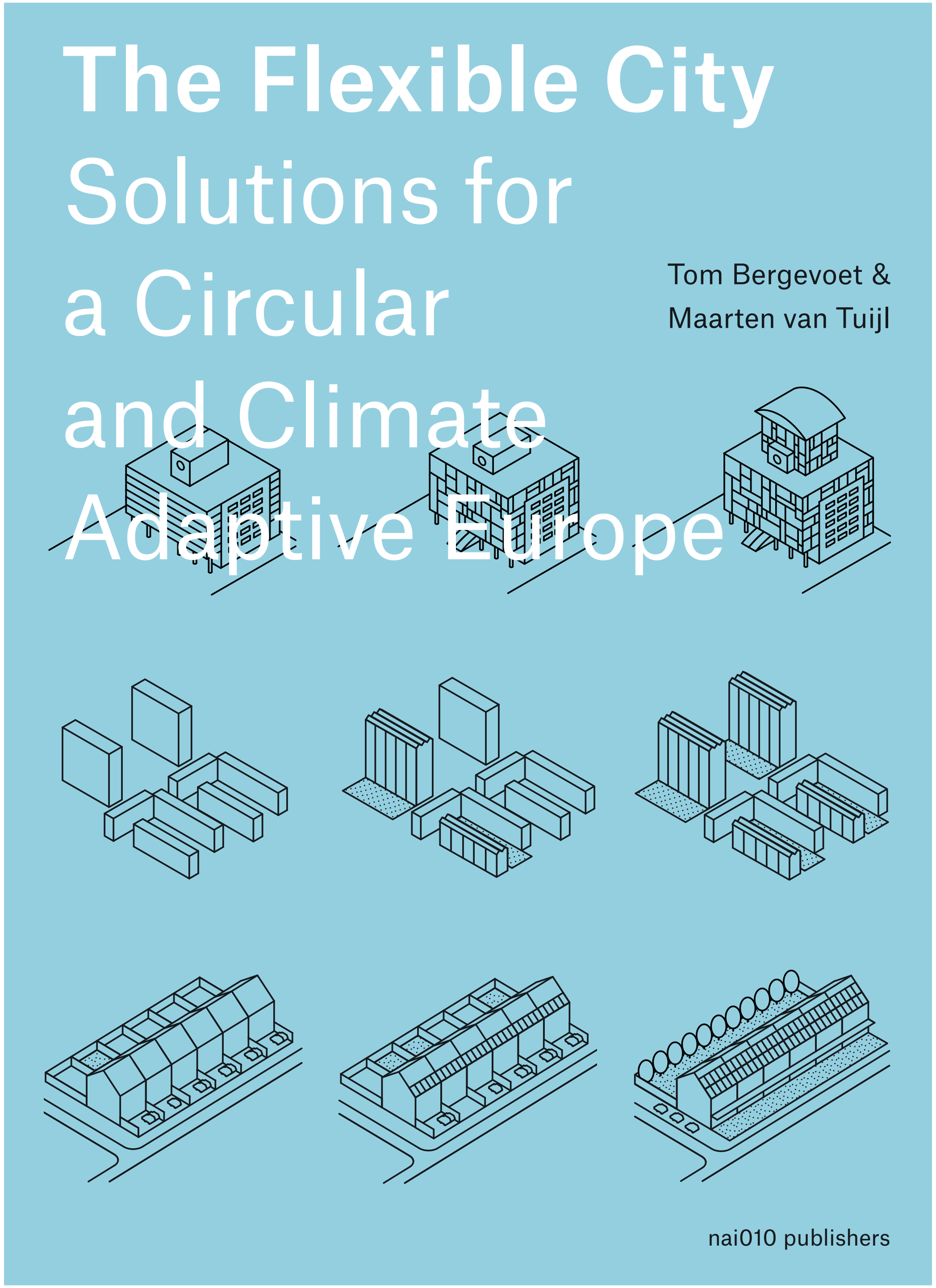


jaarevenement C-creators

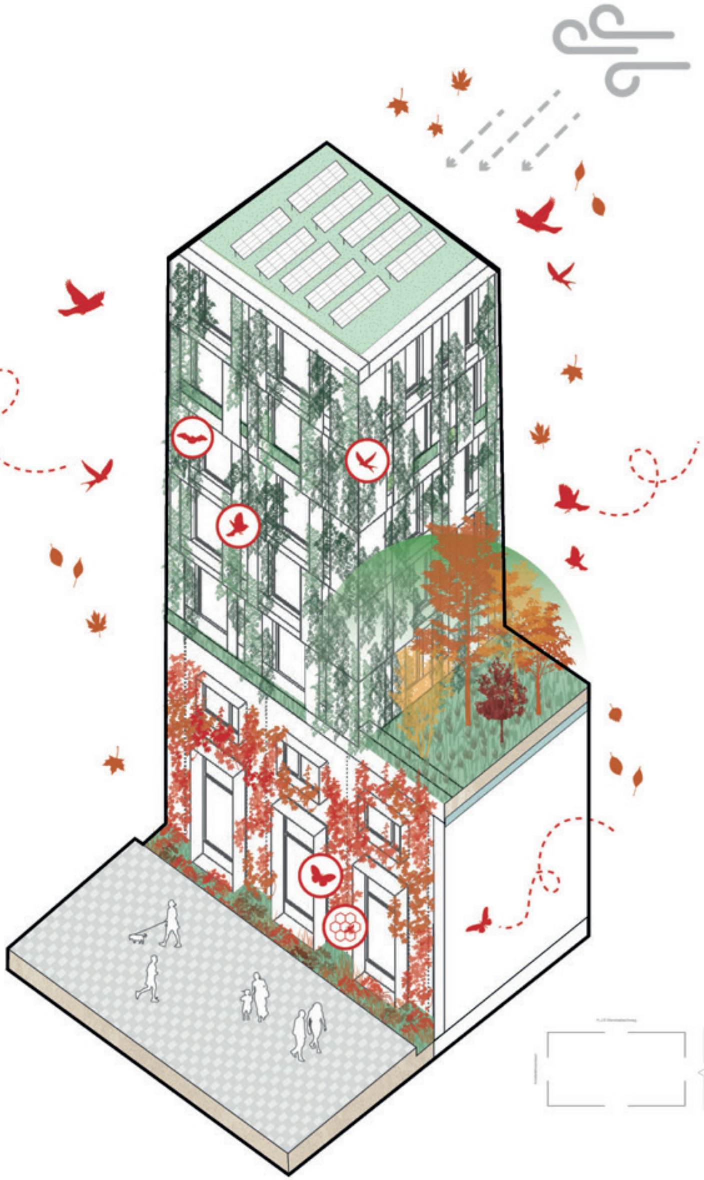
14 november 2024

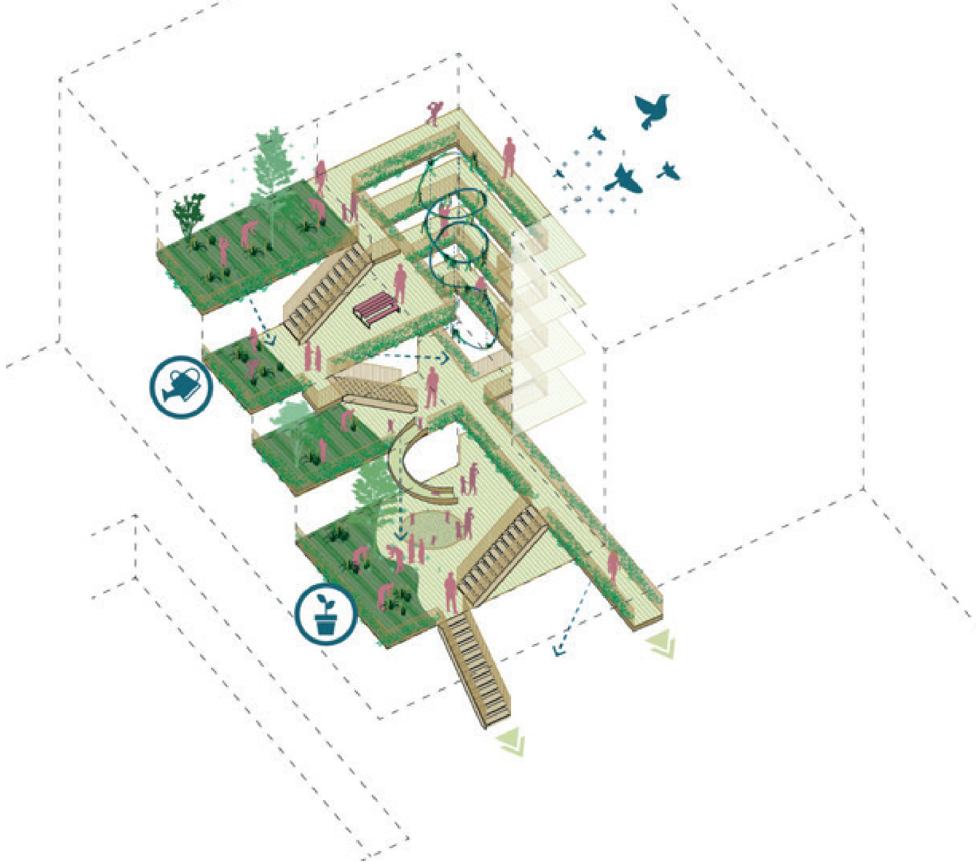
temp.architectureurbanism

Klimaatadaptieve vernieuwing entree Amsterdam UMC, locatie AMC
ontwerp: Temp.architecture & studio Nuy van Noort i.s.m. studio Blad
opdrachtgever: Amsterdam UMC
oplevering: 2022

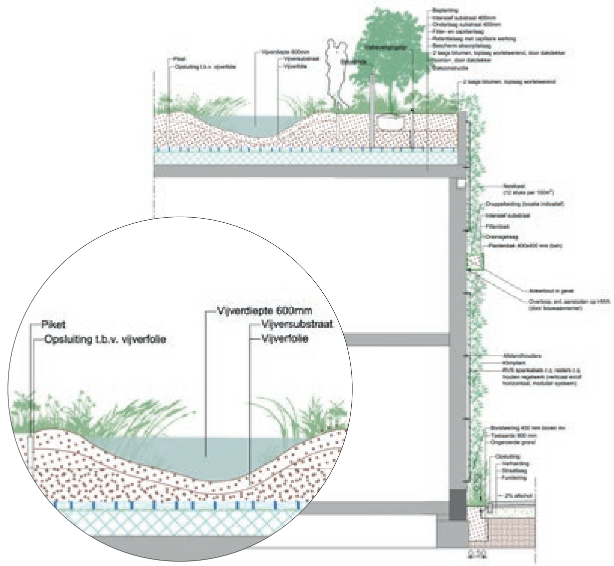

amc

natuurinclusieve woonblokken Weespertrekvaart
ontwerp: Architecten Cie, Temp.architecture, Raumplan, Flux Landscape Architecture
opdrachtgever: VORM

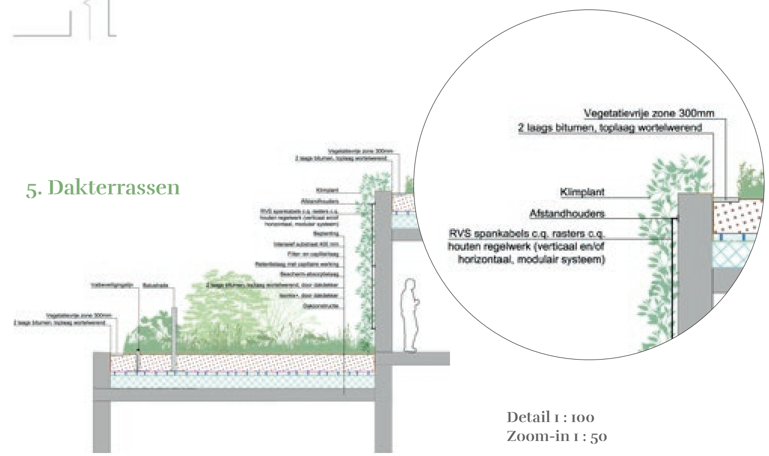




6. Natuurlijke vijver en gevelbegroeiing



5. Dakterrassen

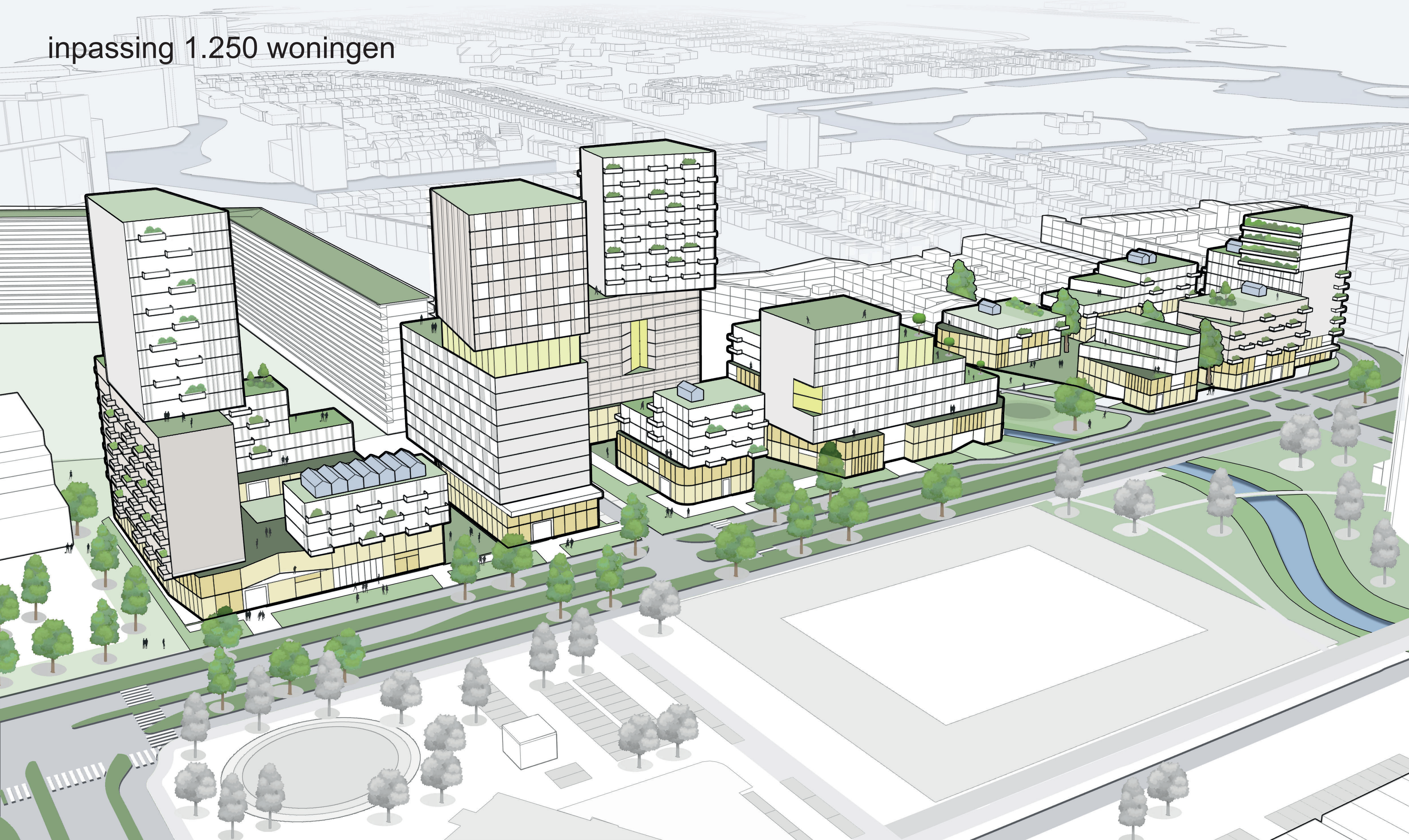


Detail 1 : 100
Zoom-in 1 : 50

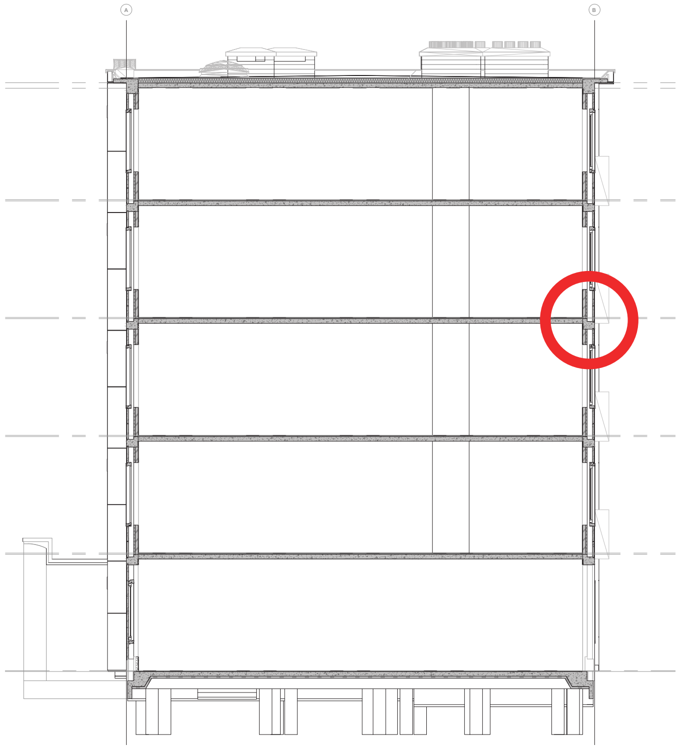
IMPRESSIE | HALF BEGROEIDE GEVELS

Stedenbouwkundig ontwerp “K-buurt”, Amsterdam Zuid-Oost
ontwerp: Temp.architecture
opdrachtgever: gemeente Amsterdam & Hart van de K-buurt

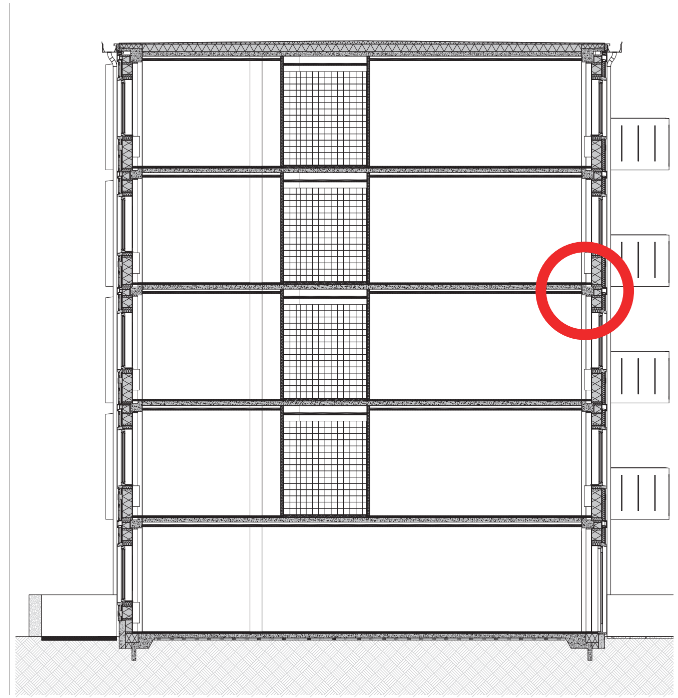
inpassing 1.250 woningen



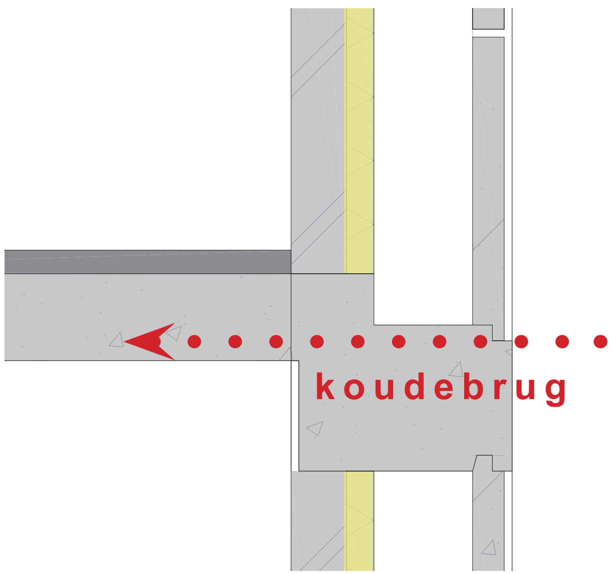

Circulaire (ver)bouw 162 sociale woningen “de Punt”
ontwerp: Temp.architecture
opdrachtgever: Ymere
oplevering: 2024-25
1.400 tonnes of CO2 reduction
compared to demolition - new construction
1963
1993
2023

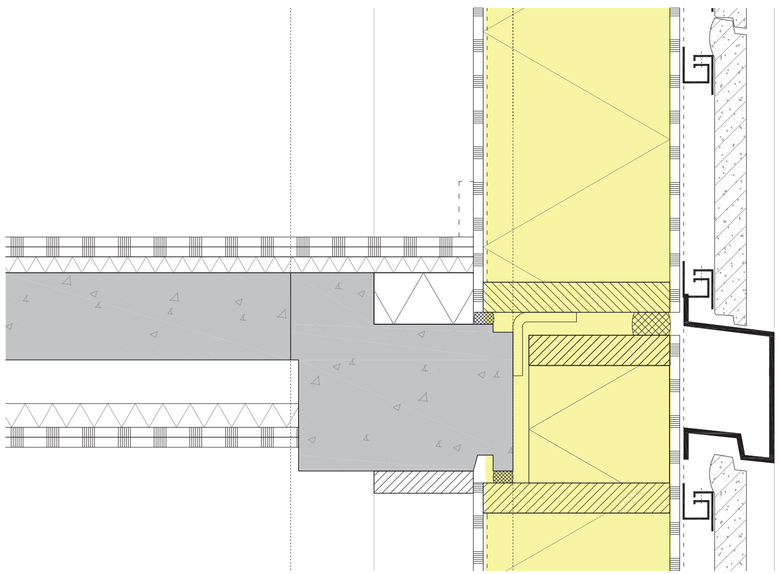


typische doorsnede bestaand



typische doorsnede voorgesteld






Circulair bedrijfsgebouw Weespertrekvaart, Amsterdam
design: Temp.architecture
client: Tenman

hergebruikte houten damwanden

hergebruikte stalen damwanden

hergebruikt donor staalskelet

kanaalplaten met droge verbinding

hergebruikte kozijnen met 3V glas




temp




circularity

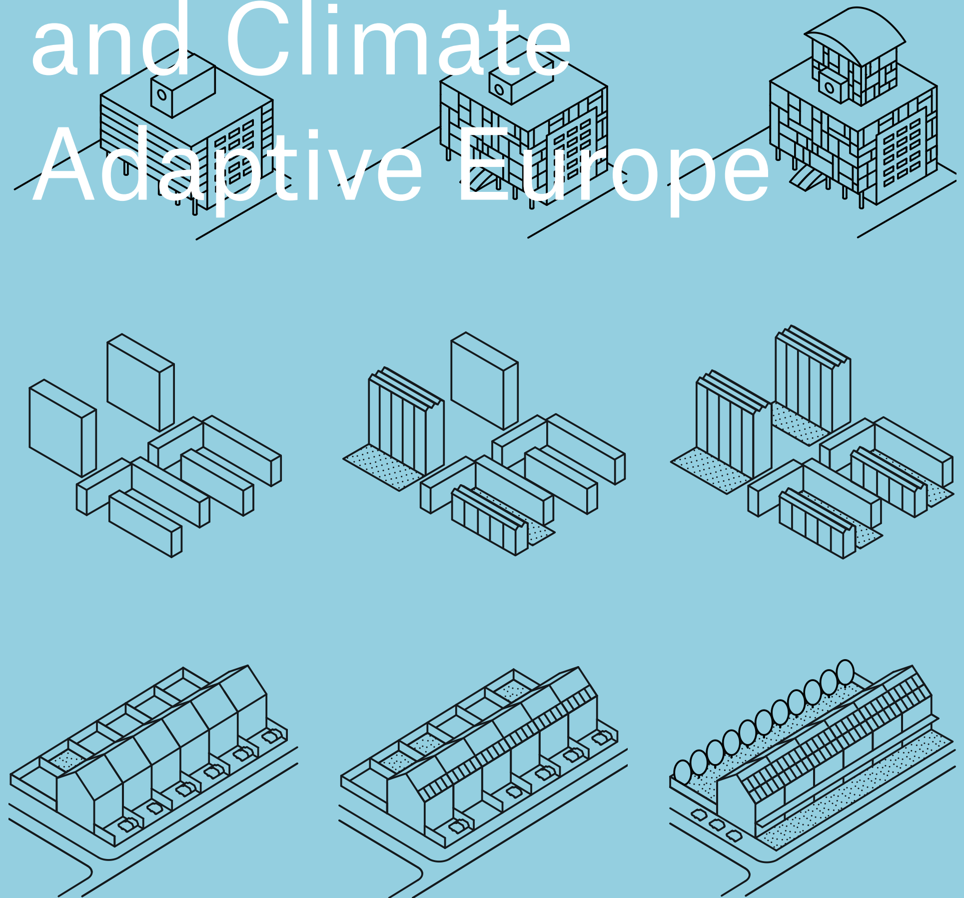
temp

climate-adaption

The Flexible City

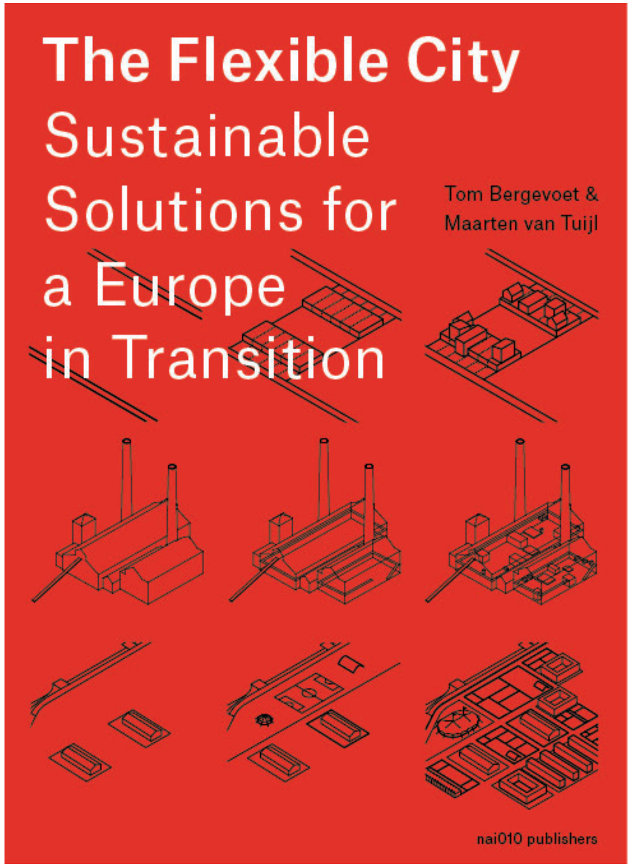
Solutions for a Circular and Climate Adaptive Europe

Tom Bergevoet &
Maarten van Tuijl



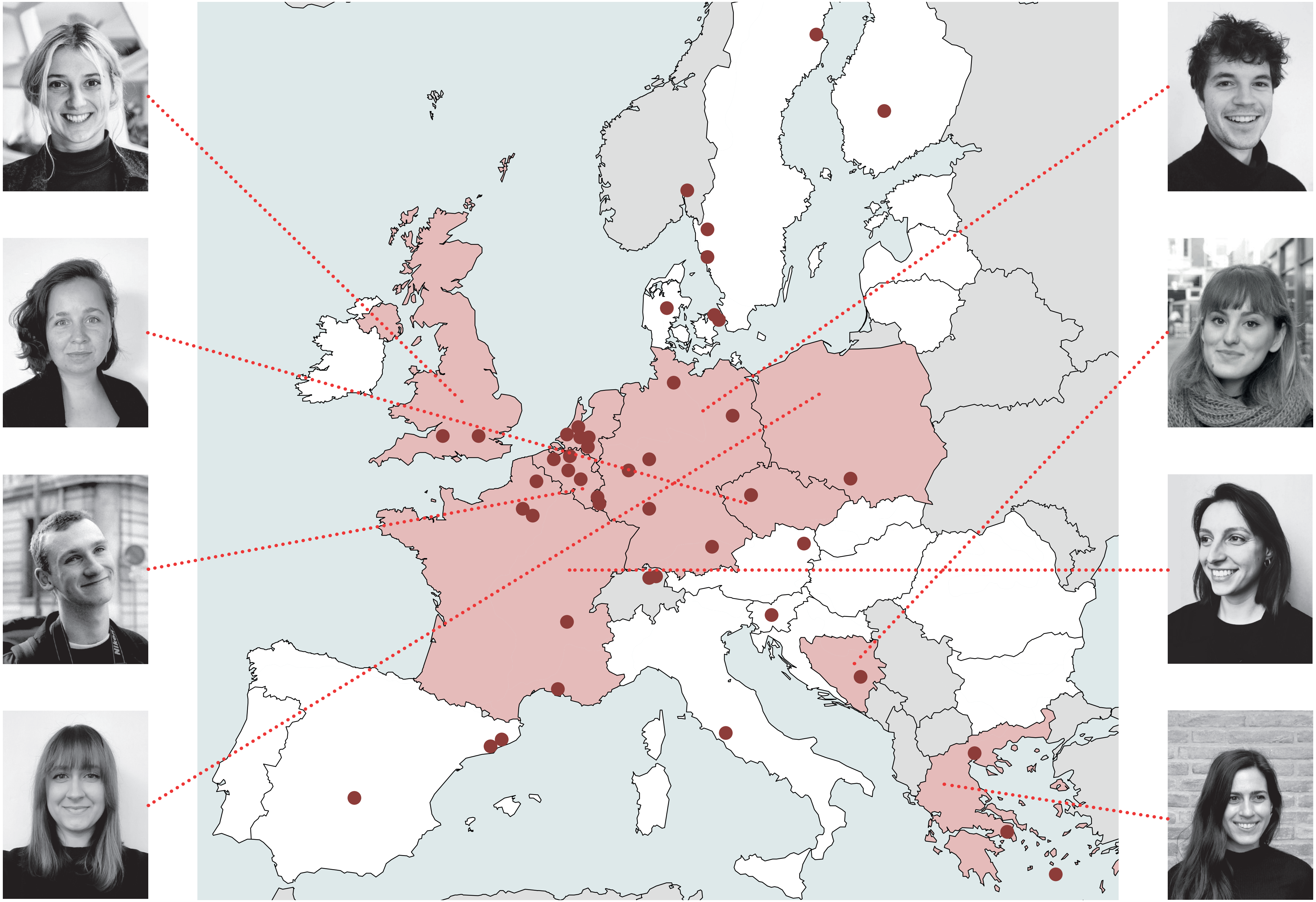
nai010 publishers

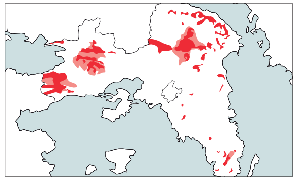
2013



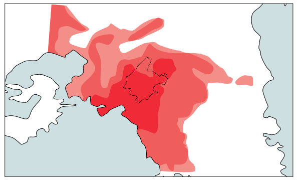
2017

2023

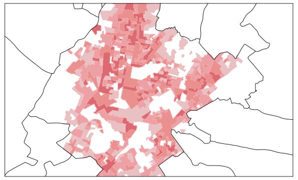




Attica region: burned areas and tree cover loss due to fires in 2021.



Athens metropolitan area: heat stress levels in 2021.



Athens: percentage of buildings without insulation.

Heat Stress

Athens, Greece

Background

Situated in the south of Europe, Greece has always been on the sunny side of the continent and a safe destination for holidaymakers looking for some sun. Recently however, this region has increasingly been facing the negative effects of global warming, such as forest fires, urban heat stress and energy-consuming measures to counteract it.

Current Situation

The country is experiencing a faster warming rate than the European average, resulting in more frequent heatwaves and prolonged droughts, which elevates the risk of fires. These result in tree cover loss, which intensifies urban heat stress and increases the risk of flooding in the affected areas. In addition to that, the current building stock is not ready to cope with the rising temperatures. Approximately half of all the residential buildings in the Attica region lack insulation, making them vulnerable to extreme heat during the summer. As a result, residents of these buildings are forced to rely heavily on air-conditioning devices, resulting in increased energy consumption during the hot months. Furthermore, only a small portion of this energy comes from renewable sources, exacerbating the problem.

Challenges

On its way to future-proof, this region is looking for more sustainable ways to deal with climate change and global warming, such as planting more vegetation in urban areas and looking for sources of renewable energy.

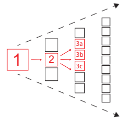
In an effort to combat urban heat stress and create more favourable microclimate conditions within cities, there are regional plans to protect existing urban green spaces, as well as to expand and increase their coverage. However, the constant growth of Athens and the lack of a holistic urban planning approach pose substantial challenges for successfully expanding green spaces within urban areas.

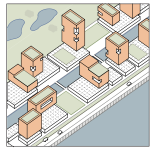
Anticipating the increased demand for cooling energy, the country is exploring the use of passive, less energy-intensive systems and is seeking ways to support the energy upgrading of the existing building stock. Through programmes like the 'Energy Refurbishment of Residences', funded by the European Regional Development Fund (ERDF) and national Greek funds, the government targets building owners directly and provides financial incentives for energy retrofitting measures for their homes. Despite these efforts, the transition to a low-carbon, energy-efficient building stock remains a major challenge and requires continued investment and engagement from all stakeholders.

Flexible Water Responsivity

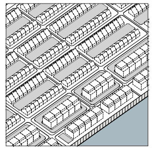
Water stress will become more apparent in the future due to climate change. This might be stormwater accumulation in depressed areas, inundation from polder systems or even flooding when dykes break.

This plan shows that the right flexibility can be reached by a strong accidentation of the ground level combined with smart basements for all buildings, introducing the possibility of a second ground floor.

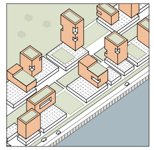




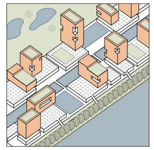
3a. Small fluctuations and surplus water can be stored in the lower parts of the accidented terrain. Traffic and daily life are unaffected.



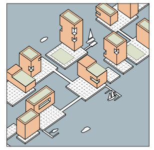
1. A generic housing plan is assessed as being too vulnerable to floods and is cancelled.



2. An alternative housing plan is realized with a strongly accidented ground level and smart basement storeys, offering the future possibility of a raised urban ground level.



3b. Bigger fluctuations are blocked by the introduction of a massive dyke along the waterside.



3c. Vast fluctuations can no longer be prevented. The basements are dismantled, building materials are reused elsewhere and basement roofs become the urban ground level.

er the building as well as numerous bicycle parking spaces and electric company cars for car sharing, making it a truly sustainable and forward-looking project. The architects promoted emissions- reducing and sustainable assets with nearly every element of their design. Even with the materiality they chose assets like highly thermally insulated block windows, which regulate the temperature and the 2,623 cubic metres of wood store more than 1.6 million kilogrammes of carbon dioxide. The design choices result in the building having one of the lowest carbon footprints to date.

The building was also designed to be constructed with great respect for the surrounding nature. All material movements and work schedules were planned to minimize disturbance to wildlife and to maintain a peaceful environment. As a result of their efforts to be carbon neutral, the Triodos Bank building has received a BREEAM rating of 'outstanding' for its commitment to sustainability. BREEAM certification is held in high regard because it is completely independent, and the assessment is carried out by a third party. To prevent possible future waste of materials within the building, the structures have a high degree of flexibility, enabling various future uses with only limited necessary architectural changes.

Legal

This is one of the first buildings with a material passport to ensure that once the building is to be demolished, the materials are known and can easily be reused. To reimagine how valuable materials can be recycled, the architects and engineers developed a system to identify and track materials in a building. With a digital material passport, they established a database that can recover the position of materials. By documenting detailed information about the location, size and use of a building element, they give the material itself a form of 'identity' that makes them independent of their current use. The system developed is used during the engineering of the project. Thus, the Triodos Bank is a pioneering example of how materials can be 'stored' in a building and reused after the building's function is over: the building becomes a bank for materials.

To make the building's resources as recyclable and reusable as possible, the architects made every element easily demountable. Besides tracking and identifying all building elements in a detailed Material passport, the architects designed the building without wet joints, using a total of 165,312 screws to be able to completely dismantle the building after its use. Every item, including the screws, can be disassembled at the time of demolition. As they are digitally documented, their functionality and state after use are also ensured, and they can be reused without imposing a safety hazard.

Financial

Upcycled materials are recyclable materials with a value that does not devaluate, but can even increase when they are used or reused. The building was constructed using different kinds of upcycled materials. The easily demountable wooden structure parts, for example, keep their value as building materials after a future demolition.

The Bank offers safe and resourceful storage of materials that can be 'harvested' and upcycled in a new building in the future. This way, the architects created a space that reflects the bank's values, focusing on ethical and sustainable banking practices. Also the construction of the core of the building, with a concrete structure for the basement, is an example of upcycled materials. The concrete is made from recycled aggregates.

Spatial

The Triodos Bank is an exemplary biobased building which showcases the use of natural resources in its materials and design. Notably, the building's prominent use of wood in its structure is a striking feature. The laminated rafters and CLT cores are clearly visible, while the CLT floors are partially hidden by wooden tracks and climate-controlling ceiling elements. Most of the wood used for the furniture and flooring is locally sourced, further emphasizing the building's sustainability.

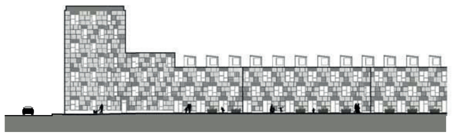
In the interior, wooden furniture elements are combined with wall-covering natural textiles, giving the interior spaces good acoustics. The insolation of the roofs is reinforced by a layer of soil, for natural rainwater retention and as a good base for plants and insects.

Resource Rows, Copenhagen, Denmark

From waste out of a building to a building out of waste

1. The Carlsberg Brewery is demolished and afterwards, the Copenhagen Metro removes temporary structures such as scaffolding.

2. Materials are harvested and brought to the new construction site.



3. The Resource Rows project – a brand new housing block – refers of the city's past by showing its reused materials.

Time-based Flexibility

Instruments: circular supply chains, material passport, upcycling, re-interpretation

Initiators and designers: Lendager Group
Completion: 2020
Programme: 63 apartments and 29 terraced houses
Website: https://lendager.com/project/resource-rows/

If circularity should become the new standard for building, we need convincing, realized examples that show us how circular building is technically and organizationally feasible, financially affordable and ready to be scaled up. Resource Rows is a circular housing project in Copenhagen that transforms 463 tons of waste from nearby demolished buildings into new space. By upcycling bricks from the nearby Carlsberg Brewery and wasted wood from the Copenhagen Metro, Resource Rows proves that circular building can compete with regular prices, conventional qualities, strict guarantees and – on top of that – offers a whole new aesthetics.

Resource Rows is a housing block with 63 apartments and 29 terraced houses in the new development area Ørestad Syd in Copenhagen that demonstrates that it is possible to reuse bricks and waste wood in a new building without compromising on costs and aesthetics. The scheme is arranged around a shared courtyard and roofscape, with two rows of three-storey terraced houses book-ended by two five-storey apartment blocks. The facade features a unique pattern of brick tiled in different directions that pays homage to the character and history of the Carlsberg breweries, old schools and abandoned homes that they were reclaimed from. The 29 greenhouses in the courtyard and on the roofscape are made of recycled glass and window frames. Even the concrete TT beam-bridge across the courtyard connecting the two parallel terraces roof-to-roof is recycled, from a nearby factory.

Since it was no longer possible to recycle individual bricks due to the strength of the mortar, existing brick facades from various abandoned buildings were cut into square brick modules, which were then assembled as a patchwork facade for the new terraced houses. The panels were mounted in steel frames to form facade modules that were fixed to a composite concrete/timber superstructure. On brick level it saved 500 grammes of carbon per brick, which is 70 per cent. The combination of vertical and horizontal bricks and the offset surface gives the scheme an almost knitted texture.

In addition, large amounts of residual wood were upcycled as finishing material in the project's interior and for the rooftop community garden huts, much of it sourced from a construction site for a new metro station nearby. In the making of the new subway tunnels of Copenhagen's expanding Metro, 900 tonnes of larch wood was used in the transportation and construction of concrete tunnel elements for the new underground. 300 tonnes of it was reused in Resource Rows. On exterior wood, an old Japanese technique (yakisugi) was applied, charring the surface with fire to impregnate it, making it completely fireproof and resistant to fungus and insects without using any chemicals.

Organizational

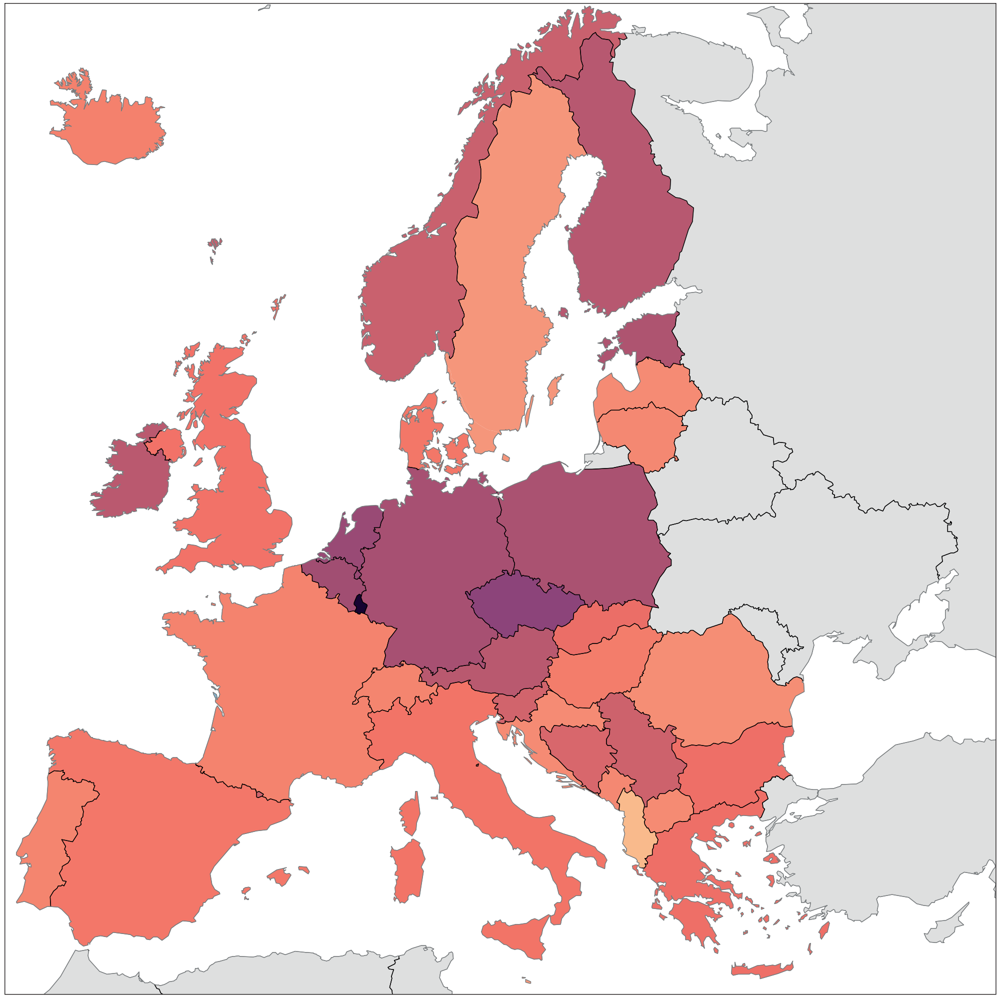
As a true circular supply chain, Resource Rows has used waste as resources for its construction. Implementing this circular supply chain required restructuring the process of building material demolition and production, and reshuffling the roles involved based on an understanding of the traditional process and interests of the stakeholders involved.

Prologue

In this prologue, a wide range of European cities is explored. All of them are facing urgent environmental challenges.

Though these challenges are all described and visualized in relation to a specific city, they are not unique to that particular city. Numerous other cities across Europe are facing similar challenges.

Carbon Dioxide Emissions



Carbon dioxide emissions per capita, 2019 (source: The World Bank)
(Carbon dioxide emissions are those stemming from the burning of fossil fuels and the production of cement. They include carbon dioxide produced during consumption of solid, liquid and gas fuels and gas flaring.)

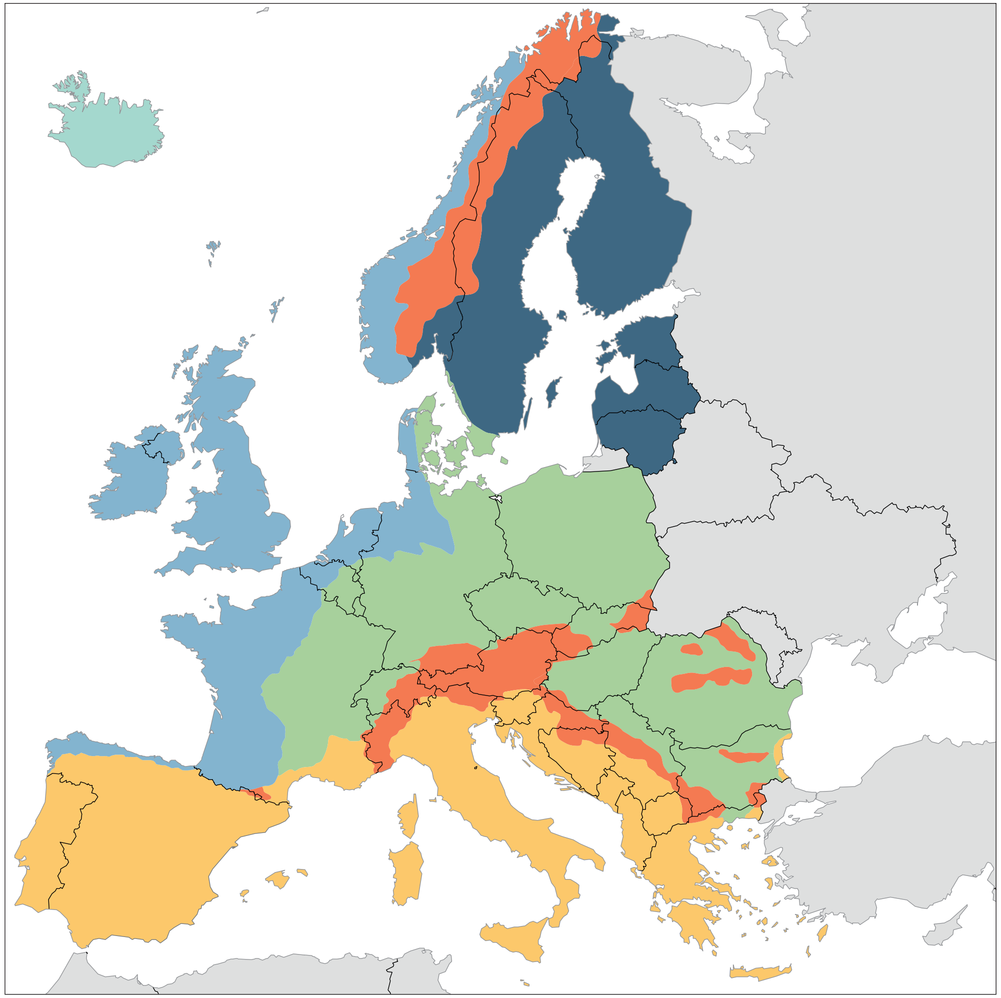
tCO2 / person / year

16

0

no data

The Impact of Climate Change on Europe



The impact of climate change on Europe (source: European Environment Agency)

Arctic: temperature rises much more than the global average; higher risk of biodiversity loss; risks to the livelihoods of local people

Boreal region: more heavy rain, less snow and ice; more rain and river flows; more risks of forest pests; winter storms do more damage

Atlantic region: more heavy rain; higher river flow; higher risk of flooding; higher risks of damage due to storms in winter; more bad weather

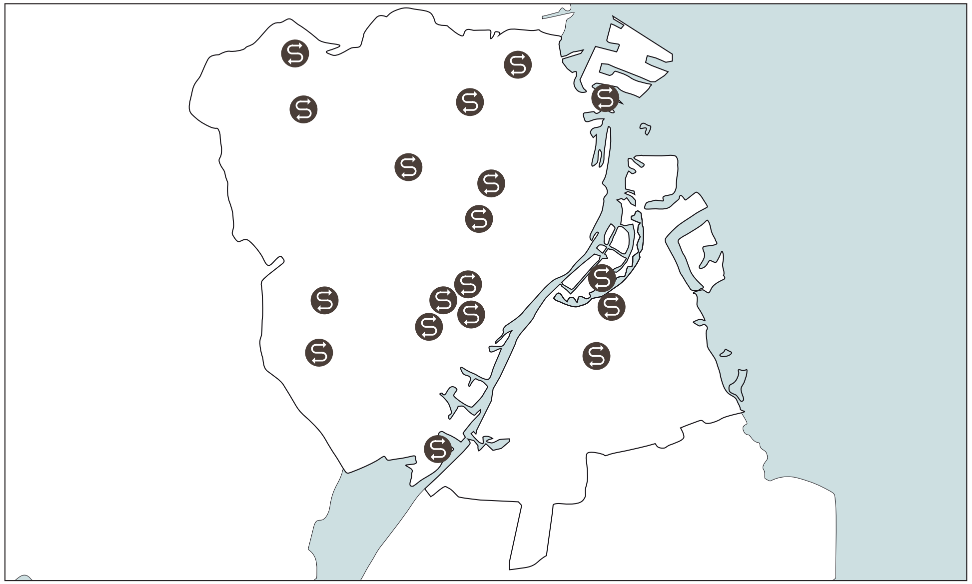
Continental region: more weather extremes; less rain in summer; higher risk of river floods; higher risk of forest fires; more energy needed for cooling

Mediterranean region: more heat extremes; less rain and river flows; higher risk of droughts; higher risk of biodiversity loss; higher risk of forest fires; more competition for water; lower crop yields; more energy needed for cooling; most economic sectors negatively affected; more people die because of heat waves

Mountain area: temperature rises more than the European average; fewer and smaller glaciers; high risk of species extinction; more risks of forest pests; more risks of rock falls and landslides; declining ski tourism

no data

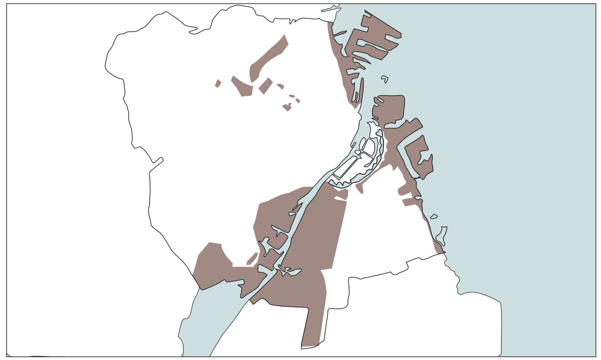
Waste management
Copenhagen, Denmark



Copenhagen municipality: recycling centres, recycling hubs or swap centres, where Copenhageners can bring their unwanted belongings to be repaired or used as a resource for new products.

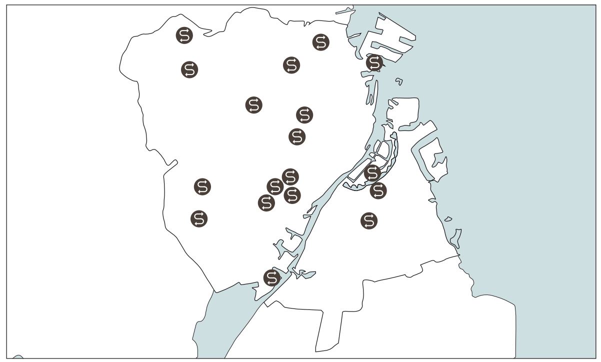
recycling centres

Waste Excess
Copenhagen, Denmark



Copenhagen municipality: landfill areas.

Copenhagen municipality and surroundings: waste incineration plants with their distribution networks for electricity and district heat.



Copenhagen municipality: recycling centres, recycling hubs or swap centres, where Copenhageners can bring their unwanted belongings to be repaired or used as a resource for new products.

1. The Inflexible City

Since the beginning of the twentieth century, the way we develop our towns and cities is modern and mainly economically driven. This has eventually led to a complex of environmental crises. The way our towns and cities are made is now threatening those very towns and cities.

To turn the tide, our cities have to be changed into circular environments, removing the causes of these environmental crises. At the same time, we have to make our cities climate-adaptive, counteracting the harmful consequences of those crises. Despite ambitions, progress in our cities is too slow. Changing our urban environment, planning habits and future expectations is tough. Conflicting interests, legal obstructions, uncovered costs and technical challenges complicate the much-needed changes.

amsterdam, historic city

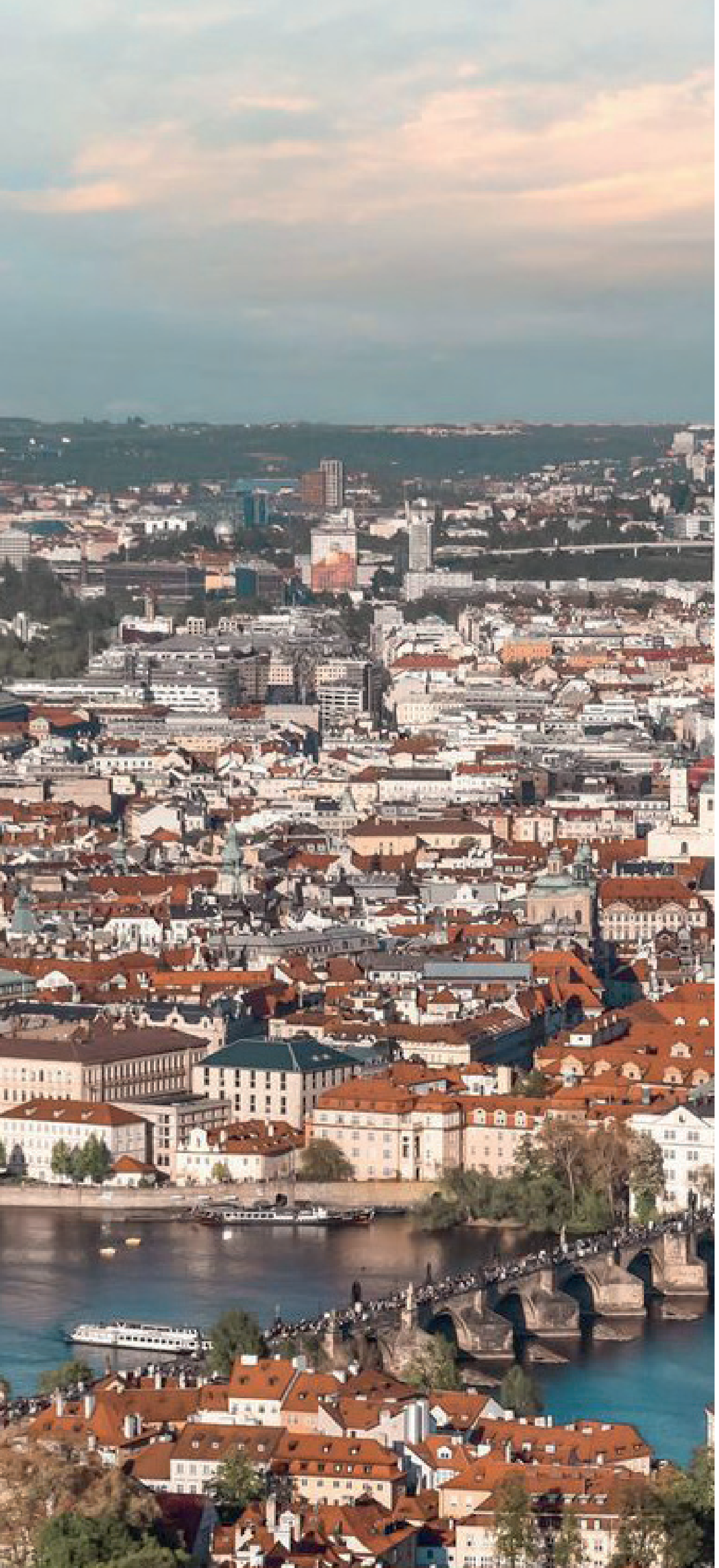
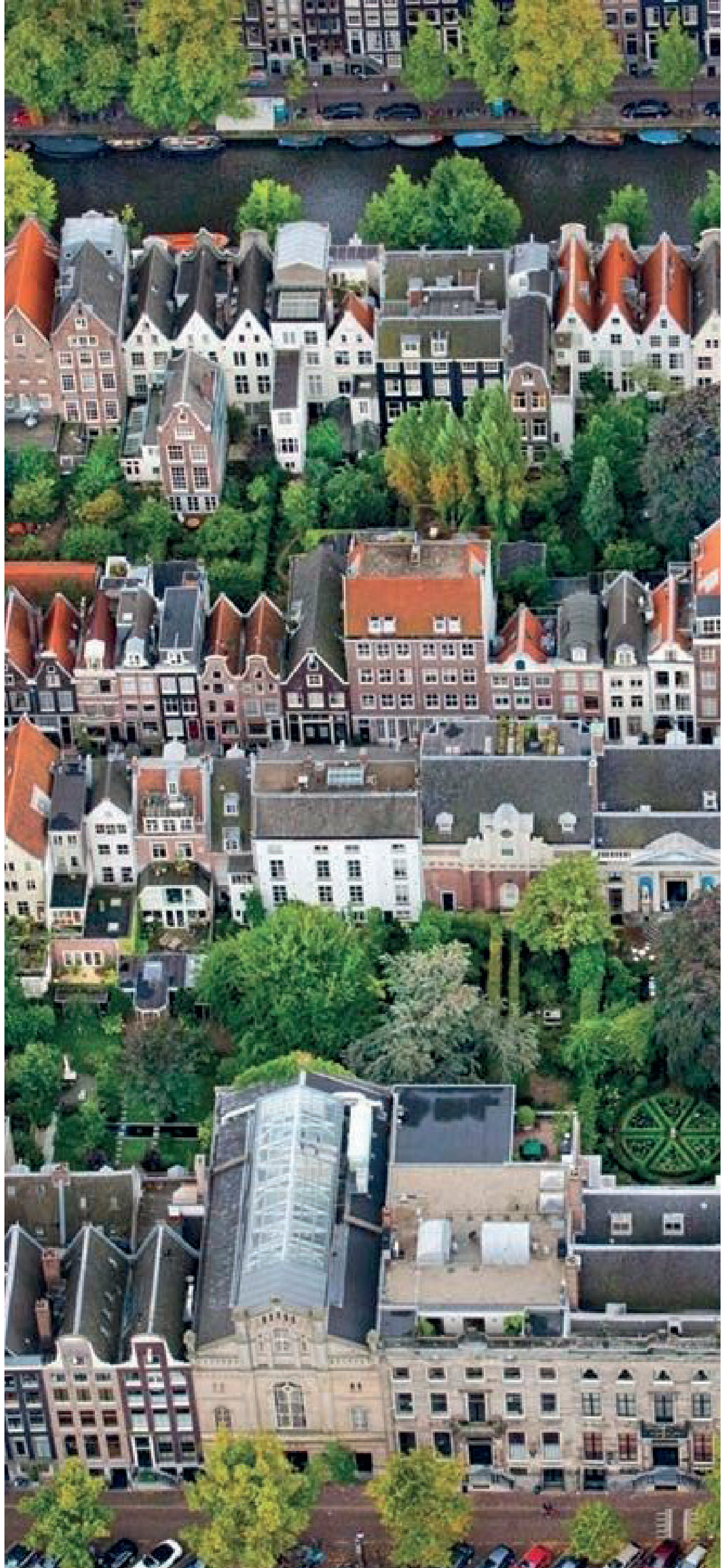
amsterdam, modern city

amsterdam, city in transition

from urban expansion...

...to urban transformation

?

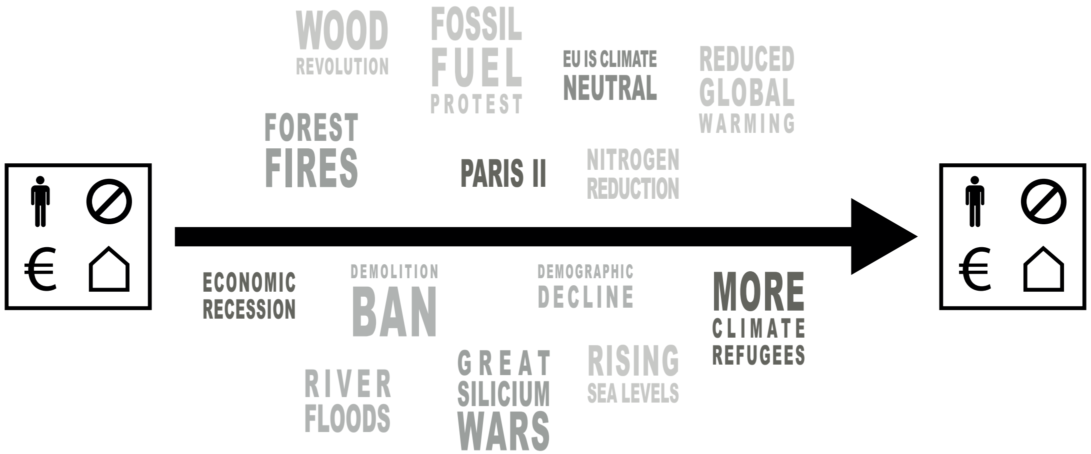

2. The Flexible City

A circular and climate-adaptive city can easily be reused, enables its inhabitants to be responsible for their own environment and is future-proof. A circular and climate-adaptive city is a flexible city.

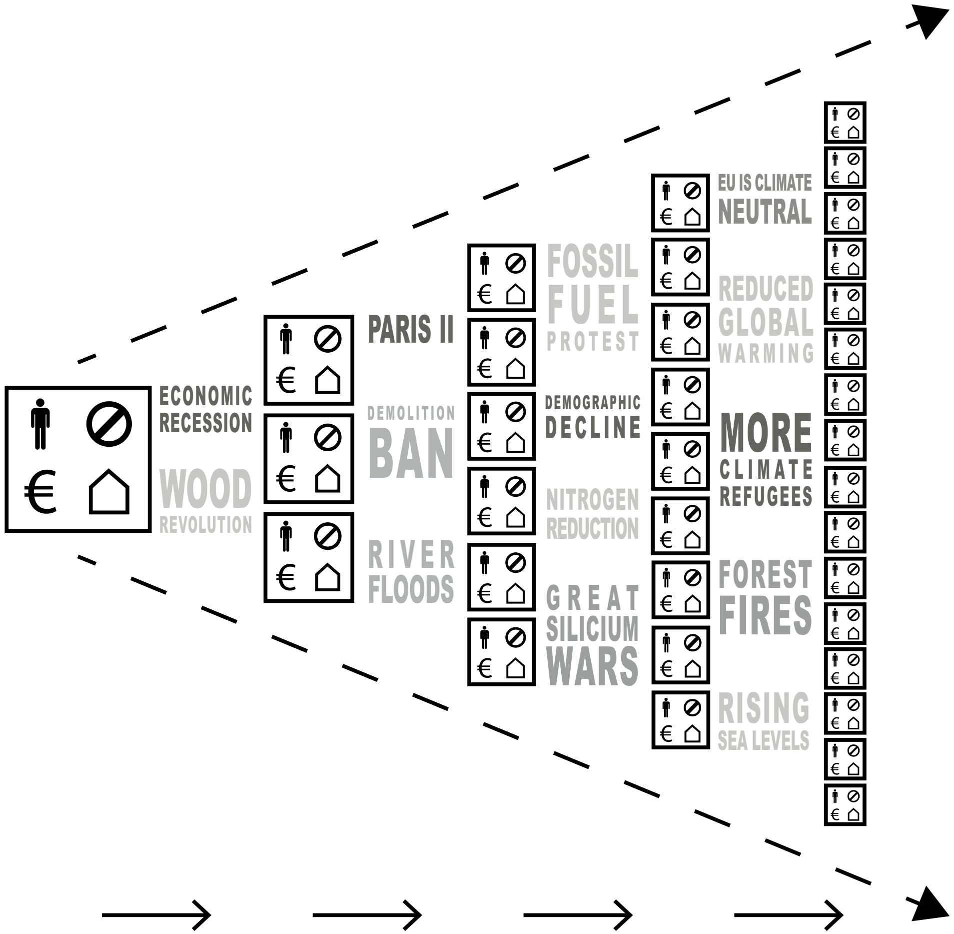
Changes are not standalone events; they are emphatically part of a process of continual transition. New developments do not lead to a fixed final position, they rather emerge from future-oriented, dynamic starting positions. Only then can truly circular and climate-adaptive solutions be found.

In this chapter, we explain what we mean by flexible area development and how it works.

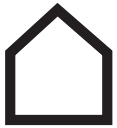
blueprint planning
(linear planning)



improvisory planning
(circular planning)



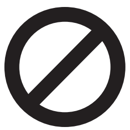
IMPROVISORY PLANNING



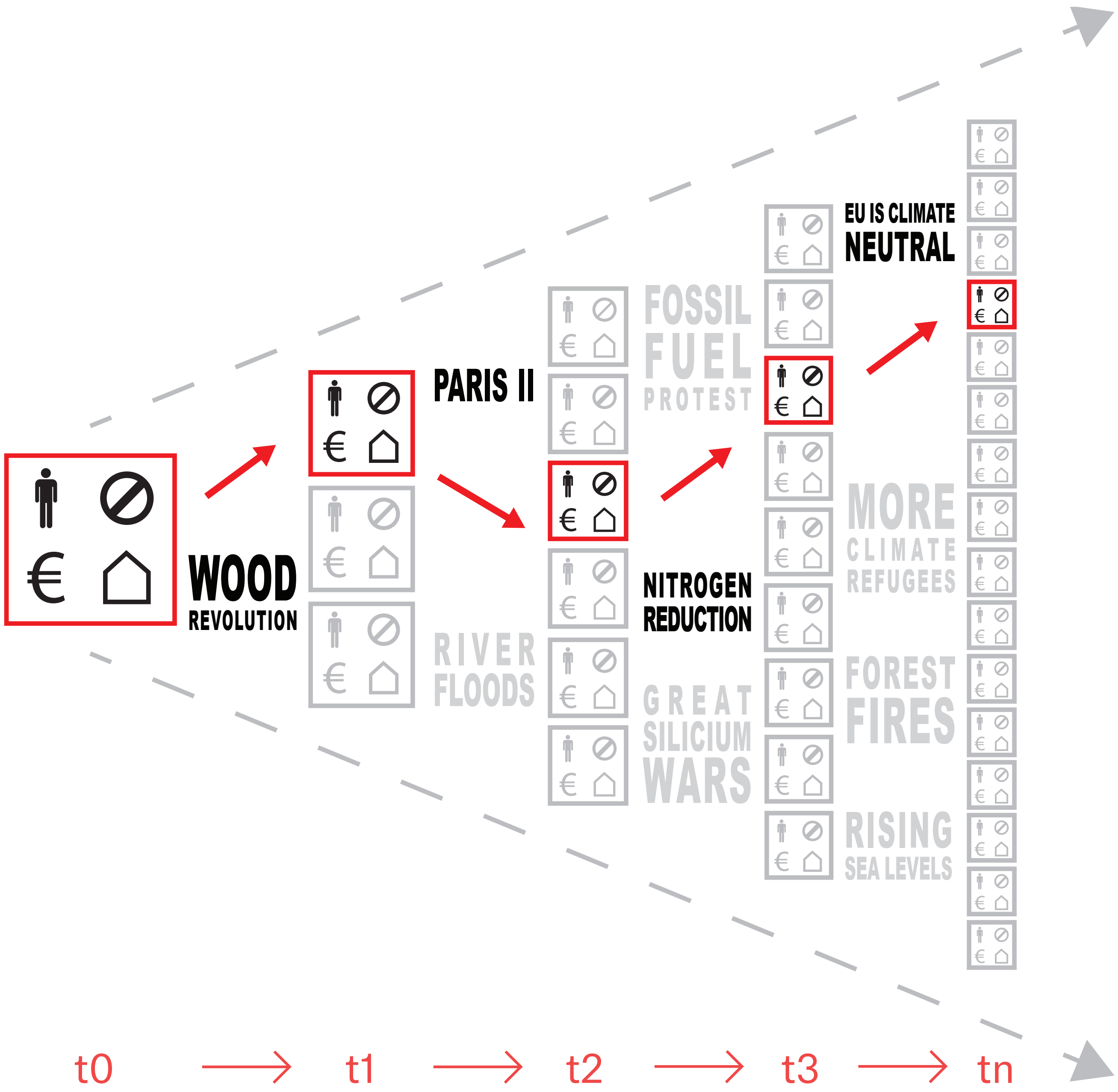
DESIGN IS NEVER FINISHED

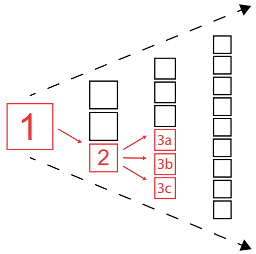
CHANCES FOR PARTICIPATION

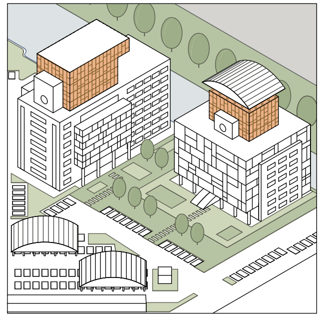
PHASED INVESTMENTS



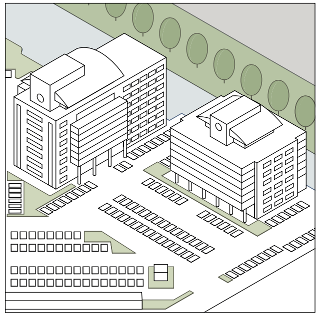
ADJUSTABLE LEGAL FRAMEWORK



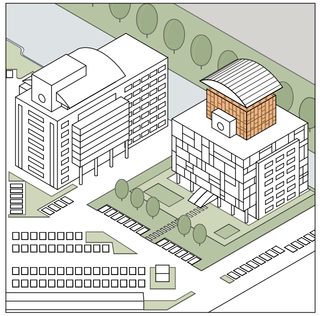




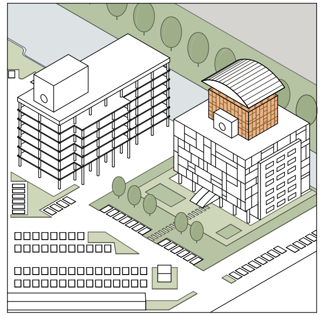
3a. As the circular transformation of the first building was successful, other buildings follow.



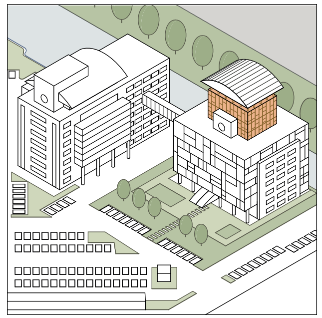
1. An office area is suffering from vacancy, while the city is particularly in need of residential space.



2. One of the buildings is transformed into a residential building, reusing its casco.

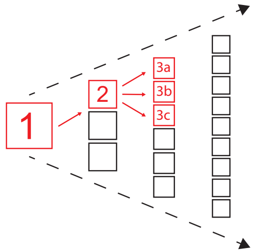


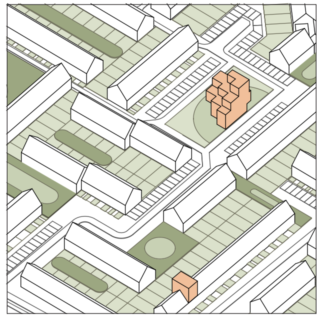
3b. Transformation of other vacant buildings is not possible anymore; all demountable materials are stolen.



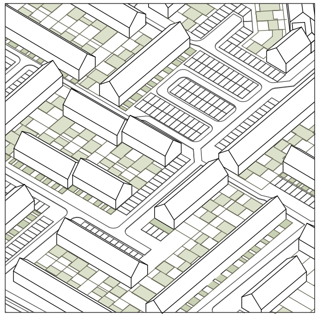
3c. Now that the residents get to know the place, they appreciate the office building and connect it to their own property with a bridge.

Flexible Suburban Mixing



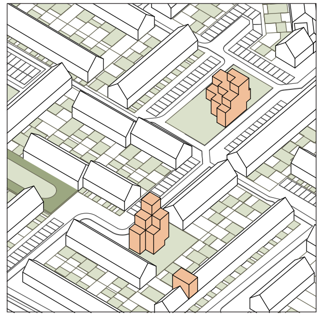


3a. Adding green and reducing the car-based infrastructure appears to get the most local support.

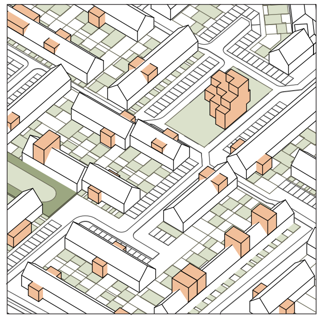


1. Many suburban parts of our cities are car-based, monofunctional, barely green, and therefore not future-proof.

2. Experiments are done to add vegetation, reduce car-dominance and diversify housing types.

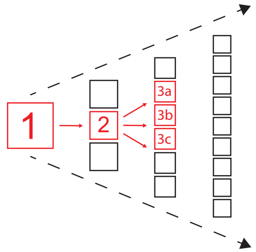


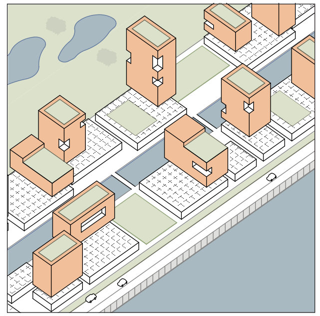
3b. Diversifying the housing stock by adding new buildings appears to be the best future option.



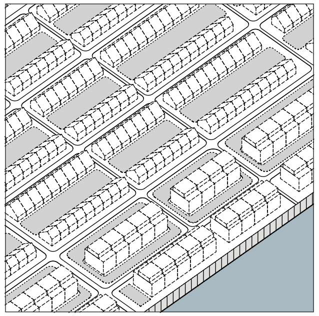
3c. Diversifying the housing stock by adjusting, splitting or enlarging existing residential buildings appears to be most popular.

Flexible Water Responsitivity

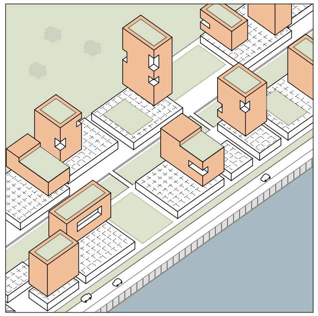




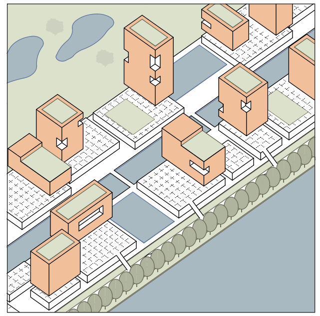
3a. Small fluctuations and surplus water can be stored in the lower parts of the accidented terrain. Traffic and daily life are unaffected.



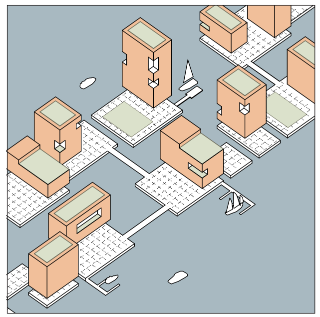
1. A generic housing plan is assessed as being too vulnerable to floods and is cancelled.



2. An alternative housing plan is realized with a strongly accidented ground level and smart basement storeys, offering the future possibility of a raised urban ground level.



3b. Bigger fluctuations are blocked by the introduction of a massive dyke along the waterside.

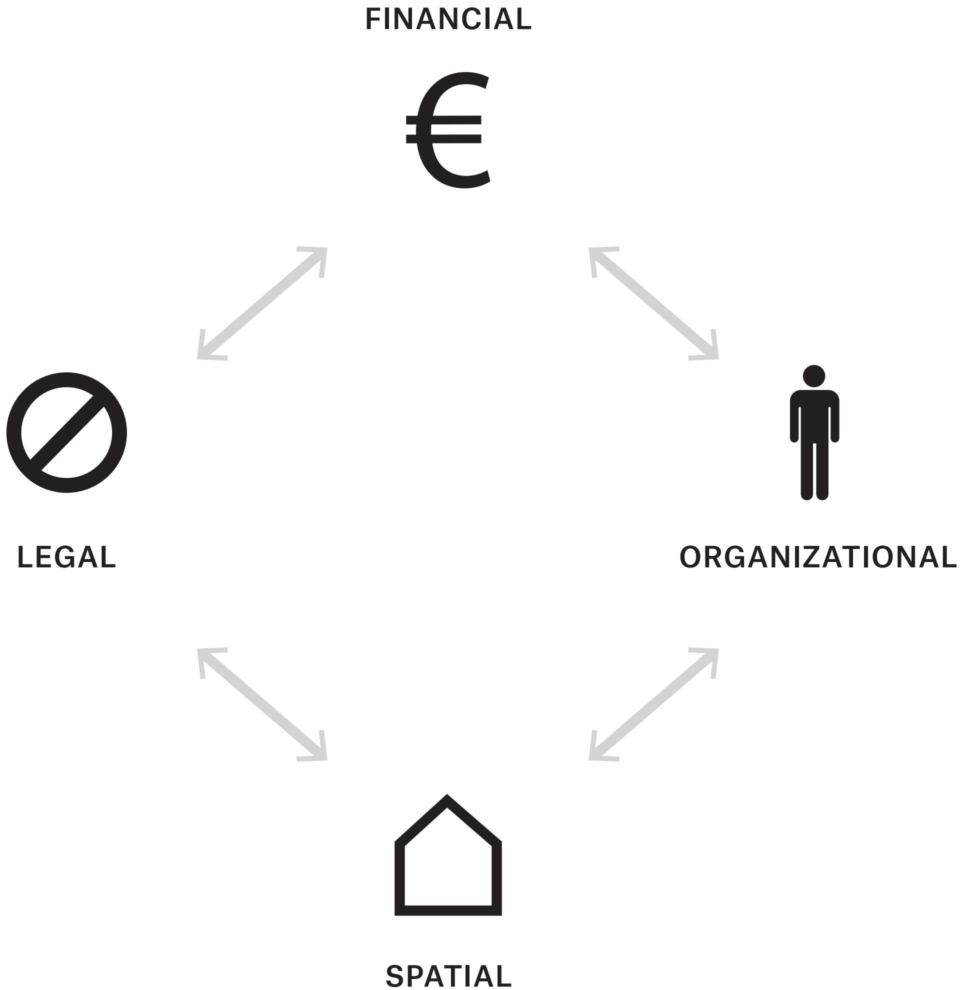


3c. Vast fluctuations can no longer be prevented. The basements are dismantled, building materials are reused elsewhere and basement roofs become the urban ground level.

3. Instruments for a Flexible City

Different instruments are needed to create more circularity in our cities and adapt them to the changing climate. Together with experts in organizational, legal, financial and spatial affairs, we have compiled a set of 36 instruments that can give shape to the flexible city. The instruments in this chapter offer more flexibility by focusing more on existing structures, usage and timing.

3.5 Legal Instruments



Local Legal Flexibility

- CAR BAN
- PURPOSE-SPECIFIC FREEZONE
- SUSTAINABILITY PROTOCOL

Use-driven Legal Flexibility

- LAW CHANGE MOTIVATION
- GUERRILLA GARDENING
- CUSTOMIZATION

Time-based Legal Flexibility

- MATERIAL PASSPORT
- EMISSION LIMITATION
- DEMOLITION BAN

3.3 Organizational Instruments

DYNAMIC BIODIVERSITY MANAGEMENT

DATA-BASED POLICIES

HOLISTIC APPROACH

REUSED MATERIALS MEDIATOR

EMPOWERING LOCAL COMMUNITIES

DESIGN OUTPUT MONITOR

INNOVATION BOOSTER

INFRASTRUCTURE REARRANGEMENT

CIRCULAR SUPPLY CHAINS

3.5 Legal Instruments

CAR BANLocal Financial Flexibility

PURPOSE-SPECIFIC FREEZONE

SUSTAINABILITY PROTOCOL

LAW CHANGE MOTIVATION

GUERRILLA GARDENING

CUSTOMIZATION

MATERIAL PASSPORT

EMISSION LIMITATION

DEMOLITION BAN

3.7 Financial Instruments

COMMUNITY SHARES

CAPITALIZED RISKS

PRIVATELY FINANCED PUBLIC ASSETS

FREE PUBLIC TRANSPORT

SOCIAL CURRENCY

SUBSIDY

UPCYCLING

RECURRENT HOUSING FUND

LIFE CYCLE FINANCE

3.9 Spatial Instruments

BIOBASED BUILDING

SOIL-SENSITIVITY

CONVERTING TRADITION

MICROCLIMATE MODIFICATION

DENSIFICATION

ROOFTOP BENEFITS

MODULAR BUILDING

RE-INTERPRETATION

SEASONAL FLEXIBILITY

BIOBASED BUILDING
Local Spatial Flexibility

Building with materials that are organic, renewable and mostly plant-based such as wood, grass or hemp and therefore have a minimal carbon footprint.

Why?
Modern building materials are mostly stony (concrete, brick) or metallic (steel, aluminium). These raw materials have a large carbon footprint due to the energy-intensive production process involved in extracting them from non-renewable sources such as chalk, pebbles, bauxite or iron ore. In contrast, biobased materials are derived directly from organic resources and are renewable. Wood for example, under sustainable forest management, can be an endless resource. Such materials are intended to fully reintegrate back into the environment, creating zero waste. On top of that, biobased materials may have a positive carbon footprint because they can store carbon. Biobased buildings could therefore contribute to the reduction of carbon dioxide emissions instead of being only consumers of resources.

Besides their low environmental impact, biobased building materials can contribute to healthier indoor spaces. Certified materials made from natural resources do not emit harmful emissions and can furthermore regulate humidity and absorb pollutants, ultimately improving indoor air quality.

How Does It Work?
Although biobased building materials are getting more popular, their integration into the construction industry is not yet widespread. Designing and building with these materials often requires a creative and innovative approach that goes beyond traditional construction methods. As contractors, investors and building owners are not yet familiar with biobased materials, they often have doubts about their performances and qualities. Some also consider it a risk if biobased materials will meet legal building requirements.

Out of all the layers that make up a building, the structure has the most significant impact on carbon dioxide emissions. By creating a timber structure, we can greatly enhance its carbon storage potential. Building a demountable timber structure facilitates the future recycling of materials. Cross-laminated timber (CLT) has the technical possibilities for using wood as a structural material in complex or high-rise structures. Regarding the building's envelope, the most common biobased method is using prefabricated timber-framed elements or solid timber components, combined with biobased insulation such as cellulose, straw or cork. Such a method requires increased wall or roof thicknesses (compared to conventional insulation products) in order to achieve a highly insulated envelope.

Biobased cladding and interior finishing include wood, bamboo, straw, clay finishes and compressed-grass panels. If exposed to water, a protective coating may be required.

Example: House of Nature, Silkeborg, Denmark
Located next to a forested area, the building serves an educational purpose, for teaching about nature and outdoor life. Aiming to fully integrate the design with the natural environment around it and reflect its educational programme, the building was constructed using only biobased materials.

The foundation of the building is made of screw piles and a wooden deck, minimizing its impact on the ground. The wooden structure is visible both inside and outside, seamlessly blending in with the surrounding forest. The facade is inspired by traditional architecture, combining oak columns with cladding made of shingles from acacia wood. The structure is well-insulated with wood fibre boards used for thermal insulation and cardboard-based material used as a vapour barrier. By using demountable fixations only, a future disassembling of the building structure is easily imaginable.

The end result is a warm and inviting building that has a natural look and immersed in the surrounding landscape; an inspiration to its visitors.

MODULAR BUILDING
Time-based Spatial Flexibility

Building with repetitive, easily transportable and combinable modules.

Why?
Conventional building tends to be a bit impracticable. Raw building products are transported to a building site where they have to be stored, waiting for the right moment to get assembled in unpredictable weather circumstances. This traditional process produces lots of greenhouse gases, has a negative impact on the immediate surroundings of the building site and its quality depends on local circumstances.

Modular buildings, on the other hand, offer several advantages over conventional building types. The production of modular building elements takes place in factories, where it is easier to collect and store building products. Since circumstances in the factories can be better controlled, the precision and quality of the building element is usually higher than building elements that are manufactured on site. Furthermore, this type of manufacturing offers better control over waste and emissions. Working conditions for builders are better too.

The use of prefabricated building elements can also increase cost-effectiveness. Especially when manufactured in large quantities, savings in materials, energy, and labour costs can be made. In addition, shorter development and construction times offer the advantage of being able to respond quickly to changing space requirements. It is easy to imagine the modules being moved to another location after some time for reuse, representing a form of circular use of building materials.

How Does It Work?
The development and construction process of modular buildings begins with the planning phase. In this step, the customer's demands are determined, and a design is made. Once the decision for a final design has been made, the building elements are prefabricated in factories, either in series or customized. However, it should be noted that modular construction requires more permanent building facilities, such as factories and warehouses, than traditional construction, which is mostly done on temporary sites. Therefore, modular construction is more cost-effective when the flow of production is regular and unceasing.

Prefabricated modules are transported as finished products to the construction site where they are assembled. This shortened and cleaner construction process impacts the environment less than conventional construction. If renovations become necessary after some time or if the spatial requirements change, the buildings can be dismantled into their individual elements and taken away. In the factories, the individual elements can be disassembled or renewed and adjusted before being reassembled elsewhere.

Example: Modular School Buildings, Berlin, Germany
To address the shortage of classroom capacity, Berlin's education and housing authorities collaborated with private architects to design a modular building type that can be used to extend existing school buildings. On ready-to-build spaces of school sites, these buildings can be constructed within six to ten months and have a service life of at least 50 years.

The assembly of the off-site prefabricated building elements is accomplished according to individual demand in four standard sizes with 12, 16, 22 or 24 classrooms, associated group workrooms and an optional cafeteria. Since 2013, the Berlin administration has completed approximately 80 of these modular school buildings, and 60 more are in the planning stages, with newer models consisting of wooden building elements. In case student numbers decline in the future, the buildings can be dismantled at short notice and the individual modules used for other purposes. The students can then be accommodated in the existing main school buildings.

LAW CHANGE MOTIVATION
Use-driven Legal Flexibility

In order to foster commitment, governments explain why strict laws regarding sustainability are in people's benefit.

DESIGN OUTPUT MONITOR

Use-driven Organizational Flexibility

Measurable output criteria set at the beginning of a process, stimulating fine-tuning between stake-holders such as clients, designers, contractors and regulators, to achieve optimal circular output.

environmental impact & material use	environmental impact
	embodied carbon
	construction stored carbon
	material use
	reuse potential
flexibility	adaptivity
	disassembly
use of waste materials	waste materials (demolition)
	waste materials (construction)
material health	toxicity

DEMOLITION BAN
Time-based Legal Flexibility

Legislation that prevents existing building structures to be demolished, reducing the environmental impact of the building industry.

MATERIAL PASSPORT

Time-based Legal Flexibility

Identifying certificate for building materials that helps understand their origin and possible future.

€ → €

UPCYCLING
Time-based Financial Instrument

By discovering uses that add value to poorly valued waste materials, circularity and reuse become a beneficial alternative for the conventional, linear way of producing materials.

LIFE CYCLE FINANCE

Time-based Financial Flexibility

Linking the development accounts to the operational accounts.

RE-INTERPRETATION
Time-based Spatial Flexibility

A different interpretation of an existing building structure.

CONVERTING TRADITION
Local Spatial Flexibility

Traditional building methods contain local knowledge about the optimal combination of available building materials, dealing with local climate risks and costs. Generic, industry-driven building systems lack this knowledge.

4. Examples of a Flexible City

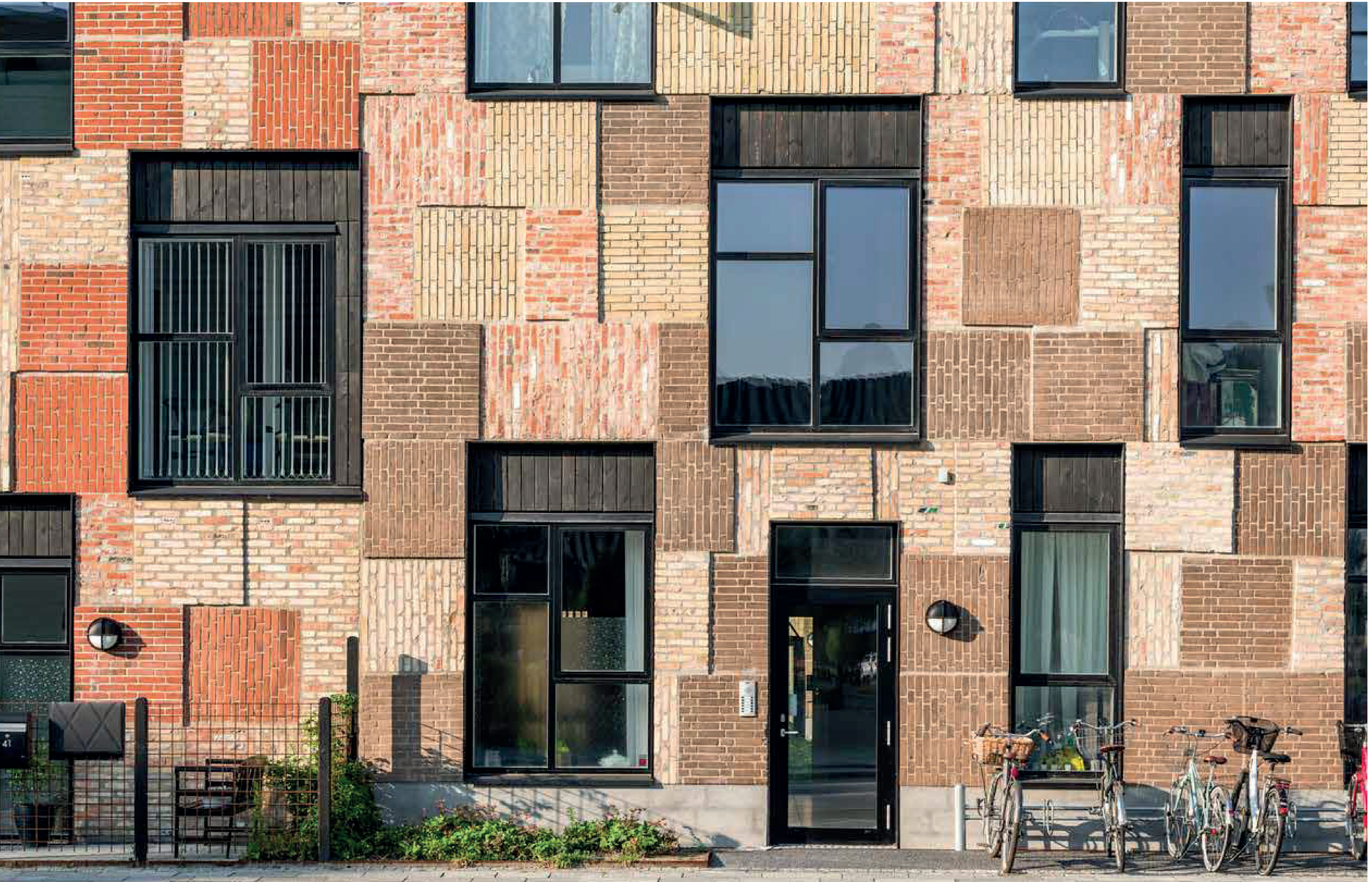
In this chapter we show how circularity and climate adaptation is taking shape in Europe, using a number of completed projects as examples: they are illustrative of a new way of working and a new mentality, with a central emphasis on reuse, social inclusion and the time factor. A description is given of how each project was realized using the flexible instruments presented in earlier chapters.

Sara cultural Centre, Zweden

modulaire houtbouw, Finland

autarkische woning, Zweden

circulair woongebouw, Kopenhagen, Denemarken



bijgebouw gemeentehuis, Korbach, Duitsland

atelier LUMA, Arles, Frankrijk

vernieuwbouw 154 portieketagewoningen de Punt, Osdorp

vernieuwbouw 154 portieketagewoningen de Punt, Osdorp

Circulaire (ver)bouw 162 sociale woningen “de Punt”
ontwerp: Temp.architecture
opdrachtgever: Ymere
oplevering: 2024-25

1.400 tonnes of CO_2 reduction
compared to demolition - new construction