The city of 2120: all natural!

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Arnhem in 100 years: the urban environment in a nutshell

What does the city of the future look like? This map summarises the design in 6 key aspects. One thing is certain: it’s wonderful to live in a city like this. Curious how we came to our conclusions? Then keep reading!

1 We need more houses!
Residential towers have been built in the Veluwe and historic villages are nestled behind wide new dykes. And the village of the future? It floats!

2 Roads are narrower and cars drive autonomously. Parts of the city are car-free. If you shop for a new outfit online, it will be delivered by drone.

3 Summers are hot in the city!
Special cool air corridors brings fresh air into the city. A lot of asphalt has been replaced with greenery to keep the streets cool.

4 New lakes in the Veluwe form a “battery” of hydroelectric power. A large wind farm is found on the high plateau north of the city.

5 Arnhem and Nijmegen embrace the Rhine and the Waal. The two rivers share a single floodplain, with plenty of room to respond to elevated water levels.

6 Red deer no longer live only in the Veluwe, but also in the river area. They now have a single contiguous habitat.

Dare to look ahead

What will Dutch cities look like in a hundred years? One thing is certain: we face great challenges, such as global warming and an ageing population. We need to generate our energy sustainably. Weather extremes are increasing, from extremely dry and hot weather to a lot of rain. And the water is getting closer — sea levels are rising, and rivers are flooding faster. As a result, the western Netherlands may become partly uninhabitable.

A future like this might make you lose heart. But you can also explore the possibilities. Wageningen University & Research (WUR) painted a positive future scenario two years ago: *Nederland 2120* (Baptist et al., 2019). In that story, we outlined how the Netherlands could be a guiding light for a green future, as a country that leads the transition to a sustainable society. This message of hope proved to be a huge success.

"We want to tell an inspiring, courageous, and realistic story"

This vision takes this story even further: how would a scenario like this shape the city of the future? We use Arnhem as an example, to show what the urban environment might look like in a hundred years' time. Might, indeed, because the future is not set in stone. We are not presenting a blueprint, but a conceptual framework. We want to tell an inspiring, courageous, and realistic story. We use the natural system and the people's well-being as our basis.

Looking ahead to our distant future

We envisage a society adapted to climate change: a world where people live in such a way that the earth does not continue to heat up. What will energy supply, nature, mobility, and housing look like then? The content was created on the basis of scientific knowledge from various fields.

Looking far ahead is more than just a fun brainstorming exercise. It's a necessity. In December 2021, the *Deltacommissaris* (Delta Commissioner) called for housing construction to take greater account of the changing soil and water system (Glas, 2021). Some 820,000 new homes in the Netherlands are planned for construction in areas that are vulnerable to climate change. In other words, we are still building new houses in places that might flood someday. The commissioner tells us that we should not shy away from taking a long-term approach. But what happens when we really take a closer look into the future? How would looking ahead to our distant future influence the choices we make today?

Smart solutions

What we need is an integrated approach, otherwise we will literally run out of space. This is why we are investigating how different solutions influence and reinforce each other. For example, a surplus of river water can be used to store electrical energy. Self-driving cars require less asphalt, leaving more room for greenery in the city. What about houses? Why not make them float as well?

In this scenario, we show what the city of the future could look like if we let the natural system lead the way.
The result is a resilient, healthy, green city. Curious how we will go about it? Then keep reading. We hope you enjoy reading our vision!

On behalf of the Arnhem 2120 project team,

Tim van Hattum
Program leader Green Climate Solutions at
Wageningen University & Research

The landscape as a basis

This vision for the future adapts the city to the changing climate and other major challenges, such as housing shortages and the transition to sustainable energy. 5 key principles serve as the basis for the design; these are found on page 23. These principles are based on those of the *Nederland 2120* scenario and have been applied to the urban environment in this vision.

Remember that this scenario is an open-ended brainstorming exercise. We could have used an example other than the city of Arnhem. We want to explore how to use natural conditions to shape the city of the future and demonstrate what an attractive, pleasant environment this creates.

Why Arnhem?

Any urban environment can be used as an example if you want to know what a Dutch city will look like in the future. However, the solutions you choose will differ. They depend on the landscape and the location of the city.

For example, is the city situated near a sea or river? On peat, clay, or sand? Does the summer heat cause issues? What is the housing need? How do residents move around the area? From where do they get their food, water, and electricity? All these circumstances make The Hague, Amsterdam, Dordrecht, and Arnhem very different cities, even though they are all in the Netherlands.

For this case study we chose Arnhem, because this city lies on the border of two predominant Dutch landscape types: the elevated sandy soils and the river area. In other words, where the Veluwe forest meets the river Rhine. This case is an example for other cities with these kinds of landscapes. For example, the design proposals for the elevated areas can also be applied to parts of Nijmegen, Apeldoorn, or Bergen op Zoom. The proposals for the low-lying areas are also suitable for cities in North and South Holland.

Elevated sandy soils
In keeping with the recent recommendation of the Delta Commissioner (December 2021), life and work will shift to the elevated sandy areas to an increasing degree. With rising water levels, this is the safer choice! Of course, this "relocation" means a big change for the eastern part of the Netherlands.
Cities will become larger and the economy will grow.

The river area
Dutch rivers will have much more water flowing through them in a hundred years, because heavy rain will be more common. Additionally, the influence of the sea will extend much further inland. We will need wider riverbeds to accommodate all that water. In some places, the risk of flooding will become too great and "normal" houses will have to be replaced. Other forms of housing, such as floating houses made from locally grown wood, can already be explored now.

Arnhem City Tour: a journey through the region

Imagine it’s the year 2120 and you’re going on a bicycle trip in the Arnhem area. What will you come across? We take you to the three most important areas: the Veluwe, the flanks of the Veluwe, and the Rhine and Waal river area.

Three types of landscapes

The area in and around the city in the year 2120 consists of 3 types of landscapes. Each area has its own interpretation, which best suits the natural landscape:

1 In the north you have the **Veluwe**, an area where people live surrounded by large green areas. There are deciduous forests, open grasslands, and sand dunes. You will also come across sawmills, where we make materials to build houses.

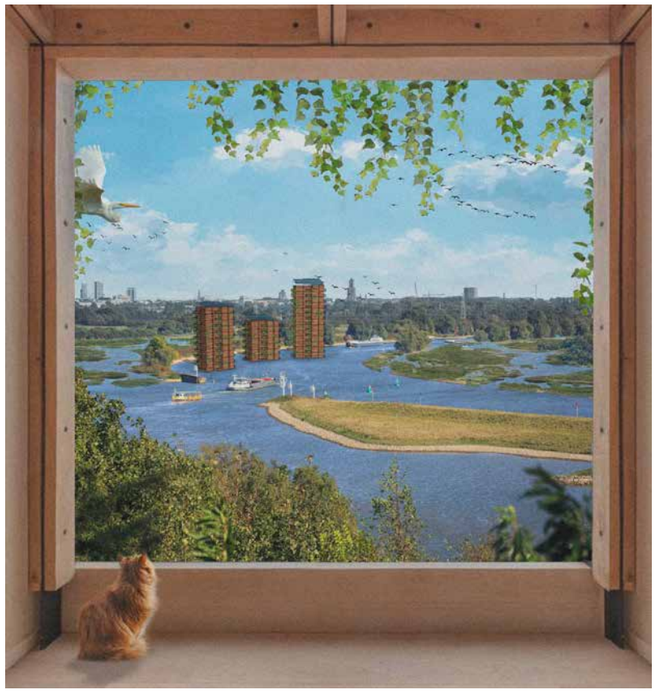
The new Veluwe: an area with deciduous forests and open fields. The area around the lakes is wetter, which allows flowers to bloom. People live in wooden apartment buildings among the trees, and large wind turbines are found in the most elevated areas. Many animal species live here, such as otters, deer, and all sorts of birds.
Have you spotted the wolf yet?

2 If you cycle downhill a bit, you are on the **flanks of the Veluwe**. This is where new city, historic city, and nature meet. Get off your bike for a bit and walk along one of the wide manmade streams. Have a drink at a café or take a dip in the waterfalls.

This is what the city at the flanks looks like. A fresh wind blows between the nature inclusive buildings. Wide stream valleys with waterfalls also provide a place to cool off. Transport drones zoom along to their destinations in the sky.

3 The Rhine and Waal form the heart of the third landscape type: the **river area**. This landscape changes all year round! During high river level periods, residents take a boat to their floating homes. Some roads are elevated on posts. Thanks to new types of agriculture and fish farming, we can always grow food in this area, despite fluctuating water levels.

Your flat in one of the floating residential towers offers wonderful views of the river. The middle of the Rhine is wide enough for ships. Marshes and willow groves are found along the riverbanks. Egrets fly past the window. The city centre can be seen in the distance.



1. The Veluwe

Because the push moraine areas are at a safe height, they will play an important role in the Netherlands in the year 2120. The rising water levels will cause many people to move away from the Randstad. A lot of new homes will be needed around Arnhem to handle this influx of new residents. New housing will also be built in parts of the Veluwe. City and nature blend smoothly into each other there.

Transport and energy hub

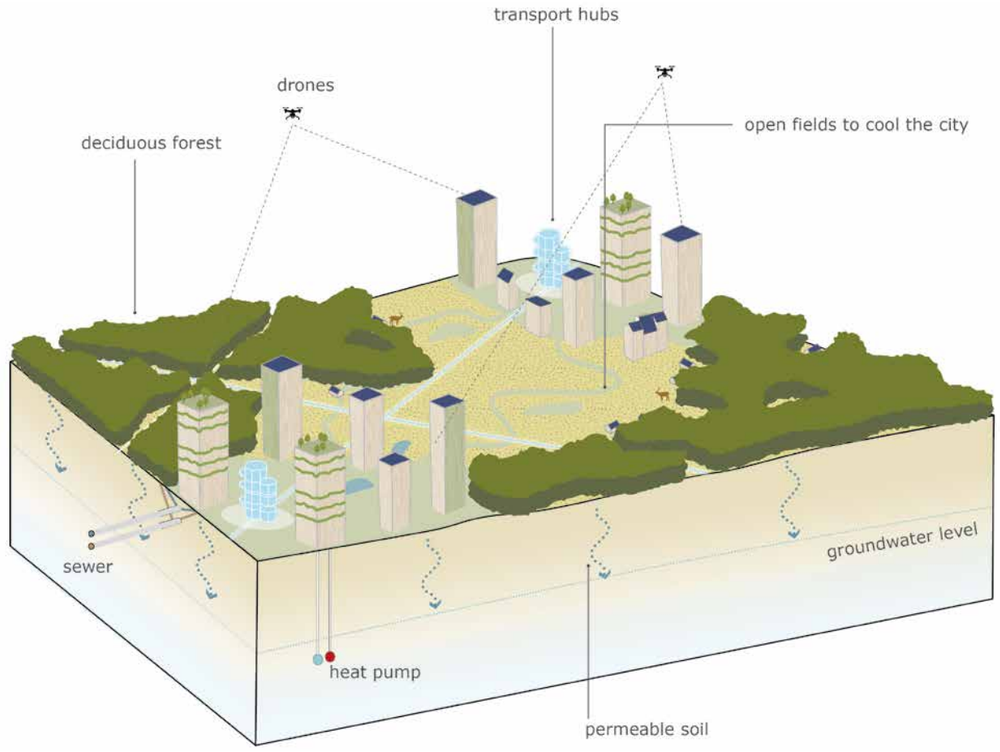
The A12 motorway is hidden under a green roof that stretches for kilometres. When visiting from outside Arnhem, the easiest way to reach the centre is via a transport hub on the Veluwe.
This is where you will also find parking spaces for self-driving cars. The strong winds in the elevated areas of the Veluwe are caught by clusters of wind turbines.

From coniferous to deciduous forest

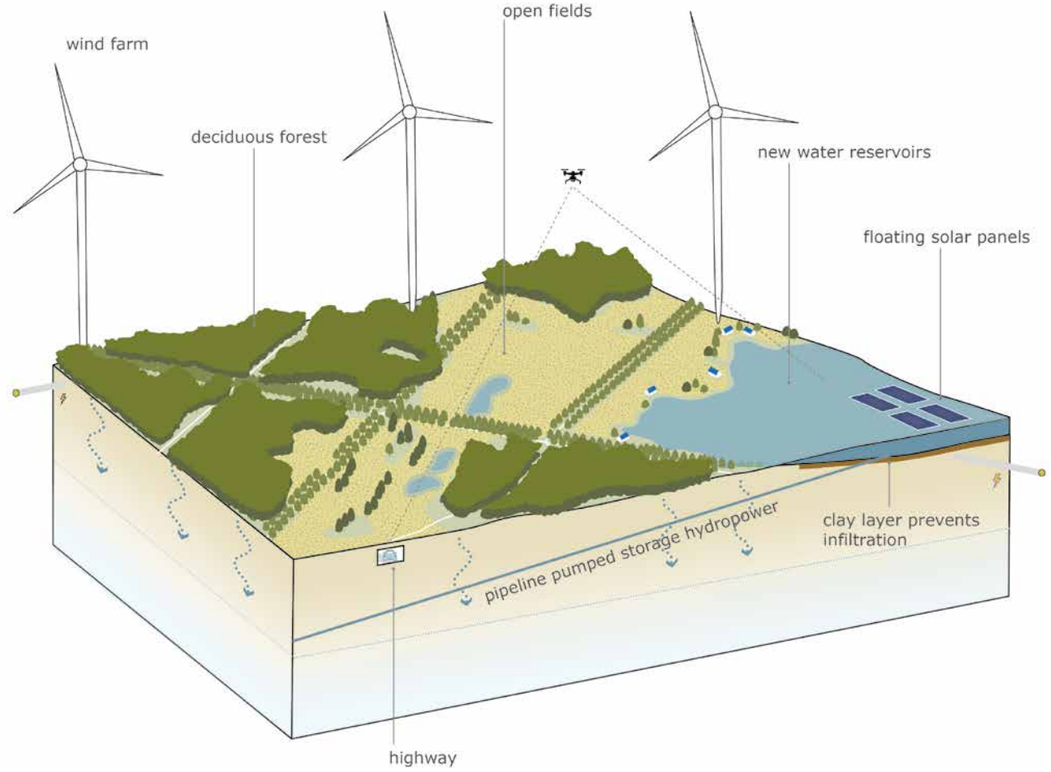
Today, coniferous trees in the Veluwe absorb a lot of groundwater. To prevent drought in 2120, these have been replaced by deciduous forests and open grasslands where heather also grows. The result: less water evaporates.
Pine trees no longer grow in the Veluwe, but now mainly oak, birch, and beech trees. They are also used to build houses in the region. The sandy soil also lends itself well to natural water purification. More rainwater filters into the ground to become a sustainable source of drinking water. Welcome to the Veluwe water supply dunes!

The large water battery

The Veluwe now houses several water reservoirs. For example, in places where the soil already contains loam. These new lakes form a kind of large “battery”. If we are unable to generate enough electricity through solar and wind energy, we can use this water to generate additional energy.



The Veluwe is where the new city and nature meet.



In 2120, it will house deciduous forests and open fields. The area is used to generate and store energy.

2. The flanks of the Veluwe

Wide stretches of water and greenery connect the Veluwe, the city, and the river area. The Veluwe flanks are characterised by these “green fingers” — strips of nature that run from top to bottom. In between lies the city of Arnhem: the historic centre, country estates, and charming neighbourhoods and parks.
This area has a mix of old and new neighbourhoods. The current green areas have been preserved as much as possible.

Nice and cool thanks to greenery and water

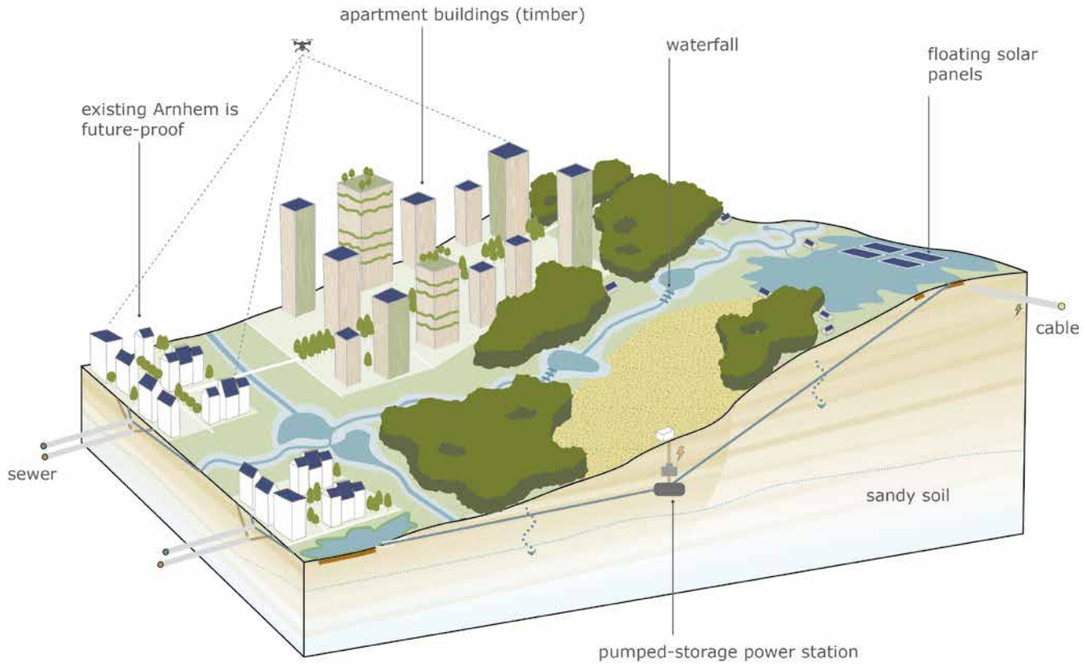
The open “green fingers” that extend into the streets of the centre create a cooling breeze that blows through the city in the summer. For this cooling effect to work properly, new apartment buildings are positioned so that the breeze can easily flow between them.

Where beaver and red deer meet

The narrow streams that flow from the Veluwe to the Rhine have been widened considerably. The streams run through the city and beyond. Outside the city, the streams are part of a large, continuous nature reserve that consists of stretches of forest that have been extended towards the river. This is where red deer from the forest and beavers from the river area meet.

Clever use of height differences

Height differences on the flanks and of the excess river water are used in a clever way. First, we pump the water upwards. This is collected in lakes on the Veluwe, which act as a “water battery”. It then flows underground through pipes towards a hydroelectric power station. This is called pumped-storage hydropower.



The stream valleys along the flanks extend into the urban area as “green fingers”.

3. The river area

Life in the river area fluctuates with the water levels. This part of the region has slight natural height differences, which have been enhanced in our design. In the lower areas, the river is given all the space it needs, comfortably allowing it to flood its banks during periods with high river levels. Surrounded by the flooded areas historic villages, new mound villages, and various forms of agriculture can be found. The river itself houses hundreds of floating homes — from high-rises and villas to “normal” houses.

Historic village centres surrounded by dykes

Several historic village centres south of Arnhem have been preserved. They are actually below river level but protected by new super-wide dikes. Bridges connect the villages to the city. The villages house bakers, lawyers, and teachers, as you can find rental and owner-occupied homes of all price ranges here.

Water cultivation and strip farming

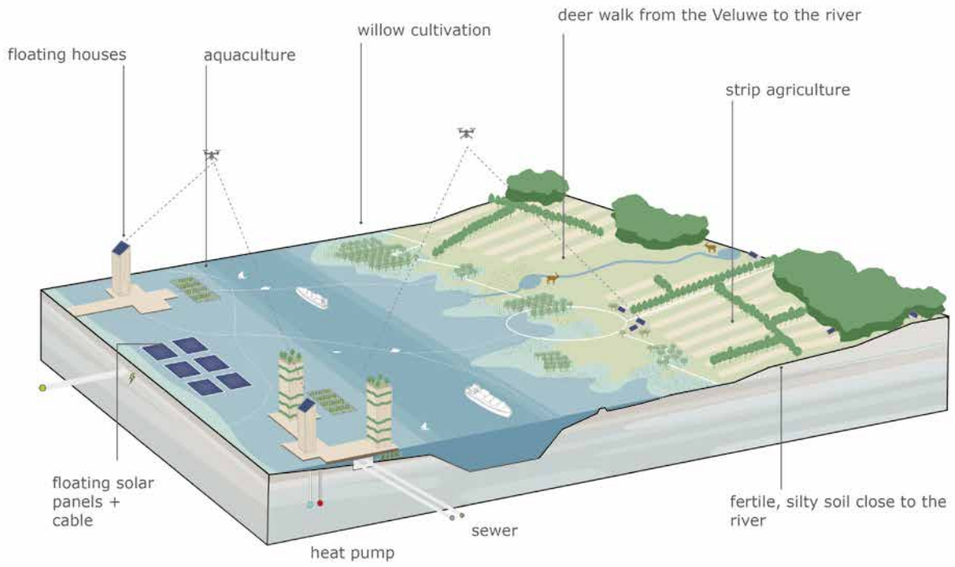
We produce food for the region’s own inhabitants close to villages and local markets. Regardless of whether the area is dry or flooded, we can always grow food here. “Water cultivation” is popular: farmers grow vegetables in floating containers on the water. Strip farming is done on the rich soils of the river area. This type of agriculture allows for all kinds of vegetables and grains to grow side by side on rich, biodiverse fields. Fish farms provide food all year round.

Diverse breeding ground

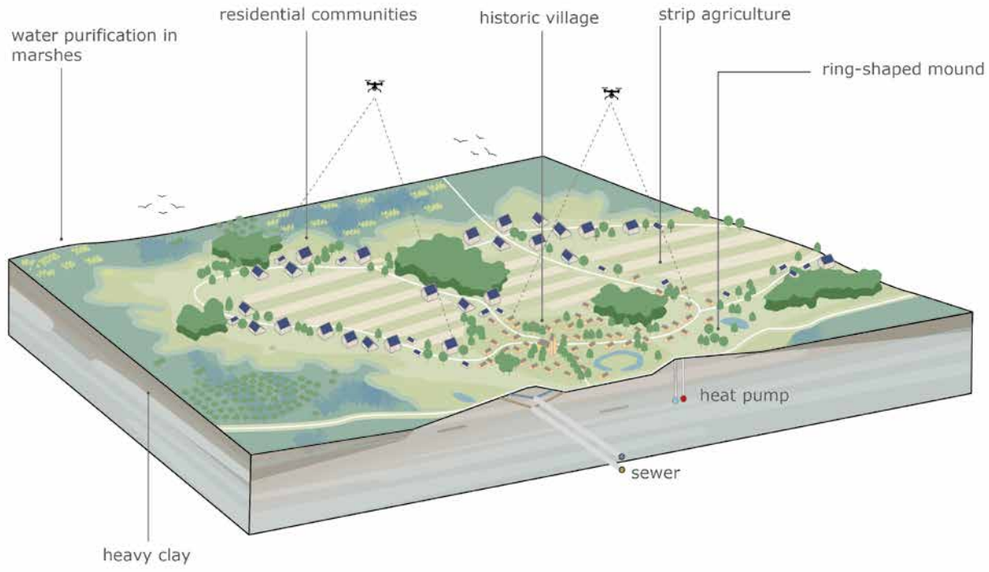
The river area is an urban wetland with many different plants and animals, including otters and herons. Helophyte filters, a natural system of water-purifying plants, have been planted in the marsh on a large scale.

High-tech food production and industry on mounds

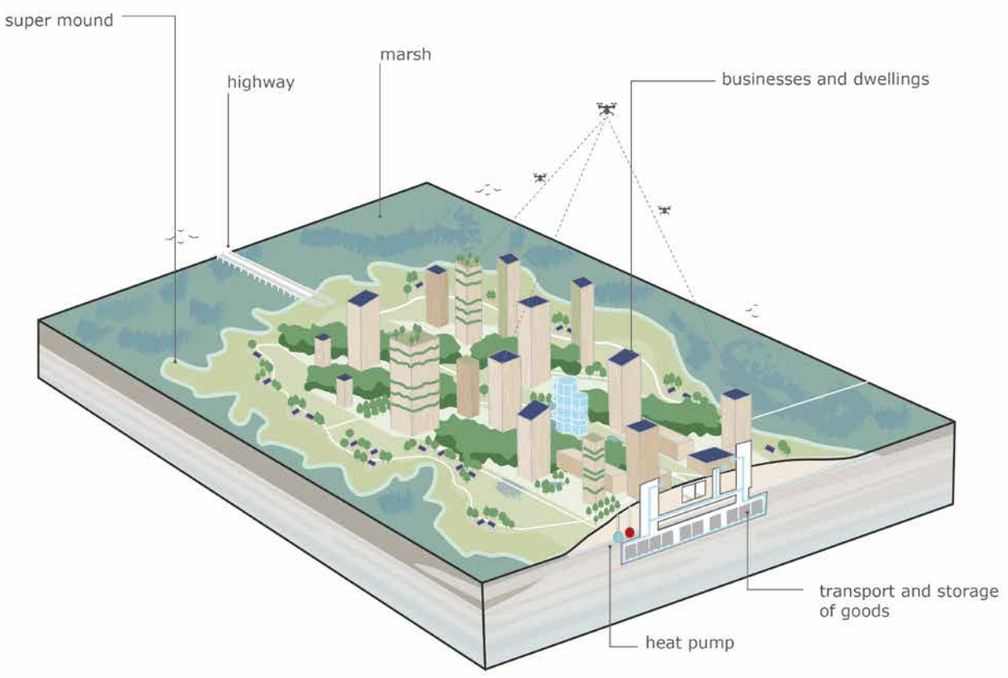
The A15 motorway crosses through the river area, connecting new mounds and largely running over bridges. In addition to housing, the mounds also support vertical urban agriculture and businesses catering to the international market. These companies are connected to Germany and the rest of Europe by the upgraded A15.
Food is grown off the ground here.
Imagine high-tech vertical farms, where vegetables and mushrooms are grown indoors in stacked layers.



People in the river area move along with the dynamics of the Rhine and Waal.



Historic village centres have been preserved in the middle of the river area.



Even super mounds near the river are part of the urban environment.

The year 2120: life in the city

What will life in a Dutch city look like in 100 years? What kinds of houses will we live in? How will we get around? Where will we generate our energy? And what about nature and agriculture? In the following pages, we show you what needs to be considered when designing such a city, based on six themes.

Housing

Two and a half times as many households, smaller dwellings

In 2120, the western Netherlands have become less habitable, as large swathes of reclaimed land have been returned to the sea and the deltas. That is why thousands of Dutch residents have moved to the higher areas, including Arnhem.

More space is needed to house them. On average, a 22nd century Arnhemmer lives in a house of 65 square metres; just over half the living area as in 2021 (113 square metres). Households are also smaller because a relatively higher number of elderly people live in the Netherlands.

Residential towers made of wood
Most people live in apartment buildings and high-rise flats. They are usually built using timber and other natural products. They are insulated with bio-based materials such as bulrush, a plant similar to reed that is grown locally. Houses almost always have solar panels or small-scale wind turbines installed. Rainwater is stored and used for things like watering the green façade of your house.

All kinds of neighbourhoods
In and around the city you will find different types of residential areas that suit the environment and the wishes of its residents. For example:

- Houses from the 20th century and before, in areas high above sea level. The historic city centre and historic villages have been preserved.
- Spacious apartment complexes along the flanks of the Veluwe, with plenty of room for large green areas between the buildings.
- Urban environments on “super mounds” in the river area. These are neighbourhoods where working and living go hand in hand and where people mainly work from home.
- Floating houses on the river, from small houses to water villas and high-rise buildings. You find them grouped together.
- Residential communities in which different families live together near the preserved historic villages in the river area.

Mobility

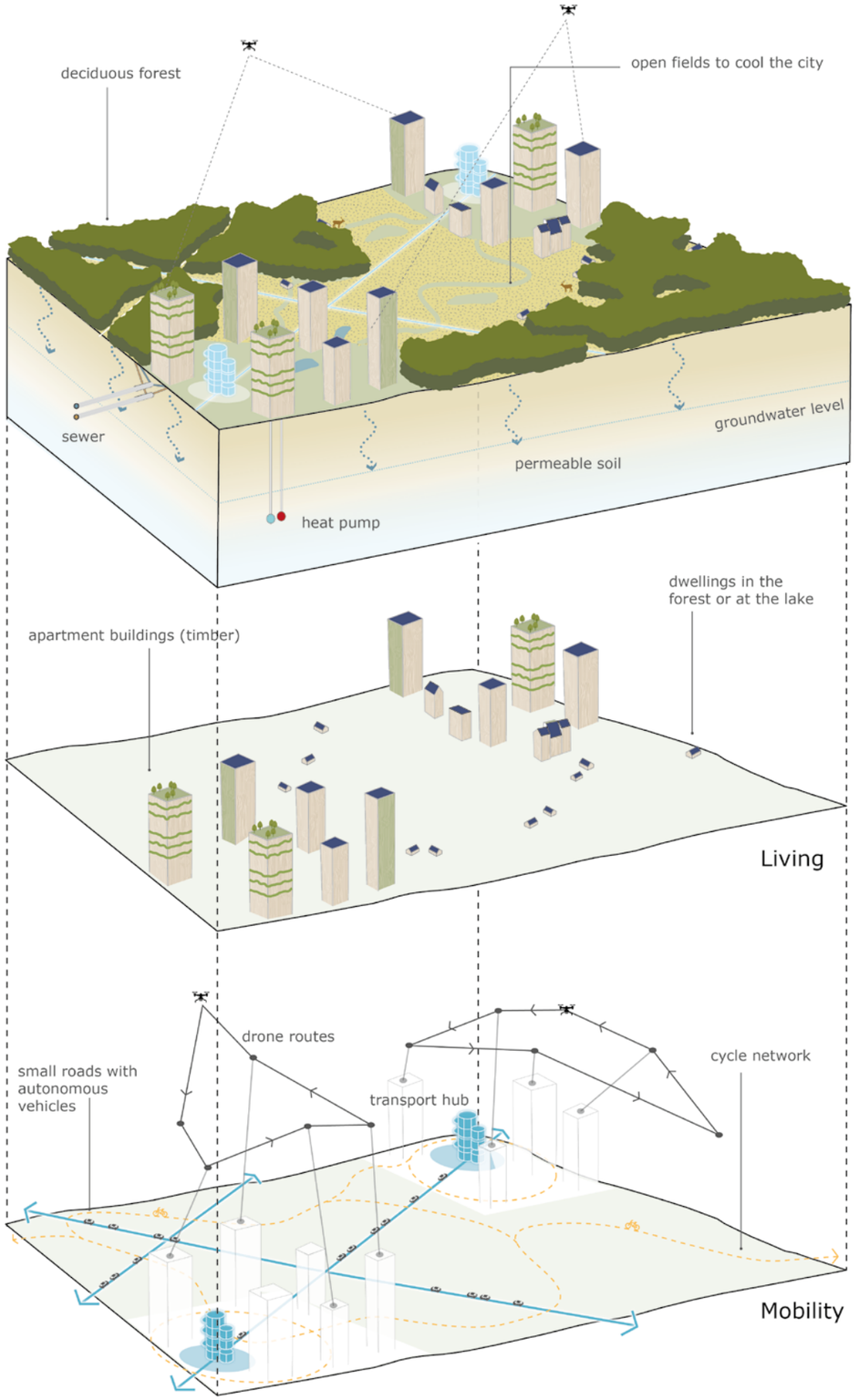
The multimodal mobility system looks like a spiderweb

The mobility system consists of multiple modes: cars, drones, boats, and cyclists. Automated trains and robot boats transport containers across Europe. Different modes of transport comes together at transport hubs. These hubs serve both as charging stations and large batteries. Electric vehicles are used to store and transport electricity. They can “return” electricity from their battery to the grid for use elsewhere. For example, at night, when there is no solar or wind energy.

Self-driving shared cars
Large parts of Arnhem city are car-free. Will there still be cars in the year 2120? Yes, definitely! They are self-driving and belong to everyone. Autonomous cars know exactly how fast the car in front of them is going and always stick closely to their lane. They can drive closer to each other. If you need a car, you can order it with your smartphone. The shared car drives to you autonomously and, after your trip, parks itself at a transport hub outside the city. As a result, as many as 80% of all parking spaces have become unnecessary.

Motorway underground and over bridges
Motorways have been integrated into the landscape. They run underground and over bridges as much as possible, so a highway is no longer a “wall” separating the city from its surroundings. Residential areas and forests are situated on both sides of the roads, resulting in the countryside being just a short bike ride away from the city. The paths between the trees are wide enough for fire engines. This allows us to quickly control forest fires caused by drought.

Drones
Everything from your weekly shopping to an evening gown can be ordered online. Transport drones play an important role in the delivery of all these products. In fact, almost all transport in the city is done by drones. From small parcels to large quantities of goods. Even as a traveller, you can get to your destination by drone: special passenger drones are designed for longer distances.



In the city of 2120, people live and travel in various ways.

City climate

Keeping a cool head

Maintaining a pleasant city centre in the hot summers is a challenge. By interconnecting nature and buildings, built-up areas offer a pleasant climate with sufficient ventilation and shade.

Let the wind blow
A refreshing wind now finds its way to Arnhem, thanks to the stream valleys. These valleys carry cool breezes from the Veluwe to the city streets. New residential areas are designed in such a way as to create “ventilation corridors” from east to west. These “corridors” guide the fresh breeze into the neighbourhoods. Height differences in the streams are used to make small waterfalls. The splashing water also cools the air.

Green is the new black
Asphalt retains a lot of heat. That is why we have removed it from the city as much as possible. With almost all parking spaces gone, children can play in the street surrounded by greenery. Walkers and cyclists can travel in the shade of trees and solar panels. Climbing plants grow against the walls of tall buildings. Roofs are covered with mosses and other low vegetation. All this also contributes to biodiversity.

Going for a walk
Urban dwellers now live in a much greener environment. No matter where your house is, nature is all around. You can take a stroll through the greenery after work, or go kayaking from your floating village.

Energy

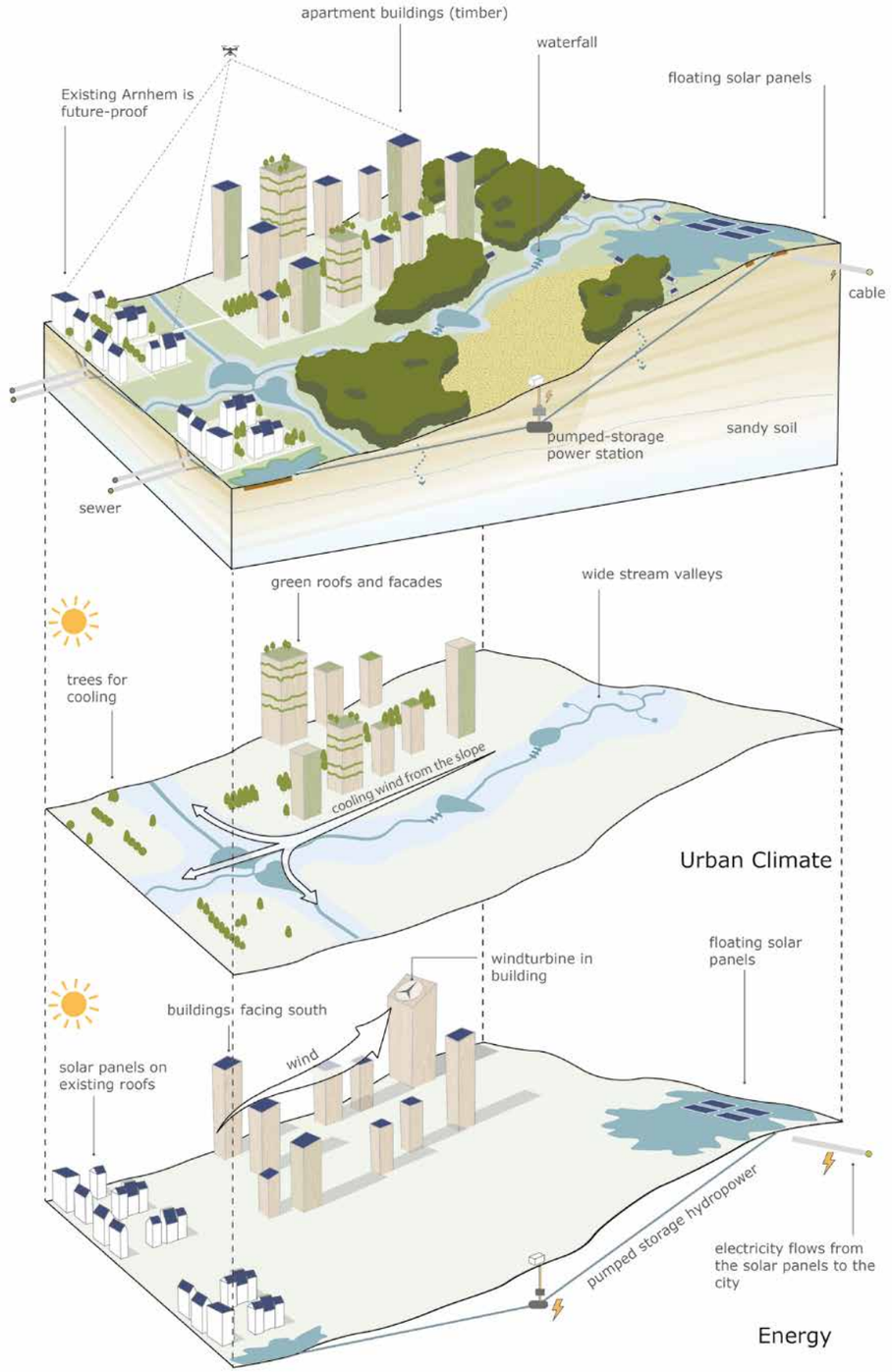
Sun, wind, water, and...?

We are all using an increasing number of clever technical gadgets, causing a growing demand for electricity.
A household used an average of 3,000 kWh of electricity per year in 2021. That quantity will have more than doubled in 100 years. Fortunately, in the future we will use the energy we generate more efficiently. Buildings are well insulated, and we only use what we really need.

Energy from sun, wind, and soil
Solar energy comes from solar panels on buildings, new lakes, and motorway coverings. They can also be installed in the road surface, e.g. to generate electricity for street lighting. Large wind turbines are located in the most elevated areas. Smaller turbines have been included in the design of tall buildings. Heating for homes and other buildings is generated by heat pumps above and below ground. In summer, we use the heat pumps to cool the buildings.

Hydropower
Hydropower offers opportunities as an energy source. The Veluwe lakes, the underground pipe system, and the hydroelectric power station supply the city with electricity when the demand exceeds what the sun and wind can provide. Pumping water up from rivers also requires electricity, so we only do this when there is a surplus of solar and wind energy.

Generating and storing enough
Heat pumps, geothermal heat, wind turbines, and solar panels help the city generate its own energy. But this is probably not enough: so what do we do then? Admittedly, that’s not an easy question. Solar and wind energy are the two most important energy sources in our scenario, because they are the main green sources we know today. But what do we do when there is no wind and it’s cloudy for days on end? For those periods, we need to make use of energy stored in places like water batteries and transport hubs. Additionally, new technologies – we have to invent them still – will be needed to enable greater power generation and increased energy storage capacity.



We use the height differences in the region to keep the city cool, as well as to generate energy.

Water

The city as a sponge

It may sound strange, but in 100 years the climate will be *both* wetter *and* drier. While the river area regularly experiences a surplus of water, the high sandy soils are very dry. This is why the city has been designed as a "sponge": every drop of water is put to use.

Water surplus in the river area
Close to Arnhem, the Rhine and Waal rivers are at about 7 metres above sea level. As the sea level rises, the elevation difference between river and sea decreases. This makes the rivers run more slowly. A calm river leads to more sand, clay and pebbles sinking to the bottom. As a result, the Rhine and the Waal are becoming shallower. To prevent them from overflowing, we need to make them wider.
In addition, more water will flow through the rivers than today. The amount of river water fluctuates considerably throughout the year and is difficult to predict in the short term.

Taking the shallower rivers and higher water levels into account, you will realise that we need to free up a lot of space for the Rhine and the Waal. The two rivers share a contiguous buffer area of about 10 square kilometres for excess river water to spill onto when it floods.

Drought on sandy soils
Coniferous forests have been replaced by deciduous forests and open grasslands to combat drought in the Veluwe. They need less moisture, and less water evaporates from them. This allows more water to infiltrate into the ground and in turn, the groundwater supply is better maintained.
The manmade creeks in the Veluwe are still there. These creeks bring groundwater to the surface. New ponds ensure that these streams do not drain too quickly. The connected ponds are positioned at different heights. As a result, the water flows downward more slowly: on its way down, the ponds retains the water temporarily. This stored pond water can be used during periods of drought.

Biodiversity and Agriculture

Paradise for plants and animals

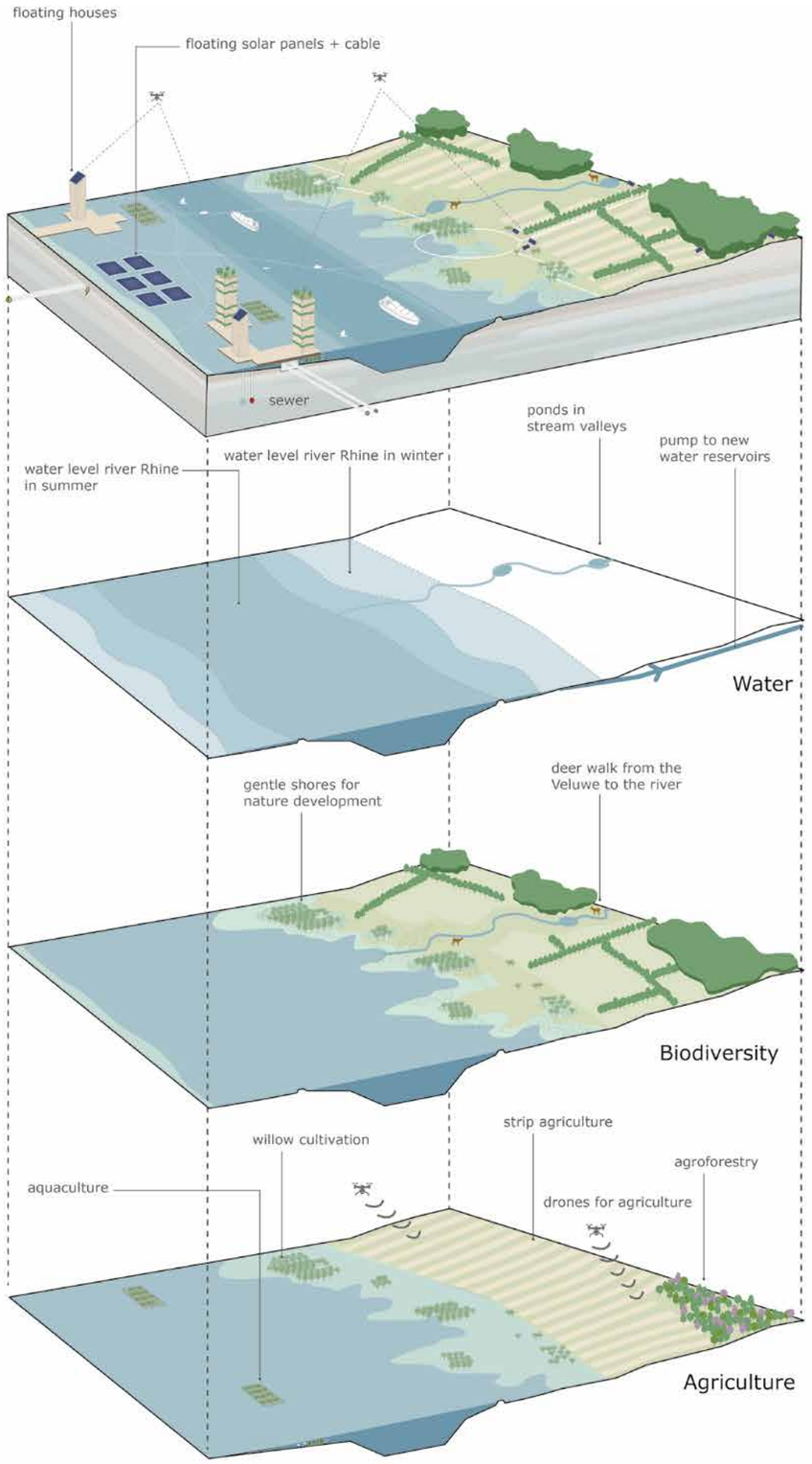
Many Dutch nature reserves that were lost in the 20th century have been fully restored. European countries decided in 2020 that at least 30% of the territory in each country should be allocated as protected nature reserve. In the Arnhem region this means an area of 3,000 hectares.

Connected habitats
From an ecological point of view, the wet and dry landscapes have become one contiguous habitat. This is to the animals' delight, as they now have better chances for survival in this area. In the new Arnhem region, red deer move freely between forest, heathland, and river area.

Unique European nature reserve: the delta
There is more room for delta nature that follow the dynamics of the river: water, willows, marshy grassland and wetlands. A setting like this has great value and is unique in Europe. This marshy natural area has drier and wetter sections. Vast floodplains line the riverbanks. They flood occasionally, and serve as nesting grounds for birds and fish.

Productive nature
Throughout parts of the river area, water purification and the production of building materials go hand in hand. Bulrush and wood from forests along the rivers are used to build houses. Willows and reeds are also natural building materials: for example, willow is suitable as a floating foundation. The same willow trees and reed plants purify the water used for agriculture.

Agriculture: high-tech and biodiverse
Thanks to new robot technology, agriculture takes place on a smaller scale and more efficiently. Large agricultural vehicles are no longer needed; special drones fly over the fields to give crops exactly the required amount of water and nutrients. Fields are separated by hedges and flower strips. They are important nesting places — for insects, for example, which help to prevent diseases, weeds, and pests. This allows for all kinds of vegetables and cereals to grow side by side in the fields. These rich, biodiverse fields are cultivated in strips. From the air, the landscape looks just like a layer cake!



The design is based on the potential of nature. In and around the city of 2120, there is room for water, nature, and agriculture.

Can you picture it? We can!

We look forward to your reaction to this future scenario. What amazes you? What raises questions? And what might make the hairs stand up on the back of your neck?

It’s a lot to take in, of course. High-rise buildings on the Veluwe, robotisation of agriculture, a contiguous natural area from forest to river. Floating villages, narrower and greener roads, wind tunnels, transport hubs outside the city, wide stream valleys instead of air conditioning, wind turbines and solar panels everywhere...

You could also use the 5 key principles for the city of 2120 (see the page on the right) to create a different design. What would that look like for your city? Whatever choices we make, we will have to find solutions to the underlying questions raised in this story together. Questions about housing, energy, the urban climate, and mobility. And questions about nature, water, and agriculture. Although these may seem like questions for the distant future, they are already relevant today. Every choice we make today, and every shovel that breaks ground needs to take our future into account.

What are the next steps?
The story of the city of the future is a story by us and about all of us. Feel free to share this future scenario with others close to you. And talk about it with others: with colleagues, friends, neighbours, and your children.

Do you have a question or comment? Send them to us at arnhem2120.nu.

Want to read more?

An online version of the *Netherlands 2120* scenario can be found on the WUR website. Scan the QR code ▸

Or watch the short video ▸

Five guiding principles

The five guiding principles serve as the foundation for this exploration of the future. These principles are based on those of the *Nederland 2120* scenario. We have applied them to the urban environment.

Nature-inclusive: the landscape is the basis

The natural system rules. We do not use technology to dominate the landscape, but to work together with the natural environment. For example, we make use of differences in altitude, local wind currents, and soil types.

The water in and around the city is optimally utilised

Water reaches Arnhem from rainfed creeks and via the river Rhine. In the city of the future, water is stored, filtered, preserved, and reused. Excess water flows into reservoirs — like large ponds — around wide streams between the Veluwe and the city. This means we will have sufficient water available during extremely dry periods.

The city is circular and climate-positive

You won’t source things from far away, when you can get them around the corner. This is why we use and reuse local raw materials first. For example, marsh plants for thatched roofs or locally grown wood to build floating houses. The air is clean: we clear more greenhouse gases from the air than we emit (“net-zero emissions”). Renewable energy is generated and stored locally. Energy solutions make use of the opportunities offered by the landscape.

People live in a vibrant city, with room for everyone

Arnhem is bustling! The city is a desirable place to live and filled with possibilities, no matter what your situation or budget is. We are creating a social city in which everyone participates. This means that there are many different residential areas and modes of transport. In other words, Arnhem has something to offer for everyone.

The urban environment offers good quality of life and keeps people healthy

Even if the Earth is warmer, Arnhem is a pleasant place to be. The city is green, the air is fresh, and there is plenty of space to get a breath of it. In the morning, you wake up to the sound of birds. And at night, you don’t need air conditioning for a good night’s rest.

Accountability: How did this report come about?

"The city of 2120: all natural!" was written by our team of researchers from Wageningen Environmental Research and the Landscape Architecture chair group at Wageningen University. The story is based on scientific knowledge and insights from various disciplines.

How did we go about this? First, we looked at which landscape types and sub-areas characterise Arnhem and its surroundings. We did this based on a literature study and an extensive landscape analysis. In the study, we focused on seven themes: geomorphology and water, urban climate, housing, energy, mobility, nature and biodiversity, and agriculture and circularity. We translated the findings into a landscape map, with the most important current features, opportunities, and risks for each sub-area.

We also made an overview of the expected trends and forecasts for the distant future for each theme. Based on this, we formulated key principles for the scenario. In this scenario, for example, Arnhem has more than 2.5 times as many households as it has now. Climate change information is based on the Royal Netherlands Meteorological Institute (KNMI) climate scenarios. We also translated the principles drawn up earlier in the *Nederland 2120* vision to an urban context.

We also developed possible solutions and the space they would take up.
If we need 100,000 new homes, will there be enough room for them? How can we generate energy locally for new and existing dwellings and how much space do we need? We calculated these and other types of land use. And what did we conclude? We do not have enough land area to implement all solutions side by side. That is why we looked for integrated solutions, using the land in a multifunctional way.

The landscape architects in our team combined the knowledge from the various disciplines and designed the possible solutions in the vision for Arnhem 2120 you are currently reading. We first made a basic design and then refined it. This is how we came up with the future image as a map, the subdivisions for each area, and the photorealistic 3D visualisations (pages 6 and 7).

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Publication information

This study was made possible by the management board of the Environmental Sciences Group, Wageningen University & Research and, with regard to communication and roll-out, by the TKI project *"Natuurlijk Basissysteem Klimaat Adaptieve Stedelijke Ontwikkeling"* (natural base system for climate adaptive urban development) (BO-60-003-004), in collaboration with the province of Gelderland.

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With the assistance of: Simone Verzandvoort, Tom Harkema

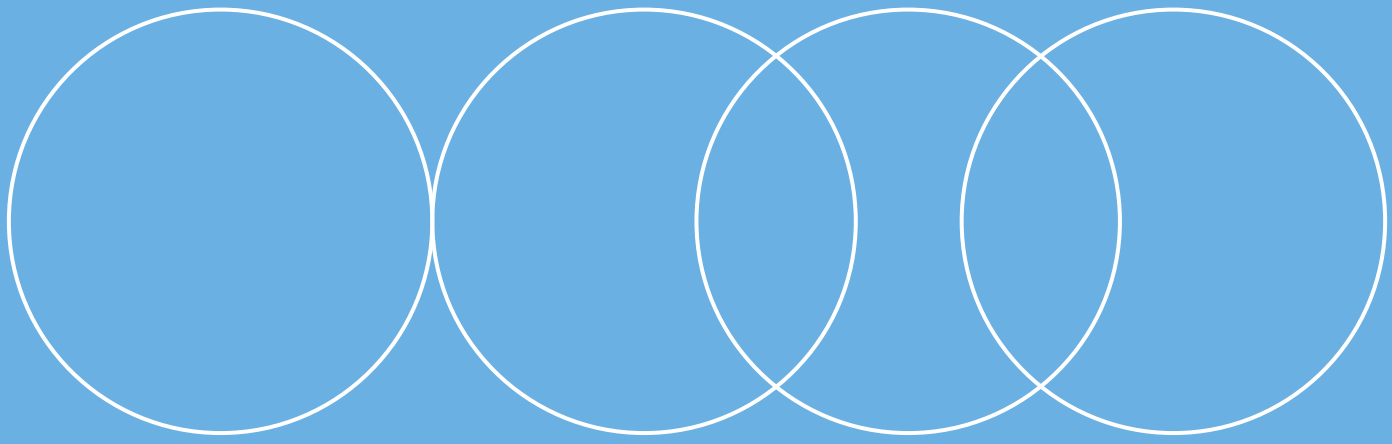
Editor: Susanne Geuze

Design: Identim

Printing: Zalsman

www.wur.eu

https://doi.org/10.18174/565412



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