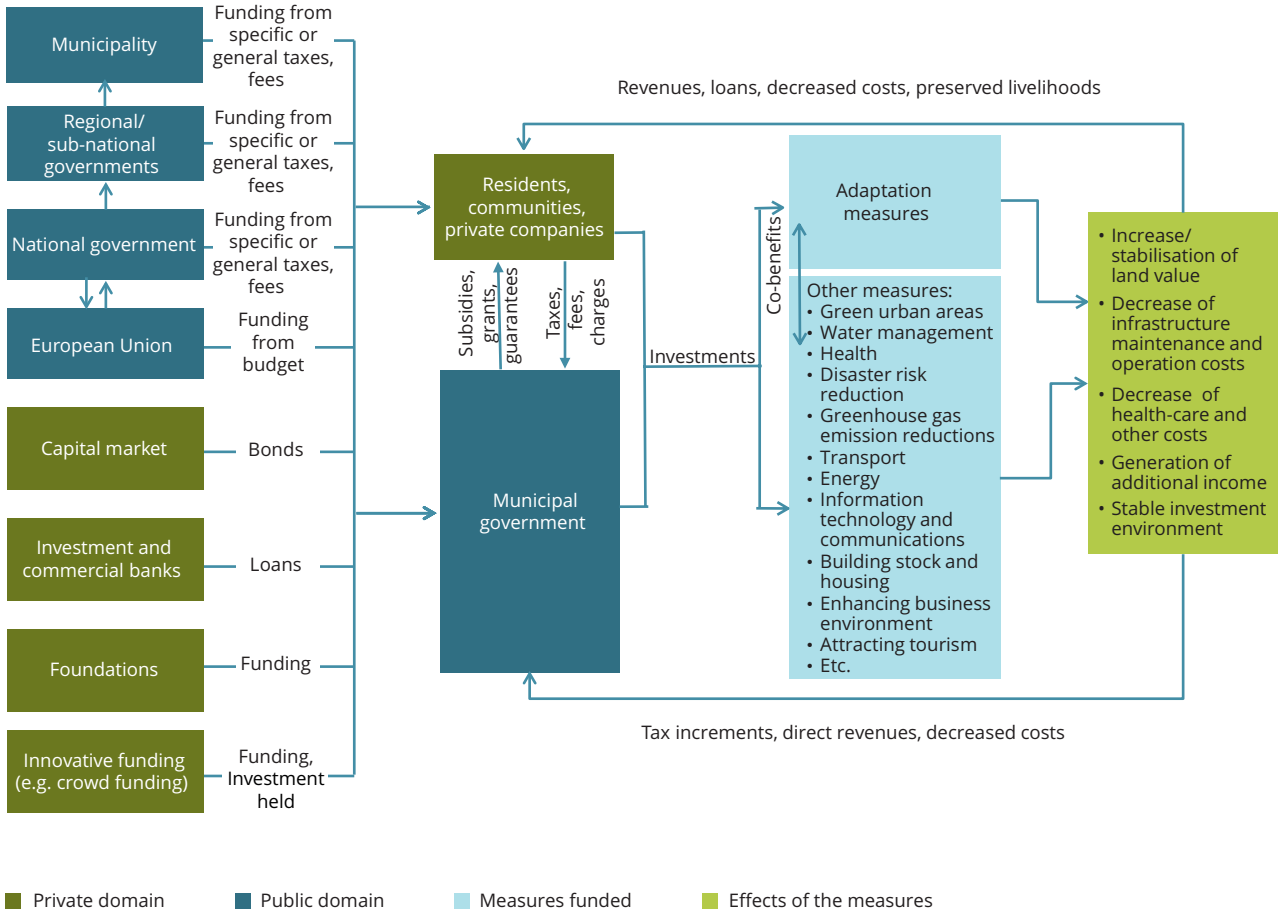
Despite its extensive capacity, the finance system in Europe currently meets only a fraction of the investment needed at local, national and European level. Public investment can act as 'seed money' unlocking additional major private investment of a different type and scale. Creatively using and combining different funding options, and fostering a systemic approach to adaptation that includes re-evaluating and re-directing funding that prolongs unsustainable activities, seems to be the way forward.

Financing for local adaptation measures is generally available through these main sources:

- Governmental sources — mostly grants, including international and EU funding instruments, national, regional and local/ municipality budgets.
- Banks and other financial institutions provide loans or guarantees, either directly or in partnership with local retail banks.
- Private stakeholders, including foundations, real estate developers, companies (especially those facing risks posed by climate change), house owners and individuals, that invest in measures directly or via crowdfunding and green bonds.
- Free/low-cost solutions exist through early integration of adaptation needs into urban planning and design, mainstreaming of adaptation measures into other municipal areas such as water management, health, nature, etc., or through supporting regulations such as building standards.

Figure 2.1 shows the various options for financing climate change adaptation in municipalities and the interplay between the various stakeholders involved. In many cases, these sources are combined, e.g. by developing public–private partnerships or by increasing the overall budget amount by providing city or state co-funding. Annex 1 provides an overview of European-level financing sources.

Figure 2.1 Opportunities for financing climate change adaptation in municipalities, and the interplay between the various stakeholders involved



3 Lessons learned from the case studies

Cities, towns and other municipalities have various options for adapting to climate change. Depending on the scope and complexity of the challenges they face, they can choose to cope with the damage caused by extreme weather events by rebuilding as part of a disaster risk management approach, they can incrementally improve the effectiveness of conventional protection measures, or find different ways to solve problems by transforming the way cities are built and organised. The last option strongly links to innovation in a broader sense, going beyond technological innovation to include social innovation and niche development. Some measures are high cost and others low cost. A comprehensive analysis can reveal which approach is most (cost-)effective. Whatever solution a city finally chooses, it needs to find ways to implement and finance it.

The 11 case studies in this publication (Chapter 4) provide an insight into the different ways to finance urban adaptation action. Interesting lessons can already be learned from this limited set of studies and the additional material listed in the annexes. The lessons are summarised below. They should be seen as a first indication and not as a comprehensive and exhaustive analysis of the situation. Such an analysis would be beyond the scope of this publication, which focuses on providing inspiration and promoting the exchange of experience. To enhance the knowledge base on financing of urban adaptation, analyses from additional cases, including further information sources, will be needed in future. The EEA has started work in the area of the financing of climate change mitigation and adaptation in Europe, and will report on this in the coming years.

Apart from cities, this experience can also be generally relevant for smaller municipalities and rural areas. In any event, upscaling solutions requires an in-depth exchange with the case study contacts, e.g. in a peer-to-peer learning process and an analysis of the particular conditions in the various municipalities. The cases featured here can inspire and share valuable practical experience but require creative handling and adjustment to specific conditions to make them work elsewhere.

3.1 Wise use of financial sources

In many of the successful instances of financing adaptation measures, European cities and municipalities combine different types of financing from various sources in different sectors and from different governmental levels. Often these sources were not developed specifically for adaptation measures but for sectors such as water management and urban revitalisation, but they can nevertheless be used for adaptation measures and developing a climate-resilient infrastructure that links to these areas (see, for example, the case study on Bologna).

Mainstreaming adaptation concerns into infrastructure and spatial project planning and other sectoral action can be a successful strategy. It offers co-benefits and synergies involving no or limited additional costs. Considering climate resilience when maintaining or upgrading infrastructure also provides benefits for little extra cost (Malmö, Amsterdam).

Financing transformational adaptation measures that change the way a city is built and organised is a typical case for cross-sectoral collaboration and mainstreaming. It can also encounter barriers, however, as the measures themselves often need to be financed by other sectors, including water management, transport, nature and health, that might resist taking additional requirements on board. Overcoming these barriers by taking a comprehensive perspective on integrated and long-term urban development can reveal solutions with lower costs overall and many additional benefits. Developing an economic case for adaptation and communicating it widely can help (Copenhagen, Hamburg).

Wide participation of all relevant stakeholders, including citizens, is key to enabling successful mainstreaming and transformational adaptation. For example, aligning with project developers and investment companies at an early stage ensures that adaptation is sufficiently and efficiently addressed in city development or renewal projects (Malmö). It then comes at little or no additional cost for the city (Bilbao, Amsterdam)

'Seed money' from a municipal government or other funding bodies can help generate momentum to increase the quality and scope of the plans, and with that further financing options. Initial public investment can leverage additional private investment (Malmö, Hamburg) and foster innovation.

3.2 Essential capacities are needed in or for cities

One of the key factors for advancing adaptation action in municipalities is to establish the capacity to identify, apply for and negotiate the various financing streams — often in parallel. This requires human resources and expertise, which is a problem in particular for smaller municipalities, where adaptation is often only a subtask for one staff member. Several financing and funding bodies, including the European Investment Bank (EIB), the EU's LIFE programme (see Annex 1) and some regional authorities, have started to provide capacity-building and technical support to help cities apply to their financing schemes.

Existing rules and regulations often hinder the implementation of certain types of adaptation measures which could be the more cost-effective ones. An evaluation of the policy framework and its impact on potential investment in adaptation projects can help to identify the barriers and define solutions to overcome them. Often this requires a multi-level approach, involving the authorities at regional and national level that are responsible for these rules and regulations (Copenhagen).

A precondition for successfully obtaining resources from financing institutions is the 'bankability' or 'fundability' of the project. Each financing organisation sets its own criteria for bankability. Commonly, criteria for evaluation are technical and financial viability, and the macroeconomic or legal context. A financial institution will often evaluate a project favourably if (1) it is technically sound, (2) the managing organisation has sufficient capacity for implementation, (3) there is a considerable social or market demand, (4) it has the potential for substantial future money flow, and (5) it has sufficient scale and fits the institution's lending strategy and aims.

Using loans from financing institutions has to date been a little used option for adaptation but could be used more in the future. Nevertheless, an important challenge still to be overcome in a multi-stakeholder approach is that many adaptation measures do not generate a direct financial return in the short-term horizon of most investors.

Some adaptation projects already have a strong business case and are bankable, due to a future flow of money provided by direct financial savings or income (Lisbon). In other cases, higher bankability can be achieved by combining adaptation measures with larger infrastructure or urban renewal projects. Several financing institutions such as the EIB provide technical consultation services to assist in making projects bankable.

Smaller municipalities face an even bigger challenge in making projects 'fundable' or 'bankable' because of the small scale of the project. They can overcome that challenge by cooperating with other (neighbouring) municipalities to bundle together several projects or, as with larger municipalities, by implementing larger urban renewal and development programmes in which adaptation is only one element among several. Another approach is to seek financing from regional investment banks (Hamburg), which in some cases work on the basis of funds provided by national financial institutions or the EIB.

3.3 Communication, reasoning, convincing

Implementing measures successfully requires more than financial resources. It also requires sufficient awareness and support among decision-makers in the public and private domain, and among citizens and other stakeholders. An adaptation strategy or plan often helps to raise such awareness. An overarching urban development strategy or plan that includes adaptation concerns among other urban development goals can help to clearly define a municipality's strategic direction and increase the confidence of financing partners that funding will be spent responsibly and sustainably and in coordination with other activities in the municipality (Malmö).

Stressing the many benefits of adaptation measures across various sectors, which include reduced risks, longer lifetime and greater resilience of infrastructure, leading to long-term payoffs, market advantage, and maintenance of or increase in property values, can help to mobilise funding from various sectoral budgets and from private sources or societal organisations. It is important to use language that speaks to the priorities, needs and concerns of stakeholders, including financing bodies.

Municipalities can use co-benefits as a strong argument to overcome the concern that adaptation benefits may materialise only in the future and with some uncertainty. For example, additional benefits

of green infrastructure measures — space for nature conservation, recreation and quality of life — materialise immediately and are dependable.

Early and active stakeholder engagement helps to ensure wider awareness, ownership and involvement of citizens in developing creative solutions with broad support; it also provides an opportunity to raise funds from private contributions such as crowdfunding or donations. Furthermore, it encourages bottom-up initiatives from citizens, initiatives that do not involve or require any additional municipal financial resources (Amsterdam).

Financial savings can be another driver for adaptation. Communicating how a municipality or company can reduce its current operational or management costs through implementing adaptation measures can encourage the adoption of adaptation measures (Lisbon, Copenhagen). For example, an organisation might avoid storm damage or breakdown costs, or reduce energy consumption (e.g. green roofs for cooling and thermal insulation).

Being visible as part of national and EU projects builds capacity and networking relationships, and increases the chance of becoming involved in similar projects (Bratislava).

4 Eleven cases of financing urban adaptation

The following short descriptions of 11 case studies focus on the financial model for implementing adaptation measures. A much broader description for each case study is available at Climate-ADAPT ([6]), by following the links or QR codes provided in the short descriptions.

Map 4.1 Eleven case studies of financing urban adaptation

([6]) http://climate-adapt.eea.europa.eu/sat.

Table 4.1 Overview of the eleven case studies

City	Case study title	Financing source	Financing type(s) ([a])	Financing mechanism(s) ([b])	Adaptation measures financed
Hamburg	Financial incentive programme enabling Hamburg's Green Roof Strategy		Subsidy for implementation of green roofs	A fund managed by a local development and investment bank	• Awareness campaigns for behavioural change • Economic incentives to build green roofs • Water-sensitive urban and building design • Green spaces in urban areas
Lisbon	Combining private investment and an EIB loan to cope with water scarcity in Lisbon		Direct private financing and a loan	Business case and EIB loan process	• Leakage detection system • Adjustment of water infrastructure to reduce water leakage • Adaptation of drought and water conservation plans • Water restrictions and consumption cuts
Bilbao	Public–private partnership for a new flood-proof district in Bilbao		Direct funding for implementing adaptation measures	Public–private partnership agreement managed by a newly established commission	• Opening of a water canal • Elevation of ground level of buildings • Establishment of green open spaces • Provision of stormwater tanks
Ghent	Ghent crowdfunding platform realising climate change adaptation projects		Direct funding and subsidy for adaptation measures	Public–private partnership managed by a newly established commission	• Urban farming • Green garden facades
Amsterdam	Vrijburcht: a privately funded climate-proof collective garden in Amsterdam		Direct funding and a loan	Collective private commissioning managed by a foundation	• Climate-proof collective garden • Rainwater storage tanks • Water-sensitive urban and building design
Smolyan	European funds for flood protection measures in Smolyan		Direct funding and co-funding for adaptation-related measures	EU European Regional Development Fund (ERDF) funding mechanism	• Expansion and cleaning of the riverbed • Reconstruction and upgrading of the existing flood protection walls • Construction of new flood protection walls

Table 4.1 Overview of the financing urban adaptation case studies (cont.)

City	Case study title	Financing source	Financing type(s) ([a])	Financing mechanism(s) ([b])	Adaptation measures financed
Paris	Climate bond financing adaptation actions in Paris		Financing of adaptation measures via an investment instrument with returns (climate bond)	Climate bond managed by independent financial institutions; implementation of business case	• Green spaces in urban areas • Planting 20 000 trees • Establishing 30 hectares of new parks by 2020
Malmö	Mix of public and private funding to adapt Malmö's new harbour district		Direct financing of adaptation measures	Stakeholder partnership; national and EU funding mechanisms	• Green roofs • Green spaces • Stormwater management measures
Bologna	GAIA — Green Area Inner-city Agreement to finance tree planting in Bologna		Direct funding of measures that offset greenhouse gas emissions and, as a co-benefit, serve adaptation	Greenhouse gas emissions compensation scheme, EU LIFE funding mechanism	• Green spaces in urban areas • Tree planting
Bratislava	Using European Economic Area grants for implementing climate adaptation measures in Bratislava		Direct funding and co-funding for adaptation measures; subsidy for small projects	European Economic Area and Norway grants mechanism; small project grant scheme	• Increase in green infrastructure • Tree planting • Green roofs • Rainwater retention facilities
Copenhagen	The economics of managing heavy rains and stormwater in Copenhagen		Direct funding	Water charges managed through municipal budget and private investments	• Stormwater runoff management measures • Detention areas to store large volume of waters

Note: ([a]) Answers the question 'What?'

([b]) Refers to the legal or institutional setup or process through which the funding and financing is obtained and managed. Answers the question 'How?'

Financial incentive programme enabling Hamburg's Green Roof Strategy

Source: © Treibhaus Landschaftsarchitektur and Mathias Friedel

Name	Hamburg
Country	Germany
Inhabitants	1.79 million (2015)
Climate impact(s)	HEAT, FLOODS, STORMS

Adaptation measures financed	• Awareness campaigns to encourage behavioural change • Economic incentives to build green roofs • Water-sensitive urban and building design • Green spaces in urban areas
Financing source(s)	National, regional and local budgets; Private investors; Supporting regulations
Financing type(s)	Subsidy for implementation of green roofs
Financing mechanism(s)	A fund managed by a local development and investment bank

Summary description

In response to climate change, one of Hamburg's objectives is to become greener, both in the city and 'on top of the city'. The goal is to plant a total of 100 hectares of green roof surface in the metropolitan area over the next decade. An assessment showed that green roof measure are economically more feasible than extending the sewerage infrastructure to cope with an expected amount of stormwater in the future.

The Federal State Ministry for Environment and Energy will be providing financial support for the creation of green roofs to the sum of EUR 3 million until the end of 2019. Two thirds of the funding comes from the Ministry and one third is from the Senate Office. The Hamburg Investment and Development Bank (IFB) handles all funding applications and transactions.

The approach taken is that financial incentives are available to those that voluntarily install a green roof before 2020. After that date, Hamburg will consider green roofs to be compulsory by law. Until 2020, building owners can receive non-refundable subsidies to cover up to 30-60 % of the installation costs for the 'greening' process.

Main challenge for implementation

A particular challenge was communication regarding the benefits of green roofs. The promotion of the benefits regarding water retention during heavy storm events was one hurdle. Another aspect was addressing the possible 'negative' effect of green roofs attracting animals. On one industrial flat roof, a seagull colony of more than 5 000 individuals established itself, putting off other businesses from installing green roofs. Similarly, green roofs attract insects, which may discourage others from installing them.

Main success factor for implementation

Promotion and communication of the Green Roof Strategy are a top priority. Strong communication persuaded stakeholders of the benefits that outweigh the potential negative aspects.

The federal government supported the strategy as a pilot programme within a larger federal programme, providing financial support to employ staff, networking and transfer of knowledge.

Contact

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Long version on Climate-ADAPT

https://goo.gl/WtWuP0

QR code

Combining private investment and an EIB loan to cope with water scarcity in Lisbon

Source: © EPAL

Name	Lisbon
Country	Portugal
Inhabitants	509 312 (2015)
Climate impact(s)	HEAT, WATER SCARCITY

Adaptation measures financed	• Leakage detection system • Adjustment of water infrastructure to reduce water leakage • Adaptation of drought and water conservation plans • Water restrictions and cuts in consumption
Financing source(s)	Private investors; Financial institution
Financing type(s)	Direct private financing and a loan
Financing mechanism(s)	Business case and EIB loan process

Summary description

In Lisbon, the water company EPAL (Empresa Portuguesa das Águas Livres) found a way to reduce the volume of water lost as a result of leakages (also known as non-revenue water). The main source of this problem is linked to faults in the pipelines due to ageing infrastructure. To address the water leakages, EPAL decided to develop the monitoring programme WONE through which it can identify water leakages more quickly and locate them more precisely. It used its own budget. The monitoring system allows the comparison of expected water usage data with real-time water usage using tailor-made software. When a discrepancy is found, it alerts the monitoring team, which then identifies the leak by tracing back from the water meter that provided the data. After the location of the leak, leak detection mechanics carry out field-based leak detection and repair the damage.

To finance the infrastructure renewal, EPAL has received loans of almost EUR 2.5 billion from the EIB, at favourable interest rates, since 1993. It used the EIB support to finance water supply extensions and upgrades, waste management measures, sanitation networks and efficiency improvements. The programme has resulted in a reduction of non-revenue water from 23.5 % in 2005 to around 8.5 % in 2015.

Main challenge for implementation

It can be difficult for cities to take the initiative in developing a water efficiency programme, as the role of the city is limited to that of a facilitator and a customer of the water company. To implement a water efficiency programme is primarily an investment decision that needs to be taken by the water company itself.

Main success factor for implementation

Support of the management board of the company, as well as the involvement of network operations, maintenance, customer relations and other key areas of the company, have been proven to be an important success factor. The extreme drought in 2005 led to a higher awareness of the risks involved in droughts.

EPAL and the EIB have built a long-term and trusting relationship through the provision of annual progress reports by EPAL to the EIB on new concepts and methodologies, as well as updates on the related national and international programmes.

Contact

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https://goo.gl/7wkxQO

QR code

Public–private partnership for a new flood-proof district in Bilbao

Source: © Comisión Gestora de Zorrotzaurre

Name	Bilbao
Country	Spain
Inhabitants	346 574 (2015)
Climate impact(s)	FLOODS, SEA-LEVEL RISE

Adaptation measures financed	• Opening of a water canal • Elevation of ground level of buildings • Establishment of green open spaces • Provision of stormwater tanks
Financing source(s)	Private investors; Municipality budget, regional budget
Financing type(s)	Direct funding for implementing adaptation measures
Financing mechanism(s)	Public–private partnership managed by a newly established commission

Summary description

In 2012, Bilbao approved a plan for the redevelopment of the Zorrotzaurre area from industrial to residential use. The main stakeholders of the redevelopment project, the land owners of Zorrotzaurre, created a public–private partnership and the Management Commission of Zorrotzaurre to advance the project. The current members of the commission own 65 % of the land in Zorrotzaurre. These are the Regional Basque Government, Bilbao City Council, the Port Authority of Bilbao and various private entities. The commission supervises the redevelopment plan and members contribute financially in proportion to the share of the land they own.

The costs for opening the Deusto canal are budgeted at EUR 20.9 million and Bilbao City Council takes up this spending, having reached an agreement with the Basque government, which will in turn finance the costs of one of the new bridges. The municipality will also pay EUR 5.1 million for a flood protection barrier, including the structural rehabilitation of the river bank and the stormwater tanks (EUR 4.74 million). The costs for the elevation of the ground level of buildings and public green spaces (as well as the other redevelopment costs) are met by the public–private partnership.

Main challenge for implementation

The redevelopment is a complex project, which was also affected by the economic downturn. Therefore, instead of carrying out the entire project at once, it was divided into phased development.

Main success factor for implementation

One of the greatest assets to the project is the involvement of a great number of land owners of all sizes gathered together in the public–private partnership.

Contact

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Long version on Climate-ADAPT

https://goo.gl/hhpKqi

QR code

Ghent crowdfunding platform realising climate change adaptation projects

Source: © Annamarie Rizzello

Name	Ghent
Country	Belgium
Inhabitants	251 984 (2014)
Climate impact(s)	HEAT

Adaptation measures financed	• Urban farming • Green garden facades
Financing source(s)	Private investors; Municipality budget
Financing type(s)	Direct funding and subsidy for adaptation measures
Financing mechanism(s)	Crowdfunding platform and fund for subsidies

Summary description

Ghent has developed a crowdfunding platform that allows citizens to propose and finance their ideas for the city. Today, two projects addressing climate change adaptation have been successfully realised with the support of the 'crowdfunding.gent' platform: (1) urban farming for residents of a social housing quarter, and (2) 'edible streets', achieved by covering the facades along the streets with planters. Any citizen of Ghent or person with an idea located in Ghent can submit a project. They need to provide a short description and a funding goal for the project. The project becomes visible on the platform once the platform manager, who is appointed by the city, has approved it. The manager checks whether the project proposal meets a set of predefined requirements.

People who provide financial backing for a project are known as 'supporters'. Their minimum donation is EUR 5. The donated amount per idea is viewed as an indicator of community support; only the projects with sufficient community support will become financially viable. 'Crowdfunding.gent' also offers initiators the opportunity to apply for a municipal subsidy for the project. The city has provided a total fund of EUR 55 000 per year specifically assigned to the crowdfunding platform. Per project the maximum amount of municipal subsidy that can be obtained is EUR 5 000. Project initiators need to indicate the request for municipal funding in the original application form. Initiators can choose to apply for 25, 50 or 75 % municipal funding. To be eligible for this subsidy, the predefined amount of co-funding first needs to be raised.

Main challenge for implementation

The use of crowdfunding as a policy instrument implies acceptance of the fact that the exact outcome cannot be controlled.

Main success factor for implementation

The appointment of a policy officer to manage the platform and support from an existing crowdfunding platform developer.

Contact

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Long version on Climate-ADAPT

https://goo.gl/djcBXy

QR code

Vrijburcht: a privately funded climate-proof collective garden in Amsterdam

Source: © DigiDaan, Amsterdam

Name	Vrijburcht quarter in Amsterdam
Country	The Netherlands
Inhabitants	838 338 (2016)
Climate impact(s)	HEAT, WATER SCARCITY, FLOODS

Adaptation measures financed	• Climate-proof collective garden • Rainwater storage tanks • Water sensitive urban and building design
Financing source(s)	Private investors; Financial institution
Financing type(s)	Direct funding and a loan
Financing mechanism(s)	Collective private commissioning managed by a foundation

Summary description

A group of people living in the centre of Amsterdam initiated the Vrijburcht complex project in 2000. The group centred on an architect. Members saw the opportunity to create their own new housing, including working spaces and a theatre. The heart of the complex is the courtyard garden with trees, a vegetable garden, lawns, flowers, benches and a greenhouse. The garden offers residents a cool environment during warmer summers; rain water is stored in underground tanks for irrigation in dry periods, and the unsealed area permits maximum rainwater permeability.

The project is a collective private commissioning initiative. This means that future residents developed the project jointly, including carrying the risks involved in the pre-financing. The future residents organised themselves into a foundation (Vrijburcht Foundation). This organisational set-up has the benefit of giving considerable freedom to future residents, but also asks for strong commitment to the process. All costs, including those of the garden and a rainwater storage facility (EUR 72 500) and the maintenance of the garden (EUR 3 000 EUR annually), are borne by the Vrijburcht Foundation on behalf of (future) residents. There was no subsidy involved. Instead, the Vrijburcht Foundation arranged the option of a personal loan at a favourable interest rate with Rabobank, and arranged procedures for a special mortgage for people with an average regular income (the so-called 'Amsterdamse Midden Hypotheek'). The social housing corporation 'De Key' also provided financial warranty and expertise in return for subsidised rental housing for assisted living for six young people with a light impairment, and their attendants, in the project.

Main challenge for implementation

Initial difficulties in attracting enough participants.

Main success factor for implementation

Building construction/development was a collective process, with the common desire for a building that was sustainable in both social and climate contexts. People in the foundation invested a lot of time and effort in the process. The social housing corporation provided a financial warranty.

Contact

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Long version on Climate-ADAPT

https://goo.gl/SsKZYc

QR code

European funds for flood protection measures in Smolyan

Source: © Municipality of Smolyan

Name	Smolyan
Country	Bulgaria
Inhabitants	39 079 (2014)
Climate impact(s)	FLOODS

Adaptation measures financed	• Expansion and cleaning of the riverbed • Reconstruction and upgrading of the existing flood protection walls • Construction of new flood protection walls
Financing source(s)	EU funds and local government funds
Financing type(s)	Direct funding and co-funding of adaptation-related measures
Financing mechanism(s)	EU ERDF funding mechanism

Summary description

In response to flooding damage in Smolyan's Ustovo neighbourhood in 2005, the city implemented a number of flood protection measures that presumably have already paid off during the wet year of 2014. The project included widening of river banks, reinforcing existing protection walls and constructing new walls.

The costs of the combined flood protection measures amounted to EUR 477 259. Smolyan provided a small part (5 %) of the total sum from the municipal budget. The majority of funding (85 %) originated from the EU through the ERDF Operational Programme Regional Development 2007-2013 'Support For Small-Scale Measures To Prevent Flooding In Urban Agglomerations'. Municipal experts took care of the implementation. The city submitted the project proposal to the Ministry of Regional Development, the managing authority of this programme. When it granted the project, it drafted a contract with the municipality of Smolyan. In the next phase, an open contracting procedure was started for the construction works. The construction company answered directly to the municipality, who in turn reported to the ministry.

Main challenge for implementation

Illegal buildings on the construction site, including barns and gardens, had to be demolished before work could start.

Main success factor for implementation

Municipal experts had access to all the information required for the project, including preliminary studies and technical designs. The land on which the measures are being implemented is owned by the municipality and it was easy to obtain building permits.

Contact

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Long version on Climate-ADAPT

https://goo.gl/FDQuvH

QR code

Climate bond financing adaptation measures in Paris

Source: © Marie Gantois, City of Paris

Name	Paris
Country	France
Inhabitants	2 240 000 (2012)
Climate impact(s)	HEAT, FLOODS

Adaptation measures financed	• Green spaces in urban areas • Planting 20 000 trees • Establishing 30 hectares of new parks by 2020
Financing source(s)	Private investors; Municipality budget
Financing type(s)	Financing of adaptation measures via an investment instrument with returns (climate bond)
Financing mechanism(s)	Climate bond managed by independent financial institutions; implementation of business case

Summary description

The Paris Climate Bond was issued in November 2015 to finance projects in climate mitigation and adaptation. The total size of the bond is EUR 300 million, with a running time until May 2031. The bond targets private investors who consider it a secondary advantage to invest in the sustainability of the city of Paris. They will receive a profit rate of 1.75 % per year. Annual reporting ensures transparency, whereby the issuer has to justify the allocation of money to projects complying with the set criteria. Vigeo, a non-financial rating agency, reviews the process and report thereby providing investors with reassurance on the use of their funds.

In a competitive tendering, the City of Paris selected two banks to accompany it in the process as partners. The City of Paris benefited from their expertise in investor expectations and from their network and marketing services. The Finance Management Support Service (SGF) of the city manages the selection of projects to be included in the bond, in full collaboration with the Urban Ecology Agency (AEU) and overseen by Vigeo. The selection process consists of two steps which are taken in accordance with criteria partly brought forward by SGF and partly from those used for socially responsible investments. Twenty per cent of the bond funds have been assigned to adaptation projects. Currently, two projects with a climate adaptation objective are being implemented: planting 20 000 trees in the city and creating 30 hectares of new parks by 2020.

Main challenge for implementation

Ideally the local authority needs expertise in the green market and knowledge of what investors is expect or value.

Main success factor for implementation

The participation of independent advisors, sectoral experts in green bonds and bankers, as well as an independent financial rating agency.

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Long version on Climate-ADAPT

https://goo.gl/OmX3mp

QR code

Mix of private and public funding to adapt Malmö's new harbour district

Source: © City of Malmö, Eva Klamméus

Name	Malmö
Country	Sweden
Inhabitants	302 835 (2011)
Climate impact(s)	HEAT FLOODS STORMS

Adaptation measures financed	• Green roofs • Green areas • Stormwater management measures
Financing source(s)	Private investors; National and EU funds
Financing type(s)	Direct financing of adaptation measures
Financing mechanism(s)	Stakeholder partnership; national and EU funding mechanisms

Summary description

The city of Malmö aims to realise climate adaptation measures by integrating them directly in the design of urban development projects, such as the Western Harbour area. Developers provide the private funding to realise these measures and carry out the actual construction of the projects. They engage in a stakeholder partnership process, initiated by the city, to ensure that the final realisation of the urban development reflects Malmö's sustainable vision. The city had asked each developer attached to the development area of the Western Harbour, as either a land owner or a buyer, to participate in the stakeholder partnership.

A stakeholder partnership process generally consists of a series of meetings and workshops for which the city provides the topics, depending on the envisaged sustainability goals. The initial phase included the design of a quality assurance programme, comprising a set of strict sustainability guidelines co-developed in 'creative dialogue' with the area developers. The city initiated the process, but its involvement decreased over time as the stakeholders take over. In the event that the developers need to meet a higher level of environmental standards, the city can initiate an application for additional public funding. The Western Harbour project used both national and European funding. The costs to the municipality are limited to the work time spent by policy officers managing the process and the provision of resources to facilitate meetings and workshops.

Main challenge for implementation

In some cases the developers initially had difficulties trusting each other, as they are usually competitors.

Main success factor for implementation

The most essential factor is trust between the partners and time to build it.

Contact

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Long version on Climate-ADAPT

https://goo.gl/l95XYz

QR code

GAIA — Green Area Inner-city Agreement to finance tree planting in Bologna

Source: © City of Bologna

Name	Bologna
Country	Italy
Inhabitants	386 633 (2015)
Climate impact(s)	HEAT

Adaptation measures financed	• Green spaces in urban areas • Tree planting
Financing source(s)	Private investors; EU and municipal funds
Financing type(s)	Direct funding of measures that offset greenhouse gas emissions and, as a co-benefit, serve adaptation
Financing mechanism(s)	Greenhouse gas emissions compensation scheme, EU LIFE funding mechanism

Summary description

The Bologna Adaptation to Climate Change Plan focuses on the development of innovative adaptation measures. These measures were developed as part of the LIFE+ project BLUE AP. One of the successful initiatives from this project is the 'Green Area Inner-city Agreement' (GAIA). GAIA was based on a public–private partnership model to finance tree planting. It uses financial compensation for the carbon footprint of businesses as a main driver for action. The financial compensation is used to purchase plants and maintain trees throughout the city, providing adaptation benefits.

Participation of the town council and local businesses in the GAIA initiative is on a voluntary basis. An easy-to-use form on the project website allows businesses to calculate the quantity of CO_2 involved in their processes and services. The business can select one of three types of partnership they would like to purchase to neutralise their carbon footprint, ranging from a minimum of EUR 200 to EUR 4 200 or more. The city of Bologna has developed clear guidelines that detail the various steps in the process and which party is responsible. The city identifies the cost components, approves the Protocol of Agreement, takes the initiative to start the planting works and pays the tree suppliers. The city also commits to providing a monitoring report every 6 months from the start of the partnership. A guideline has been developed detailing the steps involved, to aid other municipalities or authorities that wish to implement the partnership in their own cities.

Main challenge for implementation

Three orders of problems had to be solved: the identification of spaces for tree planting within the densely built-up urban area, the definition of legal terms for the public–private partnership and the identification of suitable tree species, which are sufficiently resilient with respect to future climate conditions (not requiring irrigation and resistant to high and low temperatures) and have a low allergenic potential. Scientific research developed by one of the project partners tackled the latter problem and led to new recommendations for the choice of plant species being introduced into the municipal byelaw for urban green areas.

Main success factor for implementation

Interest from companies to compensate for their CO_2 emissions voluntarily.

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Long version on Climate-ADAPT

https://goo.gl/i6W05Z

QR code

Using European Economic Area grants for implementing climate adaptation measures in the city of Bratislava

Source: © Nové Mesto, Bratislava City

Name	Bratislava
Country	Slovakia
Inhabitants	419 678 (2015)
Climate impact(s)	HEAT, FLOODS, WATER SCARCITY

Adaptation measures financed	• Increase in green infrastructure • Tree planting • Green roofs • Rainwater retention facilities to reduce run-off and for irrigation purposes • Sustainable drainage systems
Financing source(s)	European Economic Area and Norway grants and municipal funds; Private investors
Financing type(s)	Direct funding and co-funding for adaptation measures, subsidy for small projects
Financing mechanism(s)	European Economic Area and Norway grants mechanism, small project grant scheme

Summary description

The city of Bratislava has prepared and approved a strategy on adaptation to climate change and is currently preparing an adaptation action plan, which identifies the adaptation measures for the city (with special focus on heat and rainwater management) and cooperation among decision-makers, planners, the private sector and local communities. To finance the implementation of the planned measures, Bratislava city successfully applied for 'European Economic Area grants and Norway grants'. These grants provided in total EUR 2 411 445 funding Bratislava city office and city districts provided the remaining EUR 926 195. They fund the implementation of such measures as the rehabilitation and creation of new parks, squares and streets, increasing green cover and water retention capacities, as well as the implementation of green roofs.

The project also includes a small projects grant scheme to support sustainable drainage systems. A total amount of EUR 50 000 will be made available for small projects up to a maximum of EUR 1 000 per project. Eligible applicants are private home owners, non-governmental organisations and businesses. The grant covers a maximum of 50 % of total costs, and it is expected that these will be used for water reservoirs, rainwater gardens, small green roofs, adjustment of pavements, use of permeable materials, etc. The grant scheme comes with consultancy for applicants and dissemination activities.

Main challenge for implementation

Complex procedures for the implementation of measures in terms of permits and obligations for public works; time consuming public procurement procedures; and archaeological aspects that have to be taken into account in a historical city.

Main success factor for implementation

The city's participation in the 'EU Cities Adapt' project of the European Commission 2012-2013 created the necessary awareness and basic information. Following this, Bratislava had carried out a risk assessment and adopted an adaptation strategy. That served as a key success factor for obtaining the European Economic Area grant.

Contact

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Long version on Climate-ADAPT

https://goo.gl/mz6jSV

QR code

The economics of managing heavy rains and stormwater in Copenhagen

Source: © EVM Landskab

Name	Copenhagen
Country	Denmark
Inhabitants	591 481 (2016)
Climate impact(s)	FLOODS, STORMS

Adaptation measures financed	• Stormwater runoff management measures • Detention areas to store large volume of water
Financing source(s)	Private investors; Municipality budget; Supporting regulations
Financing type(s)	Direct funding
Financing mechanism(s)	Water charges managed through municipal budget and private investments

Summary description

Following a disastrous flood in 2011, the city developed a Cloudburst Management Plan to reduce the impacts of pluvial flooding after heavy rains, which are expected to increase in frequency as a result of climate change. The plan builds on a detailed socio-economic assessment to ascertain which combination of cloudburst and stormwater measures can deliver the best results for society as a whole. It has shown that continuing focus on traditional sewerage systems would result in a loss to society. Solutions that combine grey and green measures, including retention areas and natural drainage, would result in a net saving.

The Cloudburst Management Plan operates with a minimum time-frame of 20 years, requiring a prioritisation of individual projects in line with the Copenhagen Climate Adaptation Plan. The plan includes 300 interlinked projects; some are already implemented. The city estimates that around 15 projects a year will be carried out in the next 20-30 years.

The city of Copenhagen, the Capital Area Supply Company (HOFOR) and private land owners will share the total costs of around EUR 1.5 billion. Water charges will finance the part of the solutions concerned with water management. The city can save money if it coordinates the implementation of the cloudburst and stormwater management with other construction projects. The combined solutions also require private individuals to invest in anti-flood backflow valves and local stormwater drainage.

Main challenge for implementation

The prioritisation of the projects emphasises large-scale projects, which will require cooperation between municipalities and private land owners.

Main success factor for implementation

An economic assessment shows that the costs of damage to Copenhagen if nothing is done to adapt the current runoff and sewerage system are higher than those of adaptation measures. In particular, green infrastructure measures make the city safer and more pleasant and attract people and businesses. An amendment of the Danish Water Sector Act in 2012 clarified that water companies can invest in adaptation and use water charges to fund this.

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Long version on Climate-ADAPT

https://goo.gl/vvQIzu

QR code

Annex 1 Overview of European-level financing options relevant for cities (non-exhaustive list)

European Funds	Where	What is funded/financed	Co-financing rate	Contacts and further information
European Fund for Regional Development (ERDF)	EU-28	– Implementation of adaptation measures – Developing adaptation strategies – Developing networks and clusters – Capacity-building https://ec.europa.eu/clima/sites/clima/files/docs/02-climate_mainstreaming_fact_sheet-erdf_en.pdf; https://ec.europa.eu/clima/sites/clima/files/docs/04-climate_mainstreaming_fact_sheet-etc_en.pdf	Depends on the agreement in the Operational Programme. Ranges between 50 and 85 %	http://ec.europa.eu/regional_policy/en/funding/erdf http://ec.europa.eu/regional_policy/en/atlas/managing-authorities
Cohesion Fund	Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia	– Implementation of large-scale projects – Regional knowledge transfer projects – Capacity-building http://ec.europa.eu/clima/sites/clima/files/docs/09-climate_assessment_fact_sheet-erdf_cf_en.pdf	Up to 85 %	http://ec.europa.eu/regional_policy/en/funding/cohesion-fund http://ec.europa.eu/regional_policy/en/atlas/managing-authorities
European Social Fund	EU-28	– Training and educational activities – Advisory services – Knowledge sharing – Strategy development – Awareness campaigns https://ec.europa.eu/clima/sites/clima/files/docs/11-climate_assessment_fact_sheet-esf_en.pdf	Up to 100 %	http://ec.europa.eu/esf/home.jsp?langId=en http://ec.europa.eu/regional_policy/en/atlas/managing-authorities

European Funds	Where	What is funded/financed	Co-financing rate	Contacts and further information
Interreg 15 Regional Programmes and European Territorial Cooperation	EU-28, Norway and Switzerland Depends on the Regional Programme	– Implementation of cooperation projects and measures – Network development http://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial	Between 50 and 85 % depending on country	http://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial/contact-funding/
URBACT	EU-28, Norway and Switzerland	– Facilitates transnational exchange – Exchange of good practice and dissemination – Capacity-building http://urbact.eu/environment	- EU-28: 70-85 % (linked to ERDF) - Norway and Switzerland: co-financed up to 50 % by Norwegian and Swiss national funds	http://urbact.eu/faq
LIFE	EU-28	– Implementation of adaptation measures and projects – Awareness raising – Implementation of integrated projects on large territorial scale - Grants to NGOs http://ec.europa.eu/environment/life/funding/life2016/#adaptation	2014-2017: 60 % 2017-2020: 55 % Capacity-building projects 2014-2020: 100 %	http://ec.europa.eu/environment/life/about
European Economic Area grants	EU-28, Norway and Switzerland	– Information exchange – Implementation of measures and projects – Strategy and plan development http://eeagrants.org/programme/search?programme%5B%5D=pa07&submit=Search	Depends on the Partnership Agreement. Usually 85-100 %	http://eeagrants.org/How-to-apply
Horizon 2020	EU-28 and some non-EU Member States	– Research projects https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fighting-and-adapting-climate-change-1	Up to 100 % of eligible costs	https://ec.europa.eu/programmes/horizon2020/en/how-get-funding
Urban Innovative Actions	EU-28 (any city with more than 50 000 inhabitants)	– Testing innovative solutions through implementation of measures and projects – Sharing knowledge and experience http://www.uia-initiative.eu/en/initiative/12-topics-better-urban-environment	Projects receive ERDF co-financing up to 80 % of the eligible costs	http://www.uia-initiative.eu/en/get-involved-project/guidance

European Funds	Where	What is funded/financed	Co-financing rate	Contacts and further information
JPI Urban Europe	Austria, Belgium, Cyprus, Denmark, France, Finland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Turkey, United Kingdom	– Joint research – Joint implementation of projects http://jpi-urbaneurope.eu/projects/introduction-test	Depends on country	http://jpi.studio-pit.nl/app/uploads/2016/09/ENSUF-Contact-points-participating-FAs.pdf
European Investment Bank (EIB)	EU-28, EFTA countries, enlargement countries	– Implementation of measures and projects http://www.eib.org/projects/priorities/climate-action/index.htm	Bank loans	http://www.eib.org/products/clients.htm
EIB Natural Capital Financing Facility (NCFF)	EU-28	– Implementation of measures and projects – Payments for ecosystem services – Support for adaptation businesses http://www.eib.org/products/blending/ncff/index.htm	Bank loans and technical assistance supported through LIFE funds	http://www.eib.org/attachments/documents/ncff_terms_eligibility_en.pdf
EIB JESSICA: Joint European Support for Sustainable Investment in City Areas	EU-28	– Implementation of projects that form part of 'integrated and sustainable urban development plans' – Office space for SMEs, IT and/or R&D sectors http://www.eib.org/products/blending/jessica/faq/index.htm	Investment instrument supported through ERDF funds	http://www.eib.org/products/blending/jessica/index.htm http://ec.europa.eu/regional_policy/en/funding/special-support-instruments/jessica/legislation/#2
European Bank for Reconstruction and Development (EBRD)	Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Kosovo ([a]), Latvia, Lithuania, former Yugoslav Republic of Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, Ukraine	– Implementation of large-scale projects http://www.ebrd.com/what-we-do/sectors-and-topics/sustainable-resources/climate-change-adaptation.html	Bank loans	http://www.ebrd.com/contacts.html

European Funds	Where	What is funded/financed	Co-financing rate	Contacts and further information
Instrument for Pre-Accession Assistance (IPA)	Albania, Bosnia-Herzegovina, Kosovo ([a]), former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey	– Financial and technical help to build capacity during the accession process http://ec.europa.eu/enlargement/pdf/key_documents/2014/20140919-multi-country-strategy-paper.pdf Country specific: http://ec.europa.eu/enlargement/news_corner/key-documents/index_en.htm	85 %	http://ec.europa.eu/enlargement/instruments/national-ipa-coordinators/index_en.htm

Note: ([a]) Kosovo under the UN Security Council Resolution 1244/99.

Annex 2 Further information

Information sources

Mayors Adapt/Covenant of Mayors for Climate and Energy information on urban adaptation funding in the EU: http://mayors-adapt.eu/materials/funding-for-adaptation.

EU funding of adaptation: http://climate-adapt.eea.europa.eu/eu-adaptation-policy/funding.

Urban Adaptation Support Tool (guidance on urban adaptation funding): http://climate-adapt.eea.europa.eu/knowledge/tools/urban-ast/step-1-4.

Further reading

EEA Report No 12/2016: *Urban adaptation to climate change in Europe 2016 — Transforming cities in a changing climate*, available at: http://www.eea.europa.eu/publications/urban-adaptation-2016.

EEA Report No 2/2012: *Urban adaptation to climate change in Europe*, available at: http://www.eea.europa.eu/publications/urban-adaptation-to-climate-change.

Conference report: *Resilient cities 2016: 3rd Open European Day 2016*, available at: http://resilientcities2016.iclei.org/fileadmin/sites/resilient-cities/files/Resilient_Cities_2016/Documents/OED_Report_2016.pdf.

Case studies

Cases studies at Climate-ADAPT: http://climate-adapt.eea.europa.eu/sat.

Abbreviations

EEA	European Environment Agency
EFTA	European Free Trade Area
EIB	European Investment Bank
ERDF	European Rural Development Fund
EU	European Union
GAIA	Green Area Inner-city Agreement (Bologna)
IT	Information technology
LIFE	EU funding stream for the environment and climate action
NGO	Non-governmental organisation
R&D	Research and development
SGF	Finance Management Support Service (Paris)
SME	Small and medium-sized enterprise

European Environment Agency

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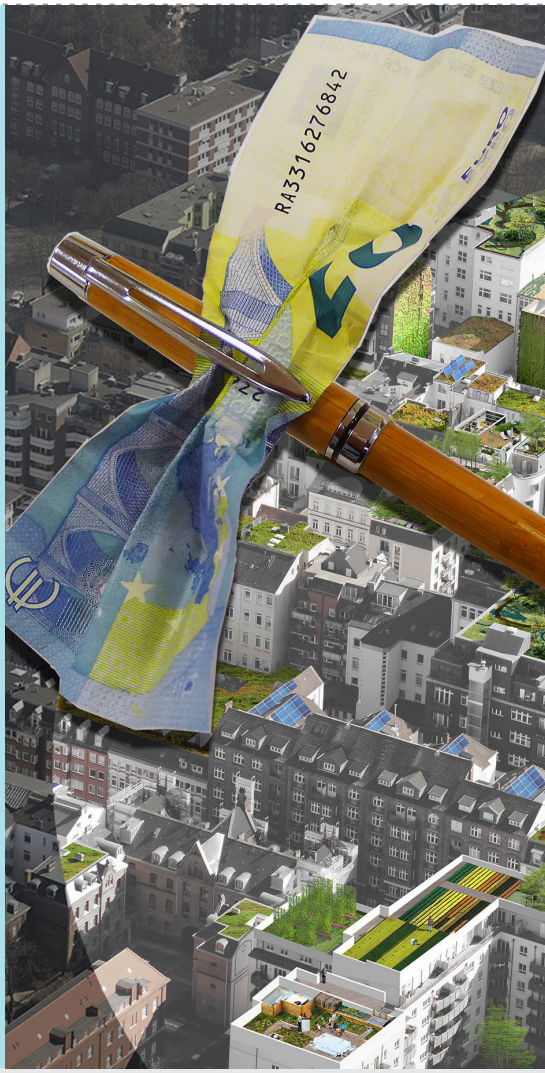

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