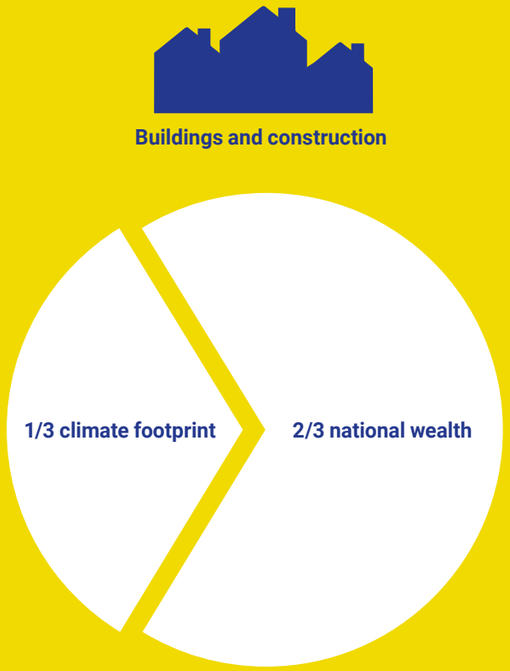
CLIMATE

Examples of how sustainable architecture can reduce the climate footprint and protect buildings and urban areas against climate change

DANISH
ASSOCIATION OF
ARCHITECTURAL FIRMS

> Denmark must resume its green global leadership. And this is only possible if we incorporate the climate in everything we do, and if we embrace new ideas and new technologies.

Dan Jørgensen, Minister for Climate, Energy and Utilities, 2019



In Europe and in Denmark, buildings and construction account for around 40% of energy consumption and 35% of the climate footprint. Energy renovation and sustainable architecture can contribute significantly to reducing both these figures. At the same time cities and buildings in Denmark need to be made more climate resilient. Climate resilience is vital for Denmark, where buildings make up 2/3 of the country's national wealth.

In this booklet, the Danish Association of Architectural Firms describes cases that exemplify how we can use planning, architecture and the landscape to create value with less impact on the climate and to protect Danish assets against climate change.

The climate around us is changing at an unprecedented pace, and we are experiencing increasing temperatures and more frequent extreme weather events. In recent years, Denmark has experienced both cloudbursts and drought, and many Danish cities lie on coasts vulnerable to rising sea levels. This presents new challenges for design and construction techniques. We must reduce our climate footprint and greenhouse gas emissions significantly, and we must protect the assets of society and individuals against climate change. But the challenges also present new opportunities:

- **Sustainable building and smart renovation can reduce both resource consumption and the climate footprint. Furthermore, building operation will be cheaper.**
- **Climate resilience integrating landscape architecture and urban space design can save society and individuals huge amounts on repairs. Furthermore, it can set the scene for urban life and create a better sense of community.**

Photo: Dorthe Krogh

ENERGY OPTIMISATION + BUILIDING PRESERVATION = SUSTAINABILITY

RYESGADE 25, KRYDSRUM ARKITEKTER

At Nørrebro, you'll find Denmark's first DGNB-certified full-scale renovation. Based on experience from earlier renovation projects in the same street, the project achieved a carbon reduction of 71%.

In the Nørrebro district of Copenhagen, extensive renovation of a historical block of flats from 1906 resulted in modern and up-to-date flats with healthy indoor climate and very low energy consumption. Unused loft space was turned into rooftop flats, the windows were replaced with energy-efficient, triple-glaze windows. Furthermore, the roof was insulated to save energy and solar cells were fitted to produce new energy. The green roof and resilient designs of basement and ground-level surroundings protect the building against cloudbursts. All entrances to the building, including to the basement, have been placed above expected flood levels. If water should penetrate the basement, it will be led to sections of the building that have been designed to withstand the water, using waterproof surfaces and materials.

The result of the renovation project is a 32-tonne cut in carbon emissions and an energy-label upgrade from G to A. Furthermore, the Ryesgade 25 project is an example of how involving the building's users can help architects understand user needs and make users more aware of their own behaviour and contribution to energy consumption and the climate footprint.

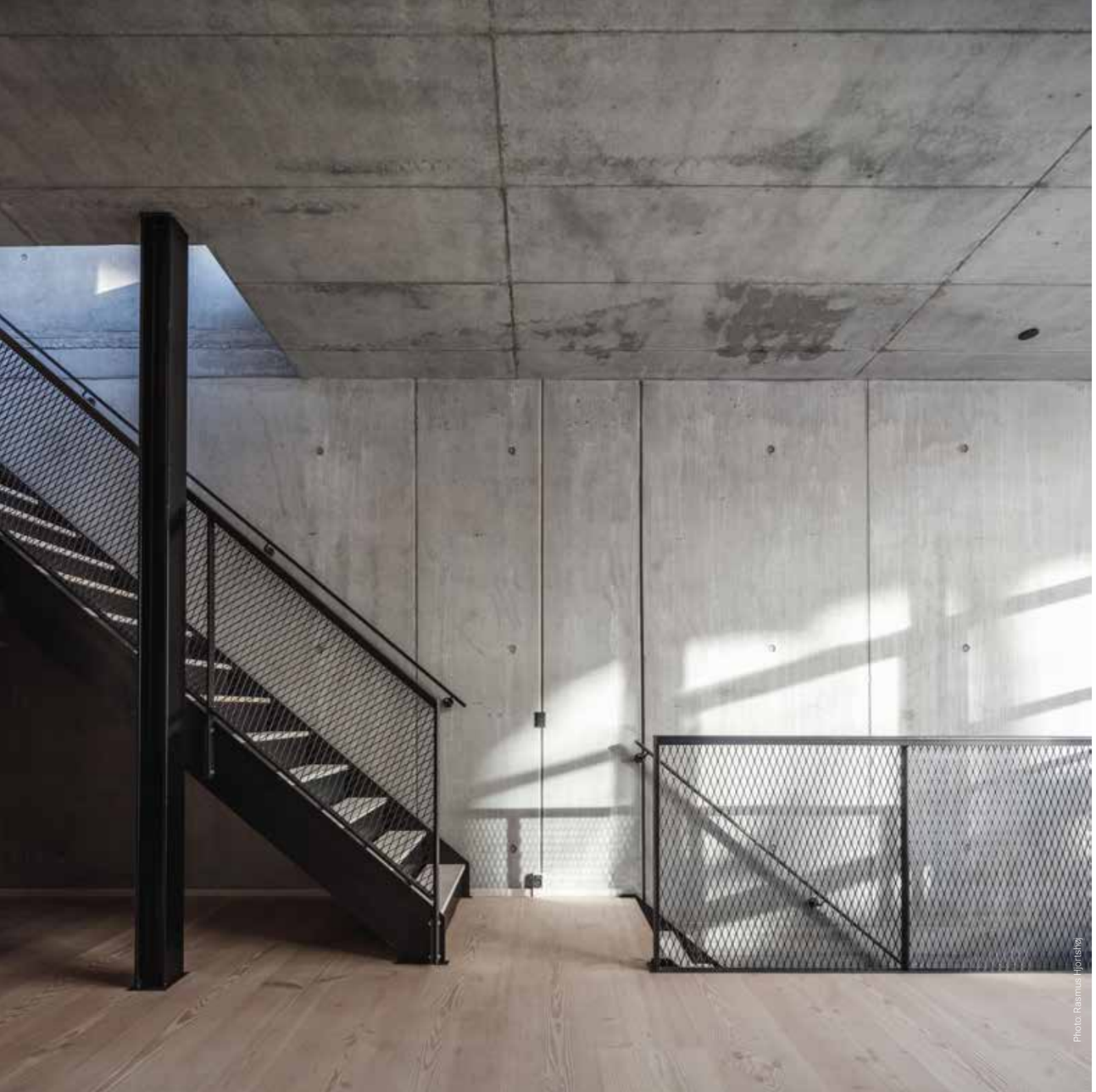
Photo: Dorthe Krogh

A study from the Technical University of Denmark (DTU) has estimated that the total area of unused loft space in Copenhagen could provide homes for 22,000 people.

Graduate thesis, DTU Civil Engineering, 2012

ARCHITECT KRYDSRUM ARKITEKTER
LANDSCAPE RONBY.DK
CLIENT DROSTFONDEN
CONTRACTOR JUUL OG NIELSEN | KBS BYG
ENGINEER FALKON | EKOLAB
LOCATION COPENHAGEN N, DENMARK
TYPE REFURBISHMENT/ FULL RENOVATION
USE MIXED USE
COMPLETED 2017
SIZE 3.955 M²
CONTRACT SUM DKK 80 MILL.

Photo: Dorthe Krogh



SUSTAINABILITY PAYS OFF

UPCYCLE STUDIOS, LENDAGER GROUP

The success of Upcycle Studios spearheads the industry towards sustainability. In the Ørestad district of Copenhagen stands the first ever building to convert cost-neutral sustainability and innovative use of resources into increased demand.

The ambition was to build the world's most sustainable residential buildings, but still on market terms. According to a Swedish report, the Upcycle Studios project has resulted in new business opportunities for partners in the value chain, 26 six-month full-time positions and carbon savings. Upcycle Studios is contributing significantly to the transition to a circular economy and green behaviour in the construction sector.

Waste was used as a resource in the construction of the buildings. For example, 75% of the windows in the 200m^2 flats come from old, demolished social housing units, contributing a 77% carbon reduction relative to using new windows. Furthermore, 840 tonnes of concrete used in the construction was waste from the new Copenhagen Metro system, and surplus wood was used to make floors, walls and façades.

The circular principles of the project create sustainable value, not only because building materials are reused instead of ending up in incineration plants, but also indirectly by engaging materials manufacturers and boosting the local economy. Developers and investors have become aware of the economic potential in sustainable construction, and the Upcycle Studios project has demonstrated that sustainability really can pay off.


Photo: Rasmus Hjortshøj

Upcycle Studios is a light-house project demonstrating that upcycling is good business. The project is instrumental in accelerating the transition to a circular economy in the building and construction sector. Our studies show how project contributors developed more interest in working with upcycled materials and greater focus on sustainability.

Julia Nussholz, Senior researcher, International Institute for Industrial Environmental Economics, Lund University


Photo: Rasmus Hjortshøj

ARCHITECT LENDAGER GROUP
CLIENT NREP
KNOWLEDGE PARTNER LENDAGER UP
CONTRACTOR AG-GRUPPEN
ENGINEER MOE | NORRECCO
LOCATION ØRESTAD, COPENHAGEN, DENMARK
TYPE NEW BUILDING
USE RESIDENTIAL/COMMERCIAL
COMPLETED 2018
SIZE 3.909 M²

USING RAIN AS A RESOURCE
THE CLIMATE TILE, THIRD NATURE

THIRD NATURE's Climate Tile will teach the world how to walk on water. The Climate Tile is a system of paving tiles that collect and reuse precipitation, so that the water collected can eventually be used as a resource.

The Climate Tile is an invisible climate solution that doesn't interfere with pedestrians or with the urban landscape. The pilot project on Heimdalsgade in Copenhagen includes a 50-metre-long pavement that protects against increasing precipitation, taking the load off the roads by absorbing up to 30% of annual precipitation. The individual tiles have small, visible holes which allow the rainwater to seep through and down into a dry well to store the water, before letting it seep further down into the groundwater or out into the surrounding green areas. Thus, the Climate Tile also takes the load off the sewer system, and the system was developed to help adapt our cities to the impacts of climate change.

The Climate Tile makes the pavement an important co-player in climate solutions by collecting and managing stormwater runoff from roofs and paved areas. The tiles have been tested and monitored over four seasons and have shown good results. People in the local area value the tiles and the urban green spaces that are part of the project. In addition to collecting rainwater 1% of the time – i.e. during extreme rainfall events – the remaining 99% of the time the tiles contribute to quality of life in the city.

After completion of the new pavement, the local coffee shop has seen a 40% increase in turnover.

Photo: Tredje Natur

> We are very happy that the test pavement came to our street. A street space made for activity is rather wonderful. A space where you can sit down and relax or experience a farmer's market with a herb garden in the pavement, or an outdoor record stall under the trees. It's really cool – give us more of the same on Heimdalsgade and in the rest of the city!

Kim Tach, Co-owner of the Heimdalsgade 22 café

ARCHITECT THIRD NATURE
CLIENT CITY OF COPENHAGEN
ENGINEER JØRGEN NIELSEN RÅDGIVENDE INGENIØRER | DANSK ENERGI MANAGEMENT & ESBENSEN | GADE MORTENSEN
CONTRACTOR MALMOS
COLLABORATION PARTNERS ACO NORDIC | IBF | DANISH TECHNOLOGICAL INSTITUTE | KOLLISION | ORBICON
LOCATION COPENHAGEN, DENMARK
TYPE INNOVATION PROJECT
USE STORMWATER MANAGEMENT
COMPLETED 2018
SIZE 50 M², PILOT PROJECT
DEVELOPMENT AND CONSTRUCTION COST DKK 8 MILL.

Photo: Tredje Natur

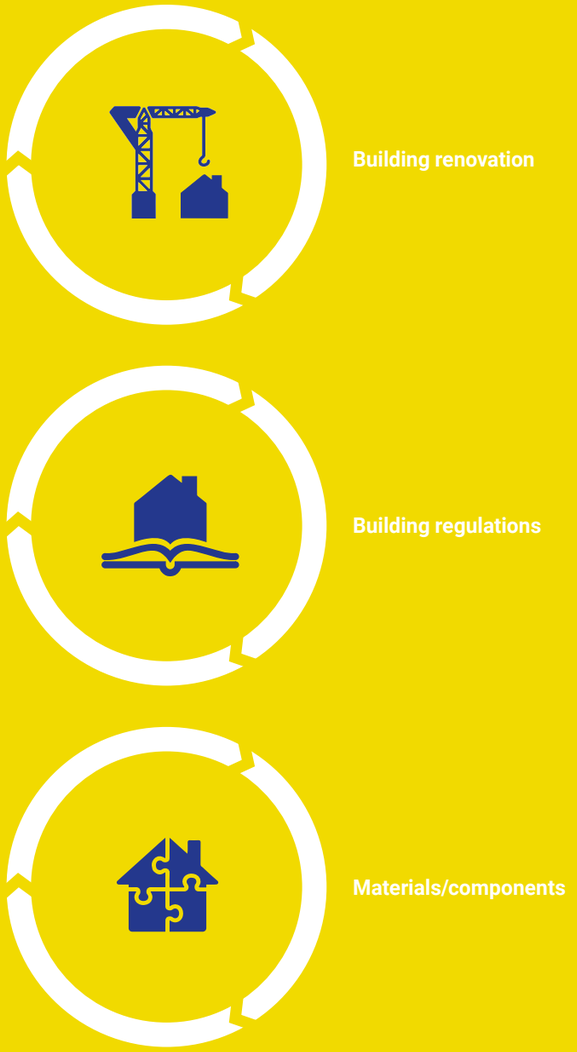
Climate change and resource scarcity are just some of the many challenges facing the world today. Buildings and construction are part of the problem, but they also hold the key to many of the solutions that can help mitigate the impacts of future climate change.

If we're to follow the recommendations of climate researchers, we must lower our climate footprint significantly by 2030, and there's no time to lose! We must transition to renewable energy and make society much more resource-efficient. Buildings and construction have an important role in this regard.

Heating, ventilation, lighting and cooling of buildings account for around 40% of our energy consumption as a society, and construction accounts for a similar share of resource consumption. But this can change! We can lower our carbon footprint using solutions that already exist:

- **Renovation can reduce the energy consumption and climate footprint of existing buildings by 50%.**
- **New buildings can be designed to be climate neutral in operation.**
- **The climate footprint from building materials can be reduced by 25-50%.**

The most important initiatives in efforts to reduce climate footprint are to renovate, optimise and maintain existing buildings; set climate requirements for new buildings, structural design and materials; and to chose designs that promote recycling, reuse and a circular economy.



The climate footprint of buildings and construction can be significantly reduced through sustainable initiatives in renovation, building regulations, and components.

Photo: Rasmus Hjortshøj (MO)

INTERNATIONAL ICON FOR THE CITY OF CYCLISTS THE BICYCLE SNAKE, DISSING+WEITLING

The Bicycle Snake in Copenhagen underline the City of Copenhagen's profile as a sustainable, bicycle-friendly metropolis. The bridge is a hub for cyclists and pedestrians, and it is one of the reasons tourists flock to the capital.

The City of Copenhagen wants more people to use their bike and the Bicycle Snake will help. With its distinctive orange cycle path, light structure and soft curves, the bridge snakes its way across the inner harbour near the Vesterbro district of Copenhagen.
It provides a shortcut for cyclists and saves them time; just as it saves Copenhagen from more congestion and traffic exhaust. Around 12,000 cyclists cross the bridge every day, saving them a total of 380 hours daily compared to the longer route through the city.
The Bicycle Snake is more than just a bridge; it's an international icon for Copenhagen and the architectural solution reaches beyond its basic function. The bridge 'floats' six meters above the water and some of the wharf where pedestrians can now walk without having to make way for cyclists.
The bridge has boosted the city's cycle tourism and draws countless guests to the capital. Thus, in a literal as well as a figurative sense, the Bicycle Snake is a structural element of Copenhagen as a cycling city. According to the 2019 City of Copenhagen cycling report, construction of cycle paths will increase the number of cyclists in the city by 15-20%.


Photo: Rasmus Hjortshøj

Saves both time and petrol. The Bicycle Snake saves Copenhageners 380 hours daily. The bicycle bridge also reduces traffic by 1,400 km every day, corresponding to 87 t of CO_2 annually. In monetary terms, the Bicycle Snake has a net present value of DKK 44 mill. over 20 years.

Copenhagen's Cycle Accounts 2017

ARCHITECTS DISSING+WEITLING
LANDSCAPE MARIANNE LEVINSEN LANDSKAB
CLIENT CITY OF COPENHAGEN
KNOWLEDGE LIGHTCONSTRUCTOR
CONTRACTOR MT HØJGAARD
ENGINEER RAMBØLL
LOCATION COPENHAGEN, DENMARK
TYPE NEW BUILDING
USE CYCLE BRIDGE
COMPLETED 2014
SIZE 230M LONG, 4M WIDE
BUDGET DKK 38 MILL.

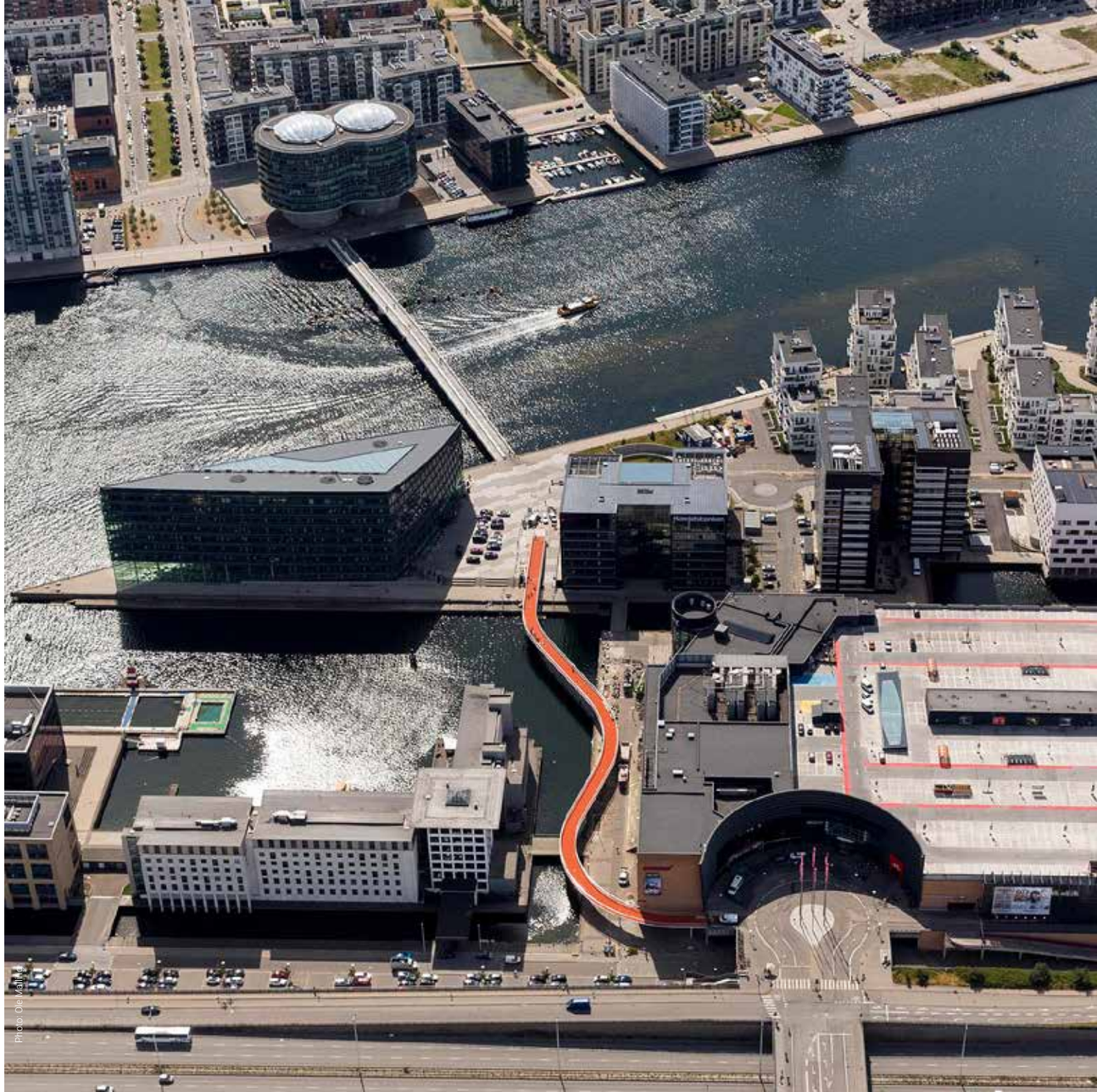


Photo: Ole Malling


Photo: Carsten Ingemann

THE WAY OF THE WATER IS THE WAY OF THE PEOPLE

CLIMATE CHANGE ADAPTATION KOKKEDAL, SCHØNHERR

In the city of Kokkedal, urban renewal and adapting to climate change go hand in hand. The project consists of 38 sub-projects, and it is the result of a unique collaboration, backing and commitment across specialist groups.

In 2007 and 2010, Fredensborg Municipality experienced several cloudbursts and suffered extensive damage along the Usserød Å watercourse, with massive repair costs. As a counter measure, the municipality now has one of Denmark's most ambitious climate change adaptation projects. Across municipal and local cadastral borders, stormwater management has been coupled with other functions such as play, art and nature.

Using a holistic approach to climate change adaptation in the city of Kokkedal, Schønherr has rendered stormwater management visible and has created recreational sites, including natural playgrounds, exercise tracks and green gardens, for locals and visitors.

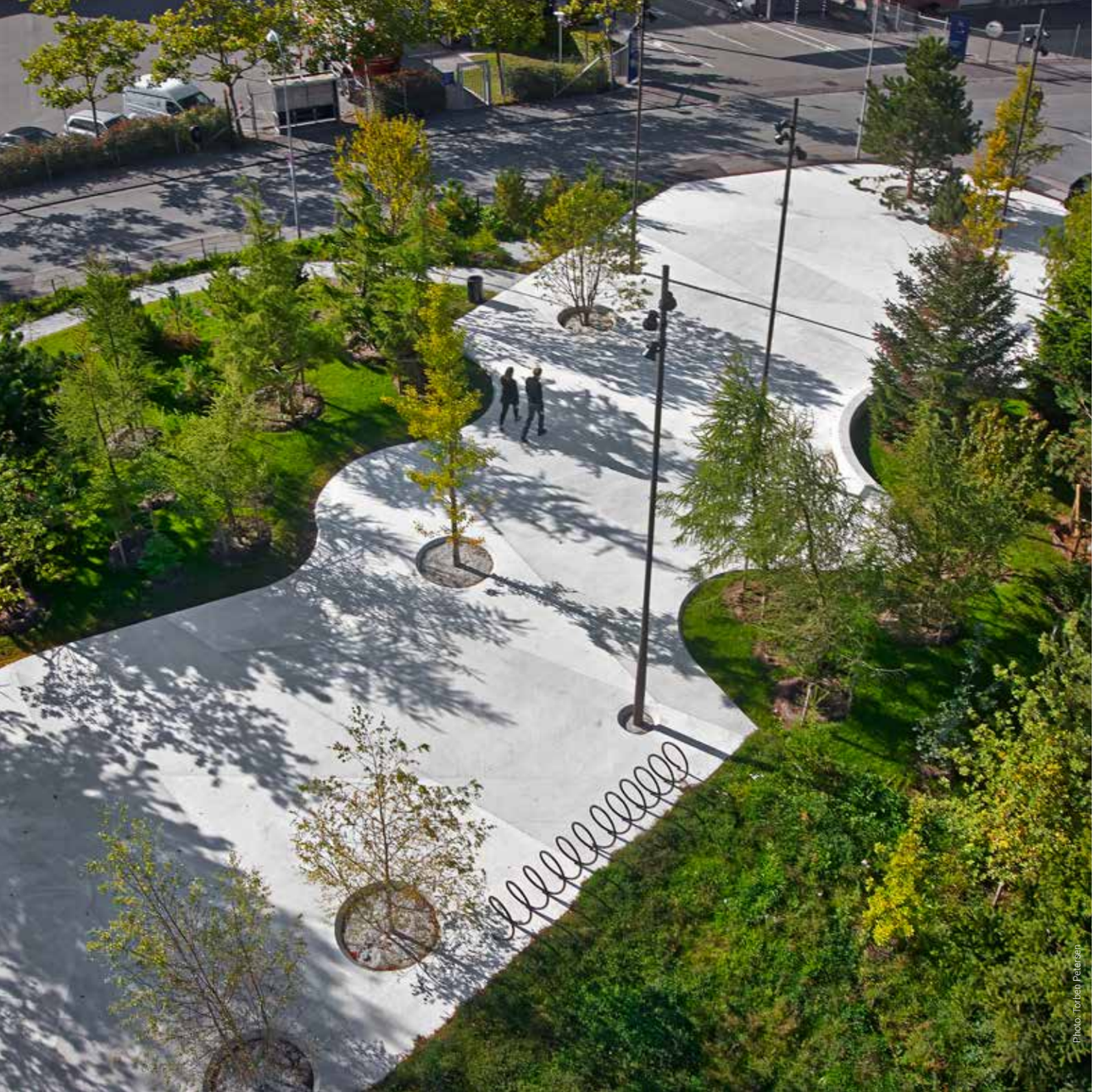
Detention basins and rainwater reservoirs have become attractive urban spaces. For example, Bølgepladsen (wave square) collects rainwater but can also be used for basket ball, skateboarding, parkour, etc. and it is being used 220% more than before. The overarching project is unique in that it involves collaboration between organisations, associations, architects, engineers and politicians, who normally do not collaborate.


Photo: Carsten Ingemann

> The Climate Change Adaptation Project in Kokkedal is a showpiece of intensive collaboration across ownership and professional groups. The project is unique, in that it was able to manage urban development of this magnitude by combining climate solutions and social activities.
>
> Thomas Lykke Pedersen , Mayor of Fredensborg Municipality


Photo: Carsten Ingemann

ARCHITECT SCHØNHERR
CLIENT FREDENSBORG MUNICIPALITY | REALDANIA | THE DANISH FOUNDATION FOR CULTURE AND SPORTS FACILITIES | HOUSING COOPERATIVE AB HØRSHOLM KOKKEDAL | HOUSING ASSOCIATION 3B | FREDENSBORG UTILITIES
KNOWLEDGE PARTNER VISUAL ARTIST EVA KOCH GENERAL
CONTRACTOR EBBE SALSGAARD | P. MALMOS | HEDEDANMARK
ENGINEER RAMBØLL
LOCATION KOKKEDAL, FREDENSBORG MUNICIPALITY, DENMARK
TYPE LANDSCAPING
USE CLIMATE-PROOFING
COMPLETE 2017
SIZE 69 HA
CONSTRUCTION SUM DKK 118 MILL.



BIODIVERSITY IN BAGSVÆRD NOVO NORDISK NATURE PARK, SLA

Lush nature, insects and deadwood adorn the entrance to Denmark's most successful company. Biodiversity is a general motif in the Novo Nordisk Nature Park, where employees can enjoy a whiff of fresh air among the trees and the gently winding paths.

When employees go to work in the morning at the Novo Nordisk head office in Bagsværd, they pass through a nature park beyond the usual. What used to be a dull parking area and industrial landscape, is now a nature-scape ripe with bird song.
The footpaths meander through the park, weaving between trees. Insects are welcome, as is the deadwood left behind to make homes for creepy crawlies.
The nature park is on top of the underground car park and not only functions as a thoroughfare between the two main buildings, but also as an area where employees can take a mental break, hold outdoor meetings and drink in the nature.
The park has more than 2,000 free-growing trees and other water-absorbing vegetation, and it supports wildlife, plant life and urban life alike. The park has minimum operating costs and moreover collects the rainwater that falls in the park area and runoff from the surrounding buildings. Thus, the landscape is resilient to climate change and provides added green value and significant financial savings.

Photo: Torben Petersen

> It's all about ensuring a good working environment, which, among other things, requires that employees can exercise at work. Employees can also appreciate the natural landscape from inside the office buildings, and in several places office desks have been placed to face the park.

Kristina Lee, Corporate Vice President, Novo Nordisk

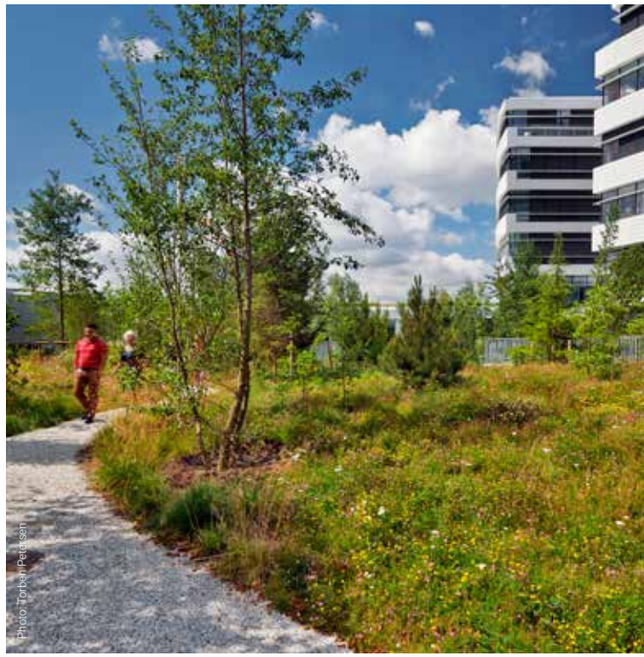


Photo: Torben Petersen

LANDSCAPE SLA
CLIENT NOVO NORDISK
COLLABORATION PARTNER HENNING LARSEN
ENGINEER ALECTIA
CLIMATE ADAPTATION ENGINEER ORBICON
GARDENER SKÆLSKØR ANLÆGSGARTNERE
BIOTOPE CONSULTANT URBAN GREEN
LOCATION BAGSVÆRD, DENMARK
TYPE LANDSCAPING
USE NATURE PARK
COMPLETED 2014
SIZE 31.000 M²

It has been estimated that rising sea levels and storm surges will cost Danish coastal cities at least DKK 93 bn in damage repairs over the next 100 years. This does NOT include cloudbursts, storms and rising groundwater levels, which means there are enormous sums to be saved from investing in climate-proofing.

The climate, and the encounter between landscape and the sea have always been a basic component of Denmark's evolution. Towns and cities are typically located where a river runs into the sea, where the soil and the climate are particularly ripe for agriculture, or where islands provide a natural harbour for trade. But climate change shifts the balance. A warmer climate means more frequent extreme weather, and sea level rises increase the pressure on coastal areas. So, Denmark needs to adapt to climate change.

The Danish building stock makes up two-thirds of Denmark's national wealth and is therefore a huge resource that we must care for, manage and develop to be more resilient towards changes in the environment. The following are particularly important:

- **Protection against flooding as a consequence of extreme rainfall.**
- **Protection against rising sea levels and storm surges.**

Climate-proofing can create new value and assets for citizens and the local community at a minimal cost. Stormwater management through landscaping and urban-space design provide a multitude of opportunities to integrate and support recreational activities, biodiversity, beautification and social relations, which, in turn, provide more public value and assets, local anchorage and urban development. Danish solutions are in international demand.

Climate-proofing = Added value. Research shows that projects with above-ground stormwater management solutions for collecting extreme rain are up to four times cheaper than traditional underground stormwater management solutions.

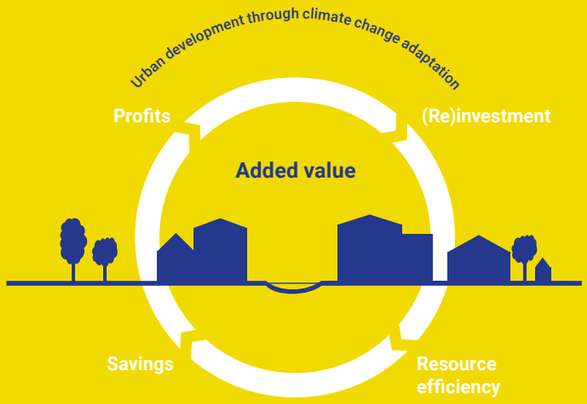


Illustration: The Climate Harbour, Middelfart Municipality / EFFEKT 2016

Photo: BJERG Architecture

PERFECT EXAMPLE OF FULL-SCALE RENOVATION TOFTEBO, BJERG ARCHITECTURE

Maximum reduction in the building's energy costs, improvements to indoor climate and comfort. Energy renovation at Toftebo is a perfect example of how to climate-proof existing building stock.

Toftebo is a non-profit housing association consisting of 83 family homes in the form of 2-to-5-room flats. The renovation project is a perfect example of how a full-scale economic approach to renovation can result in significant societal saving in terms of carbon emissions and energy for heating.

The residents at Toftebo used to turn on their heating in September because of draughts and thermal discomfort, but after renovation, most residents wait until the beginning of December before turning on their heating. The renovation of Toftebo is based on the Passive House Standard, an ultra-low-energy concept, which prohibits the use of active heating and cooling systems to regulate indoor climate and comfort.

The benefits for residents and the landlord can be measured as a 93% reduction in the building's overall energy consumption and a more than 75% reduction in energy consumption for heating the flats. By re-insulating the building envelope, replacing windows and installing efficient heat recovery, there is now fresh indoor air and up to 85% heat recovery in the building.

> An important, exemplary project. Denmark wants to be independent of fossil fuels, and buildings are extremely energy-intensive. The **Toftebo** project demonstrates how it is possible to refurbish the existing building stock to the Passive House Standard within the context of non-profit housing.

Panel of judges, Building of the Year 2017 (Residential)

Photo: BJERG Architecture

ARCHITECT BJERG ARCHITECTURE
CLIENT DAB HOUSING ASSOCIATION, DISTRICT 2903 | TOFTEBO ENGINEER WISSENBERG
CONTRACTOR HOVEDSTADENS BYGNINGSENTREPRISE
KNOWLEDGE PARTNERS VENTI | PASSIVE HOUSE INSTITUTE DARMSTADT
LOCATION VÆRLØSE, DENMARK
TYPE RENOVATION
USE SOCIAL HOUSING
COMPLETED 2017
SIZE 4.500 M²
CONSTRUCTION COST DKK 32 MILL.

Photo: Helene H. Mikkelsen

CLIMATE-FRIENDLY AND FLEXIBLE WOODEN HOMES SHOW THE WAY FORWARD

LISBJERG HILL, VANDKUNSTEN

Lisbjerg Hill is a pioneering project within modern wood building and non-profit housing. With a flexible building system, floor plans can be transformed continuously, and residents have a comfortable indoor climate all year round.

Lisbjerg Hill in Aarhus has been awarded the gold DGNB certificate and comprises 40 very different homes. Norway spruce and glue-laminated wood are the main building materials used; a good choice for the environment and for the indoor climate.

A flexible building system was developed for the project that makes it possible to replace outer walls and combine or divide flats, if housing needs change in the future. Wood-clad inner walls provide comfort and a good indoor climate, because the wooded surfaces help regulate humidity and keep the temperature neutral. By using wood, total climate-gas emissions of the building have been halved. The wood comes from sustainable forestry and can be reused or incinerated for energy recovery.

Life-cycle analyses show that the wooden facades are the most climate-friendly option. A total of 5,200m^2 of untreated wooden facade, window frames made from raw aluminium, and untreated staircases and flats combine to benefit the environment, the indoor climate and building operating costs.

Photo: Helene H. Mikkelsen

> It's wonderful to wake up in the morning. I feel like nature has moved in. The air is different. The air isn't dry like in the modern concrete buildings I've lived in. And there's less dust.

Dorthe Bek-Christensen, Resident and Chairperson of the residents' association, Lisbjerg Hill

ARCHITECT VANDKUNSTEN
LANDSCAPE VANDKUNSTEN
CLIENT AL2BOLIG
MAIN CONTRACTOR HUSTØMRENE | BRAVIDA | POUL PEDERSEN
ENGINEER MOE
LOCATION LISBJERG, AARHUS, DENMARK
TYPE NEW BUILDING
USE SOCIAL HOUSING INCLUDING A COMMON FACILITIES
COMPLETED 2018
CONSTRUCTION COSTS DKK 45 MILL.

Photo: Søren Nørby

Photo: Municipality of Lemvig

CLIMATE-PROOFING GIVES LOCAL ANCHORAGE

LE MUR, HASLØV & KJÆRSGAARD

The Le Mur (the wall) flood-protection works have saved the harbour town of Lemvig at least DKK 30 mill. in repair costs. Le Mur manages rainwater and has turned the area into an exciting public space.

Besides protecting Lemvig during high water levels of up to 210 cm above normal, Le Mur serves as a meeting point and resting area at the harbour. The wall has been constructed from concrete and can be closed with steel gates when a storm is imminent.
The wall winds its way along the harbor front, creating various places for activities such as markets and playgrounds, areas for parking and for playing ball games, or for resting and enjoying the view of the harbour basin. The wall has integrated wooden seats and is decorated with mosaics made by local children.
The wall has been designed for flexible use to meet the demands of the many events held at the harbour. Therefore, in addition to its main purpose to protect the harbour front in Lemvig during floods and cloudbursts, the wall also has a social function when local citizens and tourists use the wall for recreation and to take a break.
The wall was constructed with help from local manufacturers and has already "been in action" and proven its worth on several occasions. Thus, it has been estimated that during the three most recent storms the wall saved the Municipality of Lemvig around DKK 30 mill. in repair costs.


Photo: Kontraframe

> The concrete wall has helped transform Lemvig Harbour into a bustling area with activities for local citizens, tourists and sailors. We had to establish flood-protection for Lemvig Harbour and Lemvig. We chose to make a virtue of necessity and we have thereby gained much more from our investment for the benefit of everyone.

Erik Flyvholm, Mayor of the Municipality of Lemvig


Photo: Kontraframe

ARCHITECT **HASLØV & KJÆRSGAARD**
CLIENT **MUNICIPALITY OF LEMVIG**
ENGINEER **COWI | GRØNTMILJØ**
CONTRACTOR **SHS-BYG**
KNOWLEDGE PARTNER **ORANJE BETON**
LOCATION **LEMVIG, DENMARK**
TYPE **NEW BUILDING**
USE **FLOOD-PROTECTION**
COMPLETED **2012**
SIZE **350 M**
CONSTRUCTION COST **DKK 18 MILL.**

THE URBAN RAIN FOREST AT TÅSINGE SQUARE, GHB LANDSCAPE ARCHITECTS

World-class climate change adaptation. Inspired by the Tåsinge Square project, New York City is hoping to save DKK 4 bn by applying similar climate change adaptation strategies.

Tåsinge Square was Copenhagen's first climate-adapted urban space, and as part of the climate-resilient neighbourhood of Østerbro, it has attracted international focus on Danish visions and climate strategies.

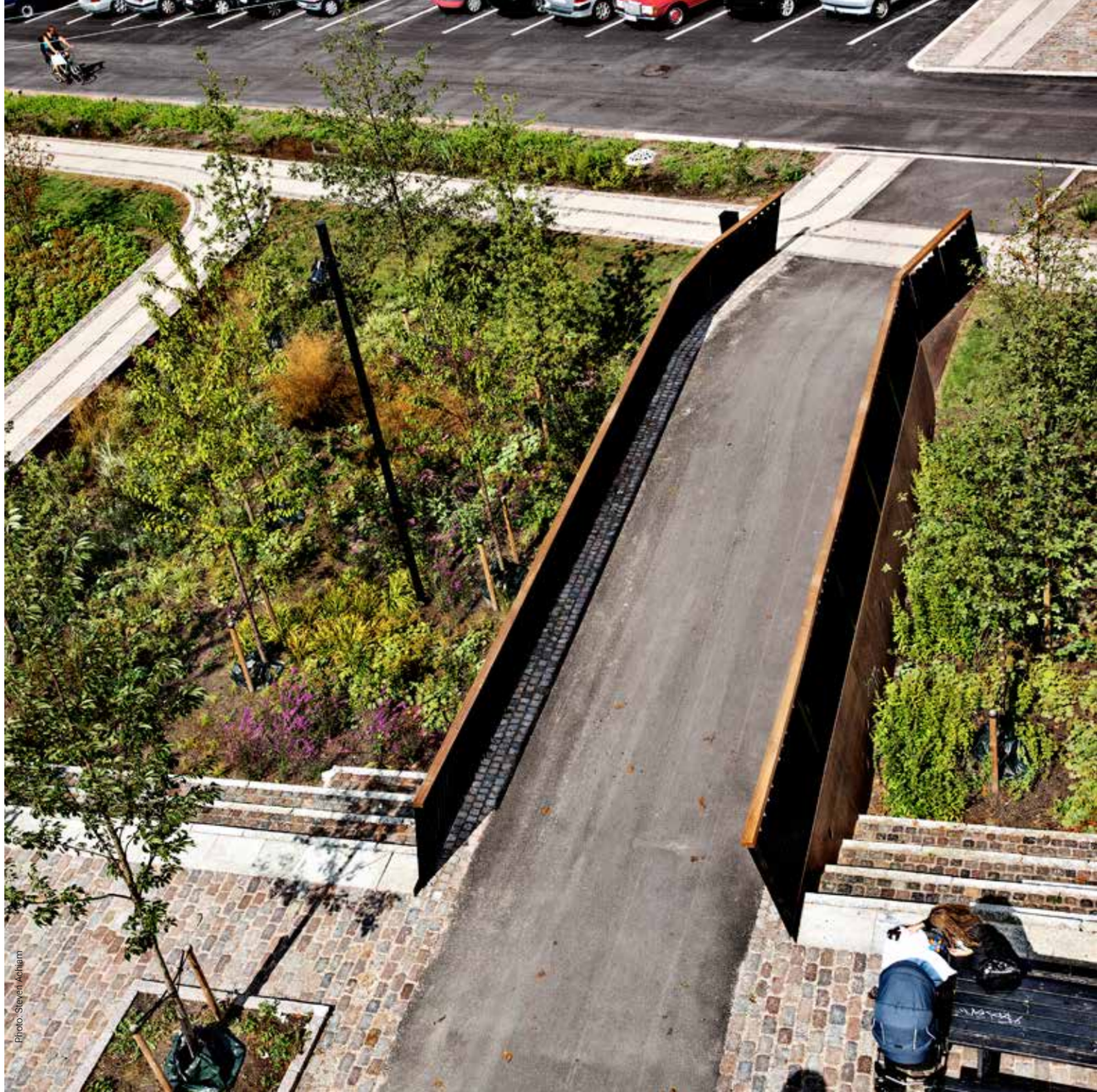
The project is being evaluated at research level, and it shows how we can future-proof our common areas through improving urban spaces. Tåsinge Square serves as a green oasis in the city and a meeting point for the local community, while large amounts of rainwater are being managed beneath the square. What used to be 1,000m² of unused paved area has been turned into a public, urban natural area; a wildlife oasis supporting biodiversity and detaining and collecting rainwater from roads and rooftops.

The urban space encourages activity, play and learning. Landmark sculptures of water parasols and water droplets adorn the square, where water can be pumped up onto the surface and used for play, after which it will seep out into the surrounding green areas.

> If the City of Copenhagen were to expand the sewer system to solve the cloudburst problem, it would cost us up to DKK 25 bn. Now we've invested in much more beautiful blue and green solutions that will cost us only DKK 6-7 bn over the next 15 years or so.

Morten Kabell, Former Mayor for the Technical and Environmental Administration at the City of Copenhagen

ARCHITECT GHB LANDSCAPE ARCHITECTS
CLIENT CITY OF COPENHAGEN
CONTRACTOR MALMOS ANLÆGSGARTNERE
ENGINEER ORBICON
COLLABORATION PARTNERS FELD | STUDIO FOR DIGITAL CRAFTS & VIA TRAFIK
LOCATION COPENHAGEN Ø, DENMARK
TYPE CLIMATE-FRIENDLY URBAN SPACE
USE CITY PARK
COMPLETED 2014
SIZE 7.500 M²
CONSTRUCTION COST DKK 11.5 MILL.



Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries and integrate climate change measures into national policies, strategies and planning.

Sustainability is gaining ever more commercial importance in the form of increased demand for services and products that contribute to green growth and social value creation. Businesses must be ready to offer new solutions and processes – or suffer the consequences and go out of business.

Helle Søholt, CEO and Founding Partner of Gehl, 2018

Globally, it has been estimated that 230 bn m² of buildings will have to be built over the next 40 years. This corresponds to building an area the size of Paris every week, or an area the size of Japan every year.

With the expected demographic growth and increasing urbanisation, the built-up area will continue to grow at a hitherto unseen pace. Population growth and a larger global middle class mean increased demand for energy and resources, and a growing climate footprint. Buildings and construction are very much a part of the problem, but they also hold the key to many of the solutions.

The 17 UN Sustainable Development Goals require sustainable transition and development, which not least requires innovative solutions and resilient adaptation strategies within architecture.

The projects in this booklet portray solutions that have already been implemented and which, in different ways, incorporate long-term, sustainable strategies in buildings and construction, supporting society's green transition without jeopardizing the common social basis for good architecture. The projects support a number of the Sustainable Development Goals but their common denominator is their unique climate action.

Climate change calls for stronger initiatives in the building and construction sector – on the one hand to promote broader use of sustainable solutions for reducing greenhouse gas emissions, and on the other hand to make our buildings and cities more resilient to climate change. We have collected a number of examples of green architecture which, in different ways, implement innovative solutions and prompt us to 'think new' in the green transition.

See more examples of architecture with added value at www.danskeark.dk

THANKS to all our members
– all the architectural firms for their permission to use their cases
– without you there would be no examples to share!

ISBN: 978-87-7797-008-5
EAN: 9788777970085
Published by: Danish Association of Architectural Firms, December 2019
Editor: Tine Weisshappel Holmboe
Text: Signe Moeslund Mains, Morten Hedegaard Kristensen,
Peter Andreas Sattrup og Karen Sejr
Graphics: Lotte Kvist
Printed by: Toptryk Grafisk
Photos: Photographers are credited under the individual photos

Danish Association of Architectural Firms
Vesterbrogade 1E, 2nd floor
1620 Copenhagen V, Denmark
T +45 32 83 05 00
E info@danskeark.dk
www.danskeark.dk

DANISH
ASSOCIATION OF
ARCHITECTURAL FIRMS