City of Amsterdam

Our city tomorrow
Climate City Contract

Action plan

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Abbreviations

Definitions of abbreviations used are

CO2	Carbon dioxide, a greenhouse gas
CO2e	Carbon dioxide equivalents. A unit of greenhouse gas production that expresses different greenhouse gases as equivalent based on warming effect.
EU	European Union
NSS	National collaboration structure. An institute to flesh out multi-level governance for accelerating sustainability.
DMI	Direct Material Input
DMC	Direct Material Consumption
RMI	Raw Material Input

Introduction

We are in the midst of a climate crisis. A global crisis whose impact is huge. We are already heading towards two degrees of global warming, with disastrous consequences. Extreme drought and floods alternate. In our own city, too, we see the effects of global warming.

Our basements flood after heavy showers and our streets become flooded. Prolonged heat waves wither our parks in summer and take a toll on Amsterdam residents. Besides, as we all know: if sea levels keep rising, we won't keep it dry in Amsterdam. We must protect the city and our residents from these inevitable consequences. At the same time, we now have the responsibility and opportunities to do everything possible to minimise even more far-reaching impacts of climate change.

Amsterdam and its residents have very high emissions per person in global comparison, especially when we include emissions from consuming goods, raw materials and products. These emissions do not always take place in Amsterdam, but they are caused by Amsterdam residents. We therefore not only address our direct emissions in the city, but we also focus on the emissions our city is partly responsible for, outside the city limits.

Amsterdam has already committed to combating climate change in recent years. In 2019, for example, we created an Amsterdam Climate Agreement with input from 1,000 conversations with people and actors in the city. With the climate neutral roadmap, we are implementing this. With various channels and networks, we continuously map what is happening in our city in terms of sustainability, and what opportunities remain.

In September 2023, we published the council letter Our city of tomorrow, in which the entire Amsterdam city council committed to Amsterdam's climate policy. Sustainability is no longer an isolated task; it is the responsibility of the entire municipal organisation. We work according to the principle of 'Sustainable, unless'. In other words: a lot is already happening. Yet despite our efforts, we are not on track. We therefore need different ways of working. That means looking for new methods, but also phasing out unsustainable practices.

Why are we participating?

To support and endorse our city's effort, the City of Amsterdam has committed to the EU mission *100 climate neutral and smart cities*. The intention of the mission is to accelerate the climate transition, contributing to our city of tomorrow. We do this by promoting cooperation between cities, actors within cities and between layers of government. We want to remove barriers to this acceleration, scale up and innovate. Our city is fully committed to this. The joint effort of the cities in the mission clarifies what barriers to acceleration are possible and what solutions are needed for this at the European, national and local levels.

Amsterdam has direct influence on 42% of total emissions (in scope 1 and 2) in Amsterdam. The remaining percentage requires policies from other layers of government or third-party developments, e.g. solar panels becoming cheaper faster. Cooperation between governments and other actors is thus preconditional, and is shaped, among other things, by the National Cooperation Structure (NSS). In addition, according to the European commission, the mission label given to cities for the climate contract will help finalise the financial framework for our sustainable transitions. Through this enhanced collaboration and pooled innovation and scale-up power, we aim to achieve accelerated implementation of our current strategies. Both in Amsterdam and elsewhere. In addition, we can share the lessons we have learned with others, which may help to scale up in other municipalities later.

Our city is not taking on this mission alone, but together with 111 other mission cities across Europe with their own strengths and limitations, the central government, the EU and perhaps most importantly: with partners from our city who want to contribute to our city of tomorrow. These all have their own roles and challenges, but do see the need to work on the transitions described here. We proactively approached some of these partners to describe their roles in so-called letters of support. The other partners are always welcome. These letters demonstrate broad-based support for the ecological transition in Amsterdam.

In front of you is the Urban Climate Contract, a (non-legally binding) document in which the City of Amsterdam reports to the European Commission what is happening in our city to become more sustainable and how the mission is being implemented at the local level. For the European Commission, this document is an important tool to see how European policies are implemented locally, which is why it must meet some formal requirements. In addition, the contract is iterative, and must be updated every 2 years for the purpose of reporting progress to the European Commission. This will be done through Amsterdam's Integrated Sustainability Monitor. Based on the measurements from the monitor, the priorities and targets from the climate contract can be updated or adjusted.

Our city of tomorrow: City Climate Contract consists of three elements:

- <u>Commitment document.</u> Describes what our commitment to the sustainable transitions looks like. In it, we describe the shared commitment of the actors who want to join us in the EU mission to make Amsterdam more sustainable, how this contributes to the sustainable transitions and the progress of these transitions therein. The council information letter 'Our City of Tomorrow' acts as the substantive common thread.
- <u>Action plan.</u> Makes clear what is happening in concrete terms to make the transition happen. It covers existing strategies, policies and actions. We are also looking at what levers we can pull to create a package of measures to maximise efforts to put our sustainable city of tomorrow within reach.
- <u>Investment plan.</u> Clarifies how we use the city's resources to ensure that the city's intentions and actions are paid for. The municipality's current resources will be insufficient to meet our goals. Through the Investment plan, we want to be able to engage more effectively with the European Commission, the state, partners and investors on how to fairly share the bill for climate transition and what it will take to get it done.

This part of the climate contract is the Action plan, which tries to make clear what is happening in our city to make the transition happen. What is still missing in this version is an insight into what our partners in the city are doing. After all, the municipality is not the only actor that considers sustainability important. Below we describe the goals the municipality has defined for the city.

The goals for our city of tomorrow

The climate crisis, resource crisis and biodiversity crisis require our maximum commitment: we take responsibility for the organisation and the city to pull out all the stops now to keep our city and the world liveable. We focus not only on CO2, but on all the targets we have set: A 100% climate-neutral, circular and climate-adaptive city by 2050. We do so because we need to take good care of the city and our world: for now and for future generations, with a focus on the most vulnerable. In all plans for the coming years, along the way, we remain in constant dialogue with the city and are transparent in the choices we make. We do it together. Together, we balance the necessary, sometimes painful measures now with the major consequences of climate change later.

About four times the CO2 emissions from Amsterdam's energy consumption are emitted annually from material consumption, for example in the production of food, building materials and consumer goods for the city, also known as scope 3 emissions (Circular Monitor, 2023). Besides the CO2 effects, Amsterdam's consumption pattern also imposes other environmental costs, which would cost billions to fix (Ibid.).

Amsterdam has therefore chosen to include scope 3 in its climate-neutral city mission. We do this based on the conviction that we must take responsibility for what we do *here* within the municipal boundaries, which causes ecological and social problems *elsewhere* in the world. Indeed, the consequences of our actions on the earth and humanity are not limited to municipal boundaries. By including scope 3 emissions and our circular policy in our climate-neutral city mission, we recognise that other places, people and animals experience costs due to Amsterdam's consumption and lifestyle. In addition, it is an intervention that allows us to look at the climate transition with a systems perspective. After all, it does not matter to the earth where CO2 is emitted.

However, including scope 3 emissions is not easy. It is difficult to know for each product how many emissions and damages occur where, and to what extent Amsterdam is responsible for them. Therefore, we do not yet introduce a target on CO_2 reduction in our chain, but commit to accelerate sustainability to the maximum.

That maximum acceleration is also the commitment in terms of CO_2 emissions from energy consumption. With the introduction of the coalition agreement, the City of Amsterdam has set a 60% CO_2 reduction target for the city by 2030, higher than the 55% stipulated by Dutch and European climate laws and our bid when we applied for the mission. At the same time, for us, a sustainable city is more than just CO_2 reduction. Indeed, planetary boundaries are crossed in several ways at once, and these interact with each other. We do not want to lose sight of this, which is why we adopt a broader interpretation of sustainability in this plan, with a focus on the CO_2 reduction task. So we are more ambitious than before, and also more ambitious than what is stipulated in law for the country and the EU. CE Delft research shows that achieving 60% reduction by 2030 requires huge efforts from Amsterdam. While we would like to increase the ambition of a 60% reduction by 2030, that would not reflect reality.

The entire college, as described in the council information letter Our city of tomorrow, feels a responsibility to do everything possible to combat climate change. Unfortunately, despite our efforts, we are not on track. If we realise our current policy intentions, we arrive at 56% at best. We will have to put maximum effort, together with the city, into achieving the 60% reduction. To realise these ambitions, we have to be realistic. Being honest about what works and what doesn't, and that this requires both a long run and a sprint. Building support and commitment to get everyone on board. Keeping agreements and delivering on promises.

Below is a summary of the most significant targets set by the municipality for the city:

2030
- Fully emission-free traffic within built-up areas
- Fully sustainable own organisation
- 80 percent of electricity used by households generated from solar and wind power
- 50 percent reduction in use of non-renewable raw materials
- 60 percent reduction in CO_2 emissions within municipal borders compared to 1990
- From 40% plant protein to 60% plant protein in our diets

2040
- Fully natural gas-free in the built environment
- All suitable roofs utilised for solar power generation

2050
- Fully prepared for climate change ('climate adaptive')
- 100% CO_2 reduction
- 100% less primary abiotic material use

The intention of the mission is to accelerate the climate transition. Our city is fully committed to this. To achieve the above goals, we need financial support and the right legislation. For example, legislation that gives us room to establish zero-emission zones for passenger cars at a local level. For example, of the total scope 1 and 2 CO_2 reductions envisaged in the climate neutral roadmap, Amsterdam directly affects about 45% of total emissions in Amsterdam. The remaining percentage requires policies from other layers of government or third-party developments, e.g. solar panels becoming cheaper faster.

To get these preconditions right, cooperation between layers of government, cities, and actors within cities must improve. That way, we can remove barriers to acceleration more effectively and innovate. The joint effort of all European cities in the mission clarifies what the barriers to acceleration are and what solutions are needed for this at the European, national and local levels.

Cooperation between governments and other actors at different levels of scale is thus preconditional. This is shaped in part by the National Cooperation Structure (NSS). In addition, according to the European commission, the mission label given to cities for the climate contract will help finalise the financial framework for our sustainable transitions and promote cooperation there. Through this enhanced collaboration and pooled innovation and scale-up power, we aim to achieve accelerated implementation of our current strategies. Both in Amsterdam and elsewhere. In addition, we can share the lessons we have learned with others, which may help to scale up in other municipalities later.

Our city is not taking on this mission alone, but together with 111 other mission cities across Europe with their own strengths and limitations, the central government, the EU and perhaps most importantly: with partners from our city who want to contribute to our city of tomorrow. These all have their own roles, challenges and needs, and all have a role to play in our transition. There is no doubt about the need to work on the transitions in Amsterdam described in the commitment document.

In front of you is the City Climate Contract Action plan, a (non-legally binding) document in which the City of Amsterdam reports to the European Commission what is happening in our city to become more sustainable and how the European climate neutral and smart cities mission is being implemented at the local level. For the European Commission, this contract is an important tool to see how European policies are implemented locally, which is why it must meet some formal requirements. In addition, the contract is iterative, and must be updated at least every 2 years for the purpose of reporting progress to the European Commission. This will be done through Amsterdam's Integrated Sustainability Monitor, which will show how we are doing in achieving our strategic and operational goals. Based on things like the measurements from the monitor, the priorities and targets from the climate contract can be updated or additional actions can be included. This way, besides being a product within the climate neutral cities mission, the contract also helps inform internally and externally about the ongoing sustainability policy, as well as its opportunities and gaps.

This part of the climate contract is the Action plan, which provides an overview of the current status of Amsterdam's climate policy. The municipality recently released Our city of tomorrow, in which the entire municipal executive expressed and established support for the ecological transition. In this letter, the municipality also announced additional actions; the Amsterdam approach.

Part A – The state of climate action in Amsterdam

In Part A of the Action plan of the Amsterdam City Climate Contract, we assess our city's starting position towards climate neutrality. This section sets the baseline to understand the system in which we want to operate climate neutrally. By mapping the current situation, we obtain the evidence base (such as the greenhouse gas emissions baseline) and the starting point for the transition to local climate neutrality. We also identify the gaps and barriers that hinder a rapid transition to a climate-neutral city. Part A thus forms the foundation for Part B - Pathways for accelerating climate transition and Part C - Facilitating actions to support the acceleration pathways.

To effectively work towards a climate-neutral Amsterdam, we must first evaluate where we are now. Tremendous efforts are already being made to make the city more sustainable, but it is still not enough.

The Amsterdam Climate Neutral 2050 Roadmap is an ambitious vision document of Amsterdam's long-term energy transition, including the actions to be taken in the short term. In this Roadmap, we described the core elements of our strategy to jointly accelerate and sustain the transition from fossil fuels to renewable energy.

As such, the Roadmap was the start of a collaborative process within Amsterdam, where there is room for experimentation, data collection and learning. This allows us to adapt and adjust our approach where necessary. Complementing the Roadmap, the Climate Contract looks beyond just direct greenhouse gas emissions (scope 1 and 2) to include the broader ecological transition, including indirect emissions in the chain (scope 3) due to what we consume here. Although many efforts are already being made, we see that Amsterdam is currently not moving at a sufficient pace to realise our sustainability ambitions. The City Climate Contract offers opportunities to take further steps in this regard.

A-1 CO2 Emissions by the city of Amsterdam

A-1.1 Geographical boundaries
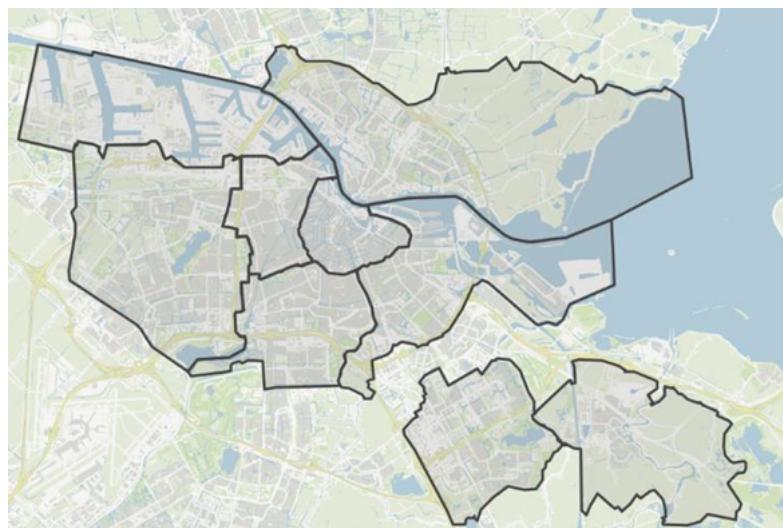
Figure 1: Amsterdam's geographical boundaries, its 9 city districts and 110 neighbourhoods.

Amsterdam covers a land area of 243.65 km^2 of which 23% is surface water and 77% is land. The municipality has a population of 918,117 distributed across: 518 neighbourhoods, 110 communities, 25 areas or 9 city districts. However, this information is for the situation in 2024, after the expansion of the City of Amsterdam with Weesp. The estimate still assumes the old municipal boundaries and

therefore does not include Weesp. The latest post-expansion information is not yet available for the first version of the climate contract.

A-1.2 Methodology for calculating Amsterdam CO2 Emissions

The calculation of CO2 emissions in Amsterdam followed the national Climate Act choices, which are based on the 2006 'IPCC Guidelines for National Greenhouse Gas Inventories' and the 2013 'EU Monitoring Mechanism Regulation'. That means monitoring emissions of all greenhouse gases, such as CO2, methane and nitrous oxide, with the exception of emissions caused by international shipping and aviation, biomass burning and the biogenic part of waste, and emissions from peatland oxidation. Energy consumption by international shipping is also not counted in the EU Renewable Energy Directive monitoring protocol.

To allocate national emissions at the municipal level, Amsterdam uses the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC). This protocol, derived from the international Greenhouse Gas (GHG) Protocol, identifies three 'scopes' of emissions. The implementation of the Amsterdam Climate Neutral Roadmap and this calculation involve scope 1 and 2 emissions. Scope 1 emissions refer to direct emissions from the built environment and transport (natural gas and petrol) and production-related activities within the municipal boundaries. Scope 2 concerns indirect emissions related to electricity and district heat consumption in the city.

To calculate CO2 emissions, we look at the consumption of electricity, gas and heat in Amsterdam. A CO2 calculator is used to convert consumption into CO2 emissions. The data sources we use to determine CO2 emissions are:

- National Climate Monitor (RIVM), for CO2 emissions.
- The Emissions Registry, for emissions from fuel consumption and other greenhouse gases.
- Heat consumption data from Vattenfall.
- Data on road traffic emissions based on licence plate scans and the Amsterdam Traffic Model (VMA) calculated by TNO.
- And data from the Emissions Authority on VU and AMC's emissions from gas consumption. Other greenhouse gases are converted to CO2 equivalents using the Global Warming Potentials according to IPCC AR5. Until 2020, Global Warming Potentials in accordance with IPCC AR4 were used. Only for the 2018 calculations, IPCC AR5 was also used, but on reflection, it should have been AR4. However, the difference is small in 2018 (3 ktonnes on total CO2 emissions).

Other greenhouse gases are converted to CO2 equivalents using the Global Warming Potentials according to IPCC AR5. Until 2020, Global Warming Potentials in accordance with IPCC AR4 were used. Only for the 2018 calculations, IPCC AR5 was also used, but on reflection, it should have been AR4. However, the difference is small in 2018 (3 ktonnes on total CO2 emissions).[1]

CO2 emissions not included
All categories that are not in the scope according to the Climate Act are not included in analysis (both for CO2 and other greenhouse gases). Table 1 lists which emissions are not included in the calculations. The emissions that are included are reflected in Table 2.

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[1] CO2 emission calculation method 2023 | Website Research and Statistics (amsterdam.nl)

Tabel 1: Categories not included in CO2 calculations

Category	CO2 emission in Amsterdam in 2017	Datasources
International shipping - Inland shipping - Maritime shipping (incl cruises)	 50 kton 100 kton	Emission registration
International aviation	Unknown	-
Hemweg plant* (generation of electricity with coal and gas)	3.360 kton	Emission registration
Burning biomass	Unknown	-
Buring the organic share of waste incineration	970 kton	Emission registration / RIVM
Oxidati0n of peat soils	20 kton	Emission registration and estimate municipality of Amsterdam based on agricultural area

*Coal plant Hemweg is closed in the end of 2019

We also do not count CO2 emissions caused by generating electricity and heat, as some of this generated energy is also consumed outside Amsterdam. Because of the City of Amsterdam's strong connection to the Afval en Energie Bedrijf (AEB), it was decided that the AEB's emissions from incinerating the non-biogenic part of its waste would be fully included in the City of Amsterdam's emissions, even though some of the electricity generated at the AEB is consumed outside Amsterdam. As emissions from waste incineration are not included in the CBS national electricity emission factor, there is no double counting.

CO2 emissions by transition pathway
CO2 emissions are calculated per transition pathway. Following the national example, this involves the following transition pathways: Built environment, Mobility, Electricity, and Port & Industry. For electricity, we look at all electricity consumption through the low-, medium-, and high-voltage grid. Electricity consumption generated behind the meter (such as by solar panels) is not included in electricity consumption. This has no impact on total CO2 emissions, as electricity consumption from solar panels does not cause CO2 emissions. For built environment and port & industry, we look at heat consumption and natural gas consumption. This includes natural gas burnt in individual boilers, natural gas burnt in collection heat plants, heat from the AEB and heat from the Diemen power plant. For mobility, we look at model-based data on emissions from fuel consumption. For all paths except electricity, we also look at emissions from other greenhouse gases. Table 2 shows which data was used for which transition pathway. Data on heat consumption we receive from Vattenfall and is not public, the other data is public data.

Table 2: Overview of data sources by transition pathway

Transition path	Greenhouse gas	Data	Data sources
Electricity	CO_2	Data on indirect emissions from electricity consumption	National Climate Monitor
Built environment	CO_2	-Data on direct emissions from natural gas consumption (for homes temperature corrected*) -Data on heat consumption (AEB and Diemenplant) -Heat emission factors -Data on direct emissions from natural gas consumption of the VU and the AMC	-National Climate Monitor -Vattenfall (non public data) -Vattenfall -Emission Authority Emission registration
	Other greenhouse gases	Model-based data on all other greenhouse gas emissions	
Harbour and industry	CO_2	-Emissions from waste incineration -Share of biogenic/non-biogenic in waste incineration -Data on direct emissions from natural gas consumption industry -Data on heat consumption industry -Heat emission factors -Model-based data on direct emissions from fuel consumption shipping	-Emission registration -RIVM -National Climate Monitor -Vattenfall (non public data) -Vattenfall -Emission registration
	Other greenhouse gases	Model-based data on all other greenhouse gas emissions	Emission registration
Mobility	CO_2	-Model-based data on direct emissions from fuel consumption highways** -Model-based data on direct emissions from fuel consumption mobile equipment	-Emission registration -Emission registration
	CO_2	Data on direct emissions from fuel consumption of road traffic inside and outside built-up areas**	-Municipality of Amsterdam / TNO
	Other greenhouse gases	Model-based data on all other greenhouse gas emissions	Emission registration

* Temperature-corrected emissions were chosen because they make us less dependent on external influences such as the weather when monitoring
** For emissions on highways we look at national calculations, because highways are managed by the national government

Preliminary figures
The availability of data on CO2 emissions is about one to two years behind. Figures published earlier are often still preliminary. For calculations of Amsterdam emissions, we rely on the aforementioned sources. The Climate Monitor publishes preliminary figures on CO2 emissions for the previous year in November/December, and they also publish final figures for the previous year around that time. So in December 2021, for example, the final figures for 2019 will be known, as well as provisional emissions figures for 2020. The Emissions Registry will release municipal-level figures for 2019 and preliminary national figures for 2020 in August 2021.

To still calculate more up-to-date figures, we use preliminary figures from the Climate Monitor. For emissions of other greenhouse gases and fuel consumption, data from the Emissions Registry, we use the (preliminary) national trend per emission category to estimate CO2 emissions for Amsterdam. For emissions from the AEB and from traffic and transport, we use sources other than the Emissions Registry. To determine emissions from traffic and transport inside and outside built-up areas, we use municipal data (emissions calculated by TNO); the AEB's emissions we get directly from the AEB. To

determine the emissions from AEB's non-biogenic waste incineration, we use the proportion of biogenic/non-biogenic as published by RIVM. This is not yet known for the past year and we are therefore using the data from the previous year.

To estimate CO_2 emissions in the most recent full year, we use PBL's estimate described in the Climate and Energy Outlook. Using the estimated national trend per transition pathway, we calculate the expected CO_2 emissions for Amsterdam according to a low and a high emissions scenario.

We are working to get more up-to-date figures on CO_2 emissions. From 2021, for example, we will use municipal data for traffic and transport emissions instead of data from the Emissions Registry as in previous years.

Reliability
Information on the methodology, quality and reliability of the Climate Monitor data can be accessed via their website. Information is also available on the method of determining (local) greenhouse gas emissions by the Emissions Registry. In addition, some specific comments on the use of this data for our calculations are listed below.

Climate Monitor
The Climate Monitor publishes CO_2 emissions of companies by SBI category. The source for this is energy consumption published by CBS. Due to traceability, energy consumption is not published for some industries. For this reason, the Climate Monitor makes estimates where energy consumption is unknown. However, this is not possible for all industries, so CO_2 emissions for some industries are unknown in the Climate Monitor. If the emissions are unknown, then we use the emissions of the last known year for that particular industry in the calculation.

Emissions registry
The published CO_2 emissions from mobile equipment (transition pathway mobility) are probably lower than they actually are. Among other things, analysis of RDW registration data, a recently conducted survey (which included information retrieved from the market) and new emission measurements show that the numbers of machines and total emissions may be a lot higher (a conservative estimate is 50% higher) than currently calculated by the models. It is expected that, for example, the numbers of smaller and older machines are underestimated in the emissions models used. In 2019, the calculated CO_2 emissions (including other greenhouse gases) for mobile equipment is 110 ktonnes, so this may be higher in reality.

Monitoring method
CE Delft has updated previous assessments of Amsterdam's CO_2 emissions. This is based on 2019 CO_2 emissions, as determined by Research & Statistics Amsterdam (O&S Amsterdam). The methodology used is similar to previous times (CE Delft, 2020, CE Delft, 2021). For the estimation, CE Delft made a realistic estimate of the impact of adopted and proposed policy measures. In addition, a range was calculated by including only the impact of adopted policy measures on the one hand, and the impact of both adopted and proposed policy measures on the other.

The 2030 calculation consists of four elements:

- **National impact (autonomous development):** Reducing emissions through national actions and measures (such as greener electricity generation and mandatory energy labels for offices; to which Amsterdam contributes).
- **Impact of measures in Amsterdam:** Reducing emissions through actions and measures taken by residents, businesses and institutions in Amsterdam and the City of Amsterdam itself.
- **Substitution effects:** Changes in energy use that lead to more or less emissions (e.g. the shift to electric cars instead of conventional cars, or heating houses with electricity instead of natural gas).
- **Growth of the city:** Additional emissions caused by new homes, buildings, residents and visitors.

Of the total estimated reduction of 3,010 ktonnes in 2030, 1,830 ktonnes (61%) is a result of autonomous developments/domestic policy, mainly making electricity generation greener in the Netherlands. In addition, 1,350 ktonnes of reduction (45%) is due to measures within Amsterdam itself. The measures with the greatest reduction effect are the phasing out of natural gas in the city, environmental zones for motorised transport and CO_2 capture at the AEB waste plant.

The city's growth is expected to increase emissions by 170 ktonnes, due to additional electricity consumption from new housing, offices and other economic activity. In the calculation, Amsterdam's solar and wind energy efforts are part of the autonomous development because they contribute to lowering the national emission factor for electricity, leading to lower CO_2 emissions per kilowatt-hour generated.

We have a good picture of where carbon emissions occur in Amsterdam (scope 1 + 2). This information is crucial for the city to adopt and manage CO_2-reducing measures. By providing insight into the data, we have laid a solid foundation to build on in the coming years.

When monitoring the circular economy, it is important to understand how much material is circulating in the economy. For this purpose, a number of indicators are tracked at the national level. These indicators have been adapted to a local level to present in this paper. These indicators provide a picture of the materials needed for the entire economy and for consumption only, both in terms of direct kilogrammes of material and material used in the supply chain. These are Direct Material Input (DMI), Direct Material Consumption (DMC) and Raw Material Input (RMI, or RMC when it comes to the DMC footprint), respectively. The figure below shows these indicators in relation to each other.
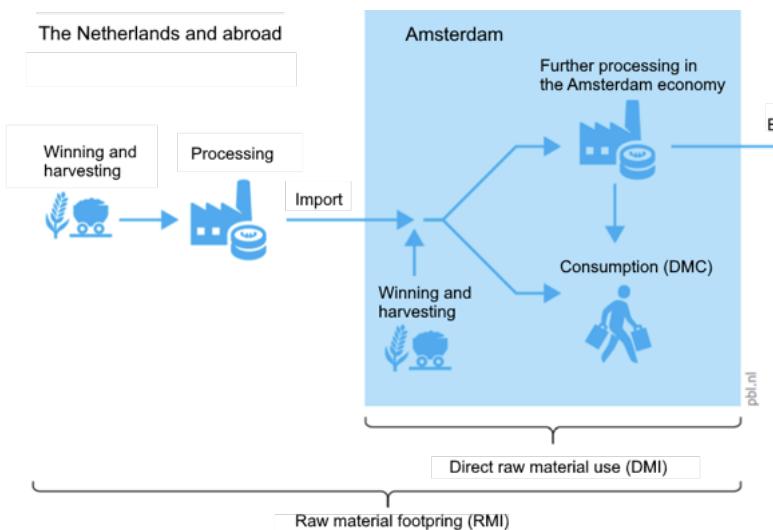
Figure 2: schematic representation of Amsterdam's raw material footprint

A-1.3 Scope 1, 2 and 3 CO2 emissions in Amsterdam

The Amsterdam Climate Neutral 2050 Roadmap focuses on scope 1 and scope 2 greenhouse gas emissions in Amsterdam.

Scope 1: Direct CO2 emissions
Scope 1 emissions are the direct CO_2 emissions within the municipal boundaries of Amsterdam. Examples include factory emissions, the combustion of natural gas in a boiler or the combustion of petrol in a car. This does not include emissions from electricity and heat generation, as some of the energy generated is consumed outside Amsterdam.

Scope 2: Indirect CO2 emissions

Scope 2 emissions are emissions related to the consumption of electricity and heat in the city. The generation of this electricity and heat in and around Amsterdam results in emissions. Scope 2 emissions are allocated to the parties that consume this energy. This is done using emission factors: what is the average emission per kilowatt-hour (kWh) of electricity or gigajoule of heat generated? As the Netherlands has one large power grid, the same emission factor is used for the whole calculation, including Amsterdam. For heat, a specific emission factor is used for each heat source. Amsterdam's solar and wind energy efforts are helping to reduce the national electricity emission factor. Green power contracts in Amsterdam are also part of this.

Scope 3: Emissions outside Amsterdam

Scope 3 emissions are all other emissions caused outside Amsterdam as a result of consumption in Amsterdam. This includes the materials we use in construction, consumer goods, and meat, dairy and other foods we consume.

This scope classification allows Amsterdam to accurately identify and address the greenhouse gas emissions the city is responsible for, with a focus on direct and indirect emissions within the city limits, but also considering the broader impact of Amsterdam's consumption patterns.

Scope 3 is not addressed in the Roadmap. The Circular Monitor also includes scope 3 emissions.
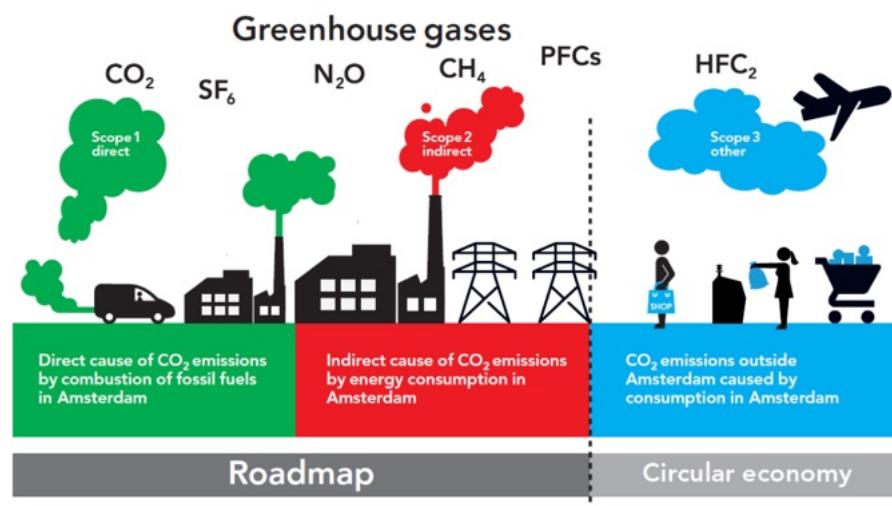
Figure 3: schematic representation of scope 1, 2 and 3 emissions in Amsterdam

The Amsterdam City Climate Contract is a consolidation of all ongoing policies in the energy, circular, and green and healthy transition.

A-1.4 Historical development of Amsterdam's CO2 emissions

Scope 1 and Scope 2

Figure 4 shows CO2 emissions for 2010 through 2021. In 2020, total CO2 emissions will be 3,920 ktonnes, a decrease of about 12% compared to 2019. Emissions are lower than estimated by CE Delft in 2021. Indirect CO2 emissions from electricity consumption decreased the most, followed by activities in the mobility sector. Emissions also fell slightly for the built environment and mobility. After declining in 2019, emissions from port and industrial activities increased again in 2020. The higher emissions from sectors in port and industry compared to 2019 are largely due to AEB being (partially) out of operation for several months in 2019. The resumed activities in 2020 contributed to AEB's CO2 emissions increasing to 436 ktonnes of CO2 in 2020 from 362 ktonnes in 2019 (+74 ktonnes). The increase in CO2 emissions within the port and industry transition pathway was somewhat mitigated by

less natural gas consumption in 2020 (vs. 2019) by the construction industry covered by this transition pathway[2]

Since 2010, CO2 emissions have been decreasing steadily, with the exception of 2021; on average, emissions are decreasing by about 135 ktonnes annually. That CO2 emissions increased in 2021 is because the sharp fall in 2020 was caused by the temporary reduction of the corona crisis.
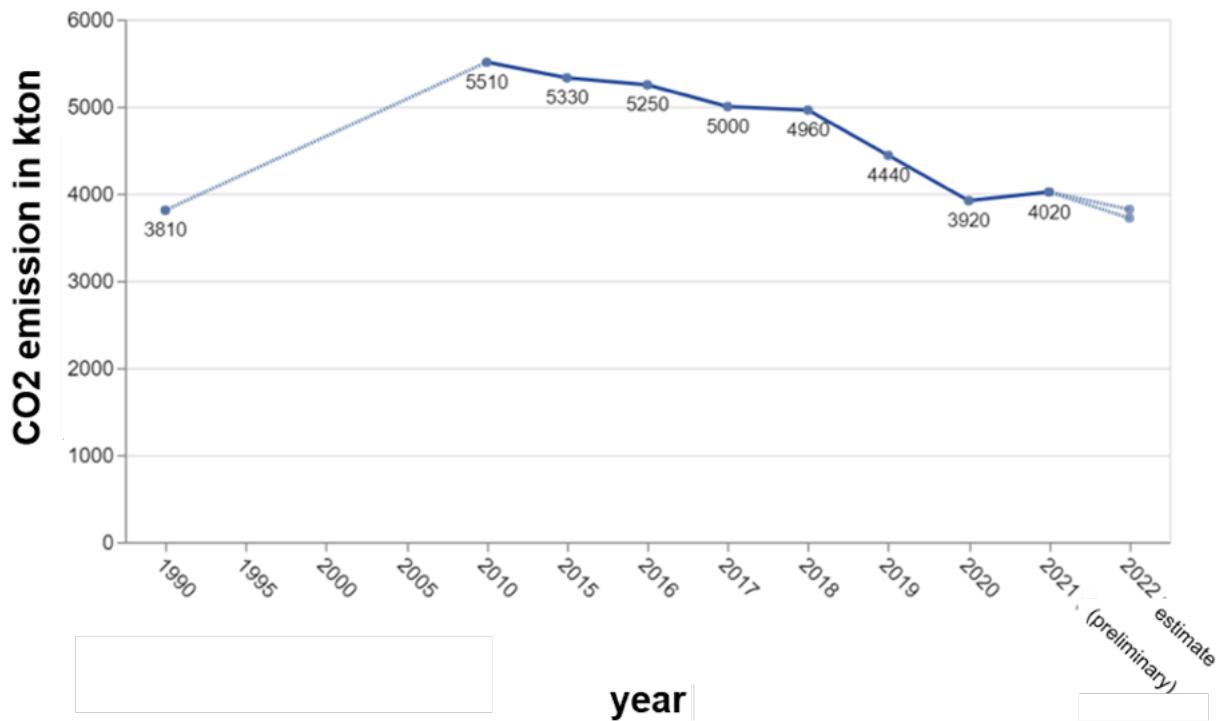
Figure 4: CO2 emissions in ktonnes/year

The figure below presents how these emissions can be subdivided among the four transition pathways in 2019 (the reference year for the Amsterdam Climate Neutral 2050 Roadmap), Built Environment (scope 1), Mobility (scope 1), Electricity (scope 2), and Port and Industry (Scope 1 and 2), respectively.
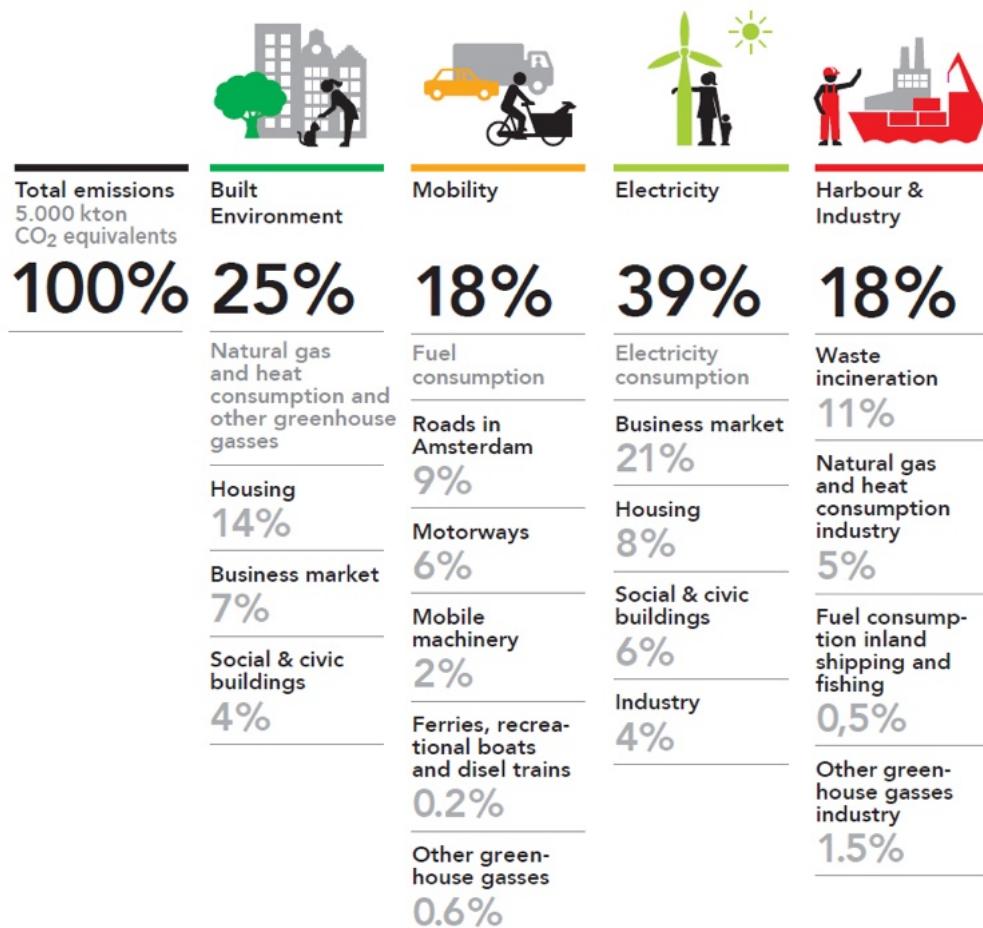
Figure 2: relative CO2 emissions per transition pathway
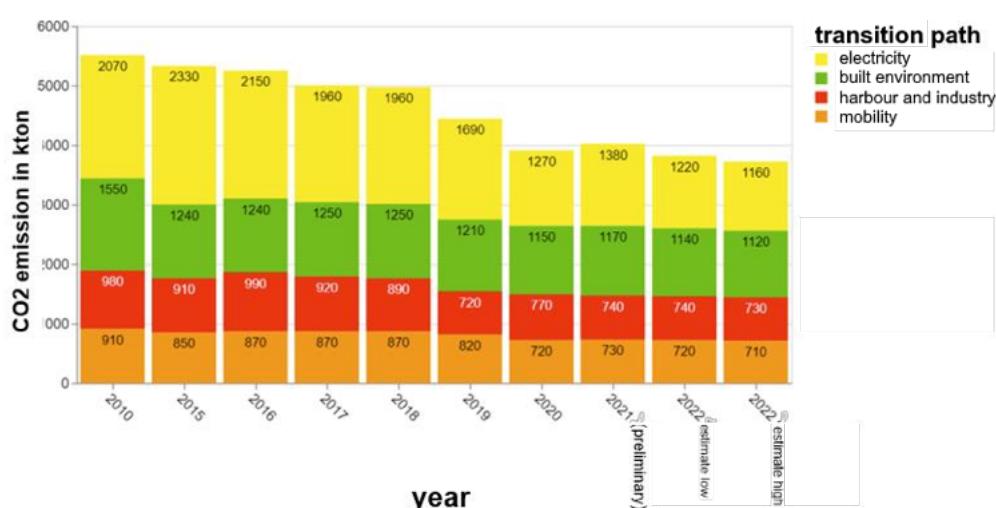
Figure 6: absolute CO2 emissions per transition pathway

Emissions from electricity consumption are 25% lower in 2020 compared to 2019 (-410 ktonnes). As in 2019, for electricity, the CO2 emission factor decreased in 2020 (from 0.37 in 2019 kg/kWh to 0.29

kg/kWh in 2020[3]). The CO2 emission factor is a factor used to calculate emissions from electricity generation. The decrease in the CO2 emission factor is mainly due to the decreased production of electricity from coal and is reinforced by an increase in renewable electricity production. Electricity demand also decreased due to the corona crisis, especially in the commercial services sector. The fall in CO2 emissions from mobility is largely due to a decrease in traffic on motorways and Amsterdam roads. Again, this cannot be separated from the corona crisis. People used the car less, so there were fewer emissions from fuel consumption[4].
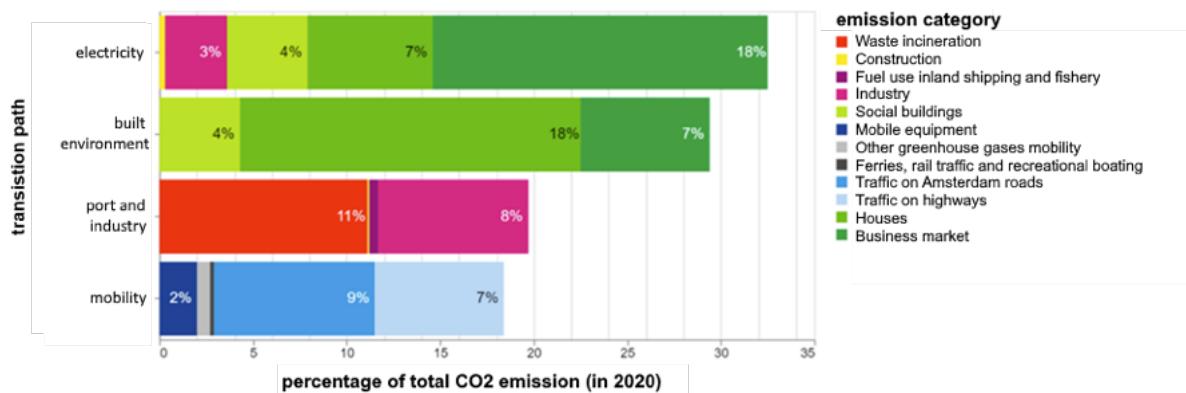
Figure 7: Percentage of total CO2 emissions per emission category

Figure 7 shows the percentages of total CO2 emissions by specific categories by transition pathway from the last calculated final year. The largest emissions are caused by electricity, gas and heat consumption in the business market, followed by electricity, gas and heat consumption by residential households.

Scope 3
The Roadmap covers direct CO2 emissions that take place within the city, and emissions from Amsterdam's energy and electricity consumption. These emissions are decreasing. At the same time, we see in the Circular Monitor that the CO2 emissions that occur in the extraction, production and transport of goods consumed in Amsterdam are 4 times greater than these direct emissions.

This means that about 80% of Amsterdam's climate footprint takes place elsewhere. The figures also show that these emissions, which mainly occur in production chains and thus elsewhere, are not structurally decreasing. The trend follows the growth and contraction of the economy.

The flow chart in the Circular Economy Monitor dashboard is intended to provide a global overview of material flows in Amsterdam. It shows where different types of materials are in the economy. It shows the interrelationships between different parts of the economy, such as imports versus extraction, and exports versus own consumption. Nationwide, a similar visualisation is used to map material flows. While the Roadmap focuses on direct emissions within Amsterdam, it also recognises the importance of addressing the much larger indirect Scope 3 emissions in the production chains. For now, these emissions remain linked to economic growth. By making material flows transparent, Amsterdam can develop more effective policies to address this Scope 3 footprint and thus make a greater contribution to reducing the climate impact of consumption in the city.

Amsterdam wants to be a thriving city for all its inhabitants, within the confines of the planet. This requires a major change in Amsterdam's economy and consumption. To achieve this, a target has been set to halve the consumption of new raw materials by 2030 and be fully circular by 2050. Circular material consumption is still difficult to measure. This monitor therefore shows the general material

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[3] Climate Monitor. Emission Factor Electricity

[4] Research and Statistics memo June 2023: CO2 emissions in 2020, 2021 and 2022

consumption in Amsterdam and what its effects are on the environment, especially elsewhere in the world.

Figure 8: Material flows through Amsterdam (O&S)

Research by the Department of Research and Statistics reveals the following:

- If environmental costs were included in the price of materials, they would have to be 42 percent more expensive on average.
- CO2 emissions within the city have decreased, but the city's overall climate footprint is not yet structurally decreasing (scope 3). The impact of material consumption is broader than just CO2.
- The effects vary by product group.
- Amsterdam's material consumption is not decreasing fast enough to meet the 50% reduction target by 2030.
- There is insufficient data available to properly measure the circularity of material flows.[5]

Amsterdam recognises that a thriving and sustainable city can only be achieved through a drastic change in the economy and consumption patterns. The targets for circular material consumption are ambitious, but current monitoring shows that additional efforts are needed, especially to address wider environmental impacts and indirect (scope 3) effects.

A-2 The policy context of Amsterdam's climate transition

The aim of the Action plan is to accelerate what is already happening and identify new opportunities to accelerate even further towards a climate-neutral Amsterdam. This chapter presents an overview of the policy context in which the city operates, from the international to the local level. The relationship with important and relevant policies on a local, regional, national and international scale is covered, as well as how they interact with our actions and vice versa.

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[5] Dossier: Circular Economy | Website Research and Statistics

A-2.1 Analysis of current policy
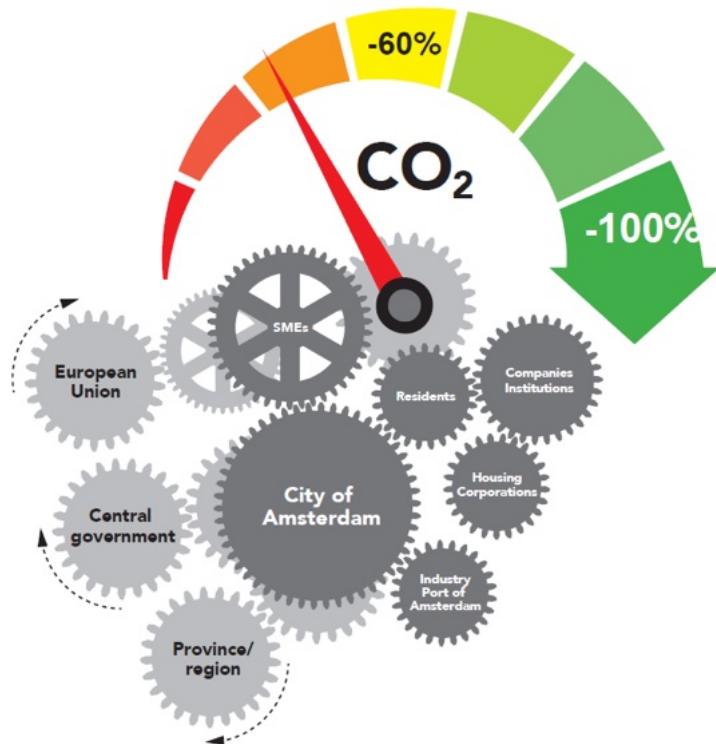
Figure 9: Schematic representation of the relationship between policy, actors and progress in the transitions

The current policy context

Amsterdam's transformation from dependence on fossil fuels to 100% use of sustainable energy from renewable sources requires an interplay of different parties that must work together to move in the right direction. This can be imagined as a mechanism with many 'gears'. Amsterdam's entrepreneurs and residents are driving the transition to a sustainable city, but they cannot do it alone. An individual resident may choose to use LED lighting at home, but cannot build a new heat distribution network. A company can sell climate-neutral products, but will not be successful if there is no market for them. It is the government's job to create the right preconditions for action. At some point, everyone will become involved in the task and everyone has a role to play: residents, entrepreneurs, businesses, institutions, research institutes, school boards and catering companies, as well as neighbouring municipalities, the province and the central government. Only by working together can we provide direction and make rapid progress towards a sustainable Amsterdam.

The realisation that we cannot do it alone is not just present locally, and resulted in the 2015 Paris Agreement, signed by 197 countries. For the first time, this agreement set a global upper limit of 2 degrees of warming compared to pre-industrial levels. It also set the target of limiting warming to 1.5 degrees and stipulated that fossil fuel consumption, the main cause of CO2 emissions, should be rapidly reduced.

The City of Amsterdam is taking its responsibility. We want Amsterdam to become a green, healthy, prosperous and future-proof city, where everyone can take maximum advantage of the opportunities offered by this social transition.

For example, Amsterdam has embraced the UN's Sustainable Development Goals (SDGs), which link 17 global challenges with the aim of eradicating poverty, inequality and climate change. Amsterdam's vision of sustainable urban development is inspired by the concept of the 'doughnut economy' (Kate

Raworth, Doughnut Economics, 2017). According to this model, an economy can only be sustainable and prosperous if social goals are achieved without exceeding the ecological ceiling.

Besides these important international developments, national, regional and local developments are also important and influence the city's climate actions.

At the national level, the National Climate Agreement was signed in 2019, setting the national target of 49% CO_2 reduction by 2030 compared to 1990. The agreement identifies five sectors within which this target must be met: electricity, industry, mobility, built environment and agriculture.

In addition, the transitions – energy transition, circular transition and green and healthy city – involve numerous relevant policy frameworks, with dependencies between national, provincial/regional and local levels.

The following sections provide an overview of the policy context at all levels and the link to the three transitions.

- Table local policy context
- Table national/provincial/regional policy context
- Table international policy context

A-2.1.1 Local level and scale

Amsterdam has made significant strides in climate action. The city has joined several global and European initiatives to accelerate efforts to tackle climate change.

At the local level, Amsterdam has launched several programmes, strategies and partnerships to achieve the transition to a climate-neutral city. Some key points are:

The Amsterdam Climate Neutral 2050 Roadmap outlines the long-term vision and approach for energy transition in the city. This ambition document describes the key elements of the strategy to jointly initiate and sustain the transition to renewable energy through four transition pathways: built environment, mobility, electricity and port & industry. In 2020, Amsterdam adopted the Amsterdam Climate Neutral 2050 Roadmap, the Heat Transition Vision and the Circular Strategy. The Roadmap describes how Amsterdam aims to become climate neutral in scope 1 and 2, the Transition Vision on Heat makes clear how Amsterdam can get rid of natural gas, and the Circular Strategy contains interventions to reduce material consumption. In addition, implementation agendas have been drawn up, which translate policy into implementation.

In addition, Amsterdam has set concrete targets to reduce CO_2 emissions by at least 60% below 1990 levels by 2030. The municipality monitors and reports progress annually through a climate report. The latest report on CE Delft's achieved reductions in CO_2 emissions has again made it clear that we are not meeting our target.

We must therefore accelerate to the maximum to meet our targets. We do this on the basis of existing plans, such as the Amsterdam Climate Neutral Roadmap, the Heat Transition Vision, the Green Vision and the Amsterdam Circular Strategy. We can only accelerate together with our partners such as housing corporations, educational institutions, residents and businesses. This City Climate Contract is a vehicle to achieve sustainability goals.

To realise these ambitions, the city works closely with local stakeholders such as entrepreneurs, knowledge institutions, housing corporations and neighbourhood initiatives. Joint programmes focus on making the built environment more sustainable, developing sustainable mobility and generating renewable energy.

Through these diverse initiatives, strategies and partnerships, Amsterdam is taking important steps to address the challenges of climate change and realise the ambitions for our city of tomorrow.

Local policy and strategy up to 2022

Type	Name & title	Year of publication	Emission domain(s)	Description	Relevance to/impact on local action	Stakeholders	Required action	Link
Ambition document	Amsterdam Climate Neutral 2050 Roadmap	2020	Energy transition	The Amsterdam Climate Neutral Roadmap is an ambition document with a long-term vision of Amsterdam's energy transition and short-term actions. In the Roadmap, we describe the key ingredients of our strategy to jointly set and keep the transition from fossil to renewable energy in motion. This document establishes how we will transition from fossil to renewable energy.	Highly relevant, direct impact	City of Amsterdam, residents, entrepreneurs, corporations, knowledge institutions	This ambition document is the basis for all (scope 1 and 2) CO2 actions towards a climate-neutral Amsterdam	Amsterdam Climate Neutral 2050 Roadmap
Implementation Agenda	Implementation Agenda 2020 - 2030: Towards a Sustainable Organisation	2020	All	The municipal organisation wants to contribute to making Amsterdam more sustainable through its own actions. This means that we apply sustainable solutions in our own operations, our own accommodation and in procurement and tendering processes. This agenda provides a picture of the level of sustainability of the municipal organisation as well as the task ahead to become a climate-neutral, circular and climate-resilient organisation.	Highly relevant, direct impact	City of Amsterdam		Implementation Agenda 2020 - 2030: Towards a Sustainable Organisation
Vision document	Heat Transition Vision	2020	Energy transition	Amsterdam is transitioning away from natural gas. In this heat transition vision, we establish a timeline to outline the sequence in which neighbourhoods or buildings will move off natural gas and gradually move to sustainable solutions. This shows what we expect a natural gas-free Amsterdam to look like based on today's knowledge.	Highly relevant, direct impact	Users and owners of real estate within Amsterdam, developers, district heating suppliers, City of Amsterdam	Regular review	Heat Transition Vision Amsterdam
Programme	2019-2025 Smart Mobility Programme	2019	Energy transition	With the 2019-2025 Smart Mobility Programme, Amsterdam is developing the mobility system of the future together with its residents, visitors, public and private parties. To achieve this, we are developing Amsterdam conditions that new mobility solutions and providers must meet. This way, we want to manage various mobility flows in public spaces to keep them liveable, clean, accessible and safe.	Highly relevant, direct impact	City of Amsterdam, other authorities, knowledge institutions and mobility and technology companies		2019-2025 Smart Mobility Programme

Action plan	Clean Air Action Plan	2019	Green & Healthy city	The 'Clean Air Action Plan' outlines how we will work towards cleaner and healthier air in the city until 2030. In doing so, we expect to extend the health of the average Amsterdam resident by three months. The most effective way to do this is to achieve zero-emission traffic. But we are not only looking at traffic as a source of air pollution. Industry, shipping and wood burning in the city are also covered. Sometimes through agreements, regulations and covenants, sometimes through lobbying and the central government.	Highly relevant, direct impact	City of Amsterdam, residents, industry, shipping, other authorities		Clean Air Action Plan
Strategy	Charging infrastructure strategic plan 2020-2030	2020	Energy transition	In this strategic plan, we establish how we will realise the charging infrastructure that will enable a zero-emission city. In the Clean Air Action Plan, the City of Amsterdam has expressed its ambition for a zero-emission city. The first step is zero-emission traffic within the A10 Ring by 2025 (passenger cars and motorbikes excluded). By 2030, the ambition is for all traffic within Amsterdam's built-up area to be zero-emission.	Highly relevant, direct impact	Users, providers and operators, other authorities, residents, grid operator, City of Amsterdam		Charging infrastructure strategic plan 2020-2030
Vision document	Municipal Port Vision 2020-2040: full speed ahead!	2020	Energy transition	Based on 5 public interests, we describe how we want to shape the area over the next 20 years. These guide the choices and cooperation with the Port of Amsterdam. The vision includes established policies on sustainability, urban development, circular economy and water transport.	Highly relevant, direct impact	City of Amsterdam, Port of Amsterdam, the central government (ministries I&W, EZK and more) Province of Noord-Holland, North Sea Canal Area (NZKG), companies in the port area	It also forms the basis for the Port of Amsterdam's Vision and Port Strategic Plan.	Municipal Port Vision 2020-2040: full speed ahead!
Strategy	Port Strategic Plan 2021-2025	2021	Energy transition	This strategy describes the port as a leading European Seaport, at the forefront of the transition to a sustainable society.		City of Amsterdam, Port of Amsterdam, the central government (ministries I&W, EZK and more) Province of Noord-Holland, North Sea Canal Area (NZKG), companies in the	The Strategic Plan has a four-year update cycle. (Version 2025-2028 under development in 2024)	Port Strategic Plan 2021-2025

						port area, suppliers, logistics service providers and authorities		
Vision docume nt	Port Vision 2030	2015	Energy transition	This vision describes the Amsterdam port in 2030 as a dynamic, multifaceted, adaptive and metropolitan "port ecosystem". A system that is flexible, recognises opportunities in time and is able to mobilise innovative power quickly.		City of Amsterdam, Port of Amsterdam, the central government (ministries I&W, EZK and more) Province of Noord-Holland, North Sea Canal Area (NZKG), companies in the port area, various authorities, companies and knowledge institutions	The Port Authority's vision is reviewed at least every 12 years. (2040 version under development in 2040)	Port Vision 2030
Implem entation progra mme	Waste and resources implementatio n programme 2020-2025	2020	Circular transition	Amsterdam wants to be a waste-free city by 2050, with clean streets and squares. To achieve this, we are taking a number of measures described in this implementation agenda.	Highly relevant, indirect impact (scope 3)	Residents, business owners, waste processors, City of Amsterdam		Waste and resources implementation programme
Action progra mme	Amsterdam Plastic Smart City action programme	2019	Circular transition	In 2019, Amsterdam signed a declaration of intent to become plastic smart - a world first. To this end, Amsterdam is developing an innovative, achievable action programme leading to a clean and healthy situation free of plastic pollution by 2030. The Amsterdam Plastic Smart City programme gives substance to this.	Highly relevant, indirect impact (scope 3)	City of Amsterdam, Plastic Soup Foundation, World Wildlife Fund Netherlands	Implementation programme to follow	Amsterdam Plastic Smart City action programme

Strategy	Amsterdam Circular Strategy 2020-2025	2020	Circular transition	The Amsterdam Circular Strategy is meant ensure a significant reduction in the use of new raw materials and materials, thus contributing to a sustainable city. The goal is to halve the use of new raw materials by 2030, and achieve a fully circular city by 2050.	Highly relevant, indirect impact (scope 3)	City of Amsterdam, entrepreneurs, social initiatives and residents, other authorities	This document is the first of four documents forming a unit, including the monitor, city donut and implementation programme	Amsterdam Circular Strategy 2020-2025
Action plan	Protein transition action plan 2021-2023	2021	Green & Healthy city	This action plan outlines guidelines and concrete actions through which the City of Amsterdam will actively contribute to the national ambition to achieve a more plant-based diet.	Highly relevant, indirect impact (scope 3)	Social organisations, hospitality industry, schools, retail and food producers, authorities, knowledge institutions	This action plan is part of the Food Strategy	Protein transition action plan 2021-2023
Policy	Artificial turf memorandum	2020	Circular transition	The artificial turf memorandum proposes steps to be taken, substantively and process-wise, to realise the incorporation of sport in the city in the most sustainable, nature-inclusive and environmentally friendly way possible.	Highly relevant, direct impact	City of Amsterdam, sports sector, market players		Artificial turf memorandum
Agenda	Swimming pools agenda							
Strategy	Business Strategy 2020-2030	2020	Energy transition Circular transition	The Business Strategy 2020-2030 describes the municipality's choices regarding the distribution and efficient use of space in the city.		Manufacturing industry and logistics, MRA		Business Strategy 2020-2030
Monitor	Circular Economy Monitor	2022	Circular transition	The circular economy is important for meeting climate targets and is needed to secure the availability of raw materials. In fact, CO2 emissions from consumption (scope 3) exceed all other emissions in Amsterdam. The Circular Monitor provides insight into material use and where impact can be made.	Highly relevant, indirect impact (scope 3)	City of Amsterdam, Amsterdam Economic Board, Amsterdam Metropolitan Region, residents, entrepreneurs	The impact of material consumption is broader than just CO2. Amsterdam's material consumption is not decreasing fast enough to meet the 50% reduction target by 2030. There is insufficient data available to properly measure the circularity of material flows.	Circular Economy in Outline | Website Research and Statistics (amsterdam.nl)

Vision docume nt	The Amsterdam City Doughnut	2020	Circular transition	The City Doughnut for Amsterdam is designed to encourage cooperation between all parts of the city and to connect a large network of players in the city in a repeating process of change. The City Doughnut for Amsterdam demonstrates some of those ways, such as taking a snapshot of the city and stimulating engagement with key initiatives.	Highly relevant, indirect impact (scope 3)	City of Amsterdam, residents, authorities, businesses, knowledge institutions, social initiatives		The Amsterdam City Doughnut
Agreem ent	Amsterdam Agreement (coalition agreement 2022-2026)	2022	All	The coalition agreement of the College of Mayor and Alderpersons contains municipal plans, priorities and finances for the 2022-2026 government period in the areas of energy transition, circular, green and healthy city.	Highly relevant, direct impact	City of Amsterdam, residents, businesses	Implementation agendas 2023-2026	Coalition agreement 2022-2026
Vision docume nt	Amsterdam environmental vision 2050	2021	All	Besides being a guideline for urban development and the quality of the living environment, the 2050 environmental vision is also an agenda for twenty-first-century city-making, together with Amsterdam residents.	Highly relevant, indirect impact	City of Amsterdam, residents, businesses		Amsterdam environmental vision 2050
Vision docume nt	Main green structure (HGS)	2020	Green and Climate Adaptive	With the new HGS, we are aiming for a contiguous network. Where possible, we integrate the Ecological Structure, the Main Tree Structure, the Green Network and the Green Streets and Paths Map into the new HGS.	High relevance: indirect impact		Green vision	Structural Vision 2040

A-2.1.2 National and regional scale

Provincial, regional and national policies

Type	Name & title	Year of publication	Emission domain(s)	Description	Relevance to/impact on local action	Stakeholders	Required action	Link
Law	Passenger Transport Act (Wp2000)	2001	Sustainable mobility	Regulations to increase the efficiency and cost effectiveness of local and regional public transport. Also states that public transport operators can allocate resources to shared mobility solutions.	Medium relevance/ indirect impact	Authorities, transport companies	Influences decisions of local and regional public transport providers.	
Policy	National Climate Agreement	2018	All	Agreement between a large group of national stakeholders committing to reduce national CO2 emissions by at least 49% by 2030 and 95% by 2050 compared to 1990.	High relevance/direct impact	All	Framework for most actions in this list. Also framework under which municipalities get national funding to implement plans in the National Climate Agreement.	National Climate Agreement
Strategy	Regional Energy Strategy	2021	Energy transition, built environment	Regional strategy for increased onshore renewable energy production.	Medium relevance/ direct impact	Governments (all levels), energy suppliers, housing corporations, residents	Framework for regional cooperation on large-scale energy production, Noord-Holland Zuid (NHZ) region.	Regional Energy Strategy
Policy proposal	Collective Heating Bill	2022	Energy transition	Proposed bill to facilitate district heating development by designating public parties to develop these networks, giving the public sector more control.	High relevance/direct impact	Governments (all levels), energy suppliers, housing corporations, residents	Framework for the development of district heating.	

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Action plan	National Insulation Programme	2022	Energy transition	National programme to accelerate household insulation to reduce energy consumption and prepare 2.5 million households for non-fossil heating sources by 2030.	High relevance/direct impact	Governments, housing corporations, homeowners, insulation companies, residents of homes in need of insulation	Link with local missions to accelerate energy saving and insulation. National Insulation Programme.	National Insulation Programme
Policy	Electric vehicle charging infrastructure policy	2022	Sustainable mobility, energy transition	The National Charging Infrastructure Approach aims to make all transport zero-emission by 2050. This can only be achieved through a good, nationwide network.	High relevance/direct impact	Governments, energy suppliers, public transport company, grid operator, logistics companies, drivers		Policy on Charging Infrastructure for Electric Vehicles
Vision	Mobility Vision 2050	2023	Mobility	National vision memorandum on the future of mobility.	Medium relevance/indirect impact	All	Framework for mobility policy	Mobility Vision 2050
Policy	National Performance Agreements	2023	Energy transition, built environment	Agreements stating that housing corporations will phase out EGF labels in all their social housing stock by 2028 at the latest. Further acceleration of efforts is needed to achieve the NPA goals.	High relevance/direct impact	Housing corporations, tenants	Link with local missions to accelerate energy saving and insulation.	
Strategy	National approach to mobility transition	Multi-year	Mobility	Accelerating the mobility transition through a joint approach by all governments.	Medium relevance/indirect impact	Ministry of Infrastructure and Water Management, Provinces and municipalities	Measures aimed at structural improvement of mobility. Link to local mobility vision and implementation.	Not yet published

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Regu-lation	Manifesto for Socially Responsible Contracting and Procurement (MVOI)	2022	All	Manifesto signed by 90 (semi-)government organisations to promote ambitious social procurement and sustainable procurement. Participation is optional, and still parties join and commit to write an Action Plan. It is divided into the themes: environment and biodiversity, climate, circularity, International Social Conditions (ISV or chain responsibility), diversity and inclusion, and social return.	High relevance/direct impact	All	Framework for municipal MVOI action plan	Manifesto for Socially Responsible Contracting and Procurement (MVOI)
Action plan	Multi-year infrastructure plan energy and climate (p)MIEK	2023	Energy transition, built environment, sustainable mobility	Integral analysis on key projects for a sustainable energy system towards 2030 and beyond.	High relevance/direct impact	Municipalities, network operators, province	Framework for energy infrastructure development at provincial level, in agreement with municipalities. Is iterated every two years.	Provincial multi-year plan on infrastructure, energy and climate (pMIEK) Noord-Holland
Strategy/ vision	National energy system plan	2023	Energy transition, built environment,	Draft vision for the national energy system	High relevance/direct impact	Governments, energy suppliers, all building owners	Framework for other integrated approaches to energy infrastructure such as the pMIEK	National energy system plan
Regu-lation	Multi-year Programme Climate Fund 2024	2023	Energy transition	The Climate Fund is intended for additional measures that contribute to achieving the reduction targets in the Climate Act, the transition to a climate-neutral energy supply, economy and society and a just climate transition.	High relevance/direct impact	All		Multi-year Programme Climate Fund 2024
Action plan	National Programme Circular Economy 2023-2030	2023	Circular transition	The National Programme Circular Economy (NPCE) contains measures to use raw materials more economically in the coming years.	High relevance/direct impact	All		National Programme Circular Economy 2023-2030

Policy	National Raw Materials Agreement	2017	Circular transition	Letter of intent to move towards transition agendas for the Circular Economy. The Raw Materials Agreement contains agreements by the central government with other parties on measures to accelerate the transition to the circular economy.	High relevance/direct impact	All		National Raw Materials Agreement
Advice	Space for circular economy	2023	Circular transition	In this report, PBL explores the implications for space demand and design in a fully circular economy using four scenarios. The future images show that the transition – with different developments of social attitudes and with different actors taking the lead – looks different.	High relevance/indirect impact	All		Space for circular economy
Action plan	Delta Programme Climate Adaptation 2024	2023	All	The Spatial Adaptation Delta Plan contains all the projects and measures that will ensure a water-robust and climate-resilient Netherlands by 2050.	High relevance	All		Delta Programme Climate Adaptation 2024
Vision	North Sea Canal Area Development Perspective (NZKG)	2023	All	In the coming decades, the North Sea Canal Area will be of national importance for realising substantial tasks. Themes such as the energy transition, circular economy, housing construction, strong port and industrial areas as well as a healthier living environment are addressed in the Development Perspective. Climate adaptation, landscape enhancement and ecology are also important themes.	High relevance/direct impact	All	Updated every 4 years	North Sea Canal Area Development Perspective (NZKG)

Vision	Draft Energy Vision Noord-Holland-Noord	2023	Energy transition	The energy vision is the strategic framework for energy system development in the province. The vision contains or lists choices about the energy system, which are made in conjunction with developments in the physical environment and at specific locations, such as residential areas and business parks.	High relevance/direct impact	All		Energy Vision Noord-Holland-Noord
Vision	Draft Energy Vision Noord-Holland-Noord	2023	Energy transition	The energy vision is the strategic framework for energy system development in the province. The vision contains or lists choices about the energy system, which are made in conjunction with developments in the physical environment and at specific locations, such as residential areas and business parks.	High relevance/direct impact	All		Energy Vision Noord-Holland-Zuid
Action plan	Regional implementation agenda urban logistics (RUAS)	2023	Energy transition Mobility	The aim of the RUAS is to facilitate the transition to more efficient and sustainable urban logistics through regionally aligned activities, thus making a regional contribution to the goals of the climate agreement.	High relevance/direct impact	All		Regional implementation agenda urban logistics (RUAS)
Policy	Green Deal Wood Construction Covenant	2021	Circular transition	Aimed at implementing the change of scale in wood construction in the Amsterdam Metropolitan Region 2021-2025	High relevance/direct impact	All		Green Deal Wood Construction Covenant
Strategy	Grid operators investment plans	2024			High relevance/direct impact	All	Updated every 2 years	
Action plan	Regional Mobility Programme Flevoland and Noord-Holland	2023	Energy transition, mobility	The Flevoland and Noord-Holland Regional Mobility Programme aims to reduce CO2 emissions from mobility to no more than 2.2 megatonnes by 2030. This is a 55% reduction compared to 1990.	High relevance/direct impact	All		Regional Mobility Programme Flevoland and Noord-Holland

Policy	Green Deal Textile	2022	Circular transition	Within the Green Deals Circular Textiles, several parties commit to the ambition to work towards a circular approach to textiles over the next three years.	High relevance/direct impact	All	Green Deal Textile
Action plan	Implementation programme MRA cycling routes	2023	Mobility	The ambition is that by 2035, there will be some 475 km of pleasant, recognisable, wide, well-lit and safe cycling paths in the region, so that residents and visitors to the transport region choose to cycle instead of drive.	High relevance/direct impact	All	Implementation programme MRA cycling routes

A-2.1.3 EU and international scale

European and International Climate Policy and Strategy

Type	Name & title	Year of publication	Emission domain(s)	Description	Relevance to/impact on local action	Stakeholders	Required action	Link
EU Policy	EU Emissions Trading System	2005	All	System based on the 'cap and trade' principle. A cap is a limit set on the total amount of greenhouse gases that can be emitted by the sectors covered by the scheme. The cap is reduced annually in line with the EU's climate target. The scope (which sectors are included) expands over time, with the maritime sector being the latest addition (2024).	Medium relevance/ indirect impact	Large emitters	EU policy to reduce emissions. Link to all missions/actions aimed at CO2 reduction.	Development of EU ETS (2005-2020) - European Commission (europa.eu)
EU Regulation	TEN-T policy	2013	Mobility	To support the transition to cleaner, greener and smarter mobility, the Commission revised the 2013 TEN-T regulation. The revised TEN-T regulation should put the transport sector on track to reduce its emissions by 90%. It responds to the need to increase connectivity across Europe and shift more passengers and freight to sustainable modes of transport.	Medium relevance/ indirect impact	Local and regional authorities	Establish local SUMP (Sustainable Urban Mobility Plan) and develop indicators.	Regulation - 1315/2013 - EN - EUR-Lex (europa.eu)
Treaty	Paris Agreement	2015	All	Treaty signed by 196 UN parties to "keep the increase in global average temperature well below 2°C above pre-industrial levels" and make efforts "to limit the increase in temperature to 1.5°C above pre-industrial levels."	High relevance/indirect impact	All	Framework for underlying climate targets and basis for National Climate Agreement.	https://unfccc.int/process-and-meetings/the-paris-agreement
EU strategy	European Green Deal	2019	All	Package of policy proposals to reduce net greenhouse gas emissions by at least 55% by 2030.	High relevance/indirect impact	Governments, manufacturing sector, consumers	The European Green Deal (europa.eu). Link to all missions/actions aimed at CO2 reduction.	The European Green Deal (europa.eu)
EU Policy	EU Climate Law	2020	All	European Union commitment to climate neutrality target by 2050 with identified 2030 target and pathway proposals to achieve both targets.	High relevance/indirect impact	All	Making the EU climate neutral by 2050 (europa.eu).	

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EU action plan	Circular Economy Action Plan	2020	Circular economy	Action plan with measures to produce more sustainable products, reduce waste and promote circularity in the EU. Part of the European Green Deal.	High relevance/direct impact	Governments, manufacturing sector, consumers	Link to missions for circular and sustainable inner cities, neighbourhoods and businesses.	EUR-Lex - 52020DC0098 - EN - EUR-Lex (europa.eu)
EU Strategy	EU Biodiversity strategy 2030	2020	Built environment	EU strategy to halt biodiversity decline and help increase biodiversity by 2030. Part of the European Green Deal.	Medium relevance/ indirect impact	Governments, developers	Link to missions/actions on green and water as the basis.	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0380
EU regulation	Alternative fuels infrastructure regulation (AFIR)	2021	Mobility	Implementation targets for 2025-2030 for charging stations and alternative fuel stations (for fossil fuels).	Medium relevance/ indirect impact	Energy suppliers, network providers, drivers, transport sector.	Placing sufficient truck charging stations, including in urban areas.	
EU action plan	Zero Pollution Action Plan	2021	All	Action plan to drastically reduce pollution within the EU. Target of zero pollution by 2050 and 25-55% reduction in various types of pollution by 2030.	Medium relevance/ indirect impact	Governments, industrial polluters, transport sector, EU residents		Zero pollution action plan (europa.eu)
EU policy	EU Nature Restoration Law	2023	Built environment, Circular economy	Set of rules to restore biodiversity and ecosystems within the EU, aiming to cover at least 20% of EU land and sea with recovery measures by 2030 and all ecosystems by 2050.	Medium relevance/ indirect impact	Governments, agricultural sector, heavy industry, EU residents	Link to missions/actions on green and water as the basis.	
EU Regulation	Regulation 2023/851 Actualised CO2 emission standards performance standards for cars and vans	1992 - present	Mobility, Built environment	Introduction of stricter CO2 emission targets for cars and vans in line with EU car and van reduction targets of 100% by 2035.	High relevance/direct impact	Car and van users (commercial or private)	Link to air quality action plan.	Regulation - 2023/851 - EN - EUR-Lex (europa.eu)
EU regulation	Actualised CO2 emission standards performance standards for heavy-duty vehicles	1992 - present	Mobility, Built environment	Introduction of stricter CO2 emission targets for heavy-duty vehicles in line with EU car and van reduction targets of 100% by 2035.	High relevance/direct impact	Industry, transport sector	Link to air quality action plan.	

EU regula tion	Energy Efficiency Directive (EED)	2012 - present	Built environme nt	Setting rules and obligations for achieving the EU's ambitious energy efficiency targets. The revised Energy Efficiency Directive establishes "energy efficiency first" as a fundamental principle of EU energy policy, giving it legal status for the first time.	High relevance/dire ct impact	All	Mandatory four-yearly audit, although we are now certified for the CO2 Performance Ladder, we will be exempt from this as the CO2 Performance Ladder is more stringent in this area.	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJ OL_2023_231_R_0001&qid=1 695186598766
EU regula tion	Clean Vehicles Directive (CVD)	2019 - present	Mobility	The aim of the CVD is to increase the market for clean and energy-efficient vehicles by promoting them through procurement by requiring contracting authorities to have a certain minimum percentage of clean and zero-emission vehicles in their fleet.	High relevance/dire ct impact	Government		https://eur-lex.europa.eu/eli/dir/2019/116 1/oj

A-2.2 2030 CO2 reduction gap in Amsterdam
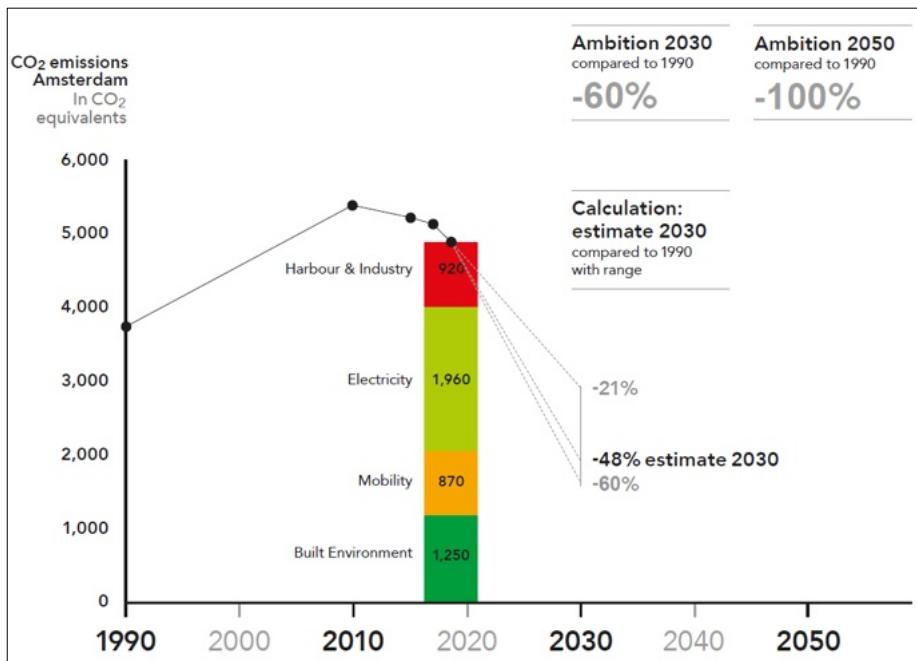
Figure 10: Estimation of 2030 emissions. (Amsterdam Climate Neutral 2050 Roadmap, 2020)

Based on a calculation of all planned actions and measures by the national government, the City of Amsterdam and citizens, companies and institutions, and growth of the city, emissions in 2030 are expected to come to a 45% reduction compared to 1990 without additional policies (1,980 ktonnes).

Due to uncertainties about the degree of success in implementing the intended actions and measures and about the size of the effects, a range has been used. The range of the calculation estimate is between -21% and -55%. Thus, the ambition of 60% reduction requires additional measures and full and successful implementation of existing actions and measures. Many actions and measures still need to be elaborated, policies still need to be developed, adopted and implemented. The municipality should also be given sufficient powers to do this work.

The sharp drop in the mobility sector estimate can be attributed, for example, to proposals for zero-emission zones. However, it is unclear whether the appropriate legislation from the state will be there to introduce it as a municipality. However, to reach 2030, this needs to start soon. Congestion on the power grid is also a major barrier to electrifying energy-intensive industrial activities. This should be resolved in a timely manner. On the one hand, for the development of Amsterdam and the region, but also to realise current CO2 reduction intentions. The following section discusses these obstacles in more detail. The action plan presented in the next chapter has one goal: Making clear how we are now trying to accelerate the implementation of the climate transition as much as possible. This overview also helps us identify or explore new opportunities, and by supporting already planned activities as much as possible by removing obstacles in the implementation.

A-3 Systemic barriers and opportunities for climate neutrality in Amsterdam

A-3.1 Organisational and Financial

Obstacles for the municipality

A lot is happening in the field of sustainability. This sometimes makes it difficult to coordinate and maintain overview of the various sustainability initiatives and innovation agendas within the municipal organisation. This can lead to fragmentation of efforts. Currently, the organisation of sustainability in municipality is developing, and we want to do all our work sustainably. This has made sustainability an organisation-wide task. This is a logical and necessary move, but at the same time, it is sometimes necessary to maintain overview and ownership.

Actors and civil servants experience, for example, that many new structures are being created that need to connect to the existing local context. This is difficult because so much is happening - through so many different structures and programmes - that it is not always clear who is (already) doing what and how it is connected. In other words, it becomes hard to see the forest for the trees, resulting in a fragmented ecosystem.

The programmes and departments at the municipality itself are also sometimes compartmentalised, whereas a streamlined approach with clear priorities and a central point of contact could increase efficiency and clout. The integrated monitor, and later a possible link between actions, progress on strategic goals, and the municipal budget, should help to (continue to) enable overview and adjustment of the sustainability task.

In addition, ambitious sustainability goals can be at odds with their feasibility within the municipality's available resources and capacity. Smaller projects and organisational units risk being overlooked during implementation because larger projects with more impact are prioritised. Subject matter experts are also often too busy to be involved in all relevant projects in time. Careful prioritisation and allocation of sufficient implementation capacity is therefore essential. Establishing the implementing organisation Energy for the City may help in this regard, but may also lead to a wider gap between policy and learning from implementation.

Financially, the limited availability of investment funds poses a challenge, especially for facilitating profitable business cases for a fully circular economy and achieving the transition away from natural gas. For this, the municipality is also largely dependent on the central government and the EU.

Monitoring and adjustment are a focus area, given challenges around data management, recording actions in policy documents and the overview of partnerships with external parties. A monitoring system is essential for a learning and adaptive approach. Here, too, the integrated monitor can help.

Organisational and financial barriers include fragmentation of sustainability programmes and strategies, lack of overview and coordination of innovation agendas, challenge of engaging substantive colleagues, tension between feasibility and ambition in objectives, risk of small components being overlooked, compartmentalisation of programmes, and lack of implementation capacity.

Opportunities for the municipality

First, it seems important that sustainability and climate goals are given a prominent place in municipal budgets and accountability. By making climate indicators more visible, and linking them to actions and the budget, resources can be allocated more effectively where they can make the most difference.

In addition, vetting and, where necessary, amending existing laws and regulations is crucial. For example, research is under way on possibilities for banning harmful advertisements or adapting zoning plans for circular activities. These kinds of interventions can contribute to a more sustainable living environment.

In terms of tendering, purchasing and procurement, too, Amsterdam can encourage sustainability through frameworks and covenants with suppliers and leasing companies. Think of a preferred supplier system with sustainability criteria, performance contracts with circularity clauses or a covenant for sustainable tyres.

That is why the CO_2 ladder was introduced, why we use an internal CO_2 price for projects over 1 million and why we increasingly work with an MKI standard during tenders. Research is also being carried out on developing new policies and instruments, such as an action framework for CO_2 pricing according to the 'true price' principle or a national benchmark for climate adaptation that all cities should comply with.

We will also continue the impact planning process that falls under the administrative order 'Sustainable city, future and organisation'. The aim is to show, for the different programme lines in the municipal budget, how they contribute to sustainability, and thus to verify whether each programme line can do enough to become sustainable. In the first iteration, the impact plans gave room for experimental and out-of-the-box ideas as well as thought frameworks to follow them up.

A-3.2 Institutional and regulations

Obstacles for the municipality
The main barrier in accelerating the transitions is the limited mandate of the municipality. As a decentralised layer of government, the scope for action is limited, and municipalities need the state or the EU. At the institutional level, there is sometimes ambiguity about the permissibility of certain sustainable applications within existing regulations and policy frameworks. In addition, it is difficult to assess what is needed or possible to achieve targets that are more ambitious than those set by the central government (see vertical policy coherence). Examples include the lack of an assessment framework for (energy) investments, problems in realising projects (capacity, money, permits), lack of clarity about the permissibility of certain activities, contradictory policies within and between governments (policy incoherence), restrictions in zoning plans for mixed use, lack of enforcement of event policies, lack of policy instruments to enforce agreements with the market or industry, and insufficient financial resources to support the market.

Opportunities for the municipality
This City Climate Contract offers the opportunity to address precisely this vertical incoherence. For Amsterdam, a big reason for joining the 100 climate neutral and smart cities mission was that it can increase the coherence of public policies. By reporting on climate policy progress *through* cities, higher levels of government could learn about and act on policy frameworks that are not working or have more potential. In such a way, the preconditions can be created at the EU and national level to better implement the climate transition at the urban level.

The National Cooperation Structure (NSS) concretises this. By clearly identifying what is needed and what does and does not work, the NSS can convey clear desires, constraints and opportunities from the municipalities to the central government and the EU, which can be used to formulate multi-scale policies that work in practice.

A-3.3 Politics

Obstacles for the municipality
Amsterdam is good at Amsterdam bravado. Setting and developing ambitions was long overdue, but it is good that the focus is now shifting to implementation. At the same time, we have found that it is challenging to properly include market players and citizens in this transition. We have to make political choices when we cannot achieve everything we want, and that can hurt.

The city faces tough choices that must be settled politically. Examples of such political and administrative barriers include questions about how Amsterdam should deal with the little space available in the city, and how housing construction can be linked to the sustainability challenge, about what an equitable climate transition looks like in practice in the context of risks of mobility and energy poverty. How the city of tomorrow can be designed for everyone, but also, for example, when an unsustainable alternative is chosen because municipal clients do not have the money. There is also the question of whether high ambitions sometimes do more harm than good, because they are difficult to realise in practice and can therefore paralyse or lead to an unreliable government. It is up to politicians to make it clear how to deal with such dilemmas.

Opportunities for the municipality
Amsterdam has a very ambitious coalition agreement. Despite the many barriers, this shows the political will to maximise sustainability. Research also shows that support for the transition is high in the city itself.

A pilot for the Assessment Framework for Broad Prosperity was recently done in Amsterdam Zuid, the aim was to enable administrators to make the tough choices and overcome dilemmas. By looking more systematically at the fundamental dilemmas underlying the major tasks facing Amsterdam and the world, we hope to make the right choices that can be implemented in the short term, and have long-term impact. There is also an administrative sustainability team, where political dilemmas can be settled.

A-3.4 Technology

Obstacles for the municipality
Technological and infrastructural barriers include grid congestion (with risk to the implementation of the energy transition, housing sustainability and required load capacity), underexposed focus on water in climate policy, and potential shortages of industrial water. In addition, there is a structural scarcity of space which complicates the elaboration and implementation of the transitions. This complicates management tasks. A heating grid, electricity infrastructure, waste containers, loading infrastructure, sewerage, as well as space requirements of tree roots and soil life, often do not all fit side by side in the subsurface. In addition, work cannot be done everywhere at once either.

Opportunities for the municipality
On the technology front, innovations, sustainable sports facilities and Positive Energy Districts offer opportunities to accelerate the transition. Integral programming in the power grid should also make it easier to deal with scarce space, which, for example, the (provincial) multi-year infrastructure programme for energy and climate can help with. Energy hubs and decentralised energy grids are also already being set up from the city. Sharing and exchanging energy at certain peak or off-peak times is a good way to relieve the congested grid. The Province of Noord-Holland is also committed to Smart Energy Hubs. Locally, organisations such as Resourcefully look for opportunities in Amsterdam Oost.

The development of battery swap stations for electric vehicles and the setting up of sharing platforms for electric cargo bikes can help make the mobility sector more sustainable.

In the construction and industrial sectors, there are opportunities in electrification of equipment, circular scans to improve material consumption, and sustainable procurement and tendering processes. Innovative solutions such as bio-based construction and removing barriers for market players can be a flywheel here. Technological monitoring and data-driven insights, such as material flow analysis, can contribute to effective management. Platforms for knowledge exchange between cities and with other parties can accelerate innovation.

A-3.5 Social aspects and behaviour

Obstacles for the municipality

Current sustainability policy around the CO2 reduction task is mainly focused on scope 1 (direct emissions) and scope 2 (indirect emissions from purchased energy). However, for integral sustainability, it is important to include scope 3 emissions (all other indirect emissions in the value chain) as well, and to keep one's eyes open to the other planetary boundaries. The question is: how do we ensure that people use their action perspective to start reducing emissions across all three of these scopes? This is not only difficult to measure, but also often beyond the scope of individuals and companies. Complex sustainability issues require a joint approach from different parties.

The municipality is good at addressing visible processes. However, for an ecological transition, it is essential to tap into underlying drivers, motivations and behaviour patterns of residents, businesses, organisations and civil servants. In Our city of tomorrow, it is mentioned that civil servants should be emboldened do more things. Organisations and individuals often remain in their traditional roles, making it difficult to discover together how to move towards our sustainable city of tomorrow, organising task-oriented collaborations even outside their own organisations.

Opportunities for the municipality

The municipality facilitates platforms and partnerships where governments, businesses, knowledge institutions and citizens can jointly formulate questions and co-create (innovative/new) solutions. We ensure an open collaboration process that not only looks at "best practices" but also identifies out-of-the-box opportunities.

An opportunity to accelerate the climate transition is for the municipality to be more approachable and facilitative to initiative from society and the city. People, organisations and institutions are looking for ways to contribute. As a Municipality, we take our role as a facilitator of the urban climate transition seriously, which means we sometimes have to take the space to deviate from usual processes and standard procedures.

Constructive cooperation between the public and private sectors is therefore essential for a successful sustainability transition. Sometimes, there is a split between the two parties, with disappointments in the municipality towards entrepreneurs, and vice versa, regarding each other's efforts. This situation leads to suboptimal progress in terms of sustainability. To break this deadlock, it is important for the City of Amsterdam to involve entrepreneurs early on in the development of sustainability policies. By being transparent about objectives and preconditions, mutual trust can be built and everyone's expertise deployed.

Knowledge institutions and other parties could, for instance, be asked to conduct action research on behaviour, but perhaps also to provide scientific education and raise awareness about sustainable behaviour among residents and entrepreneurs.

Partly for this reason, we encourage open knowledge exchange and facilitate joint innovation processes between government, business and knowledge institutions. Thus, sustainable business models can be developed that are valuable for all stakeholders and accelerate the transition. We recognise that not all answers are known in advance and that there should be room for innovation and trying out new approaches.

Therefore, a culture of innovation within the civil service organisation is key, giving civil servants the freedom and resources to explore sustainable solutions and set up pilots. Continuing to create a safe learning environment, in which "mistakes" are also embraced as learning moments, can help eliminate action anxiety.

Part B – The Amsterdam Impact Pathways

Amsterdam Climate Action plan: Our city of tomorrow

We are in the midst of a global climate crisis with an enormous impact. The impact in Amsterdam is also significant. The science shows that global warming is happening faster than ever measured and that we are already at risk towards the two-degree temperature rise. This also has serious and increasingly early consequences for Amsterdam. Climate change in Amsterdam means an increase in extreme precipitation, heat stress, drought and sea level rise. Not only must we protect Amsterdam residents from this, we must also do everything we can to combat climate change. In many countries around the world, climate change is already a matter of life and death. The next 20 years are crucial. **A lot is already happening, but despite all our efforts, we are not on track. A radical shift is needed in our thinking and ways of working.** Transitions do not follow a mapped-out route. We have to get to work now, learning as we go and making mistakes is inevitable.

This college has both the responsibility and the ability to do everything possible now to stop even more far-reaching consequences and adapt to the inevitable ones. It is our duty to ensure a sustainable and liveable city for current and future generations. For our city of tomorrow.

We do that together: the mayor and all alderpersons. Because the climate crisis belongs to everyone and the responsibility for tackling it must be taken together. This is the only way we will achieve our goals. This forms the starting point of the City of Amsterdam's Climate Action plan, which is presented in section B of the City Climate Contract.

Impact pathways

To support the European mission for 100 climate-neutral and smart cities, the European consortium Net Zero Cities has developed a logic: *the theory of change*. Our impact pathways follow this *theory of change* logic. By defining these impact pathways, systematically analysing the outcomes and secondary outcomes, this logic ensures that we can clearly see what needs to be done to facilitate and accelerate this transition. We stick to the transitions as defined in the Commitment document: The transition to a sustainable energy system; The food transition; The transition to a circular economy; The transition to a nature-friendly and climate-adaptive city; The transition to a sustainable municipal organisation. These include various themes, also called the 'fields of action' in NZC jargon.

The impact pathways are the shifts needed to keep and make the city liveable; to continue to live, work, study, eat, play sports, pursue hobbies and enjoy the city's cultural offerings. How these needs are being met now is simply unsustainable. If we continue like this, we will soon be unable to provide for the city's liveability. That is why we have to find another way. The impact pathways show this: how to keep Amsterdam liveable, but in a different way than in past decades.

For each impact pathway, we look at the situation, where we want to be in a few years, and what the ultimate outcome or goal is. We describe the direct and indirect benefits of the impact pathway. The CO_2 reduction potential realised by a given impact pathway is predicted as best as possible but often overlaps with other pathways. For each action, the systemic levers to which it relates were indicated, and then an analysis was made of where action potential is still hidden in the system. In addition, there are actions that fall under multiple impact pathways. One such action is making the city greener, which falls under the impact pathway Green existing city, which also directly affects water storage after heavy precipitation, i.e. on the impact pathway Reduce impacts of precipitation. Or reusing organic waste flows from hotels which falls under Circular, but also under the impact pathway Reducing food waste.

For each impact pathway, we look at the current situation, where we want to be in a few years, and what the ultimate outcome or goal is. We describe the direct and indirect benefits of the impact pathways. The CO_2 reduction potential realised by a given impact pathway is predicted as best as possible but often overlaps with other impact pathways. The dependencies, as described in section A-

3, are reflected in the systemic levers. The systemic levers affected by each action are indicated. We name the systemic levers for each action so that it is clear at a glance which enabling mechanisms are needed to implement this Action plan across sectors and inclusively. The co-benefits or additional benefits that can be achieved have also been identified for each impact pathway. The IPCC6 definition of co-benefits is: "The positive effects that a policy or measure aimed at one goal may have on other goals, without yet evaluating the net effect on overall social well-being. (IPCC, 2014b, p.14). To systematically allocate co-benefits, we draw on the framework of LSE Cities and C40 Cities consortium[7]

1) **What is an impact pathway?** An impact pathway is a set of actions working towards a goal. An impact pathway is the transition (or change) pathway that needs to be taken to - in this case - keep Amsterdam liveable. Each impact pathway is described in one sentence and then broken down into three phases: where are we now, where do we expect to be in years, and what is the expected outcome.

2) **What are the expected outcomes for this pathway and how can we monitor them?** We identified the direct and indirect benefits for each impact pathway. Where possible, we have included calculations of the CO2 reduction potential of these routes. Because pathways are interconnected and actions to complete a pathway often also serve multiple sustainability shifts, CO2 reduction potential sometimes transcends pathways or even subsectors. This is always mentioned.

3) **Who and what is needed to realise this process?** We map the responsible agencies by impact pathway. We have also identified dependencies. This refers to the key policy, infrastructure or financial elements on which the success of this impact pathway depends. Each impact pathway is supported by a portfolio of actions. As mentioned above, actions often serve multiple objectives and therefore recur in different portfolios. For the sake of consistency, the impact pathways and portfolios are presented together at sub-sector level. Because information on stakeholders and context is included in the impact pathways, actions are not mapped individually.

In line with the ambition and approach of the council information letter Our city of tomorrow, which emphasises urgent action and learning along the way, the aim of the action plan is to close the gap between the ambitions and their implementation, e.g. by diversifying and accelerating the transition. We do this by collecting what the municipality says it is doing in its policy documents and presenting it at the action level. Not all actions identified are at the same stage of implementation. Some are new, or actions where we have little to no experience or about which little knowledge is yet available. Also, many of the ongoing actions are undergoing further elaboration. This is part of the implementation of the climate contract. For this reason, and because of the multitude of actions, the choice was made in this action plan to focus on the impact pathways that guide the new actions, and less on the individual actions.

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[6] IPCC (2014b) Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change
[7] C40 Cities & LSE Cities. (2016). Cobenefits of urban climate action: A framework for cities.

The transition to a sustainable energy system
Built environment
Accelerate energy-efficient homes and utility buildings
Accelerate the expansion and sustainability of heating and cooling networks
Electricity
Making Amsterdam's energy mix more sustainable
Innovate and expand to a smart and flexible electricity grid
Port and industry
Accelerate the sustainability of industry: energy-efficient and electrification
Working on the H2 economy
Working on CCS
Working on the sustainable energy port
Working on a sustainable digital sector
Mobility and logistics
Optimally design public space for pedestrians, cyclists and public transport
Facilitate, stimulate and regulate the supply and use of shared mobility
Facilitate and regulate a full-fledged charging network
Make private transport (= passenger transport) more sustainable
Make public transport more sustainable
Make logistics more sustainable

The transition to a Circular Economy
Together with the city
Entrepreneurs / SMEs
Social and residents' initiatives
Port and industry
Accelerating circular Value chains and boundary conditions
Food and organic waste flows
Consumer goods
Built environment
Boundary conditions

The Food Transition
More Plant-Based
Reducing Food Waste
Short Chains and Urban Agriculture
Food Fair and Social

The transition to a nature-friendly, climate-adaptive city
Reducing the risk of rain and flooding
Heat and drought
Collaboration and knowledge exchange in the field of climate adaptation
Varied green for everyone
Green contributes to multiple tasks
We work together on green
Increasing and protecting biodiversity
Nature-inclusive construction
Improving animal welfare
Tackling infrastructural ecological bottlenecks
Towards a sustainable and integrally designed water system

The transition to a sustainable municipal organization
Maximum energy reduction and maximum energy generation
CO2-neutral business operations in 2030
Circular business operations in 2030 and maximum circular use of materials in public spaces
Climate-proof buildings and (indoor) areas
Sustainable thinking and acting

Figure 11: The Amsterdam Impact Pathways

B-1 The transition to a sustainable energy system

Fifteen impact pathways have been identified for the transition to a sustainable energy system:

Built environment
1. Accelerating energy-efficient homes and utility buildings
2. Accelerating expansion and sustainability of heating and cooling facilities

Electricity
3. Making Amsterdam's energy mix more sustainable
4. Innovating and expanding towards a smart and flexible power grid

Port and Industry
5. Accelerating industry sustainability: energy efficiency and electrification
6. Working on the H2 economy
7. Working on CCS
8. Working on the sustainable energy port
9. Working towards a sustainable digital sector

Mobility and Logistics
10. Optimising public space for pedestrians, cyclists and public transport
11. Facilitating, encouraging and regulating supply and use of shared mobility
12. Facilitating and regulating full-fledged charging network
13. Making private transport more sustainable (= passenger transport)
14. Making public transport more sustainable
15. Making logistics more sustainable

B-1.1 Built environment

Amsterdam has 442,000 homes and 24 million m2 of gross floor area of activity, both businesses and (social) institutions. The built environment's share of Amsterdam's total CO2 emissions is large: 25% or 1250 ktonnes. Homes account for more than 50 percent of CO2 emissions in the built environment. This is due to use of natural gas for heating, cooking and hot water. CO2 emissions from electricity consumption fall under the Electricity sector in this Action plan. The rest of the CO2 emissions come from buildings with a business function (20%), buildings with a social function and other buildings. In these buildings, energy conservation is always a good and necessary choice, regardless of how these buildings are going to be made natural gas-free somewhere in the period up to 2040.

The type of building or dwelling, the situation and ownership ratio largely determine the approach to make these buildings energy efficient. Saving energy in housing association homes requires a different approach than for owner-occupiers, whether or not organised in an Owners' Association (HOA). Business property and social buildings require another specific approach. Of the 442,000 homes in Amsterdam, 30% are owned by residents, 42% by corporations and 28% by private landlords. 56% of homes are part of an association. Amsterdam has over 21,000 HOAs. Amsterdam has 25,000 business buildings (45,000 addresses), with a total of 17 million m2 gross floor area (GFA). About 3,000 buildings (5,000 addresses) have a social function. The municipality has a role as owner, tenant or subsidy provider, as in primary education, sports facilities, arts and culture. At hospitals, colleges and universities, the municipality has no formal role.

The Built Environment sector will still have the largest residual emissions in 2030. It is difficult to accelerate sustainability in this sector. Sustainability requires intervention 'behind the front door', intervening in personal privacy. Every neighbourhood and even every house/household is different, making it difficult to make a big impact here all at once, on top of what is already included in the estimate (CE Delft, 2023).

B-1.1.1 Accelerating energy-efficient homes and utility buildings

Saving energy is always a good thing. Consumption of electricity and heat must be reduced. To achieve the goal of a CO2-neutral built environment by 2050 and ensure that buildings are ready for a natural gas-free city. Because energy is a scarce commodity, especially renewable electricity and renewable heat as an alternative to natural gas. The advantage is that energy-efficient buildings are often more comfortable and have lower costs for occupants and users. Companies with an eye for energy can reduce their costs as well as contribute to a climate-neutral Amsterdam. Therefore, we are going to ensure that owners of all buildings in the city, residential, social and business, take measures to reduce waste.

Impact pathway	Accelerating energy-efficient homes and utility buildings
Early results	More building owners, homeowners and residents able to take energy-saving measures; Decrease in energy bills, more room for other sustainability measures. Contribution to municipality-wide target : -5% CO2 emissions 2025
Later results	More energy-efficient homes and utility buildings Contribution to municipality-wide objectives: 2030: -60% CO2 emissions 2050: 100% climate neutral
Actors involved	Homeowners, HOAs, Social Housing Corporations, Energy Saving Action Network, …
Scale	Homes, Neighbourhoods, City,
Change levers	Social Innovation, Learning and capacities, Funding and financing, Research, Governance innovations & Policy, Research/Monitoring
Renewable energy generated	N/A
Energy consumption avoided or replaced	N/A

CO2e emissions	The central government's 2030 target is for 123 thousand homes in Amsterdam to be insulated during this period. This will save between 0.4 and 0.7 PJ of energy in 2030 compared to the current situation and between 25 and 35 ktonnes of CO2.
Offset CO2e emissions	N/A
Total costs	EUR 151 million
Co-benefits and indirect impacts	Lower energy demand Reduction in energy and heating costs Less energy poverty Improved indoor climate Health improvements through better air quality Increased comfort Technological innovation Job creation
Policy document(s)	Insulation Offensive Implementation Plan 2024 – 2026

Actions for Accelerating Energy-efficient Homes and Utility Buildings

Actions	Short Description	Levers of change
1) Courses, information and advice:		
1.1) Develop and offer HOA courses on the entire process of energy efficiency	To prepare HOAs for this, there are courses on the entire process: the technical, legal, financial aspects and on generating support.	Learning and capabilities
1.2) Courses to train market participants as HOA specialists.	To ensure more advisers, the municipality is working on courses to train market participants as HOA specialists.	Learning and capabilities
1.3) Providing professional sustainability advice to large and small HOAs focused on energy-saving measures	The municipality provides small and large HOAs with professional sustainability advice focusing on energy-saving measures, feasibility, heat solutions, PV panels. The advice looks at the current state of maintenance of the building, and the options for making it natural gas-free and sustainable. The advice also takes into account building physics effects and aesthetics requirements. The advice calculates the effect on housing costs of the various sustainability steps the HOA can take, taking into account available subsidies and loans.	Social Innovation
1.4) The municipality informs and encourages all owner-occupiers outside HOAs with a basic offer.	The municipality informs and encourages all owner-occupiers outside HOAs with a basic offer. At the energy office, all residents can find information. This energy office is being renewed and expanded.	Social Innovation, Learning and capabilities

1.5) Offering sustainability advice in priority neighbourhoods.	In priority neighbourhoods, owner-occupiers can apply for sustainability advice from 2024. This is bespoke advice following a home visit. In these neighbourhoods, the municipality integrates.	Social Innovation, Learning and capabilities
1.6) An improved office for information on sustainability.	An improved office where landlords and property professionals can go for information on sustainability.	Social Innovation, Learning and capabilities
1.7) Establish HOA activation team	From 2024, HOAs can enlist the help of an activation team to activate 'dormant' HOA members.	Social Innovation, Learning and capabilities
1.8) HOA sustainability agreements with the central government	Administrative agreements will soon be made with the central government on making HOAs more sustainable.	Governance innovations & Policy
1.9) Energy saving service for households.	energy savings service to reach households with small energy-saving measures.	Social innovations
2) Funding & Subsidies:		
2.1) Custom financial advice for individual owners	There will be custom financial advice for which individual owners can apply if they expect to run into financial difficulties due to the plans and therefore do not want to participate in improvement. This financial advice takes into account national and municipal grants for implementation.	Funding and financing, Research
2.2) A trial with pre-financing by the Heat Fund.	The municipality is conducting a trial with pre-financing by the Heat Fund at 7 HOAs. This is part of the municipal lobby with the central government to ensure pre-financing of plan development.	Funding and financing
2.3) Subsidy scheme research and knowledge exchange.	The municipality is launching a planning subsidy as a contribution towards the cost of necessary surveys and to share the outcomes with other HOAs in the city.	Funding and financing, Research, Learning and capabilities
2.4) A safety net scheme for low-income owner-occupiers for the HOA contribution.	From 2024, there will be a safety net scheme for low-income owner-occupiers who would otherwise be unable to pay the increase in the HOA contribution. This amounts to €2,000 per household.	Funding and financing
2.5) Safety net for homeowners in poorly insulated houses.	Extra insulation subsidy in Amsterdam for homeowners in poorly insulated houses who do not have enough money to make them more sustainable, the municipality is working on a safety net scheme that can be applied for from 2024. Owners can claim a subsidy of €2,000 per household.	Funding and financing

2.6) Public Housing Fund Nieuw-West for housing improvement and sustainability.	Public Housing Fund: In specific neighbourhoods in Nieuw-West, a subsidy scheme for home improvement and sustainability is expected to be introduced.	Funding and financing
3) The city together/Cooperation:		
3.1) Neighbourhood meetings in priority neighbourhoods.	We will organise neighbourhood meetings in the priority neighbourhoods. With HOAs where renovation or maintenance is urgent, we start the sustainability process. With neighbourhood meetings, the other HOAs are kept informed of the result.	Cooperation, Social Innovation, Learning and capabilities
3.2) Organising more cooperation for landlords and real estate professionals.	Organising more cooperation in the industry through regular meetings on sustainability and possibly a covenant.	Cooperation, Social Innovation, Learning and capabilities
4) Collective Procurement:		
4.1) White goods scheme for Stadspas holders.	We will provide targeted support to Stadspas holders with the one-off launch of a new voucher campaign and a new white goods scheme. By the end of 2026, a large proportion of Stadspas holders will have used one of these schemes.	Funding and financing, Social innovations
Governance innovation:		
1) Simplify the permitting process under the aesthetic standards, heritage and Nature Protection Act.	To meet the required pace of renovation, the municipality is working to simplify the permit process under the aesthetic standards, heritage and the Nature Protection Act.	Governance innovations & Policy
2) Pilot investigation of municipality's action perspective in enforcing energy quality.	Landlords and real estate professionals: Investigate in a pilot whether the municipality can enforce energy quality. If successful, this pilot will be continued as a project.	Research/Monitoring
3) Supporting tenants to make a proposal to their landlord for sustainability through the right of initiative.	Tenants are supported by !WOON to make a proposal to their landlord for sustainability through the right of initiative. If necessary, tenants are also given legal support in the process. This is double the current commitment to supporting tenants.	Governance innovations & Policy, Social innovations, Learning and capabilities
4) Pilot to enforce if an Energy Label is missing from lettings.	With the national Environment and Transport Inspectorate, we are conducting a pilot to enforce if an Energy Label is missing from lettings. If successful, this pilot will be continued as a project.	Governance innovations & Policy

Qualitative energy targets as circularity	Besides the quantitative solar task, we are also working on qualitative targets. Think local ownership, combating energy poverty and encouraging circularity and innovation.	Governance innovations & Policy Social innovations
Renovation and Insulation Monitor		
Standardise rental homes to label C insulation (CED)	The additional effect of committing to insulating half of Amsterdam's rental homes to Label C. This therefore requires landlords to have homes insulated before they can be (re)let. The municipality could make agreements with landlords to have homes to be rented insulated to Energy Label C.	Social Innovation, Governance Innovation
New agreements with housing associations on insulated and natural gas-free housing. (OSVM)	This year, we will make new agreements with housing associations for the next four years on insulated and natural gas-free housing.	Governance innovations & Policy
Energy Saving Action Plan for neighbourhoods and economic sectors		
Social Real Estate		
Implementing the Roadmap to make healthcare real estate more sustainable	This is a national roadmap. To flesh this out, talks are ongoing between the Amsterdam municipality and Amsterdam UMC. To meet the estimate, concrete commitments must be made and implemented.	Governance innovations & Policy
Covenant on behavioural change of utilities	This measure from the citizens' council proposes (partial) entering into covenants with retailers, utilities and office owners on energy savings. This can be combined with a neighbourhood approach, in which collective agreements are made. This idea can be included within the current recalibration of the Sustainable Business Market Programme (VZM). Because concluding area-based sub-covenants is labour intensive and the reduction potential is estimated at only 3 ktonnes, we are working with a 'coalition of the willing' as with the 15% GasTerug Action Network.	Social Innovation
Mandatory heat pump (+ rooftop solar) for heating smaller businesses (without process heat)	mandatory heat pump + rooftop solar for heating smaller businesses without process heat. This obligation is possible based on the energy saving obligation under the Environmental Management Act.	Governance innovations & Policy; Technology & Infrastructure

Supporting SMEs, business collectives and estates to become more sustainable. (OSVM)	Supporting SMEs, business collectives and estates to become more sustainable: We offer free custom advice through an energy office and on-site guidance. We support business collectives and estates in applying for relevant subsidies and in collective procurement for solar panels and charging infrastructure, for example.	Social Innovation
Agreements with the industrial sector	Agreements with the 10 biggest polluters on reducing emissions and making their industrial processes sustainable (OSVM).	Governance innovations & Policy
Sustainable Heritage Implementation Agenda (OSVM)	In autumn 2023, we will draw up an Implementation Agenda for Sustainable Heritage in which the college indicates how it intends to deal with obstacles in making heritage more sustainable	
Pilot energy saving healthcare facilities by the GasTerug Action Network	Pilots of possible ways of saving energy such as working with smart cooling and freezing systems, data-driven monitoring and white roofs. To support the pilots, there is a business parks energy-saving pilot roadmap.	Research; technology & infrastructure, Learning and capabilities
Pilot energy saving business parks by the GasTerug Action Network	Pilots of possible ways of saving energy such as working with smart cooling and freezing systems, data-driven monitoring and white roofs. To support the pilots, there is a business parks energy-saving pilot roadmap, as well as a knowledge base for the relevant ways of saving energy.	Research; technology & infra; Learning and capabilities
Pilot 'Doe(t) het licht uit' in offices by GasTerug Action Network	With the 'Doe(t) het licht uit' campaign, we encourage office areas to collectively turn off the lights between 22.00 and 6.00 to collectively save energy. This approach is leading to a chain reaction; more and more office areas are turning off the lights. Examples include: "Zuidas doet het licht uit", "Sloterdijk doet het licht uit" and "Knowledge Mile doet het licht uit".	Social Innovation, Learning and capabilities
Roadmap to save energy in offices by GasTerug Action Network	We help offices draw up an 'energy saving roadmap' for their office building. The roadmaps provide insight into building performance and opportunities for energy savings.	Learning and capabilities
Setting up network organisation support for energy saving by the GasTerug Action Network	The network establishes initiatives and focuses on scaling them up. To achieve this, we facilitate at the basic level, provide overarching ownership, act as a sounding board and help explore crossovers. This way, the action network leaders help think ahead about broadening and scaling up.	Learning and capabilities

'Klus- en coachaanpak' for neighbourhoods by the GasTerug Action Network	With the 'Klus- en coachaanpak', we achieve average direct energy savings of 8% on electricity and 9% on gas consumption. This approach creates awareness among entrepreneurs and motivation for further sustainability.	Learning and capabilities; Social Innovation
Support with breakthrough method by the GasTerug Action Network	The aim of the breakthrough method is to remove bureaucratic bottlenecks in order to accelerate energy transition initiatives. This is done by looking for cases facing a major issue at different levels (a home, housing complex or municipality).	Learning and capabilities; Governance innovations & Policy
Knowledge sharing by the GasTerug Action Network	The action network is full of valuable knowledge. We want to use this knowledge as much as possible for our common goal: gas reduction within the MRA. Based on this pillar, we share relevant knowledge from the network as much as possible, so that everyone who wants to can benefit from it. We do this knowledge sharing during general network meetings, specialist meetings by topic and for specific target groups.	Learning and capabilities
Data & Monitoring by the GasTerug Action Network	The action network collects current data at postal code 6 level and publishes it at a monthly frequency to gain insight into (the development of) gas consumption for all 30 municipalities in the Amsterdam Metropolitan Region. We measure in three categories: small, medium and large consumption.	Research/Monitoring
Officer.Communication Campaign by the GasTerug Action Network	This campaign seeks to reach, engage, connect and inspire as many people and organisations in the region as possible to participate through various communication channels, such as the website, LinkedIn, Instagram and a newsletter.	Democracy/Participation/Communication
Roadmaps to Paris Proof by Green Business Club	Buildings lack insight into actual consumption, especially in the case of multi-tenant business premises. In addition, the presence of sustainable technology, a BREEAM In-Use certification on the asset pillar and having relatively good labels ensure energy efficiency on paper can result in a lack of urgency among building owners and users. Moreover, this energy efficiency on paper still says nothing about actual performance. By creating roadmaps of office buildings, we provide insight into what	Research/Monitoring, Learning and capabilities

	information is missing, how to save energy in the short term and the path towards Paris Proof by 2030.	
Setting climate systems more sustainably by Green Business Club	Adjustments to climate systems can have a major impact. Can temperatures be lowered in winter and – more importantly for office buildings – raised in summer? Are there gains to be made by adapting systems at night and during weekends? The approach encourages companies to take measures in this regard and facilitates knowledge sharing between organisations on how to get this done (internally).	Technology and Infrastructure
Zuidas off natural gas! by Green Business Club	Encourage and support companies in the Zuidas to move away from natural gas. And research on the energy performance of CHP systems in the Zuidas.	Learning and capabilities

B-1.1.2 Accelerating expansion and sustainability of heating and cooling facilities

For Amsterdam, this is not a new issue. For instance, the construction of a heat network in the city has already started since the 1990s, the council approved the strategy "Towards a city without natural gas" in December 2016 and the Heat Transition Vision in September 2020. However, making the city's heat supply more sustainable is comprehensive and difficult, as the Court of Auditors concluded back in 2019[8].

According to figures from Liander and Amsterdam Research&Statistics (2023), 19% of home equivalents in Amsterdam, with a year of construction in 2020 or earlier, are natural gas-free. This totals 109,000 home equivalents. The Amsterdam Climate Neutral 2050 Roadmap sets the goal of a total of 260,000 home equivalents being natural gas-free by 2030, which could substantially reduce the city's CO_2 emissions. For homes, the natural gas-free share is currently at 14%, and for non-residential buildings (such as office buildings), it is at 34%. This means the heat transition is well underway, although much work remains to be done. For homes, it is mainly the neighbourhoods where the heat network is present where the natural gas-free share is high.

Impact pathway	Accelerating expansion and sustainability of heating and cooling facilities
Early results	Improved conditions for connection and development of heat networks Increase in connections to heat networks More sustainable heat sources 2025: -5% CO2 emissions
Later results	2030: -60% CO2 emissions 2050: 100% climate neutral
Actors involved	Housing corporations, Heat suppliers, Homeowners and residents, Building owners, Ministry of Economic Affairs.
Scale	Neighbourhood and City
Renewable energy generated	TBD
Energy consumption avoided or replaced	N/A
CO2e emissions by emission sector	73 ktonnes through sustainability of existing grids (CED)

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[8]publicaties.rekenkamer.amsterdam.nl/verduurzaming-warmtevoorziening-met-warmtenetten-onderzoeksrapport/index.html

Offset CO2e emissions (biologically or technologically fixed)	N/A
Total cost and cost per tonne of CO2e	TBD
Co-benefits	Higher resilience in case of extreme weather Reduction in energy and heating costs Less energy poverty Improved indoor climate Health improvements through better air quality Increased comfort Technological innovation Job creation Growth of SMEs in the technology sector Stable power supply for commercial activities Reduced price volatility for energy services
Policy document(s)	Heat Transition Vision, Neighbourhood implementation plans, Heat Transition Implementation Agenda

Actions Accelerating expansion and sustainability of heating and cooling facilities

Actions	Short Description	Levers of change
Accelerated sustainability of heat grid Amsterdam-Oost/Zuid (CED)	Making the heat networks more sustainable according to the pace set out in agreements with WPW and the Diemen district heating sustainability covenant (Municipality of Diemen et al., 2019). This requires the planned bio-boiler in Diemen to be realised by 2030 (this is uncertain due to a pending court case, the plant can be replaced by alternative sustainable heat projects, according to the covenant) plus 510 GWh of additional sustainable generation, e.g. with geothermal, aquathermy and residual heat from data centres. This still requires options to be researched, projects to be designed, permit procedures to be completed and actual construction to take place. Above all, the municipality should engage with the parties involved to make concrete agreements and facilitate the projects, for instance through timely licensing.	Technology and Infrastructure
Accelerated sustainability of heat grid WPW Amsterdam-Noordwest/Noord (CED)	For the WPW heat network, a solution must be found to replace non-sustainable heat. In addition, in a fully circular economy, the heat source is not future-proof, as waste is the raw material for the heat. Above all, the municipality should engage with the parties involved to make concrete agreements and facilitate the projects, for instance through timely licensing. We are also exploring sustainable alternative heat	Technology and Infrastructure

	sources such as aquathermy, data centre residual heat and electrolysis.	
Warm Amsterdam	About 100,000 homes in Amsterdam are close to an existing heat network, and for the neighbourhoods in question, a heat network seems to be the most favourable sustainable heat supply. In order to connect these homes to a heat network, much remains to be done, including talks with residents to gain support, planning, permit procedures and construction. Currently, based on the learning experiences of the past period, the approach is being revised to ensure acceleration.	Technology and Infrastructure, Governance Innovation and Policy
Preparing move to public heat company (OSVM)	The new Collective Heating Supply Act (WCW) envisages that heating companies should be largely publicly owned. The municipality is looking into what role they want to take in an Amsterdam heating company, what this will require and how best to shape it.	Governance Innovation and Policy
Heat Transition Vision outcomes review	We also want to make sure the implementation is well aligned with what the city wants and needs. This involves both a technical and social perspective. We want to learn from the lessons of recent years in the neighbourhoods where we operate. As such, the college considers it desirable to test the choices made in the Heat Transition Vision about the natural gas-free heating options.	Learning and capabilities, Infrastructure and technology
Expanding the approach	At the same time as conducting a test on the TVW, we will further expand the current course in the heat transition, which now focuses mainly on expanding the heat network in neighbourhoods with a high percentage of housing owned by corporations. Despite the delay incurred in terms of the number of investment decisions (the reaction of the heat supplier in relation to the Collective Heat Act) in the roll-out of larger heat networks, we are working in this way to achieve the desired acceleration. This broadening includes measures and actions on target groups, heat technologies and preconditions. Concrete actions are presented below:	Governance Innovation and Policy, Social Innovation Technology and Infrastructure

We encourage residents starting their own heat initiatives and cooperatives	Among others, in Middenmeer (totalling 5,000 homes), at KetelhuisWG (totalling 2,500 homes) and at least six other places in the city, we already actively support existing heat initiatives. The college is currently conducting research on how to (permanently) support current and future residents' initiatives and cooperatives. After the summer of 2023, you will receive a framework on how the municipality intends to deal with residents' initiatives and what (financial) support applies.	Social Innovation Learning and capabilities, Technology and Infrastructure
Survey of the wishes of owners of ground-level housing	We want to get and stay in a good dialogue with all residents during the heat transition. We are launching, in combination with low-threshold participation moments, a survey of the wishes of owners of ground-level homes.	Social Innovation Learning and capabilities,
HOA feasibility studies	For HOAs, feasibility studies are carried out, among other things. By 2023, we aim to advise and guide 250 HOAs. The feasibility study includes identifying the technical options for insulation-ventilation, energy generation and going off gas. There are also discussions with HOA managers on things like replacement of flue gas ducts. The college sees additional opportunities with HOAs. For example, from the end of 2023, we will explore the extent to which there are opportunities for owner-occupied housing associations (where homes are heated with block heating using natural gas) to be connected to the nearby heat network or other heating options for the building or neighbourhood. In doing so, it is crucial that any old defects in the heat pipe system are remedied at the same time.	Learning and capabilities
Integrated approach to utilities and housing	In autumn 2023, a study will be completed that will assess the costs and opportunities for the heat transition in utility buildings for a few neighbourhoods (including the Confuciusbuurt). This enables these buildings to eventually become a permanent part of the neighbourhood approach. Buildings where natural gas is used for space heating can follow along with the neighbourhood approach to homes in this regard.	Cooperation, Social Innovation

	Natural gas consumption for the purpose of corporate production processes is a separate focus here. We also want to learn from building owners who have made heat supply more sustainable in recent years.	
More and accelerated focus on all-electric neighbourhoods in the city	We will start discussions with residents in 2 neighbourhoods about heating homes with heat pumps and then, based on lessons learned, extend this approach to more (parts of) neighbourhoods in 2024. In doing so, we cooperate with Liander so that we can take into account the load on the power grid.	Cooperation, Infrastructure and technology
Working together on a source network	In Buikslotermeer Noord, we are working with some other parties on a local decentralised source network where heat from the sewers can be used to sustainably heat 700 homes. The college is enthusiastic about the potential of source networks and sees opportunities for its further innovative growth. In the aforementioned review of the Heat Transition Vision, we include the associated possibilities.	Cooperation, Infrastructure and technology
Exploration and procurement of hybrid heat pumps	We will explore how, including in 'natural gas-free gas network' neighbourhoods, we can ensure a greater number of homes using the hybrid heat pump. The municipality starts doing collective procurement of hybrid heat pumps. This involves starting by writing to small groups of residents. We aim to write to several thousand homes. Based on experience gained, the approach will be adapted and expanded.	Infrastructure and technology
Direction of FIDs in four neighbourhoods and efficiency in implementation heat network projects	In terms of expanding the heat network, we are working with Warm Amsterdam's cooperation partners on final investment decisions in the first four neighbourhoods (Confuciusbuurt, Wildeman, De Kameleon e.o. and Hakfoort/Huigenbos). In total, this involves about 4,000 homes. These four neighbourhoods are also highlighted in recent documentation on the Insulation Offensive. Both the insulation task and the societal task are large here. In practice, we already see housing associations not only betting on heat options, but also paying attention to insulation and renovation measures at the same time.	

	We are also making preparations for 13 subsequent neighbourhoods (totalling about 13,000 homes) during this period. In doing so, we scrutinise the neighbourhood process by properly evaluating and learning, so that the entire lead time can be accelerated in the future. When constructing heat networks, we ensure the least possible inconvenience to the city through smart programming of underground and public space works. We also seize opportunities to set aside space for the future heat transition to minimise social costs.	
Heat transition affordability study	In the aforementioned TVW test, we look at both the affordability of collective and individual heat solutions and include energy-saving plans. We will (have someone) map out what is needed to ensure affordability for residents in the heat transition.	Learning and capabilities,
Improving communication and information to residents	We are working on improving the provision of information toward residents through a mobile office under the banner 'Het huis van nu voor straks' (a modern home for the future). At this office, which can be used city-wide, residents can ask questions about energy saving, insulation and making homes natural gas-free. We are also continuously improving the municipality's sustainable living website.	Social innovation, Communication
Neighbourhood citizens' council in the context of heat transition	This measure organises a neighbourhood citizens' council (as a pilot) on the heat transition. The aim of a neighbourhood citizens' council is more accessible involvement of residents in the heat transition in their neighbourhood. This has the positive effect of keeping concerned residents more intensely informed, representing their neighbours and thus allowing them to inform and collectively reflect on their preferences for the neighbourhood. This would fit well within the municipality's participation policy. There is also a risk of resident disappointment if outcomes are not followed up quickly or properly, and thus expectations are not met. Currently, some 15 neighbourhoods are already discussing policies towards natural gas-free by 2040 with	Social innovation, Communication Cooperation

	residents. The idea is that with a citizens' council, awareness about sustainable heat will be created, which could accelerate the transition.	
Removing obstacles to making homes more sustainable	Where possible and necessary, the college is going to try to remove obstacles that sometimes now stand in the way of making homes and other buildings more sustainable. This may, for example, have to do with required permits for heat pumps or the installation of double glazing in listed buildings. In doing so, we do not lose sight of the city's standard of living and possible noise pollution. As a follow-up to the Solar Energy Handbook, we are also preparing a Heating Installations Handbook, which will provide residents with clarity on regulations in this area.	Governance Innovation and Policy, Information provision and communication
Preparation of Municipal Instruments Heat Transition Act	We are preparing for the upcoming Municipal Instruments Heat Transition Act (Wgiw). If this law is passed by the States General in 2024, municipalities will have the (appointing) power to decide when and how a neighbourhood will go off natural gas and which preferred alternative to natural gas will be chosen. The college believes Amsterdam should start using this opportunity in due course to ensure that a careful pace can be set in making the city's heat supply more sustainable. We will use the results of the aforementioned test on the TVW when drafting a legally required Heat Programme (the successor to the Heat Transition Vision), which we will start in 2024. Participation among residents is a crucial part of this.	Governance Innovation and Policy, Infrastructure and technology
Advocate for green gas blending	This measure involves lobbying the (new) government for an elaboration and introduction of a 20% blending obligation for green gas in the built environment. This blending obligation was included in the national coalition agreement of the caretaker government, but has not yet been fleshed out in concrete terms. The CO2 gain is estimated at 174 ktonnes	Governance, innovation and policy

Research into residual heat from data centres and geothermal heat	With the heating companies and the Meer Energie neighbourhood initiative, we are exploring the possibilities and preconditions for using the residual heat from data centres to heat homes. Preparations are also currently being made by EBN (Energiebeheer Nederland) for geothermal research drilling. This is expected to provide insight into the potential of the subsurface in and around Amsterdam by 2025. We also see opportunities for aquathermy as a sustainable heat source. The aforementioned heat transition vision test will also examine the extent to which there is sufficient supply and diversification of heat sources for the relevant neighbourhoods.	Learning and capabilities, Infrastructure and Technology.
Energy for the City	An implementing organisation within the City of Amsterdam is being set up for a large-scale roll-out of the energy transition implementation. This starts in the fall of 2023.	Learning and Capabilities
Staff shortages	The large staff shortages of technically trained personnel at all levels are a factor to consider in the implementation of heating plans. We will work on this throughout 2023-2024 through the Sustainable City, Sustainable Jobs programme.	
Committing to blending green gas (CED)	Blending green gas into the existing gas supply is a responsibility of the central government. The municipality supports the target of adding 20% green gas by 2030, but it is currently uncertain whether sufficient green gas is or will be available.	Governance Innovation and Policy
Heat programme	The heat programme is a legal document under the Environmental Act defining which sustainable heating systems will be realised in the city and when. This looks at both the technical details, financial and spatial implications and how to actually implement the preferred techniques. Besides heating, the increasing demand for cooling is also taken into account in the preparations.	Technology, Governance Innovation and Policy
Research into preferred heating technologies, including congestion of power grid	Amsterdam's power grid faces congestion. We foresee solid growth in electricity demand due to residential construction, data centres and electrification of mobility. In addition, heating sustainability has a major effect on electricity demand.	Technology and Infrastructure

	We examine which techniques are preferable based on the combined tasks, financial, sustainability, space use and building capacity to arrive at robust choices. This also serves as input for the heat programme.	
Cooperation with/support of energy cooperatives	Cooperation with/supporting energy cooperatives in building new heating facilities. What role do they have in the approach, how can the municipality support them in this (financially, organisationally) and what agreements should we make on this.	Cooperation
Revision of approach to new construction and existing city	The municipal approach to making heat sustainable in the existing city and new buildings is not leading to sufficient speed, support and risks of delay. This requires a thorough rethinking of the principles to arrive at a workable approach that can also accelerate the heat transition. The starting point is equity, feasibility and scalability. In the revision of the approach, support from the residents of Amsterdam is more central.	
Defining the Bridging Strategy	The heat programme defines the phasing of the rollout of heat facilities over the next 20-30 years, but residents and owners already have to deal with replacing old boilers in the coming period. What are meaningful steps for them? For each group (type of owners/occupiers and type of home), we explore alternatives and what the implications are in order to arrive at a substantiated recommendation. We are also exploring how to provide more concrete support at this intermediate stage.	

B-1.2 Electricity

Electricity plays a key role in the transition from fossil to renewable energy. The transition to a natural gas-free city means more electricity is needed to heat our buildings and cook differently. Further digitisation and the growth of electric vehicles is leading to a sharp increase in electricity demand. Replacing fossil fuels by using electricity is desirable because we can generate electricity sustainably. To become climate neutral, electricity must be generated sustainably. Amsterdam is part of a larger electricity system in which every municipality, region and province contributes to maximum sustainable electricity production. We see many opportunities for rooftop solar power generation in Amsterdam. Expanding provincial regulations have also made new locations in Amsterdam suitable for generating energy with wind turbines.

Electricity demand in Amsterdam will increase until 2050 due to sustainable buildings, additional data use and electric mobility. Now, the generation of electricity used in Amsterdam releases 1,960 ktonnes of CO_2 every year. That is 39% of total

Electricity

CO_2 emissions
1,960 kt

Share of total
CO_2 emissions
39%
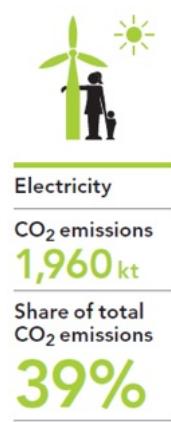
CO2 emissions. To reduce these emissions, one of our efforts is to make savings. The focus in this sector is on maximising renewable energy generation on Amsterdam territory with mature technologies such as solar panels and wind turbines. This is presented in the impact pathway "Making Amsterdam's energy mix more sustainable". The chapter on Industry and Port discusses converting biomass to electricity and heat. The share of sustainably produced energy was 6% of the energy used in Amsterdam in 2017. About three quarters of that renewable energy (electricity and heat) is generated by waste incineration; a quarter comes from solar panels and wind turbines. We believe that in the future, we will be able to domestically produce up to 30 percent of our electricity needs sustainably. Support for solar and wind energy is high among Amsterdam residents. Research by O&S from 2022 shows that nine in 10 residents are in favour of the switch to renewable energy, with 90% and 86% respectively identifying solar and wind energy as sustainable.

In Amsterdam, a lot of roof space is suitable for solar power generation and we aim to ensure that no roof is left unused. In total, there is room for about 1,100 MW of solar panels. We aim for half of Amsterdam's rooftop potential to be utilised by 2030. By 2040, all suitable roofs should be used for renewable energy generation.

Since the widening of provincial policy, the possibilities for wind turbine placement have increased. We want 52 MW of additional installed capacity on Amsterdam territory by 2030. That results in a total of 127 MW of installed capacity by 2030. The national emission factor, used to calculate emissions from electricity consumption, will drop significantly by 2030. As a result, net emissions from the power sector are decreasing. The end result for the electricity sector is that national electricity generation will be fully renewable. Additional renewable energy generation in Amsterdam helps reduce the national emission factor, but the effect is limited. Emissions in this sector can largely be reduced by focusing on increased efficiency (e.g. LED lighting, heat pumps), energy conservation and barring large consumers (CED).

In parallel with increasing generation, various sectors are electrifying to reduce emissions (heat pumps, electric cars, electric boilers, etc.). This increases the overall demand for electricity. At the same time, we see that the power grid is reaching its limits in the city. Sufficient capacity on the grid is a precondition for electrification of current energy demand and thus for a climate-neutral city. The municipality is working with Liander and other stakeholders to create a future-proof power grid that fits with the energy transition and other municipal ambitions. This is also included in the impact path "Innovating and expanding towards a smart and flexible power grid".

B-1.2.1 Making Amsterdam's energy mix more sustainable

Impact pathway	Making Amsterdam's energy mix more sustainable
Early results	Improved conditions for local wind and solar energy, Increase in renewable generation initiatives/projects, …
Later results	More renewable energy generation: 2030: 550 MW solar + 127 MW wind 2040: 1.1000 MW solar power 2050: 100% renewable energy Increase in local generation through wind and solar PV, improvement in Dutch electricity emission factor.
Actors involved	Energy communities/cooperatives, Energy suppliers, Investors, Project developers, …
Scale	Home and building, district, municipal level
Renewable energy generated	TBD
Energy consumption avoided or replaced	TBD
CO2e emissions by emission sector	TBD
Offset CO2e emissions (biologically or technologically fixed)	N/A
Total cost and cost per tonne of CO2e	TBD
Co-benefits	Reduced energy dependence Improved health Energy stability Lower energy demand

	Job creation Growth of SMEs in the technology sector Stable power supply for commercial activities Reduced price volatility for energy services
Policy document(s)	Regional Energy Strategy; Our city of tomorrow;

Actions for Making Amsterdam's energy mix more sustainable

Actions (E)	Short Description	Levers of change
Mandatory Solar on Roof	Mandatory rooftop solar for certain locations, e.g. parking spaces (CED)	Governance Innovation
Renovation and Insulation Monitor		Governance Innovation
Large-scale PV generation, e.g. floating solar park IJmeer (Citizens' Council)		Technology and Infrastructure
More Wind (OSVM)	The installed capacity of wind turbines on Amsterdam territory will grow by about 18 MW this administrative period towards 127 MW in 2030.	Technology and Infrastructure
More Solar on Roofs (OSVM)	At least 350 MW of installed solar power capacity has been realised by the end of the administrative period. It is about accelerating the realisation of solar energy on large roofs, including exploiting opportunities for obligation.	Technology and Infrastructure
Solar in the Port (OSVM)	Through a partnership with the port authority, we are working to harness the great potential for solar energy in the port area.	Technology and Infrastructure
Working towards Qualitative Solar Objectives (OSVM)	Besides the quantitative solar task, we are also working on qualitative targets. Think local ownership, combating energy poverty and encouraging circularity and innovation.	Governance Innovation
Sustainable and Circular Solar		Technology and Infrastructure

B-1.2.2 Innovating and expanding towards a smart and flexible power grid

In 2050, the demand for electricity in Amsterdam will be three to four times higher than today, according to scenario studies by TenneT, Liander and the City of Amsterdam (Theme Studies Electricity Amsterdam, TSA 1.0 and TSA 2.0). Sustainability plays a role in this: with electric transport, heat pumps and the production of electricity with solar and wind, among others. Yet other factors will have greater impact on grid capacity in 2050: data centres, economic developments, electric transport and new construction.

A congested power grid, by the way, will arise well before 2050. Liander has already announced congestion in a number of areas within the City of Amsterdam. Congestion is a shortage of transmission capacity in the power grid. The consequences of congestion are profound. To avoid overloading the grid, Liander cannot, for instance, connect new homes or businesses in congestion zones for the time being.

Impact pathway	Innovating and expanding towards a smart and flexible power grid
Early results	Better understanding of needs for the grid to facilitate transition, Smarter handling of available capacity on the grid, Faster incorporation of innovations into the grid, More efficient and faster process for grid reinforcement and expansion.
Later results	Future-proof power grid More renewable energy generation:

	2030: 550 MW solar + 127 MW wind 2040: 1.1000 MW solar power 2050: 100% renewable energy
Actors involved	City of Amsterdam, DSO Liander, TSO TenneT,
Scale	Building/home, neighbourhood, district, municipality
Renewable energy generated	N/A
Energy consumption avoided or replaced	N/A
CO2e emissions by emission sector	N/A
Offset CO2e emissions (biologically or technologically fixed)	N/A
Total costs	An overall calculation shows that the construction, as well as the design and preparation of the overall expansion of the main power grid structure, will require investments of €750 million from Liander and €650 million from TenneT.
Policy document(s)	Amsterdam Power Supply Development Framework 2035

Actions for Innovating and expanding towards a smart and flexible power grid

Actions	Short Description	Levers of change
Research and innovation on Positive Energy Districts	The ATELIER project investigates the role of PEDs in accelerating energy transition in Amsterdam in terms of generation, grid and consumption.	Technology and Infrastructure, Learning and Capabilities
Using rooftop solar locally to combat grid congestion (CED)		Technology and Infrastructure
Handing out devices that measure standby consumption to SMEs and homes (CED)		Technology and Infrastructure
Installing batteries, smart charging stations, etc.. (CED)		Technology and Infrastructure
Social prioritisation methodology (OSVM)	Collaboration with partners on methodology to prioritise social and local power allocation in the context of grid congestion.	Governance innovation and policy
Expansion of existing substations, new substations and cable connections by Liander and Tennet	Amsterdam's power grid will need to be significantly upgraded in the coming decades. This will require major modifications: 29 new substations will be built at 23 locations, with associated cable connections. And 12 existing substations are also being substantially reinforced. The growing demand for capacity in the power grid is so high that reinforcements – where possible – need to be tackled at an accelerated pace. Realisation of the expansion task in Amsterdam is largely expected in 2023-2028. An overall calculation shows that the construction, as well as the design and preparation of the overall expansion of the main power grid structure, will require investments of €750 million from Liander and €650 million from TenneT.	Technology and Infrastructure

Drawing up Implementation Agenda for power grid expansion	For more efficient management of this task, an (official) implementation agenda is being developed. This implementation agenda is a tool/resource to arrive at more specific follow-up agreements and streamlined processes of decision-making and actions for each substation to be expanded and new substation (including cable connections and possible final site selection). This is an integrated planning in which feasibility, land acquisition, administrative decision-making of a site and planning procedures are tracked and bottlenecks can be identified and addressed with the responsible parties.	Governance innovation and policy
Strategically reserving space for the grid	To realise the task and - where necessary - accelerate it, land availability is essential. This will allow grid operators to start planning and accelerate it if necessary. The shared ambition is to proactively reserve space for grid expansion in area development and to secure this in advance in planning terms in zoning plans, or soon in Environmental Plans. This may sometimes require departing from consideration principles of involved parties.	Governance innovation and policy
Participation and communication	The parties involved will develop a communication and participation strategy for each substation, aimed at Amsterdam residents. This strategy provides the foundation for communication with the immediate surroundings of where spatial and infrastructure works are planned. Where necessary, tailor-made solutions will be developed, obviously in close consultation with the city districts concerned. In participation and communication processes, there is an explicit focus on environmental factors and spatial integration.	Democracy/Participation/Communication

B-1.3 Port and Industry

The Amsterdam port area is part of the North Sea Canal Area (NZKG), and is part of the industrial area of provincial importance. This area has two dominant functions: the nautical-logistical function of the seaports and providing space for industrial activity. The Port of Amsterdam (directly and indirectly) employs over 32,000 people. Activities at the port range from industrial production, goods and fuel storage and transit, urban distribution and waste treatment, to power generation. Energy plays a central role here. For industry in the port area, it is about both consumption and also generation of energy, and for the port as a whole, its position in global energy trade is of great importance. The opportunity and challenge for the port and the companies located there, is to transform from an energy-intensive to a sustainable industry, and from fossil

Harbour & Industry

CO₂ emissions
920kt

Share of total
CO₂ emissions

18%
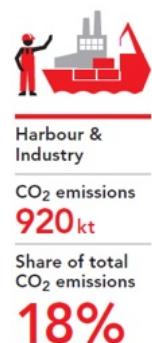
energy cluster to a leader in renewable energy, heat and alternative fuels for shipping and aviation. How the municipality is shaping this is reflected in the municipal port vision.

The CO_2 emissions of the Amsterdam Port & Industry covers all companies classified by CBS as industrial companies and located in Amsterdam, including AEB's waste incineration plants and Waternet's Sewage Treatment Plants[9]. Industrial companies in Amsterdam emit 920 kilotonnes of CO_2 annually (18% of the total), more than half of which comes from AEB Amsterdam. Most of the industrial companies are located in Amsterdam's port area. Meeting the climate target requires making the port economy greener. The port area as a 'sustainable battery for the city, region and Europe' offers prospects for a port economy with little to no CO_2 emissions and plenty of room to generate, store and distribute renewable energy to end users on an industrial scale. The new port economy provides sustainable energy products and services such as sustainably generated electricity, green hydrogen, renewable fuels, energy storage capacity and switching power. Carbon Capture, Storage and Utilisation (CCSU) is a part of the new port economy. This makes the port an important link for the energy transition of industry, power generation, international aviation, mobility and the built environment.

B-1.3.1 Accelerating industry sustainability: energy efficiency and electrification

Emissions in port and industry can be divided into three categories: 1) industry covered by the European Emissions Trading Scheme (ETS), 2) smaller industry and 3) shipping.

The ETS companies get incentives to become more sustainable, especially at European and national level, through the ETS price and the carbon tax. These companies can achieve (limited) emission reductions through energy-saving measures, but to become truly sustainable, energy-intensive production processes ultimately need to be redesigned. Several options exist for this, all of which may require production processes to be changed. That has a lot of impact on businesses. Some new technologies are still in their infancy, but a lot is also possible with current technologies. High energy prices, in addition to CO_2 prices, are an increasingly strong incentive for industry to become more sustainable. Grid congestion is an important one for electrification of industry and hence emission reduction. Resolving grid congestion is therefore a priority. In addition, the development of other infrastructure is needed, e.g. heat (and steam) infrastructure, hydrogen infrastructure and CO_2 infrastructure.

For smaller industry, there should be a focus on energy saving and heating sustainability for SMEs and industry without energy-intensive processes. This can be done, for example, through the use of heat pumps, which can deliver up to 90% emission reductions through the combined effect of the 3-6 times higher efficiency of heat pumps and the much lower emission factor of electricity compared to that of gas in 2030.

Port and inland navigation are also part of this sector. In any case, this requires increasing use of shore power, for which grid congestion can also form a barrier. Ships themselves should also become more sustainable. The availability of refuelling infrastructure and the higher price of, for example, hydrogen compared to marine diesel are currently barriers to making inland navigation more sustainable.

Impact pathway	Accelerating industry sustainability
Early results	More energy-efficient industry: 2025: -10% CO_2 emissions
Later results	Transforming the port into a sustainable energy hub. Greater hydrogen economy. More CO_2 capture AEB. More energy-efficient industry: 2030: -55% CO_2 emissions 2050: 100% fossil-free and circular

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[9] De facto just outside the boundaries of the port area

Actors involved	Industrial parties, Port of Amsterdam, Programmabureau NZKG, Province of Noord-Holland …
Scale	Business level, Port, City
Renewable energy generated	TBD
Energy consumption avoided or replaced	TBD
CO2e emissions by emission sector	TBD
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Technological innovation Improved air quality Lower energy demand Energy stability Stable power supply for commercial activities Reduced price volatility for energy services Improve the city's economic competitiveness Lower energy dependence Job creation in sustainability domain
Policy document(s)	Our city of tomorrow PMIEK,

Actions for Accelerating industry sustainability

Actions	Short Description	Levers of change
Accelerating availability of necessary infrastructure	- informing and bringing together companies and grid operators; - initiating energy-saving studies; - keeping permitting procedures short; - give official status to projects from CES (Cluster Energy Strategy) and MIEK (Multi-year Energy and Climate Infrastructure Programme); - recognising negative emissions; - timely mapping of routing (for steam, hydrogen, CO2 and residual heat) through the port of Amsterdam; - leveraging the municipality's shareholder position.	Governance Innovation
CCS for total AEB emissions (fossil and biogenic)		Technology and Infrastructure
Local steam grid in port on heat AEB (for industry) - Citizens' Council		Technology and Infrastructure
Agreements with the 10 biggest polluters on reducing emissions and making their industrial processes sustainable (OSVM).		Governance Innovation

B-1.3.2 Working on the H2 economy

Impact pathway	Working on the H2 economy
Early results	2025: -10% CO2 emissions
Later results	2030: -55% CO2 emissions 2050: 100% fossil-free and circular
Actors involved	Storage and transhipment companies, Industrial parties, Port of Amsterdam, Programmabureau NZKG, Province of Noord-Holland …
Scale	Central government, HyCC, Firan

Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Technological innovation Improved air quality Lower energy demand Energy stability Stable power supply for commercial activities Reduced price volatility for energy services Improve the city's economic competitiveness Lower energy dependence Job creation in sustainability domain
Policy document(s)	

Actions for Working on the H2 economy

Actions	Short Description	Levers of change
Developing H2 infrastructure	A regional H2 infrastructure and distribution network at the port	Technology and Infrastructure
H2A consortium	A consortium of local parties from the port and international partners to establish a 100% green value chain	Cooperation/Chains
Project EOS	Working with Zenith Energy to explore options for importing highly cooled (cryogenic) hydrogen	Learning and Capabilities
Developing regional hydrogen infrastructure	With Gasunie's subsidiary Hynetwork Services, the central governments and authorities in the region are working on a regional hydrogen infrastructure running from IJmuiden to the port area of Amsterdam via the national hydrogen network.	Technology and Infrastructure
Project H2era	With H2era, we are exploring the establishment of a 500-megawatt green hydrogen plant at the port. That would be the largest in the Netherlands so far. The plan is to have the plant ready by 2027. FID 2024	Technology and Infrastructure
Hydrogen map: Hydrogen production De Liede	The main purpose of the 15 MW hydrogen plant is to produce hydrogen, which will then be sold. Currently, the permits have been granted and the grant has been applied for. This means that we expect the investment decision in 2024, construction to start in 2025 and production to start at the end of 2025.	Technology and Infrastructure
Developing Hydrogen import chain from Bilbao Spain	The development of a green hydrogen logistics chain between Bilbao and Amsterdam to serve Dutch and European markets.	Cooperation/Chains
Developing Hydrogen import chain from Saudi Arabia	The MoU builds on a previously signed agreement between Saudi Arabia and the Dutch government, aiming to strengthen cooperation in	

	energy transition and hydrogen and establish international supply chains. A detailed feasibility study will also follow to establish a trade corridor for liquid green hydrogen between ACWA Power's production sites and Zenith's terminal at the Port of Amsterdam	
Developing Hydrogen import chain from Abu Dhabi	The development of a green hydrogen logistics chain between Abu Dhabi and Amsterdam to serve Dutch and European markets.	Cooperation/Chains
Vattenfal: Hy4Am	Development of an electrolyser for production of green hydrogen at the Hemweg location in Amsterdam. The aim is to supply green hydrogen to mobility and industry in the Amsterdam region from 2027. FID 2024	Technology and Infrastructure, Learning and Capabilities
H2avennet	H2avennet will be the future low-pressure hydrogen distribution network for the Amsterdam port area. Concept	Technology and Infrastructure
Hydrogenious Amsterdam	After a completed feasibility study on several liquid hydrogen carriers, Evos, Hydrogenious and Port of Amsterdam are now taking this next step to put Hydrogenious' unique LOHC technology into practice. FID, realisation 2026	Technology and Infrastructure
H2A	1 Million tonnes of hydrogen imports to the Amsterdam port region. The project focuses on multiple hydrogen carriers that fit the port's infrastructure. FID, realisation 2030	
Holthausen Energy Point Amsterdam	H2 filling station for cars, vans and trucks. The hydrogen is produced on site by electrolysis from solar and wind power.	Technology and Infrastructure
HS Neo Orbis on hydrogen powder	The ship is powered by electricity, which we generate with hydrogen. As hydrogen is difficult to store on board in gas form, the ship uses a new solid form of hydrogen: sodium borohydride (NaBH4). This substance reacts with water in a catalyst to produce hydrogen. It is much more compact and safer to store than hydrogen gas, which is highly flammable. Several factors are important to ensure that sodium borohydride can compete with a fossil fuel as a fuel source.	Technology and Infrastructure, Learning and Capabilities
Electriq Global hydrogen powder plant	Electriq Global and Zenith Energy are building the world's first hydrogen powder plant in the port of Amsterdam. FID 2024	Technology and Infrastructure
Working on Hydrogen infrastructure, electrolysis, H2 import (OSVM)	In the coming years, we will work on a regional and national hydrogen infrastructure, electrolysis and large-scale import of hydrogen.	Technology and Infrastructure

B-1.3.3 Working on CCS in the city

Impact pathway	Working on CCS in the city
Early results	2025: -10% CO2 emissions
Later results	2030: -55% CO2 emissions 2050: 100% fossil-free and circular
Actors involved	Municipality, AEB
Scale	Municipality (shareholder), AEB, central government (subsidy)
Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Technological innovation Improved air quality Improved health
Policy document(s)	

Actions for Working on CCS in the city

Actions	Short Description	Levers of change
CCS for AEB emissions (fossil)	AEB's total emissions (including the biogenic part, but excluding heat generation from the biomass plant) were around 1.5 Mtonnes in 2018. Oh this, approximately 520 ktonnes were fossil. Current plans for CCS amount to 480 ktonnes. Since a maximum of 90% of CO2 emissions can be captured via CCS in practice, we assume a potential for additional CCS of 650 ktonnes. This would concern mostly biogenic carbon and capture thus leads to negative emissions. (CED).	Technology and Infrastructure
Other CCS projects	If CCS is realised at AEB, and the infrastructure is in place, it is relatively easy to connect other point sources of CO2 near AEB to this infrastructure. With a significant effort from Amsterdam, it is possible to realise additional projects before 2030. This is partly about capturing biogenic CO2, creating negative emissions. Southpole (2022) has identified potential sources of biogenic emissions, where negative emissions can be realised with CCS: - Cargill (40,000 tonnes/year, no current plans, 'less promising unless strongly incentivised') - Advanced Methanol Amsterdam (AMA) ('less promising' in 2030, 'promising' in 2050: 116 ktonnes of CO2/year). - Bio energy NL ('not promising' in 2030, 'promising' in 2050). - Waternet (85 ktonnes of CO2/year, 'less promising', flows are too small and diluted).	Technology and Infrastructure, Research
Construction of CO2 network/connection to OCAP	Expanding the CO2 grid is prerequisite for CCS at carbon sources other than AEB	Technology and Infrastructure

B-1.3.4 Working on the sustainable energy port

Impact pathway	Working on the sustainable energy port
Early results	2025: -10% CO2 emissions
Later results	2030: -55% CO2 emissions 2050: 100% fossil-free and circular
Actors involved	Port of Amsterdam,
Scale	Port area
Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Technological innovation Improved air quality Lower energy demand Energy stability Stable power supply for commercial activities Reduced price volatility for energy services Improve the city's economic competitiveness Lower energy dependence Job creation in sustainability domain
Policy document(s)	2021 – 2025 Port Strategy Clean Shipping Vision 2050

Actions for Working on CCS in the city

Actions	Short Description	Levers of change
Growing in alternative fuels, building materials, logistics, agriculture and circular		
Expanding goods transport via train	A train shuttle for container traffic between Amsterdam and Duisburg.	Technology and Infrastructure
The Energy Port for offshore wind farm installation.		Technology and Infrastructure
More shortsea connections to new destinations in Scandinavia and the Baltic States	Expanding shortsea connections to new destinations in Scandinavia and the Baltic States, together with customers and partner ports.	Technology and Infrastructure
Growing in renewable energy production capacity		
A pilot plant for synthetic kerosene production		Technology and Infrastructure
The plug-and-play development of Biopark	The plug-and-play development of the Biopark to establish biobased and circular manufacturing activities	Technology and Infrastructure
More solar and wind in the port	150,000 m2 of additional solar panels with an estimated capacity of 22.5 MW and 10 MW of onshore wind.	Technology and Infrastructure
Driving the sustainability of trade chains		
Developing a sustainable settlement policy		Policy Innovation & Governance
A customer engagement programme for sustainability	A customer engagement programme to make chains more sustainable and promote chain transparency.	Social innovations
International sustainability projects.	Sustainability projects with international partner ports and	Cooperation/Chains

	customers to bind new sustainable chains to Amsterdam.	
Creating development space		
Further development of HoogTij	Further development of HoogTij together with Municipality of Zaanstad	Cooperation/Chains
Development of Energiehaven	Development of Energiehaven together with Port of IJmuiden, Municipality of Velsen, Province of Noord-Holland, Ministry of I&W and Tata Steel	Technology and Infrastructure
Develop future-proof spatial risk zoning	Future-proof spatial risk zoning of Westpoort	
Realising a sustainable nautical and land infrastructure		
Grid reinforcement electricity	A reinforced electricity grid (medium and high voltage) together with Tennet and Liander. Plus additional high-voltage supply (150 kV) and expansion of existing substations	Technology and Infrastructure
Development of shore power facilities	Shore power facilities for sea cruise, river cruise and inland navigation.	Technology and Infrastructure
Steam network development	A steam network in the port area	Technology and Infrastructure
Developing a sustainable energy and raw material infrastructure at the port		
Developing regional H2 infrastructure	A regional H2 infrastructure and distribution network at the port	Technology and Infrastructure
Developing regional CO2 backbone	A regional backbone for CO2 in Amsterdam-IJmuiden (Athos).	Technology and Infrastructure
Working towards clean shipping		
Developing ship reduction plan	A fully functioning ship emission reduction plan for climate and air quality emissions.	Policy Innovation & Governance
Development of bunkering activities and capacity of sustainable ship energy carriers	Safe bunkering of new (sustainable) marine energy carriers: LNG, methanol, hydrogen and hydrogen carriers.	Technology and Infrastructure
Eliminating harmful cargo emissions	Reducing cargo emissions of harmful substances to zero during transhipment and cleaning of tankers	Technology and Infrastructure
Reducing CO2 emissions in the port area		
Encouraging businesses to reduce CO2	Achieving CO2 savings in businesses	Policy Innovation & Governance
More sustainable freight traffic	More sustainable cargo traffic at the port	Technology and Infrastructure
Research sustainable port vessel	A new port vessel powered by hydrogen	Technology and Infrastructure
Working towards sustainable marine fuels	Maritime Energy Carriers (MEC) Working with our partners, we offer sustainable shipping fuels at the port. We also influence shipping to use these fuels.	Technology and infrastructure, Cooperation
Working on Port Emission Reduction Technologies	Port Emission Reduction Technologies (PERT) With the deployment of technology, we reduce emissions from ships docked in the port. For example, shore power on and mobile power with sailing batteries.	Technology and Infrastructure
Working on Port Call Optimisation innovation	Port Call Optimisation (PCO) We reduce emissions by handling shipping efficiently.	Technology and Infrastructure

B-1.3.5 Working towards a sustainable digital sector

Impact pathway	Working towards a sustainable digital sector
Early results	Use of residual heat; energy-efficient data centres,
Later results	Digital infrastructure integrated in urban ecosystem, less energy consumption, …
Actors involved	Data centres, …
Scale	Object level, neighbourhood, community
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Policy document(s)	Data centre establishment policy Amsterdam 2020 – 2030 (review in 2023 and expected in late 2024) Data centre strategy Noord-Holland 2022-2024

Actions for Working towards a sustainable digital sector

Actions	Short Description	Levers of change
Recalibration of data centre policy	CE Delft suggested as a measure not to honour data centre applications for a 75-ktonne emission reduction. We consider the blocking of ongoing plans and projects (often started and licensed years ago) as undesirable. However, new establishment conditions can prevent the power of data centres to grow to 670 MW in 2030, which is currently set as the maximum in the establishment decision. In early 2024, the College of Mayor and Alderpersons of Amsterdam issued a preparatory decision. Amsterdam, after adoption of the Data Centres zoning plan, will apply a 'no, unless…' policy: new data centres can only be built in Amsterdam if they directly serve an Amsterdam interest and meet new sustainability requirements. The policy applies to new establishments or expansions of more than 5 MW. The college aims to have the umbrella zoning plan ready in Q4 2024.	Learning and Capabilities, Governance Innovation and policy Technology and Infrastructure
Data centres energy saving through stricter requirements (Citizens' Council)		Governance Innovation and policy

B-1.4 Mobility and Logistics

Mobility includes all traffic, including mobile machinery and goods transport by road and rail, but excluding inland shipping. The number of residents and visitors in Amsterdam will grow substantially in the coming years and so will mobility. The main goal is to minimise polluting kilometres in order to reduce CO2 emissions from mobility in Amsterdam. **In doing so, we aim for all traffic within Amsterdam's built-up area to be zero-emission by 2030.** Motorised traffic in Amsterdam is responsible for 18% of total CO2 emissions. Reducing this is a hefty task. Half of emissions from mobility come from traffic on municipal roads. The rest consists of emissions from recreational boating, ferries and traffic on the A10 and provincial roads. On these regional roads, we have no influence as a municipality and it is up to other authorities. However, the Amsterdam measures will have a 'radiation effect' on these roads.

Mobility

CO2 emissions

870 kt

Share of total CO2 emissions

18%

Passenger cars, vans and taxis account for 95% of urban car kilometres driven and 84% of CO2 emissions from traffic. Medium and heavy goods vehicles account for just under 5% of the kilometres driven, but do produce the most CO2 emissions per kilometre. Emissions from international aviation and shipping are not attributed to Amsterdam, but emissions from recreational boating, round trips, river navigation and ferries are, and these account for 36 ktonnes of CO2 emissions per year.

More and more Amsterdam residents are opting for cycling or public transport: 70% of passenger journeys to, from and within Amsterdam are made by walking, cycling or public transport and thus sustainably. In the city, this is usually the smart and healthy choice. Thus, despite the city's strong growth in population and employment, the number of car trips in the city has actually declined slightly in recent years. On balance, CO2 emissions from mobility have remained roughly the same since 1990. The task is to further reduce the number of polluting transport movements.

At the same time, the car remains an important means of transport for many Amsterdam residents, visitors and commuters from outside the city. Most cars still run on fossil fuels, as do most buses and urban freight traffic. For the 30% of journeys still made by car, we therefore focus on less, smarter and, above all, clean traffic. Amsterdam is among the global leaders in facilitating electric transport and an example for many large cities. The switch to clean transport is still a tall order. For example, of the 200,000 passenger vehicles driving daily within the Ring, 3% are now electric. Of the 800 coaches, 1% are electric and of the 50,000 scooters, 5% are electric. Leasing companies, car-sharing companies, the moving sector and the taxi industry are already further along in the transition.

Professional passenger shipping on the canals is already 76% zero-emission. Of all recreational vessels, this is less than 5. Currently, 7 of the 14 ferries are already hybrids. During 2024, the first electric ferry will sail from Central Station to IJplein. Between 2024 and 2026, a total of four new zero-emission electric ferries will be commissioned. The approach to river navigation is only at the beginning. At the national level, opportunities to reduce CO2 emissions from flying, rail and sea shipping are being worked on. Amsterdam is closely following these developments and trying to accelerate where possible. Growth of Schiphol is only possible from a climate perspective if aviation is made more sustainable.

Besides this mobility challenge, there are major (spatial) challenges in the areas of climate (adaptation) and urban conservation. There are limits to the possibilities of using scarce public space. This requires attention for all Amsterdam residents, especially those who struggle to keep up. Choices in mobility and public spaces can and should contribute to equal access for everyone in the city.[10]

A flexible, robust and universally accessible mobility system is needed to respond to increasingly rapid developments. This calls for a mobility transition, where we steer toward use rather than ownership. Fewer privately owned passenger cars offer opportunities for a cleaner mobility system and more efficient use of space. Shared mobility (hereinafter referred to as shared transport, as that is the

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[10] Shared Transport Memorandum

common term) plays an important role in this. It is an alternative to private car ownership and car use; especially when combined with public transport. In addition, shared transport is sustainable, flexible and it encourages chain travel. The City of Amsterdam is constantly working on making the city's air cleaner and healthier. Important is the transition to more sustainable and quieter mobility. The measures involved can be classified according to the nationally and internationally used concept of the *Trias Mobilica*, which focuses on transport of people and goods by road and water. We are working to **reduce** the amount of road traffic. We do this with tasks such as *Amsterdam Autoluw* in which shared mobility and the development of hubs play an important role. **Changing** the way we travel to sustainable forms of mobility. We are working to encourage the use of public transport and cycling, rather than cars. We are also working hard to further **clean up** mobility and a number of other sources; the *Amsterdam Zero-Emission Mobility Implementation Agenda 2023-2026* mainly contributes to this.[11]

A lot is being done in the city. With various (mobility) programmes, we are working on the city of tomorrow. We do this with the programmes Air Quality, Smart Mobility, Bicycle, Boating, Urban Logistics and the Bridges and Quay Walls Action Plan, among others. Together with the Transport Region, we are working on the Mobility Investment Agenda, the Urban Public Transport Development Strategy 2020-2030, the Regional Public Transport Future Vision and the regional cycling network, among others. All these developments affect mobility and public space in the city and region. We therefore consider the various measures in conjunction and coordinate their implementation.[12]

B-1.4.1 Optimising public space for pedestrians, cyclists and public transport

As a city, we want to make space for pedestrians, cyclists and children playing, and set ourselves the goal of raising the quality of public space and making it greener. The focus is on cars because of their high spatial impact. But that doesn't mean we are against cars.

Impact pathway	Optimising public space for pedestrians, cyclists and public transport
Early results	Less space for private cars.
Later results	Increased use of active modes and public transport at the expense of private car use. 2030: Meeting 2005 WHO air quality advisory values 2030: 100% zero-emission traffic
Actors involved	City, municipality, residents, developers, shared mobility providers, GGD, knowledge and innovation organisations.
Scale	City; municipality; stations; metro stops; districts; cycling routes; streets; cycling connections.
Renewable energy generated	N/A
Energy consumption avoided or replaced	N/A
CO2e emissions by emission sector	TBD
Offset CO2e emissions (biologically or technologically fixed)	N/A
Total cost and cost per tonne of CO2e	TBD
Co-benefits	Improved air quality Improved health Active lifestyle Increased quality of life Less traffic congestion Less delay Decrease in car dependence Lower maintenance costs for users Increased efficiency
Policy document(s)	Multi-year Bicycle Plan 2019-2025 Smart Mobility Programme Agenda Amsterdam Autoluw Amsterdam Climate Neutral Roadmap (2020) 2023 Memorandum on Shared Transport

[11] Zero-Emission Mobility Implementation Agenda
[12] Agenda Amsterdam Autoluw

Actions for Optimising public space for pedestrians, cyclists and public transport

Action	Description	Levers of Change
Expansion of public transport bicycles at stations and introduction of shared bikes at metro stops.		Technology and Infrastructure
Encouraging bicycle use	Encourage bicycle use in collaboration with GGD and city districts.	Social innovations
Platform for knowledge sharing and innovation.		Learning and capabilities
Research on urban distribution by bicycle.		Research/Monitoring
Data management mobility	Own mobility data to manage mobility based on public interest.	Technology & Infrastructure
Assessment framework for new mobility solutions with a digital component	Making an assessment framework on the basis of which new mobility solutions with a digital component can be assessed.	Governance innovations & Policy
Research on architecture choices and mobility management application	Together with knowledge institutions, social organisations, residents and market players, we are increasing our understanding of architecture choices and possible applications of mobility management.	Governance innovations & Policy; Democratisation and participation
Communication on changing mobility in society	Strengthen awareness about changing mobility in society.	Social innovations
Research on new mobility concepts	Task-oriented and small-scale testing of new mobility concepts in cooperation with users.	Research/Monitoring
Committing to behavioural change in mobility	Committing to behavioural change in experiments and through life events.	Social innovations
Monitoring new mobility concepts in practice	Monitoring development of new mobility concepts and testing where there is social added value.	Research/Monitoring
Experimenting with mobility design in area development	Initiating experiments with other forms of mobility design in area developments.	Research/Monitoring
Innovating with electric mobility	Stimulating innovations with electric mobility that contribute to achieving a climate-neutral city.	Social innovations
Improving pedestrian facilities.		Technology and Infrastructure
Creating space	Creating more space in (city) streets for cyclists and pedestrians.	Technology and Infrastructure
High-quality cycling connections	Realising high-quality bicycle connection Oostelijk Pontplein - Meester Visserplein and redeveloping Kattenburgerstraat.	Technology and Infrastructure
Facilitating comfortable cycling	Facilitate comfortable cycling traffic, including widening busy cycle routes.	Technology and Infrastructure
Facilitating easy bicycle parking	Facilitate easy bicycle parking, including expansion of bicycle parking spaces.	Technology and Infrastructure
Facilitating the new cycling	Facilitate the new cycling, including encouraging bicycle-friendly behaviour.	Social innovations
Creating clean and active movements	Creating more clean and active travel, including creating space for public transport.	Technology and Infrastructure

Less car parking	Creating space through less car parking, including fewer parking permits.	Governance innovations & Policy
Technological innovations cyclists	Commit to technological innovations, including smart bicycle parking.	Technology and Infrastructure
Smart incorporation of new mobility solutions	Smart incorporation of new mobility solutions, including neighbourhood hubs with EVs.	Technology and Infrastructure
Research on more business and commuting public transport	Research on business and employee commuting by bicycle and public transport.	Social innovations; Research
Low-car cycling routes	Even less cars on Haarlemmer Houttuinen cycling route.	Technology and Infrastructure
Managing scooter parking	Taking more control of scooter parking through prohibition areas and service areas.	Governance innovations & Policy
Speed reduction	Speed reduction from 50 km/h to 30 km/h on many roads.	Governance innovations & Policy
More user-friendly urban public transport	Introducing timetable-free travel in urban public transport. Creating space for public transport with better flow and accessible stops.	Governance innovations & Policy; Social innovations; Technology and Infrastructure
Making public transport financially attractive		Funding and financing
Supporting moments of change	Trial offerings at change times.	Social innovations
Making all residential streets into residential areas		Technology and Infrastructure
Making better use of and expanding P+R		Technology and Infrastructure
Knowledge sharing	Knowledge sharing for exchange between surrounding areas.	Research/Monitoring; Democratisation and participation

B-1.4.2 Facilitating, encouraging and regulating supply and use of shared mobility

As a city, we experience that a large proportion of space is consumed by mobility. At the same time, much of the means of transport stands idle, essentially taking up unnecessary space. We want to free up more space and make smarter use of it. One way we intend to do this is by focusing on shared mobility. To ensure that shared mobility pursues its goals, we are committed to facilitating, encouraging and regulating the supply and use of shared mobility.

Impact pathway	Facilitating, encouraging and regulating supply and use of shared mobility
Early results	Increasing supply and use of shared mobility.
Later results	Reduction in private car ownership. 2030: 100% zero-emission traffic
Actors involved	City, municipality, residents, developers, shared mobility providers, knowledge and innovation organisations.
Scale	City; municipality; stations; metro stops; districts.
Renewable energy generated	N/A
Energy consumption avoided or replaced	TBD
CO2e emissions by emission sector	TBD
Offset CO2e emissions (biologically or technologically fixed)	N/A
Total cost and cost per tonne of CO2e	TBD
Co-benefits	Improved health Improved air quality Lower energy demand Job creation in sustainability domain Lower maintenance costs for users Reduced space demand for parking facilities
Policy document(s)	Agenda Amsterdam Autoluw

	Amsterdam Climate Neutral Roadmap (2020) 2023 Memorandum on Shared Transport Zero-Emission Mobility Implementation Agenda 2023-2026

Actions for Facilitating, encouraging and regulating supply and use of shared mobility.

Action	Description	Levers of Change
Tightening conditions of shared scooters policy		Governance innovations & Policy
Increase supply of shared scooters	In March 2023, the college presented the '2023 Memorandum on Shared Transport' and submitted it for consultation. In the coming years, efforts will be made to further grow the number of shared vehicles, giving Amsterdam residents increasingly easy access to zero-emission mobility.	Technology and Infrastructure; Governance innovations & Policy
Stimulating shared mobility	In March 2023, the college presented the '2023 Memorandum on Shared Transport' and submitted it for consultation. In the coming years, efforts will be made to further grow the number of shared vehicles, giving Amsterdam residents increasingly easy access to zero-emission mobility.	Social innovations; Governance innovations & Policy
Achieving better and more attractive supply of shared cars.	For example, through information exchange between municipality and car sharing providers, Monitoring effects of car sharing and more and better communication on the benefits of car sharing.	Technology and Infrastructure; Democratisation and participation; Research/Monitoring; Social innovations
Integrating shared transport in area developments.		Technology and Infrastructure
Expanding shared cars service areas.		Governance innovations & Policy
Challenging shared mobility providers to use MaaS platform.		Technology and Infrastructure
Smart organisation of mobility in the city, including working on alternatives to ownership.		Technology and Infrastructure
Sharing municipal service vehicles through municipal car pool.		Governance innovations & Policy; Social innovations
Shared bicycles at metro stations.		Technology & Infrastructure
Continuing shared bicycle experiment.		Research/Monitoring
Making agreements with shared bicycle providers regarding data sharing.		Democratisation and participation
Explore regulatory form of shared bicycle.		Governance innovations & Policy
Converting shared electric bicycles experiment to permanent policy.		Governance innovations & Policy
Increasing supply of shared bicycles.		Technology & Infrastructure
AMS Project: Sustainable neighbourhood logistics: opportunities for hubs?	Investigating and testing business models for sustainable neighbourhood logistics	Research/Monitoring

B-1.4.3 Facilitating and regulating full-fledged charging network

As a city of Amsterdam, we aim to become a zero-emission city. 100% zero-emission mobility is part of this. Electric transport is needed to achieve the goal of zero-emission mobility. The presence of all electric vehicles and vessels requires a full charging network. As a city, we are committed to facilitating and regulating this full-fledged charging network so that we can develop a safe, reliable, accessible and affordable charging infrastructure in the coming years.

Impact pathway	Facilitating and regulating full-fledged charging network
Early results	Expanding public charging network.
Later results	2030: 100% zero-emission mobility.
Actors involved	City, municipality, residents, developers, shared mobility providers, grid operators, Province of Noord-Holland, GVB, vehicle and vessel owners.
Scale	City; municipality; districts/neighbourhoods; inner-city waters.
Renewable energy generated	N/A
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Improved health Improved air quality Energy stability Technological innovation Stable power supply for commercial activities Job creation in sustainability domain
Policy document(s)	Amsterdam Climate Neutral Roadmap (2020) Charging infrastructure strategic plan 2020-2030 Monitor Clean Air Action Plan 2022 Zero-Emission Mobility Implementation Agenda 2023-2026 Regional Implementation Agenda Urban Logistics

Actions for Facilitating and regulating full-fledged charging network

Action	Description	Levers of Change
Facilitating scale-up of public fast-charging points for taxi etc.		Technology and Infrastructure
Researching scale-up hubs and fast-charging infrastructure for logistics.		Research/Monitoring
Drawing up charging infrastructure vision for public charging points.		Governance innovations & Policy
Demand-driven and strategic rollout of charging points.		Technology and Infrastructure
Publishing neighbourhood location plan for charging station sites.	Publishing neighbourhood location plan mapping potential charging station locations and coordinating with city districts, tasks and residents.	Governance innovations & Policy; Democratisation and participation
Agreements on future-proof construction of charging points in new construction projects	Internal arrangements are being made to future-proof the construction of charging points in new construction projects.	Governance innovations & Policy
Community location plans for new placement procedure.	Community location plans: the municipality will adopt a new placement procedure where traffic decisions will be made at the community level. Areas of concern	Governance innovations & Policy; Technology and Infrastructure; Funding and financing

	are the available budget, power grid congestion due to heavy charging infrastructure and fitting the charging infrastructure into the urban environment.	
Supporting marinas in installing charging infrastructure.		Technology and Infrastructure
Determining charging locations for ferries.		Governance innovations & Policy; Technology and Infrastructure
Tendering concession for passenger vessel charging points.		Governance innovations & Policy
Conversion of existing diesel and diesel hybrid ferries	The existing diesel and diesel hybrid ferries need to be converted, in tandem with the construction of charging infrastructure at the various landings.	Technology and Infrastructure
Tendering concession for public charging points for recreational vessels.		Governance innovations & Policy
Drawing up charging strategy for sailing.		Governance innovations & Policy
Including logistics in municipal charging visions.		Governance innovations & Policy

B-1.4.4 Making private transport more sustainable (= passenger transport)

Towards a cleaner and healthier Amsterdam, we are committed to making private transport more sustainable. We support this ambition by focusing, among other things, on geographical restrictions for combustion engine vehicles, and compensation schemes for the transition towards zero-emission mobility.

Impact pathway	Making private transport more sustainable
Early results	Zero-emission private mobility.
Later results	2030: 100% zero-emission mobility
Actors involved	City, municipality, surrounding municipalities, Province of Noord-Holland, central government, residents, vehicle and vessel owners.
Scale	City; municipal, cross-municipality, rural, environmental zoning, urban inland waterways.
Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Improved health Improved air quality Lower maintenance costs for users
Policy document(s)	2023 Memorandum on Shared Transport Zero-Emission Mobility Implementation Agenda 2023-2026 Monitor Clean Air Action Plan 2022 Regional Implementation Agenda Logistics Agenda Amsterdam Autoluw Charging infrastructure strategic plan 2020-2030 Amsterdam Climate Neutral Roadmap (2020)

Actions for Making private transport more sustainable

Action	Description	Levers of Change
Introduction of Environmental Zone (diesel) passenger cars.		Governance innovations & Policy

All shared cars zero-emission.		Technology and Infrastructure
All mopeds and motorised bikes zero-emission.	There will be a support measure for low-income moped and motorised bike owners (Stadspas holders with green dot). They will receive financial compensation when they give up their mopeds and motorised bikes. A total subsidy amount of €1 million will be made available for this.	Technology and Infrastructure; Funding and financing
Drafting the exemption policy.	The starting point is to continue the exemption policy of the current environmental zone for mopeds and motorised bikes.	Governance innovations & Policy
Tightening environmental zone for passenger cars		Governance innovations & Policy
Compensation scheme with special focus on low-income people		Funding and financing
Introduction of zero-emission zone in city centre area	Introduction of zero-emission zone in the city centre area by 2025 with a five-year transition period for recreational vessels with an Inland Harbour Dues Vignette.	Governance innovations & Policy
Setting up zero-emission recreational vessels website		Technology and Infrastructure
Exploring differentiated parking rates with the central government. [1]		Funding and financing
Actively approaching owners of old diesels. [1]		Democratisation and participation
Facilitating hydrogen refuelling station rollout. [1,2]		Technology and Infrastructure
A solution to the enforcement for foreign vehicles is being worked on. [1,2]		Funding and financing
Geographic expansion of Environmental Zone. [1,2]		Technology and Infrastructure
Zero-emission area s100 in 2022. [1,2]		Governance innovations & Policy
National covenant opportunities zero-emission zone[1,2]	National covenant disclosing options for introducing a zero-emission zone.	Governance innovations & Policy; Democratisation and participation
Covenant on access regime and package of measures of the zero-emission zone. [1,2]	Signing covenant with these parties containing agreements on the access regime and the package of measures of the zero-emission zone.	Governance innovations & Policy
Sharing of knowledge and experiences by all zero-emission zone municipalities. [1,2]		Governance innovations & Policy
Further development of hub strategy. [1,2]		Governance innovations & Policy
A solution to the enforcement for foreign vehicles is being worked on. [1,2]		Governance innovations & Policy
National office for environmental and zero-emission zone exemptions from 2025. [1,2]	The City of Amsterdam is working with other municipalities, various partners and the central government to create a national office for environmental and zero-emission zone exemptions from 2025.	Democratisation and participation

[1] Also part of the impact pathway 'Making public transport more sustainable'
[2] Also part of the impact pathway 'Making Logistics More Sustainable'

B-1.4.5 Making public transport more sustainable

Towards a cleaner and healthier Amsterdam, we are committed to making public transport more sustainable. We support this ambition by focusing, among other things, on geographical restrictions on combustion-engine vehicles and vessels, and replacing current combustion-engine vehicles and vessels.

Impact pathway	Making public transport more sustainable.
Early results	Zero-emission public transport.
Later results	2030: 100% zero-emission mobility
Actors involved	City, municipality, surrounding municipalities, Province of Noord-Holland, central government, Transport Region Amsterdam, GVB, NS, residents, coach owners, Royal Dutch Transport.
Scale	City; municipal, cross-municipality, rural, environmental zoning, urban inland waterways.
Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Improved health Improved air quality Lower energy demand Improved comfort in public transportation Reduced price volatility for energy services Reduction in car dependence
Policy document(s)	GVB CO2 policy Zero-Emission Mobility Implementation Agenda 2023-2026 Monitor Clean Air Action Plan 2022 Regional Implementation Agenda Logistics Agenda Amsterdam Autoluw Charging infrastructure strategic plan 2020-2030 Amsterdam Climate Neutral Roadmap (2020)

Actions for Making public transport more sustainable

Action	Description	Levers of Change
Replacing diesel buses with electric buses.		Technology and Infrastructure
Replacing diesel ferries with electric ferries/ Series hybrid ferries and electric ferries.		Technology and Infrastructure
Comfortable driving/feedback on energy-efficient driving behaviour of bus drivers.		Social innovations
Building 'zero-emission coalition' of parties in the city for coaches.		Governance innovations & Policy; Democratisation and participation
Conversion of existing diesel and diesel hybrid ferries	The existing diesel and diesel hybrid ferries need to be converted, in tandem with the construction of charging infrastructure at the various landings.	Technology and Infrastructure
Explore possibilities of hubs for coaches (incl. fast-charging option).		Technology and Infrastructure
Sustainability of the IJplein ferry	The IJplein ferry will be the first to be made more sustainable. We are currently elaborating several variants to make the fleet more sustainable. No later than in 2024, we will submit an investment decision to the City Council.	Technology and Infrastructure
All taxis zero-emission	Making agreements with companies and institutions regarding exclusively zero-emission taxi transport.	Technology and Infrastructure/ Governance innovations & Policy; Democratisation and participation
National office for environmental and zero-emission zone exemptions	The City of Amsterdam is working with other municipalities, various partners and the central government to create a national office for environmental and zero-emission zone exemptions from 2025. [2,3]	Democratisation and participation
Sustainable travel lobby	With this measure, the municipality is taking an even more active stance in its lobbying activities on more sustainable travel. The municipality does this within its role as Schiphol's shareholder and (possibly together with the G4) towards the EU and central government. Welfare rather than economic growth is taken as the starting point. With this lobby, the municipality argues for a tax on kerosene and control of flight numbers (or at least budget flights)	

[2] Also part of the impact pathway 'Making Logistics More Sustainable'
[3] Also part of the impact pathway 'Making Private Transport More Sustainable'

B-1.4.6 Making logistics more sustainable

Towards a cleaner and healthier Amsterdam, we are committed to making logistics more sustainable. We support this ambition by focusing, among other things, on geographical restrictions on combustion-engine vehicles and vessels, and regulations to support stakeholders in this transition.

Impact pathway	Making logistics more sustainable
Early results	Zero-emission logistics.
Later results	2030: 100% zero-emission traffic
Actors involved	City, municipality, surrounding municipalities, Province of Noord-Holland, central government, Transport Region Amsterdam, Topsector Logistiek, SMEs/industry/business, residents.
Scale	City; municipal, cross-municipality, rural, environmental zoning, urban inland waterways.
Comments on feasibility and progress	?
Renewable energy generated	?
Energy consumption avoided or replaced	?
CO2e emissions by emission sector	?
Offset CO2e emissions (biologically or technologically fixed)	?
Total cost and cost per tonne of CO2e	?
	Improved health Improved air quality Lower energy costs Reduced price volatility for energy services Lower maintenance costs Greater efficiency
Policy document(s)	Zero-Emission Mobility Implementation Agenda 2023-2026 Monitor Clean Air Action Plan 2022 Regional Implementation Agenda Logistics Agenda Amsterdam Autoluw Charging infrastructure strategic plan 2020-2030 Amsterdam Climate Neutral Roadmap (2020)

Actions for Making logistics more sustainable

Action	Description	Levers of Change
Setting up logistics energy office	We are joining the creation of an energy office. This provides a fixed point of contact for companies.	Democratisation and participation
Research on smart and zero-emission provisioning	Through a pilot in the Haarlemmerbuurt, the municipality is exploring ways to enable smart and zero-emission provisioning of shops.	Research/Monitoring
Research on widening time windows for zero-emission urban logistics	Tests will be carried out in (pilot) areas to determine whether widening time windows for zero-emission urban logistics is desirable and applicable.	Research/Monitoring
Feasibility studies on zero-emission transport on water. [1]		Research/Monitoring
Zero-emission urban inland waterway transport. [1]		Technology and Infrastructure
Facilitating hydrogen refuelling station rollout. [1,3]		Technology and Infrastructure
Enforcement for foreign vehicles	A solution to the enforcement for foreign vehicles is being worked on. [1,3]	Governance innovations & Policy

National office for environmental and zero-emission zone exemptions from 2025	The City of Amsterdam is working with other municipalities, various partners and the central government to create a national office for environmental and zero-emission zone exemptions from 2025. [1,3]	Governance innovations & Policy; Democratisation and participation
Geographic expansion of Environmental Zone. [1,3]		Governance innovations & Policy
Zero-emission area S100 in 2022. [1,3]		Governance innovations & Policy
Consultations and meetings regarding zero-emission zone	In the run-up to the zero-emission zone, consultations and meetings will be held with industry players and stakeholders on the introduction of the zero-emission zone.	Democratisation and participation
National zero-emission zone covenant	National covenant disclosing options for introducing a zero-emission zone. [1,3]	Governance innovations & Policy
Encouraging zero-emission mobile equipment		Technology and Infrastructure
Tightening environmental zone (diesel) vans		Governance innovations & Policy
Offering local scrapping scheme to owners of vans with emission class 4	Amsterdam is offering a local scrapping scheme for owners of vans with emission class 4 in 2024. Up to two million euros of funding will be made available for this purpose.	Democratisation and participation
Committing to an area-based approach in business parks and targeted communication towards SMEs	The municipality is further committing to an area-based approach in business parks and targeted communication towards SMEs. The aim here is to gather input from companies and different teams to help companies with the energy transition and the transition to zero-emission transport in an integrated way.	Democratisation and participation
Central government incentive scheme	Besides some tax schemes, there is a government incentive scheme: entrepreneurs can receive a financial contribution for the purchase of a zero-emission van and truck.	Funding and financing
Drafting the exemption policy	Drafting the exemption policy in proper consultation with the industry. The proposed local exemption policy is aligned with the current exemption policy of the environmental zone vans and trucks.	Governance innovations & Policy
Adopting traffic decision including exemption policy.		Governance innovations & Policy
All vans and trucks zero-emission.		Technology and Infrastructure
Tightening investigation into environmental zone freight		Research/Monitoring
Experimenting with LEVV (light-electric freight transport).		Research/Monitoring
Drafting Logistics Schedule of Requirements (LSoE).		Governance innovations & Policy

Facilitating hydrogen for urban logistics		Technology and Infrastructure
Stimulating procurement of zero-emissive logistics fleet.		Funding and financing
Stimulating smart and clean construction logistics.		Funding and financing
Stimulating smart and clean facility logistics.		Funding and financing
Enter into a covenant with logistics sector.		Democratisation and participation
Zero-emission Covenant	Signing covenant with these parties containing agreements on the access regime and the package of measures of the zero-emission zone. [1,3]	Democratisation and participation
Sharing of knowledge and experiences by all zero-emission zone municipalities. [1,3]		Learning and capabilities
Exploring differentiated parking rates with the central government. [3]		Research/Monitoring; Funding and financing
Actively approaching owners of old diesels. [3]		Democratisation and participation
AMS Project: TRiLOGy	Developing and testing sustainable transport and logistics in cities by water with electric, autonomous vessels	Technology and Infrastructure Research/Monitoring
ÀMS Project: DIT4TraM	Pilots with different techniques to decentralise mobility management in cities, to make the system more sustainable, safe and equitable	Technology and Infrastructure Research/Monitoring
AMS Project: XCARCITY	Digital twin development to model scenarios for cities with fewer cars, incl. design of suitable sustainable mobility services	Technology and Infrastructure Research/Monitoring
AMS Project: SmartHubs	Testing different types of shared mobility services in urban hubs and development of decision support tool for mobility hub policy	
AMS Project metaCCAZE	Testing and further developing various techniques for zero-emission urban mobility	
AMS Project DMI - DRO	Simme, sustainable urbanisation and mobility renewal	

[1] Also part of the impact pathway 'Making public transport more sustainable'
[3] Also part of the impact pathway 'Making private transport more sustainable'

B-2 The Food Transition

The current food system has a huge impact on the environment. Thirty percent of global CO2 emissions come from our food and its supply chain[13][14]. So the current food system is unsustainable even just in that regard. Amsterdam consumes some 3,000 ktonnes of food a year[15].

<table>
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Five impact pathways
1. More plant based
2. Reducing food waste
3. Making own organisation's food chain more sustainable
4. Short Chains and Urban Farming
5. Fair and Social Food

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Amsterdam is therefore taking a leading role in the food transition. We can show how the transition to a more sustainable food system can be put into practice. By acting as a testing ground for this, the city can inspire and the impact fans out to other cities and regions

A majority within society is against intensive livestock farming[16]. A large proportion of the Dutch populace also want to eat less meat. Still, this is only being achieved to a limited extent. This shows that the food system is currently set up to facilitate unsustainable choices.

We need to change that. This also means moving away from individual responsibility and looking at the structure in which we live: why are these choices the easy ones and why are the other choices so difficult? As a municipality, we want to introduce measures without demanding personal sacrifices from our residents, or pointing fingers.

The food transition is an essential part of sustainability transitions, especially in urban areas like Amsterdam. The food transition focuses on the transition to a more sustainable food system, significantly reducing the environmental impact of food production and consumption. In Amsterdam, for instance, we already have targets around increasing the share of plant-based proteins that Amsterdam residents eat, as well as for reducing food waste and promoting local food production in our food strategy.

The impact of this food system is highlighted by the Environmental Cost of Food Consumption in Amsterdam, which amounts to 2800 million annually, according to the Circular Monitor. This figure represents how much it would cost to restore the environmental impact of how we eat.

Health

The way we produce and consume food has a direct impact on our health. Overconsumption of processed foods and meat has been linked to several health problems. In its report 'Healthy Protein Transition', the Health Council recommends the use of policies that make it easier for the entire population to eat more plant-based foods. This is important because animal protein sources have a greater environmental impact and some sources are associated with an increased risk of chronic diseases.

A more sustainable diet, rich in plant products and produced closer to home, can contribute to better public health by preventing cardiovascular disease, cancer and rheumatism.

Similarly, the EAT-Lancet report, a leading scientific study, recommends reducing consumption of red meat and sugar globally and switching to a diet rich in vegetables, fruits, whole grains, nuts and legumes. A varied and balanced plant-based menu will not only contribute to health, but also improve your carbon footprint.

Based on this scientific evidence, the Amsterdam UMC recently published a petition[17] calling for less animal-based and more plant-based food in hospitals. In doing so, they and other health institutions

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[13] Field to fork: global food miles generate nearly 20% of all CO2 emissions from food (European Commission, 25 February 2023)
[14] Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, *360*(6392), 987-992.
[15] OIS – Monitor Food Strategy version 3 – presented by Leander Wolters late April 2024
[16] Meerderheid Nederlanders is tegen intensieve veehouderij, maar we eten nog nauwelijks vegetarisch | Trouw
[17] Petition for a plant-based food offer at Amsterdam UMC (office.com)

embracing the protein transition are sending an important message: the protein transition is essential for public health and for the planet.

Climate
Reducing meat consumption reduces greenhouse gas emissions, deforestation and changes in land use associated with livestock farming and feed production[18]. This is in line with the municipality's climate goals. The food system accounts for about 30% of global greenhouse gas emissions. This is due to:

A) Ruminants such as cows, goats and sheep breathe, burp and defecate a lot of methane. A lot of methane is also released as manure is converted into methane by bacteria. Methane is a strong greenhouse gas. Methane emissions and livestock result in 31% of emissions in the food system occurring in livestock production.

B) CO_2 is released when transporting food. Consider, for example, fresh vegetables and fruits such as avocados being flown in, as well as road transport of livestock. In addition, livestock feed is flown or shipped over. Transport accounts for about 20% of all CO_2 emissions from the food system, according to the EU[19].

C) 24% of greenhouse gas emissions caused by the food system come from deforestation and changes in land use. Two thirds of it arises from the production of animal feed, and one third from the production of food for humans.

D) 70% of all water used by humanity is used in the food system, and 78% of water pollution from excess nutrients is caused by over-fertilisation. As the earth gets warmer, the water system also comes under further pressure. The food system plays an important role in this, and reducing the agricultural area that humanity uses to feed itself can help mitigate the pressure on this system.

So by eating more plant-based and different food, Amsterdam residents and visitors to Amsterdam can achieve significant CO_2 reductions in the city's scope-3 emissions.

Economy
The protein transition offers opportunities for innovation and the development of startups and scale-ups in the food-tech sector, which can generate economic growth and jobs. Amsterdam can play an important role in this as a driver of this new, sustainable food economy. There is a lot of innovation in the food industry, as well as many start-ups and scale-ups.

In addition, growing food takes a lot of space. Livestock feed has to be produced somewhere, and the cattle themselves have to live and graze somewhere. As much as 3,000 hectares of land around Amsterdam are used for grass and feed. So reducing meat consumption also literally frees up space for other activities, such as more sustainable farming, for example.

Animal welfare
Industrial animal husbandry is often accompanied by harrowing conditions for animals. A transition to more plant-based proteins reduces pressure on the bioindustry and promotes more sustainable and animal-friendly production methods. Besides environmental impact, animal welfare, and our compassion for them, is also an important reason to change the agriculture industry. Many Amsterdam residents and Dutch feel uncomfortable with industrial livestock farming. Yet we slaughter 1.7 million animals a day in the Netherlands. That doesn't have to happen, and is ultimately a choice.

Environment
About 70% of agricultural land in the Netherlands is used for livestock farming. 60% of meat and as much as 70% of milk is exported. To feed our livestock, forests are cleared elsewhere or it comes at the expense of food production elsewhere, thus contributing to food inequality.

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[18] Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, *360*(6392), 987-992.
[19]

The current and most common forms of livestock and arable farming are at the expense of soil life and have negative impacts on biodiversity in the fields and adjacent ditches. To get the quality of the ditches and waters around the pastures and fields that are intensively fertilised to the agreed level, you will first have to do some 15 to 30 years of nature-inclusive farming on them.

The protein transition contributes to reduced nitrogen emissions, soil degradation and deforestation from agriculture, benefiting the living environment and biodiversity in Amsterdam and its surroundings.

Intensive agriculture and animal husbandry are major sources of nitrogen emissions, mainly in the form of ammonia (NH_3) and nitrogen oxides (NO_x). These emissions contribute to air and water pollution and eutrophication, leading to biodiversity loss. Food production is a major contributor to deforestation, with forests and rainforests being cleared or burned to make way for farmland for livestock and feed production. Deforestation has major impacts on biodiversity, carbon storage and climate.

As all of the above shows, it is essential to ambitiously pursue the food transition in Amsterdam. If we take a global perspective on the ecological transition, it is clear that food, and in particular the transition to eating differently, is an essential part of sustainability policy.

Below, we describe through which impact pathways we intend to make this transition happen.

B-2.1 More plant based

In late 2020, the City Council discussed Partij voor de Dieren's own-initiative proposal 'Amsterdam tackles the climate crisis with knife and fork!'. The core of this proposal is to contribute to the protein transition as a municipality. Without increased plant-based eating on a global scale, it is likely that it will prove impossible to limit global warming to 2 degrees[20]. The college supports the aims of the proposal and endorses the need to encourage, entice and drive a diet with more plant-based proteins. In response to the initiative proposal, in 2021, the college prepared *Towards a More Plant-based Diet, Protein Transition Action Plan 2021 – 2023*. With this action plan, Amsterdam has set the target of: a turnaround in consumption from 60% animal proteins and 40% vegetable proteins (current situation) to 40% animal proteins and 60% vegetable proteins by 2030.[21] The Food Strategy Implementation Agenda 2023 – 2026 further focuses on the protein transition.
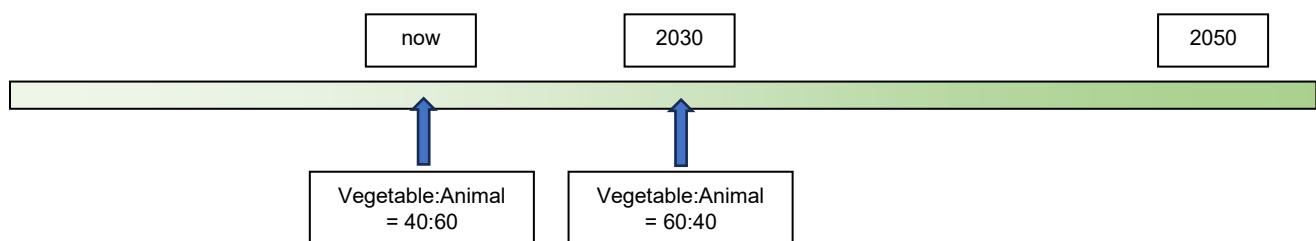
Impact pathway	More Plant based
Early results	
Result	Shifting the ratio of vegetable to animal proteins in Amsterdam residents' diets to 60% vegetable and 40% animal proteins by 2030

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[20] Clark, M. A., Domingo, N. G., Colgan, K., Thakrar, S. K., Tilman, D., Lynch, J., ... & Hill, J. D. (2020). Global food system emissions could preclude achieving the 1.5 and 2 C climate change targets. *Science*, *370*(6517), 705-708.
[21] actieplan_eiwittransitie_2021_2023.pdf (openresearch.amsterdam)

Actors involved	City of Amsterdam, Amsterdam public institutions, large employers, start-ups, hospitality
Scale	City, hospitality, canteens, events, stations
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Increased food security Improved health Improved animal welfare Sustainable food production Food safety Stimulating local food production Reduced food transport
Policy document	Food strategy implementation plan Sustainability Report 2022

Actions for More Plant based

Action	Description	Levers of Change
Implementation for plant-based offer within Municipal Organisation	Preparing implementation plan for accelerating transition of plant-based food and beverage offer within municipal organisation in collaboration with Facilities Office, GGD, Green Office	Governance innovations & Policy Learning and capabilities
Participation employees more plant-based	Drawing up plan for employee participation in transition to plant based.	Governance innovations & Policy Social innovations Learning and capabilities
Pilots plant based	Conducting several plant-based pilots within own organisation	Governance innovations & Policy Research/Monitoring Learning and capabilities
Cooperation Amsterdam public institutions	Exploring whether cooperation with Amsterdam public institutions on accelerating the transition to plant-based food and beverages in their own organisations could be part of a Community of Practice of large employers in the field of procurement for catering and beverages	Research/Monitoring Learning and capabilities
Guideline and toolkit on procurement policy for Amsterdam public institutions	Drawing up guidelines and toolkit to steer beverage procurement policy toward the transition to plant-based food at Amsterdam public institutions	Governance innovations & Policy Learning and capabilities
Plant Based Treaty	Being one of the first European cities to sign the Plant-Based Treaty.	Governance Innovations & Policy Social innovations
Research on protein ratio	Researching whether we can exceed the protein ratio of 60:40.	Governance Innovations & Policy Research/Monitoring

Facilitating innovative plant-based start-ups and scale-ups	Supporting, connecting and facilitating innovative start-ups and scale-ups. Particularly focused on More Plant Based and protein transition.	Governance innovations & Policy Social innovations Democratisation and participation Funding and financing Learning and capabilities
A campaign on banqueting (vegetarian meetings).	A campaign on banqueting (vegetarian meetings).	Governance innovations & Policy Social innovations Learning and capabilities

B-2.2 Reducing food waste

Food waste is the third biggest contributor to CO2 emissions in the Netherlands. Our way of producing, distributing and consuming food means that large amounts of food are thrown away. To combat food waste, Sustainability (Circular Economy) is drawing up an action plan. Key components are reducing food waste among consumers and businesses and commitment to saving food for social initiatives.

now	2030		2050

This is where we

This is where we want to

Impact pathway	Reducing food waste
Early results	Less food waste
Result	Reduce food waste by 50% by 2030 compared to 2015 (20.5kg pp/py)
Actors involved	City of Amsterdam, Circulaw, neighbourhood kitchens, food circles, initiatives, farmers, WUR,
Scale	Households, businesses, social initiatives
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	The related GHGs are huge. The food stream in Amsterdam accounts for 8 Mtonnes of CO2 annually. Preventing waste within our sphere of influence will not completely inhibit this, but suppose 30% is wasted, and we can reduce it to 15%, that already results in a +- 1.2 Mtonnes gain.
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	Cost reduction Increased food security Reduction in waste and waste transport

Policy document	Food strategy implementation plan Circular Monitor Circular Economy Implementation Agenda 2023-2026 Food Strategy Implementation Agenda 2023-2026.

Actions for Preventing food waste

| Action	Description	Levers of Change
Food Waste Action Plan	Creating Food Waste Action Plan to ensure less food is wasted and more reaches places like food banks.	Governance innovations & Policy Social innovations Funding and financing Learning and capabilities
CircuLaw law analysis	CircuLaw case law analysis food waste.	Research/Monitoring
Collaborating with social initiatives	Working with neighbourhood kitchens/food circles in which food leftovers are distributed for social initiatives	Democratisation and participation Learning and capabilities
Facilitating pilots	Facilitating pilots of (neighbourhood) initiatives aimed at collecting and valorising organic waste streams in the city.	Social innovations Democratisation and participation Learning and capabilities
Exploring market opportunities with farmers	Exploring market opportunities in collaboration with farmers.	Research/Monitoring
Connecting parties to social initiatives	'Saving' more food by connecting more shops, restaurants and other partners to Food Banks and social initiatives	Social innovations Democratisation and participation
Reducing food waste together	Work with consumers and businesses to figure out what we can do together to prevent food waste.	Governance Innovations & Policy Research/Monitoring
Legal measures against waste	Amsterdam is preparing legal measures to oblige businesses (hospitality, retail, distribution centres) to more actively combat waste.	Governance innovations & Policy Social innovations
Participating in WUR research	Participating in research by Wageningen University & Research on safety and energy value of compost and fertilisers from the city.	Research/Monitoring Learning and capabilities
Drawing up Food strategy lobbying agenda	Drawing up Food strategy lobbying agenda to lobby on legislation (end of waste status, fertiliser law) for reuse of organic waste streams.	Governance innovations & Policy Democratisation and participation
Exploring legal options	Exploring legal options to impose measures on hospitality and retail outlets.	Governance innovations & Policy Social innovations Research/Monitoring
Realising six food hubs	We realise six food hubs in the city where production, distribution of surplus food, food preparation and consumption come together.	Governance innovations & Policy Social innovations Learning and capabilities

B-2.3 Making own organisation's food chain more sustainable

This is described in section B-5.2.1 Making own organisation's food chain more sustainable

B-2.4 Short Chains and Urban Farming

As a capital city, we want to make an active contribution to the necessary transition of agriculture in the metropolitan landscape. From producing at the lowest price for the global market to more products for the regional and local market. We also want to make Amsterdam residents more aware of the production, distribution, preparation and consumption of food so that they will buy more sustainable food, eat healthier and waste less food. One way we want to do this is by encouraging urban farming and short chains.[22]

By 2026, 20% of Amsterdam residents will be familiar with or involved in urban

| 2020 | | 2030 | | 2050 |

10% of Amsterdam residents are familiar with or involved in urban farming (monitor 2020)

25% sustainably produced regional food available in Amsterdam
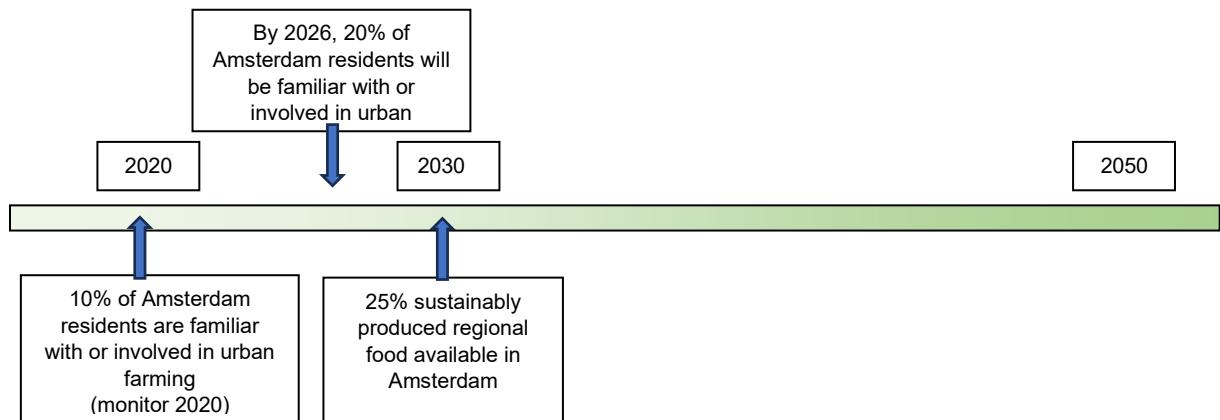
Impact pathway	Making available sustainably and regionally produced food
Early results	Residents 'prosumers': By 2026, 20% of Amsterdam residents will be familiar with or involved in urban farming Sustainable, regionally produced food becomes more available
Result	In 2030: 25% sustainably produced regional food available in Amsterdam.
Actors involved	City of Amsterdam, City Farming Foundation, City Farming Academy, local parties, Wageningen University & Research, Amped, MRA Foodcouncil, City Deal, Boeren voor Buren (Farmers for Neighbours)
Scale	City, hospitality, public institutions, municipal property, workplace, stations, social initiatives
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	

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[22] 7_vrm23_199_uitvoeringsplan_voedselstrategie_a4_liggend_1 (6).pdf

Co-benefits	Increased food security Improved health Improved animal welfare Sustainable food production Food safety Stimulating local food production Reduced food transport Reduction in waste and waste transport
Policy document	Food strategy implementation plan

Actions for Short Chains and Urban Farming

Action	Description	Levers of Change
Increasing awareness and impact of urban farming	Increasing awareness and impact of urban farming in Amsterdam and the number of people participating in urban farming.	Social innovations Democratisation and participation Learning and capabilities
Organising Urban Farming Day	Organising Amsterdam Urban Farming Day together with Stichting Stadslandbouw Amsterdam.	Social innovations Democratisation and participation Learning and capabilities
Urban Farming Academy	Urban Farming Academy in collaboration with local parties in Amsterdam Zuidoost and Wageningen University & Research (WUR)	Social innovations Democratisation and participation Learning and capabilities
Developing framework for urban farming	Developing framework for urban farming together with Stichting Stadslandbouw Amsterdam.	Governance innovations & Policy Research/Monitoring Learning and capabilities
Drawing up research agenda	Drawing up research agenda for existing initiatives, substantiation of expanding number and m2	Research/Monitoring
Food system rollout strategy MRA	Drawing up robust roll-out strategy for a regional, regenerative food system in the MRA set up by Amped/Local 2 Local in a coalition of parties from city and country.	Governance innovations & Policy Social innovations Democratisation and participation Learning and capabilities
Organising new marketplaces	Organising new marketplaces in collaboration with local parties, MRA FoodCouncil and MRA regional food system rollout strategy.	Social innovations Democratisation and participation Learning and capabilities
Sharing success and failure factors for regional production	Sharing success and failure factors of existing regional production initiatives within City Deal collaboration	Governance innovations & Policy Learning and capabilities
Revitalising collaboration Boeren voor Buren (Farmers for Neighbours).	Revitalising collaboration Boeren voor Buren (Farmers for Neighbours).	Governance innovations & Policy Social innovations Democratisation and participation Learning and capabilities
Reflective monitoring	Setting up reflective monitoring with Directie Data and VU (FoodCLIC): Co-design of indicators with stakeholders.	Research/Monitoring
Artis master plan - Food boulevard	Artis and surroundings master plan: research into realising a Food Boulevard at the Sarphatikant with a restaurant that will process cultivated food. The restaurant will be publicly accessible and the Salmhuisjes will provide space for	Social innovations Research/Monitoring Democratisation and participation Learning and capabilities

	education and storage of grown produce.	
Lobby for Healthy Food Environment	Collaboration and lobby for national laws and regulations for healthy food environment: price, location, product, promotion. More specifically: reducing fruit and vegetable tax, increasing sugar tax.	Governance innovations & Policy Social innovations Democratisation and participation
Developing annual calendar	Developing annual calendar in collaboration with networks, both urban and regional, and asking where there is a need. For co-creation, we design an annual cycle of meetings. This is linked to monitoring and impulse scheme in which initiatives participate.	Governance innovations & Policy Social innovations Research/Monitoring Democratisation and participation
Strategic Communication plan	Drafting and implementing strategic communication plan.	Social innovations Research/Monitoring Learning and capabilities
Academic Workshop Food	Academic Workshop Food City of Amsterdam + knowledge institutes, 4 x per year for knowledge enhancement and discussion	Research/Monitoring Learning and capabilities
Edible greenery in design	Incorporating edible greenery into the design of parks and public gardens, e.g. fruit trees and shrubs	Social innovations Technology and Infrastructure Democratisation and participation
Quartermaster Food Hubs	Quartermaster food hubs – schedule of requirements for food hubs.	Governance innovations & Policy
Exploring Milan Foodhubs	Exploring whether the Milan Foodhubs example could be emulated in Amsterdam. Exploring social and logistics food hubs.	Research/Monitoring
AMS Project: True Cost Accounting SFSC	Determining actual costs of urban food supply, incl. short chains, incorporating environmental costs	Governance Innovation/Policy Research/Monitoring

B-2.5 Fair and Social Food

Producing, preparing and consuming food defines who we are as individuals and as a community. The city's tastes, like its cultures, are diverse and large in number. Our goal is to make healthy, fair, sustainable and affordable food available to all and to transform existing food aid to increase food security. To do so, we will join local, area-based cooperation and will support existing initiatives, such as the food circle in Noord.

In Amsterdam, the food supply is largely unhealthy. An unhealthy food environment is linked to unhealthy food consumption and several negative health outcomes, such as obesity. The supply of healthy and unhealthy food also differs between neighbourhoods where proportionally many or few low-income people live. At the same time, being able to afford healthy food is not as obvious for every Amsterdam resident. This contributes to health inequalities in the city[23]. In 2040, the food environment is designed to protect against unhealthy food choice behaviour and encourage healthy food choice behaviour[24]

The City of Amsterdam wants to move away from a focus on individual sustainability and focus more on the broader system. Why are unsustainable and unhealthy food choices currently so easy, quick and cheap? How do food routines and the food environment play into the choices people make? And how can these domains be designed in a way that actually makes it easier to make healthy and sustainable choices, for everyone and everywhere?

A rule of thumb for Amsterdam is that transitions should be equitable and inclusive according to the principle of broad prosperity. Doughnut thinking argues sustainability goes hand in hand with social justice.

It is noted that marginalised groups often have less access to healthy and sustainable food. To counter this inequality, the municipality is committed to improving accessibility to plant-based and sustainable food for all sections of the population. By ensuring that healthy and sustainable food choices are accessible to everyone, regardless of income or background, Amsterdam aims to prevent the food transition from being reserved only for a certain group. The ultimate goal is a just food transition in which no one is disadvantaged or excluded. And we don't do it alone. There are numerous examples of initiatives and developments that are moving with this transition. This is also already happening from within society:

For instance, there is a clear trend of offering more vegetarian options in public places such as museums and zoos. By making plant-based options available everywhere, including in places accessible to everyone, the municipality hopes to make the protein transition more inclusive. Also in the news recently was that Jumbo will stop offers on meat and that Albert Heijn will introduce CO_2 labels. Vegetable products are cheaper than animal varieties for the first time this year as the category becomes more diverse and there are more and more private labels. These kinds of developments push down the price.[25]

now		2040	2050

Unhealthy food supply in streetscape 80%

Unhealthy food supply in streetscape 55%

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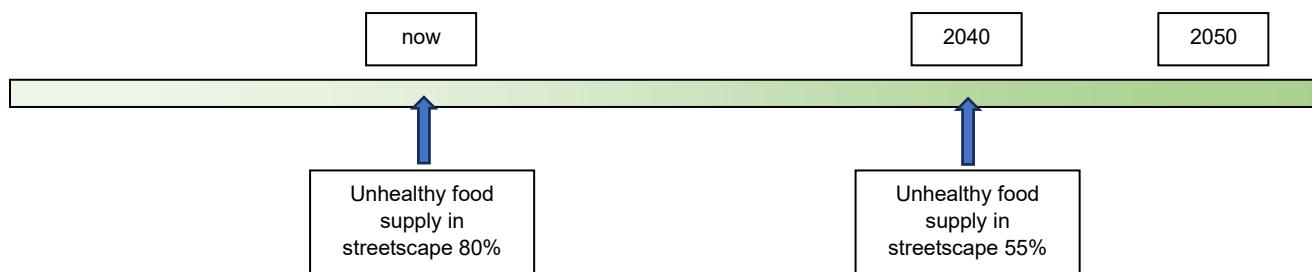
[23] Food environment - Introduction | Healthy Living Environment
[24] 7_vrm23_199_uitvoeringsplan_voedselstrategie_a4_liggend_1 (6).pdf
[25] Plant-based products cheaper than animal-based variants for the first time | Trouw

Impact pathway	Facilities encourage fair and sustainably produced, healthy offerings
Early results	By 2028, 80%-100% of the food supply from municipal policies (sporting events, canteens, social base, municipal procurement) meets the guideline for healthy and sustainable food environment by Voedingscentrum
Result	By 2040, unhealthy food in the streetscape (commercial food environment) is reduced to no more than 55% (current is 80%).
Actors involved	City of Amsterdam, neighbourhood kitchens, food circles, food banks, aid organisations, social organisations, local suppliers and producers, funds, impulse schemes, large employers, AmsterDoeners, collectives
Scale	City, food environment, hospitality, streetscape, events, canteens
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Improved health Improved animal welfare Sustainable food production Food safety Stimulating local food production
Policy document	Food strategy implementation plan

Actions for Fair and Social Food

Action	Description	Levers of Change
Facilitating neighbourhood kitchens and food circles	Supporting and facilitating neighbourhood kitchens/food circles and related kitchen gardens	Social innovations Democracy & Participation Funding and financing
Developing participation policy line	Developing policy line 'neighbourhoods for local food and against food waste', it is integral and participatory.	Governance innovations & Policy Social innovations Democracy & Participation
Agreements with Stadspas	Make agreements with the Stadspas scheme to support a fair price for healthy and sustainable food.	Social innovations Democracy & Participation
Agreements with social organisations	Make arrangements with food banks, Red Cross, Human Aid Now and other food bank-related social organisations. Linking with local suppliers and producers in the MRA.	Social innovations Democracy & Participation

Making a value case	Active cooperation with funds and impulse schemes in creating a value case	Social innovations Democracy & Participation Learning and capabilities
Community of Practice large employers	Joining Community of Practice of large employers in the field of procurement for catering and beverages	Social innovations Democracy & Participation Learning and capabilities
Roadmap alternative instruments	Drawing up a roadmap of alternative instruments that are successful, through participation Alliance 'food for the healthy generation'	Governance innovations & Policy Social innovations Learning and capabilities
Area-based approach Healthy Food Environment	Developing first area-based approach for healthy food environment in neighbourhood in together with initiatives and city districts	Governance innovations & Policy Social innovations Democratisation and participation Learning and capabilities
Supporting AmsterDoeners	Support AmsterDoeners in food (foodcommons) with knowledge, network and funding. Increasing AmsterDoen's share of the food ecosystem by making regulations and funding schemes accessible to collectives.	Social innovations Democratisation and participation Funding and financing Learning and capabilities
Organising incubator programme	Organising an incubator programme with three challenges each year. Promoting ecosystem for innovative food entrepreneurship, international exchange with other cities for trade, innovation and transition, access to talent and capital.	Social innovations Democratisation and participation Funding and financing Learning and capabilities
Strengthening local ecosystem	Strengthening the local ecosystem and making space in rules and policies: such as allowing collectives to access funding and tenders	Governance innovations & Policy Democratisation and participation Funding and financing Learning and capabilities
Monitoring added value	Monitoring and making added value measurable: financial, ecological, social.	Research/Monitoring

B-3 The transition to a Circular Economy

Sustainability is no longer an ambition; it is a dire necessity. In many countries around the world, climate change is already a matter of life and death – a humanitarian disaster that often affects those who have contributed least to its causes. The challenges do not stop at the climate. We, in the Netherlands have already consumed the whole years' worth of resources by April. In other words, if everyone on earth lived like a Dutch person, we would consume 3.6 earths this year, the Global Footprint Network calculated.

80% of the Amsterdam's CO_2 emissions are caused by material consumption. This CO_2 is not emitted IN our city, but BY Amsterdam residents. As a result, we have a major impact on communities across the border. For example, because of our meat consumption, rainforests are being cut down elsewhere in the world to produce cattle feed, and we increasingly see images of growing piles of discarded textiles and electronics in Ghana and Chile, for example. Also, some of the plastic waste we produce eventually ends up in the oceans.

The economy will have to be redesigned. The UN roadmap 'Turning off the tap' (May 2023) shows that much is already possible: with existing techniques, global plastic pollution could be reduced by 80% by 2040. Redesigning the economy offers a great opportunity to make it greener and fairer. We do this by helping precisely the most vulnerable people in our city and by taking responsibility for what happens in countries where our goods and raw materials come from.

That is why we facilitate, for example, textile entrepreneurs who ensure that less water is needed to make jeans, or who turn old clothes into new yarns. We are going to make it easier and cheaper to get appliances repaired so that fewer new raw materials need to be extracted. We provide more facilities to separate organic waste, so that less peat from sensitive areas is needed for compost production. Where 'linear incentives' are still present in economic policy, we will phase them out.

The transition to a circular economy is necessary and not optional. We no longer have time to put off difficult measures any longer. We need to accelerate the pace of implementation. The 'Circular Implementation Agenda 2023-2026' gives an overview of what the municipality is doing itself and what we are making available, so that as many parties as possible can contribute to the transition to a circular economy. This will become increasingly visible in the city in the coming years.

Doing what is possible now
The road to a circular economy is long and will sometimes be difficult. Gradually, we will overcome a lot of difficulties and resistances. We don't know everything yet either; experts are still going to carry out the necessary research and studies. But this should not be an excuse to delay action. We are not waiting for new laws and regulations from the central government or the European Union. We are going to do what is possible now. And at the same time, we continue to make proposals for further regulation by the central government.

In times of transition, the government must provide clarity about the future. The more clarity, the safer the investment climate. As circular norms and standards become more concrete in the coming years, Amsterdam will continue. With this implementation agenda, we want to send a strong signal that the municipality is an ally for all Amsterdam residents who want to help shape the circular economy.

The time to talk it all over again or wait for others is over. Only by doing it together are we going to get there. By doing, we inspire each other and generate more energy – energy to ensure that later generations still have a future.

Circular impact pathways
Following previous chapters on Amsterdam GHG emissions, the policy framework and systemic barriers and opportunities, we hereby present the impact pathways we (will) take for the circular transition. Associated actions are then elaborated and we will reflect on the early outcomes (1-2 years) and results (from 2030 onwards) of the actions and who the stakeholders are. We indicate which levers of change are used to bring about change. To the extent known, for each action, we show the expected impact in ktonnes of CO_2 by 2030 and how much renewable energy will be generated. If it is

an indirect action, we show the indirect impact and/or co-benefits of the action. Finally, we provide a cost indication per action.

We distinguish between the following circular impact pathways:
        B-3.1 Together with the city
                B-3.1.1 Entrepreneurs/SME
                B-3.1.2 Social and resident initiatives
                B-3.1.3 Port and industry
        B-3.2 Accelerating circular value chains
                B-3.2.1 Value chain Food and organic waste streams [together with green and healthy]
                B-3.2.2 Value chain Consumer goods
                B-3.2.3 Value chain Built environment
                B-3.2.4 Working on preconditions
        B-3.3 Waste-free city

For many actions within the circular pathways, not enough is yet known about direct GHG emissions and potential reductions. Many actions have an indirect impact and contribute to co-benefits. In the box below on the Circular Monitor, we explain that we have been monitoring since 2019 and in what way.

Circular Monitor
The circular economy touches on almost everything, and there are few central data sources for the topic. Over the past year, the municipality has established collaborations with CBS, TNO and PBL, among others. These collaborations led to the development of several new data models and datasets in 2021. The models the city is developing will be deployable for every municipality and province in the Netherlands. This will make it easier to understand material flows at regional level. Here we describe the resulting datasets. For now, these are mainly two: a dataset of regional material flows developed by the Central Bureau of Statistics (CBS) and a dataset from the National Waste Reporting Point (LMA). In the 09 we describe what these sources consist of, how they were created, what assumptions and decisions we made, and how reliable the data is.

B-3.1 Together with the city

The transition to a circular economy requires frontrunners and ambassadors. Many of these people can be found in SMEs and social initiatives. To support them, the municipality will remove barriers and provide opportunities. Ultimately, everyone has to join the transition. Many companies and institutions realise this, and want to, but do not yet know how. The municipality also wants to provide this group with action perspectives and support.

B-3.1.1 Enabling entrepreneurs/SMEs to work circularly

When entrepreneurs, for-profit or not-for-profit, have circular ambitions, they have a lot to overcome; after all, the economy is still predominantly linear. Amsterdam is developing solutions together with entrepreneurs and industry associations to address challenges and provide solutions to various barriers and bottlenecks.

Examples include:

- unfamiliarity with legal, tax and technical solutions;
- insufficient connection to a relevant network of circular companies;
- insufficient organisation of the chain (suppliers, logistics parties, retail, et cetera);
- lack of affordable physical space;
- uneven playing field, with conventional companies not including many shadow costs in their price, making it harder for circular companies to compete;
- insufficient power due to grid congestion, which will limit the establishment or expansion of businesses in Amsterdam in the coming years.

Impact pathway	Enabling entrepreneurs/SMEs to work circularly
Early results (1-2 years)	We enable parties in the city to work circularly. One way we do this is by offering support schemes for entrepreneurs/SMEs.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050.
Actors involved	City of Amsterdam, event organisations, entrepreneurs, textile entrepreneurs, electronics shops, entrepreneur collectives, BIZs, frontrunners and ambassadors, recycling companies, repair studios, sustainable waste processing companies, suppliers, customers, property owners, Green Hotel Club, hotels, job seekers, schools, knowledge institutions, other governments, NZKG, ORAM, network operators, Water Board AVG, industry
Scale	City level, from individual entrepreneurs to chains
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	The total municipal cost of Together with the city for the period 2023-2026 is: €14,325,000. Of this, €6,700,000 has been reserved for the actions under Entrepreneurs/SMEs.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Entrepreneurs/SMEs

Actions	Short Description	Levers of change
The innovation relay with events	The innovation relay with events	Social innovations Research/Monitoring Democratisation and participation
Showcasing circular solutions	In 2025, when Amsterdam celebrates its 750th anniversary, the city is going to ensure that events are showcases where all available circular solutions are visible, from fully reused tableware to zero-emission energy.	Social innovations Democratisation and participation
Tailored advice for 100 entrepreneurs	Beginning in 2024, Amsterdam will hire (external) capacity to provide tailored advice to around 100 entrepreneurs each year that will help them take steps towards more circular business.	Social innovations Democratisation and participation
Facilitating frontrunners in textile and appliances	From 2024, we will facilitate two collectives of entrepreneurs every year in developing frontrunner groups in textiles and appliances.	Social innovations Democratisation and participation

Removing barriers and providing opportunities for frontrunners and ambassadors	The transition to a circular economy requires frontrunners and ambassadors. To support them, the municipality will remove barriers and provide opportunities.	Social innovations Democratisation and participation Funding and financing
Creating physical and environmental space for circular initiatives	The municipality will ensure that physical space is made available for target groups such as thrift shops, repair and sustainable processing businesses that can be given (temporary) leases on a priority basis. For example, to achieve the desired retail diversity. To this end, the municipality will purchase, (temporarily) lease or develop properties (or have them developed) wherever possible, such as in transformation areas	Governance innovations & Policy Social innovations Technology and Infrastructure Democratisation and participation
Looking for circular business models	Looking for new circular revenue models (from products to services, paying for use instead of ownership, sharing economy, true price, et cetera)	Social innovations Research/Monitoring Democratisation and participation Funding and financing
Resources for business case development	Providing resources and knowledge to develop business cases, including alternative ways of including value and (environmental) costs such as true pricing	Social innovations Democratisation and participation Funding and financing Learning and capabilities
Finding action perspectives for entrepreneurs	Gaining insight into material flows and finding action perspectives for entrepreneurs	Social innovations Research/Monitoring Technology and Infrastructure Democratisation and participation
Offering action perspectives to companies and institutions that do not yet know how	Ultimately, everyone has to join the transition. Many companies and institutions realise this, and want to, but do not yet know how. The municipality also wants to provide this group with action perspectives and support.	Social innovations Democratisation and participation Funding and financing
Creating a level playing field	Lobbying towards central government/EU to create a level playing field for circular entrepreneurs.	Lobby
Making support available to entrepreneurs	Making support available to entrepreneurs, together with entrepreneurs, industry associations and other relevant parties. We will look closely at existing activities and schemes, such as also from the province of Noord-Holland, to match them, reinforce them or supplement them where necessary.	Social innovations Democratisation and participation Funding and financing
Making hotels more sustainable	Making the catering, linen use, energy and water of Amsterdam's 88,000-plus hotel beds more sustainable. By 2022, the cooperation between the hotels will have grown into an independent Green Hotel Club foundation.	Social innovations Democratisation and participation Funding and financing
Stimulating ecosystems for innovation	Actively connecting organisations	Social innovations Democratisation and participation

Creating circular jobs	Creating circular jobs through bringing together entrepreneurs and jobseekers in the Baan met Toekomst (Job with a Future) programme.	Social innovations Democratisation and participation Learning and capabilities
Low-threshold knowledge European circular legislation	Ensuring that relevant, practical knowledge in the field of (future) European regulations on circularity becomes readily available to the business community	Social innovations Democratisation and participation Learning and capabilities
Scaling up knowledge to entrepreneurial collectives	Based on the experiences, a toolkit and workshops will be developed for scaling up to entrepreneurial collectives in the rest of the city.	Social innovations Democratisation and participation Learning and capabilities

B-3.1.2 Social and resident initiatives

Together with 918,000 Amsterdam residents
The city's circularity is the sum of everyday choices, such as how we live and work. That is why the involvement of our city's more than 918,000 residents is key in shaping the transition to a circular Amsterdam. In this implementation agenda, we make room in the coming years to experience together what an alternative, circular future looks like. We enable initiatives by social organisations and residents to flourish. We do this not only because these initiatives add value, but also to learn where the greatest needs and opportunities lie. We are already having that conversation on a daily basis through numerous contacts the municipality has with Amsterdam residents, and this will intensify through the citizens' council on waste, the innovation relay with events and when developing the support schemes announced in this implementation agenda.

Social organisations and motivated Amsterdam residents are important ambassadors. They make the transition to a circular economy concrete and visible. This can be on the street or in debate centres, but also at a chance meeting in a thrift shop, a self-sufficient community centre or car sharing. They are often not yet sufficiently appreciated, especially when it comes to social significance, which is difficult to quantify. An assessment framework is therefore being developed that also includes the social and societal impact of initiatives in the city.

The Amsterdam Doughnut Coalition
The Amsterdam Doughnut Coalition is a network of people and organisations enthusiastic about the doughnut economy and working together to put it into practice. The Amsterdam Doughnut Coalition raises the visibility of initiatives, organising an annual Doughnut Festival and connecting with similar organisations elsewhere in the world. Amsterdam participates in and supports the Amsterdam Doughnut Coalition together with the Amsterdam University of Applied Sciences and employment agency Olympia, among others. Through participation, the municipality learns what transformative actions and support are needed for initiatives to flourish.

Impact pathway	Social and resident initiatives
Early results (1-2 years)	We enable parties in the city to work circularly. One way we do this is by offering support schemes for social and resident initiatives.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050.
Actors involved	City of Amsterdam, social initiatives, collective activities, neighbourhood initiatives, frontrunners and ambassadors, schools, knowledge institutions, other authorities, job seekers
Scale	City level, from neighbourhood initiative to collaborations with schools.

Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	The total municipal cost of Together with the city for the period 2023-2026 is: €14,325,000. Of this, €5,125,000 has been reserved for the actions under Social and resident initiatives.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Social and resident initiatives

Actions	Short Description	Levers of change
Strengthening support offer for social initiatives at neighbourhood level	We strengthen, in consultation, the support offer to social initiatives and collective activities that enable the circular economy at the neighbourhood level.	Social innovations Democratisation and participation Funding and financing
Elaborating concept of broad welfare	The connection between all these social and ecological aspects will be visualised through the elaboration of the concept of 'broad prosperity', the first results of which were presented to the City Council in mid-2024.	Governance innovations & Policy Social innovations Research/Monitoring Democratisation and participation
Supporting residents	Amsterdam supports residents and social initiatives, with knowledge, contacts and resources, and makes an effort to make suitable space available.	Social innovations Democratisation and participation Learning and capabilities
Collection campaigns with schools	Periodically organise collection campaigns with schools for textiles or e-waste (electrical and electronic appliances, of which some 17,840 were collected in 2022).	Social innovations Democratisation and participation Learning and capabilities
Teaching packages on waste separation	For example, we offer teaching packages on waste separation in areas where we will install new collection containers for organic waste.	Social innovations Democratisation and participation Learning and capabilities
Assessment framework impact social and community initiatives	Working on an assessment framework that also includes the social and societal impact of initiatives in the city.	Governance innovations & Policy Social innovations Democratisation and participation

B-3.1.3 Circular Port and Industry

The port area is fundamental to realising the circular ambitions of the city and region. The presence of port logistics, the possibilities for storage and transhipment, the concentration of raw materials and residual flows make the port the place where space and scale can be made available for innovations and industrial activities. The port provides more opportunities for high-quality processing of flows by facilitating companies working on mechanical and chemical recycling.

The municipality and the Port of Amsterdam aim to further build the circular industrial ecosystem in the coming years. That is why we are stepping up this collaboration.

Impact pathway	Circular Port and Industry
Early results (1-2 years)	We enable parties in the city to work circularly. One way we do this is by offering support schemes for port and industry.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050.
Actors involved	City of Amsterdam, entrepreneurs, entrepreneur collectives, biz's, frontrunners and ambassadors, sustainable waste processing companies, suppliers, property owners, knowledge institutions, other governments, port, NZKG, ORAM, grid operators, Water Board AVG, industry.
Scale	Port and industry
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	The total municipal cost of Together with the city for the period 2023-2026 is: €14,325,000. Of this, €2,500,000 has been reserved for the actions under Port and Industry.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Port and Industry

Actions	Short Description	Levers of change
Individual scheme for circular work in the port	Amsterdam is going to make it easier for entrepreneurs in the city and port to work in a circular way. There will be a scheme for individual support.	Social innovations Democratisation and participation Funding and financing
Scheme for strengthening networking and connecting organisations in the port	Amsterdam is going to make it easier for entrepreneurs in the city and port to work in a circular way. There will be a scheme to strengthen networking and connect organisations.	Social innovations Democratisation and participation Funding and financing Learning and capabilities
Scheme to ensure more physical and environmental space in the port	Amsterdam is going to make it easier for entrepreneurs in the city and port to work in a circular way. There will be a scheme for ensuring more physical and environmental space	Social innovations Technology and Infrastructure Funding and financing
Adapting laws and regulations to remove barriers to circularity	Amsterdam is adapting regulations and policies to remove barriers to circularity where possible, including adjustments to and better support for licensing.	Governance innovations & Policy
Making trade chains transparent and traceable	We work with the Port Authority around socially responsible trade chains. We build on the Port Authority's efforts to make trade chains transparent and traceable. The Port Authority makes agreements on this with entrepreneurs setting up in the port area.	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Circular advisory processes at the port	We offer assistance to (SMEs) in the port area with circular advisory processes and finding financing opportunities.	Social innovations Democratisation and participation Funding and financing
Lobbying for level playing field	Towards higher authorities, such as the central government and the European Union, we lobby for a level playing field.	Lobby
Port policy development	Participating in NOVEX approach NZKG and the topic of space is explicitly included in the development of the new policy Environmental Safety and the Port Area Vision.	Governance innovations & Policy
Active shareholdership port	On the basis of our shareholdership, we specify which frameworks and direction the municipality can give the Port Authority in this transition.	Governance innovations & Policy
Recalibration of strategic plan for port	Recalibration of the Port Authority's 2025 – 2030 strategic plan	Governance innovations & Policy
Importance of circular economy for grid connection	Together with the Port Authority and ORAM, we bring the importance of the circular economy to the public discussions on infrastructure investment and prioritisation in grid connection and expansion.	Social innovations Technology and Infrastructure Democratisation and participation

Making wastewater suitable for industrial application	The AGV Water Board and the City of Amsterdam will work with industry and the Port Authority in the port to make wastewater (effluent) suitable for industrial application by 2025.	Social innovations Technology and Infrastructure
No more groundwater pumping for industry	We ensure that the industry can start using cleaned wastewater, eliminating the need for them to pump groundwater.	Social innovations Technology and Infrastructure

B-3.2 Accelerating circular value chains

The key value chains in which the municipality can make a difference are:

- Food and organic waste streams, where about half of all ecological impacts are caused;
- Consumer goods, which have the biggest impact after the food chain;
- The built environment, on which the municipality has a lot of influence.

These value chains involve a lot of volume. They have strong economic significance for the city and a solid environmental and climate impact. In the latest publication of the Circular Economy Monitor, released annually by the municipality, we see that these three value chains have the largest share in terms of environmental impact. Furthermore, they are areas with opportunities for the municipality to influence

Figure 12: Environmental costs of Amsterdam material consumption

B-3.2.1 Food and organic waste streams

Our food has an impact (environmental cost indicator, EQI) of €1 billion a year on nature, people and climate. This is the biggest loss at almost 20% of the city's total impact. There are a number of reasons for this:

- the food system is designed so that raw materials are used only once in linear chains;
- about a third of food is wasted;
- organic waste streams (GFT) are still largely incinerated in Amsterdam, losing valuable nutrients.

This calls for strong intervention. Therefore, the municipal food strategy will be updated in 2023, in which actions will be implemented together with social organisations and knowledge institutions to ensure more choice in the supply of healthy, fair, and sustainable food for all Amsterdam residents. Amsterdam wants to ensure that healthy food is offered in more places in the city, that food waste is reduced, that more local food chains are created, that a more plant-based diet is encouraged and that the municipality sets a good example by doing as much plant-based catering as much as possible.

The previous chapter, B-2 The Food Transition, discussed these themes in detail. Within The transition to a Circular Economy, one part of the programme will include 'food waste and organic waste streams' and implement actions that contribute to 'closing' the organic cycle, in which we waste less and valuable nutrients from the city find their way back to the soil.

Impact pathway	Food and organic waste streams
Early results (1-2 years)	We enable parties in the city to work circularly. We do this by focusing on key value chains where the municipality can make a difference, including food and organic residue streams.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050. We will reduce food waste by 50% by 2030 compared to 2015. In addition, we ensure that waste is treated with the highest possible quality. We want to connect 75% of Amsterdam households to separate collection of kitchen and garden waste by 2030.
Actors involved	City of Amsterdam, the Samen Tegen Voedselverspilling foundation, Voedingscentrum, food banks, shops, restaurants, social initiatives, consumers, businesses, hospitality, retail, distribution centres, neighbourhood initiatives, worm hotels and Afval naar Oogst, (neighbourhood) initiatives and local entrepreneurs, gas producers, waste processing companies, AGV Water Board, Waternet.
Scale	City level, from neighbourhood initiative to collaborations with schools.
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	?
Energy consumption avoided or replaced	?
CO2e emissions by emission sector	?
Offset CO2e emissions (biologically or technologically fixed)	?
Total cost and cost per tonne of CO2e	The total municipal cost of Accelerating circular value chains and preconditions for the period 2023-2026 is: €3,175,000. Of this, €1,220,000 has been reserved for the actions under Food and organic waste streams.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Food and organic waste streams

Action	Short description	Levers of change
'Saving' food	'Saving' more food by connecting more shops, restaurants and other partners to Food Banks and social initiatives.	Social innovations Democratisation and participation
Thinking together about how to prevent food waste	Working with consumers and businesses to figure out what we can do together to prevent food waste.	Social innovations Research/Monitoring Democratisation and participation
Legal measures against waste	Amsterdam is preparing legal measures to oblige businesses (hospitality, retail, distribution centres) to more actively combat waste.	Governance innovations & Policy
Food Waste Action Plan 2024	In 2024, Amsterdam will write a Food Waste Action Plan to ensure less food is wasted and more reaches places like food banks.	Governance innovations & Policy Social innovations Funding and financing Learning and capabilities
Research on processing methods	Because in agriculture, the use of compost and fertilisers from the city is often still prohibited, we will figure out what is legally possible. We do this together with national parties developing new, food-safe processing methods.	Governance innovations & Policy Research/Monitoring
Facilities to separate organic waste	We provide more facilities to separate organic waste, so that less peat from sensitive areas is needed for compost production	Technology and Infrastructure
Using organic waste for compost or green gas	Amsterdam will ensure more organic waste is used for compost or green gas production.	Technology and Infrastructure
Supporting initiatives to bring nutrients back into the chain	Amsterdam supports initiatives by, for example, the Amstel, Gooi en Vecht Water Board (AGV) to extract more nutrients from wastewater and return them to the chain.	Governance innovations & Policy Funding and financing
Circular Water Chain Roadmap	Until 2026, the AGV Water Board and the City of Amsterdam are drawing up a Circular Water Chain Roadmap on how the water chain can become 50% circular by 2030 and 100% circular by 2050.	Governance innovations & Policy
AMS Project: Circular Urban Food Production, safe by design	Developing methods for safe production/cultivation of crops with organic waste as a source of nutrients.	Technology and Infrastructure Learning and capabilities

B-3.2.2 Consumer goods

Of the things we use, textiles and electrical appliances in particular have a major impact on people, nature and the climate. In addition to mattresses, furniture should also be mentioned here, as it makes up at least half of Amsterdam's bulky waste. The 2023 Intergovernmental Panel on Climate Change (IPCC) report shows that 40-70% of CO2 emissions can be reduced by changing people's behaviour. With low engagement, it appears that emotional impulses (easy, attractive) drive (buying) behaviour. Advertising around us encourages us to consume. Buying new stuff tends to take less time, money and effort than getting a product repaired. As a municipality, we will have to consider what we can change in the city to encourage more circular behaviour.

Impact pathway	Consumer goods
Early results (1-2 years)	We enable parties in the city to work circularly. We do this by focusing on key value chains where the municipality can make a difference, including consumer goods such as textile, electronics and furniture.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050. By 2030, we will have reduced the environmental impact of textiles, electronics and furniture. We ensure that waste is treated with the highest possible quality.
Actors involved	City of Amsterdam, entrepreneurs in packaging industry, mattress manufacturers, logistics parties, CircuLaw, electronics shops, textile entrepreneurs, wood industry, frontrunners in the events sector and the hospitality industry, Second-hand shops, Rental shops, Stadspas organisation, Baby stores, Repair workshops, Electronics shops, Tableware entrepreneurs, manufacturers and other chain partners, other authorities, MRA.
Scale	From city-level entrepreneurs to chain partners
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	?
Energy consumption avoided or replaced	?
CO2e emissions by emission sector	?
Offset CO2e emissions (biologically or technologically fixed)	?
Total cost and cost per tonne of CO2e	The total municipal cost of Accelerating circular value chains and preconditions for the period 2023-2026 is: €3,175,000. Of this, €150,000 has been reserved for the actions under Consumer goods.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Consumer goods

Action	Short description	Levers of change
Space for circular entrepreneurs	Ensuring that circular entrepreneurs are given more space to offer services such as repair and sharing of consumer goods, for example by developing a circular craft centre	Governance innovations & Policy Technology and Infrastructure
Entrepreneurs provide information	Encouraging entrepreneurs to educate on the impact of their products and how to extend their lifespan	Social innovations Learning and capabilities
Research into limiting advertising of 'harmful' products	Exploring restrictions on advertising of 'harmful' products in public spaces, as is also being prepared in Haarlem	Research/Monitoring Governance innovations & Policy Social innovations
Transparency in the chain	More transparency in the supply chain: where do raw materials come from, where do discarded textiles go and what waste and environmental impacts are created in the process worldwide	Research/Monitoring Technology and Infrastructure
Experimenting with reusable tableware	Amsterdam is looking for entrepreneurs willing to experiment with reusable tableware instead of single-use tableware.	Social innovations Research/Monitoring Democratisation and participation

Reuse of old clothing	We facilitate textile entrepreneurs or who turn old clothes into new yarns	Governance innovations & Policy Social innovations Funding and financing
Facilitating device repairs	We are going to make it easier and cheaper to get appliances repaired so that fewer new raw materials need to be extracted	Governance innovations & Policy Social innovations Technology and Infrastructure Funding and financing
Space for sharing economy	Amsterdam is creating more space and opportunity for the sharing economy, repair, second-hand sales and rentals	Governance innovations & Policy Technology and Infrastructure
Strengthening network of circular textiles	Amsterdam prioritises strengthening the network of circular textile companies	Social innovations Democratisation and participation
Expanding Stadspas discount for repair of electrical appliances	Amsterdam will expand the Stadspas discount for clothing repair to include at least electrical appliance repair	Governance innovations & Policy Social innovations Funding and financing
Chain collaboration textile	Chain collaboration textile	Social innovations Technology and Infrastructure Democratisation and participation
Green Deal circular textiles	Green Deal circular textiles	Governance innovations & Policy Social innovations Democratisation and participation
Lobbying for industrial scale	Creating industrial scale through lobbying with other governments	Governance innovations & Policy Democratisation and participation Lobby
Stimulating circular textile chain formation	Use our own statutory duty by making maximum use of processing contracts of collected textiles to promote circular chain formation in consultation with producers and other chain partners	Governance innovations & Policy Democratisation and participation
Discount on clothing repair	Stadspas discount on clothing repair: 90% discount	Governance innovations & Policy Social innovations Democratisation and participation Funding and financing
Discount on appliances	Stadspas discount on appliances	Governance innovations & Policy Social innovations Democratisation and participation Funding and financing
Discount on washable diapers	Stadspas discount on purchase and/or rental of washable diapers	Governance innovations & Policy Social innovations Democratisation and participation Funding and financing
Reducing non-plastic disposable packaging with frontrunners	Conducting pilot projects with frontrunners in the events industry and the hospitality sector to reduce non-plastic disposable packaging too	Research/Monitoring Democratisation and participation Learning and capabilities
Research on laws and regulations to reduce single-use non-plastic packaging	Investigate which laws and regulations can be used to be more coercive in this regard	Governance innovations & Policy Research/Monitoring
Agreements on return logistics and mandatory product take-back packaging industry and mattress manufacturers	Amsterdam will agree with the packaging industry and mattress manufacturers on return logistics and mandatory take-back of products, and explore what accelerating role the municipality can play in this.	Governance innovations & Policy Social innovations Research/Monitoring Democratisation and participation
Research on circular return logistics	Making return logistics as circular as possible in other sectors is being explored	Governance innovations & Policy Research/Monitoring

Scheme for recycling companies to encourage reuse	In 2024, we will come up with a new scheme for recycling companies with a social label to encourage reuse	Governance innovations & Policy Funding and financing
Stimulating repair	Amsterdam is going to create more opportunities in the city. We provide a guide on how to repair things yourself and where to get things repaired	Social innovations Technology and Infrastructure Democratisation and participation
Research on reducing electronic waste	We also like to prevent electronic waste in other ways. We will explore opportunities for this, for example through CircuLaw	Social innovations Research/Monitoring
Circular solar panels and wind turbine blades	Participating in national working groups organised under the NPCE to ensure that production of solar panels and wind turbine blades becomes circular and that reuse or recovery of materials improves.	Governance innovations & Policy Democratisation and participation
Facilitating less water use by textile entrepreneurs	We facilitate textile entrepreneurs who ensure that less water is needed to make jeans	Governance innovations & Policy Social innovations Funding and financing
AMS Project: ShaRepair	Co-creation of repair networks in cities to extend life of electronic devices	Social innovations Research/Monitoring Democratisation and participation
AMS Project: FAIR-PV	Development of fully repairable solar panels and digital tools to extend life of solar PV systems	Technology and Infrastructure
AMS project: Circular Resource Planning for IT	Development of dynamic product passport for life extension and circular procurement of IT hardware	Technology and Infrastructure

B-3.2.3 Built environment

Amsterdam is a compact city. When many people live relatively close together, there are usually environmental benefits: commuting is usually limited, public transport is an attractive option, and with a smaller living area - in Amsterdam about 12m2 below the Dutch average - residents have less space to heat. A number of measures from the Amsterdam Approach to Public Housing are also helping to make more efficient use of the existing housing stock. For instance, we create more living spaces in the existing housing stock by making it easier to live together in non-traditional ways and we counter vacancy through the Vacancy Ordinance.

At the same time, there is a lot of construction activity in absolute terms and a lot of maintenance and renovation of existing housing is taking place. As a result, construction accounts for about 60% of all material use in the city in terms of raw weight. The municipality has great influence in this value chain, not least because the city owns about 80% of the land. Amsterdam is working to further reduce the impact of the built environment, with the municipality working with the market on innovation to balance its circular ambition with maintaining housing production.

Impact pathway	Built environment
Early results (1-2 years)	We enable parties in the city to work circularly. We do this by focusing on key value chains where the municipality can make a difference, including the built environment. From 2022, all new designs for area developments (including transformation) and public spaces in Amsterdam will be based on circular criteria. From 2023, the municipality of Amsterdam will use circular and social criteria when working on buildings and in public spaces. 20% of new residential buildings will have wooden or bio-based main load-bearing structures by 2025.

Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050. From 2030, 50% of renovations will be carried out according to circular principles. Amsterdam's public spaces are sustainably managed and are accessible, whole and safe for all users. We manage and maintain our pavements, street & play furniture and bus stations. We have achieved a 50% reduction in use of primary abiotic raw materials.
Actors involved	City of Amsterdam, homeowners, tenants, landlords, HOAs, housing corporations, other governments, entrepreneurs, construction companies, architects, MRA, wood industry, networks of organisations in construction and knowledge institutions, farmers, private owners.
Scale	City level, from new construction to renovation
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	The total municipal cost of Accelerating circular value chains and preconditions for the period 2023-2026 is: €3,175,000. Of this, €1,005,000 has been reserved for the actions under Built environment.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026 Insulation Offensive Implementation Plan 2024 – 2026

Actions for Built environment

Action	Short description	Levers of change
Reuse of public space materials	Amsterdam reuses existing material for the design of public spaces unless there is no other way.	Governance innovations & Policy Technology and Infrastructure
Reduction in use of primary raw materials	Jointly reducing the use of primary raw materials in the built environment. To this end, we deploy instruments at the city level, such as thematic studies, and at the area level we develop specific, achievable ambitions and instruments.	Governance innovations & Policy Democratisation and participation
Circular procurement of school buildings	Entering into framework contract for circular procurement of 30 new (school) buildings. Including for procurement, tendering and tenders for land allocation. This applies to all life phases: from new construction to management to the end of the functional life, unless this is not (entirely) possible.	Governance innovations & Policy Funding and financing
Using fewer new, non-renewable raw materials	Already using 50% less new, non-renewable raw materials by 2030 (nationally; national raw materials agreement).	Governance innovations & Policy

Stimulating use of bio-based building materials	Amsterdam stimulates the use of bio-based building materials to reduce the harmful impact of building material production.	Governance innovations & Policy Technology and Infrastructure Funding and financing
Circular procurement of artificial turf	Tendering for artificial turf is circular.	Governance innovations & Policy Social innovations Funding and financing
Renovations and management according to circular principles	From 2025, 50% of renovations and management in Amsterdam will be carried out according to circular principles in existing social and private housing, social real estate, schools, utility buildings and in public spaces (both above and below ground).	Governance innovations & Policy Technology and Infrastructure
Research on circular use of wood	Support for Project Circular Wood for the Neighbourhood. Researchers from the Digital Production Research Group at Amsterdam University of Applied Sciences have deployed robots in housing corporations renovation projects to make circular reuse of wood easier and more efficient.	Research/Monitoring Democratisation and participation Learning and capabilities
Expanding knowledge of bio-based building materials	We are expanding knowledge about the applicability of bio-based building materials, such as cellulose, flax and cattail.	Research/Monitoring Learning and capabilities
Scheme for bridging price gap for bio-based building materials	We are committed to getting a scheme available that can bridge the current price gap.	Funding and financing
Promoting market for bio-based building materials	We establish links between clients and suppliers of bio-based building materials to promote market development, making them more widely available at increasingly competitive prices.	Social innovations Funding and financing
Green Deal Wood Construction	Green Deal Wood Construction of the Amsterdam Metropolitan Region.	Governance innovations & Policy Democratisation and participation
Circular zoning tenders	In tenders of spatial plans, one of the ways we select based on circular performance is through the MPG selection criterion.	Governance innovations & Policy Funding and financing
Stimulating circularity in transformation projects	In transformation projects, we will encourage circularity in negotiations.	Governance innovations & Policy Funding and financing
Applying circular design principles	Amsterdam will ensure that circular design principles are applied in all urban plans and new designs for area developments (including transformation and public space).	Governance innovations & Policy Technology and Infrastructure
More production of bio-based building materials	Amsterdam will participate with the central government and the region to work with construction companies and farmers to produce more bio-based building materials as an incentive for circular construction.	Governance innovations & Policy Social innovations Technology and Infrastructure Democratisation and participation
Sharing experiences of circular procurement	The experience gained from this will be shared widely so that we can take it into account in other procurement processes for all the municipality's 'assets'.	Governance innovations & Policy Learning and capabilities

Use of renewable materials such as wood construction	Replacing fossil and mineral materials with renewable materials. For example, by having at least 20 percent of new buildings constructed in wood by 2025. Great existing examples are Juf Nienke in the Sluisbuurt, Geins in Zuidoost, HAUT in the Amstelkwartier, Poppies in Buiksloterham and Switi in Zuidoost.	Governance innovations & Policy Technology and Infrastructure
Evaluation of nature-inclusive construction	Evaluation of point system for Nature-inclusive Construction.	Governance innovations & Policy Research/Monitoring
Seeking funding for private circular insulation	We will help homeowners insulate in a circular way. The starting point is to find funding to make it cost-neutral for homeowners.	Governance innovations & Policy Social innovations Democratisation and participation Funding and financing
Insulation offensive	Insulation offensive (See also B-1.1 Built environment)	Governance innovations & Policy
AMS project: Bio-based cement recycling	Environmentally friendly method for high-quality low-emission recycling of cement for production of concrete elements.	Technology and Infrastructure Research/Monitoring
AMS project: Bio-based industrialised zero-emission modular high-rise buildings	Development of new normal for bio-based high-rise buildings.	Governance innovations & Policy; Technology and Infrastructure Research/Monitoring
AMS Project: Circular Collaboration	Exploring and testing new chain cooperation for reuse of building elements and solar panels.	Governance innovations & Policy; Technology and Infrastructure Research/Monitoring

B-3.2.4 Preconditions

The transition to a circular economy in Amsterdam requires a different way of organising and collaborating within the municipality. The circular economy breaks with existing structures and policy themes, creating barriers. Amsterdam's circular ambitions currently coexist with the usual way of working that is geared towards a linear economy. Removing those barriers requires a lot of work that is not immediately visible. Consider how the municipality can procure, tender, design, finance and manage circularly. Different requirements need to be set for model specifications, procurement criteria need to be redefined, (digital) standards set up, circular indicators monitored, legal barriers removed, et cetera. The municipality is cooperating intensively with organisations, companies, (European) governments and knowledge institutions, such as the Central Planning Bureau (CPB), PBL, CBS, TNO, universities and colleges.

Impact pathway	Preconditions
Early results (1-2 years)	We enable parties in the city to work circularly. We do this by focusing on key value chains where the municipality can make a difference. We are also working on preconditions. Amsterdam, together with other governments and knowledge institutes, is providing the preconditions for the necessary system change. From 2024, Amsterdam will make capacity and resources available to advise and help at least 100 entrepreneurs and/or initiatives annually to take the (first) steps towards more circular operations or business.
Later results (by 2030)	Circular development is something we do together. We are working together towards a 100% circular economy by 2050. We achieve system change towards a circular city.
Actors involved	City of Amsterdam, other authorities, knowledge institutions
Scale	City level
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	The total municipal cost of Value chains and preconditions for the period 2023-2026 is: €3,175,000. Of this, €700,000 has been reserved for the actions under Preconditions.
Co-benefits	Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026

Actions for Preconditions

Action	Short description	Levers of change
Unambiguous standards and definitions	We contribute to uniform (national) standards and definitions	Governance innovations & Policy Technology and Infrastructure
Applying material passports	We apply material passports	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Monitoring material flows	We monitor material flows in the city	Governance innovations & Policy Research/Monitoring
Adjusting financial rules for circular initiatives	We are working to adjust the rules that currently stand in the way of circular initiatives, such as applying true pricing in investment decisions and procurement	Governance innovations & Policy Funding and financing

Adjusting legal rules for circular initiatives	We are working to adjust the rules that currently stand in the way of circular initiatives, such as certain permitting criteria	Governance innovations & Policy Technology and Infrastructure
Removing 'linear incentives'	Where 'linear incentives' are still present in economic policy, we will phase them out	Governance innovations & Policy Funding and financing
Expanding monitoring	Together with national parties such as CBS and PBL, we are expanding monitoring so that locally, we are able to get a detailed picture of different chains and product groups of raw material flows within a nationally or internationally uniform structure	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Developing standards	Together with knowledge institutions, authorities and other pioneers, Amsterdam is contributing to the development of some of these standards, such as for the Circular Economy Monitor, materials passports for buildings and various procurement criteria	Governance innovations & Policy Social innovations Research/Monitoring Learning and capabilities
Contributing knowledge (platforms)	We maintain and contribute to knowledge (platforms) in the region, in the Netherlands and beyond where possible	Governance innovations & Policy Learning and capabilities
Organising additional funding	To pay for the transition, organising additional funding is essential. We are putting capacity into attracting additional resources from the central government and the European Union	Governance innovations & Policy Funding and financing
Formulating more enforceable policies	Several opportunities for formulating more enforceable policies will be formulated in the coming years	Governance innovations & Policy
Input on proposals for laws and regulations	We provide input on proposals from the EU and central government.	Governance innovations & Policy
Adapting zoning policies	Amsterdam will work with (inter)national partners to map the changing demand for space in order to adapt zoning policies accordingly	Governance innovations & Policy Social innovations Democratisation and participation
Building learning organisation	The circular economy demands that all municipal organisations change. Therefore, we are building a learning organisation, where new knowledge and experiences are recorded and shared. In the Amsterdam Circular Learning Community, connections are made and differences in knowledge, expertise, (business) language, culture, practices and interests are bridged	Governance innovations & Policy Social innovations Learning and capabilities
Inserting circular principles into policy	When policies are updated, circular principles are inserted into those policies	Governance innovations & Policy
Linking regional knowledge	We will link knowledge on the circular economy more closely to programmes around energy transition in a regional context to achieve more synergy	Governance innovations & Policy Learning and capabilities

AMS Project: Logistics in the circular economy living lab	Field labs in the city with circular logistics to improve reuse and high-value recycling	Governance Innovation & Policy Research/Monitoring Democratisation and participation

B-3.3 Waste-free city

Amsterdam wants to be a waste-free city, with clean streets and squares. A city where residents and entrepreneurs produce less waste and are able to easily offer their raw materials in the right way so that they can be processed in the highest quality possible. A city that makes collection and processing sustainable and innovative. A city that invests in prevention as well as enforcement. With logistics to match the growing and busy city.

Refuse	Make a product redundant by abandoning its function or by providing the same function in a different way.
Rethink	Make product use more intensive by using (sharing) the product with more people or by giving the product more functions.
Reduce	Increase the efficiency of the machines in the production process or use fewer raw materials for the same product.
Reuse	Reuse of discarded, functioning product in the same function by a different user.
Repair	Repair defective products so that the original function can be preserved.
Refurbish	Refurbish old products to bring them up to date.
Remanufacture	Reuse functioning components of the product to make comparable products.
Repurpose	Reuse the product or components thereof in a new product with a different function.
Recycle	Reuse the materials of the product for application in new products.
Recover	Incinerate the materials with energy recovery.

Figure 13 Circular processing ladder [26]

To be a circular city by 2050, we will have to 'close' resource cycles. Amsterdam's waste chain contributes to this objective by ensuring that waste prevention, and reuse and recycling of materials

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[26] Waste & Resources Implementation Programme 2020-2050

are made as efficient as possible. This will create better opportunities for high-value processing such as reuse, repurposing and recycling. These different approaches are part of the Circular Processing Ladder. Here, the higher up the ladder, the better the measure scores in terms of circularity.

Impact pathway	Waste-free city
Early results (1-2 years)	We clean public spaces (where it matters). We ensure that residents and businesses can dispose of their waste properly. We collect waste efficiently and sustainably. We support co-management and are committed to prevention. Amsterdam prevents (residual) waste. We will ensure a 30% reduction of plastic litter on land and in water by 2023.
Later results (by 2030)	Amsterdam is a clean city and a 100% waste-free city by 2050. By 2030, we will be a city without plastic pollution. We want to connect 75% of Amsterdam households to separate collection of kitchen and garden waste by 2030. We ensure that waste is treated with the highest possible quality.
Actors involved	City of Amsterdam, frontrunners in the events industry and the hospitality industry, biz Knowledge Mile, residents, businesses, waste processors, social initiatives, collective activities, neighbourhood initiatives, entrepreneurs, experts, civil servants, other authorities, hospitals, AVG Water Board, textile entrepreneurs
Scale	City level
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Satisfaction with quality of living environment Technological innovation Cost reduction for businesses and residents Local job creation Reduction in waste and waste transport Reduced damage costs Participation Social cohesion
Policy document(s)	Circular Implementation Agenda 2023-2026 and more Budget 2024 Our city of tomorrow Amsterdam Plastic Smart City Approach Inner City Implementation Programme 2025

Actions for Waste-free city

Action	Short description	Levers of change
Citizens' council on waste	Amsterdam will organise a citizens' council on the topic of waste in 2024, where residents and entrepreneurs will discuss the city's waste challenges with each other, experts and civil servants. The citizens' council will formulate proposals to be submitted to the City Council by the college.	Governance innovations & Policy Research/Monitoring Democratisation and participation
Waste prevention plan with entrepreneurs	A 'Waste Prevention Plan' will be drawn up in 2023. Together with entrepreneurs and business collectives, such as Business Investment Zones (BIZ), we will	Governance innovations & Policy Social innovations Democratisation and participation

	work on 'the front end' to reduce waste, for example by disincentivising the use of 'to go' packaging.	
Stopping disposable plastic via Plastic Smart City	Through the Plastic Smart City initiative, cafes and restaurants between Amstel Station and City Hall will stop using disposable plastic on their terraces.	Democratisation and participation
Stimulating reusable protective clothing in hospitals	Stimulating protective clothing in hospitals to be made of washable materials so that it is not discarded after one use.	Social innovations Democratisation and participation
Pilots for new waste collection methods	Several pilots with new collection methods for household waste, commercial waste and bulky waste in different neighbourhoods.	Governance innovations & Policy Technology and Infrastructure Learning and capabilities
Pilots for clean shopping areas	Several pilots for getting the core shopping area clean. In 2024, ongoing pilots from 2023 such as the Nieuwendijk Approach will be continued, and new ones will be started.	Governance innovations & Policy Technology and Infrastructure Learning and capabilities
AMS: Solving the Plastic Soup Project	Development of monitoring system plastic litter and circular business cases.	Research/Monitoring

B-4 The transition to a nature-friendly, climate-adaptive city

The balance between people, nature and animals is important for a liveable Amsterdam. That is why we are making the city nature-inclusive and climate-adaptive. There will be more high-quality green space and the city will become more resilient to climate change. We are also working on a future-proof water system and a new food strategy. This way, we look after the health, social well-being and water safety of Amsterdam residents and Amsterdam's urban nature.

B-4.1 Climate adaptation

Climate change globally represents one of the most pressing issues of our time. The effects of extreme weather events, rising sea levels and changing precipitation patterns are becoming increasingly tangible. Including here in Amsterdam, a city with a unique heritage and rich history, built on and by the water. We are at a tipping point. We must do all we can to prevent further climate change, while focusing on the consequences of climate change that is already underway. Sea levels are rising. Precipitation, heat and drought will become more extreme and these extremes will become more frequent. We have to prepare for that adamantly.[27]

Our city suffers during extreme heat, drought and downpours, with a major effect on daily life. During the heat wave, the heat map clearly showed that there was nowhere left in the city that was somewhat cool, where the stones held the heat for a long time. Residents suffer from that: heat causes health risks, especially for vulnerable residents. Drought causes damage to wooden foundations and greenery in the city. And we direly need that greenery to provide cooling. Subsequent downpours in turn caused water damage due to flooded streets and basements. We need to better adapt our environment, our city, to the changing weather. [28]

We are working hard on that. The city is being designed, developed and transformed in a climate-adaptive way. That means ensuring in public spaces that the effects of extreme drought, heat, flooding and precipitation are minimised. With the ultimate goal of being a climate-adaptive city by 2050, resilient to the effects of climate change. At the same time, we are making every effort to achieve climate *mitigation*; to fight climate change. This is also reflected in the other impact pathways of this climate contract.

The following impact pathways have been identified based on the policy. The impact pathways are the processes where we believe impact can be made. For climate adaptation, four impact pathways have been identified, the first three of which are described here. Number 4 belongs to the transition to a sustainable municipal organisation, which is treated as a separate strategic priority.

B-4.1.1 Rain and flood risk reduction

Rain showers can cause flooding. There is a lot of stone in the city, preventing rainwater from draining away. Flooding can cause damage to houses, basements and buildings. Too much water, for example, causes trees and plants in parks to die. It also worsens accessibility (e.g. of emergency services) and can cause failure of important functions such as power supply. The probability of extreme showers will double towards 2050. The city is not yet fully prepared for these extreme showers. These vulnerabilities will be addressed. For example, by increasing drainage (the sewer system), ensuring better infiltration thanks to the construction of more greenery and less stone or increasing temporary collection capacity, for example by constructing rainwater swales. Rainwater can be temporarily collected there if needed.

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[27] def_voortgangsrapportage_klimaatadaptatie_webversie (3).pdf
[28]

01927_klimaat_adaptatie_web (4).pdf

Rain is also a valuable resource. It is important that we use rainwater differently. In fact, rainwater is valuable. It is important that everyone in our area has just the right amount of water. Not too much, nor too little. During drought or, on the contrary, prolonged rain, we distribute water intelligently.

We make room for rainwater and give it a temporary place. Catch it during peak rains and use it in times of drought. This way, damage can be limited.

We also live in a densely populated area with lots of water, which we have designed in such a way that we can live and work there safely. Much is already being done to prevent flooding. The chances of this happening are slim. Still, we cannot take the risk of doing nothing and want to further reduce the risk of flooding in the city.[29]

Impact pathway	Preventing damage and nuisance caused by extreme rainfall and flood risk as much as possible and using rainwater for the city's liveability
Early results	
Result	We are as prepared as possible for the changing climate by 2050
Actors involved	City of Amsterdam, Weerproof, AGV Water Board, Ghent University, operators, water managers
Scale	City, buildings, public space, paving
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO_2e emissions by emission sector	
Offset CO_2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO_2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023 VTH Policy Physical Living Environment 2024

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[29] Policy: Climate adaptation - City of Amsterdam

Actions for Rain and flood risk mitigation

Action	Description	Levers of Change
Rainproof Nieuwenhuysenbuurt	In the Nieuwenhuysenbuurt, the public space will be made rainproof by constructing infiltration crates, rainwater swales and water-storing streets. Completion is expected in 2025	Technology and Infrastructure
Resolving rainwater bottlenecks in maintenance projects	The municipality will resolve rainwater bottlenecks while carrying out work on 10 major maintenance projects	Technology and Infrastructure
Testing water storage system	We are testing a water storage system under the tram track in Rooseveltlaan	Research/Monitoring Technology and Infrastructure
Raising and Rainproof Sloterdijk Zuid	We are working on raising the area and rainproof landscaping of streets and parks in Sloterdijk Zuid by 2024	Technology and Infrastructure
Research on water and soil quality	Making process agreements between water managers and municipality for the AGV Water Board's study on the impact of climate change on water and soil quality	Governance innovations & Policy Research/Monitoring
Improving water flow	We will improve the flow of water in the canals and make agreements for bridges, banks, quays and the use of water	Technology and Infrastructure Learning and capabilities
Optimal water storage	We will ensure optimal water storage in Amsterdam to the north of the North Sea Canal.	Technology and Infrastructure
Research on climate-adaptive recreational areas	We are exploring opportunities to make parks and recreational areas more climate-adaptive	Research/Monitoring Technology and Infrastructure
Sea Level Rise Knowledge Programme	The Sea Level Rise Knowledge Programme explores possible effects of more extreme sea level rise with the aim of understanding the measures needed. To be completed in 2026	Research/Monitoring
Research and test on evaporation and sap flow of trees	Ghent University is researching evaporation and sap flow of trees in the city. By monitoring urban trees, "live" data on sap flow and growth are collected and analysed. Waternet is testing several versions of such solutions on Stadioneiland, Rivierenbuurt, Betondorp and Frans Halsbuurt	Research/monitoring Learning and capabilities
Mandatory rainwater harvesting	In new buildings or major renovations, it becomes mandatory that rainwater is collected and processed on private property	Governance innovations & Policy

B-4.1.2 Heat and Drought

Climate change is increasing the number of summer and tropical days. Cities can suffer more from heat as a result, as there is often more stone than greenery there. Stone retains heat and radiates it. This creates 'heat stress' in the city.

Too little rain and a lot of evaporation (due to heat) causes drought. Drought has several risks. It is detrimental to our greenery and nature. Drought also affects the level of our groundwater and the salinity of our soil. It also is responsible for damaging foundations and subsidence. This can result in further sinking and damage. [30]

Impact pathway	Minimising the effects of extreme heat and drought
Early results	Minimising the effects on people, animals, environment, economy and infrastructure in extreme heat. Be prepared for prolonged periods of drought to prevent or minimise damage to buildings, greenery, wet and dry infrastructure and dykes.
Result	We are as prepared as possible for the changing climate by 2050
Actors involved	City of Amsterdam, operators, water managers, Pantar, work brigade, Cordaan
Scale	City, buildings, public space, paving
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Climate Adaptation Implementation Agenda 2021

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[30] Policy: Climate adaptation - City of Amsterdam

Actions for Heat and Drought

Action	Description	Levers of Change
Determining greenery percentage	Determining greenery percentage: Depending on each district typology, a minimum percentage of greenery per district should be established. We are committed to ensuring that greenery in the city should not decrease compared to the current situation	Governance innovations & Policy
Determining shade percentage	Determining shade percentage on slow traffic routes	Governance innovations & Policy
Cooling green roofs	Cooling green roofs: Roofs will be designed/built in such a way to reduce heating of the buildings and hence the indoor climate.	Governance innovations & Policy Technology and Infrastructure
Adding trees	Exploring adding trees at heat stress locations in inner city	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Working in greenery	Offering opportunities to employment participants (Pantar, work brigade, organisations like Cordaan) and young people so that they can learn, participate, reintegrate or work sheltered in greenery.	Governance innovations & Policy Social innovations Democratisation and participation Learning and capabilities
Exploring new guidelines	Exploring new guidelines in the Climate Adaptation Implementation Agenda	Governance innovations & Policy Research/Monitoring
Heat and drought plan	The municipality continues to apply the heat and drought plan in public spaces in the event of extremely hot or dry periods	Governance innovations & Policy Technology/Infrastructure

B-4.1.3 Cooperation and knowledge sharing on climate adaptation

Climate problems can only be tackled together. Therefore, we need to cooperate both within the municipal organisation and water boards and with external parties in and outside the city. Every little bit helps, whether it is big or small actions and whether you are a resident or an entrepreneur. Everyone can do what is within their capacity and ability. The Amsterdam municipality and the water boards are committed to a safe and liveable city, including in terms of climate change. We are part of a big playing field here, together with all Amsterdam residents, businesses in the city, knowledge institutions and many other stakeholders.

A climate-resilient Amsterdam can only be achieved if the whole city joins in. This is necessary as some 50 percent of the city is in private hands. The consequences of climate change and possible solutions affect us all. Good cooperation is therefore essential.

The network approach means working proactively with the existing network and all relevant parties and initiatives in the city. This way, we can create awareness and encourage stakeholders to take action. By thinking based on the network, we strengthen cooperation. We connect and activate all parties that influence a climate-resilient city. The municipality is a driver here and can share knowledge and information as well as initiate and support projects.[31]

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[31] 01927_klimaat_adaptatie_web (4).pdf

Impact pathway	Cooperation and knowledge sharing on climate adaptation
Early results	We explore collaborations, generic approaches and shared guidelines, and integrate climate adaptation in the entire management and development task of Amsterdam's public space
Result	We are as prepared as possible for the changing climate by 2050
Actors involved	residents, businesses, partners, stakeholders, housing corporations, tenant associations, GGD, knowledge institutions
Scale	City, buildings, public space, paving, network, international
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Climate Adaptation Progress Report 2023 Sustainability Report 2022

Actions for Cooperation and knowledge sharing on climate adaptation

Action	Description	Levers of Change
Climate adaptation network	We will form a network around climate adaptation with stakeholders: residents, businesses and partners to answer questions and help with initiatives	Governance innovations & Policy Social innovations Democracy/Participation Learning and capabilities
Exploring guidelines	We will explore new guidelines on heat, flood, drought and flooding.	Governance innovations & Policy Learning and capabilities
Exploring structural costs	The municipality is exploring structural additional costs of climate-adaptive measures in public spaces with the aim of gaining more insight into the financial consequences of climate adaptation.	Governance innovations & Policy Research/Monitoring Funding and financing
Including climate adaptation in cooperation agreements	The municipality will explore including climate adaptation in cooperation agreements between municipality, housing corporations and tenant associations 2024-2027/2028	Governance innovations & Policy Research/Monitoring Funding and financing Democratisation and participation

Incorporating climate adaptation into design	We will develop solutions to include climate adaptation in the design of public spaces	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Integrating climate adaptation in various pathways	We will work together on climate adaptation in processes such as the Green Vision, Environmental Vision, Principles for the Healthy City, Administrative Order on Utilities, Heat Plan GGD and Actieplan Zonkracht.	Governance innovations & Policy Learning and capabilities
Structurally maintain contact with other programmes	We maintain structural contact with programmes such as the Green Vision, Environmental Vision, OPR, etc.	Governance innovations & Policy Learning and capabilities
Sharing knowledge on climate adaptation in networks	We participate and exchange knowledge in the Spatial Adaptation Delta Programme, National Adaptation Strategy and Municipal Climate Adaptation Network	Governance innovations & Policy Learning and capabilities
Contributing to National Delta Conference	We contribute to the Annual National Delta Congress. The conference aims to encourage and facilitate knowledge sharing, collaboration and networking	Governance innovations & Policy Social innovations Learning and capabilities
Contributing to Delta Programme	We contribute to the annual publication of the Delta Programme	Governance innovations & Policy Social innovations Learning and capabilities
Green Colleges	New Green Colleges will be held in 2022, in which we will seek cooperation with other departments, such as the Engineering Office and Space and Sustainability.	Governance innovations & Policy Learning and capabilities
Continued learning pathway on climate adaptation	The Climate Adaptation learning programme will continue with 60 participants.	Governance innovations & Policy Learning and capabilities
Contributing to organising events around climate adaptation	We contribute to and (co-)organise a number of (international) events.	Governance innovations & Policy Social innovations Funding and financing Learning and capabilities
AMS Project: Future-proof Living Environment Growth Fund - Infra	Dozens of living labs and studies to make construction and maintenance of urban assets (roads, quay walls, bridges) more sustainable	Research/Monitoring Technology and Infrastructure
AMS Project: i-Tree	Developing tools for measuring optimal cooling performance of hundreds of tree species in cities	
AMS Project: RED&BLUE	Developing integrated climate adaptation strategies for the built environment	
AMS Project: Green Water Hubs	Landscape-integrated water buffers for climate adaptation and mitigation synergy in water-stressed urban areas	
AMS Project: STABILITY	Testing eco-friendly and circular strategies for life extension of bridges and quay walls in cities	
AMS Project: Logiquay	Research and optimisation of planning and logistics for sustainable replacement and	

	renovation of bridges and quay walls	
AMS Project: UBQ4	Developing and testing tools to integrate values into the day-to-day asset management practices of municipal organisations	
AMS Project: Effective greenery for urban climate adaptation	Developing concrete tools for design, construction, layout and management of greenery that can effectively contribute to climate adaptation in specific spatial situations in the city	

B-4.2 A green, biodiverse, nature-inclusive and animal-friendly city

By 2050, we want to be a city where everyone can surround themselves in greenery in their immediate surroundings at home or at work. This starts at the building and continues via green streets, green squares, parks and (walking and cycling) routes to the landscape around the city. What we will now start doing for this will sometimes focus on a particular green element, and sometimes on all green elements throughout the city.

The Green Vision outlines what we will do from now until 2050 to become a greener city. As such, the impact pathways associated with this transition are mainly derived from the goals of the Green Vision. Many residents and organisations were consulted for the creation of the Green Vision; the municipality is responsible for the vision and its implementation. So for the climate contract, we transform these principles into Impact Pathways. We also add four more impact pathways under Impact Pathway 3 because nature inclusiveness and biodiversity are an important part. With the principles as a long-term vision, we describe here the actions that contribute to this. This results in the following Impact Pathways:

- We ensure enough varied greenery for everyone
- Green contributes to as many tasks as possible
- We work on Green together
- Enhancing and protecting biodiversity
- Nature-inclusive construction
- Animal welfare improvement
- Addressing infrastructural ecological bottlenecks
- Towards a sustainable and integrated water system

The Green Vision is also a reason to organise funding to create new greenery or improve the quality of existing greenery. This vision also aims to invite, encourage and inspire residents, businesses and organisations to work with the municipality on the task.

B-4.2.1 Varied Greenery For All

Every Amsterdam resident can enjoy sufficient greenery in and around the city. We guarantee access to a certain amount of green space per resident. How much that is depends on the type of greenery.

Climate change impacts the safety, infrastructure and quality of our living environment. Biodiversity is also significantly affected. This makes greenery even more important for the city. It is not only necessary for residents and animals; greenery also helps cool the city on hot days and collect water from heavy rainfall.[32]

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[32] Our city of tomorrow

Impact pathway	We ensure enough varied greenery for everyone
Early results	Manage recreational lawns in the city so that at least 25% of the surface consists of flowering plants
	More connections between green-blue areas in the city realised
	More trees planted
Result	Park-like, public area no more than 10 minutes' walk from any home in 2050
	More green streets with space for trees and flowers in tree beds and planting beds by 2050
Actors involved	City of Amsterdam
Scale	City, streets, parks, Amsterdam Forest, Haven-Stad, recreational areas
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Amsterdam environmental vision 2050 Approach Inner City Implementation Programme 2024 Climate Adaptation Progress Report 2023 Amsterdam coalition agreement 2022-2026

Actions for Varied Green

Action	Description	Levers of Change
New park in Haven-Stad	There will be a new park in Haven-Stad, next to Westerpark, to have enough greenery for existing and new residents	Social innovations Technology and Infrastructure

80 green spaces	The municipality will provide 80 green spaces in the city	Technology and Infrastructure
Managing greenery according to the Green Vision	Ensuring that the management of greenery is appropriate to the ambitions and principles set out in this Green Vision. To that end, we are also looking at the management of recreational areas outside Amsterdam's borders and the possibility of central park management.	Governance innovations & Policy Learning and capabilities
Amsterdam Forest asphalt becomes green	We transform pavement in the Amsterdam Forest to green	Technology and Infrastructure
Knowledge Mile Park	Construction of the Knowledge Mile Park	Technology and Infrastructure
Planting trees	We plant trees in streets where they are still missing or have been cut down	Technology and Infrastructure
Implementing greening initiatives	Implementing the last 14 greening initiatives of the programme. Of the targeted 80 spaces, 50 or 68 now have greenery	Technology and Infrastructure

B-4.2.2 Greenery Contributes to Multiple Tasks

Greenery can fulfil many functions in the city, such as: water collection, reducing heat, increasing biodiversity and recreation. Recreation takes many forms, all activities people do to relax, in this case in green spaces. These include exercise, play, sports, gardening and coming together. All these functions are important to us, because they contribute to a liveable city for people and animals. An important task in the city. Good design and management can support and add value to those functions. Therefore, when designing and managing greenery, we ensure that:

- Greenery with less quality is improved so that it has more value and contributes to various tasks. For example, with the right design and management, a park can be a pleasant place for a million visitors a year while being valuable for plants and animals, so contributing to health, social well-being and biodiversity.
- New greenery contributes to the various tasks that are most important at a location, taking into account the surroundings. Proper design and management depend on the location and the needs of humans, animals and plants at that site. In areas of the city with a lot of paving, the addition of greenery can optimally contribute to cooling and water storage. Other locations are more likely to need opportunities to play or exercise.
- Good-quality greenery is preserved and well managed.

We opt for a design and management that preserves, adds or enhances as many values of greenery as possible. In this way, greenery contributes maximally to various tasks in the city. [33]

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[33] Green vision

Figure 14 The various contributions of greenery

Impact pathway	We provide greenery that contributes to various tasks
Early results	Realising the green standard (for area development) Area of paved public space will decrease in coming years Manage recreational lawns in the city so that at least 25% of the surface consists of flowering plants
Result	Large green area no more than 15 minutes' cycling from any home in 2050 Park-like, public area no more than 10 minutes' walk from any home in 2050
Actors involved	City of Amsterdam,
Scale	City, bus shelters, parks, new areas, existing areas, public space, shopping and hospitality streets, Artisterrein
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	

Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023 VTH Policy Physical Living Environment 2024

Actions for Greenery contributes to multiple tasks

Action	Description	Levers of Change
Strandeiland area development	On Strandeiland, we shape the area development with high sustainability ambitions	Governance & Policy Innovation Technology and Infrastructure Learning and capabilities
Translating Green Vision	The Green Vision is translated into the practice of city districts, areas and neighbourhoods	Governance & Policy Innovation Learning and capabilities
New urban forest	We will create a new urban forest	Technology and Infrastructure Democratisation and participation
Tree-lined avenues	In new areas we create tree-lined avenues	Governance & Policy Innovation Technology and Infrastructure
Greening Weteringpark	Improving and greening Weteringpark: Implementation of the renewal of the playground and greenery will start in 2024, and plan development of the U.J. Klaren building to be completed with possible start to implementation.	Technology and Infrastructure
Frederikspark improvement	Frederikspark improvement	Technology and Infrastructure
CO2 forest with contribution from residents and businesses	Investigating possibilities for financial contributions from residents or private parties, for example in the case of a CO2 forest: urban forest constructed with contributions from businesses or residents who want to offset their CO2 emissions by planting a tree.	Social innovations Democratisation and participation Funding and financing
Babyboompje Bos	Investigating possibilities for financial contribution from residents or private parties e.g. Babyboompje Bos: urban forest constructed with the contribution of parents who plant a tree for their child.	Social innovations Democratisation and participation Funding and financing
New trees in design	We include new trees in the design of landscape parks.	Governance & Policy Innovation
Adding greenery on water	We will add more greenery on the water and explore options for a floating park.	Research/Monitoring Technology and Infrastructure Learning and capabilities
Area development Amsterdam-Rhine Canal and North Sea Canal	The area development of a future-proof Amsterdam-Rhine Canal and North Sea Canal will be water-neutral and climate-adaptive.	Technology and Infrastructure
Double use of greenery	Deploying dual-use greenery: vertical greenery, more greenery	Technology and Infrastructure

	along railway tracks, roofs of bus shelters and building roofs.	
Site survey for greener courtyard gardens	The municipality continues a site survey for making 4 courtyard gardens greener.	Research/Monitoring
Greening of bus shelters	Greening of bus shelters in the inner city.	Technology and Infrastructure
Making Artisterrein more sustainable	Master plan Artis and surroundings: sustainability and greening within the Artisterrein and alignment with municipal programmes for less cars and sustainability.	Social innovations Technology and Infrastructure
Structurally greening shopping and hospitality streets	Structurally greening shopping and hospitality streets: Next year, plans for a greener interpretation of Kalverstraat and Nieuwendijk will be further developed. These plans and how they are implemented will have to become an example and standard for all other busy shopping and hospitality streets where space is limited.	Technology and Infrastructure
Structurally greening shopping and hospitality streets	Structurally greening shopping and hospitality streets: Using the methodology and the drafted menu of choices of the Nieuwendijk/Heiligeweg facade greening pilot, the aim is to make at least two other shopping streets greener. Upon successful implementation, at least the possibilities for Utrechtsestraat and Leidsestraat will be further developed.	Technology and Infrastructure

B-2.4.3 We Work On Green Together

A green and liveable city is made with many hands. The municipality wants to join hands with residents, entrepreneurs, housing corporations, knowledge institutions and other organisations, including other authorities. We encourage residents, businesses and organisations to manage their own outdoor spaces and make them greener, such as courtyard gardens and rooftops. We are also making the properties we use or rent ourselves greener. To do so, we look at the roofs of the buildings and the adjacent areas. Civil servants, residents, businesses, knowledge institutions and housing corporations are working together and learning from each other in greening the city. For public spaces, the municipality provides clear frameworks for construction, maintenance and management. Within the municipality, we are working towards strong cooperation regarding greenery. Sharing knowledge with residents and parties outside the municipality is also important to us. We ensure that the knowledge we gain from greening the city becomes accessible to all. We learn from each other and in addition, adults and children can develop further through nature education. By realising the role plants play in our lives, the plant life around us is increasingly appreciated. There are many places in the city where you can learn about nature, such as the Hortus, school gardens and natural playgrounds.

Impact pathway	We work on green together
Early results	Area of paved public space will decrease in coming years Manage recreational lawns in the city so that at least 25% of the surface consists of flowering plants

Result	Ecological management is the standard in 2030
	Large green area no more than 15 minutes' cycling from any home in 2050
Actors involved	Municipality of Amsterdam, residents, businesses, other cities, national networks, Amsterdam 750, green organisations, greenery managers, designers, greenery workers, Pantar employees, management staff, supervisors, residents, entrepreneurs, organisations, Artis, Green Fund, green cooperatives, neighbourhood funds, Green Roofs Fund, Masterplan Artis
Scale	City, buildings, public space, paving
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023 Amsterdam coalition agreement 2022-2026 Amsterdam environmental vision 2050

Actions for We Work On Green Together

Action	Description	Levers of Change
Knowledge on greening is accessible to all	We ensure that existing and new knowledge is accessible to all. For residents and businesses, this is at least about knowledge on building façade gardens, green facades, green (and blue-green) roofs, courtyard gardens and nature-inclusive neighbourhood greenery.	Social innovations Democratisation and participation Learning and capabilities
Follow-up approach to roofscape vision and strategy	In response to Motion 1.276 ''Het Dak op', the municipality is drawing up a follow-up approach for an integrated vision and strategy for the roofscape, within the framework of the environmental vision.	Research/Monitoring Learning and capabilities
New subsidy scheme green roofs and de-tiling	Introducing new subsidy scheme for green roofs and de-tiling courtyard gardens in 2024.	Governance innovations & Policy Funding and financing
Funding studies	Exploring opportunities for funding from European and national funds.	Governance innovations & Policy Funding and financing

Collaborating in various networks	Collaborating and sharing knowledge with other (European) cities, other governments and national networks to realise the ambitions for greening cities.	Governance innovations & Policy Learning and capabilities
"Amsterdam 750" as a catalyst	Collaborating with organisations and residents on initiatives such as "Amsterdam 750", this can be a catalyst to further strengthen Amsterdam's green identity.	Social innovations Democratisation and participation Learning and capabilities
Involving and supporting green projects and green management	Involving, and where necessary supporting, residents, businesses and green organisations in implementing green projects and managing green spaces.	Democratisation and participation
Investment programme development and management of greenery	Establishing a city-wide investment programme for greenery development and management	Funding and financing
Ensuring equal level of knowledge	Ensuring that all greenery managers, designers, greenery employees, Pantar employees, management staff and supervisors have the right level of knowledge with regard to green space design and management. Appropriate to this are competencies focused on communication and advice.	Learning and capabilities
Stimulating self-reliance with regard to greening	Ensuring that residents, entrepreneurs and organisations can start (co-)managing and greening roofs, existing buildings, neighbourhoods and gardens themselves.	Democratisation and participation Learning and capabilities
Accessible knowledge	Making existing, new but also specific information and knowledge from the municipality accessible to all.	Governance innovations & Policy Democratisation and participation Learning and capabilities
Greening Artis	We will work with Artis to make the park more sustainable and greener.	Social innovations
Investing in green fund and participation	We invest in the green fund and increase participation and self-management opportunities for greenery. In doing so, we look at new forms of cooperation in green cooperatives and/or neighbourhood funds in which residents and municipality work together and bear responsibility, also with public-private financing possibilities.	Social innovations Democratisation and participation Learning and capabilities
Exploring a Green Roofs fund	Amsterdam is exploring the establishment of a *Groene Daken* (Green Roofs) Fund with partners and other investors.	Social innovations Research/Monitoring Democratisation and participation Funding and financing
De-tiling	We will stimulate removing tiles from gardens and from very wide pavements.	Governance innovations & Policy Technology and Infrastructure Democratisation and participation
Finding structural funding	Finding structural funding for part of the overall task: At least for management and maintenance, but also for the development of new greenery in the city. This funding should be able to grow with the city and changing needs.	Funding and financing

B-2.4.4 Enhancing and Protecting Biodiversity

Cities can be rich in wild plants and animals. As an increasing proportion of our land is built up, it is important to increase biodiversity in urban areas. In addition, some animals and plants depend on urban environments. Biodiversity in Amsterdam has grown in recent years. We want to continue this trend. We give plants and animals every opportunity to make use of Amsterdam's nature. We care for the welfare of animals in the city. The city will be designed and managed as ecologically as possible, aiming for high biodiversity.

Impact pathway	Enhancing and protecting biodiversity
Early results	Biodiversity is protected and enhanced
Result	Ecological management is the standard in 2030
Actors involved	City of Amsterdam, Amsterdam Wetlands
Scale	
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023 VTH Policy Physical Living Environment 2024

Actions for Enhancing and Protecting Biodiversity

Action	Description	Levers of Change
Making city attractive to birds and insects	For birds and insects, we make the city attractive with nesting boxes, swallow and kingfisher walls, brushwood fences, and dead wood in green areas and infra-passages.	Technology and Infrastructure
Innovative solutions	We look for innovative solutions, such as tiny forests, food forests and more nature-friendly roadside management.	Governance innovations & Policy Social innovations Learning and capabilities
Improving monitoring	Improving monitoring: We will draw up a monitoring plan for house sparrows, swifts and bats.	Research/Monitoring
Biodiversity Action Plan	Making Biodiversity Action Plan.	Governance innovations & Policy
Extra attention to building-dwelling animals	Extra attention to building-dwelling animals.	Governance innovations & Policy
Assessing dog parks	We will assess all designated dog parks for overlap with ecologically sensitive areas. Based on this, we will propose adjustments.	Research/Monitoring
Aligning recreational water use with ecology	We are exploring the possibility of tailoring recreational water use in ecologically sensitive periods to sensitive areas, such as Strandeiland, Buiteneiland and Zuidelijke IJmeerkust.	Governance innovations & Policy Research/Monitoring
Future-proof agriculture and robust nature	The Amsterdam Wetlands consortium is driving the development of future-proof agriculture and robust nature. Trial with cattail cultivation successfully extended.	Research/Monitoring Technology and Infrastructure Learning and capabilities
Climate-robust ecological network	We will realise a climate-robust ecological network of greenery and water that provides peace and space for plants and animals in the city.	Technology and Infrastructure
Financial calculation	Calculating financial resources needed for planning, design, implementation, (asset) management and incentive schemes.	Research/Monitoring Funding and financing
Financial expertise in terms of nature inclusivity	Ensuring more financial expertise on nature inclusiveness to find more opportunities for funding.	Governance innovations & Policy Funding and financing

B-2.4.5 Nature-inclusive Construction

Impact pathway	Nature-inclusive construction
Early results	Improving ecological water quality in ponds and ditches through better bank design, dredging and fish stock management.
Result	Nature-inclusive new construction and renovation is the standard in 2030 In 2050: 100% nature-inclusive city
Actors involved	City of Amsterdam, schools, school gardens
Scale	City, school gardens, tenders, new construction, bridges and roads
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Our city of tomorrow Animals Agenda 2024-2026 Amsterdam coalition agreement 2022-2026

Actions for Nature-inclusive Construction

Action	Description	Levers of Change
Including provisions for birds and bats during construction	In nature-inclusive construction, we include nesting bricks or features for birds and bats	Technology and Infrastructure
Wildlife crossings at bridges and roads	We will construct wildlife crossings when work is carried out on bridges and roads	Technology and Infrastructure
Sustainable requirements through tenders	Setting sustainable requirements through tenders for land allocation	Governance innovations & Policy
Flora and fauna provisions on quaysides	On all quays that are replaced, we apply flora and fauna provisions	Technology and Infrastructure
Nature-inclusive construction and management	We increase biodiversity through nature-inclusive construction, design, landscaping and management	Technology and Infrastructure

Recalibration of points system Nature-inclusive Construction	Recalibration of points system Nature-inclusive Construction	Governance innovations & Policy
Nature education	We will continue the school garden programme and invest in nature education	Democratisation and participation Funding and financing Learning and capabilities
Opportunity map for nature-friendly banks	We will create an opportunity map for nature-friendly banks for climate adaptation and biodiversity (Environmental Vision)	Technology and Infrastructure
Handbook nature-inclusive construction 2.0	Handbook nature-inclusive construction 2.0, handbook nature-inclusive bridges and quay walls, handbook greenery, climbing plant guide	Governance innovations & Policy Technology and Infrastructure Learning and capabilities
Points system in tenders	Within tenders for new construction projects, we use a points system for nature-inclusive measures	Governance innovations & Policy

B-2.4.6 Improving animal welfare

Animals are a part of Amsterdam and their welfare deserves our care. Not least because they are largely dependent on us or, in fact, obstructed by people. Paying attention to animal welfare is important not just for the animals, but also for ourselves. Living, caring and interacting with animals provides relaxation and encourages physical activity. At the same time, animal neglect can be a predictor of domestic violence or signal other concerns about people's living conditions. When animals are handled properly, there is also less risk of infectious disease outbreaks (zoonosis). Biodiversity contributes to pest species management. Bats, dragonflies and great tits, for example, play an important role in this. While bees, butterflies, hoverflies and beetles make a vital contribution to pollination.

Developments such as climate change, inflation and dense construction all affect animal welfare. As well as societal developments in how we think about animal welfare. Increasingly, animals are humanised and we are also trying to look at issues from the animal's point of view. This leads to increasing legal protection for animals. These developments raise many new questions. For example, about the necessary protection in relation to zoonoses or the pressure on public space which in turn puts pressure on nature and animals. The college therefore decided on a new Animals Agenda with a focus on animal welfare and the habitats of all animals in the city.

Together, we will make great strides towards an animal-friendly and biodiverse Amsterdam in the coming years.[34]

Impact pathway	Animal welfare improvement
Early results	Contributing to maintaining and, where necessary and desirable, improving the welfare of both pets and wild animals within the municipal boundaries of Amsterdam.
Result	Contributing to maintaining and, where necessary and desirable, improving the welfare of both pets and wild animals within the municipal boundaries of Amsterdam.
Actors involved	Municipality of Amsterdam, surrounding municipalities, central government, University of Amsterdam, residents, partners, veterinarians, Animal Ambulance, Fixbrigade,
Scale	City, surrounding municipalities, pastures, public space, paving vulnerable areas,
Comments on feasibility and progress	

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[34] Animals Agenda 2024-2026

Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023 VTH Policy Physical Living Environment 2024

Actions for Animal Welfare [35]Improvement

Action	Description	Levers of Change
Stray animals	Implementation of statutory duties for transporting/sheltering stray animals: Reducing impact on nature: making agreements on not putting stray animals back in ecologically sensitive areas.	Governance innovations & Policy
Fish mortality: Rental agreement	Reducing fish mortality: Determining lease of fishing rights with strengthened ambitions on fish welfare and biodiversity.	Governance innovations & Policy
Fish mortality: Professional fishing	Reducing fish mortality: We will explore options to ban professional fishing in ecologically valuable areas such as the IJmeer.	Research/Monitoring
Fish mortality: angling in surrounding municipalities	Reducing fish mortality: We explore whether conditions for angling in surrounding municipalities can be equally ambitious, so that fish are not adversely affected when they swim out of the municipal boundary.	Research/Monitoring
Legislation on animals and chasing away meadow birds	Improving conditions for meadow birds: We call on the central government for better legislation on conditions when buying an animal and on conditions in subsidies for not chasing meadow birds out of pastures.	Governance innovations & Policy
Research on effects of light pollution on animals	We ask the UvA to also include underwater light in its research on the effects of light pollution on animals. The results of this study	Research/Monitoring

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[35] Note: there are many more actions drawn from the Animals Agenda 2024-2026, but only the sustainability/ecology/biodiversity actions are included for the urban climate contract.

	constitute policy input for the next administrative term. We want to minimise the negative effects of light (pollution) on wild animals.	
Knowledge on the impact of extreme weather on animals: knowledge platforms	Occurrence of animal suffering due to extreme weather conditions: In publications about extreme weather, we refer to knowledge platforms such as Landelijk Informatiecentrum Gezelschapsdieren (LICG) to prevent animal suffering during extreme weather conditions.	Research/Monitoring
Knowledge on the impact of extreme weather on animals: increasing target group outreach	Occurrence of animal suffering due to extreme weather conditions: We are increasing target group outreach to inform how residents and partners can help prevent animals from suffering during weather extremes.	Social innovations Democratisation and participation Learning and capabilities
Exploring arrangements for wildlife in need	Occurrence of animal suffering due to extreme weather conditions: We explore what agreements, expertise and equipment is needed between the safety region and the Animal Ambulance to help wild animals in distress during emergencies.	Research/Monitoring Learning and capabilities
Flora and Fauna code of conduct	We will draw up an Amsterdam Flora and Fauna code of conduct for invasive exotic species. This helps accommodate needy and non-self-sufficient wild birds and mammals.	Governance innovations & Policy
Fixbrigade at veterinarians, shelters and community centres	We encourage the Fixbrigade to also hold consultations at veterinarians, shelters and community centres to raise awareness about taking care of needy and non-self-sufficient wild birds and mammals.	Learning and capabilities
Monitoring causes of wildlife victimisation	Monitoring: recording causes of wildlife victimisation. At least for: window, traffic, event, violence by person, violence by other animal, infectious disease and zoonosis. This way, we aim to prevent disturbance to wild animals at outdoor events.	Research/Monitoring
Creating awareness among residents	Creating more awareness among residents through communication on risks, help with behavioural problems and shelters. This way, we help owners improve the mental and physical health of (domestic) animals.	Learning and capabilities
Requesting regulation from central government	In discussion with central government: requesting regulation regarding online sales, matching obligation, health insurance obligation, pressure on veterinarians. This way, we help owners improve the mental and physical health of (domestic) animals.	Governance innovations & Policy

Monitoring by veterinarians	More and better monitoring by veterinarians.	Research/Monitoring
Reinforcing ADAM scheme	Reinforcing ADAM scheme	Governance innovations & Policy
Reinforcing space for nature and environmental education	Reinforcing space for nature and environmental education on what it takes to keep farm animals and how to make their immediate environment nature-inclusive.	Learning and capabilities

B-2.4.7 Addressing Infrastructural Ecological Bottlenecks

Based on the Green Vision and Environmental Vision, we will work to increase biodiversity. Solving ecological bottlenecks and increasing biodiversity are integral tasks within projects. However, more money is needed to include nature-inclusive construction, ecological bottlenecks, ecological water quality and soil quality as standard

Impact pathway	Addressing infrastructural ecological bottlenecks
Early results	Resolving ecological bottlenecks and stimulating initiatives Designating rest areas and creating nature-friendly banks and quays
Result	No more infrastructural ecological bottlenecks by 2030
Actors involved	City of Amsterdam, Waternet, Amstel, Gooi en Vecht Water Board
Scale	City, water system, vulnerable areas, recreational areas,
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Animals Agenda 2024-2026

Actions for Addressing Infrastructural Ecological Bottlenecks

Action	Description	Levers of Change
Wildlife refuges	We create places where animals can escape from the water (at bottlenecks).	Technology and Infrastructure

Structurally safeguarding places of refuge	We will explore whether structural securing of these places of refuge (preferably through creation of additional nature) is possible during the realisation of bridge and quay walls.	Funding and financing
Position of animals	Strengthening the position of animals during work in progress.	Governance innovations & Policy
Invasive exotic species	We will investigate which local invasive exotic species are adversely affected by their presence in the Dutch climate.	Research/Monitoring
Recreational water use	We are exploring the possibility of tailoring recreational water use in ecologically sensitive periods to sensitive areas, such as Strandeiland, Buiteneiland and Zuidelijke IJmeerkust.	Research/Monitoring
Closing Amsterdam waters	We are investigating which Amsterdam waters, if any, we can close to boating traffic to create rest areas so that an ecologically sustainable water system can develop there.	Research/Monitoring Technology and Infrastructure
Avoiding bottlenecks	We will avoid bottlenecks and construct wildlife crossings when work is carried out on bridges and roads.	Technology and Infrastructure
Bottleneck map and handbook	Bottleneck map ecological structure, handbook nature-inclusive bridges and quay walls.	Research/Monitoring
Bank map	Mapping and managing current banks.	Research/Monitoring Technology and Infrastructure
Nature-friendly banks	We transform hard banks into nature-friendly banks. Making the banks nature-friendly, by giving riparian and aquatic plants a chance to grow on gradually sloping banks, can significantly improve the natural values of Amsterdam's water.	Technology and Infrastructure

B-2.4.8 Towards a Sustainable and Integrated Water System

This impact pathway consists of actions taken by Waternet.

Impact pathway	Achieving a sustainable and integrated water system
Early results	Working towards good status for natural water bodies (both ecological and chemical) (GET) (Guideline values 2027: Fish: 100%; Macrofauna: 100%; Plants: 35%; Algae: 100%) Active groundwater management in 2025 Meeting the KRW by 2027
Result	Water chain 50% circular by 2030, and 100% circular by 2050 2050: 100% nature-inclusive water system[36]

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[36] 010 – Sustainable Amsterdam 010 - Duurzaam Amsterdam.pptx (sharepoint.com)

Actors involved	Waternet, City of Amsterdam, Operators
Scale	Drinking water system Wastewater system Rainwater system
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Water management programme Amstel, Gooi en Vecht 2022-2027

Actions for Water system

Action	Description	Levers of Change
Carrying out management and control of treatment plants and pressure pipes		Governance innovations & Policy Technology and Infrastructure
Far-reaching removal of micropollutants at six treatment plants		Technology and Infrastructure
Increasing climate resilience of treatment plants		Technology and Infrastructure
Getting and keeping crisis management in order		Governance innovations & Policy Learning and capabilities
Visualising deployability of new sanitation		Research/Monitoring
Identifying/utilising opportunities to extract raw materials and energy from wastewater and reuse sludge		Research/Monitoring Technology and Infrastructure
Implementation and maintenance of water heritage		Governance innovations & Policy Technology and Infrastructure
Defining responsibilities and funding waterway management		Governance innovations & Policy Research/Monitoring Funding and financing
Keeping up to date and implementing regulations, signage and enforcement of (sailing) rules		Governance innovations & Policy
Enabling recreational routes, taking nature into account		Governance innovations & Policy

Effective cooperation and participation in water-related social tasks		Social innovations Democratisation and participation
Implementing vision of 100% circular execution of tasks		Learning and capabilities
Deploying communication and media strategy		Social innovations Learning and capabilities
Implementing vision for Aquathermy and energy from solar and wind		Technology and Infrastructure Learning and capabilities
Implementing activities World Waternet		Social innovations
Conducting research focused on sustainable innovation		Research/Monitoring Learning and capabilities
Inspecting and testing flood defences and taking management measures to reduce risks		Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Regulating use and maintenance as per regulation		Governance innovations & Policy Technology and Infrastructure
Reinforcement of defences according to dyke programme		Technology and Infrastructure
Carrying out maintenance of flood defences and associated technical systems		Technology and Infrastructure
Stimulating spatial planning that takes water safety into account		Governance innovations & Policy Learning and capabilities
Developing and applying a 'blue label' per polder basin section		Governance innovations & Policy Social innovations
Implementing (nature-friendly) management and maintenance and control of water system (room for customisation)		Governance innovations & Policy Social innovations Learning and capabilities
Sufficiently sizing the water system		Governance innovations & Policy
Making main waters comply with waterway and/or fairway profiles		Governance innovations & Policy
Regulating use and maintenance as per regulation		Governance innovations & Policy Technology and Infrastructure
Advising on climate-proof spatial design and plans		Social innovations Learning and capabilities
Activities aimed at updating and implementing the entire Water Level Decree system		Governance innovations & Policy
Implementing soil subsidence strategy and peatland action plan		Governance innovations & Policy Technology and Infrastructure
Activities focusing on the polder system		Governance innovations & Policy Technology and Infrastructure
Implementation of Basin Plan 2.0		Technology and Infrastructure
Cross-area cooperation with all stakeholders in the storage basin system		Social innovations Democratisation and participation Learning and capabilities
Activities focusing on the basin system		Technology and Infrastructure
Carrying out groundwater care, together with other parties		Democratisation and participation Learning and capabilities

Implementing solutions to drought		Governance innovations & Policy
Implementing and advising on KRW measures[1] in water bodies		Social innovations
Implementing and advising on measures in 'other waters'		Social innovations
Stimulating and subsidising agricultural water management		Social innovations Funding and financing
Tackling historical pollution of water beds		Technology and Infrastructure
Stimulating spatial protection of ground and surface[1] water quality		Governance innovations & Policy Learning and capabilities
Implementing soil management[1] memorandum		Governance innovations & Policy
Implementing Fish Memorandum to achieve healthy fish stocks and fish accessibility		Governance innovations & Policy
Giving biodiversity a guiding role in AGV work		Governance innovations & Policy
Implementing and encouraging nature-friendly management and maintenance		Social innovations Technology and Infrastructure Learning and capabilities
Being an effective networking partner on biodiversity		Social innovations Democratisation and participation
Projects nutrients from wastewater	Amsterdam supports initiatives by, for example, the Amstel, Gooi en Vecht Water Board (AGV) to extract more nutrients from wastewater and return them to the chain.	Funding and financing Learning and capabilities
Drawing up circular water chain roadmap	Until 2026, the AGV Water Board and the City of Amsterdam are drawing up a Circular Water Chain Roadmap on how the water chain can become 50% circular by 2030 and 100% circular by 2050.	Research/Monitoring Learning and capabilities
Making wastewater suitable for reuse	The AGV Water Board and the City of Amsterdam will work with industry and the Port Authority in the port to make wastewater (effluent) suitable for industrial application by 2025.	Social innovations Technology and Infrastructure
Raw material recovery pilots	Exploring with pilots such as new sanitation, how we can recover valuable raw materials in the water chain.	Research/Monitoring Technology and Infrastructure Learning and capabilities
Research on water management	We are continuing our research on proper drainage to maintain water levels at a desirable level together with the water boards, the central government and the province.	Research/Monitoring
AMS Project: AquaConnect	Developing and demonstrating sustainable water management in urban green space management.	Technology and Infrastructure Learning and capabilities

B-5 The transition to a sustainable municipal organisation
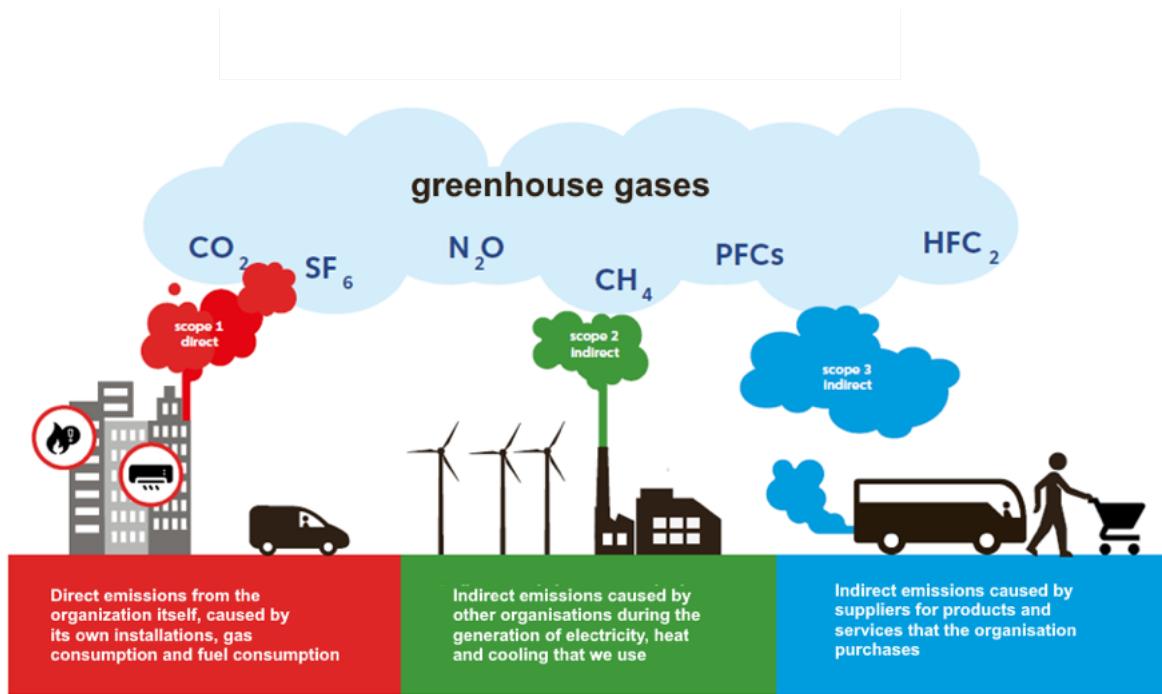
Figure 15 the three scopes

With the administrative order Sustainable Future City and Organisation, we commit the departments and city districts to realise the sustainability of the city and organisation together and on time, including by providing insight into the climate footprint per budget programme. The administrative order also entails area-based management. This will give each area its own plan that suits the neighbourhood, to shape the transitions equitably and inclusively.

Administrative instruments: administrative order and administrative team

By 2030, we want to be a circular, climate-neutral organisation and maximise our own energy generation. We want to work in a climate-adaptive environment, with officials steeped in sustainable thinking and action. To achieve this, we have launched the *Sustainable Future City and Organisation* administrative order, aimed at a municipality-wide incorporation of the sustainability task. We are also rolling out the 'Sustainable, unless' principle in the city through this administrative order. We appeal to all organisational units to do as much as they can. And ensure that everyone in the organisation feels responsible and knows that working on sustainability is not without obligation, so that the entire civil service organisation steps up to the common task. At the initiative of the college, the Sustainable Future administrative team was formed, where aldermen and two administrative representatives of the city districts make breakthrough decisions to start, scale up, continue and accelerate implementation.

Derived from the urban programmes are the climate targets for their own organisation:

1. Maximum energy savings and maximum energy generation
2. Carbon-neutral operations in 2030
3. Circular operations in 2030 and maximum circular use of materials in public spaces
4. Climate-resilient buildings and (courtyard) areas
5. Looking, thinking and doing[37]
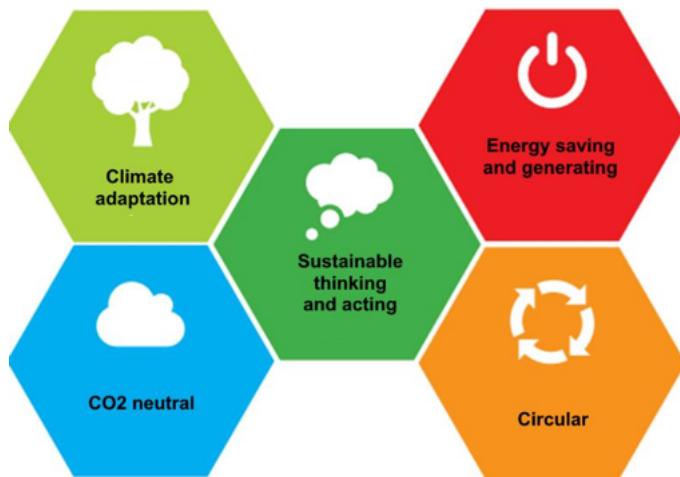
Figure 16 Five sustainable goals for our own organisation

There is extremely little time to meet the set targets for 2030. All departments are jointly responsible for this. The aim of the Accelerating Sustainability administrative order is to get from thinking to doing in all portfolios as quickly as possible: implementing the adopted policy while accelerating to meet the 2030 targets. This applies to the energy transition, the transition to a circular economy, the transition to a green and healthy city including climate adaptation and making the municipal organisation more sustainable. Anchoring and accelerating the implementation of the sustainability task throughout the organisation is central to this administrative order. [38]

B-5.1 Maximum energy reduction and maximum energy generation

An organisation is energy neutral when as much renewable energy is generated by the organisation as is consumed. To achieve this ambition, we first reduce our consumption and deploy alternative energy sources[39]. Thus, we leave "no roof unused" for energy generation on our own buildings. The municipality follows the Trias Energetica[40] strategy.

1. Reduce energy consumption by eliminating waste.
2. Make use of energy from renewable sources, wind, water and solar.
3. Make the most efficient use of fossil fuels to meet remaining energy needs. [41]

Energy storage is also expected to become part of step 3 in the future.

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[37] Implementation Agenda Towards a Sustainable Organisation 2020-2030
[38] Sustainability Report 2023
[39] Towards a Sustainable Organisation, Implementation Agenda 2020-2030
[40] RvO Information sheet Trias Energetica and energy-neutral construction

Energy consumption in 2018 was around 684 terajoules (TJ). In 2021, we as a municipal organisation consumed 594 Terajoules (TJ) of energy. This means we continue to see a downward trend compared to the starting year 2018 (11 percent less energy consumption), but the reduction is not as great as in 2020. The decrease is caused by the organisation's overall electricity consumption. This refers to direct consumption by the municipal organisation's own operations, as well as the energy consumed for municipal tasks and responsibilities such as lighting public spaces, car parks, public transport facilities and some municipal sports facilities. We distinguish between:

B-5.1.1 Buildings: Maximum energy reduction and maximum energy generation

The greatest energy-saving potential for our own organisation lies in the municipality's offices and yards used by civil servants. Reducing energy consumption reduces energy costs and directly results in a reduction of CO2 emissions.

Impact pathway	Maximum energy reduction and energy generation in buildings
Early results	Lower energy costs, reducing CO2 emissions, at least energy label C by 2030
Later results	Energy label A for all buildings in the municipal portfolio
Actors involved	City of Amsterdam, social institutions, users, tenants
Scale	61% municipal housing properties and yards 16% municipal sports halls and swimming pools 10% metro stations 5% parking garages 8% other buildings (concerns part of energy costs for the municipality of properties being rented out).
Comments on feasibility and progress	
Renewable energy generated	The total solar potential of all roofs of buildings owned is 15 MW, which means that a total of about 50,000 panels can be put on our roofs. If it is possible to also install solar panels on the embankments of metro lines, about another 4.5 MW could be generated. That's another 15,000 solar panels.
Energy consumption avoided or replaced	Of the municipal housing properties and yards owned (77 properties), 29 properties have energy label A and 11 properties are natural gas-free. Improving the energy performance of these buildings to label A level potentially yields an 11% energy reduction in total energy consumption. Looking at all properties belonging to the scope of this Implementation Agenda, that potential is higher, at around 18% Label A+ energy reduction measures
CO2e emissions by emission sector	Absolute decrease of 123 terajoules in 2030 compared to 2018, i.e. a 35% decrease
Offset CO2e emissions (biologically or technologically fixed)	?
Total cost and cost per tonne of CO2e	?
Co-benefits	Improved health Improved air quality Efficient energy consumption Reliable energy supply Increased resilience Lower energy costs Reduced energy poverty Improved indoor climate Increased comfort Stimulating innovation Job creation Growth of SMEs Minimisation of energy losses Lower energy dependency Stable power supply Price stability Strengthening competitiveness

	Sustainable employment opportunities Awareness within organisation
Policy document(s)	Recalibration of the 'Transition Plan For Making Amsterdam's Fleet More Sustainable – 2019' Noise Action Plan 2020-2023 Amsterdam Climate Neutral Roadmap (2020) Sustainable Organisation Implementation Agenda GGD Green Deal Sustainable Care 3.0

Achieving these savings is possible by reducing the consumption of electricity, gas, and district heat by taking building-related measures (such as façade and roof insulation, double glazing and optimising the control technical installations) and user-related measures (the energy performance of ICT facilities, kitchens, multi-functionals, beverage dispensers and the way the users use them).

This means the municipality needs to implement even more energy-saving measures. We should also look for more sustainable local generation options and innovations if we want to be energy neutral by 2030.

B-5.1.2 Public space: maximum energy reduction and maximum energy generation

Impact pathway	Reducing energy consumption in public spaces
Early results	The municipality leads by example
Later results	By 2030, the use of primary raw materials should be reduced by 50% compared to 2019. The municipality has made agreements within the MRA to work together on circular procurement.
Actors involved	City, municipality.
Scale	- Lighting - Tunnels, bridges and locks - Other public spaces
Comments on feasibility and progress	Public spaces contain light poles, traffic lights, tunnels and locks, fountains and security cameras. Much of this energy consumption is difficult to reduce, because these services are essential to the functioning of the city.
Renewable energy generated	
Energy consumption avoided or replaced	By switching to LED luminaires for different types of lighting. Amsterdam has around 150,000 luminaires. Of these, 41% are now LED. Replacing the remaining luminaires with LED lighting will reduce our total energy consumption by 9%.
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Improved health Improved air quality Lower energy costs Efficient energy consumption Reliable energy supply Increased resilience Reduced energy poverty Stimulating innovation Minimisation of energy losses Lower energy dependence Stable power supply

	Price stability Strengthening competitiveness Sustainable employment opportunities Awareness within organisation
Policy document(s)	Towards a Sustainable Organisation 2020-2030 Sustainability Report 2022 Sustainability Report 2023

Actions for public space

Action	Description	Levers of Change
Reducing energy consumption and generating renewable energy	For everything in the public space that consumes energy on behalf of the municipality, we are looking for a more energy-efficient variant. All municipal land suitable for energy generation will be used for this purpose (provided it is feasible).	Technology/Infrastructure
Reducing CO2 in public spaces	With the Green Deal 'Het Nieuwe Draaien', the municipality commits to reducing CO2, particulate matter and nitrogen emissions from mobile machinery. Construction traffic accounts for 30 to 40 percent of inner-city logistics. With the Green Deal 'Sustainable logistics in construction', the municipality commits to applying smart construction logistics solutions	Technology and Infrastructure Funding and financing
Sustainable public procurement	By including sustainable requirements and award criteria in our procurement processes, we influence the market to move in a sustainable direction. We are working towards standardisation so that we can ask for sustainability more often. We can help shape this by collaborating with other governments in the physical domain.	Technology and Infrastructure Funding and financing Learning and Capabilities
Material use and reuse	'Reuse unless' principle: materials and raw materials in public spaces should be reused unless absolutely impossible. We are also experimenting in a number of areas in public spaces with reusing materials or asking for circular principles in procurement processes.	Governance Innovation Learning and capabilities
Knowledge and innovation	Scaling up	Learning and capabilities

B-5.1.3 Municipal vehicle fleet: maximum energy reduction and maximum energy generation

Impact pathway	**Making municipal vehicle fleets more sustainable.**
Early results	Fully electrified fleet
Later results	By 2030, our entire fleet will be zero-emission.
Actors involved	City, municipality.
Scale	Scooters, passenger cars and small vans; Sweepers; Trucks and waste trucks; Other vehicles
Comments on feasibility and progress	
Renewable energy generated	
Energy consumption avoided or replaced	18% of the municipal organisation's current energy consumption, i.e. 122 terajoules (TJ), goes to the municipal vehicle fleet. Reduced CO2 emissions: 11 ktonnes By fully electrifying the fleet, we will save at least 10% energy on our total energy consumption
CO2e emissions by emission sector	That means we will use at least 50% less energy for the fleet (vs. 2018).
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Awareness within organisation Improved air quality Active lifestyle Mental well-being Increased quality of life Reduced traffic congestion Less delay Decrease in car dependence Lower maintenance costs Greater efficiency Improved comfort in public transportation Reduced space demand for parking facilities
Policy document(s)	Recalibration of the 'Transition Plan For Making Amsterdam's Fleet More Sustainable – 2019' Noise Action Plan 2020-2023 Amsterdam Climate Neutral Roadmap (2020) Sustainable Organisation Implementation Agenda GGD Green Deal Sustainable Care 3.0

Actions for Making municipal vehicle fleets more sustainable

Action	Description	Levers of Change
Reducing noise pollution from the municipal vehicle fleet.	Reducing noise pollution from the municipal vehicle fleet. Besides the commitment to zero-emission, it also involves encouraging the use of quiet and fuel-efficient tyres and a smart tyre pump.	Technology and Infrastructure
Vessel sustainability pilots	Starting pilots across the full range of vessels, and if successful, accelerating the upscaling.	Research/Monitoring
Zero-emission forklifts	Replace all non-zero-emission forklifts with zero-emission variants in the short term.	Technology and Infrastructure
Testing of zero-emission sweepers	Continuing testing of zero-emission variants of diesel sweepers.	Research/Monitoring; Technology and Infrastructure
Electrification of municipal passenger and delivery vehicles	Replacing municipal passenger and delivery vehicles with electric.	Technology and Infrastructure

	Between 2023 and 2030, we will replace all 1,500 vehicles in the fleet with electric variants.	
Brainstorming sessions at departments	Preparing implementation plan per department: Organise brainstorming sessions on vehicle use.	Social innovations
Research on use of electric two-wheelers	Researching what effect the sub-optimal experience of electric two-wheelers has on usage.	Research/Monitoring
Research on vehicle categories for implementation plan	Preparing implementation plan per department: identifying what different vehicles exist for each vehicle category.	Research/Monitoring
Research on financial task until 2030 for implementation plan	Preparing implementation plan per department: Calculating more precisely how big (financially) the task is until 2030.	Funding and financing
Stakeholder engagement for implementation plan	Preparing implementation plan per department: Determining what the key stakeholders are and engaging with them.	Democratisation and participation
Charging infrastructure plan	Preparing implementation plan per department: More detailed plan for charging infrastructure. By 2023, the number of charging stations for municipal vehicles will be increased to at least 400.	Technology and Infrastructure
Conducting pilots for implementation plan	Preparing implementation plan per department: Launching pilots to learn more and increase Market Readiness Level.	Research/Monitoring
Research on pilot for tractors	Tractors: keenly following market developments and extracting information from pilot projects. From there, determining whether it makes sense to start our own pilot project.	Research/Monitoring
Research on accelerated replacement	Exploring the possibility of accelerated replacement for the 30% with depreciation periods later than 2025.	Funding and financing
Committing to HVO (biodiesel) municipal vehicle fleet	Committing to HVO (biodiesel) municipal vehicle fleet during the transition period.	Technology and Infrastructure
Sustainable procurement of transport equipment	Including 'carbon-neutral' or 'low-carbon' as a starting point for purchasing means of transport.	Governance innovations & Policy; Technology and Infrastructure
Expanding car pool	Expanding sustainable use of car pool.	Technology and Infrastructure
Making GGD business trips more sustainable	GGD: Identifying CO2 emissions on business trips and commuting + drawing up plan on how to reduce it.	Governance innovations & Policy; Research/Monitoring
Making business travel more sustainable	Making business travel and commuting more sustainable.	Social innovations
Sharing municipal service vehicles through municipal car pool.	Sharing service vehicles	Governance innovations & Policy; Social innovations

B-5.2 Carbon-neutral operations in 2030

This domain covers everything civil servants need to do their job. This includes the activities and resources of departments of ICT, Facilities Office, P&O, the municipal vehicle fleet and our commercial waste. We also mention loose equipment in buildings in municipal housing properties here.

Within many contracts, there are already agreements to carry out municipality activities in a carbon-neutral way. In 2018, 67.5% of our carbon emissions in scopes 1 and 2 were avoided or offset. Buying green power has made the biggest contribution.[42]

The Implementation Agenda takes as its starting point that our operations are carbon-neutral when all scope 1 and 2 emissions are avoided or offset. It was stated then that we did not have a sufficient picture of our scope 3 emissions to quantify measures on them (Implementation Agenda, p. 25). This baseline measurement shows that 92% of our emissions are in scope 3, mainly due to the large amount of materials we purchase as an organisation. We cannot claim to be a 'climate-neutral organisation' if we leave out 92% of our footprint.[43]

One way to make business operations more carbon neutral is to scrutinise our own organisation's food chain. With its thousands of colleagues, there are considerable gains to be made by making the food chain more sustainable, for example by focusing on more sustainable lunches, catering and procurement.

B-5.2.1 Making own organisation's food chain more sustainable

Impact pathway	Making own organisation's food chain more sustainable
Early results	The municipality leads by example
Result	The municipal organisation's food chain will be transparent, sustainable and responsible by 2030
Actors involved	City of Amsterdam, Customers, subsidy recipients, GGD,
Scale	The City of Amsterdam, municipal property, public institutions
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Increased food security Improved health Improved animal welfare Sustainable food production Food safety Stimulating local food production Reduced food transport Reduction in waste and waste transport Awareness within organisation

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[42] Implementation Agenda Towards a Sustainable Organisation 2020-2030
[43] Sustainability Report 2023

Policy document	Food strategy implementation plan GGD – Green Deal Sustainable Care Sustainability Report 2022 Our city of tomorrow

Making own organisation's food chain more sustainable

Action	Description	Levers of Change
Sustainable Unless	All decision-making and implementation is governed by the premise of: 'Sustainable, unless'. Should there be reasons why this cannot be met, this must be substantiated and an executive assessment will follow, whereby the agreements made in the current coalition agreement generally prevail.	Governance innovations & Policy
Reporting negative climate impacts	This measure provides insight into the cost savings of early action on climate change, providing a financial tool for long-term public investment.	Governance innovations & Policy
Catering	Catering will be sustainable, healthy, varied and local.	Governance innovations & Policy Social innovations Funding and financing Learning and capabilities
Catering ratio vegetable/animal is 60:40	Catering ratio animal/vegetable is 40/60	Governance innovations & Policy Research/Monitoring
Mapping food waste of own organisation	Food waste: mapping and minimising	Research/Monitoring
GGD: sustainable and responsible procurement of medicines	Considering environmental and international social conditions when procuring medicines.	Governance innovations & Policy Research/Monitoring Funding and financing Learning and capabilities
Plant-based fruntrunner group	Fruntrunner group on plant-based, fair and sustainable food within major catering employers; scan for instruments and agreements (contracting, subsidisation, tenders).	Social innovations Research/Monitoring Learning and capabilities
GGD as a sustainable and healthy organisation	GGD as a sustainable and healthy organisation (procurement).	Governance innovations & Policy
Implementation for plant-based offer within Municipal Organisation	Preparing implementation plan for accelerating transition to plant-based food and beverage offer within municipal organisation in collaboration with Facilities Office, GGD, Green Office.	Governance innovations & Policy Learning and capabilities
Participation employees more plant-based	Drawing up plan for employee participation in transition to plant based.	Governance innovations & Policy Social innovations Learning and capabilities

Pilots plant based	Conducting several plant-based pilots within own organisation	Governance innovations & Policy Research/Monitoring Learning and capabilities

B-5.3 Circular operations in 2030 and maximum circular use of materials in public spaces

The municipality can use its purchasing power to encourage circular production. This requires circular principles to be included in tenders. Recently, therefore, the CO_2 performance ladder has been applied to tenders. The CO_2 Performance Ladder is a widely accepted tool used to map the CO_2 emissions of a project or organisation. It is a CO_2 management system for organisations, so it is also used in tenders.[44]

For a circular business, the organisation needs to evolve. It requires systemic change and a different way of thinking. It requires all civil servants, especially those who procure and order, to be mindful of reducing procurement. Always asking themselves: 'is it necessary to order this?' This includes small materials (e.g. office supplies) as well as larger appliances. The premise is simple: anything that does not need to be produced reduces the pressure on the environment. By purchasing reusable and repaired products, the municipality reduces waste. Therefore, less needs to be incinerated or landfilled, which in turn reduces emissions to air and soil.

The ambition is to buy 20% less stuff within the municipal organisation by 2030. Besides reducing procurement, we are exploring the possibilities of 'Product as a Service'. Purchased products that are not reusable or repairable should at least be (high-quality) recyclable. Municipal buildings are full of valuable materials that can be reused. They are the raw material depots of a circular economy. [45]

For every object in the public space, it must be known where it is located, how it was built and what materials it is made of. In short: each object should have its own passport. To gain this insight, the Materials Passport Task Force was set up. Several organisational units are already working with material passports in different sectors, such as construction, utilities and public spaces. The task force brings together the knowledge and expertise of these organisational units. Since a materials passport is a digital tool, colleagues involved in digitisation, research and innovation are also involved. The aim of the task force is to bring together the experience and knowledge of each organisational unit involved, to learn together from practical examples and ultimately to arrive at a joint approach.[46]

In public spaces and construction, too, it is imperative that prior to development, we investigate whether it is really necessary. For example, instead of new structures, can we extend the lifespan of existing buildings? Or can we make (parts of) municipal assets available for use elsewhere?[47]

Impact pathway	Circular organisation
Early results (1-2 years)	50% circular procurement by 2025
Later results (by 2030)	100% circular procurement by 2030 100% circular operations by 2030 In 2030: 20% reduction in consumption
Actors involved	City of Amsterdam
Scale	City of Amsterdam
Comments on feasibility and progress	Many actions have already been or are being initiated and stem from established policies.
Renewable energy generated	
Energy consumption avoided or replaced	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	

[44] Sustainability Report 2023
[45] Implementation Agenda Towards a Sustainable Organisation 2020-2030
[46] Sustainability Report 2023
[47] Implementation Agenda Towards a Sustainable Organisation 2020-2030

Total cost and cost per tonne of CO2e	
Co-benefits	Cost reduction Reduction in waste and waste transport Awareness within organisation
Policy document(s)	Circular Implementation Agenda 2023-2026 and more Sustainable Organisation Implementation Agenda Our city of tomorrow

Actions for Circular organisation

Action	Short description	Levers of change
Sustainable public procurement	Sustainable procurement for public space (Measure 27)	Governance innovations & Policy Funding and financing
Sustainable procurement and tendering of assets	Sustainable procurement and tendering of assets (Measure 14)	Governance innovations & Policy Funding and financing
Material use and reuse in public space	Material use and reuse in public space (Measure 28)	Governance innovations & Policy Technology and Infrastructure
Separating municipal commercial waste	Separating municipal commercial waste	Governance innovations & Policy Technology and Infrastructure
Mapping material flows	Mapping material flows	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Reducing paper use	Reducing paper use	Governance innovations & Policy Social innovations Technology and Infrastructure
Research on development costs and investment	As part of the Circular Economy programme, the possibility of making development costs part of property investment and capital costs is being investigated.	Governance innovations & Policy Research/Monitoring Funding and financing
Research on cost recovery of circular building materials	Investigate key figures and standard costs for 'Total Cost of Ownership' - determination when applying circular building materials. This includes exploring the environmental cost indicator (MKI) cost recovery for innovative materials choices.	Governance innovations & Policy Research/Monitoring Funding and financing
High-quality reuse of renovation and demolition materials	When renovating and demolishing our buildings, we try to reuse the released materials in a high-quality manner.	Governance innovations & Policy Technology and Infrastructure
Research on materials passports for existing buildings	We will investigate the possibilities and conditions for creating materials passports for existing buildings as well.	Governance innovations & Policy Research/Monitoring Technology and Infrastructure
Living lab life extension for bridges and quay walls	In a living lab, life-extending solutions for repairing bridges and quay walls will be explored and applied together with market players.	Governance innovations & Policy Research/Monitoring Democratisation and participation
Reducing consumption	The municipality will also reduce its consumption by 20%, starting with consumables and furnishing its own premises and, where possible, those of social property.	Governance innovations & Policy Technology and Infrastructure

Using less stuff	Amsterdam itself will use less stuff, repair more and engage in circular procurement.	Governance innovations & Policy Social innovations
Presenting true price procurement behaviour	The municipality will lead by example and present the true price of its own procurement behaviour by 2025. This is an extension of the carbon price included in tenders.	Governance innovations & Policy Social innovations Funding and financing
Less procurement of new IT hardware and furniture	The municipality will lead by example and purchase less new IT hardware and furniture.	Governance innovations & Policy Social innovations
Repairing more often	We are going to make our own furniture, laptops, phones, tablets, etc. last longer, including by choosing repair more often.	Governance innovations & Policy Social innovations
Green ICT Action Plan	For making ICT more sustainable, the Green ICT Action Plan was drawn up, which the City Council took note of on 20 April 2023.	Governance innovations & Policy Social innovations
Framework contract building circular schools	The municipality will lead by example by concluding its own framework contract for the construction of 30 new (school) buildings on a circular basis. The first nine circular schools will be tendered from 2023.	Governance innovations & Policy Technology and Infrastructure
Reuse of building materials	The municipality sets a good example by reusing suitable existing building materials when renovating and maintaining its own properties and/or using new organic or used building materials, as in the case of the educational institution Stichting MK24 at Mauritskade 24.	Governance innovations & Policy Technology and Infrastructure
'Reuse unless…' for material use in the built environment	The municipality will set the right example by applying the 'Reuse unless ...' principle for the use of materials in public spaces. For better materials management, we will provide new ICT systems and storage space.	Governance innovations & Policy Technology and Infrastructure
Setting up action frameworks for circular procurement	Setting up concrete action frameworks for sustainable procurement.	Governance innovations & Policy
Circular organisation	We will ensure that the municipal organisation is able to operate circularly by 2026.	Governance innovations & Policy Social innovations

B-5.4 Climate-resilient buildings and (courtyard) areas

The municipality's first priority is to make our buildings more sustainable (energy efficient, natural gas-free) and to put solar panels on the roofs. Climate-adaptive measures contribute to the future-proofing and thus value preservation of our buildings. Therefore, when carrying out major maintenance, it is wise to also investigate what climate-adaptive measures can be taken. That way, we make work with work and avoid capital destruction.

B-5.4.1 Making the municipal organisation climate adaptive

Impact pathway	Making the municipal organisation climate adaptive
Early results	The municipality leads by example
Result	By 2030, all courtyard gardens and roofs of municipal buildings will be climate adaptive
Actors involved	City of Amsterdam
Scale	Buildings
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023

We want to structurally integrate climate adaptation into all the work of our organisations. It needs to be considered 'normal' that climate-adaptive thinking and action is a standard part of our processes and ways of working. We strive for employees to be aware of what impact their work has on the city's climate resilience. The following is a selection of activities undertaken to structurally integrate climate adaptation into our operations and management[48].

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[48] Climate Adaptation Progress Report

Actions for Making municipal properties climate adaptive

Action	Description	Levers of Change
Research on costs for green roofs	The municipality will look into funding and maintenance costs for green roofs, facades and courtyard gardens.	Research/Monitoring Funding and financing
Nature-inclusive development and management of roofs and facades	Greener and nature-inclusive development and management of the roofs and facades of buildings and adjacent land owned or used by the municipality of Amsterdam.	Governance innovations & Policy Learning and capabilities
Green tendering and procurement	Committing to greenery and nature inclusiveness in tenders or procurement processes.	Governance innovations & Policy Funding and financing
Maintenance and climate adaptation will be intertwined	Each project considers whether climate adaptation measures are necessary. An appropriate set of climate-adaptive measures will be established for the different types of maintenance. Linking climate adaptation to maintenance work in this way makes the city a little more climate-adaptive with every maintenance project.	Governance innovations & Policy Technology and Infrastructure
Climate adaptation as part of 'Sustainable, unless' decision-making	When this way of working is successfully rolled out, it means that every physical project that is started should also be realised in a climate-adaptive way. Only under specific circumstances can an exception to this be made, and this exception must then be ratified by an official in a resolution. This way, structural attention is paid to the topic of climate adaptation within projects.	Governance innovations & Policy
New and quicker insights through the QuickScan climate adaptation	This gives project teams insight into climate adaptation risks and opportunities at the very start of a project, allowing them to estimate the costs of possible measures in a timely manner. With further development, initial risk assessment can be done faster and at a lower cost.	Governance innovation & policy
We share knowledge and good examples with each other	We are continuously raising awareness about climate adaptation. Increasingly, knowledge exchange and advice on how best to incorporate climate adaptation is taking place. Both internal and external communication and knowledge sharing play a major role here. Through knowledge tables, learning pathways, presentations and a news series on climate adaptation plans, we aim to make all organisations involved with us more 'climate literate' in the coming period.	Learning and capabilities

B-5.5 Sustainable thinking and action

Sustainable Thinking and Action
Awareness starts with behavioural change. Everyone can behave sustainably in the workplace: there is a great opportunity to achieve a new normal here.

It goes without saying Act Sustainably and separate your waste, work paperless and use materials and energy sparingly. We reduce CO2 emissions, energy and resources by behaving differently. With the right knowledge and communication message, behavioural change leads to greater awareness, or: Sustainable Thinking. Sustainable Thinking and Action influence and reinforce each other. When we feel the urgency and necessity of sustainability, it becomes more natural to include sustainable principles in carrying out our work.

Doing what we say and saying what we do
What we ask of the city, we as an organisation must also do ourselves (Sustainably). The sustainability transition is complex. Within our own operations and in our own premises, we have the opportunity to experiment. New successes we can share with the market. This requires the organisation to stimulate and facilitate (its own) initiatives. And that employees know what the organisation is already doing in terms of sustainability. Sharing good examples is an important tool to inform and inspire each other. Sustainability is an increasingly important factor in being an attractive city or employer. If we want to present ourselves as a credibly sustainable municipality, we need to show internally and externally what the municipal organisation is already doing and what it is not (yet) doing.

Sustainable Civil Servants Network
The network of sustainability ambassadors has broadened and evolved, continuing under the name Sustainable Civil Servants Network (DAN). Colleagues from across the organisation can join this to exchange experiences on making their departments more sustainable. The urgency to become more sustainable is felt by more and more colleagues. Some 1,200 officials signed the 'fire letter' – addressed to the CMT – stating that we need to do more to meet our sustainability ambitions. By now, it is clear to almost everyone: things have to change. The City Management Team organised the first climate event on 14 December with the aim of exchanging ideas, gaining inspiration and exploring together what we can do to accelerate sustainability in the city and in our own organisation. This event generated a lot of energy and ideas. Of all these ideas, 10 were further developed in the second climate event, which took place on 14 February 2023. The climate event on 14 December included a call to claim 'climate time'. After all, sustainability requires systemic change, and that takes time. Colleagues indicate that they are now often consumed by the issues of the day; that sustainability is still perceived as something extra and non-committal; and that insufficient urgency is felt by managers or other colleagues.

Sustainable procurement framework
A Sustainable Procurement and Contracting Action Framework was developed and established in 2022. This action framework is a concrete translation of the 'Procurement with Influence' and 'Procurement for Amsterdam' procurement policies. The action framework provides concrete tools for buyers and clients to translate sustainability policy into procurement[49].

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[49] Sustainability Report 2023

Impact pathway	Sustainable thinking and action
Early results	The municipality leads by example
Result	By 2030, we will be a circular, climate-neutral organisation and generate our own energy to the maximum extent possible.
Actors involved	City of Amsterdam
Scale	Own organisation and the city
Comments on feasibility and progress	
Renewable energy generated	
Removed/substituted energy, volume, or fuel type	
CO2e emissions by emission sector	
Offset CO2e emissions (biologically or technologically fixed)	
Total cost and cost per tonne of CO2e	
Co-benefits	Awareness within organisation Health benefits Safety Improved liveability of the city Increased biodiversity Improving and exploiting ecosystem services Improving the quality of the living environment; and Increased biodiversity
Policy document	Green vision Climate Adaptation Progress Report 2023

Actions for Sustainable thinking and action

Action	Description	Levers of Change
Platform for a sustainable organisation	Green Office reports annually on progress on carbon and energy footprints, initiatives taken and progress on measures and provides advice where necessary. We also work on knowledge transfer, employees' sustainable thinking and actions, an ambassadors' network and making our own sustainability and climate goals visible internally. To this end, Green Office has an informative intranet page, a newsletter and an active Tamtam page.	
Advice on learning and development programmes Sustainable thinking and action	Various subject-specific courses and workshops, training courses, working methods and roadmaps for sustainability are available in the organisation. These were developed bottom-up and intended for one's own department. To unlock the knowledge from the existing offer, Green Office makes a recommendation for the provision of training and education accessible to all employees, and we remain in dialogue to retrieve the needs of employees.	
Green Colleges and Green Screens	During Green Colleges, internal and external professionals explain issues about sustainable thinking and action, energy, CO2, circularity and climate adaptation. It also translates what some see as abstract goals to their own organisation and employees' own work. Green Screens are screenings	

	of documentaries or informative films on a sustainability or climate topic. All colleagues can attend both lectures and films.	
Every department sustainable	Often, the opportunities for sustainability are less obvious. Through the workshop 'Make your department sustainable', Green Office makes departments aware of their opportunities to become more sustainable. The workshop helps to identify the steps to be taken and build support. With information on the impact to be achieved and advice on measures to be taken, departments receive support in their sustainability task.	
Toolbox for Ambassador Network	Periodically, we organise meetings that we conclude with a networking meeting. We meet to exchange news from the organisation, figure out sustainability issues and for lectures, workshops and master classes. The aim of these meetings is to inform, encourage and enthuse the ambassadors and, through this network, to break down the partitions between departments.	
Behavioural interventions	Municipality-wide behavioural campaigns and interventions stimulate colleagues to get involved themselves and teach them how to make sustainable choices. In this way, we also create a visible joint responsibility for employees. Where possible, we link up with national or urban behavioural change campaigns.	
Stimulating and facilitating initiatives	Green Office stimulates, advises and implements projects to make business processes more sustainable. Where possible, Green Office also encourages and facilitates initiatives taken by colleagues themselves. Waste separation in municipal premises is now possible. The new banqueting (vegetarian is the norm) and catering (80 percent vegetarian) makes choosing more sustainable drinks and lunch easy. Green Office stimulates managers to appoint an ambassador or sustainability coordinator in their department.	
Internal and external sharing of internal successes	Sustainability successes are shared via interviews with colleagues on intranet and Tamtam, on the internet as a Sustainable Example, externally as a case study on New Amsterdam Climate and Rainproof, on Green Office LinkedIn, on Duurzaam020 and in the Green Office newsletter (internally over 1,000 colleagues) and Duurzaam020 (externally).	
Indoor communication	It is important for employees to know what is sustainable in the premises where they work. We share that information through displays, posters, campaigns, information boards, et cetera.	

B Indicators for monitoring evaluation and learning

In the integrated monitor, we report on progress on the objectives below. Based on this monitor, we evaluate the progress and see where policies can be improved or need to be more ambitious. This first integrated monitor is currently being worked on (September 2024). The specific progress indicators on each objective, and the status of the individual objective, will therefore not be described here.

The targets that will be measured are:

- 100% natural gas-free or transition-ready municipal property by 2030
- 260,000 natural gas-free WEQ by 2030
- 1,500 WEQ in investment decisions by 2024
- WPW grid emissions to 0 in 2040
- By 2035, 110,000 homes connected via Warmtemotor (now Warm Amsterdam)
- 3% annual CO2 reduction by 2023 among housing corporations
- 400/120 energy scans business/social buildings in 2024
- Reach 14,000 to 28,000 households with energy-saving service
- Supporting more than 2,000 HOAs to make homes more sustainable
- Give energy-saving advice to 4,000 owner-occupiers in priority neighbourhoods
- Energy-neutral construction
- More medium-voltage rooms and installed power substations (target values to follow)
- Renewable generation (550 MW solar by 2030)
- At least 15 MW of solar power generation by 2030
- 100% of all suitable roofs covered with solar panels (1100 MW) by 2040
- At least 15 MW of solar power generation by 2030
- Climate neutral (all scope 1 and 2 emissions avoided and/or offset) in 2030
- Energy consumption reduced by at least 37% compared to 2018 by 2030
- All motorised traffic on Amsterdam roads zero-emission by 2030
- The realisation of an additional 10MW of wind energy by 2030 by the Port Authority and using all suitable rooftops for solar panels
- 100 MW electrolysis plant by 2024
- CO2 capture AEB: achieve annual reduction of 500 ktonnes CO2 by CCSU by 2030
- From 2050, the Port of Amsterdam will be a fully sustainable energy and fuel cluster with green hydrogen, biofuels and synthetic fuels. We aim to phase out fossil fuels before 2050.
- There will be no more coal storage and transhipment in the Amsterdam port by 2030.
- Air quality should meet the (2005) limit values on annual average concentrations of particulate matter (PM2.5 and PM10) and nitrogen dioxide (NO2) WHO advisory standards in 2030
- Tightening current environmental zone for passenger cars to from emission class 5 (diesel) from 2025
- 100% zero-emission fleet by 2030
- 100% zero-emission own scooters by 2030
- 100% zero-emission own passenger cars by 2030
- 100% zero-emission own forklifts by 2030
- 100% zero-emission own small sweepers by 2030
- 100% zero-emission own boats by 2030
- 100% zero-emission own waste trucks by 2030
- All motorised traffic on Amsterdam roads zero-emission by 2030
- (Public transport) buses zero-emission by 2025
- Zero-mission area within Ring A10 for buses (public transport buses and coaches) by 2025
- Zero-mission area within Ring A10 for taxis by 2025
- Zero-mission area within Ring A10 for vans by 2025
- Zero-mission area within Ring A10 for trucks by 2025
- Zero-mission area within built-up areas for mopeds and motorised bikes by 2025

- Entire inland water/centre area zero-emission for waterborne transport by 2025
- All passenger vessels on the Amsterdam
- inland waterways should be zero-emission by 2025
- For recreational vessels, the ambition is to have zero emissions in the centre by 2025.
- From 2030, all recreational vessels throughout
- Amsterdam should be zero-emission.
- Shared cars fully electric by 2025
- Mobile tools and aggregates as little emission as possible by 2025
- Mobile equipment zero-emission by 2030
- Small equipment (<19kW) zero-emission from 2023
- All GVB ferries zero-emission by 2030
- Reduce nuisance and emissions from wood burning
- Amsterdam optimally equipped for pedestrians, cyclists and public transport by 2040
- Noise below preferred limit value (or below limit value after consideration process)
- Noise level is below 55 dB
- Expand public charging network to 18,000 by 2030
- Expand the number of fast charging points for cars and vans to 800 by 2030
- Expand total number of charging points to 82,000 by 2030
- Expand total number of truck charging points to 2,800 by 2030
- Expand total number of charging points for passenger shipping to 550 by 2030
- Expand the number of depot chargers for public transport buses to 240
- Expand the number of opportunity chargers for public transport buses to 51
- Expand the number of charging points for passenger cars (including taxis) to 65,000
- Expand the number of charging points for vans to 17,000
- Park-like, public area no more than 10 minutes' walk from any home in 2050
- Large green area no more than 15 minutes' cycling from any home in 2050
- Plant trees wherever possible and desirable
- Achieve the green standard (in renewal and existing city)
- Manage recreational lawns in the city so that at least 25% of the surface consists of flowering plants
- Area of paved public space will decrease in coming years
- Biodiversity is protected and enhanced
- Ecological management is the standard in 2030
- Nature-inclusive new construction and renovation is the standard
- Implementation of statutory duties for transporting/sheltering stray animals
- Resolving ecological bottlenecks and stimulating initiatives.
- Promote
- nature-inclusive construction.
- Reduce fish mortality
- Improve conditions for meadow birds
- Minimise negative effects of light (pollution) on wild animals.
- Minimise negative effects of storm drains on wild animals.
- Employees of the municipality act in accordance with the Flora and Fauna Act and the
- Amsterdam code of conduct
- Prevent disturbance to wild animals at outdoor events.
- Prevent animal suffering due to extreme weather conditions.
- Shelter for
- needy and non-
- self-reliant wild
- birds and mammals.
- Help owners improve the mental and
- physical health of (domestic) animals.

- Improve ecological water quality in ponds and ditches through better bank design, dredging and fish stock management
- Designate rest areas where aquatic ecology can develop
- Create more nature-friendly banks/embankments, both below and above water
- Realise more connections between green-blue areas in the city
- Use of deep surface water
- for cold storage for district cooling.
- Integrated and sustainable design of surface water
- Innovative and sustainable use of water
- Efficient and effective asset management of dewatering resources in practice for active groundwater management in 2025
- All courtyard gardens and roofs of municipal buildings climate adaptive by 2030
- Preventing damage and nuisance caused by extreme rainfall as much as possible and using rainwater for the city's liveability
- Minimising the effects on people, animals, environment, economy and infrastructure in extreme heat.
- Be prepared for prolonged periods of drought to prevent or minimise damage to buildings, greenery, wet and dry infrastructure and dykes.
- Reduce flood probability and consequences
- In 2030: 25% food produced regionally and sustainably
- Stimulate fair and sustainably produced, healthy offerings
- Leverage the diversity of cuisines in the city in organising awareness about healthy and sustainable eating
- Reduce food waste by 50% by 2030 compared to 2015.
- Connect 75% of Amsterdam households to separate collection of kitchen and garden waste by 2030.
- 60% vegetable and 40% animal proteins by 2030
- 50% circular procurement by 2025
- 100% circular procurement by 2030
- 100% circular operations by 2030
- In 2030: 20% reduction in consumption
- Reduced the environmental impact of textiles, electronics and furniture by 2030
- Good circular infrastructure before 2023
- Campaigns encouraging less consumption
- We ensure that waste is treated with the highest possible quality.
- Amsterdam's public spaces are sustainably managed and are accessible, whole and safe for all users. We manage and maintain our pavements, street & play furniture and bus stations.
- From 2022, all new designs for area developments (including transformation) and public spaces in Amsterdam will be based on circular criteria
- From 2023, the municipality of Amsterdam will use circular and social criteria when working on buildings and in public spaces
- Wooden or bio-based main load-bearing structures in 20% of new residential buildings by 2025
- 50% of renovations carried out according to circular principles from 2030
- All new designs for area developments (including transformation) and
- Public spaces in Amsterdam based on circular criteria from 2022
- 100% circular economy by 2050
- 100% waste-free city by 2050
- Amsterdam is a clean city
- Amsterdam is a clean city
- We clean public spaces (where it matters)
- We ensure that residents and businesses can dispose of their waste properly
- We collect waste efficiently and sustainably
- We support co-management and are committed to prevention

- Amsterdam prevents (residual) waste.
- City without plastic pollution by 2030
- 30% reduction of plastic litter on land and in water by 2023
- 50% reduction of primary abiotic raw materials use
- Sustainable thinking and action

Part C – Enabling acceleration of climate action

C-1 Governance innovations

We feel responsible
As one of the most prosperous cities on earth and the capital of the Netherlands, we have a responsibility to make a substantial contribution to the transition to a more sustainable world. Amsterdam has strong cards to play for this. We are a compact and densely built-up city, so there is plenty of support and opportunities for collective solutions that are efficient and sustainable. Amsterdam is also a smart and creative city with a deep-rooted commercial spirit. The city has a high density of knowledge-oriented companies and institutions, making it a breeding ground for innovation. The unique combination of creativity, innovation and entrepreneurship makes Amsterdam a city that can handle big changes. Amsterdam will continue to prosper in the future if we work together, residents and businesses, to use precious resources as efficiently as possible and we create new sustainable products to meet a growing demand for sustainable solutions.

Doughnut thinking
Even in our city, the impact of the energy transition is not the same for everyone. Some residents or neighbourhoods are more vulnerable or benefit less from the opportunities offered by the energy transition. The Amsterdam municipality wants this transition from fossil to renewable energy to take place in an equitable manner. The assumption is that housing costs for low-income and middle-income households will not increase due to the costs of energy transition. Climate justice is a guiding principle. We aim for a fair distribution of benefits and burdens, open access to the decision-making process and fair opportunities in a changing labour market. We apply this principle in implementing the roadmap, and we assess and test our own actions against this principle.

Taking the lead
We see it as our main task to be the director of the process of becoming sustainable as a city. Without incentives, government control, top-down regulation and hard agreements with the larger parties, we will not meet our CO2 targets. We see it as our job to set clear public goals for the city as a whole. What do we want to achieve and what are important steps to get there? With Our city of tomorrow, and underlying visions, ambition documents and implementation agendas, we create insight into what is happening and monitor progress.

For the part of the task for which we are responsible, we set targets that we as a municipality can be held accountable for. Such as making one's own organisation more sustainable. Where collective solutions are needed, we take the lead. Consider building a city-wide heat grid. We expect other parties to take up their share of the task. We will support that as much as possible. If parties do not act or do too little, we as a municipality eventually deploy regulations. Or we urge the state or province to (enable) more binding legislation or rules. Soon, for example, we will enter into administrative agreements with the central government that should make it easier to make HOAs more sustainable.

The municipality and other authorities ensure compliance with these rules. By direction, we also mean initiating and maintaining effective forms of cooperation between co-governments, market players, social parties and residents. We organise talks, bring parties together and thus provide direction and cohesion.[50]

C-1.1 Sustainable, Unless
In its budget, the City of Amsterdam works with various programme lines, consists of 50 departments and even more subdivisions. Since 2023, sustainability has been integrated horizontally throughout the organisation. This means that everyone applies the 'Sustainable, unless' principle in their own domain.

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[50] Amsterdam Climate Neutral 2050 Roadmap

Our existing organisational structure makes acceleration difficult. We are well aware of that. Despite good intentions and a commitment to integrated working methods, we and others see that we still often work in a compartmentalised way. Therefore, we are innovating within our organisation to best facilitate these transitions. At the same time, this compartmentalisation is functional. Amsterdam is big, and if you want to get something done you cannot always coordinate with everyone. However, if we don't make sustainability everyone's responsibility, the transition will not succeed. Therefore, however counterintuitive, we need to work in a more integrated way to accelerate sustainability.

C-1.2 Strategic Coalitions with the city for sustainability

The complexity of sustainability and the (political) playing field demand that we as a municipality organise more ourselves. By forming strategic coalitions, we hope to improve connectedness within the city and make our execution more robust. The municipality is committed to making Amsterdam more sustainable. In this context, we want to make visible the support of various urban parties. The aim is to get their willingness to support and document how they contribute to a sustainable city, for example using the statement of support we got for the commitment document.

By building strategic coalitions with various parties in Amsterdam, we aim to gain support for urban sustainability policies, understand what people are already doing and find opportunities to work together on their contribution to a sustainable city of tomorrow. What we have collected in it will be presented at an event. It would be a nice step to do that when we get the mission label.

By understanding the ecosystem, we also want to be better able as a municipality to play a facilitating role in the sustainability process and be able to connect actors. Partly for this reason, we want to organise a closing event with signatories and the alderperson for sustainability to signal Amsterdam's continued maximum commitment to sustainability.

C-1.3 Changing finance by financing change

The financial system is part of the economy and concerns the flow of money in society - globally, nationally, and locally. Currently, these flows anchor a fossil system and encourage economic development that increases vulnerability, and therefore potential costs, to climate change. At the same time, these flows also play an important role as vital infrastructure in the change to an emission-free system and long-term adaptation to climate change. Financial institutions play a crucial role in the necessary economic transition because they ensure that sufficient financial flows (credit and investment) are available for businesses and residents to realise the transition. In the Amsterdam Agreement 2022-2026, the coalition expresses its desire for a leading role in Sustainable Finance. As a municipality, we are currently exploring what role we want to play in promoting sustainable finance. This exploration is designed from the mindset of 'changing finance to finance change'. In doing so, we look at both the funding needed for change and the change in the financial sector itself.

On the one hand, this refers to the resources needed to realise the task of sustainability, because the municipality cannot finance this task on its own. That means looking for innovative financing options, using equity, loans taken and other methods of financing, valuation and forms of ownership and management of money. In addition, there are many stakeholders, such as citizens, businesses, that the municipality can collaborate with on this change, including the necessary funding.

And on the other hand, this refers to the financial sector itself having to change for the sake of the sustainability task. That means examining our own cash flows - and the methods by which these cash flows are managed and deployed - in light of the municipality-wide task of sustainability and thereby leading by example. Consider, for example, the use of carbon pricing and the use of Avoided Costs methodology. But also addressing and seeking out the financial sector that is inherently linked to the city to strike a balance between profitability and financing long-term sustainability transitions.

C-1.4 Active shareholdership for the sake of the sustainability challenge

The council letter Our city of tomorrow includes the ambition to engage as an active shareholder in favour of the sustainability challenge. The aim of the active shareholdership process is to gain insight into the current sustainability developments of the participations and how we as shareholders can

focus on this. We answer questions such as: what is already being done in the participations in terms of Corporate Social Responsibility (CSR)? What issues are the participations facing during implementation? And what tools can we as a municipality use to accelerate the task?

This results in an understanding of the opportunities that exist in our participations, and the room we see in our role as an active shareholder to focus more on this issue, with a number of concrete proposals for selected participations to accelerate sustainability. We are already fulfilling this role, for example through the active role we are playing as a shareholder in the current port vision and strategy review, based on our municipal port vision. Or through the recently released position paper Schiphol, in which we, as an active shareholder, give our view on the development of the airport and aviation.

Actions for Leadership in sustainability

As an active shareholder, we are committed to making participations in which Amsterdam has a stake more sustainable. (OSVM)
We want to understand the impact of policies and actions on key economic, ecological, spatial and social themes, so that we can manage them, make qualitative considerations and arrive at transparent choices (on broad prosperity). (OSVM)
Unequal investment for equal opportunities in climate transitions, position of vulnerable groups improves (see 4 points p.14). (OSVM)
Explore social impact of (policy on) the energy transition and what is needed to make the transition fair. (OSVM)
Lobby with the central government for standardisation, pricing, climate justice, phasing out fossil subsidies (OSVM)
We are looking at a smarter and more efficient combined use of municipal, national, European and private resources to pay for making the city more sustainable, also in the longer term. (OSVM)
"Climate consultation: Alderperson Pels will set up a climate walk-in clinic to make it as easy as possible for residents and businesses to engage in conversation about their concerns and solutions."
Participation in the Coalition for Disaster Resilient Infrastructure (CDRI) irt Climate Adaptation
AMS Project: Ideal(s) City

C-2 Doing it together and conversation with the city

For the City of Amsterdam, it is evident that the transition to a sustainable city can only succeed if we do it together. That is why we work with partners inside and outside the city and our residents in various ways to make them more sustainable. Within our city, we do so in several ways described below.

The conversation with the city[51]
The New Amsterdam Climate Accord grew out of a series of more than 1,000 conversations we had with Amsterdam residents in 2019. This 'conversation with the city' was announced in the Amsterdam Climate Neutral Roadmap: step 1 that we published in early 2019, subtitled 'The invitation to the city'.

We conducted the talks across the full breadth of Amsterdam society: shopkeepers, residents, homeowners' associations, large and small companies, sports associations, museums, hospitals, industry, energy cooperatives, churches, neighbourhood associations and many more. It became clear that the bottom-up energy transition is already in full swing.

The talks resulted in the Amsterdam Climate Accord of June 2019: an alliance of the city to work together towards a climate-neutral Amsterdam. At the same time, the online platform New Amsterdam Climate was launched. On the platform, residents, businesses, institutions and the municipality show what they are currently doing to make the city sustainable. Since then, more than 180 sustainable initiatives have been included in the Amsterdam Climate Accord. These initiatives contribute to reducing CO2 emissions by saving energy and generating clean energy and making the city more sustainable. Working together on our city of tomorrow does not stop here.

For instance, in 2022, we organised a mini citizens' council to ask citizens for advice to collect additional sustainability opportunities for the CO2 reduction task. At the citizens' meeting, 21 measures were devised, 10 of which can contribute to the CO2 reduction targets in scope 1 and 2. Some measures are, or were, incorporated into established policies, while others require further research.

The Food Strategy was also created in cooperation with various partners from the field (initiators, social organisations, entrepreneurs, knowledge institutes and networks), the province of Noord-Holland, the MRA Food Council and Voedsel Verbindt. This was done by including them in the creation of this implementation plan and soliciting their feedback on it, including through a meeting with a core group of stakeholders, various interviews with involved individuals and organisations, as well as an inventory of barriers from the Food Strategy 2019-2022.

Amsterdam will organise a citizens' council on the topic of waste in 2024, where residents and entrepreneurs will discuss the city's waste challenges with each other, experts and civil servants. The citizens' council will formulate proposals to be submitted to the City Council by the college.

Broadly speaking, the city's circularity is a sum of everyday choices, such as how we live and work. That is why the involvement of our city's more than 918,000 residents is key in shaping the transition to a circular Amsterdam. In this implementation agenda, we make room in the coming years to experience together what an alternative, circular future looks like. We enable initiatives by social organisations and residents to flourish. We do this not only because these initiatives add value, but also to learn where the greatest needs and opportunities lie. We are already having that conversation on a daily basis through numerous contacts the municipality has with Amsterdam residents, and this will intensify through the citizens' council on waste, the innovation relay with events and when developing the support schemes announced in this implementation agenda.[52]

Diverse groups of Amsterdam residents were also heard in the making of the environmental vision, which guides Amsterdam's development perspective. They pointed out, besides issues such as

[51] Roadmap p.161
[52] Circular Implementation Agenda p.30-31

sustainability, accessibility, affordability and meeting, the importance of being able to co-determine what the city and neighbourhoods will look like. This involvement is essential, because we make the city together. The turbulent growth of the past decade has caused alienation, the feeling of losing one's neighbourhood. Participating gives Amsterdam residents a chance to take back their city. In this vision, the city board makes choices that will sometimes hurt. Sometimes existing interests and space users have to make concessions. The choices have been made on solid grounds, which reflects the character of this college, but good and better are debatable. The board is keen to engage further with the city on this in the coming years. How the environmental vision will have its effect in practice will be elaborated in an Implementation Agenda for the Amsterdam Environmental Vision.

Doing it together
The invitation to the city was the kick-off of an intensive process to explore and agree together with residents, businesses and institutions how to get this huge social transition done. An Amsterdam Climate Agreement was concluded and an online platform nieuwamsterdamsklimaat.nl was launched with over 200 initiatives for a sustainable city.

In the pursuit of a sustainable and climate-neutral city, the involvement and participation of all Amsterdam residents plays a crucial role. The City of Amsterdam is therefore actively committed to involving citizens, businesses and social organisations in the development and implementation of sustainability policies and beyond. For instance, the participation ordinance is currently being renewed.

In anticipation of national legislation, the municipality has had participation policies in place since 2021. In June 2024, the municipality will lay down the participation policy in a participation ordinance, thus replacing the consultation ordinance. The participation ordinance stipulates that in all plans of the municipality, you have to make it clear to everyone from the beginning when, on what and how they can contribute or participate. For all Amsterdam residents, but also for administrators and civil servants. Neighbourhood rights and a neighbourhood platform right are likely to become part of the participation ordinance in phases. The adoption of policies did not immediately initiate an organisational change. This requires creating awareness, motivating, inspiring, but above all actively managing change.

In addition, several initiatives to engage in dialogue and gather input are ongoing, such as citizens' councils and the discussions for the energy transition roadmap. To accelerate the transition to a climate-neutral city, movement is needed from within the city. Fortunately, this movement can be seen in many different ways: from energy communities to citizen initiatives for sustainable mobility, from entrepreneurs embracing circular business models to knowledge institutions researching green technologies. There are countless examples of Amsterdam residents working towards a sustainable and climate-neutral future. In order to, on the one hand, ensure that the municipality's sustainability policy is well embedded in the city and, on the other, be open as a municipality to acceleration *from* the city, we see the following opportunities:

- First, there is room for increased cooperation in the actual implementation of projects and policy-making. Amsterdam residents are increasingly coming up with their own ideas. The municipality sets up participation processes for all kinds of different projects, so that Amsterdam residents' ideas can have a place in them and the plans improve: resident participation. The way this is happening is changing. Not only at times when the municipality asks for residents' input, but also to facilitate Amsterdam residents with good ideas to develop their initiatives. With a focus on more structural cooperation with (groups of) residents: government participation and network participation. Joint implementation processes, such as sustainability coalitions, also offer opportunities for knowledge sharing, support building and innovative solutions from the bottom up.
- Second, more synergy in participation policies may be good. In the past, this was often fragmented across different sustainability domains. People got involved in energy transition or food, but not all at once. An integrated vision of participation, broadening the view to other themes such as circular economy, food supply and climate adaptation, can lead to greater involvement of Amsterdam residents, but also risks fragmentation. At the same time, it is also

a way of outlining a broader perspective in which individual transitions and other dossiers can reinforce each other.
- Third, the facilitation of sustainable community initiatives and collectives deserves attention. The strength of the Amsterdam community lies in the multitude of bottom-up sustainability initiatives. By actively supporting these initiatives, offering room for growth and providing the right preconditions, the municipality can make the most of and strengthen them. The municipality intends to focus on this in the coming years.

Looking ahead

This climate contract provides a comprehensive overview of what is currently being done in Amsterdam to make our city more sustainable. We will use the integrated monitor to see if this policy is adequate. In addition, we foresee that an update of the climate contract should take into account the following:

1 Adaptation of EU climate law, and subsequent policy
The European commission recommends introducing a 90% reduction target for 2040 at the European level. We endorse this recommendation as we see it is the CO_2 reduction needed to meet global climate goals. At the same time, Amsterdam policy currently envisages a linear reduction towards 2040 which means that existing policies will not be sufficient to meet this recommendation. What impact an introduction of 2040 targets has on Amsterdam, and whether additional local policies are necessary and feasible, depends on the specific target and choices made by member states and the European Parliament. The national outline agreement states that no decisive action will be taken in terms of European climate policy, so here we are extra dependent on good frameworks from the EU.

2 Introduction of a scope 3 target
As indicated in the Commitment document and Action plan, Amsterdam does not yet have a scope 3 reduction target. There are several reasons for this. For example, it is difficult to monitor and unclear what an equitable target would be. It is also still unknown what the upcoming EU 2040 target is, and what new policies are ambitious but achievable within the new national and European context.

Because Amsterdam does include a reduction in scope 3 emissions as a reason for various actions in the climate contract and as an important way of fulfilling its responsibility for places elsewhere, it is necessary to have decided in a subsequent climate contract whether a scope 3 target is desirable, and what would be a good target to express Amsterdam's responsibility with.

3 Strategic coalitions and the Amsterdam ecosystem
The drafting of this climate contract has shown that a lot is being done in Amsterdam. For the municipality and actors in the city, it is not always clear who is working on what. That full review is also impossible to make because of how much is happening, and almost always immediately obsolete after release. What is necessary, however, is for Amsterdam's sustainability system to act in a unified way, and to be able to make easy contact to grab acceleration opportunities in sustainability. In two years, the aim is to have made strides in connecting through the Strategic Coalitions action.

4 Climate budget
The budget methodology currently used by the municipality does not allow for insight into how much impact different aspects of the municipal budget have on the sustainability task. In a future college period, we want to offer the possibility of being able to manage the CO_2 impact of the programmes in the Amsterdam budget.

5 Integrated monitor
In order to manage the CO_2 impact of the municipal budget, it is necessary to be able to do integrated reporting on the progress of sustainability measures so that it can be made clear what exactly which programme line is doing. When the integrated monitor is finished, it will be able to do so, allowing municipal policy to be driven much more effectively by the board.

6 Improving the Investment plan
In parallel with improving our own budget system, we know that the municipality has insufficient funds to pay for the climate transition. For a next Investment plan, we want to take steps to make municipal

and urban climate policy more financeable by, for example, getting more private capital invested in the sustainability task. We will implement this by working on identifying avoided costs, and the various strategies associated with the actions around sustainable finance as described in the current Investment plan.

Annexes
Annex 1: technical Q&A JRC

This Q&A is meant as a technical annex to the action plan which provides clarity to several questions the European commission still has concerning which specific greenhouse gases and emission sources are included in our plans. Where there is a difference between information provided in the CCC and the annex, the information in the annex is leading.

Colophon

Annex 1: technical Q&A for the joint review committee

Introduction

Amsterdam is fully committed to the EU's 100 Climate-Neutral and Smart Cities Mission by 2030. We are taking all possible actions within our means and are even exploring bold and radical measures to accelerate progress toward this goal. To achieve the goals set out by the mission we also require support from other levels of government and actors. This is why we are convinced that the mission is necessary. It facilitates the radical change needed to get our continent within planetary boundaries.

How we contribute to this goal is described in our climate action plan. This Q&A is meant as a technical annex to the action plan which provides clarity to several questions the European commission still has concerning which specific greenhouse gases and emission sources are included in our plans. We also want to highlight that we are continuously developing additional climate action and have large ambitions concerning the circular economy which will have significant impact on our scope 3 emissions amplifying our existing efforts.

Clarify exclusions and inclusions in emissions targets and inventories:

Please clarify which emissions sources are included or excluded in your targets (and whether this applies to the inventories too). This includes clarifying if ETS facilities, industry, agriculture, waste, and transport emissions are fully, partially, or not included at all. Please specify geographic exclusions too. Please include justifications for excluding large emitters, ensuring all aspects of the city's emissions are considered in the strategy by 2050.

This is a request to all cities to run a screening of their CCC and clarify the inclusion or exclusion of:

- **ETS facilities**: please explain if they are fully included, partially included, excluded, and please quantify their absolute emissions (possibly whenever relevant, crucially in the baseline inventory used for target setting). This request also originates from the need to be able to scope the city's ambition in dealing with urban emissions (i.e. those not regulated through other schemes).

Clarification on the inclusion of ETS facilities

Almost all ETS facilities are included in our climate action plan. We do exclude emissions from electricity production and heat generation within our borders and instead account for consumption with national standards for carbon intensity of energy consumption. Power plants are counted towards the emissions of the national electricity and heating mix in the Dutch regional carbon reduction monitor. This prevents double counting of emissions. The Hemweg powerplant is therefore excluded to prevent double counting, and the waste to energy plant is included whilst falling out of scope in the EU ETS.

The list of ETS facilities in Amsterdam

Name	Company	Place	tCo2 2022	Comments
AEB Amsterdam (AVI)	AEB Exploitatie B.V.	Amsterdam	-	Not (yet) in ETS as of 2022
Amsterdam UMC, locatie AMC	Stichting Amsterdam UMC	Amsterdam	36.906	
Asfalt productie Amsterdam (APA) B.V.	Asfalt Productie Amsterdam (APA) B.V.	Amsterdam	6.322	
AsfaltNu C.V. Amsterdam (ANA 1)	AsfaltNu C.V.	Amsterdam	5.766	
AsfaltNu C.V. Amsterdam 2 (ANA 2)	AsfaltNu C.V.	Amsterdam	1.265	
Asfaltproductie Regio Amsterdam BV (ARA)	Asfaltproductie Regio Amsterdam B.V.	Amsterdam	4.876	
Bunge Netherlands B.V. Amsterdam	Bunge Netherlands B.V.	Amsterdam	60.964	
Cargill B.V. Multiseed Amsterdam	Cargill B.V.	Amsterdam	25.285	
Global Switch Amsterdam B.V.	Global Switch Amsterdam B.V.	Amsterdam	501	
HWC Amsterdam Driehoek	Vattenfall Power Generation Netherlands B.V.	Amsterdam	2.068	
Ketjen Netherlands B.V.	Ketjen Netherlands B.V.	Amsterdam	56.505	
Sonneborn Refined Products	Sonneborn Refined Products B.V.	Amsterdam	13.209	
Stichting VU	Stichting VU	Amsterdam	22.497	
TWC VU	Vattenfall Warmte N.V.	Amsterdam	-	
Vattenfall Centrale Hemweg	Vattenfall Power Generation Netherlands B.V.	Amsterdam	628.372	
Vattenfall HWC Boris Pasternak	Vattenfall Power Generation Netherlands B.V.	Amsterdam	152	
Amsterdam total			**864.688**	
Abbott Healthcare Products BV	Abbott Healthcare Products B.V.	Weesp	10.724	Not in scope in this iteration of the ccc, but added for thoroughness

Rationale and consequences of the exclusion of electricity and heating providers

Electricity and heat producers are excluded from the climate action plan. The exclusion is there to prevent double counting of emissions, as the emissions from these plants are attributed towards the national energy mix instead of towards emissions on our local level. The carbon intensity of this mix is then used to calculate local emissions based on consumption.

This is not necessarily advantageous looking at achieving our carbon reduction goals, as it excluded large developments such as the closure of our coal fired power plant in 2019. Furthermore, all our policies to advance roof-topped solar, wind or geothermal are only very indirectly helpful to reach our carbon reduction target and the mission goals due to how monitoring is done. On the other hand, it could be argued that this is fair. As Amsterdam is not large enough to produce all its own power within its borders sustainably it imports power from power plants outside the city and is also not the competent authority when looking at large power plants and the effective policies to make them more sustainable.

An exception is the inclusion of the waste to energy plant in our climate action plan. The choice was made to include it, due to how strongly intertwined the plant is with the city. The municipality owns 100% of the shares in the company operating the plant, and the plant provides many services to the city related to, for example waste management. Furthermore, the national bureau of statistics does not account for carbon emissions from the waste incinerator and its power production, thus no double counting happens.

Moving on to reference data for our baseline: our baseline is 1990, no ETS data exists for the facilities considering ETS was launched in 2005.

Industry, IPPU, and stationary energy: please clarify if the city has excluded:

- o IPPU – typically emissions from chemical reactions in manufacturing and non-energy uses of fossil fuels (e.g., cement and lime) or use of products (e.g., refrigerants).
- o The stationary energy component of industry (e.g., energy-related emissions of industrial buildings)
- o Both (IPPU and stationary energy)

Emitters excluded from this list are the gas-powered Hemwegcentrale owned by Vattenfall and the demolished coal power plant. IPPU is included with all greenhouse gases and emissions sources like non-energy related fossil fuels or use of products like refrigerants.

- **Agriculture, AFOLU and stationary energy**: Please note that AFOLU (e.g., enteric fermentation, manure management, land use changes) should be distinguished from the energy-related emissions of e.g. agriculture buildings.

We exclude the oxidation of peat soil (as per page 11 action plan, 20 kton). In this iteration we include emissions from livestock, and agricultural energy related emissions. However, most emissions

concerning soil are excluded. For specifics concerning the 382 emission sources please refer to our data-set on carbon emissions within the municipality of Amsterdam.

- **Waste, wastewater, stationary energy and respective Scopes**: Similarly to the above when excluding or including waste, please clarify if the decision applies to i) both solid waste and wastewater, ii) to waste only (non-energy related emissions from disposal and treatment of waste as a result of aerobic or anaerobic decomposition or incineration both if treatment occurs inside the boundary – Scope 1 – and outside of it – Scope 3); iii) to the stationary energy component of waste (e.g., emissions from waste-to-energy, where waste/wastewater material is used directly as fuel or converted into a fuel); iv) a combination of ii) and iii) or v) to specific scopes. If some scopes do not occur at all this has to be explained or it may be seen as a possible exclusion.

Emissions from waste and wastewater are included in the target in scope 1. Non-CO2 emissions are also accounted for in this context.

If facilities are located outside of our geographical boundaries they are not included in the 60% target, which concerns scope 1 & 2. The potential for scope 3 emissions from waste and wastewater are deemed very low compared to total emissions, due to the waste to energy plant and the main wastewater treatment facility being within municipal boundaries. Like mentioned in the ccc a target surrounding scope 3 is a political question which will be discussed in an updated or next ccc.

Currently the city has a scope-3 target for all emissions from the municipal organization and our current scope-3 monitoring practices includes all emissions resulting outside of Amsterdam as a result of the consumption of Amsterdam. If a scope 3 target concerning city consumption is set by fall 2027 it would likely follow the same logic.

The AEB-waste incinerator is included in our the baseline for 1990 and this iteration of the ccc. The choice was made to include it, due to how strongly intertwined the plant is with the city. The municipality owns 100% of the shares in the company operating the plant, and the plant provides many services to the city related to, for example waste management. Furthermore, the national bureau of statistics does not account for carbon emissions from the waste incinerator and its power production, thus no double counting happens.

- **Transport Scope 2:** please clarify its inclusions/exclusion, if it seems unaccounted for in the inventory.

Transport emissions consist mainly of direct emissions from fossil fuel use within municipal boundaries (scope 1), which are calculated based through a traffic-model enhanced with smart-phone data and based on real world measuring on key roads and waterways to be able to divide emissions from traffic per municipality in the Netherlands. We include scope 2 emissions stemming from electricity usage for electric vehicles (including tram train and metro). They are accounted for in our data-set of emission sources, available here for the category tram train and metro and via electricity consumption in the build environment with the national emission standards. Unfortunately, whilst scope-2 emissions via electricity usage are included, the way it is monitored at

a national level makes us unable to report specifically on the emissions of EV's. If the data becomes available to do so in the national regional monitoring system the emissions from electricity consumption to charge EV's will obviously be reported separately. Right now EV's are included, but within the larger category: built environment. Excluded are international shipping and aviation as per GPC guidelines.

- If **geographical exclusions** apply, please specify associated land area, population, and absolute emissions (possibly whenever relevant, crucially in the baseline inventory used for target setting).

In this iteration of the ccc we exclude Weesp, as data for 1990 and during the gap-analysis was unavailable. At a later stage we will include Weesp, this will cause a discrepancy looking at our 1990 data as that does not include emissions from Weesp. A solution to this problem will have to be found at a later stage, however the emissions from Weesp are covered by the same reduction targets as the rest of the city.

It is critical that exclusions and inclusions are very clear as concerns the city's target (i.e., the percent emissions reduction to be achieved with respect to the baseline year).

It is also important to clarify whether the same approach is reflected in the baseline inventory of if there is any mismatch between target and inventory coverage we should be aware of.

All emission sources except those excluded in the ccc are included. We use the choices from the national climate law, based upon the IPCC guidelines for national greenhouse gas inventories and the EU monitoring regulation No525/2013 (see here). This means we monitor all greenhouse gases, like CO_2, methane and N_2O (See page 11 of the climate action plan, and table 11 for excluded emissions).

To allocate national emissions to the local level we try to conform as much as possible to the global protocol for community-scale greenhouse gas emission inventories as published by C40. The roadmap to climate neutrality, and therefore our 60% in 2030, and 100% in 2050 targets concern the direct emissions within the city and the indirect emissions stemming primarily from electricity and heating consumption in the city.

1. **Quantify residual emissions by 2030 and residual emissions strategy**:

Please present an emissions gap table showing baseline emissions, projected reductions by 2030, and resulting residual emissions in 2030.

Please provide an emissions gap table or similar, showing baseline emissions vis-à-vis total emissions reduction 2030 and residual emissions in 2030 (absolute numbers, sectoral breakdown).

See our emissions gap graph with emissions in 2019 from the ccc down below.

## A-2.2 2030 CO2 reduction gap in Amsterdam
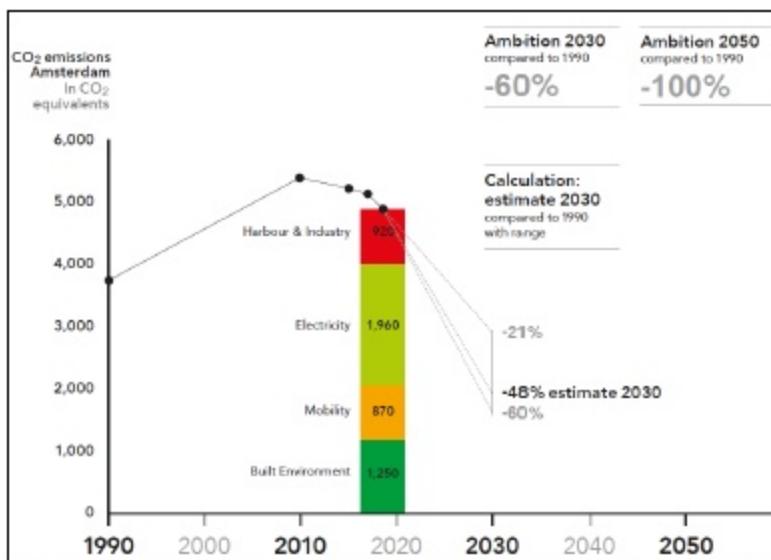
Figure 10: Estimation of 2030 emissions. (Amsterdam Climate Neutral 2050 Roadmap, 2020)

As described in the investment plan we are also working towards a citywide carbon budget, which will make clear how much responsibility different city budget programmes have towards the carbon mitigation targets. Because of this process, we will be able to deliver insight into sectoral carbon goals in the fall of 2027, as by then a political decision upon how these budgets should be divided will have to be made. This will be included in the ccc at that time.

In parallel to our city climate contract, we release a yearly climate report that provides an overview of the emissions reductions that will be reached through existing policy and efforts, and what share which efforts are providing. This review has been attached to the submission of the ccc.

Only accounting for policies, measures and investments in implementation the following carbon emission values are expected:

Sector	Tons CO2e in 1990	Tons CO2e in 2022	Tons CO2e in 2030	Tons CO2e in 2050
Industry	718.672	501.503	321.194	181.549
Built environment	2.223.207	2.050.354	1.145.514	323.659
Mobility	886.643	858.127	573.573	139.789
Agriculture	15.392	44.550	37.353	31.836
Total emissions	3.843.914	3.454.435	2.077.635	676.832
Target	N/A	N/A	1.537.565	0
Target gap	N/A	N/A	540.070	676.832

The climate city contract also includes policy that we cannot yet fully implement due to a lack of policy freedom and funds. These policies are not accounted for in the yearly climate reports but are

incorporated in policy documents such as the roadmap to climate neutral. This explains the gap between the climate action plan and the carbon reductions targets that we are expecting to achieve. The UPM annex in the investment plan presents an overview of the potential CO2-impact of the measures described in the action plan operationalised with parameters stemming from the roadmap to climate neutrality and other key sources or the standard values provided by the model.

Additionally, the city should consider clearly identifying what share of the emissions reduction originates from existing strategies and what is the contribution of additional actions developed or to be developed within the CCC.

As is mentioned in the climate city contract and the joint statement the implementation of the climate transition remains a challenge. In our ccc, a very rough analysis with the NetZeroCities investment model indicates that full implementation of all policy from the ccc could theoretically result in a 68% CO2-reduction by 2030 (see annex 1 UPM). This would leave a gap of 20% between the impact of all envisioned policy in the climate action plan and the expected 2030 result based upon the review in our yearly climate report.

This is largely explainable due to measures such as the ambition in the roadmap for a zero-emission zone for all mobility in the city not being included in yearly climate report, as it is currently unimplementable and the heating transition slowing down and not reaching the envisioned 175k housing equivalents connected to a sustainable heating source in 2030. There will also be some discrepancies due to the different models used between the NetZeroCities model, and the CE-Delft analysis that is the foundation of the climate report.

Furthermore, our policy is set independently from the climate city contract cycle as our carbon mitigation efforts predate the EU mission, which makes the contract an exhaustive report of all local sustainability policies, rather than a document which is intended to set out new policy. We are for example working towards additional climate action measures at this time.

The contract therefore does not lead to additional actions as those are embedded in our regular policy cycle. In new iterations of the contract, we expect it to be more in sync with these processes due to being more intertwined with our regular reporting and policy cycle as described in the action plan.

Please remember that the Mission would like to see urban emissions reduced to very low levels per capita by 2030.

If we can implement sufficient policy from our CCC and thus make our 60% reductions target (1.537.565 tons of CO2e) whilst maintaining expected city growth of more than 1 million inhabitants (national environmental assessment agency, 2022) Amsterdam will reach 1,537 or less tCO2e/per capita in 2030 (1.537 kton / 1.000.000). Current implementation as per our emissions table leaves an emission gap of 0,5tCO2e per capita in 2030.

Please explore strategies to achieve net-zero emissions by integrating carbon sinks and credits to get as close as possible to net-zero by 2030, beyond existing plans to reach additional emission reductions in a longer timeframe.

Please clarify if the city is working with carbon sinks and credits to get as close as possible to net-zero by 2030. This goes beyond mitigation efforts and applies even in case the city has a climate neutrality target going beyond 2030 as it is understood that residual emissions will nevertheless exist. The point is to demonstrate that the city is committed to net-zero and not to an emissions reduction target. For instance, the city could explore the carbon removal potential of expanding/improving its natural sinks, bearing in mind the implications on the inclusion/exclusion of AFOLU (see point 1).

As you can see from our reductions table, we are unable to reach sufficient reduction for the reasons described in our joint paper: "*climate reduction targets in a Dutch context.*" And in the climate action plan. We are exploring measures to achieve more carbon reduction through unconventional methods in scope 1 and 2 and will deliver options to the city council this winter.

We are exploring carbon sinks in different ways such as extending CCS to biogenic emissions on the waste to energy plant, our involvement with the city CDR initiative or the current development of a LIFE application oriented towards using waste from parks to create biochar and verifiable and trustworthy carbon credits. These measures are included in our current research for additional measures to enable us to make our 60% 2030 target.

Furthermore, we are exploring how to reduce impact in scope 3 in order to take more responsibility and explore alternative paths in achieving emission cuts. Our food program, which includes a transition towards plant-based protein, as well as our work on circular economy topics like bio-based building provide examples of this (see ccc).

However, carbon credits are currently politically unviable as a compensation tool as the trustworthiness of the credits is low and there is risk of these credits being seen as a way to avoid responsibility for the climate crisis instead of enabling lasting and impactful carbon mitigation. Furthermore, the potential scale of natural carbon sinks is likely to be negligible compared to our emissions. If natural carbon sinks prove to be an impactful route for other cities, we will explore the possibilities in a new iteration of the ccc.

2. **Explore potential of actions at exploratory/planning stage**:

Please assess the potential impact of all actions incl. the additional actions that are being considered to accelerate the transition as part of the Mission. Even rough estimations show dedication to reducing the emissions gap by 2030; their accuracy can be explicitly discussed in the CCC to anticipate refinements in future iterations.

We invite you to try to quantify the whole action portfolio to appreciate the full potential of the action plan. For the purpose of this first CCC it is sufficient to i) provide rough estimations, ii) clarify that those are rough estimation and may significantly change in future iterations, and to iii) commit to refine the calculation and keep exploring options with the ambition to reduce the gap to climate neutrality as much as possible already by 2030.

Based on the NetZeroCities model and with the parameters used to translate our climate action plan into the model we can achieve a 68% emissions reduction based on the actions described in the CCC. These are rough estimates and will significantly change in future outlooks. This reduction depends on measures that we are unable to implement due to insufficient policy freedom, lack of funding for large scale investments and grid capacity as described in the Dutch mission cities joint

statement. Given this context we currently expect to achieve a 46% reduction in 2030, if no extra policy can be implemented.

Nevertheless, as described in our commitment document and in our city of tomorrow the entire city board feels a shared responsibility to do their utmost to stop climate change. It is our duty to ensure a sustainable and liveable city for current and future generations. This means we take a maximal effort to reduce climate change. Since the release of our roadmap to climate neutrality we have a proven track-record of developing new opportunities to reduce our carbon emissions and are also currently researching and developing additional carbon reduction measures.

Additional city-specific requests:

- Amsterdam to please provide their 1990 emissions inventory for reference.

This is the most recent baseline from CE-Delft, which is in line with national monitoring standards. For your convenience find the table 22 from the report translated below:

Sector	Tonnes of CO2-eq in1990
Industry	718.672
Built environment	2.223.207
Mobility	886.643
Agriculture	15.392
Total	3.843.914

The methodology of CE-Delft is available on their website

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Introduction

We are in the midst of a climate crisis. A global crisis whose impact is huge. We are already heading towards two degrees of global warming, with disastrous consequences. Extreme drought and floods alternate. In our own city, too, we see the effects of global warming.

Our basements flood after heavy showers and our streets become flooded. Prolonged heat waves wither our parks in summer and take a toll on Amsterdam residents. Besides, as we all know: if sea levels keep rising, we won't keep it dry in Amsterdam. We must protect the city and our residents from these inevitable consequences. At the same time, we now have the responsibility and opportunities to do everything possible to minimise even more far-reaching impacts of climate change.

Amsterdam and its residents have very high emissions per person in global comparison, especially when we include emissions from consuming goods, raw materials and products. These emissions do not always take place in Amsterdam, but they are caused by Amsterdam residents. We therefore not only address our direct emissions in the city, but we also focus on the emissions our city is partly responsible for, outside the city limits.

Amsterdam has already committed to combating climate change in recent years. In 2019, for example, we created an Amsterdam Climate Agreement with input from 1,000 conversations with people and actors in the city. With the climate neutral roadmap, we are implementing this. Through various channels we continuously map what is happening in our city in terms of sustainability, and what opportunities remain. Amsterdam does not do this alone, of course, but together with the urban region it is a part of governments and organisations both inside and outside the Netherlands.

In September 2023, we published the council letter Our city of tomorrow, in which the entire Amsterdam city council committed to Amsterdam's climate policy. Sustainability is no longer an isolated task; it is the responsibility of the entire municipal organisation. We work according to the principle of 'Sustainable, unless'. In other words: a lot is already happening. Yet despite our efforts, we are not on track. We therefore need different ways of working. That means looking for new methods, but also phasing out unsustainable practices.

Why are we participating?

To support and endorse our city's effort, the municipality of Amsterdam has committed to the EU mission *100 climate neutral and smart cities*. The intention of the mission is to accelerate the climate transition, contributing to our city of tomorrow. We do this by promoting cooperation between cities, actors within cities and between layers of government. We want to remove barriers to this acceleration, scale up and innovate. Our city is fully committed to this. The joint effort of the cities in the mission clarifies what barriers to acceleration are possible and what solutions are needed for this at the European, national and local levels.

Amsterdam has direct influence on 42% of total emissions (in scope 1 and 2) in Amsterdam, The remaining percentage requires policies from other layers of government or third-party developments, e.g. more international trains or alternative energy sources becoming cheaper faster due to innovations. Cooperation between governments and other actors is thus preconditional, and is shaped, among other things, by the National Cooperation Structure (NSS). In addition, according to the European Commission, the mission label given to cities for the climate contract will help finalise the financial framework for our sustainable transitions. Through this enhanced collaboration and pooled innovation and scale-up power, we aim to achieve accelerated implementation of our current strategies. Both in Amsterdam and elsewhere. In addition, we can share the lessons we have learned with others, which may help to scale up in other municipalities later.

Our city is not taking on this mission alone, but together with 111 other mission cities across Europe with their own strengths and limitations, the region, the central government, the EU and perhaps most importantly: with partners from our city who want to contribute to our city of tomorrow. They all have their own roles and face their own challenges, but they do see the need to work on the transitions described here. We proactively approached some of these partners to describe their roles in so-called letters of support. Other partners remain welcome. These letters demonstrate broad-based support for the ecological transition in Amsterdam.

In front of you is the Climate City Contract, a (non-legally binding) document in which the City of Amsterdam reports to the European Commission what is being done in our city to become more sustainable and how the mission is being implemented at the local level. For the European Commission, this document is an important tool to see how European policies are implemented locally, which is why it must meet some formal requirements. In addition, the contract is iterative, and must be updated every 2 years for the purpose of reporting progress to the European Commission. This will be done through Amsterdam's Integrated Sustainability Monitor. Based on the measurements from the monitor, the priorities and targets from the climate contract can be updated or adjusted.

Our city of tomorrow: Climate City Contract consists of three elements:

- Commitment document. This element describes what our commitment to the sustainable transitions looks like. In it, we describe the shared commitment of the actors who want to join us in the EU mission to make Amsterdam more sustainable, how this contributes to the sustainable transitions and the progress of these transitions therein. The council information letter Our city of tomorrow acts as the substantive common thread.
- Action plan. This element makes clear what is happening in concrete terms to make the transition happen. It covers existing strategies, policies and actions. We are also looking at what levers we can pull to create a package of measures to maximise efforts to put our sustainable city of tomorrow within reach.
- Investment plan. This element clarifies how we use the city's resources to ensure that the city's intentions and actions are paid for. The municipality's current resources will be insufficient to meet our goals. Through the investment plan, we want to be able to engage more effectively with the European Commission, the state, partners and investors on how to fairly share the bill for climate transition and what it will take to get it done.

This part of the climate contract is the Commitment document, which seeks to reflect our city's commitment to the sustainable transitions. The municipality recently released Our city of tomorrow, in which the entire municipal executive expressed and established support for the ecological transition. In this letter, the municipality also announced additional actions; the Amsterdam approach

The Amsterdam approach

Last year, in the council information letter Our city of tomorrow, the entire college introduced 10 guiding principles for Amsterdam's ecological transition. These are:

1. Unequal investment for equal opportunity is always the guiding principle, we are committed to a social transition. We do this, for example, by insulating homes of residents in a vulnerable position first and coming up with an Energy Conservation Action Plan in which we help neighbourhoods reduce their energy consumption.
2. From now on, all decision-making and implementation will be governed by the premise of: 'Sustainable, unless'. Should there be reasons why this cannot be met, this must be substantiated and an executive assessment will follow, whereby the agreements made in the current coalition agreement generally prevail.
3. We structurally integrate extreme weather risks into the joint task of achieving a climate-adaptive Amsterdam. We are developing new standards, requirements and guidelines to protect Amsterdam from extreme weather as much as possible.
4. By setting up the implementing organisation 'Energy for the City', we are committed to accelerating the energy transition. The time of policy plans and visions is over: it is time for us to execute, execute, execute.
5. With the administrative order Sustainable Future City and Organisation, we commit the departments and city districts to realise the sustain-ability of the city and organisation together and on time, including by providing insight into the climate footprint per budget programme. The administrative order also entails area-based management. This will

give each area its own plan that suits the neighbourhood, to shape the transitions equitably and inclusively.

6. We are preparing a public heat network for Amsterdam, where affordability of residents' energy bills is paramount.

7. We act as an active shareholder towards our associates and ask them to make impact plans.

8. We are working on a new sustainability council and setting up a climate consultation with voices from under-represented groups both inside and outside Amsterdam.

9. Circular working is becoming the standard. That means producing smarter and consuming less. We will also help at least 100 entre-preneurs every year to take the (first) steps towards more circular business.

10. In our purchasing policy, we not only make our own organisation more sustainable, but also ensure that the market becomes more sustainable faster. One of the ways we do this is through circular purchasing and applying an internal carbon price.

In addition to the measures from Our city of tomorrow, a package of Amsterdam policies around sustainability was introduced in 2020. It reflects Amsterdam's commitment to sustainable transitions. At the time, the Climate Neutral Roadmap, Transition Vision on Heat, Climate Adaptation Strategy and Circular Strategy and the Implementation Agenda Towards a Sustainable Organisation 2020-2030 were adopted by the municipality as guiding principles. The Roadmap describes how Amsterdam is reducing carbon emissions from energy consumption within its municipal boundaries, the Transition Vision on Heat makes

clear how Amsterdam is moving away from natural gas, and the Circular Strategy contains interventions to reduce material consumption. From 2022, implementation agendas have been drawn up, which translate policy into implementation. In the action plan, based in part on these documents, we map out what is underway in Amsterdam to realise the sustainable transitions and clarify what implementing the sustainable transitions looks like in Amsterdam.

The following is a summary of key documents:

Amsterdam Climate Neutral Roadmap

The Amsterdam Climate Neutral Roadmap is an ambition document adopted in 2020 with a long-term vision of Amsterdam's energy transition and short-term actions. In the Roadmap, we describe our strategy to set the transition from fossil to renewable energy in motion. The roadmap was drawn up together with 1,000 stakeholders from the city and initiatives from the city can continuously seek cooperation with each other and with the municipality in the climate challenge, for example though 02025 and the GasTerug Action Network. Progress on the roadmap is monitored annually.

Circular strategy

In this strategy, we use Kate Raworth's donut economy as a basis to look at the necessary economic and social developments required to live within socially equitable boundaries (the inner boundary of the donut) and planetary boundaries (the outer boundary of donut). This is in line with our ambitions and lines of action for realising a circular Amsterdam.

Climate adaptation strategy

With the climate adaptation strategy, we as the municipality of Amsterdam, together with the three water authorities of Amstel, Gooi and Vecht, Hollands Noorderkwartier and Rijnland, create a future vision for a climate-resilient city. Climate adaptation is essential to ensure that physical, social and economic value of Amsterdam is preserved. It is an opportunity to make an important contribution to a safe, green, liveable and attractive city together with all Amsterdam residents.

Food Strategy

With the Food Strategy, we as a municipality are taking responsibility for helping drive change in the food system. The goal of the Food Strategy is for more Amsterdam residents to have access to healthy, fair and sustainably produced food.

Sustainable, unless

All decision-making and implementation is governed by the premise of: 'Sustainable, unless'. The aim of this premise is to develop new standards that contribute to the timely achievement of our sustainability goals. These sustainability standards can vary between different domains, depending on the context. The trade-off between climate targets and other goals, such as political agreements and limited resources, remains an administrative choice.

Administrative order Sustainable Future, City and Organisation

The administrative order Sustainable Future, City and Organisation focuses on a citywide incorporation of the sustainability task. The premise of 'Sustainable, unless' is one way to implement this. Within this framework, the Sustainable Future administrative team was formed, where aldermen and representatives of city districts make breakthrough decisions to initiate, scale up and accelerate implementation.

Implementation agendas
The implementation agendas translate existing policies, such as the above visions, into concrete handles for implementation in practice. These agendas focus on different themes, such as zero-emission mobility, circular economy, food strategy, heat transition, climate adaptation and making monuments sustainable.

The Implementation Agenda Towards a Sustainable Organisation 2020-2030 translates the urban programmes into five climate goals for the municipal organisation. The basic premise is for us to be a fully sustainable organisation by 2030. By 2030, we want to be a circular, climate-neutral organisation and maximise our own energy generation. We want to work in a climate-adaptive environment, with officials steeped in sustainable thinking and action.

The action plan will detail the actions that the municipality and signatories of this contract are implementing to achieve the ecological transition.

The Amsterdam sustainable objectives

The climate crisis, resource crisis and biodiversity crisis require our maximum commitment: we take responsibility for the organisation and the city to pull out all the stops now to keep our city and the world liveable. We focus not only on CO_2, but on all the targets we have set: a 100% climate-neutral, circular and climate-adaptive city by 2050. We do so because we need to take good care of the city and our world: for now and for future generations, with a focus on the most vulnerable. In all plans for the coming years, along the way, we remain in constant dialogue with the city and are transparent in the choices we make. We do it together. Together, we balance the necessary, sometimes painful measures now with the major consequences of climate change later.

About four times the amount of CO_2 emissions from Amsterdam's energy consumption are emitted annually from material use, for example in the production of food, building materials and consumer goods for the city, also known as scope 3 emissions (Monitor Circulair, 2023). Besides the CO_2 effects, Amsterdam's consumption pattern also imposes other environmental costs, which would cost billions to fix (Ibid).

Amsterdam has therefore chosen to include scope 3 in its climate-neutral and smart city mission. We do this based on the conviction that we must take responsibility for what we do here within the municipal boundaries, which causes ecological and social problems *elsewhere* in the world. Indeed, the consequences of our actions on the earth and humanity are not limited to municipal boundaries. By including scope 3 emissions and our circular policy in our climate-neutral city mission, we recognise that other places, people and animals experience costs due to Amsterdam's consumption and lifestyle. In addition, it is an intervention that allows us

to look at the climate transition with a systems perspective. After all, it does not matter to the earth where CO_2 is emitted.

However, including scope 3 emissions is not easy. It is difficult to know for each product how many emissions and damages occur where, and to what extent Amsterdam is responsible for them. Therefore, we do not yet introduce a target on CO_2 reduction in our chain, but commit to accelerate sustainability to the maximum.

That maximum acceleration is also the commitment in terms of CO_2 emissions from energy consumption. With the introduction of the coalition agreement, the City of Amsterdam has set a 60% CO_2 reduction target for the city by 2030, higher than the 55% stipulated by Dutch and European climate laws. This means we are more ambitious than the country and the EU. CE Delft research shows that achieving 60% reduction by 2030 already requires huge efforts from Amsterdam.

The entire college, as described in the council information letter Our city of tomorrow, feels a responsibility to do everything possible to combat climate change. While we would like to increase the ambition of a 60% reduction by 2030, that would not reflect reality.

Unfortunately, despite our efforts, we are not on track for that 60%. If we realise our current policy intentions, we arrive at 56% at best. If we only look at what we are implementing now, we end up at 45%.

We will have to put maximum effort, together with the city, into achieving the necessary 60% reduction. But to live up to ambitions, we have to be realistic. Being honest about what works and what doesn't, and that this requires both a long run and a sprint. Building support and commitment to get everyone on board. Keeping agreements and delivering on promises.

Below is a summary of the most significant targets set by the municipality for the city:

2030
- Fully emission-free traffic within built-up areas
- Fully sustainable municipal organisation
- 80 percent of electricity used by households generated from solar and wind power
- 50 percent reduction in use of non-renewable raw materials
- 60 percent reduction in CO_2 emissions within municipal borders compared to 1990
- From 40% plant protein to 60% plant protein in our diets

2040
- Fully natural gas-free in the built environment
- All suitable roofs utilised for solar power generation

2050
- Fully prepared for climate change ('climate adaptive')
- Fully climate neutral compared to 1990
- Fully circular economy

These objectives underpin Our city of tomorrow. They go beyond the city's direct energy consumption, because we see that Amsterdam's impact on our planet does not end at municipal borders. Other objectives, such as climate adaptation but also traffic diversion, instead have local effects, and are related to other aspects of the sustainability challenge, and the effects of climate mitigation. We therefore include our entire sustainability policy in the climate-neutral city mission. As such, we do not exclude any areas within our city limits or emission sources from the mission and keep the possibility open for any new targets and tasks in future iterations of the contract. In fact, we also feel responsible for emissions in the chain of the Amsterdam economy.

To achieve sustainability targets, preconditions must be realised at other layers of government. Amsterdam, for example, has a direct impact on 42% of CO_2 reductions in scope 1 and 2 with the measures from the Climate Neutral Roadmap. Illustrative are developments in the heat transition and mobility transition, where it is clear that flanking, essential legislation and funding from other layers of government are not always in place at the right time to make our current goals achievable. Therefore, maximising sustainability also means learning together and scaling up.

Our commitment in the mission is to take steps in this regard, which is also why we are positive about the NSS (National Cooperation Structure), in which we cooperate with the government interdepartmentally to achieve zero-emission accessible cities, integral sustainability of neighbourhoods and bio-based construction and insulation. This means we are jointly paving the way for cities and towns elsewhere in the Netherlands as well. This way, Amsterdam's impact extends beyond its municipal borders and we take our responsibility as a capital city and partner in sustainability.

What do we save by going sustainable now?

Clearly, the climate transition is a transformation of great magnitude. What may not be as clear is what we get in return, and what future costs our city avoids through ambitious climate policies. By accelerating now, we avoid lots of costs in the future: every euro spent on the transition today results in a multitude of savings later.

The IMF argues that investing in a climate-neutral world will pay off twice over; every euro towards climate solutions yields 1.5 to 4 euros in societal cost savings. In our sustainability policy, we strive to ensure and improve broad prosperity in our city, for which the sustainability transition offers opportunities. We also see this in our city. With the mission, we hope to make strides in this too.

Insulating homes, for example, improves housing quality and reduces energy poverty. Overdue maintenance can be addressed. And in case of bio-based home insulation, it also contributes to the circular transition and can even store CO_2 in the building, which can help boost the sustainable agriculture chain. Finally, it offers opportunities for retraining disadvantaged residents into new jobs created by the sustainable transition.

In addition, our city's energy security improves, and we become less vulnerable to another gas crisis. In turn, climate adaptation offers opportunities for more greenery and water security, but also helps promote physical and mental well-being by expanding green spaces in the city and reducing the negative impacts of climate change. Adding more greenery and removing paving in neighbourhoods increases residents' quality of life. A green and sustainable neighbourhood is also pleasing to property owners due to an increase in value.

The transition will also be accompanied by a reduction in air and noise pollution. Currently, people in Dutch cities die 9 months earlier than Dutch people in rural areas. Therefore, when air and noise pollution decrease due to reduced motorised mobility, we live longer, and age more pleasantly. In other words, this transition is not just important for the earth, but for the health of our residents as well.
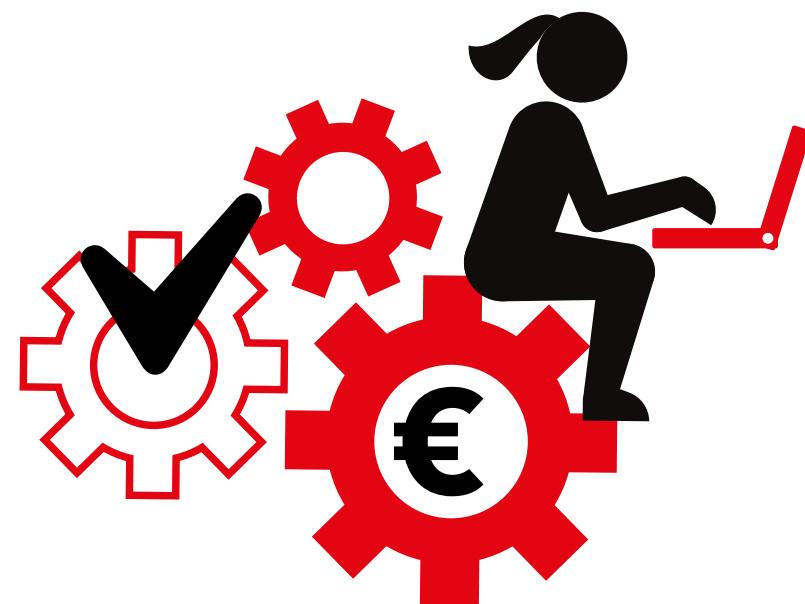
Strategic priorities in sustainability

Five strategic priorities for sustainability can be identified in Amsterdam. They are:

1. The transition to a sustainable energy system
2. The transition to a sustainable, fair and healthy food system
3. The transition to a circular economy
4. The transition to a nature-friendly and climate-adaptive city
5. The transition to a sustainable municipal organisation

In this chapter, we outline the transition paths for each of these strategic priorities. Besides the strategic priorities, the 10 guiding principles from Our city of tomorrow also guide the sustainability policy.

The transition to a sustainable energy system

In 2022, Amsterdam emitted about 3760 ktonnes of CO_2 in the energy system, for example by burning fossil fuels. This is 1240 ktonnes less than in 2019, our so-called carbon peak of 5000 ktonnes. For making the energy system more sustainable, the Climate Neutral Roadmap outlines the transition paths the municipality is committed to. There are four of them:

1. The port & industry
2. The built environment
3. Mobility
4. Electricity

These transition paths are fleshed out along pillars that indicate how the municipality will follow up on making these sectors more sustainable. The concrete actions below have been incorporated into the action plan.

The port & industry

The central task is to realise the necessary preconditions for making industry in the Amsterdam port area and the North Sea Canal area industrial cluster more sustainable. Here, we focus on developments such as the introduction of hydrogen, the carbon and circular economy, wind energy generation (sea and land), solar energy (and heat coupling) and energy saving for the city, the region and Europe.
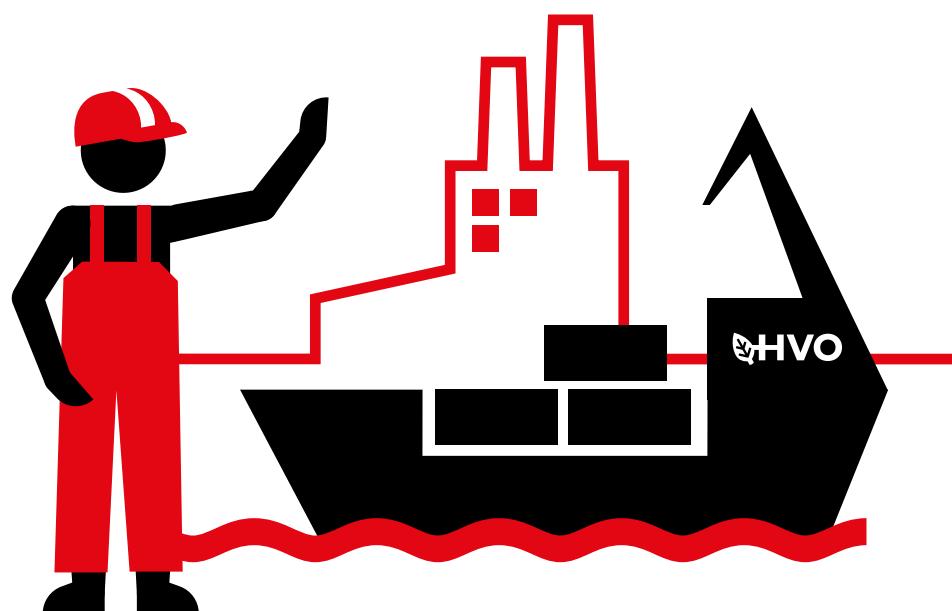
1. **Transforming the port into a sustainable battery for the city, region and Europe**

The port as a 'sustainable battery for the city, region and Europe' is the shared future perspective for the Amsterdam port, in which sustainable energy is generated, produced, converted, stored and distributed to end users on an industrial scale. We support this perspective and ensure that the Port of Amsterdam together with the companies in the port area are enabled to shape this transition decisively. In doing so, the port also contributes to the energy transition outside Amsterdam and in sectors such as industry, mobility, electricity and the built environment.

2. Develop green hydrogen

Green hydrogen is an important energy carrier in the future energy system and for 'the port as a battery for the city, region and Europe'. Green hydrogen is not a substitute for sustainably generated electricity, but it is an essential raw material and fuel for industry, heavier mobility and shipping and aviation. Hydrogen could eventually play an important role as temporary storage and switching capacity in the energy supply. To get here, we need to initiate cooperation with key partners in the region active in the hydrogen chain. We also need to ensure that crucial framework conditions such as infrastructure and location policy for the development of hydrogen chains are in place.

3. Capturing, storing and reusing CO_2 emissions

CO_2 capture is a way to achieve significant CO_2 reductions in the short term and as a building block for 'the port as a battery for the city, region and Europe'. The municipality supports CO_2 capture in production processes for which there are no alternative fossil-free production methods. An increasing number of parties, including the IPCC and PBL, are convinced that carbon capture is necessary to achieve negative emissions and meet the Paris targets. Carbon capture and storage is also necessary for Amsterdam to meet its CO_2 reduction targets. CO_2 capture is most efficient in places where a high concentration of CO_2 flue gas is released into the air, such as waste incinerators. Captured CO_2 can be used to produce synthetic kerosene, essential for making aviation more sustainable, or as a source of carbon molecules in other production processes.

The built environment

By 2050, all buildings in the city should be heated in a sustainable way. Replacing natural gas with alternative heat sources and saving energy are therefore key. Work needs to be done behind every front door, behind every facade and in every street. At the same time, we must ensure that CO_2 emissions do not increase further as the city grows. To achieve this, Amsterdam is working on seven pillars with specific measures reflected in the action plan.

1. Natural gas-free neighbourhood approach

We are working to make our city natural gas-free. We are currently accelerating the implementation through the establishment of the 'Energy for the City' implementing organisation and in the recalibration of the Transition Vision on Heat. We remain dependent on framework conditions in laws and regulations for this approach, and see a major financial challenge to scale up in a way that is good for residents, businesses and housing associations.

2. Development of sources for the heat grid

By scaling up the neighbourhood-by-neighbourhood approach, demand for renewable heat is growing. This should be provided for, and a variety of sources should be considered for this to create a robust system. The current heat grid is fed by AEB's Waste Incineration Plant (AVI) and Vattenfall's Diemen power plant. These sources currently provide enough heat, but are insufficient to meet growing demand AND they are not yet fully sustainable. New sources that could play a role are geothermal, aqua thermal and waste heat from industrial processes such as data centres, electrolysers and artificial turf fields.

3. Growing city-wide heat infrastructure

Making Amsterdam natural gas-free requires growing the heat infrastructure into a city-wide infrastructure that transports the right heat to the right place. In addition, more and more decentralised grids are emerging, fed from decentralised sources. One thing to keep in mind here is that infrastructure does not develop only in neighbourhoods with a diminishing business case. Every Amsterdam home and building should be able to become natural gas-free. The impact of constructing these new infrastructures on the city's public spaces is significant.

4. Making homes more energy efficient

Consumption of electricity and heat in homes must be reduced. Homes account for more than 50% (690 ktonnes) of CO_2 emissions in the built environment and 14% of Amsterdam's total. Amsterdam now has about 441,000 homes, of which 30% are owned by residents, 42% by housing associations, and 28% by private landlords. Amsterdam's Insulation Offensive ensures energy savings in the existing housing stock. It makes an important contribution to the municipal climate target of saving 60 percent CO_2 by 2030. With this implementation plan, the college outlines how it will support homeowners through 2026. Tenants and owners, landlords and asset owners must then make their own choice of insulation and sustainability. Together, the 2030 goals are within reach. This will help contribute to a climate-neutral city by 2050 and reduce energy poverty.

5. Making the business market energy efficient

All commercial buildings must become natural gas-free and climate neutral. The business market has several industries and is characterised by a wide variety of properties: offices, hospitality, retail, multi-tenant buildings and industrial halls. Each industry has its own opportunities and challenges. Making the business market more sustainable requires energy-saving measures in buildings and connection to heat infrastructures for access to renewable heat. It is also about making business processes more energy efficient.

6. Making social buildings energy efficient

In community centres, schools, sports facilities, hospitals and arts and culture venues in the city, energy consumption must be reduced. These approximately 3,000 buildings can set an example in the energy transition and inspire Amsterdam residents to make their own sustainability efforts. Social buildings have many variations in terms of building type, use and ownership. Building owners and users are responsible for a climate-neutral building. We offer tailor-made support.

7. Sustainable construction

There is only one time to give new construction in the city the quality it needs, and that is when it is built. That is why we want to deliver homes as sustainably as possible.

Mobility

There are increasing numbers of residents, visitors and jobs in Amsterdam. More people also means more travel. Doing nothing will lead to more CO_2 emissions, pressure on public spaces and negative health effects from air and noise pollution. Therefore, we ask every vehicle owner or driver to consciously choose a sustainable form of transport. As a municipality, we encourage, facilitate and, where necessary, regulate this switch. We do this with the following three paths:
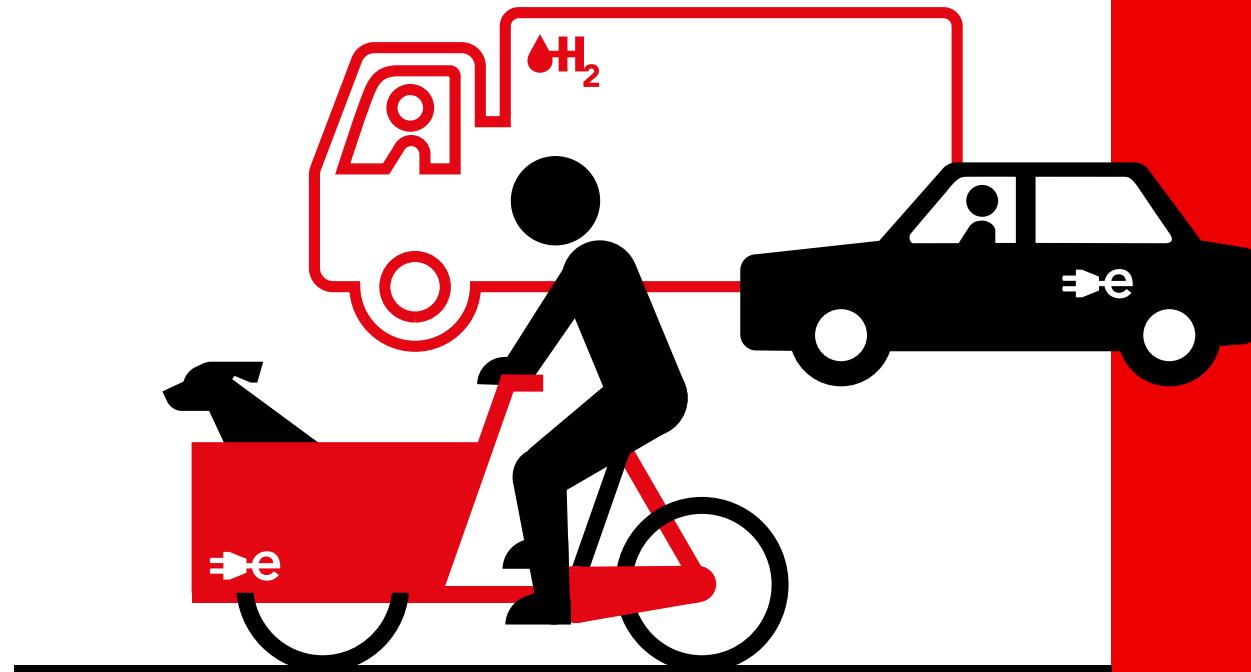
1. Changing traffic movements

We are designing our city and streets differently, experimenting with traffic management methods and traffic psychology. This effort not only contributes to a cleaner and quieter Amsterdam, it also makes the city more attractive and liveable for everyone.

2. Reducing polluting traffic movements

We have been working for years to reduce polluting traffic movements in the city by encouraging walking, cycling and the use of public transport.

3. Cleaning traffic movements

Motorised transport remains an important mode of transport for many residents, business owners and visitors. However, most vehicles run on fossil fuels. The switch to 100% zero-emission transport requires a contribution from all parties in the city. We are committed to less, smarter and especially cleaner traffic, for example by introducing a zero-emission zone.

Electricity

Electricity plays a key role in the energy transition. With the transition to a natural gas-free city and the growth in electric vehicles, much more electricity is needed. This electricity must be generated sustainably. We will do that as follows:

1. Maximum sun on roof

There is a lot of roof space in Amsterdam. We want to make the best use of that space for renewable energy generation. Rooftops can generate electricity for hundreds of thousands of households. The advantage of solar panels is that installation is technically simple and panels are usually a profitable investment.

2. Exploiting the potential for wind energy

We want to make an appropriate contribution to the diversification of electricity generation in the Netherlands through more wind power generation. Opportunities for this are aligned within the region in the Regional Energy Strategy (RES) and can be increased if provincial policy is broadened.

3. Future-proof electricity infrastructure

Electricity has a key role in the economy and in the energy transition. More and more electricity is consumed for heating buildings, electric mobility and other purposes. Sufficient capacity on the electricity grid is an important prerequisite for a sustainable city. That is why Amsterdam is working hard with other governments in the region and with partners such as Liander and Tennet to create a robust electricity system, and to deal with the lack of capacity that exists on the grid today.

The food transition

The food transition is prerequisite for achieving a climate-neutral, circular and more nature-inclusive society. This is because the food system accounts for about 30% of global greenhouse gas emissions. Reducing the impact of this system by consuming differently thus becomes a strategic opportunity in the climate challenge. These impacts come from methane emissions from livestock farming, among others, and CO_2 emissions from food transportation and land-use changes. The system is also a major consumer of water and contributor to water pollution from over-fertilisation and other chemicals. Moreover, changing how we eat can lead to health benefits.

Amsterdam has therefore adopted a food strategy that aims to promote plant-based and local food and prevent food waste. This way, we become healthier, and more sustainable, and save animal suffering. It also offers opportunities for our economic system, for example by freeing up land area for other uses. We see the food transition as a strategic opportunity for urban sustainability policy in Amsterdam. Necessary for arriving at a city that exists within planetary boundaries. Regionally, the Amsterdam Metropolitan Area (MRA) is also contributing to this, for example through the Voedsel Verbindt (Food Connects) project.

More plant based

A shift in consumption from animal proteins to more plant proteins is better for our health and lowers the environmental pressure of our food production. The ambition is to shift the share of plant proteins in the diet from 40 to 60 percent by 2030. The share of plant-based food in our own catering will go to at least 50 percent and we are exploring whether we can work towards a 70 percent share. We also signed the Plant Based

Treaty as a strong signal that reflects principles from the 2015 Paris climate agreement for a climate-neutral and circular food system.

Food waste and organic residues

About a third of all food worldwide is wasted. The impact of this on the environment is significant. The municipality aims to reduce food waste by 30 percent by 2026 and 50 percent by 2030. We do this by focusing on preventing waste in businesses incl. hospitality and households and saving food for social initiatives. We will collect more organic waste streams such as vegetables, fruit, food waste and garden waste. Furthermore, we support city-based initiatives on composting and nutrient recovery, such as circular water treatment. Thus, as a city, we will contribute to closing the food cycle.

Urban agriculture and short chains

As a capital city, we want to make an active contribution to the necessary transition of agriculture in the landscape of the surrounding area. From producing at the lowest price for the global market to more products for the regional and local market. We also include the objective of moving to sustainable forms of logistics and distribution here.

Fair and social food

Producing, preparing and consuming food defines who we are as individuals and as a community. The city's tastes, like its cultures, are diverse and large in number. Our goal is to make healthy, fair, sustainable and affordable food available to all and to transform existing food aid to increase food security. To do so, we will join local, area-based cooperation and will support existing initiatives, such as the food circle in Noord.

The transition to a circular economy

In a fully circular economy, materials and products are used and reused almost infinitely. Renewable raw materials, such as wood or flax, play a major role. This helps prevent waste and pollution. In a circular economy, we live within planetary boundaries, mindful of a social foundation. We will no longer be dependent on new, non-renewable resources, such as oil and gas, which may run out or come from geopolitically unstable regions.

Achieving the circular economy is not an end in itself. It is a way of working and living that delivers a climate-neutral, equitable economy, within the limits of the earth. A circular economy:
- reduces greenhouse gas emissions;
- reduces human impact on biodiversity;
- improves the quality of the living environment; and
- improves security of supply of raw materials

Currently, we are still far from a fully circular economy, but we are making strides. Our goal is for Amsterdam to use 50% fewer primary raw materials by 2030, and to be fully circular by 2050. This is why the Amsterdam municipality wants to help its residents and entrepreneurs take responsibility in the transition to this circular economy. For some raw material flows, the city alone is too small a scale to become circular, so we also need to look at the regional, national or even European levels. The municipality plays a role in bringing parties together, creating opportunities and removing obstacles. The circular implementation agenda therefore includes the following pillars:

Together with the city

The transition to a circular economy requires frontrunners and ambassadors. Many of these people can be found in SMEs and social initiatives. To support them, the municipality will remove barriers and provide opportunities. Ultimately, everyone has to join the transition. Many companies and institutions realise this, and want to, but do not yet know how. The municipality also wants to provide this group with action perspectives and support. We are also working with our partners in the port and industry to explore together what is needed to make the circular economy happen. Circular initiatives also have an important social function by involving people in the neighbourhood, increasing cohesion and providing a place for vulnerable people to participate in society.

Consumer goods

Of the things we use, textiles and electrical appliances in particular have a major impact on people, nature and the climate. In addition to mattresses, furniture should also be mentioned here, as it makes up at least half of Amsterdam's bulky waste.

The 2023 Intergovernmental Panel on Climate Change (IPCC) report shows that 40-70% of CO_2 emissions can be reduced by changing people's behaviour. With low engagement, it appears that emotional impulses (easy, attractive) drive (buying) behaviour. Advertising around us encourages us to consume. Buying new stuff tends to take less time, money and effort than getting a product repaired. As a municipality, we will have to consider what we can change in the city to encourage more circular behaviour.

For that reason, Amsterdam wants to:

- Ensure that circular entrepreneurs are given more space to offer services such as repair and sharing of consumer goods, for example by developing a circular craft centre;
- Encourage entrepreneurs to educate on the impact of their products and how to extend their lifespan;
- Explore restrictions on advertising of 'harmful' products in public spaces, as is also being prepared in Haarlem.
- More transparency in the supply chain: where do raw materials come from, where do discarded textiles go and what waste and environmental impacts are created in the process worldwide.

Built environment

Amsterdam is a compact city. This offers environmental benefits: commuting is limited, public transport is an attractive option and, with a smaller living area than the Dutch average, residents also have less space to heat. At the same time, due to the housing crisis, there is a great need for new housing, which Amsterdam is helping to fulfil with initiatives like the housing deal.

Partly because of this, there is a lot of construction activity in absolute terms and, partly due to the energy transition, a lot of maintenance and renovation of existing housing is taking place. As a result, construction accounts for about 60% of all material use in the city in terms of raw weight. The municipality has great influence in this value chain, as the city owns about 80% of the land.

Amsterdam is therefore working to reduce the impact of the built environment. We are working with the market on innovation to balance circular ambition with maintaining housing production.

Food and organic waste streams

As already described under food, because the transition to a more sustainable food system has such an impact on the circular economy and the mitigation challenge but also interfaces with other portfolios in the areas of biodiversity and health, the choice was made to include it as a separate strategic priority in this climate contract. This is also considered a pillar within the circular economy.

The transition to a nature-friendly, climate-adaptive city

Climate change impacts the safety, infrastructure and quality of our living environment. Biodiversity is also significantly affected. This makes greenery even more important for the city. It is not only necessary for residents and animals; greenery also helps cool the city on hot days and collect water from heavy rainfall. Greenery must therefore become a staple in our work to develop and manage the city. Planting choices, public space design and maintenance should contribute to climate adaptation, biodiversity, social well-being and health. The broad welfare benefits of creating more greenery are thus large and diverse.

Therefore, integral working is necessary. In the pilot cities programme with the other Dutch cities from the mission, we are practising making an integral area plan based on the integral public space design method

in Amsterdam. That means designing the public space based on a shared budget, overall future-proofing requirements and integrating replacement tasks.

In addition, for each new neighbourhood design, we work towards a continuous green ecological structure with high biodiversity and a natural network of water and plants. We also opt for nature-inclusive, green and biodiverse banks, quays, verges, parks, forest and woodland, grasslands, lawns, parks, streets and squares when constructing or redesigning public spaces. We transform pavement in existing public spaces from grey to green, such as the asphalt in the Amsterdam Forest. In the Rembrandtpark, among other things, waterways will be deepened and reconstructed, paving will be replaced by greenery and nature-friendly banks will be constructed to increase water storage capacity.

In tenders commissioned by the municipality, we apply the 'nature-inclusive building' points system. Tenderers must demonstrate how they incorporate nature-inclusive solutions into the design. The municipality will weigh this in its assessment of the winning proposal. This points system is now being evaluated. Examples of recent tenders with a focus on sustainable use of materials and nature-inclusive construction include Habitat Royale on the Zuidas and Robin Wood on Centrumeiland.

The transition to a sustainable municipal organisation

As a municipal organisation, we have big ambitions. On 14 February 2018, the council adopted the Climate Initiative proposal. The Implementation Agenda Towards a Sustainable Organisation 2020-2030 followed in

March 2020. This sets the target of 100% less CO_2 emissions (in scope 1 and 2) by 2030 (or earlier when possible) for the municipal organisation. This requires a major effort from the municipality itself. Five goals have therefore been set to lead to a sustainable municipal organisation by 2030.

Maximum reduction of energy consumption and maximum energy generation

In 2022, as a municipal organisation, we consumed 596 Terajoules (TJ) of energy. This means we continue to see a downward trend compared to the starting year 2018 (11 percent less energy consumption). There has been a slight increase in energy consumption since 2021, mainly due to electrification of the vehicle fleet. The absolute decrease is caused by using less natural gas and fuels in the organisation.

Fully carbon neutral operations

In 2022, we continued the trend of reducing the carbon footprint in scope 1 and 2. We had emissions of 5.2 ktonnes CO_2-eq. in 2022. That is a reduction of over 60% compared to 2021. These gains are mainly due to the use of green gas instead of natural gas since 1 January 2022. In addition, we have consumed less gas, and in 2022, the fleet ran almost entirely on HVO100 (as transition fuel) instead of diesel.

In 2022, we could largely return to travelling as before the pandemic and this is reflected in the increase in business travel and air travel, compared to 2020 and 2021. In other categories in our indirect emissions (scope 3), such as coffee consumption, target group transport and commuting, we are also back to pre-2020 levels.

Circular operations and circular use of materials in public spaces

By 2025, the municipality aims to procure 50 percent of all products and services in a circular way and to use 50 percent fewer new raw materials by 2030. To achieve this, we purchase strategically. For example, the Sustainable Contracting and Procurement (TDO) team was launched in 2021. The TDO provides advice on how to include sustainable policy goals as a requirement or award criterion in tenders.

We are clearly still at the beginning of the transition to a circular economy. In recent years, we have mainly been working to get a better picture of where we stand. For example, we have more insight into the CO_2 emissions from purchased materials and services (scope 3 emissions).

In 2022, we delivered a baseline measurement. This showed that over 92% of the municipal organisation's carbon footprint comes from scope 3 emissions. These are emissions which we do not always fully control, but can exert a lot of influence over. These include greenhouse gases released during the production and transport of goods and services we purchase. Therefore, one of the measures we deploy as an organisation is the 'Reuse, unless' programme. Materials and raw materials in public spaces should be reused unless *absolutely impossible*.

Climate-resilient buildings and sites

We are working on climate adaptation to protect our city from increasing heat, drought, extreme rainfall and flooding. To achieve that, we are committed to making our own roofs and courtyards greener. Every new building also complies with the rainwater regulation, which requires the collection and treatment of rainwater. We are also working hard on the greenery around our sports fields. All our sports parks get a sustainability label and, in cooperation with our ecologists, we improve biodiversity. This contributes to climate adaptation and also ensures that sports parks are pleasant areas in the city for different forms of recreation. For example, the sports fields on Zeeburgereiland are climate adaptive by being able to store and reuse water. To scale up the innovations that make this possible, we are working on a scale-up method. We do this by asking about four new themes for new artificial pitches: smarter and cleaner building, climate adaptation, energy, circular.

Sustainable thinking and action by Amsterdam officials

Getting the city ready for the future is not just about technology and money. To create a sustainable organisation, people also need to have different knowledge, and different behaviour. We help our colleagues make sustainable choices and apply sustainability in their work. One way we do this is by providing them with a network of civil servants (Sustainable Civil Servants Network). Colleagues from across the organisation can join this to exchange experiences on making their boards more sustainable. We make sustainability in our organisation visible, understandable and accessible to all.

Process and principles

What happens next?

Needless to say, a lot is happening. The Amsterdam municipality therefore sees the climate contract as an instrument to report in full on the sustainability task and to perpetuate collaborations with organisations in the city. By making it clear and concrete what the municipality is doing in the field of sustainability, and what is going on in our city, it is easier to collaborate between policy areas and achieve implementation with an eye on the whole. It also makes it easier for partners and people in the city to find out about relevant actions on sustainability and contact the municipality about it. This contributes to the transparency of municipal government and shaping the city together.

To that end, this contract is a first iteration, building on the direction from Our city of tomorrow. However, the contract is not a one-off document, but must be updated until at least 2030. The Climate City Contract will therefore be updated if necessary, identifying sustainability opportunities, constraints and possibilities based on the results from the integrated sustainability monitor, which monitors progress on the targets set out in this contract.

This also means an ongoing invitation to city stakeholders to engage with us to see what more we can do together to implement the sustainability of our city. Every tonne of emissions avoided counts. The first update of the Climate City Contract will become public by the end of 2026.

What is the municipality doing differently now?

We are jointly responsible as a city. This college must lead by example. We will use all the roles we have as local government: landowner, property owner, tax collector, licensing authority, legislator, enforcer, employer, purchaser, subsidy provider, healthcare provider and shareholder. We procure our own goods and services as sustainably as possible, make our buildings climate resilient and, as an active shareholder, we are committed to making our municipal holdings, such as Schiphol, the port and the GVB (public transport), more sustainable.

The network of colleagues involved in sustainability is growing steadily. Two years ago, 1,200 officials sent a letter to the municipal management team stating the urgency of accelerating the climate transition. This signal has been received by the municipal management team and they have conveyed to all Amsterdam civil servants that sustainability is part of your regular work, and you are therefore allowed to spend time on it.

Furthermore, we have set up a transition team, which is working hard to improve the sustainable thinking and doing capacity of officials in the organisation. They do this by bringing colleagues together, helping to identify dilemmas and enabling a fresh perspective on sustainability from other policy areas.

To help where things get stuck in bureaucracy, the Institute for Public Value works with us to achieve breakthroughs. Furthermore, the municipality organises climate meetings for its own organisation, to come together and learn more about sustainability and the climate crisis. Five meetings so far have involved hundreds of colleagues.

Our engineering firm has also translated the city sustainability policy into an implementation standard in their own sustainability strategy. As a result, it managed to build a 100% circular road, and 14 projects have been tendered with an MKI standard. We also started using an internal carbon price of €433 per tonne (in 2024). This price is used as a consideration framework for investments over 1 million.

The process of arriving at a Climate City Contract has helped improve the consistency between the concrete actions contained in the action plan and the operational targets from the integrated sustainability monitor. A next step is to link these targets to the strategic goals from the municipality's annual budget. Thus, sustainability can be much better anchored in the internal planning & control (P&C) cycle. It also makes us better able to report on how each organisational unit contributes to the sustainability task, which reduces fragmentation.

Through this monitoring and improvement cycle of the broad sustainability task, we aim to be able to make adjustments more effectively and quickly when we fail to meet our current targets. It also allows the municipality to better ensure internal policy coherence.

Joint implementation and learnings

The municipality cannot do this alone. We very much need help from everyone in our city. We also cooperate with the central government, the region and other European cities facing the same major challenges. For example, through Eurocities and NetZeroCities, but also through other partnerships and initiatives, such as CNCA, DeCarb-Pro and many more. We need to cooperate and innovate together with the central government and the EU to achieve the scale-up needed to enable us and other Dutch cities to become more sustainable. Otherwise, climate neutrality will never become a reality.

There is no time to lose, and at the same time, this transition is all about the long haul. There is no other option but full speed ahead, but we are also entering uncharted territory. We have never done this before as a society. We no longer have time to meticulously plot our way forward. We will have to make strides, sometimes by trial and error, and learn from our mistakes along the way.

There is no alternative
All this is why the Dutch mission cities have been in frequent contact over the past two years to share lessons and best practices on the mission and sustainability. We are jointly learning about neighbourhood-based investment platforms for sustainability. We see how new financing structures and ways of designing and budgeting could contribute to the financial challenges we face there.

We also look beyond borders. NetZeroCities helps us innovate in the way we think about investments and financing systems. NetZeroCities has, for instance, introduced a capital hub that allows it to see how projects that are not currently fundable can become so. This overlaps well with Amsterdam's work on the ESG hub for cities, where we are also looking for ways to link sustainability issues to resources. We also share Amsterdam's knowledge through our networks and city ties, such as in the Eurocities working groups, or by providing input on new laws and regulations to the European Commission and the state through these ties, networks, official contacts and council platforms.

Partly for this purpose, the national cooperation structure with the central government was set up, in which we work together to accelerate sustainability and remove barriers for cities in terms of zero-emission mobility, bio-based construction and insulation, and integrated neighbourhood-oriented sustainability. Under the guidance of Platform 31, in the NSS we look for supported scalable interventions and shared knowledge needs to accelerate sustainability as a collaborative government. With the Institute for Public Value (IPW), we are also working at this scale level to achieve breakthroughs in areas where we as a government ourselves get stuck in bureaucracy. We also collaborate in the DMI ecosystem, to harmonise the digital ecosystem, for example by participating in an advisory board on monitoring on the climate challenge.

On a regional scale, cooperation within the framework of the Amsterdam Metropolitan Region is relevant. This is a partnership of 30 municipalities, two provinces and the Transport Region that seeks to realise shared goals and ambitions through regional cooperation and joint agreements. Examples of such agreements are the Wood Construction Green Deal and the Bicycle Green Deal. Based on a periodic MRA Agenda, this partnership is firmly committed to making the region more sustainable.

Together with Amsterdam's knowledge institutions, we are working on various pilots and programmes to achieve upscaling of sustainability, both large and small. For instance, we collaborate with the University of Amsterdam in the 'Changemaking' subject and present our organisation as an opportunity to co-learn how to deploy social change. The Amsterdam University of Applied Sciences (HvA) is spearheading the U!reka project, in which they have established a pan-European university to help cities in the knowledge needs for the climate-neutral city mission, and have also established the citynetzero expertise centre. Through projects such as the growth fund application for future-proof assets or metacazze, the AMS Institute is working to make Amsterdam more sustainable.

With the GasTerug Action Network, which was launched on the initiative of then-Amsterdam alderman Van Doorninck after Russia's invasion of Ukraine to reduce dependence on Russian gas, the municipality is working closely on the theme of energy saving. This network, which received the prestigious C40 Cities Award in Buenos Aires in 2022, helps Amsterdam make connections with businesses, social organisations and citizens and develop concrete initiatives together. This is based on the idea that energy saving is not only a technical issue, but also a matter of cooperation, vision and common will.

By staying in touch with initiatives, actors and organisations in our city, we also want to gain a better understanding of where and why sustainability stagnates. Therefore, a climate consultation hour has been introduced and we are working on a sustainability council. We also organise a citizens' council around waste, a neighbourhood council around heat and try to facilitate energy cooperatives more. We also want to improve contact with existing initiatives and networks in the city, to see how they could be helped by other networks, stakeholders and initiatives in the city to accelerate in sustainability, or what unnecessary barriers they experience from municipal or other government policies in implementation. The sustainability coordinators and city brokers provide a listening ear for this. Another way we do this is by soliciting statements of support for making Amsterdam more sustainable from partners in the city.

Statements of support
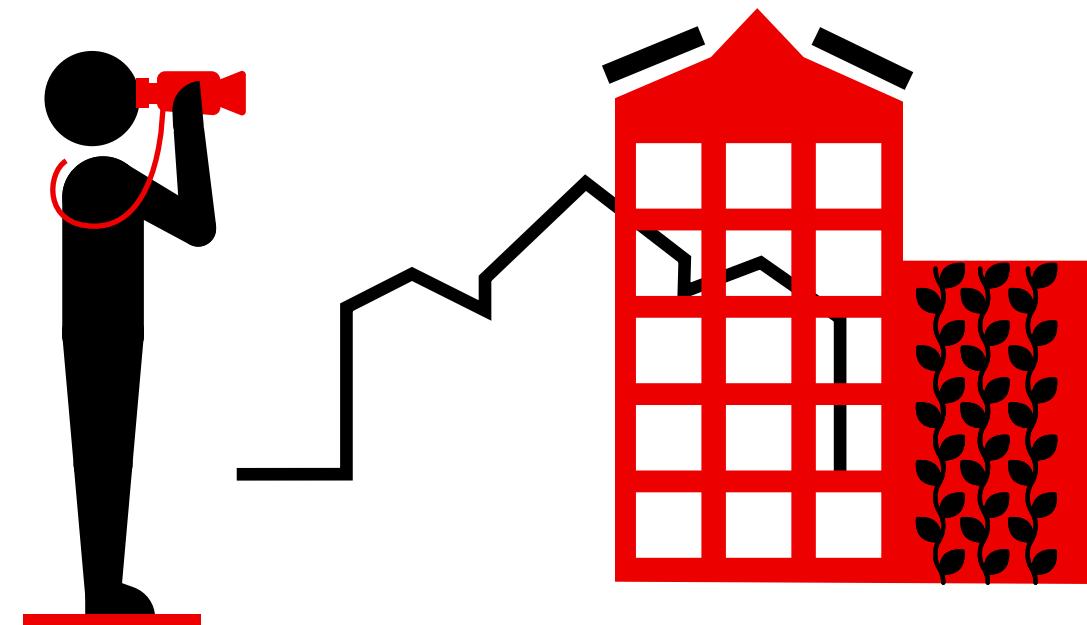
Statements of support

A separate annex lists various statements of support received by the municipality from partners in the city. The statements of support themselves are kept and are available on request. These declarations were enclosed with the submission of this document to the European Commission.

More info? amsterdam.nl/en/policy/sustainability

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