



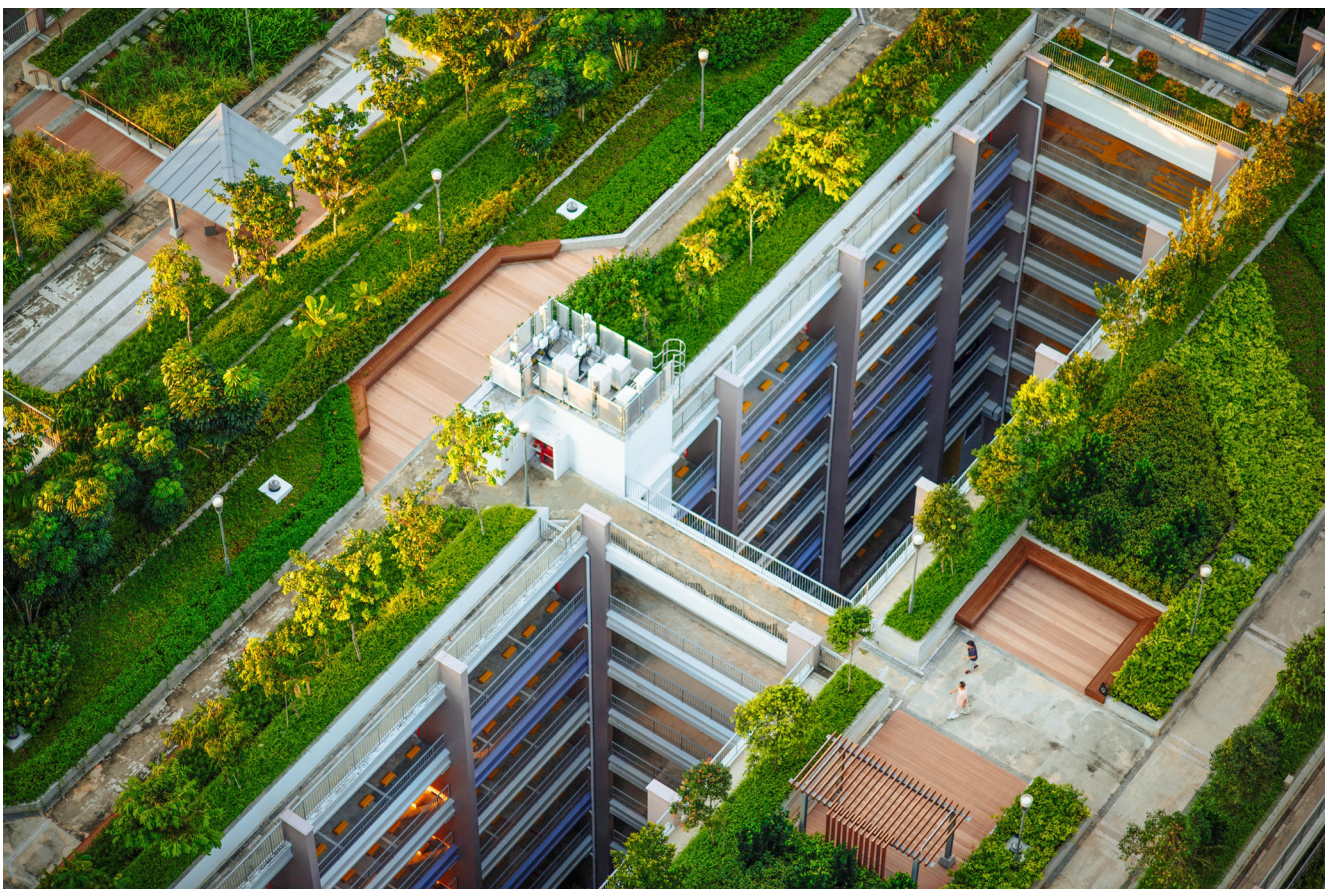
INVESTING IN A GREEN URBAN FUTURE

Innovative Financing of Nature-based Solutions
in Copenhagen, Bologna, Hamburg, and Glasgow



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Executive summary

As urban areas around the world continue to grow, so does their environmental footprint. Simultaneously, cities themselves face major environmental challenges as they are extremely prone to flooding, pollution, and heat waves, and as their inhabitants are increasingly demanding green areas for recreation and overall quality of life.

Worldwide, cities are looking for ways to cope with these challenges and to develop smart solutions to become more resilient. Nature-based Solutions provide a major opportunity to develop green urban areas that cater to the increasing sustainability needs, while decreasing cities' environmental footprint. By implementing green roof strategies, adding green pockets to streets or developing sustainable natural drainage systems, cities around the world are stepping up and are starting to work with nature to develop vibrant and sustainable urban settings.

However, the implementation of such solutions does not happen seamlessly and is often challenged by high implementation costs. As public funding is often not sufficient and private investments are only starting to pick up, the development of innovative financing mechanisms to implement Nature-based Solutions is crucial.

This report explores four exemplifying case studies, where holistic, out-of-the-box thinking proved to be successful in the financing of Nature-based Solutions, and aims to inspire investors and urban developers around the world to follow.

The showcases from Copenhagen, Bologna, Hamburg, and Glasgow tell us that public funding remains key to get (private) stakeholders on board and scale implementation of Nature-based Solutions. Combining forces is critical to success and is particularly effective when the diverse benefits to and needs of the different stakeholders are clear and well-understood. Building on these examples, the next step is to develop more, and more accessible, financial arrangements to scale up Nature-based Solutions. This requires an active role of governments, municipalities and other public stakeholders, going beyond funding Nature-based Solutions, and shifting to becoming an effective process manager in the development of new financial mechanisms.

Acknowledgements:
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Urbanization: a sustainable process?

Urban areas are centers of innovation, culture, and commerce. Accounting for 85% of global GDP, they are powerful motors for the global economy. This continuously attracts more and more inhabitants: over the past century, the world's urban population has increased by almost 1000%. Today, almost 55% of the world's population live in cities, expected to rise to 68% by 2050. Urbanization coupled with world population growth will lead to an estimated 2.5 billion new city inhabitants, mostly in Africa and Asia.

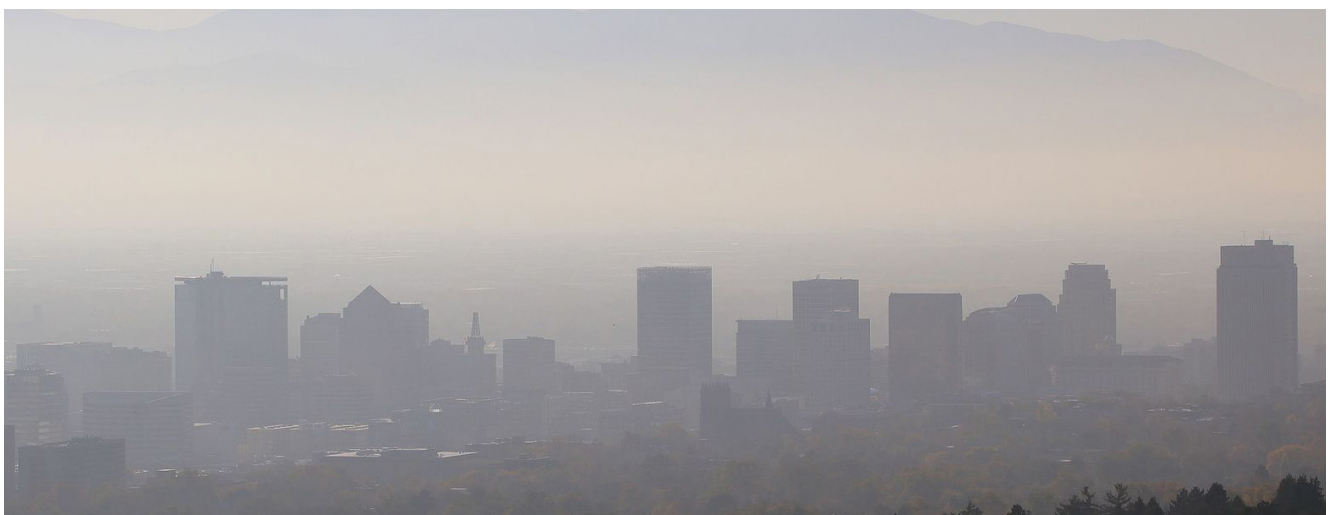
With urban areas continuing to grow, so does their environmental impact. Today, cities already account for 75% of natural resource consumption, 50% of global waste production, and 60-80% of greenhouse gas emissions. As urbanization processes continue business as usual and cities grow rapidly, these numbers are likely to increase.

As urban areas fail to account for the environmental impact they create, they are also more likely to experience consequent negative effects. With over 90% of urban areas being located in coastal areas, they are extremely vulnerable to natural hazards. Heavy storms and rising sea levels increase the risk of floods in these areas. Today,

around 70% of urban areas worldwide are already confronted with the effects of climate change and almost all are at risk.

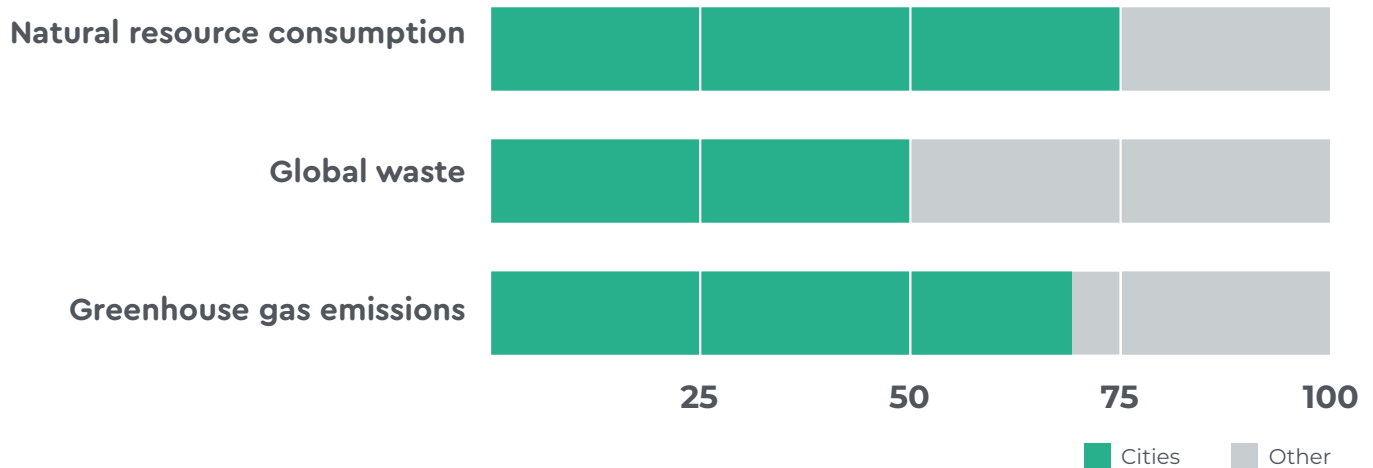
Most cities are currently not equipped to deal with major challenges such as climate change, food insecurity, biodiversity loss and the effects these can have on social segregation. Heavy storms, consequential floods, and droughts can incur damage to buildings and infrastructure, causing extreme financial strains that disrupt city budgets and business operations. Grey infrastructure and lack of green spaces lead to pollution, putting citizens' health at risk. Developing livable, risk-proof cities is, in short, not only in the interest of the urban population but also of developers, utility and insurance companies, healthcare organizations, and municipalities.

While most cities now have a negative environmental impact, they have the potential to transform into future-proof areas that successfully deal with many of the greatest challenges of our time. After all, cities are hotbeds for innovation and economic growth. Cities around the world increasingly recognize the important role they play in climate change adaptation and mitigation and, more broadly, in promoting



Polluted air and smog in Salt Lake City

The environmental impact of cities: Cities account for...



sustainable development. More and more cities are turning towards implementing green solutions as an effective instrument to become more resilient.

However, the implementation costs of such solutions pose a major barrier to municipalities. Lack of financial resources hinder cities to rapidly implement projects and transition to greener, more sustainable living environments. Implementation of green solutions is further hampered by high population density and consequently competing land claims. This is particularly true in some of the fastest growing cities, that are often also facing the largest social and environmental challenges.

These environmental and socio-economic challenges require not only efficient planning of urban infrastructure, but also a holistic and cross-sectoral way of thinking. Nature-based Solutions offer opportunities to address urban challenges, while connecting the needs and interests of different stakeholders.



A street flooded after heavy rainfalls

Nature-based Solutions for a resilient urban future

Urban Nature-based Solutions (NbS) are solutions that are inspired by nature and help to develop resilient, sustainable urban environments. They are a powerful tool to tackle challenges such as biodiversity loss, stormwater, and other climate change effects. They offer a way to effectively mitigate and adapt to climate change whilst providing economic, environmental and social benefits. Urban NbS are diverse in nature and can take different forms, including public parks and community gardens, green roofs, urban farming, and flood alleviation measurements. As they often tackle multiple risks at once and serve multiple goals (see table 1), a variety of stakeholders can engage in one and the same project.

Urban NbS are effective and long-term solutions to the various challenges that urban areas are facing. They help improve air quality, enhance biodiversity, decrease risk of flooding by controlling stormwater, and control the urban heat effect. Research has shown that NbS, in urban and rural settings, can provide over one-third of the climate mitigation required until 2030 to stabilize global warming to below 2 °C. Beyond risk control, NbS can contribute to creating healthy living environments for the urban population. Furthermore, NbS can help reduce financial strains as a result of climate change and boost the local economy by creating jobs.



Mainstreaming greening of new urban developments
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NbS can provide over onethird of the climate mitigation required until 2030 to stabilize global warming to below 2 °C

Source: UN Global Impact

Table 1: Most NbS interventions tackle multiple risks

Nature-based Solution	Risks tackled			
	Flooding	Urban “heat island” effect	Pollution	Loss of biodiversity
Green roofs & facades	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Parks	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Street trees	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Green/blue infrastructure	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Allotments & community gardens	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★

Despite these benefits, implementation of urban NbS is picking up slowly. This is mainly due to financial reasons, as NbS can be costly and their effects are not easily monetized. The distribution of public and private benefits of NbS is often complex, involving many stakeholders, with investors not always directly benefiting from NbS and if so, only in the very long term. Silo thinking and an institutional lack of collaboration across actors is common. However, various successful cases demonstrate the benefits of recognizing a more holistic value of implementing urban NbS. Highlighting these successful examples is crucial to demonstrate the potential of innovative, out-of-the-box thinking when it comes to the implementation of NbS.

This report showcases four case studies across Europe, featuring several innovative financing mechanisms for implementing urban NbS. These range from increasing the value of real estate and land, to improving public health and decreasing health care costs, to marketing purposes. Table 2 provides an overview of various financing mechanisms and instruments for NbS. While in some cases one mechanism can be clearly identified, in other cases a combination of financing mechanisms

facilitates the implementation of the solution.

All in all, it is clear that these mechanisms alone are not able to scale up NbS across Europe or the globe. More innovation is needed to create financial arrangements that capture the value that NbS can provide and turn it into an investable business case. The cases discussed uncover the first stepping stones in this ongoing journey.

Read more:

- [C40 Cities \(2012\). Why Cities? Ending Climate Change Begins in Cities.](#)
- [United Nations Global Impact. Nature-based solutions to address climate change.](#)
- [Ellen MacArthur Foundation \(2017\). Cities in the circular economy. An initial exploration.](#)

Table 2: A variety of financing mechanisms and instruments

Financing mechanism	Description	Stakeholders involved
Increased land/property value	NbS (e.g. green/blue roofs) increase the value of the land/property and thus generate revenue upon sale	Private land/property owners, can be supported through subsidies
Marketing benefits	Investing in NbS helps improve corporate image and cater to sustainability-conscious consumers	Private investors / businesses
Saving wastewater /energy / drinking water usage charges	Implementing NbS such as green/blue roofs can lower drinking water usage and wastewater production, saving charges	Land/property owners, private investors, businesses
Financial instruments	Description	Stakeholders involved
Green bonds	Bonds intended to support sustainable/environmental projects including NbS, often attracting investors through tax incentives	Private investors Often issued by governments
Public funding from charges/taxes/budgets	Public budgets such as health or education budgets are used to (partially) support NbS; can lead to saving of costs (e.g. utility companies saving damage costs, health services saving costs by accelerating recovery time)	Municipalities, public bodies, utility companies
Subsidies	Private investors receive subsidies to split costs of implementing NbS	Public bodies, private investors, land/property owners

Copenhagen Cloudburst Management Plan

As part of the Copenhagen Climate Adaptation Plan, the city of Copenhagen developed the Cloudburst Management Plan in 2012. It is an integrated project including the development of green spaces and corridors, stormwater roads and pipes, and green roads. The project's overall aim is to adapt to climate change effects and mitigate the negative consequences of heavy rains that result in flooding. The large-scale project is co-financed by the municipality, the local utility company 'HOFOR', and private landowners, incentivized by the high risk of flood damage costs.

Project description

Prone to heavy rainfalls, the city of Copenhagen is regularly affected by floods. As a result of climate change, these rainfalls are likely to increase in number and magnitude. After a major devastating cloudburst in 2011, costing the municipality over EUR 800 million, the city responded with the development of a large-scale project to mitigate the destructive consequences of such rainfalls.

An initiative was taken to measure the estimated costs of flood damage if no solution is being implemented. In 2010, these costs were estimated at EUR 2.1 billion over 100 years. By 2014, around EUR 1 billion of these damage costs had already been incurred, demonstrating that the initial cost estimate was far too low. A further socio-economic assessment was undertaken to estimate whether stormwater management solutions would pay off in the long-term. This assessment demonstrated a benefit of EUR 672 million compared to no implementation of such solutions.

The large-scale initiative consists of the development of various projects, funded by different stakeholders. Around the city, surface solutions are implemented to

KEY FACTS

City:	Copenhagen, Denmark
Inhabitants:	632,000
Type of NBS:	Stormwater management measurements (incl. green-blue infrastructure)
Objectives:	Prevent flooding Save damage costs
Investment size:	ca. EUR 1.48 billion
Financing sources:	Municipality Utility company Private investors (property owners)
Time frame:	Ongoing since 2013



manage stormwater. Low-lying parks, for example, provide green leisure areas during sunny days and catch rainwater during cloudbursts. These solutions furthermore aim to mitigate other challenges such as the urban heat island effect and biodiversity loss. Next to the development of public spaces, private landowners are incentivized to invest in anti-flood backflow valves, decreasing the risk of high damage costs after flooding.

Financing mechanism

The implementation of the project is facilitated by a co-financing scheme (see table 3) which allows the municipality to finance water management solutions through water charges. The local utility company HOFOR finances hydraulic solutions through water taxes. Incentive for HOFOR to finance the solutions are the saved costs in comparison to traditional underground drainage solutions. At a cost of ca. EUR 134 million (2015) the municipality supports the development of these solutions and finances green spaces, e.g. greening of low-lying parks serving as rainwater catchment systems.

Private land- and property owners are incentivized to invest in managing stormwater on their own property, e.g. through anti-flood backflow valves and green-blue solutions. Workshops and information sessions are regularly organized by the municipality and HOFOR to raise awareness and communicate the benefits to property owners. Investment in stormwater control measures can prevent high damage costs to buildings and land, which decreases the costs of damage insurance for private land and property owners. Property and land that implemented cloudburst solutions are expected to rise in value. At 2015, the overall investment size of private property owners was ca. EUR 323 million.

Table 3: Financial set-up of the project

Stakeholder	Contribution	Component financed
Local utility company HOFOR	EUR 481 million	canals and tunnels
	ca. EUR 283 million	surface solutions
	ca. EUR 134 million	connection/disconnection outside property boundary
Municipality of Copenhagen	ca. EUR 134 million	urban space improvements / green hydraulic solutions
Private property owners	ca. EUR 323 million	stormwater management measures on private properties (e.g. green- blue solutions)



Credits:

TredjeNatur, COWI and Platant for the Municipality of Copenhagen

The Copenhagen Cloudburst Management Plan is an interesting example of a large-scale multi-stakeholder project. While the local utility company HOFOR finances the implementation of hydraulic solutions through charges, the municipality supports the greening of the areas. At the same time, private land and property owners are educated and incentivized to invest in their own properties. Different stakeholders have different interests in the implementation of the projects but all work together towards an overall goal: to create a livable, sustainable city and decrease possible damage costs where possible.

Read more:

- [City of Copenhagen \(2012\). The Cloudburst Management Plan \(Report\).](#)
- [City of Copenhagen \(2014\). Cloudburst Management Pays Off \(Report\).](#)
- [Climate ADAPT \(2016\). The Cloudburst Management Plan.](#)
- [Oppla. Cloudburst Management Plan.](#)



GAIA Green Area Inner-city Agreement Bologna

KEY FACTS

City:	Bologna, Italy
Inhabitants:	388,367
Type of NBS:	Re-greening the city through planting street trees
Objectives:	Counter urban heat-island effect Offset carbon footprint Improve corporate reputation
Investment size:	EUR 1,202,000
Financing sources:	European LIFE+ fund Municipality Local businesses
Time frame:	2010 - 2013



To mitigate urban heat island effects and relieve the city from the effects of increasing heat waves, the GAIA project focuses on re-greening the inner city of Bologna by planting trees. It is a multi-stakeholder initiative, partially supported by private investors who financed the tree planting.

Project description

As a consequence of climate change, the city of Bologna increasingly has to cope with extreme heatwaves and extended periods of drought. The heatwaves in the city challenge its inhabitants and water levels of surrounding lakes have decreased by 12% in recent years. Widespread deforestation has aggravated the problem by decreasing the water transpiration rate, leading to a drier climate. To mitigate the urban heat island effect, the city of Bologna developed the GAIA Green Area Inner-city Agreement, securing EUR 600,000 funding from the European LIFE+ fund. Greening the inner city through the widespread planting of trees provides a solution to adapt to heatwaves and droughts. Through evaporation and transpiration, trees can make an important contribution to lower the city's temperature by up to 4.5 degrees. Furthermore, they improve air quality, provide much-needed shade for the city's inhabitants, and contribute to the preservation of riverbanks.

Financing mechanism

Table 4 provides an overview of the project's financial set-up. The European Life+ fund contributed ca. EUR 600,000 which was mainly used for the development of instruments and guidelines. The city of Bologna added its own funds to monitor the progress of the initiative and to keep the project on course. Almost EUR 300,000 was contributed by private investors, mostly local businesses.

Table 4: Financial set-up of the project

Stakeholder	Contribution	Component financed
European Life+ fund	ca. EUR 600 000	development of instruments and guidelines
Local businesses	ca. EUR 300 000	adoption of trees to offset carbon footprint
Municipality of Bologna	non-disclosed	project management and monitoring

Private corporations were incentivized to support the project by financing trees as it enabled them to offset their carbon footprint. Companies that showed interest in joining the partnership were provided with a tool to calculate their carbon footprint and were given the opportunity to choose between different types of partnerships. Once the companies have chosen the preferred type of partnership, they committed to finance the planting of trees and the first three years of their maintenance. In addition to neutralizing their carbon footprint, participating companies get access to workshops on environmental issues. They are also provided with further (marketing) benefits, such as receiving a GAIA plate in a re-greened area or representing their business at the GAIA conference.

Up until April 2016, 1405 trees had been adopted by local businesses, who invested ca. EUR 281,000 into greening their city.



Trees providing shaded seating areas in the city of Bologna.
© City of Bologna



Newly planted trees in Bologna.
© City of Bologna

The GAIA project in Bologna is a great example of how financial support through public funds can be reinforced by getting private businesses involved. This way, the initial funding that the city of Bologna received from the EU was increased by almost 50%. Key to the success of this financing mechanism was a clear understanding of what incentivizes local businesses to support the project. By offering a tool that calculates businesses' carbon footprint, local businesses were encouraged to reflect on their environmental impact and take their responsibility by financially supporting the greening of their local environment.

Read more:

- [Climate ADAPT \(2016\). GAIA - Green Area Inner-city Agreement to finance tree planting in Bologna.](#)
- [EU Life+. GAIA - Green Areas Inner-city Agreement "GAIA".](#)
- [EU Life+. Layman's report. GAIA A wonderful enterprise.](#)



Green Roof Strategy Hamburg

KEY FACTS

City:	Hamburg, Germany
Inhabitants:	1,789,954
Type of NBS:	Green (and blue) roofs
Objectives:	<p>Counter urban heat island effect</p> <p>Prevent flooding</p> <p>Save damage costs</p> <p>Increase green surface in city</p>
Investment size:	EUR 3 million subsidies
Financing sources:	<p>Public body</p> <p>Private investors (Property owners)</p>
Time frame:	2016-2019



To increase the surface area of green roofs in the city and mitigate the risks of destructive flooding, To increase the surface of green roofs in the city and mitigate the risks of destructive flooding, the city of Hamburg incentivized private property owners to install green roofs on their buildings by partially subsidizing the projects.

Project description

Rising temperatures, extended periods of drought, and heavy cloudbursts increasingly pose a major challenge to the city of Hamburg. As one of Germany's largest cities, living conditions are aggravated under the urban heat island effect, leading to temperatures up to 5 degrees higher than in surrounding rural areas. Green (and blue) roofs are key Nature-based Solutions to tackle these challenges. They mitigate the loss of biodiversity due to grey infrastructure and contribute to improved air quality. Furthermore, green roofs provide important surface areas in densely populated cities to implement stormwater management solutions and decrease the risk of flooding. Therefore, Hamburg developed the Green Roof Strategy to increase the number of green roofs in the city. To incentivize property owners to install green roofs on their newly built or renovated buildings, they can receive a subsidy of up to 60% of the installation costs, carrying less than half of the installation costs themselves. Between 2015 and 2019, the green roof surface in Hamburg has increased from 80ha to 124ha.

Financing mechanism

The project is financed through both public and private stakeholders (see table 5). A fund of EUR 3 million provided subsidies to property owners until the end of 2019. EUR 2 million was contributed by the Ministry responsible for city development and environment; another EUR 1 million by the Senate Office. Between 40-70% of the



Green roofs can keep buildings cool during heat waves and insulate during cold winter months, decreasing energy costs.
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installation costs of green roofs are paid by the building owners, 30-60% are subsidized by the fund. Basic green roofs receive a basic subsidy, more specialized roofs receive additional subsidies.

Several benefits incentivize building owners to install green roofs: green roofs provide a natural insulation for the building, keeping temperatures higher in winter and lower in summer. This saves building owners heating and, if applicable, cooling costs.

Energy savings vary from 2-44% (depending on other insulation measures of the building additional to the green roof). Green roofs furthermore catch rainwater which can significantly decrease rainwater fees for building owners. Costs are further saved by reducing drinking water consumption. Moreover, green roofs improve the overall image of a company and can provide attractive business meeting venues.

Table 5: Financial set-up of the project

Stakeholder	Contribution	Component financed
Ministry for Development and Environment	ca. EUR 2 million	subsidies to finance 30-60% of the installation costs of green roofs
Senate Office	ca. EUR 1 million	
Private property owners	ca. EUR 3 million	remaining installation costs once subsidies have been received



The Green Roof Strategy in Hamburg is a good example of how public funding used as subsidies can contribute to the mainstreaming of installing green (and blue) roofs. By informing private property owners about the benefits of a green roof, spreading awareness of the potential cost-savings, and financially supporting the implementation of such NbS, the surface of green roofs in Hamburg almost doubled within three years.

A green roof in Hamburg contributing to biodiversity preservation.

© BUE, Isadora Tast

Read more:

- [Hamburg Ministry for Environment and Agency. Green Roof Strategy Hamburg \(presentation\).](#)
- [Climate ADAPT \(2016\). Four pillars to Hamburg's Green Roof Strategy: financial incentive, dialogue, regulation and science.](#)
- [Hamburg Ministry for Environment and Agency \(2017\). Hamburg's Green Roofs Economic Evaluation \(Report\).](#)



'The Back Garden' at Possilpark Health & Care Center Glasgow

KEY FACTS	
City:	Glasgow, Scotland
Inhabitants:	611,748
Type of NBS:	Community garden
Objectives:	<p>Decrease NHS costs</p> <p>Improve patients' health and experience</p> <p>Create a strong local community</p>
Investment size:	TBD
Financing sources:	<p>Environmental bodies</p> <p>National Health Service Scotland</p>
Time frame:	2012-2014



'The Back Garden' at the Possilpark Health & Care Center in Glasgow is part of the National Health Services (NHS) Greenspace Demonstration Project, facilitated by the Green Exercise Partnership (GEP). The GEP is a joint initiative by two public sector environmental bodies and the National Health Service in Scotland to provide spaces for outdoor exercising and contribute to a greener city. The NHS Greenspace Demonstration Project is aimed to mainstream the health benefits of exercising outdoors and engaging in gardening work.

Project description

The greening of the back garden of the Possilpark Health & Care Center in Glasgow is one of the initiatives of the NHS Greenspace Demonstration Project, initiated by the Green Exercise Partnership Scotland in 2012. On a vacant piece of land behind the community health center, the partnership constructed an urban garden. The space features 'starter plots' which members of the local community can adopt and care for. Furthermore, a food growing and waste reduction project was started. The garden, called by locals the 'Back Garden' provides a space for community members to connect, engage with nature, and grow their own vegetables. Moreover, it provides a space for patients of the center to relax and wait for their appointments while enjoying the proven health benefits of being in a natural environment. Next to these social and health benefits, the project furthermore contributes to reversing the loss of biodiversity in the city. In addition to the garden of the Possilpark Health & Care Centre, the GEP facilitated several more greenspace interventions within the NHS Greenspace Demonstration Project.

Financing mechanism

A public partnership facilitated the financing of the project (see table 6). The project



Community members are care of the maintenance and practicing gardening skills.
© Glasgow Wood Recycling

was facilitated through the Green Exercise Partnership Scotland. Established in 2007, the partnership is a joined collaboration between three public sector bodies: two environmental bodies – the Forestry Commission Scotland (FCS) and Scottish Natural Heritage (SNH, now Nature Scotland) – as well as the National Health Service Scotland. Recently, Public

Health Scotland joined the partnership as a fourth party.

The GEP has two main goals: the greening of NHS estate, and the mainstreaming of engaging with the natural environment which offers benefits to public health. The NHS Greenspace Demonstration Project brings forth community gardens and green spaces where people can go for exercise and leisure activities, proving benefits to hospital patients, staff, and the local community.

By having local community members and organizations adopt the starter plots, maintenance costs are saved. At the same time, gardening activities are being promoted and mainstreamed. Increasing evidence shows the health benefits of physical activities in a natural environment and proximity to green spaces. Developing green and healthy environments for NHS patients can therefore lead to cost-savings as the recovery of patients can be accelerated. Greenery on NHS estate can also improve the wellbeing of NHS staff, which may lead to cost-savings in trainings and recruitment processes.

Table 6: Financial set-up of the project

Stakeholder	Contribution	Component financed
Green Exercise Partnership (Forestry Commission Scotland, Nature Scotland, NHS Scotland)	ca. EUR 3.28 million	12 greenspace solutions of NHS estates
Government of Scotland		which – depending on scale – received ca.
NHS Scotland Health Boards		EUR 237 000 on average



Biodiversity preservation on NHS grounds.
© Glasgow Wood Recycling

By bringing together different public health and environmental bodies, the GEP provides an example of how innovative use of public budgets can lead to new, successful solutions. The GEP clearly determined the different interests of the partners involved and developed a NbS that is not only meeting the different interests of the partners but is also easily replicable. Using public health and environmental budgets to increase greenspace helps create sustainable and viable spaces where patients' recovery time is speeded up, therewith saving healthcare costs.

Read more:

- [NatureScot. Green Ways To Health Case Study: Possilpark Health & Care Centre.](#)
- [NHS Forest \(2012\). Greenspace design for health and wellbeing \(guide\).](#)
- [Forestry Commission Scotland, NHS Scotland, NatureScot \(2015\). Green Exercise Partnership Briefing Note.](#)



Key Take-aways

Nature-based Solutions hold a lot of promise for the future of our cities. It is becoming increasingly evident that cities cannot continue with business as usual without imposing high societal costs. The four showcases in Copenhagen, Bologna, Hamburg, and Glasgow demonstrate a variety of innovative financing mechanisms for implementing Nature-based Solutions in urban settings. A number of key take-aways can be distilled from these cases:

1. Nature-based Solutions are effective instruments in realizing future-proof cities

NbS can take on different forms and can provide a variety of benefits, effectively responding to pressing economic, environmental and social challenges. The Copenhagen case shows how NbS are implemented to adapt to climate change effects and flooding risks. The Glasgow case shows that NbS can deliver social benefits including improved health. Which NbS best to implement depends on what goals you aspire to achieve.

3. Collaborating for a resilient city

Multi-stakeholder collaborations are the way forward when it comes to innovative financing of urban NbS. NbS can offer multiple benefits to a variety of stakeholders. For successful collaborations, it is key to understand who benefits from what and to communicate this effectively. This can range from cost-savings to increasing the value of real estate to marketing benefits. Each stakeholder needs an incentive to engage in NbS projects.

2. Develop innovative financial arrangements

Different stakeholders have different needs and interests. Aligning these by creating new financial arrangements is the key to unlocking more private funding for NbS. As shown in the case of Bologna, public funding can be used for the development of such mechanisms, at which point private sector can also chip in and contribute to clear and recognizable components. When creating such arrangements, keep the interests and needs of a variety of stakeholders in mind.

4. Public funding remains key

Most of the funding for NbS continues to come from public organizations as shown in the four showcases. However, if used strategically, public funds can be extended to incentivize private investors to finance projects, scaling up impact. The Green Roof project in Hamburg shows that subsidies can be an effective instrument to incentivize property owners to install a green roof, rapidly expanding the surface area of green roofs in the city.

5. Learning by doing

Rome wasn't built in a day. Combine a clear and audacious vision for a fully sustainable city with taking achievable steps. Moving in the right direction, even with small steps, is better than to arrive at a standstill or to move in the wrong direction altogether. We'll have to learn as we go, mistakes will be made, but cities need to start including NbS in their scenarios and take a longer-term look when deciding on the best way forward.



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