

Nordic Sustainable Cities

From loneliness among the elderly to urban floods to air pollution – cities around the world face enormous yet similar challenges.

The UN Agenda 2030 provides a framework for solving many of these challenges. The Sustainable Development Goal (SDG) 11 specifically outlines the crucial role that cities and communities play. But as this exhibition shows, urban solutions are not restricted to Goal 11, but connected to many of the other goals.

The Nordic countries are dedicated to the UN Agenda 2030 and already have solutions that can contribute to the fulfillment of the SDGs.

In this exhibition you'll find some of the solutions that Nordic architects and engineers are already working on within the fields of health, mobility, low carbon, circular economy and resilience.

The Nordics are on a journey towards sustainability and we hope to inspire you to join us!



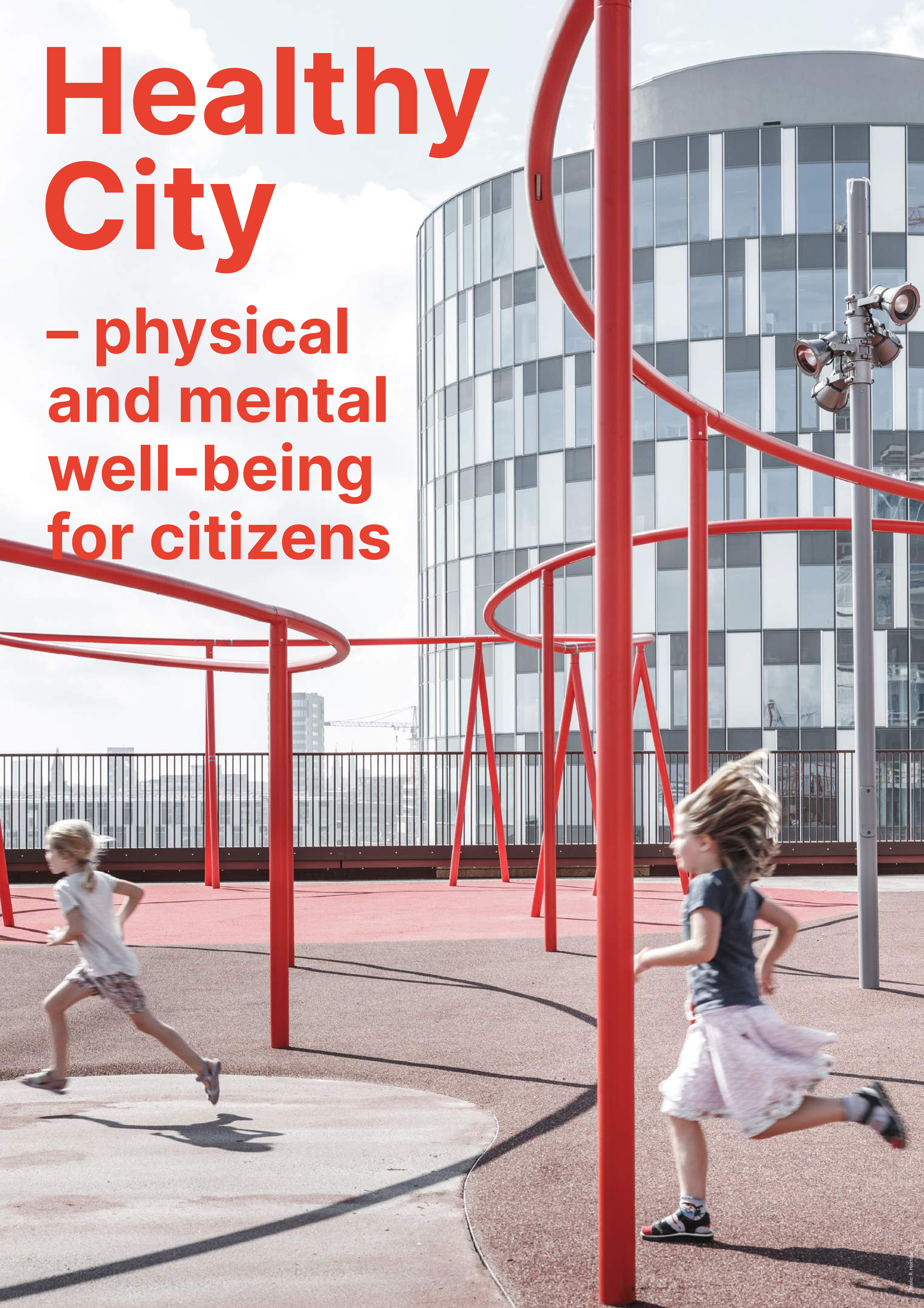
The exhibition is funded by Nordic Innovation and created by the Danish Architecture Center (DK), Design and Architecture Norway (NO), ArkDes & Form/Design Center (SE), Iceland Design Center (IS) and Archinfo (FI).



The Nordic countries are situated in Northern Europe and consist of Sweden, Norway, Finland, Iceland and Denmark – including the associated territories Greenland, The Faroe Islands and Åland.

Healthy City

– physical
and mental
well-being
for citizens



How do we turn a car park into an attractive public space?



Park'n'Play combines the static function of a car park with an invitation for an active lifestyle. Located on the rooftop of the car park – 24 meters above ground – is a recreational area with a view of the horizon, often reserved for the privileged few.

With less space in our cities, we need buildings to be versatile, not monofunctional. Park'n'Play is not just a typical car park but also a playground and outdoor gym. The design is playful and filled with colors – inviting both grown-ups and children to engage in the physical activities while also providing facilities for more dedicated training programs. A beautiful graphic frieze invites people to follow the history of the Copenhagen harbor all the way to the top of the roof, where the view is bound to impress!

Project name: Park'n'Play / Konditaget Lüders
Client: By & Havn
Place: Copenhagen, Denmark
Year: 2014-2016
Companies: JAJA Architects, 5e byg, Søren Jensen ingeniører, Rama Studio
Link: www.ja-ja.dk



A free gym that attract visitors and locals



Multifunctional buildings make better use of costly building sites



Old Nike sneakers and car tires are turned into pavement

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



3.4. REDUCE MORTALITY FROM NON-COMMUNICABLE DISEASES AND PROMOTE MENTAL HEALTH

How do we reduce loneliness among the elderly?



Sweden has the largest number of single-person households in the world and at the same time an urgent need for residential units. This initiative matches students with available, affordable housing at seniors' homes.

One roof, two generations (Ett tak två generationer) is a new digital matching service for those looking for shared accommodation with security and well-being in focus. It's focused on seniors (55+) who have spare rooms in their homes, and students needing accommodation close to school. A win-win situation arises in encounters across generational boundaries.

Project name: Ett tak två generationer
Place: Sweden
Year: 2018-
Companies: Ett takk två generationer
Link: <https://etttak.se>



Saves money for the city – by not having to invest in new housing and infrastructure



A better use of space and sharing of utilities



Reducing loneliness among groups at risk – while securing affordable housing

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



11.1 – SAFE AND AFFORDABLE HOUSING

How do we help local city dwellers and tourists unwind?



The Guðlaug Baths are an attraction that serve an important role as a gathering point for ocean swimmers in need of warming up and an energizing spot for both locals and tourists.

The Guðlaug Baths are nested in a rocky breakwater barrier that runs along the beach. They are designed to fit into the surroundings and are based on the ancient Icelandic bathing culture from the hot springs. The hot water is led directly from the springs to the baths making it a low-cost high-yield option to the benefit of everyone in the area – while also being free of charge.

Project name: Guðlaug
Client: Town of Akranes
Place: Langisandur, Akranes, Iceland
Year: 2018
Companies: Basalt, Mannvit and Liska
Link: www.basalt.is



Low energy cost and maintenance because of natural resources.



Built with respect for the surroundings and local wildlife.



Preserving local culture – while creating a social focal point.

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we bring people together?



All Finns have the experience of a lakeside sauna imprinted in their hearts. In the times of urbanisation, sauna culture was rooted in the cities as well – but was later forgotten. Helsinki's recent revival of public saunas combines the two traditions.

The small Lonna Island outside of Helsinki was, until a few years ago, occupied by the Finnish army. As the military left, a new public sauna was commissioned. The handcrafted log building is part of the continuum of the tradition of public saunas in Finland and of the newly revived urban sauna culture. On the border between city and nature, Lonna Sauna offers views of both the city with its historical harbour and the archipelago all the way to the open sea. It creates a meeting place where people of all ages and backgrounds come together.

Project name: Lonna Sauna
Client: Governing Body of Suomenlinna
Place: Helsinki, Finland
Year: 2017
Companies: OPEAA / Anssi Lassila
Link: www.oppeaa.com



The Sauna stimulates urban life – creating business opportunities for shops



It brings people of all ages together!



Less CO² – due to the use of wood

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we reduce our footprint – while solving social issues?



Vindmøllebakken is the first project by Gaining by Sharing to be realized. Not only will this give inhabitants the opportunity to reduce their own carbon footprint, they are also included in a social network of sharing.

The architectural companies, Helen & Hard, Indigo Vekst and Gaia Trondheim, have developed a new commercial co-living model, based on the principles of sharing. The model sets standards for energy use, use of timber and materials with low emissions and renewable energy sources. 54 housing units in timber have been built at a site in Stavanger. Forty of them belong to the co-living project, where the inhabitants are introduced to the values and potentials of a sharing model. The model has a huge impact on social health challenges such as loneliness.

Project name: Vindmøllebakken
Client: Kruse Smith
Place: Stavanger Øst, Norway
Year: 2018
Companies: Helen & Hard, Indigo Vekst, Gaia Trondheim and Future of The Fjords
Link: www.helenhard.no



96 percent of people living in cohousing reported an improved quality of life



Saved "investment cost" is approx. 850,000 per household – when considering reduction in m², car sharing etc



Each housing unit is 30m² smaller on average – when comparing between co-housing and regular housing.

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



Resilient City

– adaption to
climate change



How can we bring nature back into cities?



An old water system became a lush corridor, combining the city with the nature, thus changing Iladalen from a deprived industrial zone, to a well-functioning recreational area.

The river Ilabekken in Trondheim, Norway, had been sealed underground in a piping system from 1910–1960. It was not before a new road was due in 1990, that the municipality again considered the advantages of an open running river stream. Different zones have been developed along the river, from canals down in the city centre, to green parks further up, ending in a forestry vegetation at the top. The growth in biological diversity in the area has been immense, with additional reduction in noise level and improved temperature regulation.



Open water flow gave room for fluctuating water quantities, thus preventing possible flooding.



Birdlife reappeared – and the trout returned.



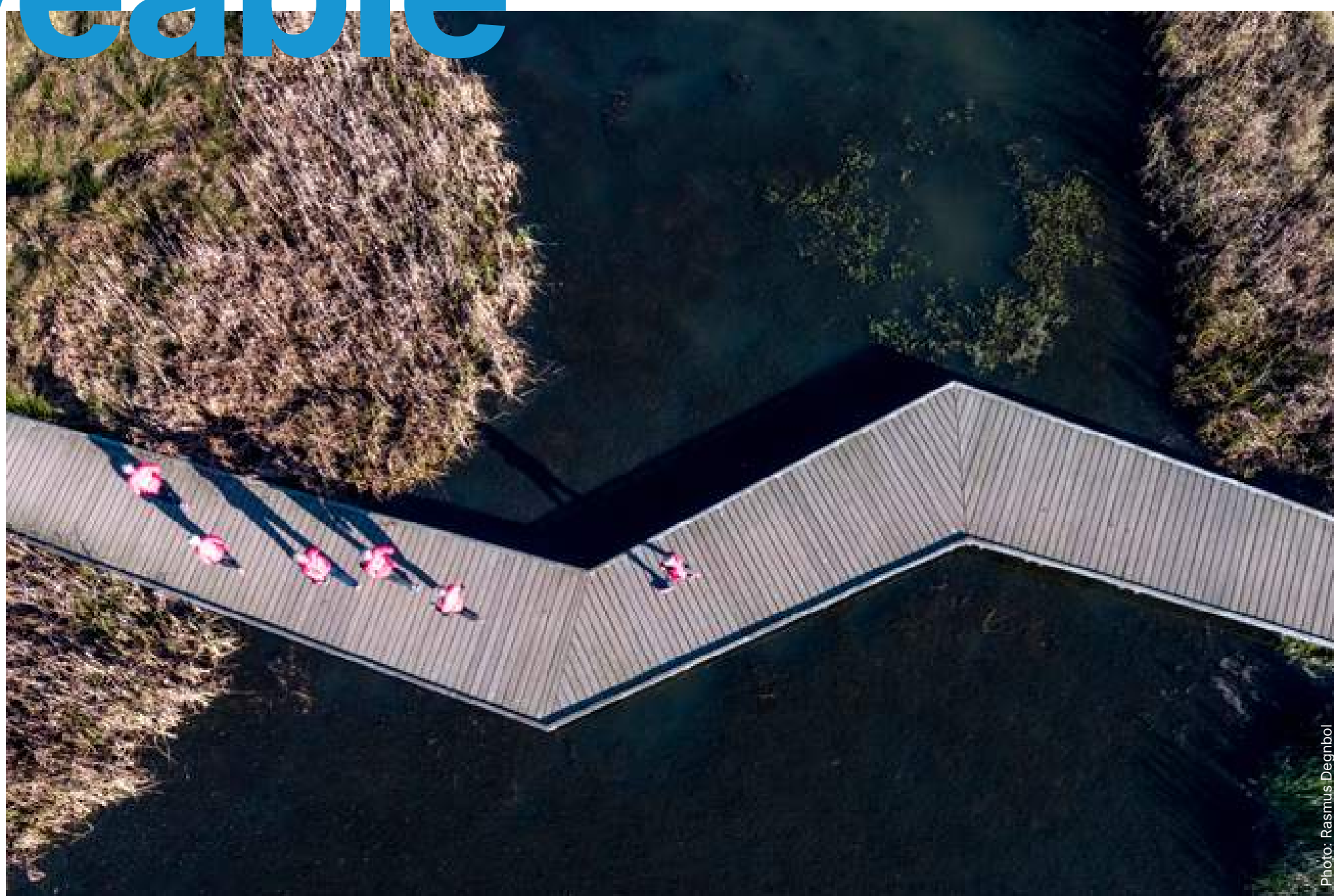
Reduction in noise level and improved temperature regulation.

Project name: Ilabekken, recreational area along river
Client: Statens Vegvesen, Trondheim Municipality
Place: Ila, Trondheim, Norway
Year: 2005 – 2008
Companies: Multiconsult AS, Asplan Viak AS, Reinertsen Anlegg AS, Reinertsen Anlegg AS, Solrunn Roness, Stefan Christiansen
Link: www.multiconsult.no

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How can climate adaptation create more liveable cities?



The town of Kokkedal, north of Copenhagen, was facing acute problems with cloudbursts. With the largest climate adaptation initiative in Danish history, they have both solved problems with flooding and created a more attractive city.

Kokkedal Climate Adaptation contains an extensive catalogue of solutions for landscape based stormwater management. The main strategy is to always work with dual-use – being able to handle water when it rains while creating spaces for play and recreation when the sun is shining. The water is drained from the potentially flooded parts of the city through pools where the water is cleaned and used for community gardens and playgrounds. The project was nominated for the World Architecture Festival Award in 2018.

Project name: Klimatilpasning Kokkedal
Client: Fredensborg Municipality
Place: Kokkedal, Denmark
Year: 2011-2018
Companies: Schønherr, Rambøll
Link: www.klimatilpasningkokkedal.dk



Cheaper to handle water over ground – rather than laying new pipes

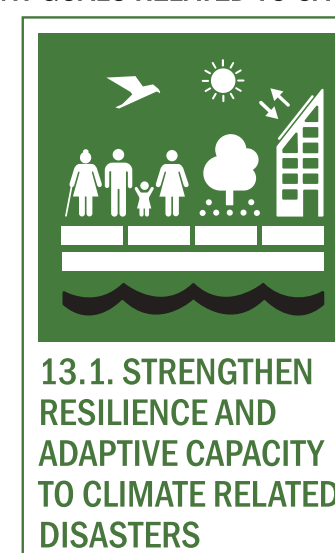


A heightened sense of security & improved urban life – among the citizens



Greater biodiversity

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How can a university campus contribute to a more resilient city?



University campuses occupy huge parts of a city. In Stockholm a new 70,000 square metre campus is being constructed with the focus on resilience and sustainability – not just in relation to the buildings but to the entire urban development project.

The Albano Campus in Stockholm provides a gateway between the city and the national urban park for birds and other migrating animals. For that reason, the task is to preserve the crucial ecosystems and green areas while at the same time facilitating an urban development. Several initiatives are involved, such as strengthening the potential for increased biodiversity for bees, insects and birds. New water systems are being created in the area to take care of surface water and improve the microclimate, while outdoor environments are being designed to strengthen the distribution pathways of plants and animals.



Attracts
restaurants, shops
and housing



Creates a gateway
between the city
and the park



Mixed use
buildings –
stimulating
urban life

Project name: Albano Campus
Client: Akademiska Hus
Place: Stockholm, Sweden
Year: 2015-2021
Companies: COWI, Cedervalls arkitekter, BSK arkitekter, Nivå Landscape AF (installations), Christensen & Co architects, Arkitema Architects
Link: www.cowi.dk

SUSTAINABLE DEVELOPMENT
GOALS RELATED TO CASE



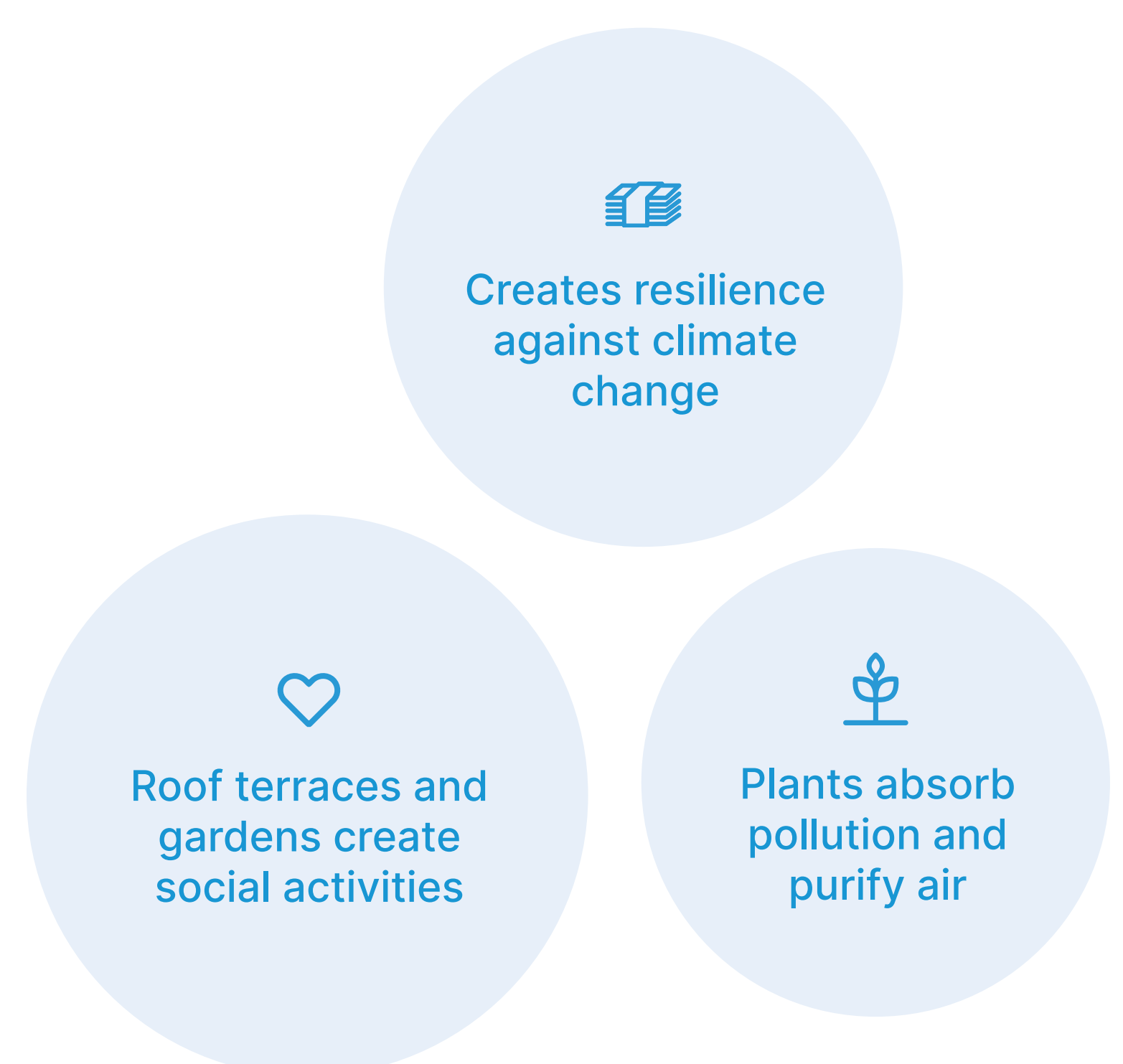
How do we add green spaces to a densely built city?



More people are moving into cities – forcing cities to become more and more compact. We need new innovations to ensure green areas within the city. The Greenest Block of Flats experiments with rooftop gardens and growing plants on the facades.

The Greenest Block of Flats in the new Jätkäsaari district in Helsinki explores how to incorporate green areas and allotment gardens on residential building rooftops and growing plants on the facades. The project has an impact on urban runoff, energy efficiency and a positive effect on the sense of happiness and community among the residents. The building's appearance will be developing over the years as the vegetation takes over, perhaps in unpredictable ways.

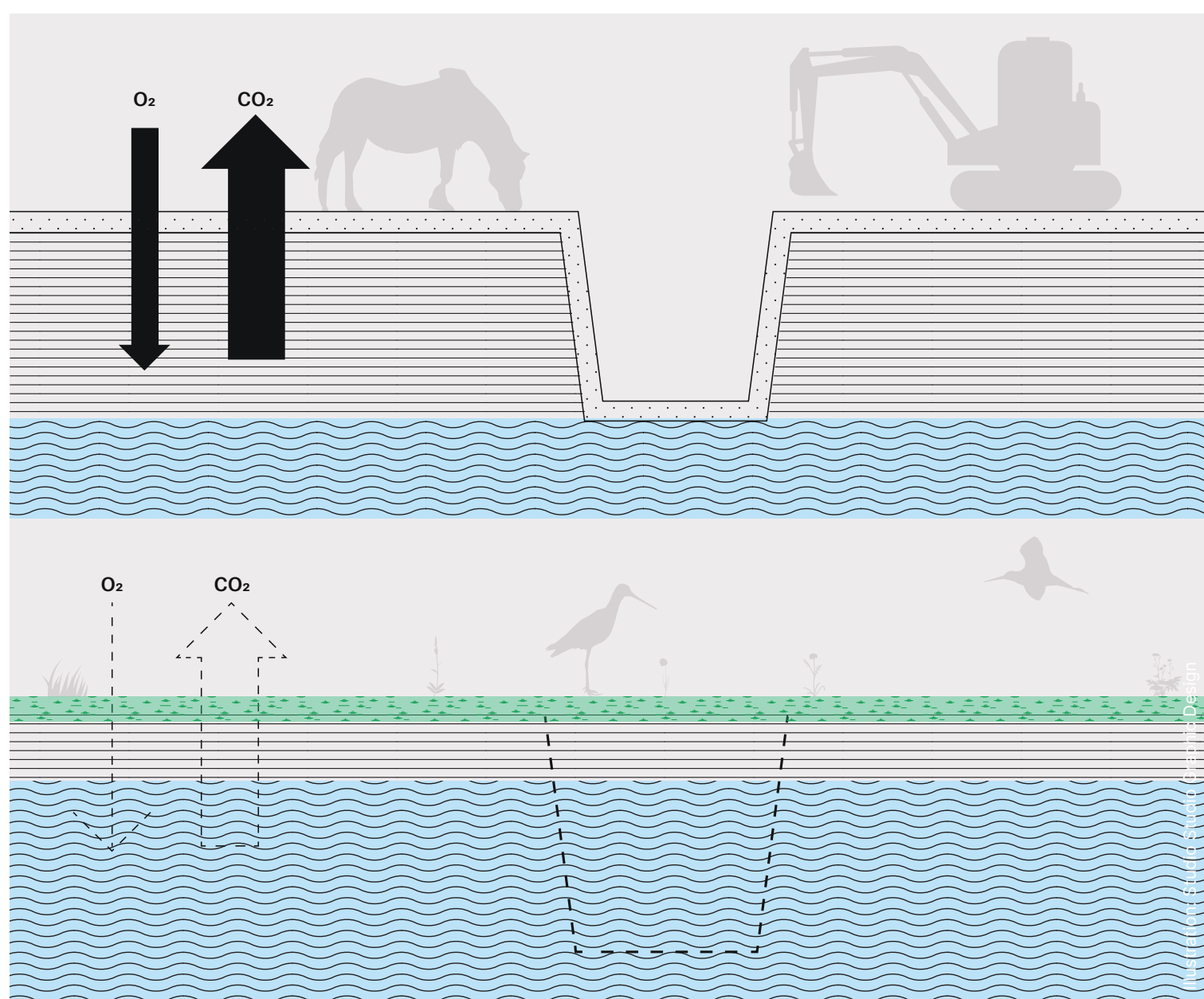
Project name: The Greenest Block of Flats
Client: TA-Rakennuttaja Oy
Place: Helsinki, Finland
Year: 2017
Companies: Talli Architecture & Design, LOCI Landscape Architects, Helsinki University Urban Ecology Research Group
Link: www.talli.fi



SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How can we reduce our CO² output by returning the land to its natural state?



Reclaiming wetlands within cities is a natural solution to lowering CO² emissions. Reykjavík is taking measures to use an area the size of 100 football fields for wetlands.

In Reykjavík's municipal plan for 2010–2030, one aim is to reclaim wetlands in Úlfarsárdalur, a semi-rural suburban area of the city. Wetlands recovery can help reduce carbon emissions since wetlands bind carbon which is otherwise released continuously in great quantities from drained wetlands. Wetlands reclamation is also highly beneficial for local biodiversity.

Project name: Reclaiming wetlands
Client: The City of Reykjavík
Place: Úlfarsárdalur, Reykjavík, Iceland
Year: 2018–
Companies: City of Reykjavík, Verkís
Link: www.reykjavik.is



Increases ability to handle water from cloudbursts



Stops the release of 400 tons of carbon per year – while boosting plant- and animal life



Recreational area – for the locals and tourists to enjoy

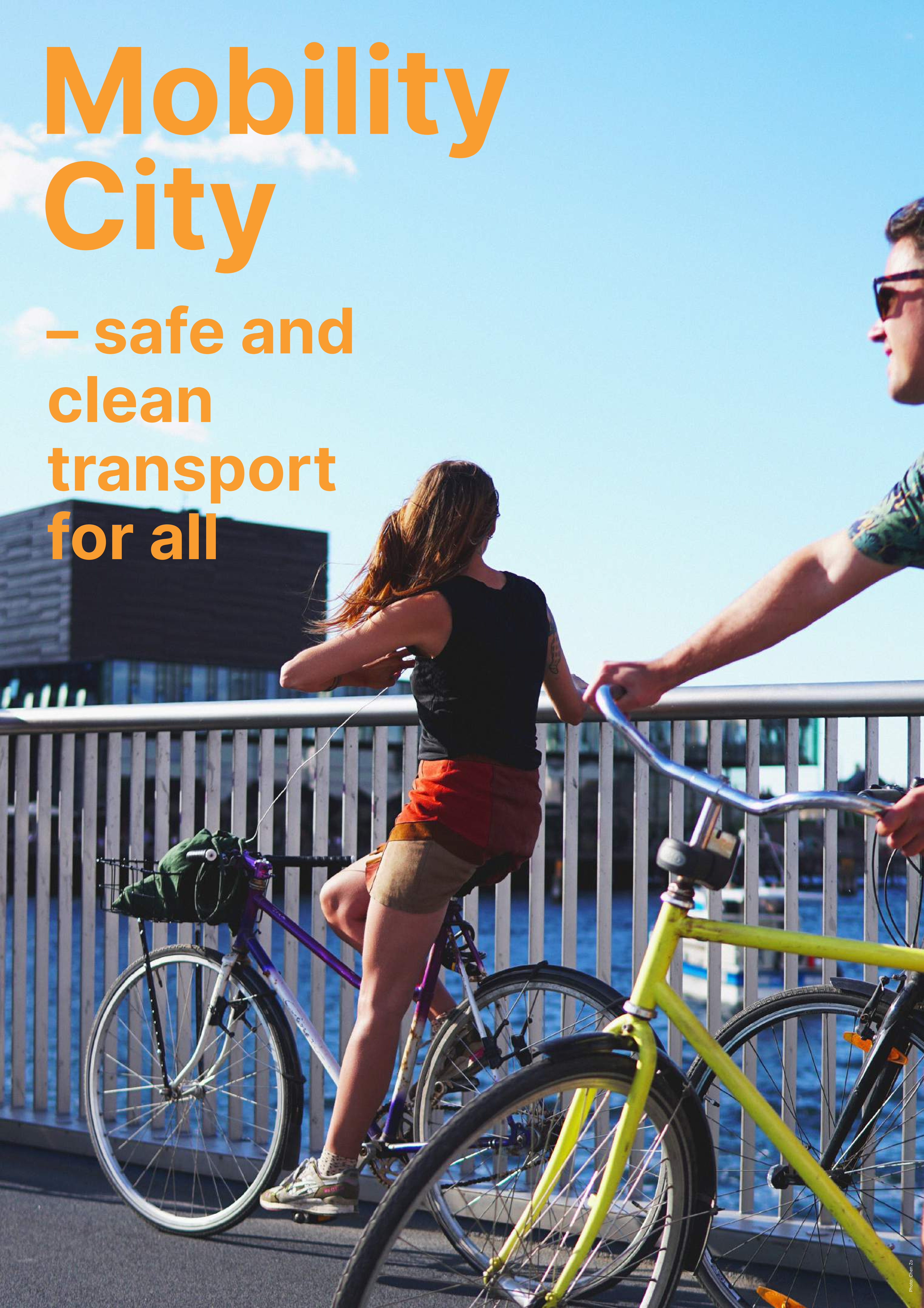
SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



6.6. PROTECT AND RESTORE WATER-RELATED ECOSYSTEMS



14.5. CONSERVE COASTAL AND MARINE AREAS



Mobility City

– safe and
clean
transport
for all

How do we make cycling the obvious choice at a regional level?



In the Copenhagen area the time spend waiting in car traffic is equivalent to 22.000 full time jobs a year. To reduce congestion, noise and air pollution, Copenhagen Municipality sought to make it easier to cycle from the suburbs into the city.

Although Denmark is known as a cycling nation, the number of cycle trips at the national level is going down. Therefore 23 municipalities and The Capital Region of Denmark have joined forces to create The Cycle Superhighways – a cycling infrastructure that makes it easy, flexible and safe to cycle to and from work. One example is to make the route as direct as possible with few stops and good connections.



765 million euros
socio-economic
surplus



92% less CO²
emission – when
changing from car
to bike



40,000 fewer days
sick leave annually
– from 61% more
people biking

Project name: Cycle Superhighways (www.supercykelstier.dk)
Client: The Capital Region of Denmark and 23 municipalities
Place: Greater Copenhagen, Denmark
Year: 2009 -
Companies: Sekretariatet for Supercykelstier, Dissing+Weitling architecture, COWI
Link: www.supercykelstier.dk

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we design a city where cars are superfluous?



The core idea behind the infrastructure of Vantaa's new Kivistö district for over 50,000 residents is public rail transportation and sustainability in general. Along with a dense urban structure it creates a district where all services are accessible by foot or by bicycle and parking is centralised in common use parking facilities.

In Vantaa, much effort has been put into sustainable transportation – for example by connecting the airport with the centre of Helsinki by the new ring rail line and building the new Kivistö district along it. In Kivistö, all infrastructure is based on smart transportation innovations, including an effective waste collection tube system.

Project name: Kivistö local centre
Client: City of Vantaa
Place: Vantaa, Finland
Year: 2015–
Companies: City of Vantaa, HSL Helsinki Regional Transport Authority, NCC
Link: www.vantaa.fi



Cyclists and pedestrians pay more visits to shops – compared to motorists



High sense of ownership – created through citizen involvement



Fewer private cars decrease the CO² emissions

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



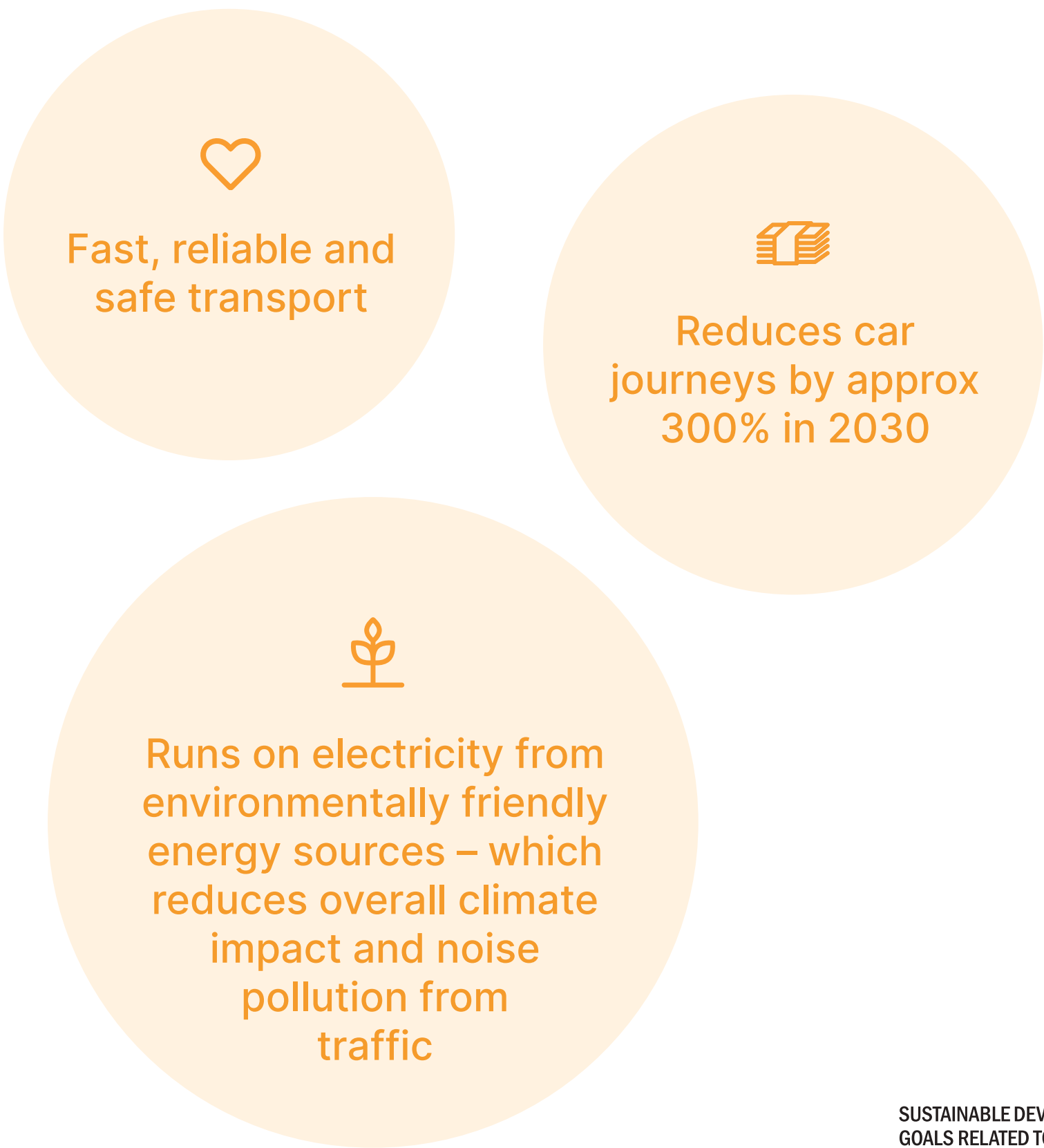
How do we make public transportation the most attractive option in a city designed for cars?



Reykjavík’s goal of becoming carbon neutral by 2040 has forced the small community to think differently about transport options and dig deep into the cultural as well as practical barriers for its citizens’ use of public transport.

The municipality knew that they needed a high-quality transport system if they wanted the citizens of Reykjavík to give up the everyday comfort of traveling by individual cars. The Borgarlína (City Line) makes traveling throughout the city faster because the busses have their own lanes and priority at traffic lights. As an added value, the bus stops will be heated in cold weather and passengers will have the option of bringing their bikes.

Project name: Cityline
Client: Association of municipalities in the Capital Area and the Road and Coastal administration
Place: The Capital area, Iceland
Year: 2023/2024
Link: www.reykjavik.is



How do we bolster wildlife tourism in a sustainable manner?



With the fully electrified boat Future of The Fjords, 400 passengers can view the spectacular sight along Nærøyfjord, knowing that they are not contributing to any fossil fuel emissions.

The maritime sector is responsible for about 2.5% of global greenhouse gas emissions. Future of The Fjords is a high-speed lightweight carbon fibre passenger boat, running solely on electric power. The ship sails on pure battery power in the World Heritage areas of Nærøyfjord and Gudvangen. With an 1800 kWh battery pack, the ship can run 2,5 hours at 16 knots speed, before a 20 minute re-charge of the batteries. The innovative hull design minimizes wake, thus reducing the impact of erosion of the vulnerable shoreline.

Project name: Seasight
Client: The Fjords AS
Place: Nærøyfjord and Gudvangen, Norway
Year: 2018
Companies: Brødrene Aa AS
Link: www.braa.no/seasight



1800 kWh battery pack running for 2,5 hours at 16 knots



100% battery operation with zero emission.

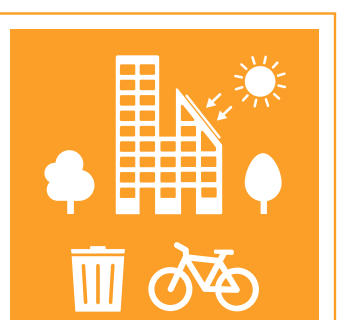


80 % of the exterior is open to passengers

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



11.2. AFFORDABLE AND SUSTAINABLE TRANSPORT SYSTEMS



11.6. REDUCE THE ENVIRONMENTAL IMPACT OF CITIES

How do we develop more sustainable methods of transports for the city?



In Gothenburg, Sweden 15 partners from industry, academy and society are working together to develop, test and demonstrate new mobility solutions for the future. This cooperation goes under the name of **ElectriCity**.

ElectriCity goes beyond public transportation and intends to revolutionize all urban transport, including the electrification of heavy trucks (e.g. refuse, dumper). Electrified, exhaust-free and quiet trucks would allow, for example, the collection of garbage or delivery of parcels and goods during night shifts relieving daytime traffic. The first outcome of this collaboration was bus route 55, a route served entirely by electric and plug-in hybrids buses.



The maintenance costs are less than standard diesel buses



Lower noise level on busses



Up to 80% more energy efficient – for buses running on electricity

Project name: ElectriCity – Cooperation for Sustainable Public Transport
Client: The City of Gothenburg
Place: Sweden
Year: 2013 -
Companies: Volvo Group, Västtrafik, Västra Götalandsregionen, Chalmers University of Technology, Swedish Energy Agency, Johanneberg Science Park, Göteborg Energi, Keolls, Akademiska Hus, Chalmersfastigheter, Ericsson
Links: <https://www.electricitygoteborg.se>

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



Low Carbon City

– growth
without
increasing
emissions



How can an ecosystemic approach facilitate great urban living?



Photo: JAKOB+MACFARLANE / T.ARK

Living Landscape, a formerly polluted industrial site, will be an innovative, mixed-use area that aims for a zero-carbon footprint, a positive impact on its environment, and the protection of a local ecosystem.

Living Landscape is one of the winners of the C40 “Reinventing Cities competition 2019”. The project has had an ecosystemic approach where reduction of carbon emissions has been considered at each phase of the project’s life. For example, during the construction phase the project team has committed to avoid diesel machinery by using machinery that runs on electricity.

Project name: Living landscape
Client: HEILD / UPPHAF / KLASI / ARNARHVOLL
Place: Árbær, Reykjavík, Iceland
Year: Not constructed yet
Companies: JAKOB+MACFARLANE / T.ARK, LANDSLAG, EFLA Consulting / Eckersley O’Callaghan (structural)
Link: www.jakobmacfarlane.com



Converts an unused industrial site into a desirable living area



Green space will cover 75% of the site – including green roofs and a large central garden.



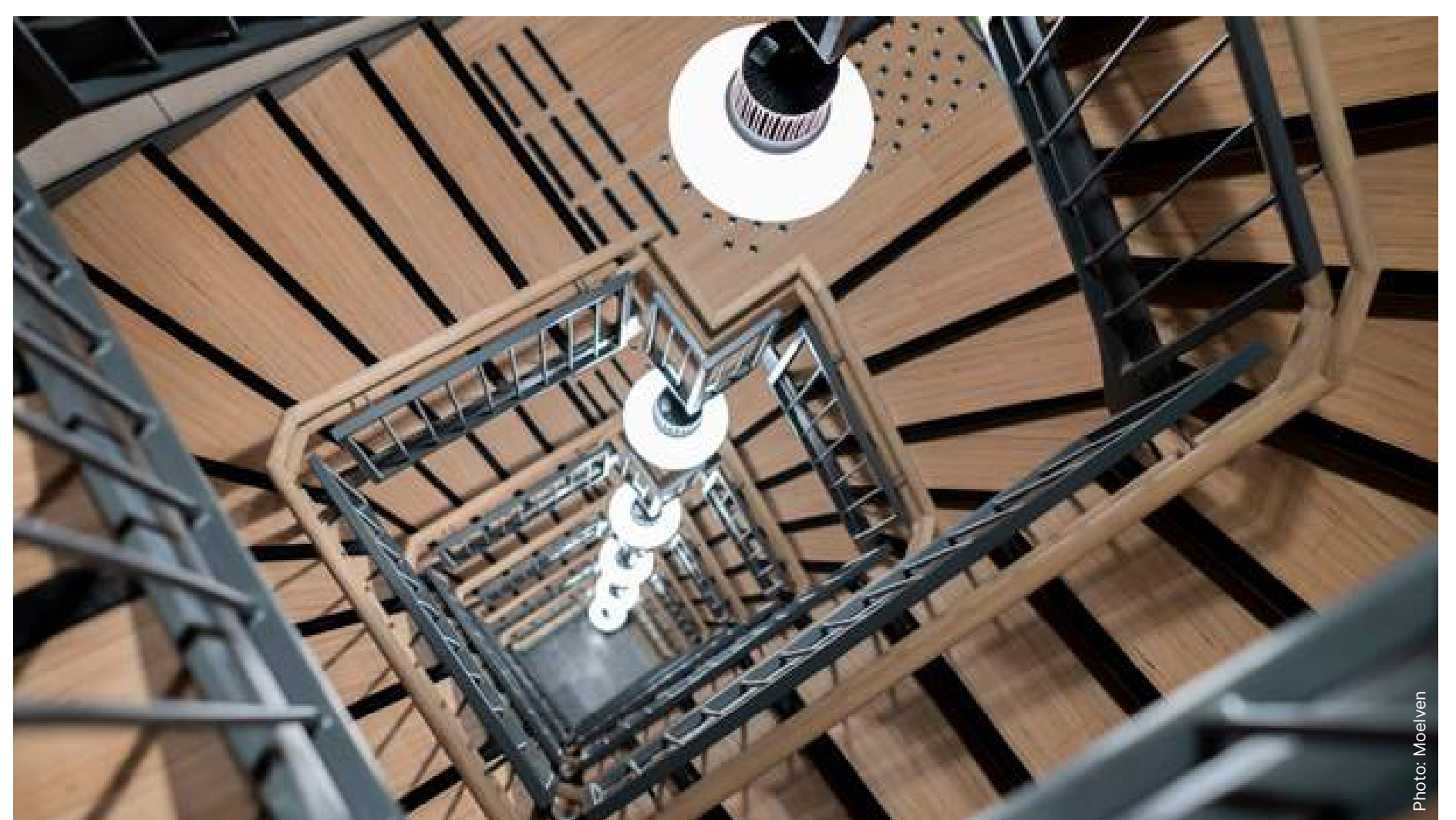
Will foster social bonds by offering quality public spaces – such as communal greenhouses.

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



7.2. INCREASE GLOBAL PERCENTAGE OF RENEWABLE ENERGY

How do we build high buildings in structural timber with a low carbon footprint?



Being the tallest timber building in the world, Mjøstårnet serves as an archetype for future city expansion, demonstrating that wood can be the material to build highrise buildings in the future.

To construct Mjøstårnet, both technical expertise and materials have been sourced locally. Standing 85,4 meters tall by the shore of Lake Mjøsa, the world-record holding building covers a total of 11,300 square meters of floor area. The building contains seven floors of apartments, four floors of hotel rooms, together with offices, a restaurant and a swimming pool. The main material is glulam, which is planed wood glued together to form strong columns and beams. Using timber for the load-bearing structures provides a significant environmental impact.

Project name: Mjøstårnet
Client: AB Invest
Place: Brumunddal, Norway
Year: Complete 2019
Companies: Moelven Industrier, Voll Architects, Hent
Link: www.moelven.com



Huge economical benefits by sourcing material and expertise locally.



100% renewable main material source



Co² storing in the wood material throughout its lifecycles.

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we make large-scale public buildings CO² neutral?



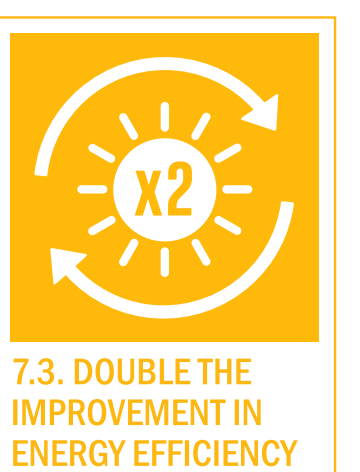
When it opened in 2018, Middelfart Townhall became Denmark's most sustainable public building – integrating a unique mix of sustainable solutions like solar panels, leftover wood and smart cooling systems.

The Middelfart City Hall is a perfect example of a public building that is both beautiful, sustainable and communal. A few of the ingenious solutions include: the cooling system is mechanically operated with electricity generated by 700m² solar panels on the roof; walls and ceilings are constructed of materials to reduce noise and create the optimal working environment; and any surplus heat created by people or computers is used as district heating for the homes in the city. Even food waste from the canteen is turned into natural gas.

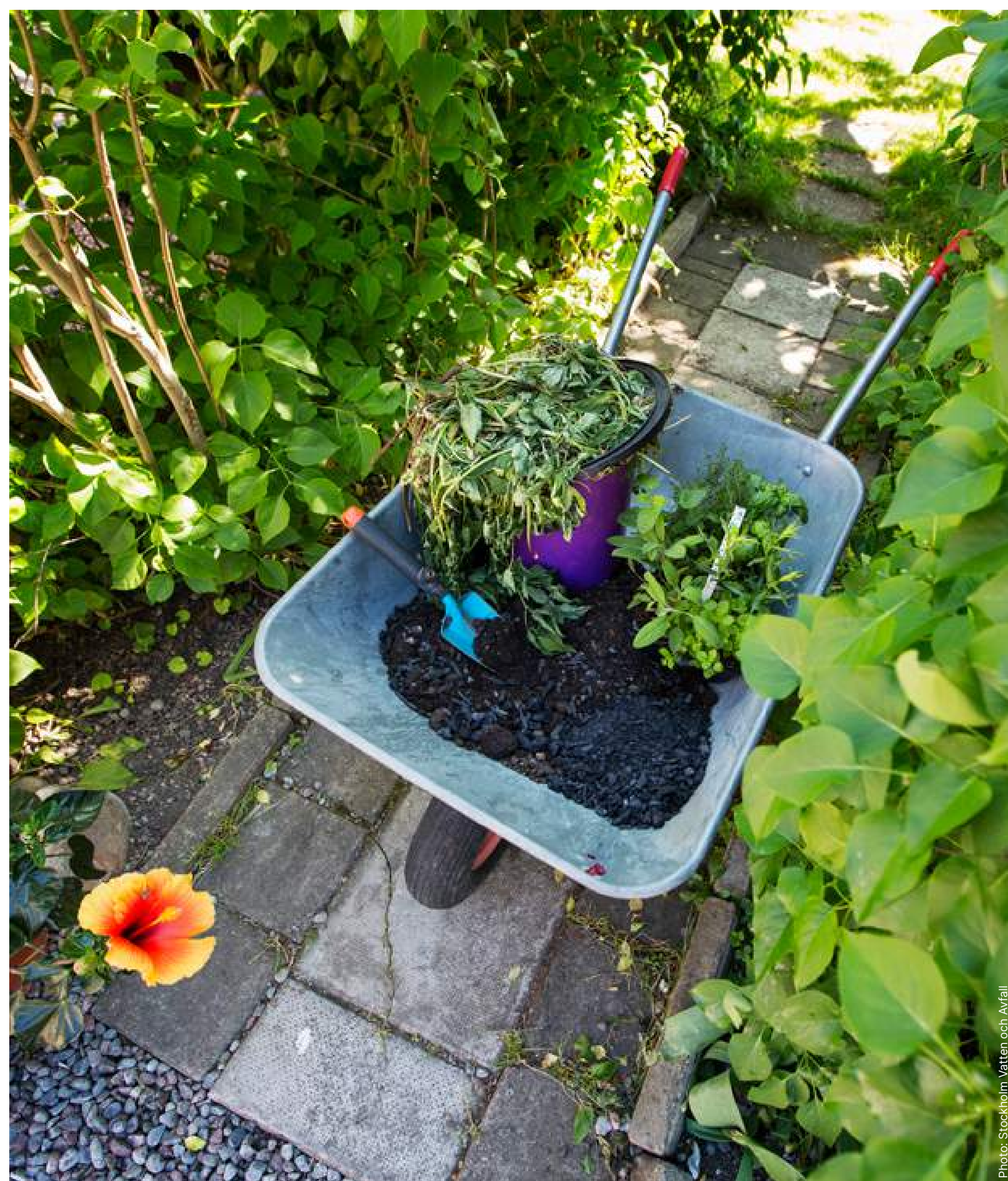
Project name: Middelfart Town Hall
Client: Middelfart Municipality, Kulturøens Bycenter, Hexagon Ejendomme
Place: Middelfart, Denmark
Year: 2014-2018
Companies: 5E Byg, Henning Larsen Architects, Rambøll, LIW Planning
Link: www.henninglarsen.com



SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we manage the increasing amount of waste generated in cities?



As climate change is one of the greatest threats of our time, Stockholm aims to become a fossil free city by 2040. Eighty percent of citizens in Sweden's capital say they want to take an active role in fighting climate change. The Stockholm Biochar Project makes this possible.

Residents provide garden waste to the city, which is turned into biochar – a charcoal-like product that can sequester carbon in soil for thousands of years. This biochar is used as a soil conditioner in public and private plant beds, therefore creating a vast carbon sink. The by-product of the biochar production process, pyrolysis gas, is used to help generate energy for the city's district heating system. Many cities are now replicating the model globally.

Project name: Stockholm Biochar Project
Place: Stockholm, Sweden
Client: Bloomberg Philantropies, Stockholm Vatten och Avfall
Year: 2013 – 2020 Pilot phase
Companies: Stockholm Vatten och Avfall, Trafikkontoret, Stockholm Exergi, Bloomberg Philantropies
Link: <https://mayorschallenge.bloomberg.org/ideas/biochar-for-a-better-city-ecosystem/>



Empowering citizens to fight climate change



Reducing the cost of garden waste management



Contributing to Stockholm's carbon sink and renewable heat production

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



12.6. ENCOURAGE COMPANIES TO ADOPT SUSTAINABLE PRACTICES AND SUSTAINABILITY REPORTING

How do we use wood for larger-scale projects?



Monio is a school and community center built in massive timber. When completed, it will be one of the largest of its kind in the world. Building in wood decreases CO² emissions significantly both during construction and the lifespan of the building. As an added bonus, it improves indoor climate and acoustics.

Finland is well-known for its successful school system – and Monio school will develop that further. The school represents a new type of learning environment, with the emphasis on flexibility and multi-functionality of spaces, spatial openness and collaboration between different school subjects. It functions as both school and community center which has proven to be a successful way to create a sense of community, share resources and promote interaction between different groups of society.

Project name: Monio School and Community Centre
Client: Municipality of Tuusula
Place: Tuusula, Finland
Year: 2020
Companies: AOR Architects
Link: www.aor.fi



Spatial efficiency
 – by using all spaces as learning environments



Decreased CO² emission – as wood stores carbon



Increased interaction and collaboration between different social groups

SUSTAINABLE DEVELOPMENT
 GOALS RELATED TO CASE



Circular Economy City

– turning waste into a valuable resource



How do we build more while consuming less?



Upcycle Studios is a real example of what everybody is talking about within resource efficiency: Upcycling. The financial frame shows that upcycling not only saves resources, it also makes the finished product significantly cheaper.

Building waste today represents a huge untapped resource. In Upcycle Studios, a residential area, 75 percent of the windows come from abandoned buildings. And 1400 tons of upcycle concrete are cast from very durable concrete waste from the construction of Copenhagen Metro. Lendager Group, the company behind Upcycle Studios, is also working on a new large scale project called UN17 Village. It will become the first building project in the world to convert the 17 development goals into a residential building.

Project name: Upcycle Studios & UN17 Village
Client: NREP & Arkitektgruppen
Place: Copenhagen, Denmark
Year: 2015-2018
Companies: Lendager Group, MOE, Norrecco
Link: www.lendager.com



A commercial project defined by market conditions and designed to be scaled up



A new model for shared living – with flexible spaces to be divided and shared

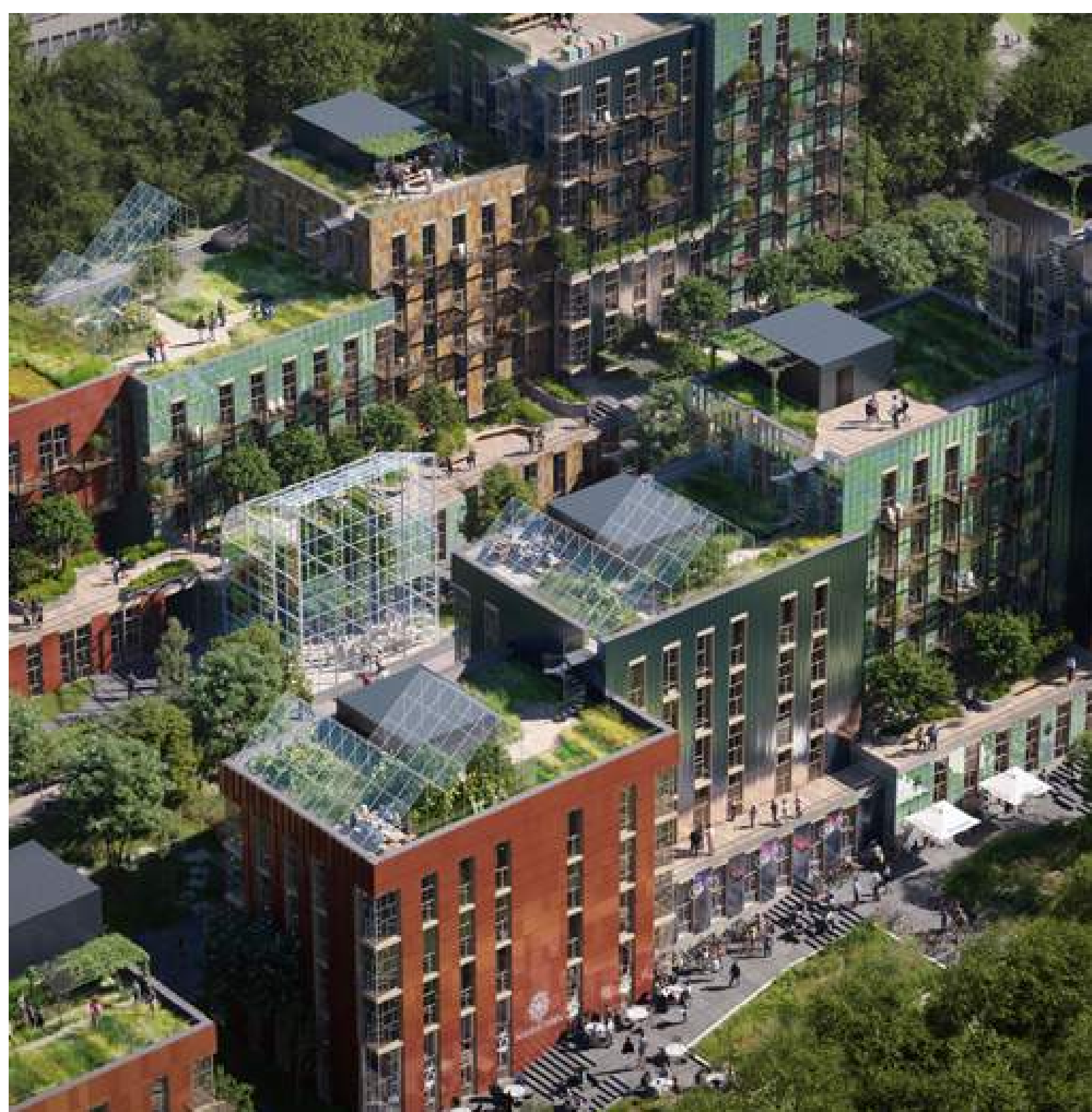


Reduction of total CO² emissions by 60 percent over 50 years

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we build the places we need from the things that we throw away?



Recipe for Future Living takes urban planning to the next level, with a zero-energy goal, reduction of social inequality and a strengthening of the local community. These actions are returned a full score in the C40 Reinventing Cities competition.

Mad Arkitekter has developed a proposal for a residential and commercial area, based entirely on a circular economy, the use of sustainable resources and reuse. The project addresses the building industry's massive waste problem, and just by reusing building components, they will be able to reduce material emissions by 90%. The plan is to be carbon neutral. Fifty percent of the site is to be dedicated to public spaces, including gardens and exposed soil. Innovative start-ups will offer job opportunities, accelerating proposals that can tackle the environmental crisis.

Project name: Recipe for Future Living
Client: Ineo Real Estate and Oslo Municipality
Place: Fossumdumpa, Stovner, Oslo, Norway
Year: 2019
Companies: Ineo Real Estate, Mad Oslo AS, Mad Stavanger AS & LANDSCAPE+AS, Vill Urbanisme AS by Vill Energy AS, Léva Urban Design AS, Resirquel AS and Asplan Viak
Link: www.mad.no



Growth in social wellbeing, access to own grown food and reduced power cost.



90% reduction of material emission – with zero net energy consumption.



50% of the site is dedicated to social interaction in public spaces, with 1000m² of fertile landscape.

SUSTAINABLE DEVELOPMENT
GOALS RELATED TO CASE



8.4. IMPROVE
RESOURCE
EFFICIENCY IN
CONSUMPTION AND
PRODUCTION

How do we move a whole city?



In one of the largest urban transformations of our time, the Arctic city of Kiruna has to move before continued mining destabilises the ground beneath it. In the future, moving cities due to sea-level rise might be necessary. Kiruna could serve as an example of how to tackle this difficult task.

Thinking in terms of circularity is a central part of moving Kiruna. One example is the Kiruna Portal – a physical and virtual meeting place where there will be an in-house factory that recycles the building materials from the demolition. This is a sustainable way of handling accessible resources in an isolated region – as well as a way to retain some of the city's identity. The population has also chosen 21 buildings that will be entirely relocated and integrated in the in the new city.

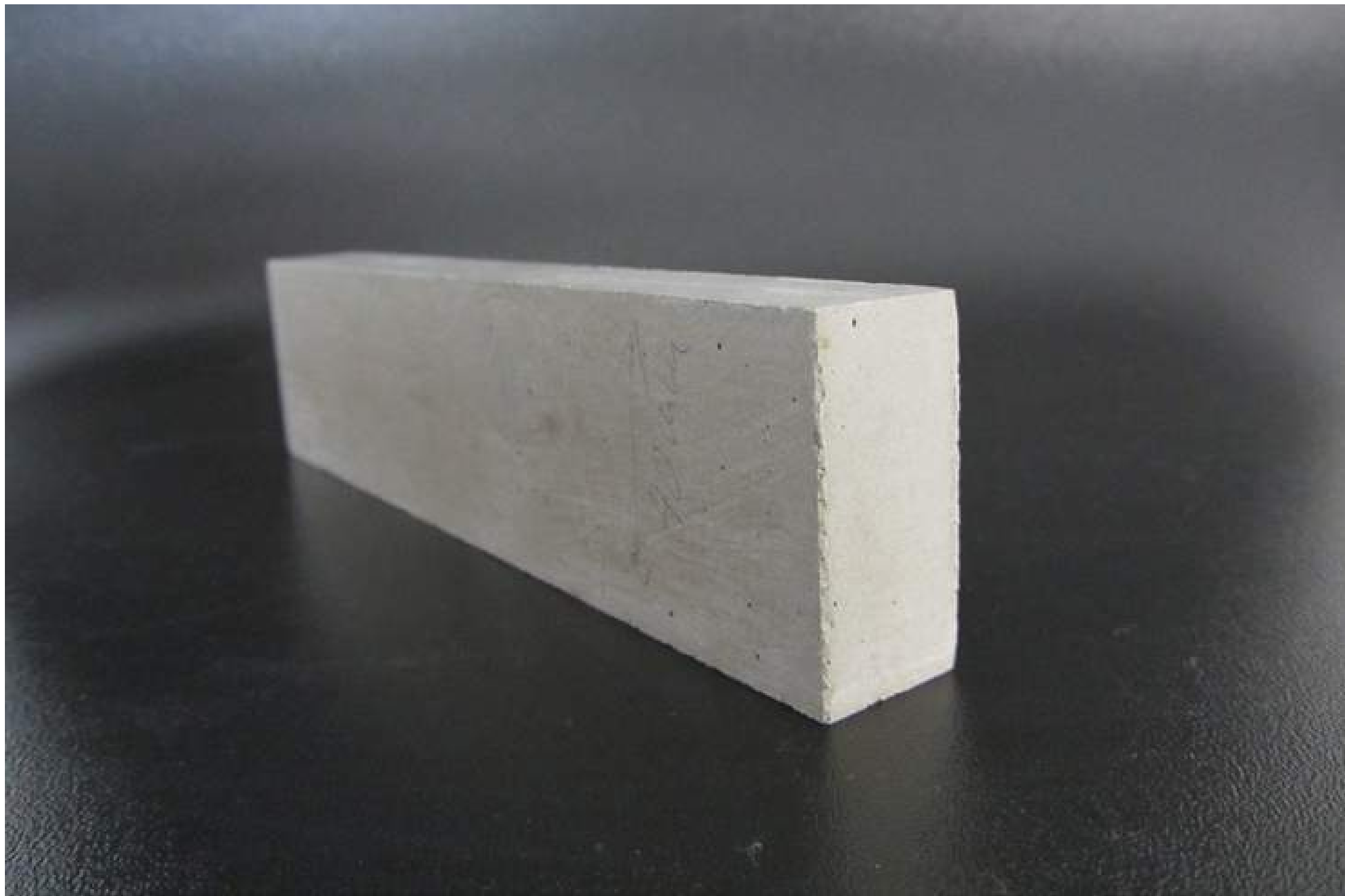
Project name: Kiruna 4 ever
Client: Kiruna Municipality & LKAB
Place: Kiruna, Sweden
Year: 2005-2033
Companies: White Architects, Ghilardi+Hellsten, Henning Larsen
Link: www.whitearkitekter.com



SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



How do we reclaim materials in urban infrastructure?



The City of Lappeenranta's Urban Infra Revolution seeks to completely eliminate waste and CO² emissions by 2050. CO² emissions can be significantly reduced by turning side streams of the construction industry into usable materials.

The Urban Infra Revolution project tests new solutions replacing concrete in urban structures. New innovative construction materials tested in 3D printable urban structures are made with side streams of industry and construction waste, which can be used as binders to replace cement. One of the first projects using these materials will be a new co-created skate park.

Project name: Urban Infra Revolution
Client: City of Lappeenranta, funded by EU Urban Innovative Actions Fund
Place: Lappeenranta, Finland
Year: 2017-2020
Companies: City of Lappeenranta, Apila Group, UPM Kymmene, Lappeenranta University of Technology, Fimatec, Outotec, Imatra Region Development Company, Nordkalk, Design Reform, Metsä Group, Saimaa University of Applied Sciences, Total Design, Stora Enso
Link: www.uia-initiative.eu/en/uia-cities/lappeenranta



Lower costs on new materials – by reusing waste materials



Reduced CO² emission – by reduced use of concrete



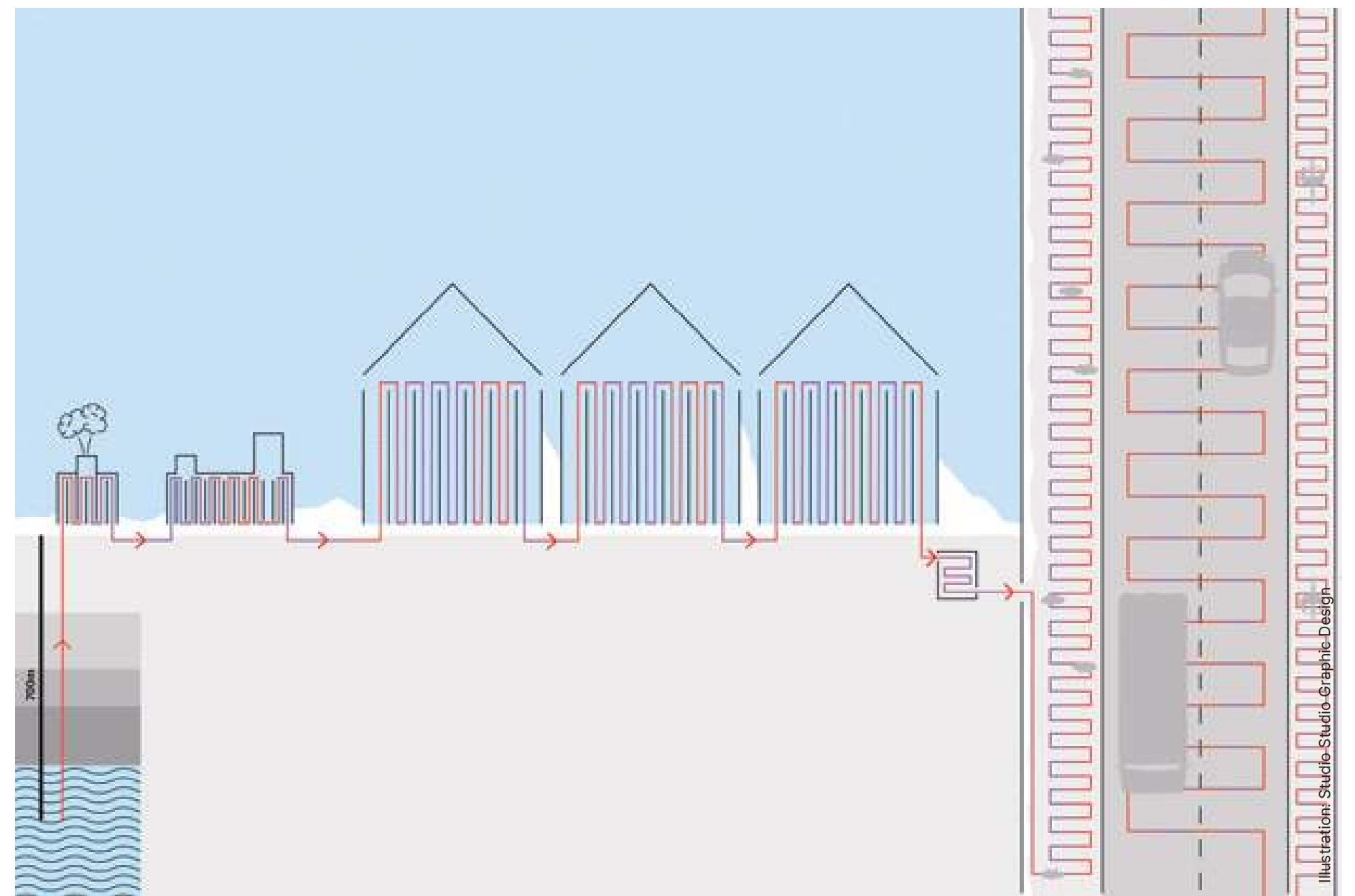
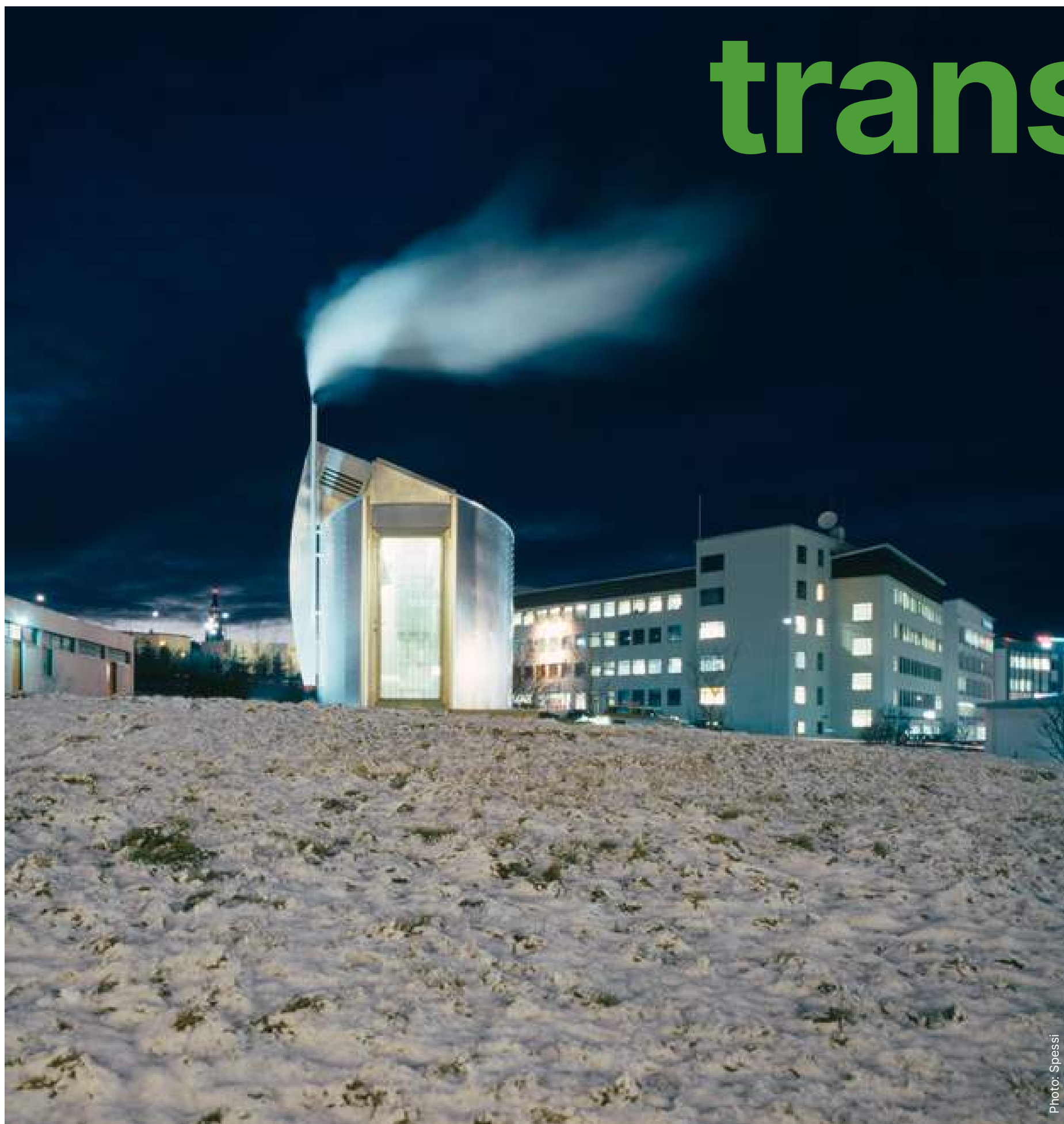
Community ownership – through citizen involvement

SUSTAINABLE DEVELOPMENT GOALS RELATED TO CASE



12.5. SUBSTANTIALLY REDUCE WASTE GENERATION

How do we use local natural resources for safer transportation?



Winter can be harsh in Iceland. The combination of steep hills, snow and ice can make transportation difficult during the wintertime. This solution reuses the geothermal water that heats the buildings, by letting it flow underneath the roadways to melt the ice making it safe to travel.

Geothermal water is pumped from wells located around Reykjavik into pumping stations. From there the water goes out to heat homes and offices. After being used in the buildings the water returns back to the pumping stations to be distributed via pipes underneath roadways and sidewalks to keep them dry and safe.

Project name: Paths and pavements heated with geothermal water
Client: The City of Reykjavik
Place: Reykjavik, Iceland
Year: 1951-
Companies: The City of Reykjavik, Reykjavik energy
Link: www.reykjavik.is



Lowering the city's cost for snow-removal – and supporting the existing heating infrastructure.



Making use of an environmentally friendly and natural resource.



Creates year-round mobility for people in all areas of the city.

SUSTAINABLE DEVELOPMENT
GOALS RELATED TO CASE



12.4. SUSTAINABLE
MANAGEMENT AND
USE OF NATURAL
RESOURCES