Gemeente Amsterdam

Amsterdam Climate Neutral 2050 Roadmap

Phase 1: An invitation to the city

There's only one moment to be on time

15 Januari 2019

Invitation to the city

Following a year in which one weather record was broken after another, Amsterdam City Council is launching the Amsterdam Climate Neutral 2050 campaign. With this programme, we are taking an irreversible step towards ridding the city of harmful CO_2 emissions for good.

We have identified the major building blocks that are needed to create a climate-neutral city, and we know what we want to achieve. But we cannot do this alone. We are calling on you, the people of Amsterdam, to share your ideas and initiatives. How can we work together to make this happen? What do we need from each other? What shall we agree to do?

In the coming months, we will organise meetings, discussions and events across the city. We will make a list of everything that is already happening and the plans that you are proposing, and we will draw up collaboration agreements. By the end of 2019, this should result in the Amsterdam Climate Neutral Roadmap 2050. This document will outline our activities and our goals, what we need to achieve them, how we are going to achieve them, and who the main actors are. One important part of the Roadmap will be a local Amsterdam Climate Agreement with our partners in the city, detailing specific agreements for the coming years and beyond. Independent auditors will be commissioned to assess the plans and verify that the proposed actions will be sufficient to reach our intermediate and end targets.

But there's more. We will not only work with you to draw up the Roadmap, but we will also invite you to work with us to implement it. Everyone will have the opportunity to get involved. In the end, making Amsterdam carbon neutral will be the sum of many different initiatives, large and small. Together we will start a movement; together we will make Amsterdam Climate Neutral.

There's only one moment to be on time

For a long time, climate change was not at the forefront of many people's minds. Its significance only dawned on us slowly, as we read the bleak scenarios projected by climate scientists and watched Al Gore's documentary film An Inconvenient Truth. It's likely that most of us only started to realise the full implications of the impact of climate change when the historic Paris Climate Agreement was signed in 2016.

The earth's climate seems to be in total disarray: increasing heat and drought one month, heavy rain and violent storms the next. Our weather forecasters report one weather record after another, attributing this to global climate change in no uncertain terms. Climate change and the approaching end of the fossil-fuel era have also started to make themselves felt in our homes, in the form of higher energy bills.

In 2018, the Netherlands launched discussions to draft a National Climate Agreement. Amsterdam also welcomed a new Mayor and Cabinet at that time. The new administration has seized this opportunity to broaden and accelerate the transformation towards a carbon-neutral and natural gas-free city. Amsterdam wants to kick-start an irreversible process to completely and permanently eliminate all CO_2 emissions, by switching from coal, oil and gas to 100% clean energy. It will be a transformation the like of which has not seen since the industrial revolution.

The situation might be compared to the challenges faced by Amsterdam in the late 19th century, when a structural improvement in hygiene conditions was needed to combat disease and epidemics. Between 1832 and 1866, Amsterdam suffered three outbreaks of cholera, claiming thousands of deaths. To put an end to these epidemics, the city installed new sewers, clean running water and social housing for thousands of people over the course of a few decades.

But the challenges we are facing today are different. The municipality cannot make the transition to a carbon-neutral city on its own. We need everyone to contribute. We want to make it easy for all citizens of Amsterdam to get involved and participate, regardless of income or education, by asking them what they need, sharing knowledge and supporting constructive plans. All this will enable us to improve the insulation of our homes, use new methods for cooking and heating, and adopt new ways to move around the city. As the municipality, we will lead by example.

But more than this needs to be done, of course, to achieve our goal of making Amsterdam climate neutral by 2050. We will work with our partners, neighbourhood by neighbourhood, to help households make the transition from natural gas to sustainable heating sources. We will also consult with Amsterdam's industries to explore sustainable solutions. Where needed, we will provide financial support. The city needs to rise above itself and look beyond its borders, improve the collaboration with neighbouring towns and villages, and exert its influence on central government in The Hague to lobby for the right decisions.

We are embarking upon an adventure; an exploratory journey in which the municipality will set the framework, but leave plenty of room and support for experimentation. In this way, we will be able to find out what works and what does not. There is never one single solution; if there were, the path ahead would be straightforward. Thus, for every decision, large or small, we will need to use our judgement on how we can best serve the climate and the city.

The legendary footballer Johan Cruijff once said, 'There is just one moment when you can be exactly on time'. That moment is now. If, by 2050, we want to retain the same pleasant city that we have today, with the same quality of life, we have to start acting now. To build a city with plenty of living space, thriving communities and fresh air. A city where the lights still come on when we need them, where everyone has a warm home when it's cold outside, and where a smart power grid will store and deliver sustainable energy as and when we need it. A city where our children and grandchildren will thrive. A city of which we can be proud.

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City of Amsterdam, 15 January 2019

Introduction

The Amsterdam Climate Neutral 2050 programme

If we want to maintain the quality of life in our city for future generations, we need to reduce CO_2 emissions in Amsterdam by 95% by 2050, relative to 1990 levels, as well as completely phase out the use of natural gas before 2040. To achieve these ambitious targets, the city has set up the Amsterdam Climate Neutral 2050 programme. The carbon emissions that pollute Amsterdam's air are caused by the use of energy for homes, businesses and transport. In order to become a climate-neutral city, we need to achieve an energy transition; a structural transformation of our energy system in which we stop using fossil fuels such as oil, gas and coal. This means that the city's residents, businesses and visitors will need to reduce their energy consumption significantly, and that the energy they do use is sustainable. This will only be possible if we take Amsterdam off the natural gas grid by 2040.

In addition to energy use, other practices also have a big impact on our CO_2 emissions and hence on the climate. These include the materials used in manufacturing and construction; the consumption of meat, dairy and other foods; and the waste we produce. Our habits do not only cause CO_2 emissions in Amsterdam, but also in other parts of the world. In order to tackle this issue, Amsterdam has set up an ambitious programme to realise a circular economy by 2050, recycle waste as a renewable resource, make manufacturing circular, introduce sustainable designs for products and buildings, and share more of the things we use. We need to make our economy circular in order to achieve international climate targets.

While bearing these related issues in mind, the focus of the Roadmap will be firmly on the energy transition, and on getting things moving here and now. We will always seek measures that not only contribute to reducing CO_2, but also help to create an attractive city with a great quality of life, space for children to play, plenty of green space, clean air and less waste.

Transformation

We know that the city needs to become climate neutral, and that a transformation is required to achieve this. But we don't know what the path to our end goal will look like, except that it will be long and bumpy, and full of obstacles, detours and dead ends. The plans we are proposing today may look different when we develop them tomorrow, and new initiatives may be taken on our journey. It's important to try new things and experiment, especially in the beginning. Not all of the experiments will have the desired effect, but that is part and parcel of the programme. The key thing is that we start an irreversible process to drive structural change: a transition to a clean, green city that uses only sustainable energy. More and more parties are getting involved in this process, including businesses, public sector organisations, housing corporations and private homeowners. This small group of frontrunners will rapidly have to grow into a larger movement. Ultimately, everyone will need to contribute to the transition to becoming a climate-neutral city.

Goal:
Reduce CO_2 emissions in Amsterdam by 55% in 2030 and by 95% in 2050

Collaboration

None of the participating parties can achieve this transition on their own, not even the municipality. We therefore need to collaborate: with parties within Amsterdam, but also with the Dutch government and with partners in the region. That is why Amsterdam is actively taking part in a range of different committees and steering groups at the international, national, regional and local levels. At the same time, we are also buckling down and taking action now, rather than waiting for the outcomes of the negotiations conducted in these groups. The municipality wants to lead by example, and that is why we are driving the transition to zero emissions within our own organisation. We also have significant influence on plans for new housing developments, and we will ensure that the city's growth does not add to the task at hand.

In areas where we have less influence, we will encourage stakeholders to join us, for instance by supporting them financially. If needed, we can also introduce regulations and use special powers to compel collaboration. We will take the initiative to negotiate clear agreements on CO_2 emissions, and work with them to reach those targets. We also see it as our task to advise residents, businesses and other stakeholders, put them in contact with each other and encourage them to take action. The bottom line is that everyone who seeks help, will get help. We can help to realise effective initiatives by creating planning space, offering favourable conditions and removing any obstacles. We also see it as our task to set minimum requirements to ensure targets are met, but at the same time to challenge everyone to exceed these targets and achieve even more.

We want to set an irreversible process of structural change in motion: a transition to a clean, green city that runs on sustainable energy alone.

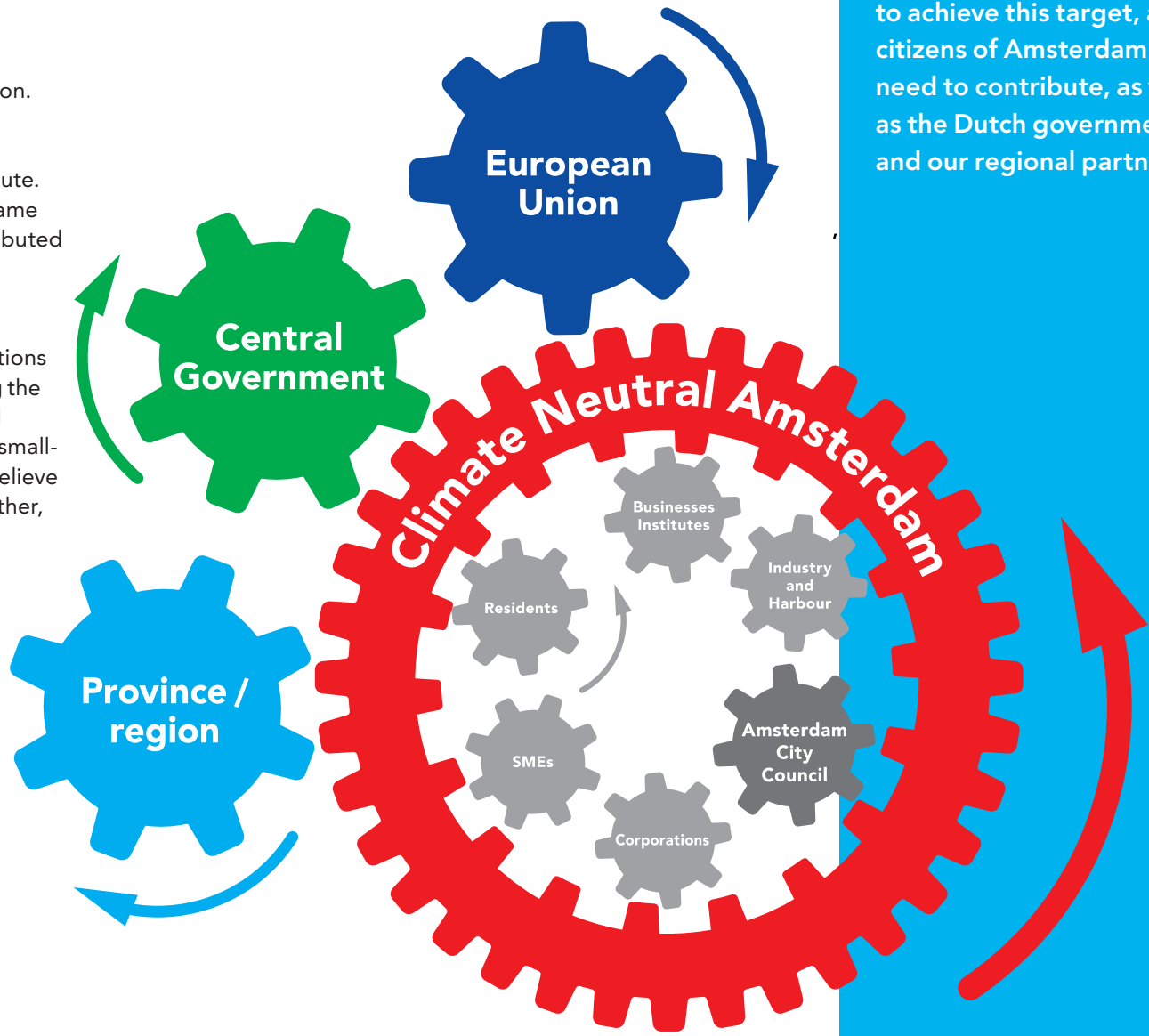
Collaborative principles

On such a long, winding path, we run the risk of losing sight of one another. It is therefore important to propose a number of collaborative principles that we see as essential for collaboration.

1 Climate justice
In order to reach the targets, everyone will need to contribute. Our central principle is that the 'polluter pays', but at the same time we will ensure that the benefits and burdens are distributed fairly.

2 Large and small
We will focus on realising a number of large-scale interventions that are specific to Amsterdam's situation, such as building the infrastructure that's needed to achieve sufficient scale and speed. On the other hand, we also believe in the power of small-scale initiatives that are realised from the ground up. We believe the two approaches will complement and reinforce each other, and both are needed for a successful transition.

3 Room to experiment
We will create room for experimentation and innovation. We will show the necessary flexibility to adjust or accelerate plans and initiatives, and we expect our partners to do the same.



The ambition is to reduce greenhouse gas emissions by 50% by 2030. In order to achieve this target, all citizens of Amsterdam need to contribute, as well as the Dutch government and our regional partners.

Context

In December 2015, the UN Summit on Climate Change marked the historic moment when 195 countries, including the Netherlands, signed the Paris Climate Agreement. The signatories agreed to take action to limit the rise in temperature to 1.5°C above pre-industrial levels. This means that the use of fossil fuels, a major cause of excessive CO_2 emissions, will need to be phased out rapidly. To achieve this, we need to take measures at all levels, ranging from the individual citizen to regions and nations.

Fortunately, we are not starting from scratch in Amsterdam. For years, residents, businesses and public sector organisations have worked with the municipality to save energy and generate sustainable energy. Eighty-nine per cent of people in Amsterdam say they feel a shared sense of responsibility for sustainability. More than 50% have already taken action to promote sustainability. Everyone who wants to invest in sustainability can apply for a loan or subsidy from the municipality. In 2017, the municipality lent 20.8 million euros for sustainable investment in the city and granted a total of 2.4 million euros in subsidies for sustainable initiatives. Fifteen neighbourhoods are currently developing initiatives to switch from natural gas to sustainable sources. Housing corporations have improved the energy efficiency of 11,000 homes. And since 1 January 2019, all energy used by the municipality has come from sustainable Dutch sources.

Last year, central government in The Hague introduced the so-called 'climate tables' or climate talks. At these talks, the government negotiates with various stakeholders from the mobility, industry & harbour, built environment, electricity and agricultural sectors to agree on their contributions to the climate agreements. There were also regional talks with large-scale industry clusters and their partners. Amsterdam participated in the regional North Sea Canal Area talks to negotiate agreements with large companies such as Akzo Nobel, Tata Steel and the Port of Amsterdam. It is expected that these agreements will be ratified in the Dutch Climate Agreement in the first half of 2019.

The national agreements will subsequently be developed into practical Regional Energy Strategies (RES). Amsterdam forms part of the North-Holland South Regional Energy Strategy area, together with the municipalities in the Amsterdam Metropolitan Area and the Province of North Holland. This RES will set out how much energy will be derived from solar, wind and sustainable heat sources, and how much space this will require.

89%

of Amsterdam's residents feel that they share responsibility for sustainability

What are the issues?

The statistics

If we want to maintain the quality of life in our city for future generations, we need to reduce CO_2 emissions in Amsterdam by 95% by 2050, relative to 1990 levels, as well as completely phase out the use of natural gas before 2040. At present, more than 4.5 million tonnes of CO_2 are emitted in Amsterdam each year. In 1990, the figure was 3 million tonnes. The first target is a 55% reduction by 2030, which means a reduction of 3.2 million tonnes over a period of 12 years. Various measures have resulted in an increase in the production of sustainable energy in Amsterdam as well as nationally, while energy use per capita is falling – and that is good news. In recent years, however, the city has grown significantly (around 10,000 new residents each year), and that is why total CO_2 emissions have stayed level since 2012. To meet our targets, we will therefore need to make a transition.

Five sectors

Similar to the national level, Amsterdam has identified a number of sectors where this transition will need to take place. They are the built environment, mobility, electricity, and industry & harbour.

The Built Environment covers existing and planned housing and offices in the city, but also schools and hospitals, for example. The built environment is responsible for 28% of total CO_2 emissions in Amsterdam. The challenge for this sector is to use as little energy as possible, as well as ensuring that the energy we need (for cooking, heating and warm water) is sustainable.

Mobility on Amsterdam's roads causes 9% of all emissions, a figure that's doubled if one also includes provincial and national roads within the city limits. The challenge is to transport people and goods without emitting any CO_2.

Electricity includes the sustainable generation of energy and the construction of a reliable energy infrastructure. With 51% of CO_2 emissions, this is the sector with the largest share of emissions.

Industry & Harbour involves the development of a sustainable industrial cluster that will provide sustainable energy for Amsterdam. Its share of total CO_2 emissions is 11%.

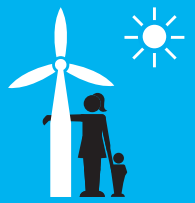
The municipality thinks that it is important to lead by example, which is why we have added our own organisation as a fifth sector. Our share of total CO_2 emissions is roughly 1%.

A transition for each sector

The route to zero carbon emissions is different for each sector: every sector will follow its own transition path. Achieving a fully carbon-neutral built environment is still in the early phases, for example, and will take longer to realise than the transition in mobility. Weaning our infrastructure off natural gas will take a lot of organising, learning and experimenting. In the coming years, we will have to take things step by step, neighbourhood by neighbourhood.

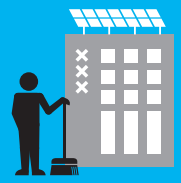
The Built Environment

Mobility



Electricity

Industry and Harbour



The Municipality

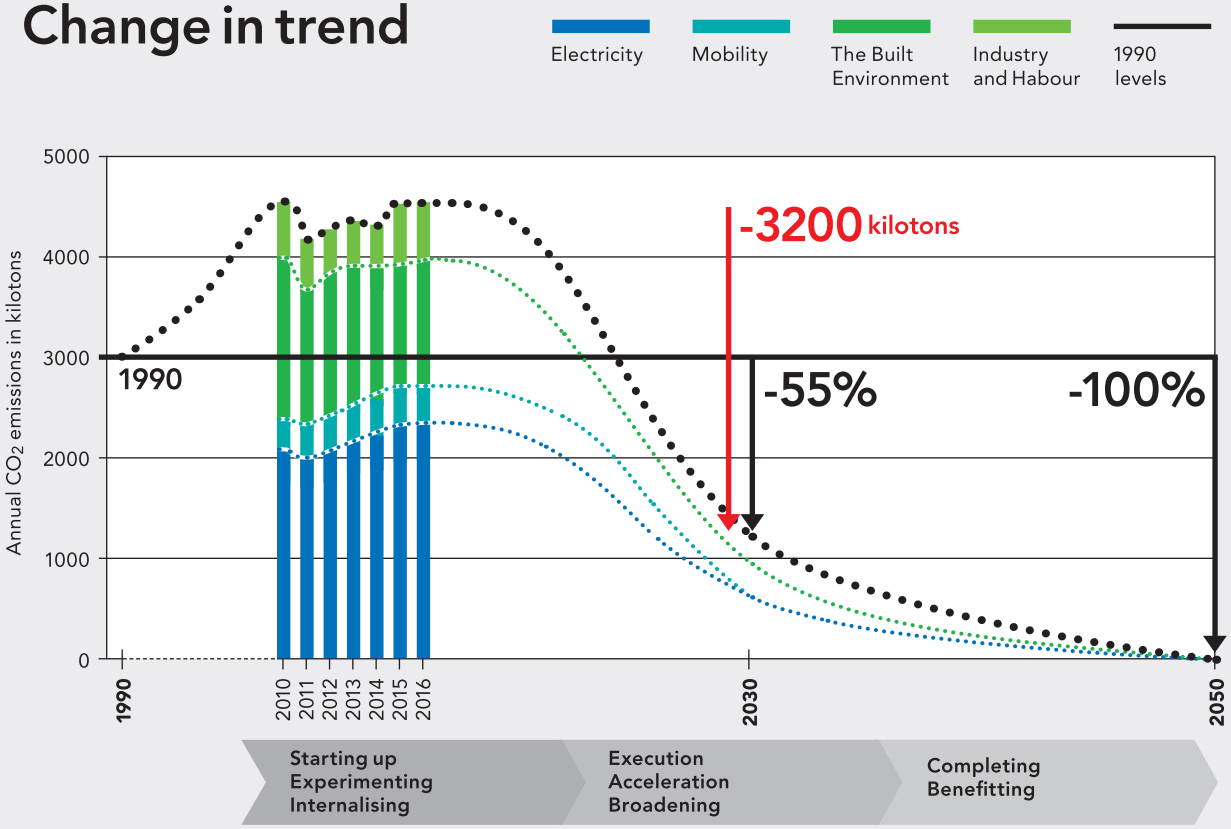
The transition within the Electricity and Industry & Harbour sectors is highly dependent on measures that need to be taken at the level of the EU, the national government and within the private sector. It is likely that the transition to carbon-free mobility in Amsterdam can be realised relatively quickly. The municipality, research institutes and private-sector actors have already introduced various measures and experiments, such as stimulating cycling and car-sharing, reducing the number of parking spaces, setting up car-free zones and investing in thousands of charging stations for electric transport. We must now ensure that the switch to zero-emissions traffic is accelerated and expanded across the entire city.

Different roles

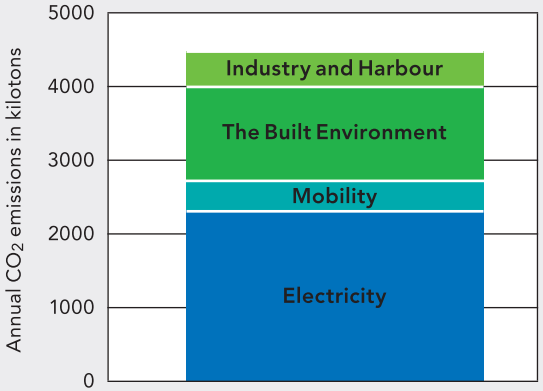
The five sectors have different roles to play in the transition, too, and these may change over time. Naturally, the municipality will be primarily responsible for making our own organisation climate neutral. As we are in the driver's seat, we are aiming to make the switch to becoming carbon-neutral and natural gas-free before 2030.

In the Built Environment sector, we have considerable influence on the requirements for new buildings. As the municipality, we can attach conditions to the granting of land and challenge tendering parties to build as sustainably as possible. The situation is different for the existing built environment, however, as we are highly dependent on partnerships with property owners such as housing corporations, owner occupants, owner associations and commercial property investors. This part of the transition will require significant investment from property owners, energy companies and grid operators to make the built environment more energy-efficient, stop using natural gas and provide sustainable heating. In many cases, it will also be necessary to make significant modifications to the buildings themselves, to guarantee the health and safety of residents and users. Other complicating factors include the great diversity of the built environment and the

Change in trend



Total carbon emissions for each transition sector



Currently we emit more than 4.5 million tonnes of CO_2 in Amsterdam annually. In 1990 this was still 3 million tonnes. The first target is a 55% reduction in 2030, which is a reduction of 3.2 million tonnes over a period of 12 years.

large number of parties involved. The municipality wants to play a leading role in this, actively promoting the transition to a carbon-free built environment and making a substantial effort ourselves.

In the Industry & Harbour sector, private-sector parties will need to take the initiative, supported by measures from the EU and the national government. Amsterdam City Council will mainly focus on creating closer partnerships with the Industry & Harbour sector, encouraging good conduct and, if necessary, imposing stricter enforcement of national regulations.

We expect that it will be possible to realise the transition in mobility relatively quickly by means of market innovations and development. The municipality will facilitate this process by investing in the required infrastructure, introducing regulatory measures such as environmental zones, and supporting new initiatives with subsidies or other forms of support.

Amsterdam can only generate a limited amount of electricity within its own borders. For the most part, renewable electricity will have to be imported from outside. The rate at which the city will be able to start generating its own wind and solar energy will also be highly dependent on national and regional policies and regulations, as well as energy taxes. The municipality's primary role will be to promote sustainability in this sector.

Carbon accounting

All of the actions and initiatives described in this document will have an impact on our annual carbon emissions. Some will have an instant effect, others will take longer. Some will be big, others small. To ensure we remain on target, we need to be able to assess these effects. We asked the Delft-based environmental consultancy agency CE to calculate the effects of some of the proposed initiatives. Here are a few examples of potential CO_2 reductions:

- If we switch all existing and new homes from natural gas to sustainable heating by 2040, this will deliver a carbon reduction of around 370 kilotons, almost 30% of current emissions in the Built Environment sector.
- If the national government and other parties carry out the agreed plans to move to a cleaner electricity system, this will reduce carbon emissions in Amsterdam by 1.2 million tons, which is 51% of current emissions in the Electricity sector.
- If Amsterdam installs solar panels on all suitable roofs, this will reduce carbon emissions by roughly 440 kilotons. If we add 67 megawatts-worth of wind turbines, this will result in a carbon reduction of around 100 kilotons. By producing sustainable energy, Amsterdam will both contribute to a cleaner national electricity system and reduce carbon emissions from electricity used in Amsterdam itself.
- If all mobility in Amsterdam (motorised traffic on Amsterdam's roads, excluding motorways and provincial roads) becomes emissions-free by 2030, this will reduce carbon emissions by around 360 kilotons.
- If the coal-fired Hemweg power plant is replaced by sustainable sources, this will reduce carbon emissions in the Netherlands by around 4,500 kilotons. We will benefit directly from this in Amsterdam, because the national electricity grid will become more sustainable.

The final version of the Roadmap document will outline all intermediate and end targets and the corresponding actions and initiatives. To make sure we stay on track, we will calculate the carbon effects and assess where we are in relation to our targets.

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The Built Environment

CO_2 emissions

1270 kilotons

Share of total CO_2 emissions

28%

Role of municipality

Large

Built environment already natural gas-free

13%

The Built Environment

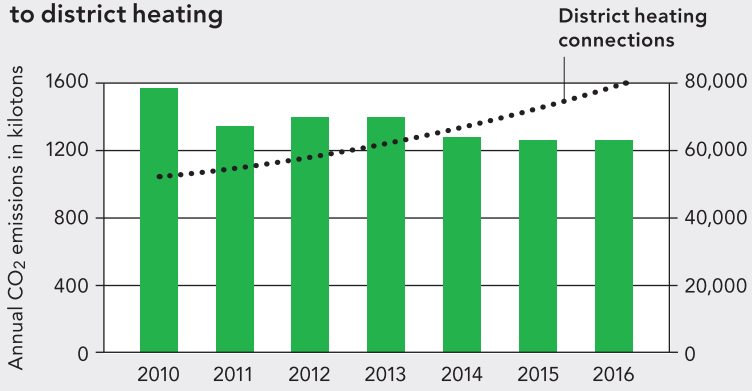
Saving energy and introducing sustainable heating, cooking and showering

What is this about?

The Built Environment is about the switch to sustainable energy and reducing energy consumption in all buildings, including all private and rental properties, shops, offices, business premises and community buildings. It covers all existing buildings and all new buildings.

New buildings provide us with a unique opportunity to create sustainable and energy-neutral buildings – or even buildings that supply energy. On the whole, this is technically feasible. What is more difficult, however, is to reduce the heat demand of existing buildings to any significant degree and to provide these buildings with sustainable, natural gas-free heating. Reducing electricity consumption is also a priority, especially in offices and for other large consumers.

CO_2 emissions in relation to gas consumption and number of housing equivalents connected to district heating



What is at stake?

Emissions from the Built Environment constitute 28% of total CO_2 emissions, which is a considerable share. The city is also growing rapidly: the residential population has grown by 10,000 a year since 2010, with a corresponding number of new jobs and offices. Despite this rapid growth, natural gas consumption has decreased by 16% and carbon emissions from this sector have fallen by 3%. In the same period, the number of natural gas-free buildings (in home equivalents) has grown by 32,500 to a total of 85,000, mainly by connecting to the city's district heating system; that is, 13% of the city's built environment.

Much has happened to accelerate this trend in the meantime. At the end of 2016, the strategy entitled 'Towards a natural gas-free city' was launched. Under the banner of the Natural Gas-Free City Deal, the municipality, housing corporations, tenants and energy companies agreed to work together to realise this transition. The housing corporations agreed to convert 10,000 social housing units to sustainable energy. The first conversions are now underway, and the remainder will be carried out in 2020 at the latest. The city's two district heating networks are also growing, not only thanks to new-build connections, but also thanks to new connections with existing buildings. A recent survey has shown that 72% of Amsterdam's residents are aware of the Dutch government's ambitions to phase out the use of natural gas.

In our bid to stimulate energy savings and sustainable energy production in existing homes, we have set up covenants with housing corporations and are offering free advice and financial support to

Goal:
Make all buildings in Amsterdam CO_2-neutral by 2050 and natural gas-free by 2040

private homeowners. We are also working with the sport, culture and care sectors to improve the sustainability of public properties, and we are investing in healthy, sustainable school buildings. We have set up agreements with around 80% of large energy-consumers in the private sector reduce their energy consumption. Some of these businesses have already started taking action.

Whereas large new developments have been built natural gas-free for some time, this has now been introduced for smaller private new buildings, too. At the end of 2018, Amsterdam introduced more stringent standards for the energy performance (EPC) of new housing (from 0.4 to 0.2), making us the national frontrunner in this area.

What do we want to achieve?

We want to make the entire built environment carbon-neutral by 2050 and natural gas-free by 2040. By 2050, all buildings in the city will use sustainable heating. Existing buildings will be disconnected from the natural gas network, area by area and neighbourhood by neighbourhood, in the run-up to 2040. Our short-term goal is to develop this approach in collaboration with our partners, enabling us to get started by the end of this municipal term. We will need a broad range of tools to make this happen, including partnerships, investment and support. Where necessary, we will also seek ways to impose binding agreements, to ensure that tenants, owner occupiers, owner associations and other property owners get involved and contribute to the neighbourhood plans.

Investing in natural gas-free buildings should also go hand-in-hand with measures to save energy consumption. In areas where homes, offices or business premises will not be disconnected from the natural gas grid in the short term, taking measures to save energy is nearly always a wise investment.

We believe that it is important to create awareness and support for the energy targets and approach among Amsterdam's residents. In the end, the transition will involve all of us – residents and businesses. We believe the transition to a natural gas-free city should be fair, and should not lead to greater inequality. Housing costs for low and middle-income households should not rise as a result of the energy transition.

We believe that businesses that consume large amounts of energy should take action to significantly reduce their consumption. We also want to make sure that the growth of the city, and the new developments and transformation that come with this, do not lead to increased carbon emissions. The challenge that we are facing is large enough as it is.

Amsterdam Natural Gas-Free subsidies

All around the city, private homeowners and owners' associations are taking the initiative to disconnect their homes from the natural gas grid. In the Indische Buurt, a former school building was transformed into 25 natural gas-free homes. Supported by an Amsterdam Natural Gas-Free subsidy, the owners' association has taken the building off the gas grid and installed an electric heating system to store heat or cold in the ground. This technology is used to either heat or cool the building.

What can the municipality do?

As the municipality, we believe that we should play a leading role in this transition. We will actively encourage the transition to a carbon-free built environment and make a substantial effort ourselves, too. Below you will find a selection of current initiatives.

During the current municipal term, we will work with our partners in the Natural Gas-Free City Deal programme to embark on the irreversible process of taking three Amsterdam neighbourhoods off the natural gas grid. At the same time, we will start talks with residents and property owners in a much larger number of areas. We are inviting all housing corporations to take part and intensify partnerships. We want to come to an agreement whereby major maintenance and repairs are clustered, to support the area-specific approach set out in the Natural Gas-Free City Deal.

In 2020, before the legal requirement comes into force, Amsterdam will introduce its vision document on the heating transition, detailing the most suitable heat provisions for each neighbourhood and the time needed to convert from natural gas to sustainable heating.

Together with other stakeholders, including central government, we will invest in natural gas-free projects in the city, and will work to get the first projects off the ground during the current municipal term. We will provide financial support to prevent property owners from losing out and avoid any 'climate injustice'.

We will make agreements with all property developers to realise energy-neutral new developments and, if possible, positive energy developments. New tools will need to be developed for this. From 2019 onwards, we will set the requirement for new developments close to energy-neutral (BENG, which roughly corresponds to an energy rating of 0.2). In tenders, we will require a minimum of energy-neutral (BENG+).

We are launching a large-scale research project on the possibility of using geothermal heating. We want to assess the suitability of the substratum before 2020. If it is suitable, we want to start test-drilling before the end of the current municipal term. In collaboration with our regional partners, we want to draft a Regional Energy Strategy as soon as possible, outlining which energy sources are available for which applications, now and in the future.

Amsterdam will make efforts to urge central government to draft a new, greener energy tax system, which should make it more attractive to invest in sustainable alternatives to natural gas.

Unfortunately, not all residents and businesses are yet convinced about the desirability and necessity of the energy transition. Amsterdam is in talks with central government to develop a 'binding' set of regulations, which will be necessary to make real strides. These will always be applied fairly, of course, with sufficient support.

We are making agreements with all stakeholders to realise energy-neutral new buildings and, where possible, positive energy new buildings.

What can you do?

Saving energy and heating our homes and offices sustainably is something that concerns us all. Home and property owners, energy companies and grid operators all need to make a substantial effort to make the built environment more energy-efficient, disconnect buildings from the natural gas grid and provide them with sustainable heating. The municipality is looking forward to offering help and support.

If you own your own home or any other property (including owners' associations), you can start making your property climate-neutral and natural gas-free whenever you want, by investing in energy savings (insulation), for example, or installing solar panels.

We are particularly calling on businesses that consume large amounts of energy to curb their consumption drastically. From 2023, all office buildings will need to comply with the legal standards under the 'C' energy label or higher, if this is agreed in the National Climate Agreement. Appropriate support is available from the municipality.

You can also play an active part yourself in choosing an alternative to natural gas for your home or neighbourhood. The municipality will increase its efforts to broaden social consensus for phasing out natural gas.

Many residents and businesses in Amsterdam are already actively working to make their neighbourhoods climate neutral. It would be great if they were to draft and carry out their plans in partnership with their neighbours. Wherever possible, the municipality will support these partnerships with expertise and resources.

We invite all stakeholders, including private property owners, energy companies and (umbrella) community & residents' organisations to take part in the Natural Gas-Free City Deal. Every housing corporation will be invited to take the initiative for this transition in at least one neighbourhood where they are active.

Housing corporations are invited to develop energy-neutral or even positive-energy housing. We would be happy to help you develop strategies to realise this.

Amsterdam has a large number of public properties, housing, museums, libraries, hospitals and schools. As they receive a large number of visitors each year, these properties could play an exemplary role in the transition. We are inviting the owners and managers of these properties to explore with us how they could play this role.

In this context, we think it would be a positive statement to take five pre-war buildings off the natural gas grid before 2022. All newly-built schools in the city will be natural gas-free and energy-neutral.

We are inviting local and regional partners to broaden and intensify the search for suitable heat sources and their development.

If you have ideas you'd like to share or are experiencing problems, please contact us at klimaatneutraal@amsterdam.nl

How can we break the trend?

Breaking the trend by reducing carbon emissions from the built environment will require all new buildings by all developers to be energy neutral, and a steep rise in the number of positive energy buildings. This isn't being achieved yet in all cases. The real breakthrough will come when we succeed in creating a virtuous spiral, whereby we systematically take Amsterdam's neighbourhoods off the natural gas grid. This will allow us to accelerate from taking thousands of buildings off the gas grid each year, as is presently the case, to the tens of thousands that are required.

Mobility

CO_2 emissions

360 kilotons

Share of total CO_2 emissions

9%

Role of municipality

Large

Number of charging units

5000

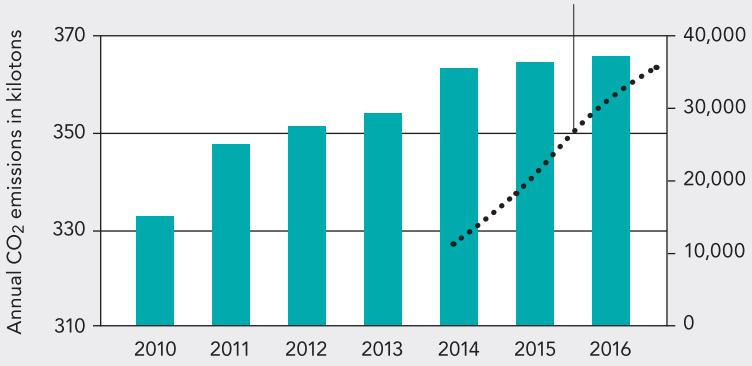
Mobility

Emissions-free traffic and transport

What is this about?

The main challenge for the Mobility sector is to realise zero-emissions passenger and goods transport, curb traffic growth in terms of vehicle miles in the city and the region, and restrict car traffic in parts of the city. Space will be needed to charge electric cars and other vehicles, but space will also be created by the decrease in car traffic in the city centre. This space could be turned into green spaces and used for recreation, cycling, sports and play. As well as a reduction in CO_2 emissions, cleaner traffic will also improve the air quality, which is good for our health, will boost the quality of life and make our city a more attractive place in which to live and work.

CO_2 emissions in relation to mobility and number of unique charging station users



What is at stake?

Traffic on Amsterdam's municipal roads within and beyond the built-up area accounts for 9% of total CO_2 emissions. The challenge is even bigger if we include national and regional roads within the municipal boundaries, and the emissions caused by commuters from Amsterdam who work outside the city. In the European Union as a whole, it is estimated that mobility accounts for 25% of total CO_2 emissions. Local government can have a direct impact on emissions on municipal roads within and beyond the built-up area.

The growth in jobs, population and tourism will also lead to more traffic in the city. Forecasts show a mobility increase of between 20% and 40% by 2040. If we do not act, this increase in mobility will also lead to a rise in CO_2 emissions. Between 2010 and 2016, CO_2 emissions caused by mobility mainly rose due to an increase in vehicle miles by cars and motorbikes. Passenger cars (private, vans, taxis and light commercial vehicles) account for 95% of total vehicle miles in the city and 88% of total traffic CO_2 emissions. Medium and heavy goods vehicles account for only 5% of vehicle miles, but they do have the highest CO_2 emissions per mile.

The good news is that car ownership in the city is decreasing and residents are increasingly choosing to cycle. Seventy per cent of all journeys to, from and within Amsterdam are made using sustainable transport (by foot, bicycle or public transport).

Tourists mainly use public transport or travel by foot. By contrast, a growing number of commuters still use the car to travel to and from the city.

Goal:
Making motorised traffic in Amsterdam emissions-free as much as possible by 2025 and fully sustainable by 2030

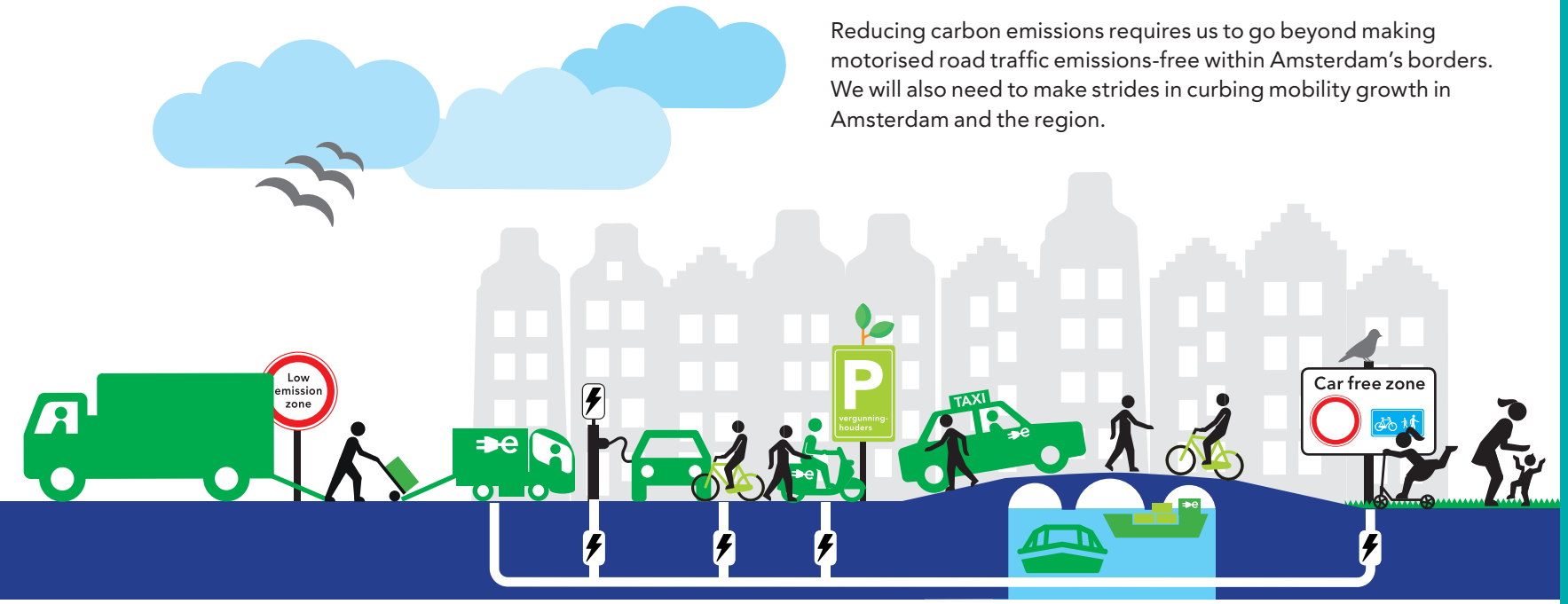
For decades, Amsterdam has pursued a policy of curbing traffic and parking in the city, while encouraging travel by foot or bicycle. The idea behind this policy is to maintain accessibility and to cope with the limited space for cars in the city, as well as reducing carbon emissions and air pollution in general. Amsterdam is leading the world in stimulating electric transport, by facilitating the city's charging infrastructure and other measures to encourage the use of electric vehicles. The city has 2,800 public charging points, as well as a similar number on private properties.

What do we want to achieve?

Once a distant dream, an emissions-free Amsterdam in 2025 is rapidly becoming a reality. Today's technological developments make it possible to introduce zero-emissions requirements for many vehicle types by 2025, including buses, coaches, taxis, scooters, canal boats, ferries and vans, as well as car-sharing cars, additional public transport, special community transport and the municipality's own vehicles.

At the same time, in the lead-up to an emissions-free city, we will be limiting traffic and/or banning traffic emissions in various areas by 2025. Between 2025 and 2030, we will gradually expand these areas until all motorised traffic in Amsterdam is emissions-free, including other passenger vehicles and heavy goods traffic, depending on market developments. To ensure that emissions-free means carbon-neutral, all electricity and hydrogen used for traffic and transport in Amsterdam will be produced in a sustainable way. The challenge also covers impact and the opportunities for spatial integration and the electricity grid, as well as any increase in pressure on the city's quays as a result of the switch to electric goods vehicles.

Reducing carbon emissions requires us to go beyond making motorised road traffic emissions-free within Amsterdam's borders. We will also need to make strides in curbing mobility growth in Amsterdam and the region.



Clean taxis in Amsterdam

In 2016, the city agreed a covenant with Amsterdam's taxi companies that all taxis would be emissions-free by 2025. Supported by an extensive fast-charging network and priority policies in locations including Central Station and Leidseplein, there are now more than 800 electric taxis in Amsterdam. More and more taxi drivers are discovering the financial benefits, comfort and low-maintenance nature of electric driving. We expect the fleet of electric taxis to grow exponentially in the coming years.

What can the municipality do?

For years, the municipality has pursued a policy of maintaining accessibility and quality of life in the city. Building on these past achievements, our efforts should now focus on accelerating and expanding the switch to emissions-free traffic.

In partnership with the Amsterdam Metropolitan Region, we are facilitating the installation of charging points in Amsterdam and the region, as well as stimulating the switch to electric transport, for instance by giving priority to electric taxis. There are subsidies available for emissions-free vehicles.

Together with the region, we are also stepping up mobility management, for instance by facilitating working from home. In addition, we aim to increase the efficiency of goods transport (using hubs and bundling goods flows), expand and improve public transport, and improve the cycling infrastructure.

We are going to limit car traffic in various parts of the city and/or make them emissions-free. During this municipal term, we will also add new and more stringent environmental zones to the zones that are already in place. Ultimately, our aim is for all traffic in environmental zones to become emissions-free.

We are going to assign dedicated places in and around the city for vehicle parking and loading.

We will continue to steer our parking policy in order to encourage people to choose forms of mobility other than the car. Parking tariffs in the city centre will be raised. Parking will be limited in new developments, and fewer or no parking permits will be issued. At the same time, we will encourage and facilitate cycling and continue our policy to promote car-sharing.

We are going to limit car traffic in various parts of the city and/or make them emissions-free.

What can you do?

The municipality cannot achieve this alone. Phasing in zero-emissions traffic will also require considerable effort from the market and research institutes, especially in terms of innovation and development. The municipality will facilitate this process, for instance by investing in infrastructure. How can you help?

You could ask yourself whether you're able to reduce your carbon emissions, for instance by making more use of public transport or cycling. Or would it be feasible for you to buy an emissions-free electric vehicle? We are happy to give advice and provide subsidies to businesses if it's not yet feasible for them to purchase and use emissions-free vehicles.

Research institutes, taxi companies, the logistics sector and public transport providers are all invited to share their ideas and work with the municipality to explore smart ways to introduce zero-emissions vehicles and what this will entail.

Owners of public buildings, including owners of parking garages, will be challenged to install more charging facilities. The municipality is keen to strike agreements on this.

We will ask third parties such as NS Vastgoed (Dutch National Railways Real Estate) and the logistics sector to explore the options for providing charging infrastructure at busy passenger and goods hubs.

We will need a smart energy grid to balance the electricity supply and demand. Different stakeholders can work together to design a smarter charging infrastructure and make better use of electric vehicles' charging potential. The municipality looks forward to taking part in these projects.

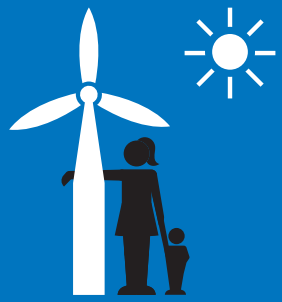
We will challenge passenger transport providers to make their buses, taxis, tourist boats and other vehicles emissions-free. The municipality will also apply this standard in new contracts with other forms of public transport.

If you have ideas you'd like to share or are experiencing problems, please contact us at klimaatneutraal@amsterdam.nl

How can we break the trend?

At the moment, there is a relatively small but growing group of electric drivers, including taxi drivers, lease-car drivers and moving companies. We will break the trend by reducing CO_2 if, in a few years, innovations and market developments make it mainstream for all forms of transport to be emissions-free. To facilitate this, the municipality will invest in the required infrastructure. The trend break will be accelerated by introducing emissions-free zones and stimulating hydrogen as the fuel of choice for heavy goods transport.

Electricity



CO_2 emissions

2340 kilotons

Share of total CO_2 emissions

51%

Role of municipality

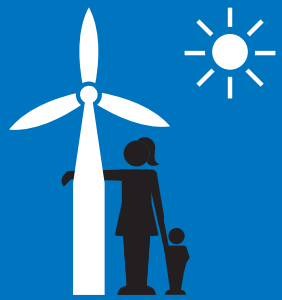
Limited

Solar panels on roofs

180,000

Electricity

Sustainable generation of electricity

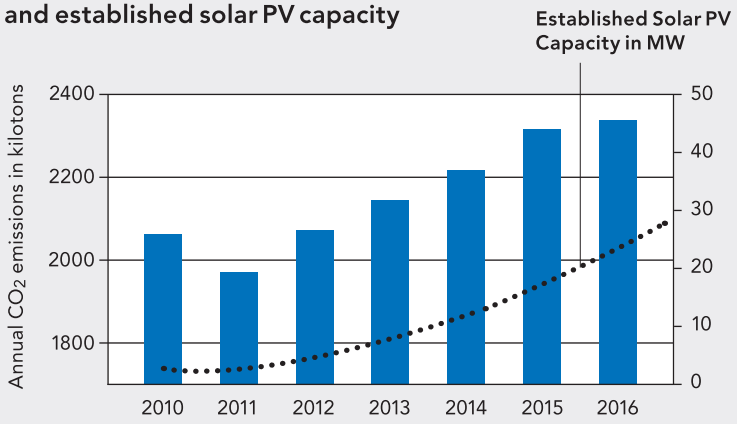


Goal:
Amsterdam will maximise the production of sustainable electricity

What is this about?

The challenge for the Electricity sector is to do everything that is needed to supply enough sustainably-generated electricity for Amsterdam. Electricity will play a central role in the transition from a fossil-fuel society to a sustainable society. The demand for electricity in the region is projected to grow by a factor of four over the period to 2050, not only because of population growth, but also because of digitisation and sustainability targets for electric transport, businesses and the built environment. All of this electricity will need to be generated in a sustainable way in the country, the region and partly also in Amsterdam itself. The electricity challenge for Amsterdam will mainly focus on what Amsterdam can achieve within the municipal limits, using the technologies that are currently available. These include solar panels and wind turbines, but also turning biomass into electricity and heat (see the chapter below on Industry & Harbour). In addition to what Amsterdam can generate within its own borders, the city will also need large amounts of sustainable electricity from elsewhere. Sustainable energy generation will inadvertently result in visible changes to the city and landscape.

CO_2 emissions related to electricity consumption and established solar PV capacity



What is at stake?

Electricity generation results in large amounts of CO_2 being emitted if the electricity is not generated sustainably. The amount of electricity we use in our homes and businesses results in the emission of 2.34 million tons of CO_2 each year, which is 52% of Amsterdam's total emissions.

In 2017, sustainable energy generation rose to 6% of total energy consumption. The largest share of Amsterdam's sustainable energy (electricity as well as heat) is produced by burning biomass at the city's AEB waste-to-energy plant. A quarter of all sustainable energy is produced by solar panels and wind turbines. The good news is that a growing number of residents, businesses and public sector organisations are investing in projects to boost energy savings and sustainable energy generation in the city.

These days, new homes and businesses usually have solar panels installed, but more and more solar systems are also being installed on the roofs of existing businesses. In total, Amsterdam has around 180,000 solar panels on its roofs, generating 45 megawatts (MW) of power. There are also a number of new solar projects in the pipeline, including a government subsidy for 125 MW-worth of solar panels

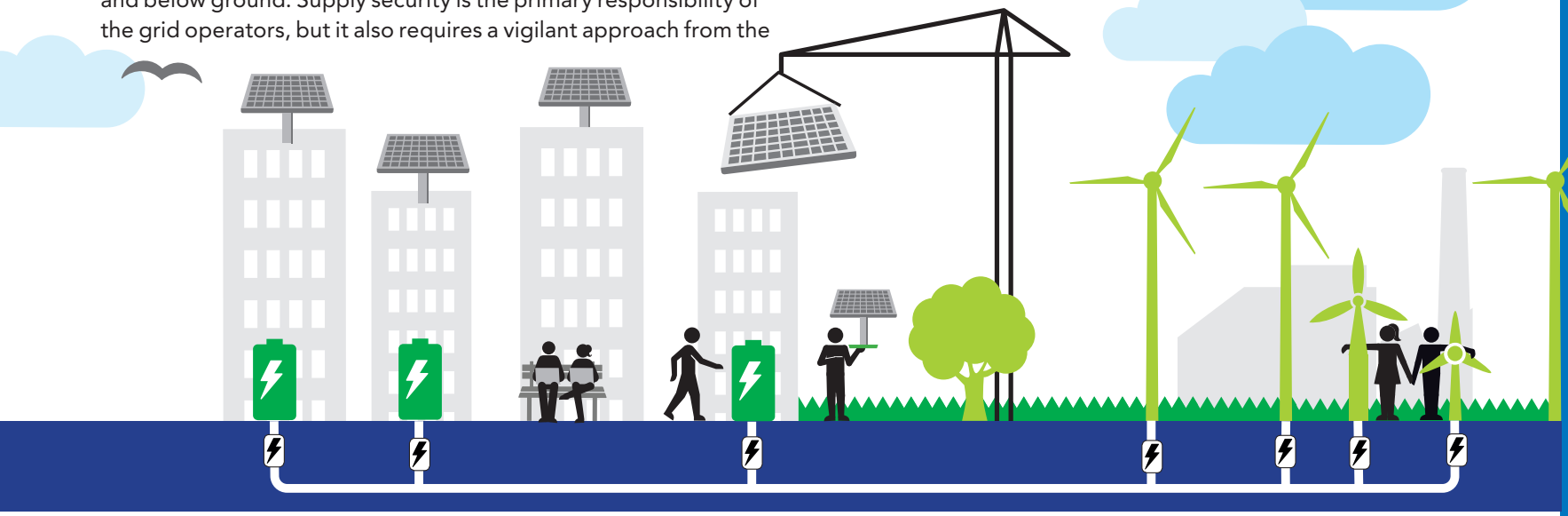
on Amsterdam's roofs. Nevertheless, only a small part of the total available roof space in Amsterdam is currently being used for solar energy generation.

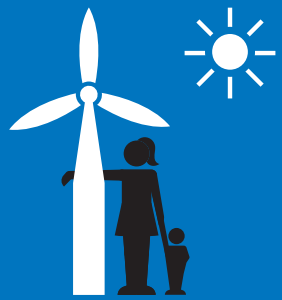
The share of wind energy in Amsterdam has not risen since 2010, but has remained level (with 67 MW from around 40 turbines), mainly due to restrictive provincial policies. Despite the scarcity of available space in Amsterdam, however, we are convinced that more space can be created for wind power within the city limits, especially in the harbour area. Nevertheless, even if Amsterdam were to increase its generation of wind, solar and biomass, the maximum amount of sustainable electricity the city can produce is only around 10-20% of the total amount needed. Demand needs to be met by the surrounding region and the rest of the country, and we are highly dependent on sources such as wind energy at sea.

Growing electricity consumption combined with an increase in local energy production means that the electricity network will need to be adjusted and expanded. This will have a big impact, both above and below ground. Supply security is the primary responsibility of the grid operators, but it also requires a vigilant approach from the municipality. After all, the electricity network is part of public space and enters the homes of all of Amsterdam's residents.

What do we want to achieve?

We want to make use of all the available options to generate sustainable energy in the city. Amsterdam makes a substantial contribution to promoting and providing green power in the Dutch electricity grid. We believe that solar panels should be installed on suitable roofs and wind turbines should be installed in appropriate locations. As part of the Regional Energy Strategy, we want to work with the provincial and central governments to designate new wind power locations. We want all residents of Amsterdam, including those who are less well-off, to be able to benefit from locally-generated sustainable energy. Together with electricity network operator Liander and the Dutch national electricity transmission system operator TenneT, we are working on a future-proof smart network to facilitate the energy transition.





Large solar system in Amsterdam's harbour area

One of Amsterdam's largest solar systems can be found on the roof of Nissan's facility in the harbour. Nissan uses the solar power generated by the panels for its own operations, but the company has also made part of the roof available for people who have no suitable space of their own. More than 400 citizens of Amsterdam are participating in the project, which was initiated by the Amsterdam Solar Coalition and financed by the City of Amsterdam's sustainability fund.

What can the municipality do?

The municipality believes that we should put all our efforts into generating as much sustainable energy as possible within Amsterdam. Our primary role is to encourage and facilitate this ambition. Here is a selection of the actions we plan to take:

In partnership with the Port of Amsterdam, we want to ensure that the licensed wind turbines for the harbour area (around 17 MW) are installed before 2022.

Before the end of this municipal term, we want to realise at least 250 MW of solar energy, roughly equivalent to 1 million panels. We will make sure that every roof-owner is made aware of the benefits of solar panels and opportunities to install them. All roof-owners will receive a so-called 'solar offer'.

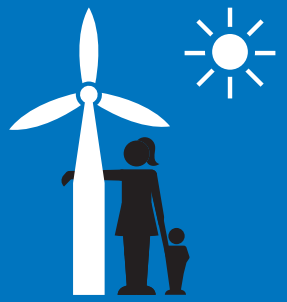
Together with stakeholders, we will commit ourselves to finding suitable locations for 50 MW-worth of wind energy, and incorporate them into the Regional Energy Strategy. Construction should take place in 2026 at the latest.

We will make agreements with housing corporations to offer tenants a stake in solar energy, and ensure that it will benefit them in terms of their net rental costs.

In urban development plans and tenders for new developments, the guiding principle will be that available roof space will be used for solar energy if possible.

Installing solar panels in protected heritage areas will be subject to planning considerations.

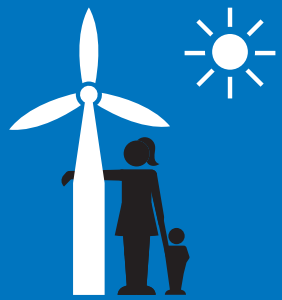
Amsterdam will make financial contributions to sustainable energy projects by means of the Duurzaamheidsfonds (Sustainability Fund), Energielening (Energy Loans) or indirectly through the Amsterdams Klimaat en Energie Fonds (AKEF, Amsterdam Climate and Energy Fund).



We will ensure that every roof-owner is made aware of the benefits of solar panels and the opportunities for installing them; all roof-owners will receive a 'solar offer'.

What can you do?

The speed at which we can move towards 100% sustainable electricity is highly dependent on initiatives at all levels: central government, the region, the province, the municipality and all citizens of Amsterdam. What can you do?



You can decide for yourself whether it is possible and attractive to install solar panels on the roof of the building that you live in or own. We can only achieve 1 million solar panels on Amsterdam's roofs by 2022 if we make a concerted effort. We will ask Amsterdam's housing corporations to make a substantial contribution to achieving this aim.

You can decide to conclude an electricity contract with a provider sourcing green power from a sustainable source.

If you buy equipment for your home or business, opt for an energy-efficient model. This will save you money and limit your carbon emissions.

We are inviting research institutes, electricity suppliers and distributors such as Nuon and Liander to join us in exploring new ways to use local, sustainable electricity to charge the growing number of electric vehicles in the city.

As electricity grid operators are preparing for a sustainable future, we want to work with them to plan a smart and sustainable electricity infrastructure that also takes into consideration its spatial integration above and below ground.

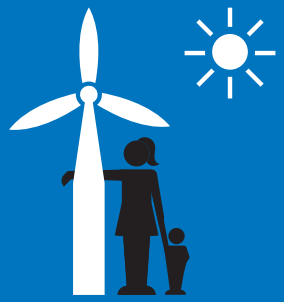
We are inviting central government in The Hague to explore the options for using embankments along the rail, road and water infrastructure for sustainable energy generation, and we look forward to setting this in motion.

We are asking central government to draft regulations to encourage sustainable electricity generation, such as an attractive successor to the existing power purchase agreement and the Stimuleringsregeling Duurzame Energieproductie (SDE, Regulation on Stimulating Sustainable Energy).

Working with the Province of Noord Holland and other municipalities in the Noord-Holland Zuid region, we expect to draw up an effective Regional Energy Strategy for the generation of sustainable energy and the required infrastructure. We will embed this strategy in our Environment and Planning Vision.

If you have ideas you'd like to share or are experiencing problems, please contact us at klimaatneutraal@amsterdam.nl

How can we break the trend?



Electricity needs to become carbon-free, for example by generating it using wind, solar or other forms of sustainable energy. We will break the trend in the electricity sector if Amsterdam maximises its efforts within the limited context of a compact and densely-populated city; if agreements with the region and central government result in the supply of sustainable electricity to the city; if Amsterdam can start building new wind turbines after years of stagnation; if we can scale-up the use of suitable roofs for solar panels from 4% to 100%; if Amsterdam's electricity infrastructure becomes smarter and more robust, and is able to cope with the strong growth in demand for electricity; and if there is broad support among the people of Amsterdam for the required sustainable electricity infrastructure, whereby wind turbines and solar panels become a standard and visible part of our city.

Industry and Harbour

CO_2 emissions
(excl. the Hemweg power plant)

480 kilotons

Share of total CO_2 emissions

11%

Role of municipality

Limited

Energy consumption

16%

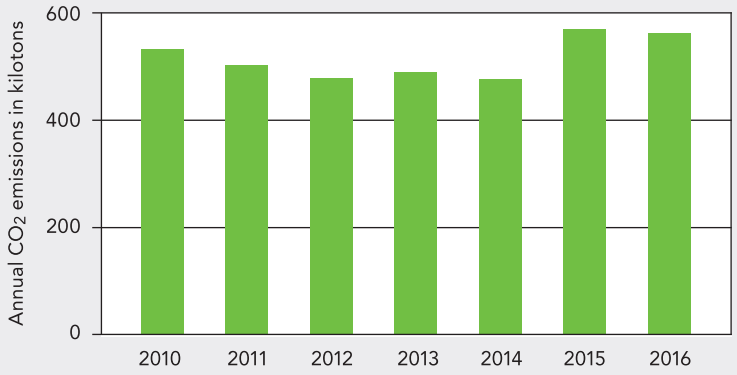
Industry and Harbour

Towards a sustainable industrial sector that plays a leading role in the energy transition

What is this about?

The port of Amsterdam forms part of the Noordzeekanaalgebied (NZKG, North Sea Canal Area), one of the largest industrial complexes in the Netherlands. This area comprises multiple municipalities and is characterised by activities in large-scale storage, handling and transport of goods and fuels, waste-to-energy and power plants, data centres, the foodstuffs industry and forms of circular initiatives. All these activities require energy, which is currently still accompanied by high levels of CO_2 emissions. Many of the processes involved in these activities also produce a lot of waste energy, for instance heat. In this sector, we will focus on the redevelopment of the North Sea Canal Area into a sustainable industrial cluster that supplies sustainable energy to Amsterdam, among other things.

CO_2 emissions related to Industry and Harbour sector



What is at stake?

The harbour and its industries account for 480 kilotons of carbon emissions, 11% of total emissions. This is excluding emissions from the area's power plants, which are attributed to the users of the electricity and the heat this produces. The largest part of industrial emissions (80-90%) is related to the use of gas to produce heat for industrial processes and to fuels for shipping. Although there is growing awareness about sustainability, most activities in this industrial area still revolve around and are contingent on the fossil fuel chain. As CO_2 emissions have not yet been priced fairly (polluters do not pay in proportion to how much they emit), fossil free and circular production are not yet sufficiently profitable for them.

At the same time, industry and the harbour area are essential for Amsterdam's (energy) transition. There are opportunities to increase the harbour area's supply of sustainable electricity and heat to the built environment. Circular industry, wind turbines, power stations and infrastructure need sufficient space, which in Amsterdam is only available in the city's harbour areas.

As part of the National Climate Agreement, arrangements will be made to accelerate sustainability efforts and reduce CO_2 emissions by Amsterdam's industries. Becoming natural gas-free and making substantial energy savings are vital in this respect. Whilst the municipality will collaborate with businesses, the Port of Amsterdam and the province will initiate concrete projects to start the transition to a climate-neutral and circular harbour area.

Goal:

Industry and harbour to be climate neutral and circular by 2050, and to start contributing to the city's energy transition in the short term.

Carbon capture and storage (CCS) is only acceptable as a temporary solution to reduce carbon emissions in the short term. The same applies to the use of biomass to produce energy. Both are only allowable as provisional solutions and under strict conditions related to sustainability.

What do we want to achieve?

The harbour area's industry will function as a sustainable battery for Amsterdam and the region, supplying energy to the built environment and the mobility sector, including electricity, sustainable heat and possibly also sustainable hydrogen. In collaboration with the Port of Amsterdam, we are drafting plans to realise considerable reductions in the use and transport of fossil fuels by 2030. This will be an intermediate step to finally achieving a fully sustainable harbour by 2050. Businesses will need to benefit from switching to fossil-free and circular operations.

Building large-scale wind parks in the North Sea will be essential to power a new, sustainable industrial cluster in Amsterdam. In partnership with the Port of Amsterdam, the province, regional partners and the municipality will push for the construction of wind parks at sea and their connection to Amsterdam's metropolitan region. Peaks in wind energy can be turned into hydrogen, which can be used for industry and mobility.

To achieve the climate targets, fossil power plants will need to be closed and replaced by sustainable energy sources. Amsterdam is in favour of the early closure of the city's Hemweg plant.

Car Terminal

Koopman Car Terminal has not used any natural gas since the autumn of 2018. Instead, it is using sustainable district heating produced by the nearby Orgaworld composting plant. Koopman Car Terminal has also installed 1,240 solar panels to meet its electricity demand.

What can the council do?

The municipality will mainly focus on collaborative projects, promoting good behaviour and, if necessary, stricter enforcement of national regulations. Below you will find a few examples of the areas that we will focus on.

We will encourage and support the construction of a hydrogen cluster and other projects in the region that are vital to realising a new, sustainable energy cluster in the harbour area.

We will play a leading role in setting up a 'coalition of the ambitious', which will include Amsterdam-based companies and organisations that want to work with the municipality to bring about a climate-neutral city.

We will devise a new framework for data centres, focusing on their contribution to (Amsterdam's) energy transition, for instance to the supply of heat for new neighbourhoods.

In partnership with the Regional Agency for the Environment (Omgevingsdienst), we are introducing stricter enforcement of companies' energy performance. This will help sustainable businesses to avoid unfair competition from businesses that are lagging behind, and it will encourage companies to become climate neutral.

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What can you do?

Within Industry and Harbour, the onus is mainly on the private sector to act, supported by EU and central government incentives. We are asking the private sector to intensify its efforts to work towards a more sustainable harbour and industrial sector in Amsterdam.

We are inviting the Port of Amsterdam to rapidly come up with a plan to scale-down the use and transfer of fossil fuels and resources. We are keen to explore the options for this with the Port of Amsterdam.

We are asking the Harbour and Industry sector to work with us to create a favourable business climate focused on attracting innovative and sustainable activities.

The Port of Amsterdam, the municipality and the province will together assess which electricity, hydrogen and carbon infrastructure is required to start the energy transition and carry out the NZKG Energy Transition Development Strategy.

We urge central government to bring about a fair transition based on the 'polluter pays' principle, for instance by introducing CO_2 pricing.

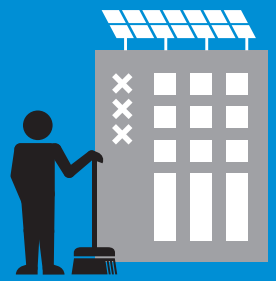
We are urging central government and Nuon to speed up the closure of the Hemweg power plant and replace its output with sustainable sources.

If you have ideas you'd like to share or are experiencing problems, please contact us at klimaatneutraal@amsterdam.nl

How can we break the trend?

Breaking the trend by reducing carbon emissions from the Industry & Harbour sector will require Amsterdam's port and industry to accelerate the transition from fossil energy sources and goods flows to sustainable ones. We will break the trend if we can build a sustainable alternative to the Hemweg power plant, and if Amsterdam's port can switch to serving as a sustainable battery for the city. To make this possible, we need to expand existing sustainable infrastructure (heat and electricity) and develop new sustainable infrastructure (hydrogen).

The Municipality



CO_2 emissions since 2010

23 kilotons

Share of total CO_2 emissions

1%

Role of municipality

Very large

Green electricity

100%

The Municipality

Sustainable operations, properties and procurement

What is this about?

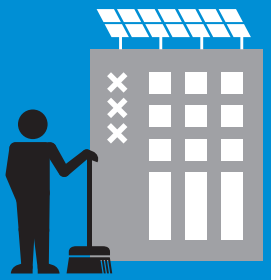
The municipality wants to lead by example. As well as asking our partners in the city to take action, we will also take action ourselves to make an impact where we can. This means focusing on our own internal operations, including the municipal fleet of vehicles, metros and trams, real estate, and procurement, such as the materials we purchase to furnish the public space. This sector also concerns the awareness and behaviour of our own employees. We will focus on our internal operations, because this is where we can have the biggest impact and produce rapid results.

Within our own organisation, we have an added responsibility to reduce CO_2 emissions beyond Amsterdam's borders as well. We can do this by being careful about the materials we procure and use, and about the waste we produce.

What is at stake?

The first steps have already been taken in recent years. Municipal CO_2 emissions have been reduced by 23 kilotons per year since 2017. This is a reduction of 33% compared to 2012 emissions and almost three quarters of the target for 2025 (31 kilotons). The actions that led to this result include moving 50 decentralised data centres to two new energy-efficient centres and introducing LED lighting in public locations and tunnels. We are currently working on a large number of solar projects at municipal sport facilities, metro stations and other municipal properties. From 1 January 2019, all power used by the municipality will be from renewable Dutch sources.

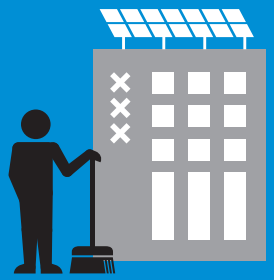
The municipality is also focusing on awareness, education and support among its own staff. Sustainability ambassadors have been appointed and a 'Green Office' has been installed to support employees who want to contribute to a climate-neutral organisation. The goal of these initiatives is for all municipal workers to have the sustainability gene in their DNA by 2030. We are also reinforcing our relationships with other municipalities, research institutes and businesses to gain and transfer expertise on sustainability. We are taking part in a number of different local, national and European learning networks, including PIANOo (the Dutch Ministry of Economic Affairs and Climate Policy's Centre of Expertise on Procurement), the European Green Office Network and Duurzaam 020 (Sustainable Amsterdam).



Goal:
Creating a CO_2-neutral and natural gas-free organisation by 2030

What do we want to achieve?

In early 2018, Amsterdam City Council passed the Climate Initiative with the aim of achieving a climate-neutral and natural gas-free municipal organisation by 2030. We are striving to become energy-efficient, produce as much sustainable energy as we can and ensure the energy we use is from sustainable sources. We are also reducing waste and taking steps towards building a circular organisation.



Sport and Woods

The municipal department for Sports and Woods has been working for years to become more sustainable. Having installed solar panels at the Laan van Spartaan sports complex and the offices in the Amsterdamse Bos, solar power systems are now being introduced at Sporthal de Pijp, De Mirandabad, Sportfondsenbad Oost and Apollohal. In total this will generate 0.77 MWP of solar energy, enough to supply 230 households with power. Starting this summer, the Brediusbad swimming pool will use waste heat from the Westcord Hotel next door. The hotel and the pool will be taken off the gas grid and connected to a sustainable heat pump installation. The costs of investing in the installation will be recovered within five years.

What can the municipality do?

The municipality needs to become more sustainable within its own organisation. Here are some of the things we are going to do.

We will develop the Climate Initiative into a Climate Plan for our own organisation, setting out specific actions to be taken to build a climate-neutral organisation by 2030.

We will work to install solar panels on all suitable council roofs. In 2018, we launched a tender process for 32 council buildings, including 17 with large roof spaces exceeding 500 m2. Citizens of Amsterdam will be able to participate in at least half of these solar projects.

We aim to disconnect three municipal buildings from the natural gas grid in 2019, and ten municipal buildings in 2022.

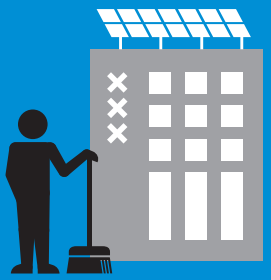
We are taking measures to ensure that an additional 150 municipal buildings will achieve the 'A' energy label by 2022.

By 2025, municipal vehicles used for distribution, cleaning, mobility and other services will be fully emissions-free. These vehicles will include all passenger cars, delivery vans, boats, scooters and third-party transport services.

Since 2013, we have introduced energy savings for all street lighting. By 2023, all lights should be replaced by sustainable LED lights or another sustainable alternative.

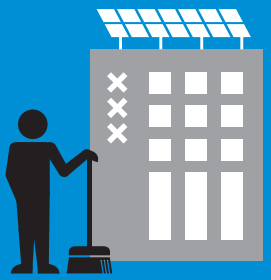
We are taking action to make our metro and tram infrastructure more sustainable, including the installation of solar panels on metro stations, reducing energy consumption and introducing LED lighting.

We are going to reduce the amount of non-recyclable waste we produce, in accordance with national agreements on this issue.



By 2025, municipal vehicles used for distribution, cleaning, mobility and other services will be fully emissions-free. These vehicles will include all passenger cars, delivery vans, boats, scooters and third-party transport services.

How can we break the trend?



We will break the trend in reducing CO_2 emissions if our ambition to become climate neutral is put at the heart of all municipal projects and activities. We will achieve scale if we install solar panels on all council roofs, instead of the few that we have now. Only if we take all of our buildings off the gas grid and move to a zero-emissions fleet will we truly lead by example.

The way forward

In this Roadmap, we have provided a first outline of the path to a climate-neutral and natural gas-free city. We would like to invite you to engage with us, to see what we can achieve together. What do we need and what can we offer each other to make Amsterdam climate neutral? In this way, we can work together to create a complete Roadmap, describing the actions we will take in the short or longer term and the resulting reductions in CO_2 emissions. At the end of 2019, we will submit the Roadmap to Amsterdam City Council. The complete Roadmap will serve as the multi-annual plan for the Amsterdam Climate Neutral programme.

Invitation to participate

The municipality wants to make it as easy as possible for everyone to participate, regardless of educational background or income. We aim to have different types of discussions with all groups in Amsterdam: young and old, experts by experience, specialists, residents, the industrial sector and the Port of Amsterdam, and so forth. We can meet each other offline, at venues, schools or events; or online using digital platforms. We can discuss and inspire each other with vlogs, films, stories and plays, and in ways we cannot anticipate, because you are going to surprise us.

We would like to invite you to engage with us, to see what we can achieve together. What do we need and what can we offer each other to make Amsterdam climate neutral? In this way, we can collaborate to create a complete Roadmap, describing the actions we will take in the short or longer term and the resulting reductions in CO_2 emissions.

Some of the discussions to be held

- Amsterdam has plenty of frontrunners: inspired and inspirational people who can offer their knowledge, expertise, creativity and experience to build a sustainable Amsterdam. Many of them have been developing these ideas for years. With them, we will explore which of these ideas can be turned into experiments to reduce CO_2 emissions.
- Amsterdam has a number of large energy consumers such as offices, hospitals, department stores, data centres and industries. By forging a 'coalition of the ambitious', we can show what is possible in terms of energy reductions and energy recovery. The municipality is a large consumer, too, and we will start leading by example.
- Young people are deeply engaged in green issues and have a vested interest in building a climate-neutral city. After all, it's their future that's at stake. We want to give schools, colleges and universities in Amsterdam an active role in the movement to make Amsterdam climate neutral, and we will also seek to collaborate with organisations such as the KIT Royal Tropical Institute, Artis Zoo, NEMO Science Museum and the public library (OBA).
- Many sustainable initiatives are already up and running in Amsterdam. We are keen to showcase these, whether they are big or small, new or established. We have therefore set up an online platform where residents of Amsterdam can join, register new initiatives and find partners, expertise or experience. They can also ask the municipality for financial support.
- We are organising campaigns to create awareness among as many people as possible. We are also setting up online and offline meetings that focus on a particular topic, area or target group, so we can develop solutions together.

Amsterdam's Climate Agreement

We would like to make agreements on the efforts the municipality, residents, businesses and public sector organisations will make to achieve a climate-neutral Amsterdam. We will agree on the content of these agreements together. All of the agreements, large and small, will make up the Amsterdam Climate Agreement, which we will sign at an official celebration and update annually. Every city district or borough will draw up their own climate agreements, and the city as a whole will also draw up a city-wide agreement containing the agreements with partners from industry and the business community. Together, these agreements will constitute the Amsterdam Climate Agreement and become part of the final Roadmap.

What is the municipality doing?

The municipality is already active in many areas related to creating a climate-neutral city. We will continue with the actions and initiatives described in the previous chapters, of course; and at the same time, we will also work on assessing and forecasting the total gains, costs and impacts for the final version of the Roadmap. Specifically, we will work on the following topics:

Calculating targets and actions
The initiatives that we have described in this document are the result of extensive research into the most effective and suitable measures for Amsterdam. Based on our discussions with you, we will tailor our list of actions. Next, we will commission a third party to calculate the effects of the initiatives for the final version of the Roadmap. Will the selected actions make an adequate contribution to meeting our intermediate and end targets? Once we've completed the actions to be taken by 2022, we will detail what still needs to be done, so that it is clear what future municipal administrations need to do to achieve these goals.

Amsterdam has plenty of frontrunners: inspired people who can offer their knowledge, expertise, creativity and experience to build a sustainable Amsterdam. Many of them have been developing these ideas for years. With them, we will explore which of these ideas can be turned into experiments to reduce CO_2 emissions.

Social costs and benefits
The city administration wants to achieve a fair energy transition by distributing the costs and benefits as fairly as possible. To be able to assess this, we need more insight into how the various actions and initiatives will contribute to the city. As well as reducing carbon emissions and boosting the quality of life, we will also look at economic benefits such as more jobs. The actions will also involve costs, such as investment in new infrastructure or energy savings. What are the costs and benefits, and who will they affect?

Spatial effects of the energy transition
Generating, saving, storing and transporting energy requires a lot of space, something that comes at a premium in a dynamic and increasingly densely-populated city such as Amsterdam. The energy transition will have a significant impact on the available space, both above and below ground, as well as on the city's appearance. Think, for example, of the introduction of various installations, and the increase in the number of solar panels and wind turbines. We will investigate and assess these impacts, as well as establish their connection to other spatial issues such as urbanisation, mobility, quality of life, green space, public space and economic development. Where possible, we will try to combine functions to make smart use of the available space and maintain the city's appeal.

Use of tools
In addition to collaboration, expertise, research and regulation, we also need money. The city administration has made an additional €150 million available to start and support sustainable initiatives. This document will be presented to the City Council along with a proposal to establish a Climate Fund as financial backing for the Roadmap. The proposal will set out rules to ensure that funds are spent on the actions that yield the most and that are best suited to the municipality's role in the energy transition. The Roadmap, Climate Fund proposal and the discussions with all of the city's stakeholders will result in a definitive financial expenditure plan at the end of 2019. We will also need new (national) legislation in some areas. Where this is insufficiently available or in development, Amsterdam and other fellow frontrunners will urge the Dutch government to take action.

Monitoring system
It is important that we frequently assess where we have got to in relation to our intermediate and end targets. This is why we are developing a system to calculate the extent to which all existing and new actions will contribute to reducing CO_2. As well as monitoring the hard data, we also want to know whether the movement towards a climate-neutral city is growing. One important measure for this is support among the people of Amsterdam. Are growing numbers of residents, businesses and public sector organisations aware of the issues and willing to contribute? Have new forms of collaboration emerged? Finally, to ensure that the climate transition is taking place fairly, we want to monitor whether the costs and benefits are fairly distributed. We will ensure that our monitoring methodology is up to date and transparent, so everyone can check whether we are on course to meet our targets. The monitoring results will be used to update the Roadmap each year.

Final version of the Roadmap
We will draw on our discussions with you, the collaborative agreements in the Amsterdam Climate Agreement and the work we've done as a municipality to draft the final version of the Roadmap.

Contact

If you want to respond, or if you have any questions or ideas, please email us at klimaatneutraal@amsterdam.nl and we will get in touch with you.

Working together to build a sustainable city

As well as working together to draw up the Roadmap, we will also collaborate to carry it out. This will be a complex task requiring long-term collaborations between residents, businesses, the municipality, research institutes, industry, public organisations and interest groups, locally within Amsterdam, but also regionally, nationally and internationally. Everyone will have an opportunity to participate and contribute. In the end, a climate-neutral Amsterdam will be the sum of all our efforts, big and small. Together we will build a growing movement to make Amsterdam Climate Neutral!

Colophon

Amsterdam Climate Neutral 2050 Roadmap Phase 1: Invitation to the city, was adopted by the Mayor and Cabinet on 15 January 2019

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