Climate City Contract

2030 Climate Neutrality Action Plan

(2030 Climate Neutrality Action Plan for the City of Stavanger)

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Summary

An abstract **summarizes the content** of the 2030 Climate Neutrality Action Plan (CCC Action Plan) that is developed jointly by local authorities, local businesses, and other stakeholders.

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Abbreviations and acronyms

The list of abbreviations and acronyms **identifies the abbreviations** (a shortened form of a word used in place of the full word) **and acronyms** (a word formed from the first letters of each of the words in a phrase of name) used in the CCC Action Plan.

Abbreviations and acronyms	Definition

SRH	Port of Stavanger
CCS	Carbon Capture and Storage
NEA	Norwegian Environment Agency

Introduction

Introduction

Stavanger is an elongated city- and island municipality with large agricultural and marine areas. Approximately 2/3rds of the city`s 776km^2 is beneath the sea surface. That is 262km^2 land and 514km^2 at sea, figure 1. Stavanger's Mission Cities goal includes all emissions within this territory as well as allocated contribution to four emission-sources located outside the city boundary. Stavanger is Norway's fourth largest city, counting 149 048 inhabitants in 2023, and is home to a wide range of nationally important industries. Thus, known as the energy capital, Stavanger aims to be one of the countries greenest, most climate-friendly cities by 2030. One of the challenging sectors to identify sufficient mitigating measures is within agriculture. Another focus area towards 2030 will need to be energy security, to ensure enough capacity for the green transition. There is a need to a broad collaboration to work on these issues.

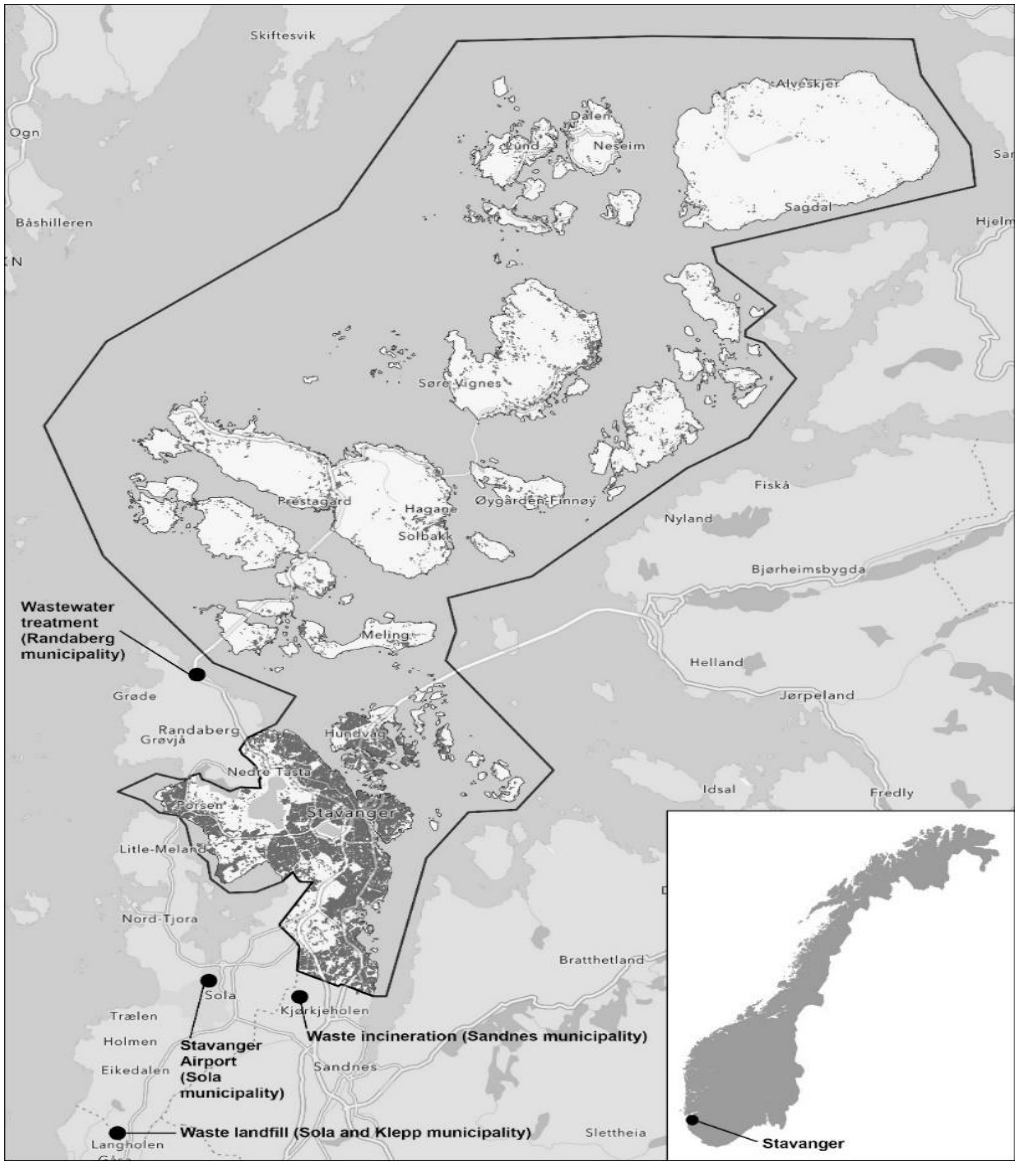

Figure 1 Map of land area and sea area for Stavanger

The mayor declared in 2021 the commitment to the objective of the Mission, to reach climate neutrality by 2030. The objective corresponds well with the city`s stated ambition to reduce its emissions by 80% compared to 2015, and to become fossil free by 2040. A strategy to account for the 20% residual emissions will be looked into as part of the participation in the mission.
Furthermore, the national Norwegian ambitions are aligned with the EU`s – to reduce emissions by 50-55% by 2030, and in addition to become climate neutral within the same year.
Although an associated member of the EU, these ambitious, corresponding goals on both EU, national as well as city level, gives confidence to a successful transformation in collaboration with all city stakeholders, including the citizens.

. Further objectives in the politically adopted climate plan are:

- to cut greenhouse gases by 80% by 2030 compared to 2015, and to be fossil-free by 2040.
- to ensure it is safe to eat fish and seafood from all marine areas in Stavanger by 2030
- to ensure clean air for all residents
- to protect the living conditions of plants and animal life and increase biodiversity.

Further explanations on reduction target and how it corresponds to climate neutrality beneath in chapter 1.1.

Trade and industry are still largely linked to the production of oil and gas, but also other resource-based industries like aquaculture and agriculture, other energy productions as well as ICT. From the city of canning to the oil capital. From the oil capital to the energy capital. Stavanger has always been part of the transition and are now facing yet another challenge. As a region, Stavanger must ensure a more sustainable business basis to have a more diverse economy. Almost 50 years of oil and gas have given both a unique competence and a competitive advantage toward a more sustainable business sector. The goal is for the Stavanger region to be the metropolitan area with the greatest competitiveness and value creation in the country, and to be leading in the green transition.

The city faces major, complex challenges such as climate change, growing economic, demographic and social disparities. At the same time, financial budgets are getting tighter and thus challenging the municipality's sustainability, that is the ability to ensure that residents' basic needs are met without this impacting future generations. The future welfare society is developed through a collaboration between residents, social stakeholders and the city's organisation.

Stavanger aims to create a socially, environmentally and economically sustainable city and prioritize 3 target areas: daily life quality, regional powerhouse and green spearhead.

The main priorities for the coming years are tackling climate and demographic change, and social exclusion. Innovation, research and cocreation are motivating tools to reach these objectives. The city has allocated funds for innovation and has formed a research department to develop the municipality`s ambition in this regard. This contributes to a rethinking the of the municipal role as a service shop, towards seeing it as an accelerator for local, joint development of the city. Developing the city as a good welfare society is a joint task requiring various stakeholders, both public and private, to work together. New ways of performing tasks, new technology, expertise and interdisciplinary cooperation are helping improve the capacity. Stavanger will develop a diverse and competitive business sector throughout the region and strengthen the city as a driving force. Stavanger wants active local communities, giving children and young people a good starting point for mastering everyday life and adulthood to make sure no one is left behind. Reducing social inequalities is important for residents and the stability of the community. The number of seniors is growing and need for comprehensive assistance is increasing while employment levels are decreasing. Stavanger will lead the way for a climate and environmental-friendly society and protect the habitats, biodiversity and cultural landscapes and be at the forefront of developing new sustainable solutions. A zero-growth target applies

for private car traffic within the city borders. The city will develop and carry out duties with residents, adopting user-friendly, digital solutions for everyone to contribute. The UN SDGs, describing important focus areas from a global perspective, are highlighted and transformed into concrete action locally. The city provides a culture for external expertise, for asking questions and daring to try and fail. Co-creation, innovation and digital solutions will form a natural part of the daily work in partnership with citizens, NPOs, and other external stakeholders ensuring equality and genuine influence. Mutual trust is vital for success. Despite the constraints the city faces, Stavanger has the wish and desire to reach the ambition and add an extra layer of cocreation to how we address the climate neutrality objective and theory of change in future iterations.

Political and administrative organisation:
The political system in Norway is based on representative democracy with several political parties. Norway as well as the other Nordic countries has developed societies that are based on strong egalitarian values. Citizens tolerate high tax levels to pay for public welfare services such as healthcare, education, social services and elderly care. However, their public finances are among the healthiest in OECD with surpluses on the general government accounts.

Local democracy is strong, and the local government sector is a well-established institution in Norway. The Alderman Act of 1837 first defined local authorities' rights and responsibilities. Both at the municipal level and at the county level there are elections with popular representatives responsible to their constituents. Norway has a two tier-system of local government: the municipalities and the county authorities. The municipalities and the county authorities have the same administrative status, whereas central government has the overriding authority and supervision of municipal and county municipal administration. The main representative of central government supervising local authorities is the County Governor[1].

The municipality is governed by a municipal council of directly elected representatives. The mayor is indirectly elected by a vote of the City Council. The city Council is made up of 67 representatives who are elected for a four-year term. The current period is 2023-2027.
The political governance model in Stavanger is called the chairmanship model. It entails that the city council, which is the highest political body, delegates authority to other committees and bodies, where both the political majority and the minority are represented.

In addition, the municipality has several politically elected committees to follow up specific thematic areas, like the committee on climate and nature, or the committee urban development. To ensure that vulnerable groups are being heard the city has created committees on for instance diversity and inclusion to connect the immigrant population to the municipality. The student population has its own committee, as have the elderly, the disabled and of course the youths. All boroughs in Stavanger are represented in politically elected borough committees to make sure that citizens are heard in matters that affect their neighbourhood.

The city of Stavanger has employed 2 democracy advisers whose responsibility is to engage and connect volunteers, private and public efforts, and to involve the citizens in the management of their city.

The administration investigates and evaluates to give the politicians the information they need to govern as they wish.

[1] local_government_in_norway_h-2313e.pdf (regjeringen.no)

The municipal director, who is the head of the municipality, presents the facts in each case presented the politicians, assesses various conditions, and presents his professional recommendation.

How the CCC relates to and complements other existing plans:
Stavanger has adopted a planning strategy with separate thematic plans to follow-up of the municipal master plan (Stavanger's Green Deal), shown in figure 2.

Figure 2 The local planning system

Work Process
A project mandate for the preparation of the CCC was developed and approved by the Councilman`s management board September 2022. The work was organized and led by the international staff unit. A project group (transition team) with team members from all relevant municipal departments was created, and in addition an advisory group consisting of directors from the departments.
After 6 months the organization was changed from a collaborative project group, into a linear form where the coordination team created assignments to departments and relevant stakeholders to map relevant action plans to cut emissions by 2030 and all barriers to achieve this goal.
Ultimo March 2024 it was decided to free resources from 3 departments to start filling out the CCC based on the deliverances from the assignments. After easter holiday the first meeting was held, and this "writing group", has since been active. Hope is that this group can form the basis of a transition team responsible for implementations and iterations of the CCC.
Workshops and meetings have been held frequently throughout the past 2 years working with the CCC process. These inclusion actions have been targeted to politicians, municipal companies, academia, local businesses, and relevant stakeholders within and outside the municipal organisation. The innovation clusters and umbrella organisations for businesses and citizens are examples. The goal has been to 1) Inform, learn and understand the Mission and the purpose and need of new ways to govern and collaborate, and 2) to engage and commit all relevant stakeholders to emission reduction and behavioural changes to enable climate neutrality.
The priority has been to achieve a binding collaboration with the companies that holds important social goals and tasks, and which were involved in the creation of the expression of interest. This applies to the local energy company LYSE, Port of Stavanger, Rogaland County who among many important responsibility areas oversee public transport both at land and at sea, IVAR which is the intermunicipal company with the responsibility of critical urban infrastructure as water supply, wastewater handling and cleansing, as well as waste handling and circular economy services. In addition, the municipal renovation company has been included, which has the responsibility of the collection and transportation of waste from households and businesses.

In addition, the university of Stavanger has been in the loop since before applying for the mission. A task force, to coordinate the two missions in this region (Mission Cities and Mission Adaptation) is under development.
The municipality has reached out and included the local business segment in the CCC. They have mapped and selected companies with operations within the different emission sectors, who wishes to take a further societal responsibility towards climate neutrality within 2030. All businesses contacted have been positive to contribute, however with a different readiness level. Some businesses have a thorough emission reduction strategy, and a well-developed action plan and reporting system. Some are at the starting point, nudged by the new directives derived from Fit for 55, and most somewhere in between. Which is why a new network "Action Group for Economic Development and Sustainability" has been established as a result of the Mission mobilisation process. It is a collaboration between the municipality and the university where the goal is to create a movement where business-to-business contact is easy, and business-to-government is based on correct information and proper dialogue. There is also an aim to use this work in research, so that we can broaden the knowledge of barriers related to cutting emissions and to fill the competence gap needed to become climate neutral.
To make sure multi level governance, Stavanger has invited the national and regional level to cooperate on the missions. A reach-out to the other Norwegian "mission cities", as well as the other cities applying for the mission without success has resulted in what may become a national platform for cooperation.
Stavanger has frequent contact with the other mission cities, and informal meetings with the national authority approximately 4 times a year. This cooperation is still in a process of mapping and building a strong mandate, but the creation of a national support platform for the mission is moving forward.
Advocating for the mission methodology to reach net zero is an iterative process where patience and learning loops are key drivers.

1.1 Target

Stavanger's politically adopted goal from 2018 is to reduce direct emissions within the city boundary by 80 percent, from 2015 (baseline year) to 2030. This goal has later been politically adjusted through two political decisions in 2020 and 2021. In addition, the city council decided to collaborate with the EU and 112 other cities within the frame of the Cities Mission which means to calculate reductions with a baseline newer than 2018, to account for residuals and to become climate neutral.

Biogenic emissions from agricultural processes are excluded from the locally adopted goal but included in this CCC. In addition, Stavanger's allocated contribution to four emission-sources located outside the city boundary have been included. These four are:

- Waste incineration in Sandnes municipality
- Waste landfill in Sola/Klepp municipality
- Wastewater treatment in Randaberg municipality
- Aviation in Sola municipality

The goal does not include scope 2 emissions from electricity production, but these data are collected and reported in our inventories. The possible inclusion of such goals will be considered in coming plan-processes. The inventory and goal do however include all emissions from district heating which lies entirely within Stavanger's geographic borders.

Stavanger municipality has also adopted sector-specific reduction-goals:

- Reduce the direct local greenhouse gas emissions from the transport sector by 80% by 2030 and by 100% by 2040

- Emissions of greenhouse gases from buildings and construction sites are reduced by 80% by 2030, and by 100% by 2040
- Natural gas as a heating source in the city area has been phased out by 2030
- By 2030, the direct greenhouse gas emissions from stationary energy have been reduced by 80%. Direct emissions of greenhouse gases from agriculture's machinery and stationary heating are reduced by 80% by 2030 and by 100% by 2040 (*Plan for Climate and environment in the agricultural sector)*.
- At least 25% of livestock manure is used for biogas production by 2030 (*Plan for Climate and environment in the agricultural sector)*.

Stavanger does not have a quantified goal for carbon sinks. In the city's *Plan for Climate and environment in the agricultural sector*, one of the goals is to preserve our agricultural land as important carbon stores, both in terms of area and quality. Further, it is a goal to stop recultivation and decommissioning of bogs. The municipality's aquaculture plan has a goal to keep carbon-rich areas and habitat types in the sea intact, and to map and preserve carbon-rich nature underwater. For further explanations see section B-2.3 on residuals. *The Green plan* deals with the entire green structure and the green open spaces, where the main goal is to preserve and develop interconnected green spaces for more biodiversity.

The climate and energy plan states that the municipality shall not buy climate quotas in other parts of the world to achieve the goals of GHG emission reduction in Stavanger.

Table I-1.1: Climate Neutrality Target by 2030

Sectors	Scope 1	Scope 2	Scope 3
Stationary energy	Included	to be defined	Optional information
	Excluded: F-gases, HFKs and PFKs, SF6 are not included in our emission inventory and target per now		Optional information
Transport	Included	to be defined	Optional information
	Excluded: F-gases, HFKs and PFKs, SF6 are not included in our emission inventory and target per now		Optional information
Waste/wastewater	Included	Not applicable	Stavanger's allocated contribution to Waste incineration in Sandnes municipality, Sele landfill emissions in Sola/Klepp municipality, Wastewater treatment in Randaberg municipality
	Excluded: F-gases, HFKs and PFKs, SF6 are not included in	Not applicable	

	our emission inventory and target per now		
IPPU	Included, in inventory sector "industry, oil and gas"	Not applicable	Optional information
	Excluded: F-gases, HFKs and PFKs, SF6 are not included in our emission inventory and target per now	Not applicable	Optional information
AFOLU		Not applicable	Optional information
	Excluded from locally adopted target, but available emission data from NEA. Will look to address this according to missionrequirements	Not applicable	Optional information
Geographical boundary	**Same as city administrative boundary**	**Smaller than city administrative boundary**	**Larger than city administrative boundary**
(Tick correct option)			x
Specify excluded/additional areas			Same as city administrative boundary, plus Stavanger's allocated contribution to four emission-sources located outside the city boundary have been included; • Waste incineration in Sandnes municipality • Waste landfill in Sola/Klepp municipality • Wastewater treatment in Randaberg municipality • Aviation in Sola municipality

Table 1: Climate Neutrality Target by 2030

2 Part A – Current State of Climate Action

2.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

2.1.1 Greenhouse gas Inventory

The Norwegian Environment Agency (NEA) publish emission inventories for all municipalities in Norway annually, which form the basis for Stavanger's reporting. The methodology is consistent with the national greenhouse gas inventory which is submitted to the UNFCCC and follows the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The inventory is largely based on bottom-up calculations for sectors where this is available. Documentation of method and CCC process is described in attached documents. The geographical boundary of the GHG inventory is all territorial land area. Stavanger's geographical border also extends 12 nautical miles to sea from the seashore baseline. The inventory includes through-traffic from ships (which is not included in the national inventory).
The emission Inventory includes the following gases:

- CO_2
- CH_4
- N_2O

Per Q1 2024, F-gases, hydrofluorocarbons (HFKs) and perfluorocarbons (PFKs), Sulphur hexafluoride (SF_6) and Nitrogen trifluoride (NF_3) are not included in the inventories for municipalities. There are no emissions of NF_3 in Norway. On the national level emissions of PFCs, HFCs and SF_6 in 2021 together accounted for 1.9 % of the total GHG emissions (ref National inventory report). Stavanger Municipality collaborate with national authorities and other Norwegian mission cities to address the inclusion of these gasses, and NEA will provide necessary data for inclusion before dd 2024. The inventory for municipalities from NEA is compiled for the years 2009, 2011, 2013, 2015, and annually thereafter. The inventories cover Scope 1 emissions as defined in the GHG protocol for cities, and heavily rely on the methodology and factors described in the IPCC Guideline. The inventory is distributed amongst nine emission sectors and 45 sources (categories) of emissions. In appendix CCC AP emission data per category and gas for Stavanger is provided.

GWP values from UN Climate Panel's fifth main report (AR5) are used. The same values are used for the entire time series, so that the emission figures are comparable between years.

In the inventory from NEA, emissions of CO_2 from biomass are considered zero emissions in the municipal greenhouse gas accounts. This is because CO_2-emissions from biomass are either considered zero emissions, if the biomass is based on crops that after withdrawal grows back again within a year (for example grains, fruit and vegetables) and thus takes up CO_2 equivalent to that which is emitted during use; or is counted in the land use sector when the biomass is removed from an area, if the biomass is based on perennial crops (crops that use more than one year to grow back – mainly wood material).

Emission-inventories are updated annually with methodological improvements for the entire timeseries, as also data for the newest inventory year is added to the timeseries.

The baseline year for our politically adopted goal is 2015. For the CCC, 2022 will be used as a basis for calculations of residual emissions. The rationale for this is to use an inventory year newer than 2018, ref. Info Kit for Cities.

A description of the methodology used is described in document M-2667 available at NEAs website. The QAQC process is also available at NEAs website.

The inventory from NEA is available at https://www.miljodirektoratet.no/tjenester/klimagassutslipp-kommuner/?area=428&sector=-2.

As previously described, Stavanger's goal includes Stavanger's allocated contribution to four emission-sources located outside the city boundary. A summary of the methodology for estimating Stavanger's contribution to these emissions are included in the table 2.

Table 2 Stavanger has four emission sources which are included, and which are outside the city territory.

Sector	Emission source	Municipality	Allocation method	%-share, Stavanger
Aviation	Stavanger airport	Sola	Information on the traveller's municipality of residence, from Avinor's travel habits survey	24,3
Waste and Wastewater	Central treatment facility SNJ	Randaberg	Wastewater: Discharges are distributed between the owner municipalities based on the number of inhabitants connected to municipal sewage, biological treatment of waste: Uses Stavanger's population share of the average pe load for SNJ	52 % Wastewater 41 % biological treatment of waste
Waste and wastewater	Waste deposition-site Sele	Sola	Ownership in IVAR	42
Waste incineration	Forus Energy recovery (Forus energigjenvinning)	Sandnes	Ownership in Lyse/IVAR Stavanger's share is currently calculated based on the ownership shares of Lyse and IVAR (intercommunal companies) at the two combustion lines, and Stavanger's ownership share in these companies.	40

Figure 3 gives a visual presentation of the emission inventory from 2015 until 2022. Stavanger's allocated contributions to four emission-sources located outside the city boundary are indicated using shaded bars.

Stavanger uses the Norwegian environment agency's greenhouse gas inventory as a basis for our climate budget. However, we also submit a greenhouse gas inventory to the Carbon Disclosure Project (CDP) in GPC format. The main differences between the inventory from NEA and the inventory in GPC is a difference in the categorization of sectors, and NEA is the data provider for scope 1 emissions in both instances. In the GPC reporting, scope 2 and certain scope 3 emissions are also included. Reported CDP data are provided in appendix CDP reporting. The most recent submission to CDP at the time of CCC submission will contain emission inventories for the years 2009, 2011, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2021, and 2022.

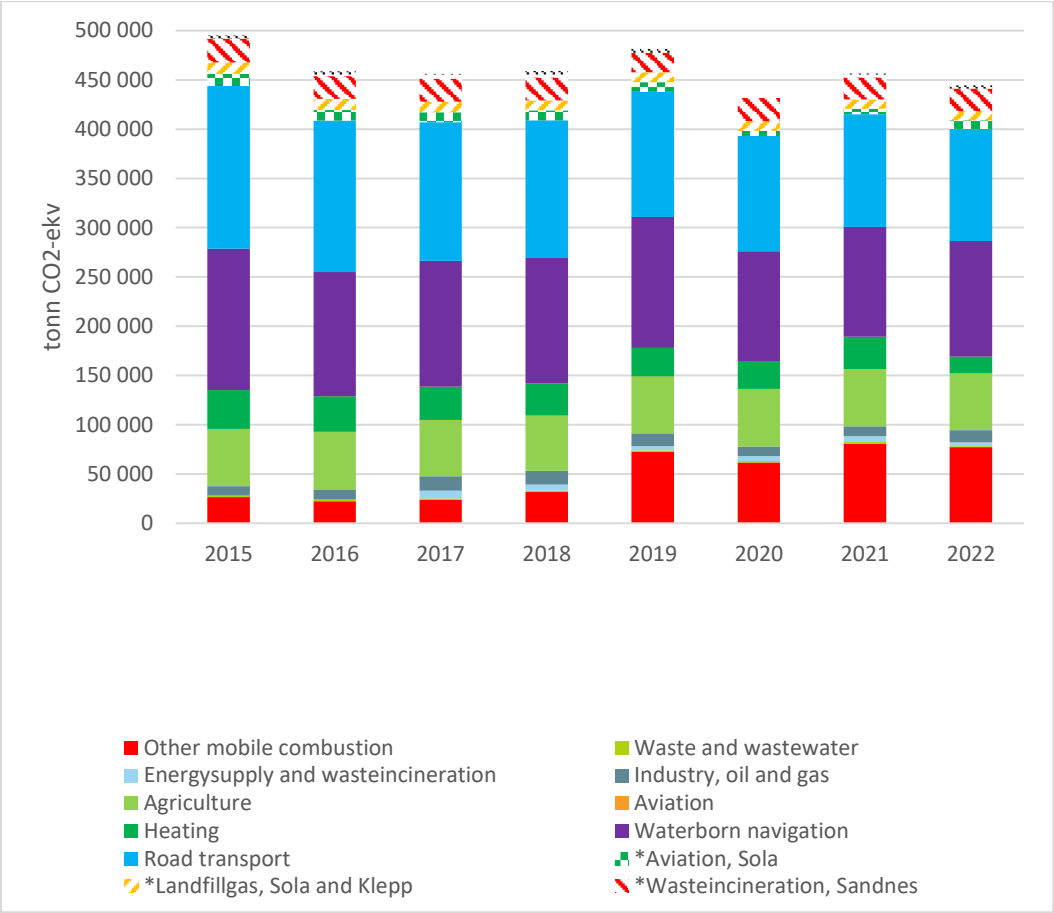

Figure 3 Emission inventory for Stavanger Municipality

2.1.1.1 Forestry and other land use

NEA also publishes a knowledge base for reducing emissions and increasing uptake of greenhouse gases from forestry and land use/land use change emissions for municipalities, available at https://www.miljodirektoratet.no/tjenester/klimagassutslipp-arealbruk-kommuner/?area=428&sector=-3

The inventory is updated every five years, and the results for 2020 is expected to be published in 2024. The emissions in this sector amounted to 7 659 tonnes of CO_2-eq. in 2015. The sequestration amounted to 20 244 tonnes of CO_2-eq. in 2015, resulting in a net uptake of 12 585 tonnes of CO_2-eq. in 2015.

This inventory reports on the absorption of greenhouse gases from the atmosphere occurring when biomass grows, absorbs and stores more carbon in the soil, roots, trunk and foliage, and the release of greenhouse gases occurring when the biomass is burned or broken down. Cultivation of the soil can also increase the breakdown of the organic material in the soil, which produces emissions of CO_2.

The inventory is calculated based on the UN Climate Panel's (IPCC) methodology, and follows the method used in the national greenhouse gas accounts, using data from various maps (AR5, N50 and SSB Land Use) and a combination of regional and standard emission factors.

A tool to show, and in time quantify emissions from land use change: In addition, Stavanger is working on a “carbon map” to visualise the emission potential of land use change, focussing on the areas with the highest ability for carbon storage. Existing tools are developed to report national emissions from the LULUCF sector, and do not have the level of precision needed for use in urban planning. The Norwegian

cities Stavanger, Oslo, Trondheim and Bergen have cooperated on collecting existing knowledge in a report on soil carbon in cities. We now need to use the recommendations from the report to increase precision and connect the existing tools with other available information about soil conditions, cover and ecosystems.

2.1.2 **Emission inventory for** Stavanger per emission sector

2.1.2.1 Road Transport

Sector emissions from road transport include emissions from the subsectors passenger cars, light duty vehicles, heavy duty vehicles and busses. Total emissions in baseline year 2015 was 165 200 tonnes CO_2-eq., this was reduced to 113 700 tonnes by year 2022. The decrease in this period is mainly due to an increased use of biofuels (from 4 percent average in 2015 to 12 percent in 2022), and the increased use of electric cars (electric passenger car ownership in Stavanger increased from 3 percent in 2015 to 26 percent in 2022).

In 2022, Passenger cars accounted for 56 percent, light duty vehicles 16 percent, heavy duty vehicles 19 percent and busses 9 percent of the emissions from road transport.

2.1.2.2 Waterborne Navigation

Total emissions in baseline year 2015 from waterborne navigation was 143 400 tonnes CO_2-eq., this was reduced to 117 300 tonnes by year 2022. Stavanger's geographical border to the sea extends 12 nautical miles from the seashore, and the emission inventory therefore also includes emissions from shipping that is not docked. There can be relatively large fluctuations in emissions for different ship categories between years. This is partly explained by the extensive boarder, where for example oil-related vessels to a varying degree can stay in our sea areas between assignments.

Subcategory Passenger ships are the largest emission category within Waterborne navigation (47 percent of waterborne navigation emissions in 2022) and include ferries and high-speed boats. Emissions from cruise traffic have been significantly reduced from 2019 to 2020 and 2021, because of the corona pandemic. The activity increases again in 2022.

The subcategory Offshore supply ships had high emissions in 2015, probably because of several supply ships traveling into Stavanger in anticipation of short-term assignments. This is the main reason why greenhouse gas emissions have been reduced by 18 percent from 2015 to 2022 for sector waterborne navigation.

2.1.2.3 Other mobile combustion

The sector includes emissions from the use of tax-free diesel and petrol for non-road motor vehicles such as tractors, construction machinery and snowmobiles. Tax-free diesel is used, among other things, in industries such as agriculture, forestry and construction. The sector also includes machinery used by private households.

Total emissions in baseline year 2015 from other mobile combustion was 26 724 tonnes CO_2-eq., this increased to 77 158 tonnes by year 2022. The data availability and quality for this sector is low, and calculation method used by the Norwegian Environment Agency to estimate emissions from other mobile combustion is therefor subject to some uncertainty, which makes it challenging to explain both emission levels and trends in the sector.

2.1.2.4 Heating

Sector emissions from heating include emissions from the subsectors bioenergy, fossil oil, paraffin, LPG, Natural gas, woodstoves and “other”. (See sector Energy supply for information regarding district heating). Total emissions in baseline year 2015 from heating was 39 300 tonnes CO_2-eq., this was reduced

to 16 800 tonnes by year 2022. A national ban on oil heating entered into force on 1 January 2020, explaining the decline in fossil oil emissions from 2015 to 2022.

According to the emission inventory from NEA, emissions from heating decreased by almost 50 per cent between 2021 and 2022, as a result of reduced consumption of natural gas. There was a rapid switch from natural gas to LPG in 2022 for many customers, due to increased natural gas prices. The activity data for LPG-emission calculations will be updated by the Norwegian Environment Agency next year, and it is expected that the revised emission data for heating in 2022 will be at a more similar level as in 2021.

2.1.2.5 Aviation

Emissions from this sector originate from emissions from aircraft and helicopters during landing or take-off. Within the city boundary, there is one landing site, at the hospital, with minimal emissions (1-3 tonnes per year).

The main airport used by citizens in Stavanger is Stavanger airport located in Sola municipality. Allocated emissions from Stavanger citizens travelling to and from Stavanger airport was 12 200 tonnes in 2015 and 8 600 in 2022. This was estimated by using travel habit survey data from 2022.

Due to more energy efficient engines, improved aerodynamics, lower weight and more seats have contributed to a reduction in the emissions per passenger kilometres. The emissions in 2022 may also be slightly affected by the pandemic.

2.1.2.6 Waste and wastewater

The central treatment plant in Randaberg municipality (SNJ) had emissions of 6 916 tonnes of CO_2-eq in 2022. Allocated emissions due to Stavanger Citizens is estimated to be 3 274. The emissions stem from biological treatment of waste (methane emissions from the biogas plant), and emissions of methane and nitrous oxide from wastewater treatment. The facility has no requirement for nitrogen removal, and the nitrogen content of the outlet water from the facility is assumed based on the load on the facility. There is also a stable, low amounts of emissions from this sector within the city boundary, 1 054 tonnes of CO_2 in 2022 mainly originating from septic tanks.

Stavanger previously deposited waste at the now closed waste disposal facility at Sele in Sola and Klepp municipality. The plant was active from 1982 to 2009, The landfill gas is used for district heating in Klepp. Remaining emissions allocated to Stavanger was 9 294 tonnes CO_2-eq in 2022. From 1. of July 2009, a ban on the disposal of biodegradable waste, such as residual waste, paper/cardboard, wood and textiles made from natural materials (wool and cotton) was introduced in Norway. Emissions from the plant has decreased by 35 percent since 2015, and emissions are expected to continue to decrease as the waste is decomposed.

A highly advanced and effective post-sorting plant for municipal waste was operative as of 2019. It reduced GHG by 35 000 t CO_2 e2/yr. Reuse of municipal waste is prioritised over energy recovery in line with circular economy principles. Unfortunately, the plant was destructed due to a fire 22.7.2022. However, in June 2023 the politicians decided to rebuild the plant.

2.1.2.7 Energy supply and Waste incineration

This sector includes emissions of 4 078 tonnes of CO_2-eq. emissions in 2022, from the use of natural gas in local district heating (smaller units). There is also a larger district heating unit, which uses spill heat from waste incineration (located in the neighbour municipality Sandnes) and some biofuel.

There is no waste incineration occurring within the city boundary. Allocated emissions in Stavanger's emissions inventory, based on ownership at the facility, from waste incineration in Sandnes was 23 000 tonnes CO_2-eq. in 2022, and has been relatively stable in the period from 2015.

2.1.2.8 Industry, oil and gas

The Oil and gas industry is an important industry in Stavanger, however, the emissions from these activities occur offshore, outside the city boundary. There are three main industrial facilities within the city border, with 12 265 tons CO_2-eq.-emissions in 2022. Emissions increased by 20 percent from 2021 to 2022, mainly due to propane usage by one of the industries. Energy use in smaller businesses is included in sector *heating.*

2.1.2.9 Agriculture

The emissions from agriculture are linked to three emission sources:

- Digestive processes in livestock: emission of methane from digestion
- Manure handling: emissions from manure storage
- Agricultural land: emissions of nitrous oxide from the spreading of manure, manure released during grazing, use of artificial fertilizers; from plant residues and the use of sludge and other organic fertilizers; from the cultivation of marshland liming; and indirect nitrous oxide emissions from fallout of ammonia and runoff

The emissions have been stable over time. Total emissions in baseline year 2015 from agriculture was 58 331 tonnes CO_2-eq., and 57 796 tonnes in year 2022. Emission levels correlate closely with the activity in the sector, such as the number of livestock and cultivated agricultural land area.

Emissions from energy use in agriculture are not included in the agricultural sector but are included in sectors other mobile combustion and heating. Emissions and sequestration due to changes in carbon storage in cultivated soils are included in the inventory *Forestry and other land use.*

2.1.3 Baseline trajectory

As part of the climate-budgeting process, a baseline trajectory is developed. The baseline trajectory shows a business as usual- (BAU) scenario, against which future climate measures are calculated. An overview of integrated presumptions, and short description of methodology, used in the baseline trajectory is included in the table 3.

Table 3 Baseline trajectory assumption

Sector	Method, baseline trajectory
Other mobile combustion	Average last 3 years + population growth. Adds 10 per cent biofuel blending from 2024, ref. regulatory requirement
Waste and wastewater	Based on anticipated local population growth
Energy supply and waste incineration	constant equal to the last year in the accounts
Industry, oil and gas	Based on anticipated local population growth
Agriculture	constant equal to the last year in the accounts
Aviation	constant equal to the last year in the accounts
Heating	Based on anticipated local population growth. For projecting heating to climate budget 2025, 2021 is used as the basis, because 2022 is unnaturally low since the LPG basis has not been updated
Waterborne navigation	A “growth”-pathway is used from a report on Waterborne navigation emissions in Stavanger (DNV), based on emission path with current emission intensity, and development in traffic. Biofuel usage requirement for domestic shipping is 6 % from 2024, where 68 % is the estimated share of domestic shipping in Stavanger

Road transport	Based on the expected local increase in electric vehicle shares, and the adopted escalation of sales-requirements for biofuel until year 2024. Electric vehicles share 2030 is 59 % for passenger cars, 31 % for commercial vehicles, 14 % for heavy vehicles in 2030, based on expected local turnover rate. Biofuel sales requirements per 2024 legislation for road transport is 19 % (national legislation).
*Aviation, Sola	Projection from Avinor, Avinor estimates an approximate annual increase of 2 % compared to the 2019 level. Avinor anticipates traffic growth at its airports until 2050, this also applies to Stavanger Airport, which is planning to expand its capacity. Share of travellers who live in Stavanger is from Avinor's travel habits survey 2022[2].
*Landfillgas, Sola and Klepp	Constantly equal to the last year in the accounts
*Waste incineration, Sandnes	The facility burns approximately 102 000 tonnes of waste per year, which produces emissions of approximately 58 000 tonnes of fossil CO_2-eq. Ownership at the two combustion lines is used to allocate a share of emissions to Stavanger.
*Waste and wastewater, Randaberg	Emission trends for wastewater follow expected population growth, while emissions from biological treatment of waste are kept constant.

According to the baseline trajectory, the emissions will be reduced by five percent from 2022 to 2030. Sectors with declining trends are largely due to implemented legislations and incentives for electric vehicles.

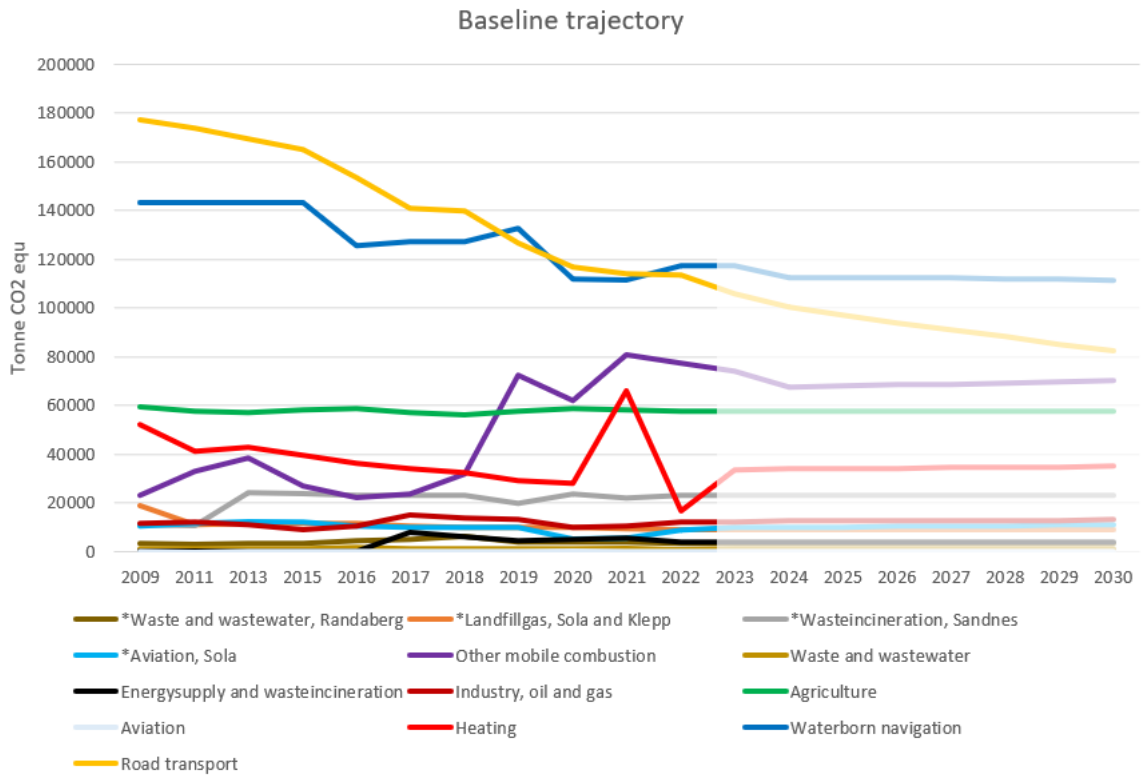

Figure 4 Visualization of baseline trajectory

The baseline trajectory, figure 4 has been used, and is used, to inform on key sectors to target when identifying measures and incentives for the climate budget. However, the main reason for developing the baseline trajectory, as part of the climate budget, has been to have a more realistic trajectory to calculate the effect of measures against, instead of inertly assuming that the last year's emission inventory is representative for future years. For instance, emissions from cruise ships were close to non existent during covid, but this emission level was not considered representative for years to come, which could be reflected in the baseline trajectory.

Implications of the emission composition in Stavanger for designing impact pathways and climate action

As shown in the BAU scenario, the largest emitting sector in Stavanger in 2030 is expected to be **waterborne navigation**, if no new measures were to be implemented. The local and national government's ability to reduce emissions from shipping is affected by *the type* of traffic. Domestic traffic is defined as ship traffic between Norwegian ports/offshore installations. A consultancy report[3] from 2022 shows that 2/3 of sea traffic emission in Stavanger's seawaters stem from domestic traffic and will be covered by drivers for domestic emission reductions, such as the Norwegian CO_2 tax and turnover requirement for biofuel in sold fuel. Important drivers for regulation emissions from international shipping are regulations from IMO and EU.

A high proportion of waterborne emissions, 28 %, is linked to port stays in Stavanger. Nationally, this proportion is 7 %. This shows that ships come particularly with the intention of going to the quay, for example to pick up or deliver supplies, equipment, goods and personnel. Offshore and cruise ships are in port most of the time they are within Stavanger municipality (approximately 70-90 %). 74 percent of the emissions from cruise ships is emitted during port stays. Measures to cut emissions while vessels are in port, including shore power, will therefore have a relatively greater effect in Stavanger. This knowledge will be built upon in Part B.

Emissions from **road transport** is expected to further decline towards 2030 due to legislation and incentives already in place for use of biofuels and the transition to electric vehicles, but efforts in this sector will need to be intensified further.

Agriculture: After the municipal merger between the former Stavanger municipality (city area), and the islands of Finnøy and Rennesøy in 2020, Stavanger went from being primarily an urban area to also becoming an important agricultural municipality in Norway. 35,7 % of the land area in Stavanger is farmland.

As described in the section on emission inventory, emissions from energy use in agriculture are not included in the agricultural sector in the emission inventory but are placed in sector other mobile combustion and heating. Important measures that stakeholders within the agricultural industry can implement, such as reduced use of natural gas for heating, or transitioning to electric machinery, will be visible in other sectors in the inventory than the agricultural sector. Identifying and working on measures to cut CH_4 and N_2O emissions in the agricultural sector is challenging as it is linked to production, but section B will explore pathways to work with also these emissions, for instance through biofuel production from animal waste and manure.

2.1.4 Stavanger Climate Budget

Stavanger municipality has used a climate budget (i.e. carbon budgeting) to communicate progress towards the reduction goal, and associated measures, since 2020. The climate budget is produced annually and entails a quantification of reductions due to identified and planned actions. Since the Climate

budget is a part of the financial budget, it focuses on the coming four-year period. The net Zero action plan however also includes estimates towards 2030.

The main policy informing the climate budget is the climate and environment action plan. The climate budget also includes measures which key players in the city are responsible to implement, such as private actors, intermunicipal companies and other governmental organisations.

The table 4 shows a summary-table of the measures, and calculated effects in 2030, relative to the emission inventory for year 2022. The budget is revised annually. Calculated effects are adjusted for double counting against measures in the BAU scenario.

Table 4 Climate budget measures

Sector	Climate budget Measure	Effect 2030, tonne CO_2-eq.
Road transport	Measures to facilitate emission-free vehicles. **Effect is included in baseline trajectory scenario. Effect not included in sum**	*24712*
Road transport	Zero increase in passenger car transportation from 2019 to 2029. **The effect of the measure is an avoided increase in emissions. Effect is not included in the sum**	*4939*
Road transport	Fossil-free Road public transport It is assumed that the start of the new bus contract for Nord-Jæren will take place on 1 July 2026, and that from then on, the buses will be battery-electrically operated throughout this contract. Estimates 5 % private buses that will not be electrified.	9500
Road transport	Stavanger municipality's vehicle fleet strives to be emission-free by 2025. There are still 222 petrol and diesel cars to be replaced by 2025 (all departments including enterprises). Effect included in first measure, not included in sum.	280
Waterborne Navigation	Fossil-free fast boats and ferries calling in Stavanger: Electrification of the Ryfylke ferry, the Ryfylke routes, the Hommersåk connection, Finnøy and Vassøy connection	15807
Waterborne Navigation	Measures to facilitate fossil-free port operations: Shore power at the Buøy shipyard: Rosenberg Worley's shore power facility opened June 2022. Emission reductions from shore power facilities for cruise ships at the shore quay from 2026. The effect of loading speedboats is taken care of by the measure above.	3970
Heating	Increase in biogas share as a result of increased production from IVAR's two plants. Estimates that half of the increase entails a reduction in natural gas consumption in Stavanger, including in the greenhouse industry	1940
Heating	Reduction of natural gas for heating; Transition from natural gas to district heating (“Godalen vgs”, expansion of the district heating network effective from 2025, phasing out the gas boiler at “Stavanger Forum”). Phase out at Stavanger university hospital	3256

Heating	Production of biogas from animal waste: "Bio Jæren" wants to establish a plant to produce biofertilizer, bio soil and biogas at Grødaland in Hå from animal manure, with biogas production of up to 150 GWh of biogas. "Finnøy Bioenergi" is planning a village facility for livestock manure of 15 GWh. Assumes that 25 % of the biogas is used in Stavanger municipality and displaces natural gas use.	8600
Heating	Phasing out of fossil gas in Lyse's local district heating plants by 2030. including avoided emissions at "Søra Bråde" biocoal plant: production of heat and biocoal from municipal green waste, replacing natural gas use from 2026.	3930
Carbon storage	"Søra Bråde" biocoal plant: production of biocoal from municipal green waste - **effect of storage of carbon in biocoal, effect is not included in sum in this table.** This is the offsets, see Table 6	*1300*
Other mobile combustion	Emission-free municipal building and construction sites and emission-free machines/equipment in Stavanger municipality by 2025.	2300
Other mobile combustion	Fossil-free municipal buildings and construction sites from 2021.	
	Total effects (excluding measures which are included in BAU, sequestration of avoided emissions)	**49303**

The aggregated effect of actions in the climate budget is measured against the baseline trajectory and are expected to reduce the emissions in 2030 by 49 000 tonnes CO_2-eq. compared to 2022.

The emissions are estimated to be reduced by 24,7 percent from 2015 to 2030, and by 16,2 percent from 2022 to 2030 based on the assumptions in the baseline trajectory and climate budget.

The effect of all climate measures is not captured in the Climate Budget, as the Climate Budget covers the direct emissions in the municipality. An example of this is energy saving measures, which is important as it allows the energy to be used for other purposes, but which does not result in direct emission reductions in Stavanger.

An important strategy in Stavanger is the land-use part of the municipal master plan from 2023, through which it was decided to return approx. 1,300 acres of registered areas for development in current municipal plans, into areas for the purpose "agricultural, nature and outdoor area". It is estimated that approximately 25,000 tonnes of CO_2-equivalent are avoided through this decision, as a result of preserving the carbon stock in the soil. This measure will however not contribute to a visible decrease in emissions in the climate budget, since this is a measure to avoid an increase in emissions, and since carbon changes in soil from land use changes are not captured in the nine emission sectors that is included in the municipalities' emission accounts prepared by the Norwegian Environment Agency.

The portfolio in section B-2 include the actions in the Climate Budget. Although the Climate Budget includes known measures, in some instances the measures are ongoing and need continuous focus, and in other instances the projects are in the development or implementation phase and may still have ongoing work regarding financing and investment decisions. It is therefore considered relevant to also include them in part B and the action portfolio.

2.1.5 Other Identified Measures

A more ambitious projection towards 2030 has also been developed, shown in table 5. This projection, "ambitious means of action" includes key trends and targets with associated measures. These include national target-figures for the escalation of sales requirements for biofuels, as communicated in the Government's climate status and plan (published 6th of October 2023), as well as National targets for electrification of road transport from the national transport plan. The allocated effects for Stavanger of a possible CCS at the waste incineration plant in Sandnes municipality is also indicated, even though investment decision has yet to be made, it is therefore uncertain that the project will be finalized by 2030. Avinor operates 43 airports in Norway, and their emission trajectory towards 2030 based on 1,5 % annual efficiency improvement, and introduction of sustainable fuel is also included. Stavanger has signed a letter of intent together with the largest cities in Norway to work towards emission free municipal building sites by 2025 and for all building sites within the city border to be emission free by 2030. However, as of today the municipality does not have the necessary legal authority to impose this on private developers and contractors. There is an ongoing process on a national level analysing if either the Planning and Building Act or the Pollution Act can be revised to create the necessary legal leeway. The outcome of this analysis is uncertain, and should it lead to a clearer authority for the municipalities it is still necessary to have a local political consensus before any demands can be made towards the private building sector. Due to these uncertainties this measure is included as an "identified measure". As was the case for climate budget measures, the portfolio in section B-2 also includes actions identified "ambitious means of action".

Table 5 Other identified measures (ambitious means pathway)

Sector	Ambitious means of action	Effect tonne CO_2-eq., 2030
Other mobile combustion	Escalation of sales requirements for biofuel for non-road machines to 28 % in 2030 (ref. The Government's climate status and plan published 6 October 2023). Effect is adjusted to avoid double counting against the BAU scenario; 10 % biofuels from 2024 is included in BAU scenario.	-14 000
Waterborne navigation	Escalation of sales requirements for biofuel for domestic shipping to 18 % in 2030 (ref. The Government's climate status and plan published 6 October 2023). The effect is adjusted to avoid double counting with BAU scenario; 6 % domestic involvement from 2024 is in the BAU scenario. 10 % emission cut in foreign navigation in Stavanger's seawaters, due to anticipated effects of IMO and EU regulations, estimated effect from DNV report. Ferry line Mortaviga- Arsvågen: Possible zero emission solution when new contract to be negotiated (contract run until dd 2024 with 5 y optional extension period). The ferry line will be replaced by Rogfast undersea tunnel approx. 2033.	-44 500

Road transport	Electrification: Use target figures from the National Transport Plan 2022-2033: - new passenger cars and light vans must be zero-emission vehicles in 2025 - by 2030, 50 percent of new trucks must be zero-emission vehicles The National Transport Plan (NTP) 2025–2036 will be presented in spring 2024. The effect is adjusted against the expected increase in line with the renewal rate that lies in the BAU scenario, to avoid double counting. The effect of electrification of buses is included as a measure in the climate budget. Biofuel: Escalation of sales requirements for biofuel for road traffic to 33 % in 2030 (ref. The Government's climate status and plan published 6 October 2023). The effect has been adjusted to avoid double counting against the already adopted share of 19 % from 2024. Reduced travel by passenger car: Target to reduce share of travels from 41 percent to 30 percent by 2030.	-25 500
*Aviation, Sola	Effect from Avinor, based on 1.5 % annual efficiency improvement, and introduction of sustainable fuel.	-4 600
*Waste incineration, Sandnes	The building of a CCS plant at Forus energigjenvinning (waste incineration plant in Sandnes municipality) is included as an identified measure as per now. There is no investment decision. Stavanger's share is currently calculated based on the ownership shares of Lyse and IVAR (intercommunal companies) at the two combustion lines, and Stavanger's ownership share in these companies, Stavanger's allocated effect corresponds to 14,000 tonnes CO_2-eq. (14 000 is the avoided emissions at source point, see next chapter for offset).	-14 000
Agriculture	Nationally identified measures in "Climate measures in Norway: Knowledge base 2024", excluding biocoal/biogas plants and measures affecting the LULUCF sector. Measures include; Consumption in line with the dietary guidelines, Reduced food waste, various fertilizer measures, Methane inhibitors. Finnøy bioenergy: Biogas production from animal manure. Reduction of emissions from cattle manure and pig manure compared to normal manure handling.	-14 450
Other mobile combustion	Emission-free private and governmental building and construction sites and emission-free machines/equipment	-7600
Sum, effect ambitious means pathway		**-124 700**

2.1.6 CO_2 sequestration

Regarding sequestration, two possible projects involve an element of carbon storage, see **Feil! Fant ikke referansekilden.Feil! Fant ikke referansekilden.**6. In part B.2.3, a description of efforts for protection and restoration of nature and enhancing natural sinks is given.

Table 6 Two specific sequestration projects - offsets

Sector	Measure (Sequestration)	Effect 2030, tonne CO_2-eq. offsets

Heating	Binding of carbon in biocoal, Søra bråde	-1300
*Wasteincineration, Sandnes	CCS plant at Forus energigjenvinning. (Stavanger's share of offsets, see table above for avoided emissions)	-26000

*As will be described in section 3.1.1.3, this may increase to 36 000 tonnes of CO_2 as Stavanger's calculated share of sequestration, depending on which project solution is selected. Realization of the project is dependent on funding and investment decision.

As described in section 2.1.1.1, the inventory for the sector forestry, land use and land use change from NEA also indicate that Stavanger had a net uptake of 12 585 tonnes of CO_2-eq. in 2015. New data for 2020 is expected to be published in 2024.

2.1.7 Emission gap and residual emissions

Below is a compilation of emissions per sector, the effects of previously described measures in the BAU- and ambitious scenario-pathways and measures in the climate budget, and estimated emission gap in 2030, given fulfilment of all the assumptions in the calculations. As previously described, calculations of all effects are adjusted to avoid double counting between the BAU scenario and the "ambitious means of action" scenario.

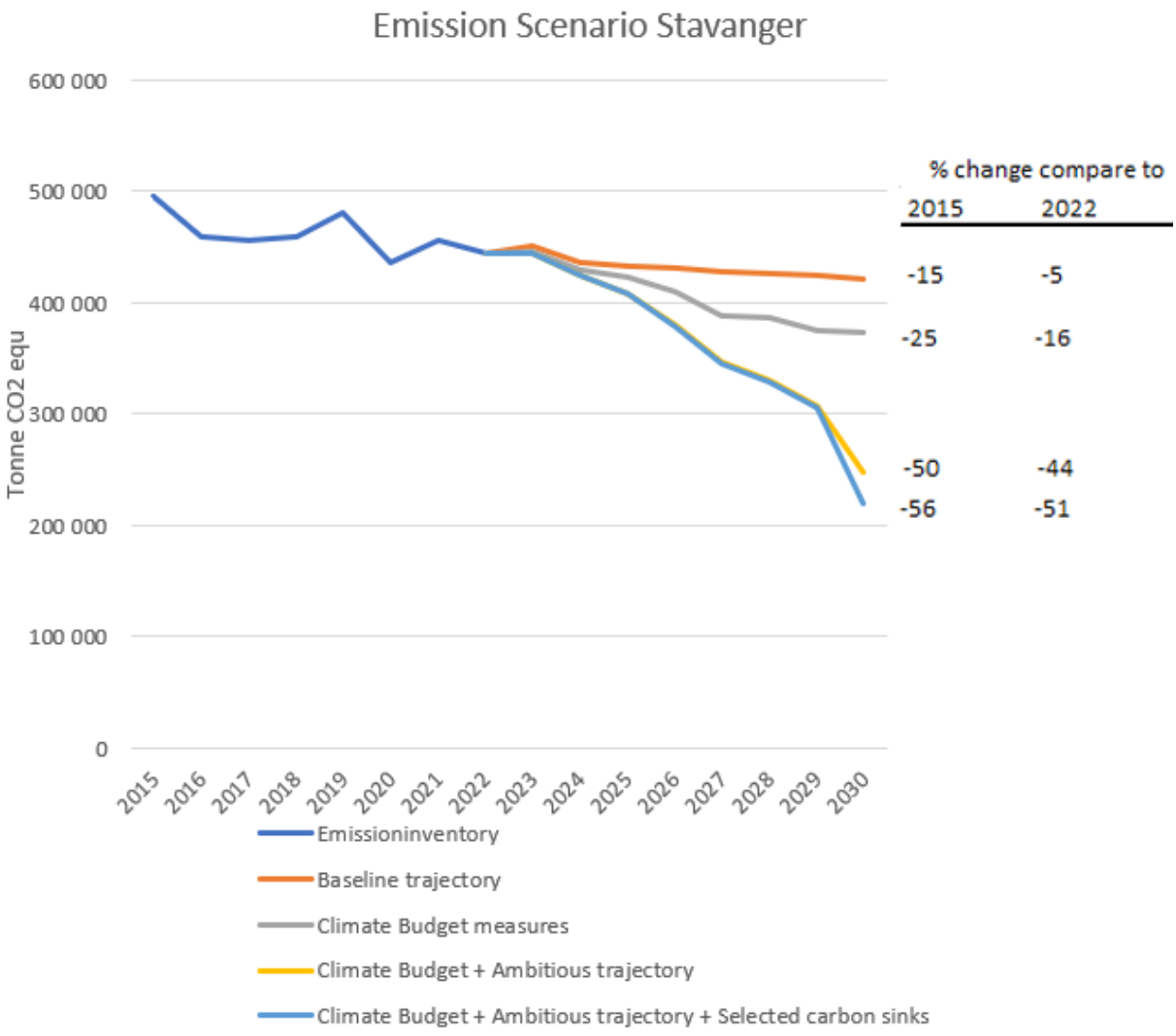

Figure 5 Emission scenarios for Stavanger

Figure 5 show the trajectory which includes measures in the baseline trajectory, climate budget and other identified measures, shows that emissions can be reduced by 50 percent from 2015 to 2030, and by 44 percent from 2022 to 2030. Stavanger municipality has therefore not yet identified enough measures to reach the goal off reducing emissions by 80 percent by 2030. Section B explores further work and pathways which can contribute to close the gap. Below are some figures which visualize the possible development towards 2030. **Feil! Fant ikke referansekilden.** Figure 6 shows a scenario for emission development towards 2030 broken down per sector, based on the measures and assumptions in the baseline trajectory (Figure 4), climate budget (Tabel 4) and identified ambitious means of actions (Tabel 5). A diagram showing estimated emissions composition in 2030 is shown in Figure 7.

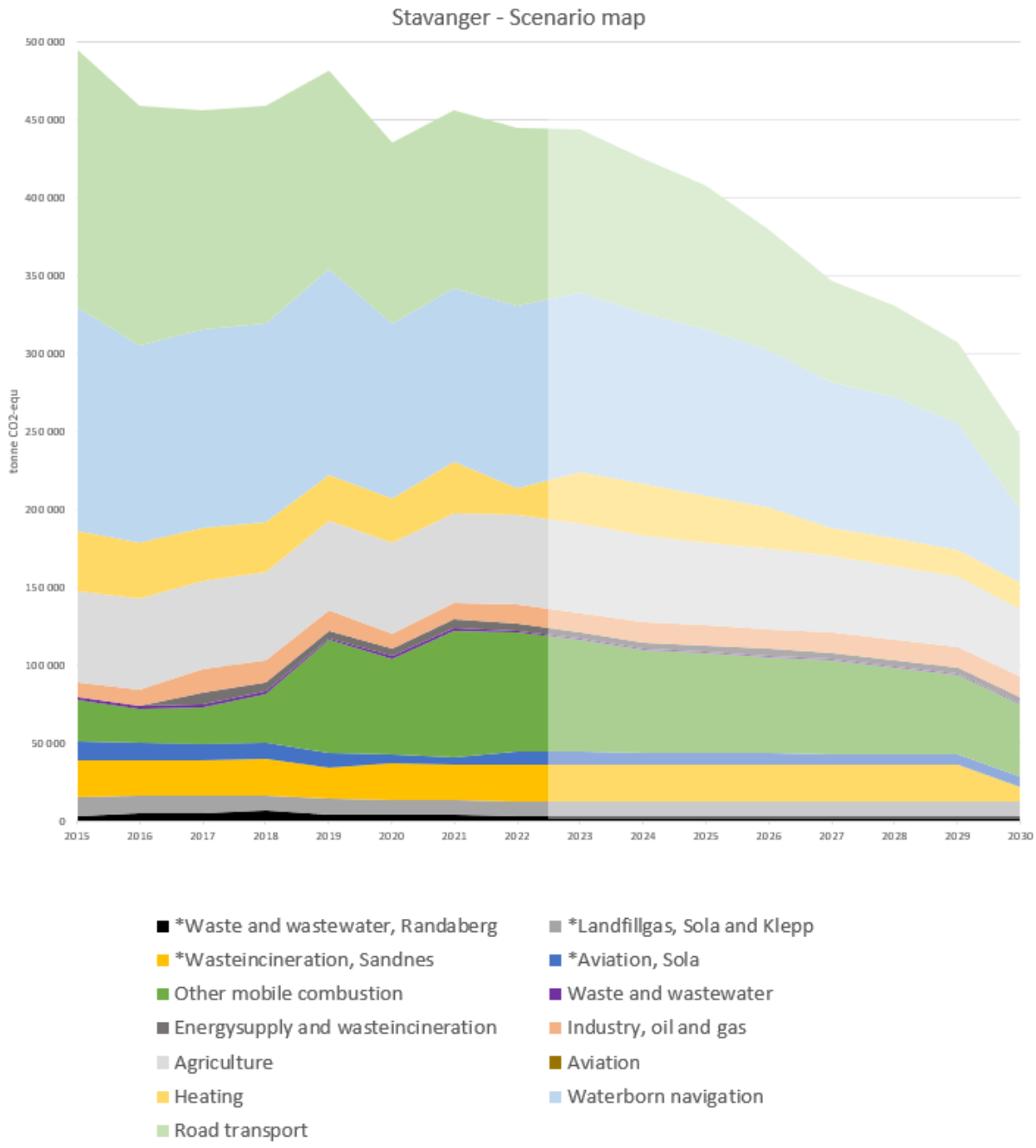

Figure 6 Emission Scenario broken down by sector. Includes measures and assumptions in the baseline trajectory, climate budget and other identified ambitious means of actions.

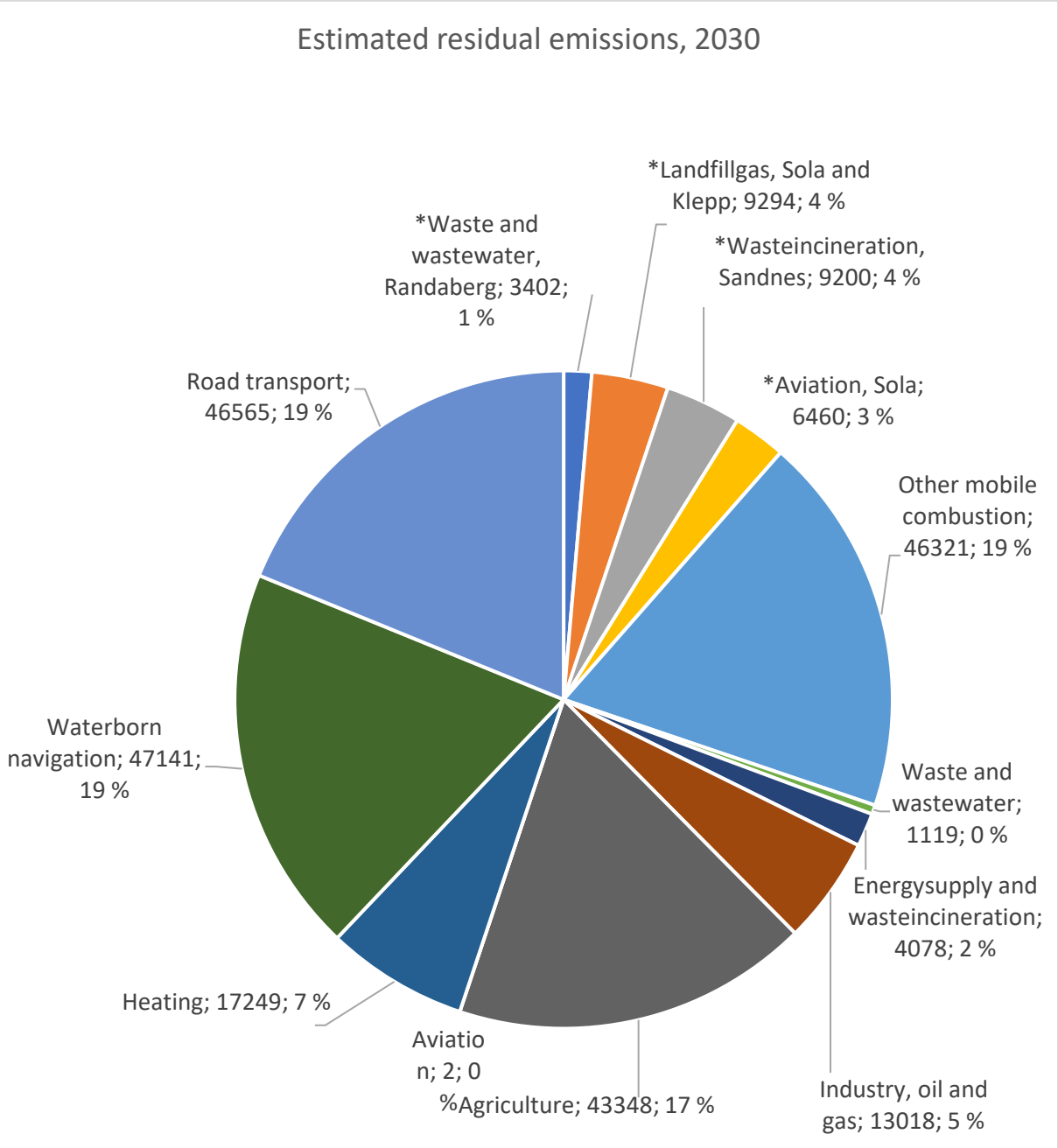

Figure 7 Estimated residual emission in 2030, Includes measures and assumptions in the base-line trajectory, climate budget and other identified ambitious means of actions.

Table 7 Emission gap and residual emissions

Sector	Baseline emissions	Monitoring year emissions	2030 Emissions in Baseline trajectory			Pathway "Ambitious means of action", (additional reductions)		Emission reductions, climate budget 2025		Residual emissions		
	2015	2022	2030			2030		2030		2030		
	Absolute (tonne CO2 equ)	Absolute (tonne CO2 equ)	Absolute (tonne CO2 equ)	absolute change, compared to 2022	% change, compared to 2022	Absolute (tonne CO2 equ)	% reduction, compared to 2022	Absolute (tonne CO2 equ)	% reduction, compared to 2022	Absolute (tonne CO2 equ)	% change, compared to 2022	% change, compared to 2015
Other mobile combustion	26 724	77158	69999	-7159	-9,3	-21608	-28,0	-2070	-2,7	46321	-40,0	73,3
Waste and wastewater	1 441	1054	1119	65	6,1					1119	6,1	-22,4
Energysupply and wasteincineration	77	4078	4078	0	0,0					4078	0,0	5179,7
Industry, oil and gas	9 300	12265	13018	753	6,1					13018	6,1	40,0
Agriculture	58 331	57796	57796	0	0,0	-14448	-25,0			43348	-25,0	-25,7
Aviation	1	2	2	0	0,0					2	0,0	242,5
Heating	39 293	16846	34974	18128	107,6			-17726	-105,2	17248	2,4	-56,1
Waterborn navigation	143 412	117344	111455	-5889	-5,0	-44537	-38,0	-19777	-16,9	47141	-59,8	-67,1
Road transport	165 227	113681	82559	-31122	-27,4	-26493	-23,3	-9500	-8,4	46566	-59,0	-71,8
*Aviation, Sola	12167	8642	11064	2422	28,0	-4604	-53,3			6460	-25,2	-46,9
*Landfillgas, Sola and Klepp	11697	9294	9294	0	0,0					9294	0,0	-20,5
*Wasteincineration, Sandnes	24082	23006	23200	194	0,8	-14000	-60,9			9200	-60,0	-61,8
*Waste and wastewater, Randaberg	3253	3274	3402	127	3,9					3402	3,9	4,6
Total	495 007	444 440	421 959	-22481	-5,1	-125690	-28,3	-49073	-11,0	247196	-44,4	-50,1

As informed in the Infokit for cities, “An emission source can be considered insignificant if the size of emissions is smaller than any other sub-sector that shall be reported. In addition, the combined emissions from all sources that are considered insignificant should not exceed 5 % of total emissions that shall be reported». No subsectors have been excluded from reporting, since the data are available. However, it is expected that estimated emissions reduction would have been slightly higher, if such deductions had been made. The reason for this is that the climate budget work has not focussed on estimations of potential for the smallest emitting sources, and most of them are included with emission developments according to expected population growth, or stable emission trajectories towards 2030.

2.2 Module A-2 Current Policies and Strategies Assessment

There is an extensive number of local guidelines, strategies, concepts, as well as regional and national legislation that influence local climate action. The EU's political strategy md Grønn Deal & Fit for 55 provides new regulations that also affect Norway and Stavanger. Table 8 provides an overview of local, regional and national laws, strategies, plans and regulations that are relevant to the emission sectors and the work on climate action. For each, a short description is given, climate-relevant assessments in a political context.

Table 8 List of relevant policies, strategies, and regulations.

Type	Level	Name & Title	Description	Relevance
Strategy	Global	IMO	IMO Regulations (dnv.com)	The revised strategy aims to significantly curb GHG emissions from international shipping. The new targets include a 20 % reduction in emissions by 2030, a 70 % reduction by 2040 (compared to 2008 levels), and the ultimate goal of achieving net-zero emissions by 2050. The emission reductions before 20 % are expected to be concentrated around energy efficiency and fuel.
Strategy/ Regulations	European	Green Deal & Fit for 55		
Regulation	European	FuelEUMaritime	Through FuelEU Maritime, the ships will be required to gradually reduce the ships' emission intensity, or in other words, the amount of greenhouse gas emissions linked to the production of energy on board the ships. These emission targets do not only take into account direct emis-	There is a demand for the development of shore power by 2030 for container ships and larger passenger and cruise ships. The requirement applies to all ports that are part of the Trans-European Network for Transport (TEN-T), and in Norway we have 16 such TEN-T ports. Furthermore, the Norwegian authorities are also required to set national targets for the further development of infrastructure for alternative fuels, such as hydrogen and ammonia.

			sions, so-called "Tank-to-Wake", but also include emissions linked to more indirect emissions linked to production and distribution ("Well-to-Tank"). The purpose of these requirements is to stimulate increased demand for fossil-free fuels. In addition, there are requirements for larger container ships, passenger ships and cruise ships to use shore power or zero-emission technology in port from and including 2030, and the fines for not meeting these requirements can quickly reach a six-figure sum in kroner per call.	
Regulation	European	ETS	EU ETS – Emissions Trading System (dnv.com) Skipsfart i EUs klimakvotesystem - Miljødirektoratet (miljodirektoratet.no)	ETS (Emission trading systems) is the European carbon credit regime, that is being expanded from 2024 to include shipping. ETS will hit Shipping companies in traffic between Norway and EU. Shipping companies may look for ways to reduce their emissions, which could lead to changes in routes and which ports they choose to call at. SRH don't have an overview of how many vessels in Stavanger that are affected by ETS.
Law	National	Climate change act / Klimaloven	The climate change act applies to emissions and removal of greenhouse gases covered by Norway's first nationally determined contribution submitted under the Paris agreement of 12th of December 2015. The purpose of this act is to promote the implementation of Norway's climate targets as part of its process of transformation to a low-emission society by 2050. The target is for greenhouse gas emissions to be reduced by at 55 % by 2030 (reference 1990) and to become a low-emission society by 2050 (reduction of 90-95 %).	The climate change act is the law that promotes the implementation of Norway's climate targets as part of its process of transformation to a low-emission society by 2050.
Plan	National	The governments climate status and plan /	The green book is the government's comprehensive climate status report and road map for	The green book doesn't formulate any direct instructions and rules for the municipalities in Norway, that comes through other plans and strategies. What the green book does is that

		Grønn bok	the future. It shows the progress in climate policy, how last year's plan has been strengthened and how likely Norway is to reach the climate targets. The Green book is also the government's reporting according to the climate act (the climate act is a law ratified in 2018 and is meant to further the implementation of Norway's climate goals as part of the transition to a low-emission society in 2050).	it describes areas where the municipality has a responsibility to act, and outlines goals Norway should reach. The climate crisis is one of our times most pressing dangers, and the municipality plays an important role in the transition to a climate neutral society. As the main authority on land-use, the municipalities have a responsibility to find solutions that fits within their unique context and local community. The green book also describes some of the framework the municipalities work within, both laws and parliamentary notices/recommendations. One of their recommendations is that municipalities in their revision of the land-use plan assess whether previously approved land use should be changed if it has a negative impact on climate. Stavanger did this in 2023 during the last revision and removed several areas in the former Master plan for land-use to reduce climate impacts (and protect natural environments).
Plan	National	National transport plan / Nasjonal Transportplan	The national transport plan is the state's transport policy and long-term plan for the transport infrastructure. The overarching transport policy goal is a "effective, environmentally friendly and safe transport system in the whole of Norway by 2050". The transport system includes infrastructure and policies for all modes of transport, including cycling and walking. It is a stated goal of the transport plan to contribute to reach Norway's climate goals, as the transport sector stands for 1/3 of Norway's emissions.	The national transport plan describes the national policies for transport, and areas to prioritize. It is a plan for the whole transport sector in Norway, which also includes the municipalities. Stavanger has a responsibility to follow up on the goals outlined by the state. The municipality has a responsibility through the role of land-use authority to plan according to national and regional interests. The municipality also has a responsibility for all municipal/local roads and harbours, and the local land-use and parking policies. Many of the goals set in Stavanger's land-use plan and transport policies are continuations of the policies described in the national transport plan.
Strategy	National	Roadmap for green maritime transport	The roadmap for green maritime transport within the construction and civil engineering sector contains concrete recommendations and milestones for builders, contractors, shipping companies, ports and authorities who want to contribute to increasing green maritime transport in construction and civil engineering projects. The	Much of the building materials and construction materials often go to more central areas and towns. Bringing this in over local ports will often help to keep the number of kilometers by car transport down. This can reduce the strain on the local road network and reduce local and global emissions. Use of ships will also require suitable areas for intermediate storage and handling of goods. With a development where more and more ships use more environmentally friendly fuels and

			overall goal of the roadmap is to provide direction and user-friendly tools for reducing greenhouse gas emissions from the sector.	shore power, there is a need for suitable areas for, and investments in, facilities for environmentally friendly fuels and shore power.
System/Tool	International		The Environmental Port Index (EPI) is a unique reporting tool developed in collaboration with DNV and numerous shipping industry experts.	The aim is to increase the operational efficiency of both ship owners and port operators, while reducing their impact on the environment. The EPI is an international solution, backed by global maritime experts and a robust IT infrastructure capable of supporting ports around the world.
Plan	National	Action plan for green shipping / Handlingsplan grønn skipsfart	Norway is on its way to become a low-emission society. The road there will be demanding, but also offer opportunities. For the maritime sector this creates opportunities for green value creation both nationally and internationally. The government wants to plan for Norwegian winners in the green shift in shipping. The action plan presents policies to cut national emissions, strengthen the maritime industry and contribute to the global technology development to achieve the international environmental goals. Measures taken to reduce greenhouse gas emissions often cuts other environmental emissions, like sulfur and NOx too.	The plan is made as a national plan and is relevant for all municipalities and county's. Some goals that are relevant for Stavanger municipality includes: - The government want to cooperate with the municipality's and local port authority's to towards a shared goal of emission-free ports by 2030. To reach this goal it's important that the ports can provide sustainable fuel like biogas and hydrogen, and land energy supply and power. - The government wants to facilitate for a fast infrastructure development for throughout the whole country, with a combination of public and market finances, to keep up with the increase in electric modes of transport. - The municipality can set a port fee for ships that arrive at the port, to cover municipal expenses according to the ports and waters act. Many municipalities give discounts to ships running on sustainable fuel. - In 2019, 13 different cruise ports (Stavanger included) agreed to 14 measures to be taken to reduce emissions and make for greener harbors. These include that all cruise ships must use landpower from 2025, that cruise ships must be emission-free as soon as the technology is available, that low-emissions cruise ships are prioritized in the harbors and to work for a new act/law that can give legal ground to set a max amount of cruise ships in a harbor a day.

Strategy	National	Action plan for circular economy / Handlingsplan for en sirkulær økonomi	The action plan aims to readjust the Norwegian economy towards a circular economy. It has a stated goal of making Norway a leading country in the development of a green, circular economy that aims to reduce the total stress on the climate and environment, and to create new jobs in the whole country. Norwegian citizens have a high material footprint per inhabitant compared to other countries, and OECD has recommended that Norway needs to facilitate for a more circular economy to counteract this.	The action plan outlines a need for increased interaction between the state, private businesses, the counties, municipalities, and others. The municipality has an important role in facilitating for a circular economy. Through the different roles the municipality inhabits, it acts as a promoter of social development, purchaser and provider of goods and services and as the planning authority within its borders. Within the space of opportunity these roles provide the municipality has a responsibility to promote circular economy.
NOU	National	The Norwegian Official Report 2023:25 *« The transition to low emissions. Climate policy choices towards 2050 »* / NOU 2023:25 *«Omstilling til lavutslipp – veivalg for klimapolitikken mot 2050»*	The Norwegian report on transition to low emissions is an official report that conducts an overall view of Norway's choices for achieving the 2050 climate targets, and to describe a pathway for the transformation to a low emission society that is cost-effective as possible. Resulting in a society where resource use is efficient, and business and industry is competitive. This process must also ensure a development pathway that safeguards biodiversity and maintains a welfare-based society. The committee will evaluate progress towards the targets and assess the benefits obtained against economic costs.	The Norwegian official report is not a legally binding document but gives a thorough evaluation of Norway's potential road to climate neutrality by 2050. Several of the recommendations in the report touches the responsibilities and concerns of the municipalities. If these recommendations are followed the possibilities to regulate and make claims to the private sectors, as well as in own organization can be strengthened.
NOU	National	The Norwegian Official Report 2023:3 *«More of everything – faster»* / NOU: 2023:3 *«Mer av alt – raskere»*	*"More of everything – faster*" examines and evaluates the long-term possibilities and challenges of the Norwegian energy industry. The report presents recommendations and suggest actions that are necessary to change the pace of Norwegian energy policies.	The report concludes that the need for energy in the green transition is very high. Norway have historically had a surplus of energy but is now facing the risk of an energy deficit. Stavanger municipality is a co-owner in the energy company "lyse" and is therefore affected by the changes in energy prices, supply, and regulations. If the recommendations and suggestions of the report is followed through it can affect the municipal economy as well as access to electricity.
Law	National	The planning and building act /	The most important Norwegian law when it comes to managing and planning land use in Norway.	The planning and building act have strict rules on the mandate of the municipalities. This law dictates on which matters the municipality can regulate private developers. For instance, utilization rate, quality, energy supply etc.

		Plan- og bygningsloven	The law coordinates several other laws that relates to land use and clarifies the hierarchy between them. It regulates both plans for land-use are to be made and followed, and how building applications are to be administrated.	The law is also very clear on matters the municipalities cannot regulate. Because the law has not been revised in a long time (2008) and has not been up to date on the climate changes its limits the necessary legal ground to make developers build the city in the best way possible with regards to emissions Because of the limitations of the law, the municipality doesn't have the legal authority to prevent old building from being demolished, set a minimum threshold for Co2 emissions, or demand local energy sources in new projects.
Agreement	National/Regional	City Growth Agreement (2019-2029) / Byvekstavtalen	The city-growth agreement is an agreement between the national government (The Norwegian Public Roads Authority, Norwegian Railway Directorate, Rogaland County Governor), the municipalities in Nord-Jæren (Stavanger, Sandnes, Sola and Randaberg) and Rogaland County authority/council. The agreement is an important tool for the government to promote the development of attractive cities with good mobility and accessibility. The parties are also obliged to work towards fulfilling the zero-growth goal. The goal for the city areas is that emissions, congestion and air and noise pollution will be reduced through effective land-use, and all growth in mobility is to be in public transport, cycling and walking, and not cars.	The agreements form the basis of which investments are necessary to reach the zero-growth goal. The most important investment projects are: - The bicycle highway - Bus rapid transit system for Nord-Jæren - Investments for cycling, walking, public transit and traffic safety infrastructure - Highway projects In addition, there is also allocated funds for a mobility package, which will fund new mobility solutions and increase use of these new mobility solutions. The infrastructure projects are funded through road toll, VAT compensation from the regional county authority and funds from the government. The agreement forms the basis of which investments are necessary to reach the zero-growth goals. The most important investments are the "bicycle highway" and the "Bus rapid transit system for Nord-Jæren"
Strategy	Regional	Regional plan for Jæren and southern Ryfylke /	The regional plan for Jæren and southern Ryfylke is a long-term plan for the development of 10 municipalities in Rogaland County that together forms one of Norway's largest housing and labour markets.	Stavanger is the largest of the 10 municipalities in the plan and is considered the regional centre. Through guidelines and advice for varying themes, and a regional regulation for trade, the plan describes the regional

		Regionalplan for Jæren og Sørlige Ryfylke	The plan gives directions for further development of a sustainable and adaptable region towards 2050. The main goal of the plan is to steer the planning towards a sustainable city and regional development. This includes a reduction in emissions.	policy for coordinated housing, land-use and transport planning. The plan is the fundament for the county's planning guidance towards the municipality and is to be used in all levels of planning, also by the municipality. If the municipality makes plans contrary to the principles and strategies in the regional plan the county can challenge/object the plan, which stops to the planning process until it's resolved, either through an agreement, or in the "*Ministry of Local Government and Regional Development*".
Strategy	Regional	Development plan for Rogaland – regional planning strategy 2021-2024 / Utviklingsplan for Rogaland – Regional planstrategi 2021-2024	The governing document for Rogaland County, where it is stated that the county municipality's vision is a sustainable development and strong communities throughout Rogaland. One of four long-term development goals for the county is climate change and a viable natural environment, and one of the four areas of effort under this development goal is reducing greenhouse gas emissions in all community sectors in accordance with the Paris agreement.	The plan names climate change as a leading principle in the municipalities' and county council's work, and that it is important to prioritize the most cost-effective measures that provide the greatest emission reduction for the money – seen from a life-cycle perspective. The development states that the transition to a low-emission society stands out as the biggest and most important task that we are now facing, and that municipalities and counties must facilitate this transition by contributing to a more sustainable way of life for the population and supporting business in the necessary changes. Rogaland county council has different roles as a land-use authority, comprehensive transport policy actor, building owner, developer and operator of roads, facilities and buildings.
Plan	Regional	Regional plan for climate transition / Regionalplan for klimaomstilling	The county municipality is working on a new regional plan for climate adjustment/change, which will be submitted for consultation in 2024 and finally adopted at the beginning of 2025. This plan will set emission targets both for Rogaland as a whole and for the county municipality's operations. The plan will address a wide range of topics in the transition to a low-emission society: Emission reductions, energy transition, circular resource use, sustainable land-use, safe and climate-adapted society and fair transition.	The regional plan for climate change is under work and is expected to be ready early 2025. The regional plan is meant to coordinate the county and the municipalities planning and will be a basis for planning in the region. As a municipality in Rogaland Stavanger will have to follow guidelines and strategies in the coming regional plan. The plan is also meant to ease the planning process and work for the municipalities by laying the groundworks for a common knowledge base and recommendations, and increased cooperation between sectors and across municipal borders.

Strategy	Regional	Transport strategy for Rogaland County 2022-2033 / Samferdselsstrategi for Rogaland fylke 2022-2033	Rogaland County Council's Transport strategy for Rogaland 2022-2033 was adopted by the county council in December 2021. The transport strategy for Rogaland County 2022-2033 are guidelines for the county council's work with transport and mobility, and how transport will be focused on in upcoming regional spatial and transport plans. The regional strategy describes some overarching goals for the transport sector and is indicative of which direction transport planning is going but doesn't itself give any concrete guidelines or measures to follow.	Within the transport sector the county work towards reduced emissions both by getting people to choose climate-friendly means of travel and by a transition to zero-emission technology on county council buses, speedboats, and ferries. The county will in its tenders have up to 70 % weighting of price, and at least 30% weighting of (greenhouse gas) emissions. In addition, there is an opportunity for the county to set environmental requirements in tender processes related to investments, operation and maintenance of the county road network etc. The transport strategy has the following strategies for climate and emission reduction: -The county municipality must prioritize the climate measures that provide the greatest reduction in emissions for the money. -The transition to zero-emission solutions in public transport must be carried out in a way that ensures the greatest possible emission reduction per kroner invested -The county municipality's efforts to implement national climate initiatives should preferably be linked to increased government allocations to cover additional expenses. -Functional requirements (for example zero emissions), not technology-specific requirements, should be in calls for tender. Tender notices must contain environmental requirements.
Strategy	Regional	Property strategy 2023-2026 / Eiendomsstrategi 2023-2026	The property strategy was adopted by the county council in December 2022. The strategy sets out the direction and goals for property management in Rogaland County municipality. Here there are several targets and measures that have an impact on energy use and direct and indirect greenhouse gas emissions.	The most relevant strategies for the municipality: -Solar cells must be established on prioritized buildings by 2028 (which buildings this applies to has not been clarified for the entire period, but is assessed on an ongoing basis, among other things, based on the need of roof replacement etc.) -Natural gas as a source of heating must be phased out by 2026. -Emission-free construction sites must be strived for in construction projects. -Fixtures and equipment must, as a general rule, be reused. -Climate budget must be included in alternative analyses for projects over NOK 50 million.

				-In the case of rehabilitation/new construction, efforts must be made to have the lowest possible greenhouse gas emissions, reuse, and use of materials with a long service life and flexible solutions. -Technology-neutral energy-saving and energy-producing measures must be considered for new buildings and major renovations.
Plan	Regional/ Local	Plan for harbour development / Plan for havneutvikling	The plan provides an insight into the framework for port development in the Stavanger region. The Stavanger region Havn IKS is a inter municipal company, owned by Stavanger, Sola and Randaberg, and acts as port authority. Port of Stavanger is developed with a long term-perspective. Some important framework for the development is law, purpose, sustainability, reputation, economy and market. Co-operation between public and private stakeholders have opened opportunities for both sustainable and efficient development. Because of this shipping is on the way towards a change in direction of the EU's sustainability goals. Port of Stavanger aims to reduce emissions by 80% by 2030.	The plan is important to reach Stavanger municipality's aim of reducing emissions by 80 %. Some goals outlined in the plan are: - Port of Stavanger will have sufficient space to be both a destination and a hub for public transport at sea. The port will provide for shore power so that the ships can be charged at berth. - The EU and other Nordic countries have a common ambition to transfer at much long-distance transport as possible from road to sea and railway. A premise for this is that port infrastructure is developed in sustainable locations and efficient roads to and from ports are built. The harbors Risavika (Sola), Mekjarvik (Randaberg) and Dusavika (Stavanger and Randaberg) are prioritized areas for development. - Stavanger is a popular cruise destination. The port authority plans to become a zero-emission cruise-port and is developing infrastructure to accommodate newer and more sustainable boats.
Strategy	Regional/ Local	Cruise ship strategy for Stavanger region 2020-2030 / Cruisestrategi for Stavangerregionen 2020-2030	The cruise strategy is made by the business association of Stavanger. It is developed by a broad group made up of different stakeholders which are: business organizations and businesses, the interest group for old Stavanger, the destination group for Region Stavanger, Stavanger municipality and Port of Stavanger. The goals described in the municipality's climate plan and UN's 10 principles for sustainable destinations are used as a framework for the strategy. The vision of the plan is "Stavanger – a zero-emission cruise destination with high local value	The strategy is not adopted politically by Stavanger municipality, but it still holds some relevance as it shows what goals different stakeholders in Stavanger work towards for cruise tourism in Stavanger. It's sectioned in to four sub-goals; environment, product development, profitability and market. Some relevant measures and goals for climate are: - Zero-emission in transport for connected to cruise ships, also for the local transport connected to it. - Prioritize cruise ships with low or zero-emissions and use EPI (environmental port index) to increase the share of cruise ships with low or zero-emissions.

			creation". The main goal is for the city to be a sustainable cruise destination with high local value creation that is good for the local communities.	- Consider the use of joint financing system that also includes cruise ship tourists. - Work with national authorities to fulfill the goal of zero-emission in the cruise sail in to Stavanger.
Plan	Local	The planning strategy 2024-2027 / Planstrategien 2024-2027	The planning strategy is neither a strategy nor a plan, but a tool and a framework for all municipal planning. The planning strategy points out considerations that must be taken, and which guidelines that are applicable. Additionally, the planning strategy discusses challenges and obstacles towards the long term societal-development and assess the need to revise the municipal master plan (both land-use and social).	The planning strategy, though not its own plan or strategy, lays the groundwork for all municipal plans. This includes theme plans like the climate plan, the green plan and all others. Some key points from the planning strategy are that the municipality must work towards climate neutrality and make plans for how to accomplish this. Mission cities climate contract is also mentioned as a key document for accomplishing this goal.
Plan	Local	The Municipal Master plan – the social element 2020-2034 / Kommuneplanens samfunnsdel 2020-2034	The Masterplan - community part 2020-2035 The community part of the masterplan describes what the municipality is going to focus on the next 15 years, and how we will follow the UN's sustainability goals. The masterplan has three main goals; 1. Good everyday lives for everyone, no matter who you are. 2. Regional engine is about having a diverse business community and strong city centre. 3. Green spearhead is about taking care of nature and becoming more climate and environmentally friendly.	The municipal plan's community part deals with what we will focus on in the next 15 years and how we will meet the UN's sustainability goals. Stavanger must reduce greenhouse gas emissions by 80% by 2030 and become fossil-free by 2040.
Plan	Local	The Municipal Master plan – land-use part 2023-2040 / Kommuneplanens arealdel 2023-2040	The land-use part shall facilitate a sustainable and long-term development that takes account of the environment, climate, and natural values. The land-use part of the masterplan is the link between the desired social development, and the land-use. It is meant as a tool to ensure comprehensive and long-term management of the municipality.	There are some important regulations in the land-use masterplan that contribute to emission reductions: -Effects on the environment, climate gas emissions and energy use must be assessed in the zoning plan. For plans with buildings projects over 1000 square meters climate consequences must be documented with an environmental program.

			The land management is meant as a help to achieve the overarching goal set in the community/societal part of the masterplan. The land-use masterplan consists of two interconnected parts: The zoning map and the zoning regulations.	-Climate consequences of building applications for new buildings, extensions, total rehabilitation or change of use that exceeds 1000 square meters must be documented through climate-gas calculations. In the case of development that together make up more than 1,000 square meters of heated floor space, energy needs and solutions must be documented in the zoning plan. -In zoning plans of already built areas, the reuse potential must be clarified/mapped. -The land-use section introduces the principle of land neutrality for nature areas. Land neutrality means that the municipal aims to preserve total natural areas, and if some are built down others must be restored. -The master plan has adopted a new agricultural land conservation target that specifies national and regional agricultural targets: No more than 24 acres of agricultural land in total for the municipality should be allowed allocated in zonings plans throughout a year. No more than 66 acres of agricultural lands should be built down each year. -Areas zoned for development in the master plan that are on agricultural lands are to be reduced.
Strategy	Local	Transport and mobility strategy 2023-2040 / Transport og mobilitetsstrategi 2023-2040	The purpose of the plan is to for the transport needs in Stavanger to be solved by: -More walking, cycling, public transport and sharing solutions. -Land-use planning needs to facilitate for a short-distance everyday life, so that the need for transport is reduced. -New housing, and different activities a lot of people go to, should be built centrally, and close to the public transport. -The streets and public spaces are to be developed as pleasant and safe spaces to travel through.	The strategy describes some relevant targets when it comes to reducing emissions. In 2030, a maximum of 30 % of all trips should be made by car. From 1998 and towards 2019 the percentage of trips made by car decreased from 57 % to 45 %. In 2021 the percentage had increased again to 50 %, which can largely be explained by the coronavirus epidemic. Another goal is that the emissions from personal vehicles must be reduced by 100 % by 2030.
Plan	Local	Green plan / Grønn plan	The green plan is a plan for the green areas in Stavanger. It's a holistic plan that includes what the blue-green structure means for both humans and nature, in established natural areas and in urban	The plan's main goal is for Stavanger's green structure to be preserved, and further developed. As areas of use and recreation of people in their local environment. By focusing on the nature near people, as areas of

			areas, and with a focus on natural diversity, recreation and the local environment for the inhabitants that live there. It was made to secure and develop green and blue areas in the whole municipality, that are important for natural diversity, health and are good public spaces. It's also a goal of the plan to follow up on the UN's sustainability goals.	recreation and enjoyment the need for transport other places are also reduced. For the natural diversity, which amongst other also contributes to the climate adaptation and natures own resistance to change. Preservation of natural diversity and carbon storage is also important to achieve climate neutrality.
Strategy	Local	Strategy for architecture and urban form / Strategi for arkitektur og byforming	The strategy contains principles of developing cities and places in a future-oriented way: Developing the city in a sustainable way involves, among other things, increased use of circular principles. Shared solutions and reuse of buildings will be important elements. There is a focus on housing for everyone, in all parts of the municipality, regardless of economic ability, social status, stage og life or other needs.	The strategy for architecture and urban form is used in municipal planning, building and in the assessment for private planning proposals. It's not legally binding but is used as a guideline. With the principles described in the strategy climate emission will be reduced, through an increased focus on reuse of existing buildings or elements of the buildings, a focus on buildings with the lowest possible emissions and better connectivity to and from for cycling and walking.
Plan	Local	Climate and environmental plan 2018-2030 / Klima og miljøplan 2018-2030	The climate plan is Stavanger municipality's strategy for sustainable development. The municipality has the role of authority, facilitator and driving force to reduce greenhouse gas emissions and preserve the natural environment. The most pressing environmental challenges in Stavanger are: - Emissions of greenhouse gases from road traffic, cruise tourism and from energy use in construction, industry, and facilities. - Pollution of the seabed - Periods of poor air quality due to too much particulate matter and emissions of harmful gases. - Pressure on species and natural areas. - Emissions from air and ship traffic and from 2020 also agriculture	The most important goals described in the climate and environmental plan are: - Reduce greenhouse gas emissions by 80 % in 2030, compared to 2015, and be a fossil-free municipality by 2040. - Make it safe to eat fish and seafood from all sea areas in Stavanger by 2030. - Clean air for all residents - To preserve the living conditions for plans and animals and increase biological diversity.

Action plan	Local	Climate and environmental plan – action part 2022-2026 / Klima og miljøplanen – handlingsdel 2022-2026	The action plan is a concretization of specific action points that will contribute to achieve the objectives of the community part of the master plan and follow up on the climate and environmental plan 2018-2030.	The action plan provides an overview of all measures to be taken, and a description of these. There is also a second part/appendix, which concretizes the effect of the measures that reduce direct emissions of greenhouse gases. The secondary part contains an estimated reduction in CO_2 emissions, a description of costs and an assessment of whether the measures ensure that we reach the emissions limit for 2026. If we assume a linear decrease from 2015 to the target of 80 % reduction in 2030, emissions must be reduced by 59 % in 2026.
Plan	Local	Thematic plan for aquaculture / Temaplan for havbruk	The thematic plan for aquaculture is a plan for sustainable development of the aquaculture industry. The goal is to both to facilitate for a diverse coastal industry and secure a good and well functioning coastal environment. A robust and clean ocean environment is the cornerstone of the aquaculture industry, and sustainable practices is therefore paramount for the industry and the municipality.	Aquaculture is Norway's fourth largest industry, and for Stavanger it's and important economic sector. Most of the direct emissions from the aquaculture sector in Stavanger comes from shipping, and shipping is also the second highest emission sector in Stavanger as a whole. 5% of all shipping emissions comes from the aquaculture industry. -The municipality aims for all on-shore facilities to be electrified and connected to land-power this planning period. -Off-shore facilities are reliant on other solutions to become emission free. - In the national climate plan one of the measures is phase in low or zero emission solutions for service vessels. Hydrogen-powered work and service boats are being developed. If we look away from the municipal boundaries and look at the total emissions from the industry, we see that around 70 % of the emissions originate from the fish feed used by the aquaculture industry.
Plan	Local	Theme plan for climate and environment in agriculture / Temaplan for klima og miljø i landbruket	The plan describes measures that agriculture and the municipality must take to reduce agriculture's climate and environmental footprint, reduce food waste and link food producers and consumers closer together.	The goals of the plan are that: -Direct emissions of greenhouse gases from agriculture's machinery and stationary heating are reduced by 80 % in 2030, and by 100 % in 2040. -At least 25 % of livestock manure should be used for biogas production by 2030. -Reduction in greenhouse gas emissions of biological origin. -Preserve soil and agricultural land as important carbon stores and preserve/increase the carbon storage in these.

				-Stop building down/reduction of agricultural lands and other important carbon stores. -Stop the recultivation and building/development on bogs.
Plan	Local	Inter-municipal sub-plan for (IKDP) Forus / Interkommunal kommunedelplan (IKDP) Forus	The inter-municipal plan for Forus is made in co-operation between Stavanger, Sola and Sandnes. Forus is one of Norway's largest business areas, and is situated between these municipalities. Forus should be a climate-friendly business area and contribute to a reduction in greenhouse gas emissions in accordance with the climate agreement and the signed city growth agreement for Nord-Jæren.	All development and planning in the Forus area must follow the IKDP. The plan also ensures effective co-operation between the municipalities, with shared goals for the continues development of Forus. The plan describes the need to ensure climate adaptation and biological diversity and facilitate for green corridors and increased use of natural water in the area.
Strategy	Local	Charging strategy / Ladestrategi	The strategy describes Stavanger municipality's measures and planning to achieve the goal of zero-emission transport.	To achieve the zero-emission goal for transport, the municipality will: -Contribute to the development of charging infrastructure. -Contribute to the implementation of cost-effective investment measures. - Together with the charging companies (actors/stakeholders), the municipality will facilitate/stimulate for the most rational development of the charging infrastructure over time.
Strategy	Local	Urban public space strategy for Stavanger city centre / Byromstrategi for Stavanger sentrum	The urban space strategy describes qualities in the green structure in central Stavanger and provides guidelines for the planning, design, and construction of 40 selected urban spaces.	The plan contributes to the reduction of car traffic, and motivates people to use walking, cycling and public transport within and to/from the city centre.
Plan	Local	Action plan for streetscapes: home zones and environmental streets 2021-2025 / Handlingsplan for Gatetun og miljøgater 2021-2025	Home zones and environmental streets are both street environments facilitated for walking, living, and playing. The biggest difference between home zones and environmental streets are that home zones typically don't have traffic through them, they are at the end destination.	The plan aims to make it easier to walk, cycle, travel by public transport and drive emission-free. There is an emphasis on public participation to design functional and aesthetic street environments adapted to local needs and identity.
Plan	Local	Management plan for urban trees part 1 /	Stavanger municipality should be a green city with a rich, varied, and biodiverse population of city trees, which has an intrinsic value and from a climate and a living condition perspective.	There are several goals of the municipality in the conservation of the city trees:

		Forvaltningsplan for bytrær del 1	Trees play an important role in the uptake and storage of Co2 from the air. It's also important for climate adaptation and helps with absorption of stormwater amongst other benefits.	-The number of city trees must be kept at the current level and increased significantly. -The health and stability of the city trees is a continuous priority. -Good growing conditions must be ensured for city trees. -Conservation-worthy trees should be especially protected. -There should be good communication and cooperation with the population in the management of city trees.
Plan	Local	Plan for pollinating insects / Temaplan for pollinerende insekter	The plan is a follow-up to international, national and municipal plans, goals and commitments to take care of natural diversity. The plan is a tool the municipality must use to reverse the negative trend, to take care of habitats for insects and better facilitate new habitats for insects.	- A third of the wild bee and bumblebee species in Norway are threatened with extinction. - Nature and humans are completely dependent on pollinating insects and that these pollinate plants. - Stavanger municipality wants to take better care of the wild pollinating insects in the municipality.
Strategy	Local	Strategy for playgrounds in central Stavanger / Lekestrategi for lekeplassene i Stavanger sentrum	Stavanger has 371 municipal playgrounds that are covered by the playground strategy. The goal for the planning and designing of public playgrounds is to make inviting and green recreational areas for everyone.	The recommended programming of playgrounds has a focus on climate-friendly and inclusive design. 30% of the playgrounds should be green structure, 35% accessible to everyone and 30% activities for various motor skills. In the purchase of new equipment climate requirements and lifespan/quality is to be emphasized.
Plan	Local	Plan for outdoor light in Stavanger city centre / Lysplan for Stavanger sentrum	The plan for outdoor light in Stavanger gives the technical guidelines for the conversion of all public outdoor public lighting from conventional to LED.	All public lighting is to be replaced to LED lighting by 2030 and will be a contributing factor to reduce power consumption by over 80 % in 2030.
Strategy	Local	Research strategy 2023-2034 / Forskningsstrategi 2023-2034	The research strategy is meant to be the municipality's guideline for follow-up and prioritisation of research and development. The overarching goal of the strategy is to use and develop knowledge to solve the societal issues facing the municipality.	Stavanger is taking measures to increase research activity, with a goal of developing and use new knowledge to solve the societal issues the municipality face. The strategy has three areas of interest for the research: Climate and environment, demography and health and inclusion.
Plan	Local	Action plan for competence development in Stavanger kindergardens /	In line with the municipality's climate and environmental plan 2018-2030, all municipal organizations must be certified as environmental beacons.	The municipality aims to develop material and resources to support the teaching of sustainability in kindergartens as part of the broader curriculum.

		Handlingsplan for kompetanseutvikling i Stavangerbarnehagen		
Strategy	Local	Stavanger kindergartens towards 2030 – strategy for quality in kindergartens / Stavangerbarnehagen mot 2030 - strategi for kvalitet i barnehage	The "strategy for quality in the kindergartens" aims to translate the goals and principles set in the societal part of the Master plan to practice. The differing commitment and strategies from the master plan is incorporated in the plan as principles and priority-areas in the "Stavanger kindergarten towards 2030 – strategy for quality in the kindergarten".	The Kindergartens in Stavanger wants to contribute to the green shift, chose sustainable solutions and be curious about the development of climate friendly practices. Sustainable development will be incorporated as an integrated part of the education, from a kid's point of view.
Plan	Local	Theme plan for Stavanger cultural school 2023-2027 / Temaplan for Stavanger kulturskole 2023-2027	Stavanger cultural school plans to increase teaching activities in the different districts. The school wants to facilitate so youth can participate across the districts and age in group settings and in performances.	Through the different activities the cultural school facilitates for a network will form with parents and professionals. This group should focus on sustainable practices through the materials and resources they use and the goods they buy, and reduced transport needs for teachers and students.
Plan	Local	Action plan for business development 2024-2025 / Handlindsplan for næringsavdeling 2024-2025	The action plan for business development is following and building upon the plan for 2023-2024. The plan is adapted to changes in society and new challenges, such as demographics, social exclusion, and inflation. Four key areas are selected, these being transition, competence, collaboration and "welcome to Stavanger".	The action plan is setting into motion specific actions to support the green transition, competence building and sharing, and collaboration both locally and internationally.
Plan	Local	Business development Strategy (næringsstrategi) Department for business development and international affairs	The business development strategy has four main target areas, driving forward the city as an Energy Capital, supporting agriculture and aquaculture, industry, technology, and competence, and lastly support sustainable travel and cultural life. Through being the best host municipality, build an attractive city region, future oriented business, and focus on international relations, the goal for the strategy is for the city to be a strong competitor and value creator, whilst being a leading city in the green transition.	This plan is relevant for the path the business development in the city will take. The city shall be leading in the green transition, and this permeates the strategy, both in terms of social, economic, and environmental factors. Sustainable development intersects the targeted pillars of the business development strategy and secures that the business development strategies set by the city are in line with the climate goals. The strategy also is the main defining strategy for the action plans developed by the department of business development and international affairs.

A-2.1: Description & assessment of policies

Both national and local level have high ambitions to reduce emissions

In the current policies and strategies, there are high ambitions to reduce GHG emissions both at the national, regional and local level. The Norwegian Government has in accordance with the Paris Agreement passed and enhanced the emission reduction goal. The target is that Norway will *reduce emissions with at least 55 % by 2030 compared with 1990-level and be climate neutral by 2030*. The Rogaland County Council is also in the process of creating a Regional Plan for Climate Transition (Regionalplan for klimaomstilling), which will be passed by the County Council at the start of 2025. This plan will investigate how the County of Rogaland can transition to a low emission society, and which challenges and opportunities this gives for municipals, stakeholders and the Rogaland society.

These are the important policies to reduce emissions

To reach the target for reduction of emission, both the national, regional and local level have implemented measures, which impacts the possibility for the city of Stavanger to reach the goal of reduction of 80 % of emissions.

The national level

The national government has since 2001 subsidised electric vehicle, by decreasing Value Added Tax (VAT), which makes it a lot cheaper buying an electric vehicle (EV) than a fossil vehicle. During this period the local level has also been given the authority to give other incentives for electric vehicles, like allowed EVs using lanes prioritised for public transport, free parking and exemption for road toll. With increased uptake of EVs, the subsidies have been reduced but there are still several incentives to buy EV`s in place. These measures have had a significant impact to increase usage of EVs in Norway. A disadvantage of this policy is that it increases car use and reduces the effectiveness of car restrictive measures.

The national government is also in the process of deciding if there should be set requirements for waterborne public transport for zero emission boats (from 2025) and ferries (as early as possible). The proposal was on a hearing in 2023 but has at this time not been passed by the government.

The national government is also an important partner in the City Growth Agreement. This is an investment-package for public transport, walking and cycling infrastructure. The goal of the City Growth Agreement is the zero-growth-target: *That future increase in traffic caused by population growth is solved trough walking, cycling and public transport*. The infrastructure projects are funded through a combination of road toll and founds from the national government.

The regional level

Rogaland County Council is the regional administrative level. The County Council is the authority for public transport and an important partner in the City Growth Agreement.

As authority for public transport, it is the County Council which decides how and when public transport should be electrified. The County Council plans that bus transport should be electrified from 2026 in combination with procurement process for a new bus contract. The County Council also have high ambitious for electrifying waterborne public transport and have this as one of several criterions in the tender process for new boat and ferries contracts.

As road owner of county roads and authority for public transport, Rogaland County Council is also an important partner in the City Growth Agreement. As part of the agreement the County Council is responsible for planning a building the “Busway”. This will be northern Europe’s longest Bus Rapid Transit system (BRT-system) when completed.

The local level

At the local level Stavanger City Council has the authority for land use planning. This gives the city the possibility to cater for a compact urban development, which decreases travel distances and increases walking, cycling and use of public transport.

The city of Stavanger is also a partner of the City Growth Agreement. The city of Stavanger is responsible for investing in infrastructure for walking and cycling along municipal roads. The municipality also uses funds from the City Growth agreement to enact soft measures to increase walking, cycling and new mobility solutions.

The municipality is also in the process of implementing several strategies and thematic plans which will help to reduce GHG emissions. Measures from these plans are included as actions in part B, and are listed below.

Through different participation processes and projects such as the area-regeneration projects (områdeløft), the municipality the municipality also enables the co-participation and empowerment of citizens. This is important to give every citizen an opportunity to voice their opinions, which is a prerequisite for a just climate transition.

The municipality is also a co-owner of different public enterprises, ranging from waste treatment, energy production to urban development. By being a co-owner, the municipality can influence these public companies to reduce emissions.

The following plans and strategies are included in the BAU scenario

- The zero-growth-target which is part of the City Growth Agreement. That means that the BAU scenario includes the assumption that car traffic will not increase towards 2030.

The following plans and strategies are included as actions in part B

- Municipal master plan – the land use element 2023-2040
- Transport and mobility strategy 2023-2040
- Green plan 2023-2040
- Climate and environment plan 2018-2030
- Climate and environment action plan 2022-2026
- Theme plan for climate and environment in agriculture
- City Growth Agreement
- Charging Strategy

2.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

A-3.1: Description of urban systems, systemic barriers, and opportunities

The national level channels policy direction and regulation, as the mentioned urban growth agreement. Different funding schemes finances different measures to fulfil climate ambitions. Some are available for the municipality, while others are aimed at research institutions, businesses, and citizens. Although not directly available for the city, it`s available for the city`s stakeholders. Through cooperation on climate city contract we can more easily make sure that activities within the city border are aligned towards the same goal. The national level has also been helpful streamlining indicators and monitoring of emissions, thus making it easier for Norwegian cities to compare and monitor whether actions are successful. Extensive analysis of the nations potential for reducing emissions and propositions to measures accordingly has been published as a guideline. At regional level, cooperation with the county council, strategies and measures on mobility and infrastructure are of great value. As is

the County Governor of Rogaland, which role is to advise and supervise the local authorities in the implementation of central policies in a local context. Cooperating with different levels of authority gives access to different tolls and skills. Programs and incentives, channelled through e.g. the Norwegian research council, Innovation Norway and ENOVA are useful when heading for climate neutrality by 2030.
At local level the Municipal plan for Stavanger 2019-2034, Revised city development strategy. outlines the provisions and guidelines for any development within the city`s territory.

The public bodies in Norway is well and thoroughly organised in silos, with clear mandate and responsibility. Organisational barriers are surfacing when new methodologies and targets demanding a cross-sectoral approach appears. Fragmented responsibility as well as support schemes and funding are obstacles to continue to fight in the implementation and iteration process.

The area of Stavanger has through the last 50-70 years been designed with the car in mind. The placement of housing, offices, services and more is spread across the whole municipality, and not easy to reach by public transport. This have resulted in a culture where most people drive everywhere and own more than one car. Seeing as the distances are long and the public transport is not nearly as efficient as using your own car this is a habit that has proven difficult to change. In a user survey done for the whole region in 2023, 37 % of the habitants asked would rather go by car if going by public transport made the travel time 10 minutes longer[4].
Stavanger is also a city with an unusual high amount of single housing, and a large amount of them are older wooden houses. “Trehusbyen” is the largest remaining continuous area of wooden houses in Europe. In total it is approximately 8 000 houses, with the oldest ones dating back to early 19th century. Combined with Norway’s history of very low energy prices these houses have a pattern of high energy use, and little to no investments in energy efficiency.
There are approximately 15 000 business organizations registered in Stavanger.[5] The most significant business area is related to Energy. Stavanger is the energy capital of Norway, with a long tradition in oil, gas, shipping, aquaculture, manufacturing, and services. Stavanger is also using its strong foundation in energy to diversify its economy, building up clusters in aquaculture, energy transition, smart city, health tech, green maritime shipping, and agriculture. Stavanger is in addition taking a key role in new energy solutions, taking a position in new solutions such as offshore wind, bioenergy, and hydrogen.
History as the oil and gas capital of Norway with heavy financial reliability on income from this sector. Lack of optimism is a challenge when it comes to emission reduction. In a survey from 2024, 84 % of local business leaders stated that they saw the 2030 goal as unrealistic.[6] A mere 10 % was optimistic about reaching the reduction target. This also influences the inhabitants view on the climate crisis. ¼ does not believe it to be a problem[7].
However, a survey commissioned by the municipality in November 2023 reveals that 2 out of 3 citizens view the reduction target as important and 59 % are willing to make changes in their own lives to achieve this goal but request better information from the municipality about climate and the environment.
63 % state that it is likely that they will reduce their own consumption in the next two years, 55 % state that it is likely that they will take measures to improve energy efficiency at home and 44 % state that it is likely that they will change their travel habits in a more climate-friendly direction.
The survey also shows that half of Stavanger's residents think it is important that the city is a frontrunner in order for Norway to reach its climate targets. This conviction is shared by the former minister of trade and industry, Jan Christian Vestre, who proclaimed that “Whether or not Norway succeeds in its green transformation or not is determined in the Stavanger region”.
Further 55 % believes that it will be better to live in Stavanger if the climate targets are met. This gives the city and the politicians a great opportunity and confidence to be ambitious in every aspect when

[4] NORCE+H%26S%2C+rapport+nr+16-2022.pdf (unit.no)
[5] KommuneProfilen. Statistikk som rangerer og sammenlikner norske byer etter antall bedrifter og bedriftsstørrelse - basert på offisiell statistikk fra SSB
[6] Sparebanken 1 SR-Bank (2024) Konjunkturbaromenteret. Available at: Konjunkturbarometet_jan_2024_hovedpresentasjon.pdf (sparebank1.no)
[7] EU-study: One in four Norwegians do not believe that climate change is caused by humans (sciencenorway.no)

it comes to implementing reduction actions. It is however important at the same time to prove that the actions, in fact, does bring more benefits for the citizens to maintain the support.

The Stavanger region consists of many small municipalities within a confined geographical area. This leads to both opportunities and barriers when it comes to cooperating about rules, legislations and ambitions. As of 2024, Stavanger, Sandnes, Sola and Randaberg are pooling their political muscles to strengthen the region's weight towards central authorities. The mayors of Stavanger, Sandnes, Sola and Randaberg have established a new political council which will formalize and strengthen political cooperation in the region. The goal is to cooperate more and have a louder and more impactful voice towards Oslo and the central authorities.

Stavanger is working, and will continue to work, actively to influence national authorities and make necessary changes in national laws, such as the Planning and Building Act. Stavanger challenge the national authorities on several arenas to make its needs heard and noticed. For instance, the national authorities are invited by the municipality to debate and answer questions on large political public events, municipalities cooperate in several networks, sending letters and feedback as a joined force and there is directly cooperations, through meetings or interviews when they conduct assessments.

As shown previously in this chapter, the national government has looked to biofuels as a part of the solution for emission reductions, and increased use of biofuels in several sectors have been included in the emission scenarios towards 2030. The Norwegian environment Agency however point out that the transport sector in Norway will not be restructured with increased biofuel imports. Biofuel with good sustainability properties will be a very scarce and expensive resource both in 2030 and in 2050. There is very limited production of advanced biofuel in Norway today.
Heavy use of biofuels may mask structural challenges in the transition to a low-emission society, and the Norwegian Environment agency state that it is unrealistic that all or large parts of the current consumption of fossil fuels can be replaced by renewable fuels such as biofuels without unacceptable consequences for nature. Relying largely on imported biofuel to reduce emissions may entail a restructuring risk. Stavanger's conversion to an efficient transport sector with significantly reduced fuel consumption is therefore necessary. This requires measures and instruments that reduce the volume of transport, move transport to more efficient means of transport and that enable a faster phase-in of zero-emission technology.

An assessment and system and stakeholder mapping of the eco-actors in Stavanger against the main systems and the city's greenhouse gas emission domains has been carried out, in table 9. The overview shows who are the main stakeholders in these systems and what are the links between them.

A population with the second highest consumption rates in the EU (26 % higher than EU average - Norge femte dyrest i Europa – SSB) and a circular economy of 2,4 % (one of the lowest in the EU - Norway - Circularity Gap Reporting Initiative (circularity-gap.world))

Table 9 Systems & stakeholder mapping

A-3.2: Systems & stakeholder mapping			
A map over possible stakeholders within the city ecosystem. Some are contacted, some are partners, some have not yet been contacted.			
System	**Stakeholders**	Influence on the city´s climate neutrality ambition	Interest in the city´s climate neutrality ambition
Governance & policy	**Local, regional and national political committees**	Overall responsibility and high influence	Overall responsibility

	Youth City Council	Political organisation for youth, influence mostly among younger population	General interest in environmental and climate concerns.
	Local, regional and national administration	Responsible for implementation and execution of the political agendas	Responsible for implementation and organisation of net zero actions
	City of Stavanger	Overall responsibility and high influence	Overall responsibility
	Rogaland County Council	One of the biggest employers in the county with responsibility for a plethora of public services.	Working on establishing a regional plan for climate transition.
	The County Governor	Oversees regional administration, implements national policy and ensures compliance with laws within their jurisdiction.	Dedicated to the Mission City goals that Stavanger has set and works together with Stavanger.
	Ministry of Local Government and Regional Development	Responsible for coordinating policies related to municipal affairs, regional development and the overfall functioning of local governments.	Dedicated to the Mission City goals that Stavanger has set and partakes in the national Net Zero Cities initiatives.
	The Norwegian Environment Agency	Manages and implements environmental policies, protecting biodiversity, ensuring sustainable use of natural land resources.	Dedicated to the Mission City goals that Stavanger has set and partakes in the national Net Zero Cities initiatives.
	Design and Architecture Norway	Promotes the use of design and architecture as tools for innovation, sustainability and value creation in society.	Dedicated to the Mission City goals that Stavanger has set and partakes in the national Net Zero Cities initiatives.
	Norwegian Research Council	Norwegian Government Agency that funds research and innovation projects.	Supports and guides start-up communities, research facilities and projects through funding or resources. Support circular, zero emission and green other collaborative projects
	The Norwegian Association of Local and Regional Authorities	Represents the interest of municipalities, counties and public enterprises in Norway,	Supports cities initiatives and promotes sustainable action.

		working to influence policies.	
Technology & infrastructure			
Energy	**LYSE AS**	Grid owner and energy supplier, hydropower, district heating, CCS.	Interest in securing green energy to the businesses and inhabitants
	LYSE NEO AS	Owner of district heating network, supplies cooling, delivers biogas. Operates Norway's largest land-based gas network.	Interest in securing green energy to the businesses and inhabitants
	IVAR	Intermunicipal company responsible for water, wastewater, waste disposal and recycling.	Building business cases for circular economy, energy production, biogas supply.
	Forus Business Park	Norway's largest contiguous commercial area with 6,500 DA and 2500 businesses.	Undergoing transformation to make renewable energy accessible for company buildings
Transport/Mobility	**Rogaland County Council**	One of the biggest employers in the county with responsibility for a plethora of public services.	Working on establishing a regional plan for climate transition.
	Kolumbus AS	Provider of public transportation, bus and ferry operations.	Facilitates for more use of public transportation, as well as zero-emission and autonomous vehicles
	Port of Stavanger	Manages the port and invests in clean energy.	Goals of reducing their own emission by 80 percent within 2030.
	Møkster Shipping AS	Supplier of modern support vessels for offshore energy sector.	Engages in project development for new value chains and green business
	Norsea Group AS	Owner of port infrastructure, complete provider of port services, base and logistics solutions.	Growing business within renewable industries such as offshore wind and ocean space.
	The Norwegian Public Roads Administration	Responsible for developing good road systems for the people and the environment,	Reduce environmental impact of construction, operation and maintenance of the road network.

		which promotes accessibility, reduces accidents and contributes to the transition to a low-emission society	
	Rogaland-Stavanger Taxi AS	A taxi company with a variety of vehicles. Transitioning its taxi fleet to be fully electric within 2026.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
	Rødne Fjord Cruise	Fjord Cruise company that aims to operate as climate friendly as possible and has invested half a billion NOK in energy reduction for its vessels and operates the battery electric vessel “MS Rygerelektra”.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
	Norled	Norled is one of the country's largest ferry and fast boat companies.an that operates multiple ferry routes in Stavanger. Their vessels include battery electric vessel “MS Medstraum” and hydrogen vessel “MS Hydra”. It is crucial for the city that vessel operators experiment with low emission and no emission vessels as 30 percentages of the City’s emissions stem from ocean traffic.	Dedicated to the Mission City goals that Rogaland County has set in the tenders for ferry and fast boat routes.
	Tide	Provider of public bus transport.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
Waste/Wastewater	**IVAR**	Intermunicipal company responsible for water, wastewater, waste disposal and recycling.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company.

	Renovasjonen IKS	Intermunicipal waste management company. Collect both household and commercial waste.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
	SWECO	Leading consultant agency with a focus on renewables, power systems and energy transition	Aims to be climate neutral within 2040 and has special competence on sustainable cities.
	Norsk Gjenvinning	Provider of circular solutions and environmental services, dedicating to expediting the shift towards a circular economy.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
Buildings/Property	**Forus Næringspark SK**	Property manager in the industrial area in Stavanger and neighbouring municipalities. Works towards the City's climate goal, as it is also partly owned by the city	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
	Stavanger Utvikling KF	Property developer owned by the City of Stavanger. Works towards the City's climate goals.	Dedicated to the Mission City goals that Stavanger has set. Collaboration with a variety of stakeholders to continue a green growth of their company
	Grønn By	Nonprofit organization that assists the construction industry and helps bringing a green agenda.	Works towards greening the construction industry.
	BASE-group	Property developer with a focus on environmentally friendly constructions.	Been in the forefront of developing constructions with BREEAM certifications.
	Stavanger Boligbyggerlag	Property developer that has been environmentally certified since 2008.	Build in environmentally friendly ways, has been ECO lighthouse certified in 2008 and was recertified again in 2021.
	OBOS	Large national property developer	Aims to reduce emissions by 45 % within 2026 from new buildings.

Industry	**Skretting AS**	One of the worlds largest fish feed producers, was founded in Stavanger and has a strong presence here. Skretting works to reduce their energy needs, produces sustainable fish feed and is a large employed in Stavanger.	Have reduced CO_2-eq. emission from feed in the period from 2018 to 2023. Have explored and installed electric boiler for food production to reduce CO_2 emissions locally.
	Felleskjøpet AS	Animal feed producer and the largest standalone feed mill in Norway. Critical company in the value chain and services farmers in Stavanger.	Works to reduce emissions and works locally by installing electric boilers and uses methane inhibitor to reduce emissions.
	Rosenberg Worley	Shipyard in the city centre of Stavanger. Aims to have 75 % of their revenue from sustainable industries by 2026.	Works to reduce emissions, 65 % reduction in net Scope 1 and Scope 2 (market-based) emissions by FY2025 from an FY2020 baseline
	Bremnes Seashore	Large salmon producer with presence in Stavanger and the surrounding area.	Works to electrify their locations, their boats and towards environmentally friendly transport. Have reduced their scope 1 and scope 2 emissions.
	Laerdal Medical Group	A world leading company in producing medical equipment and has a global presence. Has set ambitions goals of emission cuts, while at the same time increasing their energy demand and production capacity.	Aims to reduce carbon emissions by 70 % within 2030, while aiming to more than double their revenues. Works on making their existing buildings and factories in Stavanger more sustainable.
	Grieg Seafood AS	Large salmon producer with a strong presence in Stavanger. Aims to electrify their production.	Uses new technology in their fish pens that reduces emissions, electrify their boat transport and production.
	Mowi AS	Largest salmon producer in the world, but with a smaller presence in Stavanger.	Works to use new technology and electrifies their production. Has reduced their scope 1 and scope 2 emissions, but scope 3 is their biggest challenge.

	Bravida	Electronic equipment installer which supplies large properties with renewable and energy saving solutions. Plays a key role in providing solutions to large constructions like hospitals etc, in Stavanger.	Aims to have a climate neutral value chain by 2045 and 55 % emission cuts by 2030.
	Finnøy Betong	Local cement producer located in Finnøy. Sells environmentally friendly cement and cement solutions	Key provider of environmentally friendly cement that is crucial for the reaching Stavanger's climate goals.
	Finnøy Bioenergi	Bioenergy company that is owned by the largest grid company in Stavanger. Aims to provide farmers with an opportunity to deliver waste and produce energy and fertilizer.	Important project for creating a circular value chain, and important for reducing the pressure on the grid in Finnøy. Will also give the opportunity for farmers to get a circularly produced fertilizer.
	Lauvsnes Gartneri	Green house that produces vegetables in Finnøy. High energy demand, but works to produce responsibly and	Aims to be a leading climate neutral greenhouse, combines capturing CO_2 in a closed facility.
	Norwegian Shell	Part of Shell, which is a large multinational oil producer. In Stavanger, Shell aims to take sustainable decisions in terms of their transport and office facilities.	In Stavanger, Shell is aiming to reduce their energy needs and get more of their employees to take public transport.
	Faber Bygg AS	Construction company that constructs many of the challenging and highly praised buildings in Stavanger. Many of their construction has gotten climate awards.	Faber aims to be a leading construction company, and has electrified a share of their cars, and has built multiple environmental awarded projects and certified buildings.
	Hitechvision	Actively managed fund that invests in the energy transition. This fund is Stavanger based.	HiTech Vision invests in the energy transition and is a leading fund in the Stavanger area. Their work is crucial for accelerating the energy transition.

Social innovation	**SUS**	SUS is a large hospital in Stavanger. SUS aims to reduce their CO_2-eq. emission by 40 % within 2030.	SUS works towards reducing their emissions and is a large crucial institution in Stavanger.
	Frivilligsentraler	One of the initiatives by the city to engage the citizens, by offering volunteer activities.	Helps the local societies by providing volunteer activities.
	Red Cross	Humanitarian organisation working to help people in need and strengthen local communities.	Has aims to help people affected by the climate crisis.
	Norwegian Peoples Aid	Politically independent membership organization, humanitarian solidarity organisation of the labour movement.	Contributes to securing democratic, just and safe societies.
	Clean Shores	NGO gathering citizens to clean the shores.	Dedicated to the Mission City goals that Stavanger has set.
	Bydelshus	Community centres in the city boroughs. A meeting place for citizens and can also be rented for free.	Dedicated to the Mission City goals that Stavanger has set.
	Tou Scene	An art, knowledge and resource arena, one of the country's largest independent cultural institutions.	Host for a spectre of different sustainability activities, events and conferences.
	Pådriv Hillevåg	Partnership for sustainable and climate-friendly development of the Hillevåg borough/community.	Facilitator for urban gardens, community engagement and social inclusion
Democracy/participation	**Sølvberget**	Public library which offers social meeting places for a broad spectrum of inhabitants. Offer language courses, reading session and computer courses.	Dedicated to the Mission City goals that Stavanger has set.
	Oilers	Ice Hockey team. Driver behind many socially inclusive activities in and outside of the arena.	Own train-carriage to transport players to and from games. Several initiatives for social sustainability and for citizen engagement.

	Viking FK	Football team with socially inclusive initiatives in and outside the arena.	Involved with citizen engagement and social inclusion, gender equality.
	Rogaland Theater	Theatre which offers modern and classic dramas from both international and national writers. Uniquely in Norway, the theatre offers theatre as leisure activity for children and young people.	Involved with citizen engagement and social inclusion, youth activities and accessible social activities
	Stavanger Symphony Orchestra	Symphony Orchestra with 85 musicians from 22 different countries.	Engaged in
Business clusters/nettverk	**Nordic Edge**	Non-profit organization working in close relation with private companies, municipalities, academia and citizens towards smarter and more sustainable cities and communities.	Work interdisciplinary with a broad array of actors to advance a smarter and greener society.
	VIA Cluster	The mission is to support and help to evolve the infrastructure for transportation, focusing on developing the most safe, smart, and sustainable roads, bridges, rails, and tunnels.	Makes testing of innovative solutions for reducing climate gas emissions possible in close collaboration with central stakeholders and actors.
	Maritime Cleantech	One of the world's most complete maritime commercial hubs. They utilize the long history of Norwegian maritime experience and expertise to develop energy-efficient and sustainable technologies with their member.	Portfolio of projects include fully electric, zero-emission passenger vessels, high-power ammonia fuel cells, wind-powered vessels and charging solutions for electric offshore solutions.
	Stiim Aqua Cluster	Strong innovation system for aquaculture related businesses, consisting of technology companies from various industries, aquaculture and seafood-	Involved in a range of R&D projects, such as innovative land-based aquaculture and closed-loop systems.

		related business, entrepreneurs, capital environments and knowledge institutions.	
	Agritech Cluster	Cluster for industry pioneers, emerging start-ups and tech specialists to redefine sustainable agriculture. Mission is to achieve more with less.	Provides courses for farmers on land and at sea in sustainable farming practices.
	Norwegian Energy Transition	Energy transition cluster bringing world-leading expertise and technology environments together to increase the pace of innovation and energy transition.	Mission to facilitate for knowledge sharing and transfer from oil- and gas sectors to renewable energy projects. Helping connect investors with entrepreneurs.
	Norwegian Smart Care Cluster (NSCC)	Arena Pro Cluster that works to ensure that members take part in developing sustainable health solutions for the future. 280 members.	Dedicated to the Mission City goals that Stavanger has set.
	Yago	Cluster with responsibility for establishing a national and international test centre for autonomous vehicles. **Influence:**	Dedicated to the Mission City goals that Stavanger has set.
	Offshore Wind Cluster	Goal of establishing world leading supply chains within floating offshore wind.	Hosts events for knowledge sharing, networking and supply chains for offshore wind.
	TEAL business incubator	Working to strengthen the blue-green businesses regionally within aquaculture and agriculture.	Offer courses for sustainable practices for farmers on land and at sea.
	Bondelaget | The Norwegian Farmers Union	The leading organization for agricultural policy and services in Norway.	Increase sustainable food production and self-sufficiency by promoting business development, job creation and supported local communities.
	Norges Rederiforbund | Norwegian Shipowners Association	The leading employers, emergency preparedness and interest	Norwegian shipping industry aims at being climate neutral by 2050, and from 2030 Norwe-

		organization for Norwegian-affiliated shipping companies.	gian shipping companies will only order ships based on zero-emission technology. Invested in offshore wind and recycling of ships.
Business organisations	**Stavanger Region European Office**	Organization that works in partnership or on behalf of the City of Stavanger.	Helps Stavanger's Mission Cities ambitions by focusing on large events and projects aimed at sustainability.
	NHO | The Confederation of Norwegian Enterprise	Brings together Norway's largest community of businesses and is the leading organization for employers.	NHO has a focus on distributing information and supporting businesses in working with the transparency act, sustainability reporting and EU taxonomy.
	Stavanger Chamber of Commerce	The biggest Chamber of Commerce in Norway. Working for their members in the whole region.	Prioritize sustainability and engage with environmental regulations, aiming for efficient energy use and pollution reduction as integral parts of their operations.
	ONS	Every other year the Offshore Northern Seas Foundation hosts a large conference and exhibition for national and global players within the energy sector.	The conference has shifted its focus to also include renewable energies, such as wind, solar, batteries and CCUS.
	Klimapartnere Rogaland	32 companies in Rogaland have joined forces in Klimapartner Rogaland, this network aims to help companies be as prepared to meet the sustainability demands for today and the future.	Provides reporting systems and help for companies to map their baselines and strategies to achieve emission goals.
	Klimanettverk Jæren	This climate network is made up of municipalities in the southern Jæren region and Utsira. In addition to receiving professional input, each municipality is to set own specific	Topics so far have been transportation, energy solutions, agriculture, built environment etc.

		measures for emission reduction.	
	Nettverk for næring og bærekraft	Network established by the City of Stavanger to create an arena for dialogue and action for businesses in the Stavanger region.	Topics so far have been energy, built environment and sustainability culture building for businesses.
	STAS (Stavanger Sentrum)	Works to fill the city's streets, centre, and alleys with people, create unique moments, and genuine experiences and contribute to increased activity in the city centre. In close collaboration with Stavanger municipality, they work strategically with positive city centre development.	Dedicated to the Mission City goals that Stavanger has set.
NGO`s	**Ryfylke friluftsråd**	Municipal task collaboration consisting of 9 member municipalities. Mission is to manage public outdoor recreational areas.	Protects and secures a sustainable management of public outdoor areas.
	Idrettsrådet	Part of the Norwegian Sports Federation. Service organization for the sports clubs in the region.	
	Naturvernforbundet	Works on a wide range of issues related to environmental and nature conservation.	Particular focus on nature conservation, climate, energy and transportation.
	Arkitektforeningen | Norwegian Association of Architects	Professional and non-profit membership organization for architects in Norway.	
	Stavanger Turistforening	The largest outdoor recreation organization in Rogaland. Manages several cabins and facilitates for good outdoor experiences for the public.	Dedicated to the Mission City goals that Stavanger has set.

	Bondelaget	The leading organization for agricultural policy and services in Norway.	Increase sustainable food production and self-sufficiency by promoting business development, job creation and supported local communities.
Finance & Funding	**SR-bank**	Financial group for Southern Norway, and part of the second largest Norwegian-owned bank Sparebank 1.	The bank works with the transparency Act, have their own sustainability and climate strategy and plan for transition.
	DNB	Norway's biggest bank.	All the private banks in Norway do have a climate strategy and plan for transition.
	Nordea	One of the ten biggest banks in Europe.	All the private banks in Norway do have a climate strategy and plan for transition.
	Kommunalbanken	KBN is the Norwegian state's municipal bank. They are 100 per cent owned by the state and aim to ensure stable and attractive funding for the Norwegian municipal sector. All the country's municipalities have at least one loan from KBN.	
	Husbanken	Husbanken is a Norwegian government agency that is subordinate to the Ministry of Local Government and Districts. Husbanken's social mission is to prevent people from being put at a disadvantage in the housing market, and to help ensure that those who are unable to do so themselves can obtain and keep suitable housing.	
	Nysnø	Investment fund with mission to make profitable, long-term investments that contribute	Interested in securing a long-term and stable horizon for green investments and green start-ups to scale-ups.

		to greenhouse gas reduction.	
	S&P Global Rating	A credit rating company.	Stavanger municipality have a rating on AA+/A-1+'
Learning & Capabilities	**Horisont Rogaland**	Project to improve the impact of Horizon Europe by collaboration between relevant actors in the region.	Provides advice, help with application processes, seminars and workshops to strengthen the regions access to Horizon Funding.
	University of Stavanger	University of Stavanger provides a range of bachelor, master and PhD-courses.	Has in recent times established new study programs for students in collaboration with industry to secure competence for the new green jobs and the energy transition in general.
	NORCE	Independent research institute conducting research for private and public actors to facilitate for sustainable and informed choices for the future.	Committed to do research within novel and innovative sustainable practices and areas. Developing new technology and preparing them as market products.
	Universitetsfondet | University Fund for Rogaland	Inter-municipal fund for strengthening the county's knowledge position by helping to establish necessary educational offers.	Committed to support research within novel and innovative sustainable practices and areas.
	Stiftelsen Rogalandsforskning | Rogaland Research Foundation	Driving force for the development of knowledge environment on the Ullandhaug campus.	Committed to do research within novel and innovative sustainable practices and areas.
	NGU	Norway's national geological survey. Disseminate and present data to meet society's needs for basic geological information.	Committed to do research within novel and innovative sustainable practices and areas.
	HI | Institute of Marine Research (IMR)	One of the biggest marine research institutes in Europe. Research, advisory work and monitoring.	Committed to do research within novel and innovative sustainable practices and areas.
	NIBIO	One of Norway's largest research institutes,	Committed to do research within novel and

		who contribute to food security, sustainable resource management and innovation.	innovative sustainable practices and areas.
	NINA | Norwegian Institute for Nature Research	Independent foundation focusing on environmental research, especially the interaction between society, natural resources and biodiversity.	Committed to do research within novel and innovative sustainable practices and areas.
	Statens Kartverk | Norwegian Mapping Authority	Extensive remit at land and sea, collating geographical data.	Committed to do research within novel and innovative sustainable practices and areas.
	Innovasjon Norge | Innovation Norway	Helps Norwegian companies to grow sustainably and increase exports by giving access to competence, capital and networks.	Supports and guides start-up communities, research facilities and projects through funding or resources. Support circular, zero emission and other green collaborative projects.
Consultancies	**Multiconsult**	An engineering and architecture company that offers multidisciplinary consulting.	Committed to assisting with competence and resources on green business- and project management
	PwC	Consulting firm helping businesses with auditing, finance and legal services.	Committed to assisting with competence and resources on green business- and project management
	Veni	Company working with the built environment, by combining digitalisation expertise and industry knowledge.	Committed to assisting with competence and resources on green business- and project management
	Norconsult	Interdisciplinary consulting firm on engineering, architecture and digital expertise.	Committed to assisting with competence and resources on green business- and project management
	Rambøll	A global engineering, architecture and consultancy firm working for sustainable change.	Committed to assisting with competence and resources on green business- and project management
	Asplan Viak	Consultancy within engineering, architecture and city planning.	Committed to assisting with competence and resources on green

			business- and project management

A-3.3: Description of systemic barriers

There are several systemic barriers towards a reduction in emissions and a sustainable development. Some systemic barriers are more general in nature and is applicable in several of the municipality's sectors and levels of governance, while some are more sector specific.

What are the barriers for reaching climate neutrality?
Even though there are several opportunities for reducing emissions at the national, regional and local level, there are also several barriers for reaching climate neutrality.

National level

- Expensive to implement climate policy – can be unpopular among voters and/or politicians want to prioritize other investments.
- Increased subsidies of electric vehicle increase traffic and will make it harder to reach the zero-growth target for car traffic.

Regional level

- Rogaland County Council are dependent on increased funding or allocated more funding to implement electrification of public transport.

Local

- The Plan and Building Act sets limits on how ambitious climate requirements the municipality can impose on the developers in urban development.
- Citizen's acceptance of road toll and parking regulations to reduce car use
- Costs of climate measures can hit vulnerable groups harder and make it more difficult to carry out a just transition.

General barriers:

Planning and building act
The planning and building act, as described in A-2, is the most important law when it comes to managing and planning. It regulates both plans for land-use, and how building applications are to be administered.

The planning and building act dictate which matters the municipality can regulate private developers on, in energy supply, quality etc. Because the act has strict rules on the mandate of the municipality, it also restricts the room for action the municipality has.

The law is also very clear on matters the municipalities cannot regulate. Because the law has not been revised in a long time (2008) and has not been up to date on the climate changes its limits the necessary legal ground to make developers build the city in the best way possible with regards to emissions.

Because of the limitations of the law, the municipality doesn't have the legal authority to prevent old building from being demolished, set a minimum threshold for Co2 emissions, or demand local energy sources in new projects.

Fragmented responsibility
The work with sustainable development and a reduction in Co2-emissions is managed by several sectors, and different levels of governance. Much of it is also dependent on private businesses and industry doing it on a "volunteer" basis.

In additions to internal coordination within the municipal apparatus and with local stakeholders, there are county policies, national policies, and EU policies that must be aligned.

Because of this, different parts of the municipality and other local partners have different responsibility areas, meant to fulfil the overarching goal of a reduction in emissions. It is therefore important that there is good cooperation and that the different stakeholders are working towards common goals.

Public acceptance/choices
For change to be made there needs to be a general public acceptance, and without it there is a harder path towards climate-reduction. Because the governance is democratically decided, on both local and national levels, there are direct links between the public acceptance of (1) there being a problem, and (2) that we need to do something about it.

There also needs to be public acceptance on which measures to chose, both in the private sphere and in public governance. To reach the municipality's goals of climate reduction, and in time climate neutrality, there has to be a behavioural change in the general populace, towards more bicycling and walking, less flying, more effective heating etc.

The municipality already uses the carrot- and stick approach, with an aim to make sustainable options the overall best option. This is done through better public transport infrastructure, municipal grants for changing to newer and better insulated windows in parts of the city, economic support from the municipality if you buy an electric bike, and toll on the roads for cars.

Sector specific barriers:

Energy systems
- Municipality can not mandate private developers or citizens to chose local energy sources (lack of legal framework)
- Stavanger is a municipality with a high share of tree houses, with relatively bad heat efficiency.

Road Mobility & transport
- High costs
- Lack of infrastructure for alternative transport forms – the road network that we have today was planned with cars in mind
- Public acceptance/shift in forms of travel – e.g. more people must choose to bike, take the bus and walk, and generally travel less with car.

Built environment
- High capital cost
- Often private developers or citizens that plan and develop properties
- Not a strong framework to push for the best climate solutions from the municipal side (e.g. Planning and building act).
- Finance model

Institutional/Regulatory/Governance:

Ability and will to stop planned projects based on climate and sustainability matters

National regulations on grid ownership, restrictions on energy flow between producers and consumers

Waste: Lack of national EPR schemes on textiles and furniture.
Decarbonisation of waste incinerators
Ineffective waste prevention (packaging etc)

Energy: Contradictory decision making/regulations. For instance, are decisions on solar on every municipal roof in conflict when it comes to cultural heritage in some cases. A certain development strategy can be hindered in a different department due to differences of opinions.

Seaborne transport:
Silos
Cruise traffic – barriers
Intermunicipal barriers with difference of interest in the municipalities.
Politically governed (boards)
Prioritised docking.
Non existing policy on leisure boats.

Political/Governance:
Fragmented responsibility
Long decision-making processes
Slow processes on support from national level
Political will to prioritize climate neutral solutions under pressure and tight time frame and budget
Governance/Distribution of energy – the power to prioritize electricity supply in accordance with societal needs.
The responsibility to upgrade and renovate existing building stock. Government or house owner.

Technological/Infrastructural:
Waste: Lack of infrastructure for circular economy measures
Drainage system: The current drainage system is not sustainable and pollutes our fjords. It has high water and energy consumption. The final product after purification has a lot of heavy metals and cannot be used as fertilizer in agriculture. Need for transformation of sewage system into sustainable circular system where human faeces are treated as a resource, composted and used as fertilizer for agriculture in a circular system.
Transport: Low flexibility due to e.g. narrow roads, few traffic lights etc
Immature technology to switch into renewable fuel in heavy duty transport. Charging/fuelling infrastructure is also underdeveloped.
Heavy duty transport firms are small, even sole proprietorships with only one truck. These are unable to make the capital-intensive investments required to change the fuel source in the truck. Funding schemes must be intensified.
Development of hydrogen as a fuel source is lagging.
Municipal tender weight a minimum of 30% on renewable transport
Security and risk mitigation: Is it safe that all critical infrastructure is electrical? Ambulances?
Seaborne Transport: Tender on speedboats and ferries fuelled by renewables.
Underdeveloped technology (e.g. Medstraum and Hydra cases).[8]
Demand/supply: underdeveloped or lacking value chains, even with a fully electric ferry vessel, in order to generate enough electricity for the battery for multiple trips, a diesel generator is necessary to charge the battery. There are technology companies offering solutions to this, like Shifter, which would offer battery swapping for ferry vessels, but here we see a lack of willingness to be a first mover or take the risk locally for such a solution. (Shifter and Rødne cases).[9]
Few ships can receive onshore power – different demands of effects (standardised charging is very immature)

Energy: Lack of energy to electrify all sectors. NEA have calculated that Norway needs to produce 34 TWH more annually to be able to succeed in the 55 % carbon reduction goal within 2030.
Lack of essential knowledge on the solar production potential in Norway.
Need to expand the grid, but where? Under already build area? Virgin territory? At sea?
Energy sources.
Storage: Standardising the possibility to deliver electricity from e.g. cars to the house to be able to use cars as storage.

[8] Reference needed
[9] Interview with Rødne, November 10th 2023

Security/capacity – is it secure to be 100 % electrified? Back up on vulnerable infrastructures like for instance hospitals?
To achieve zero emission building sites, clean energy supply needs to be available. That is a great barrier because grid is not necessarily available at the site nor in close proximity.

Organisational:
Managerial responsibility
Recruitment and allocation
Short on resources on dedicated personnel and cross-sectoral coordination
Monitoring
Knowledge management
Regulatory red tape (the complexity of burdensome administrative rules and procedures that have negative effects on the organisations performance. Bureaucratic obstacles to climate neutrality)
Strategic, divisional and unit planning and reporting
Common practices
Common understanding – how deep is the understanding when urgent action is needed
Will to change

Financial:
Need for growth in every aspects
Fluctuation in credit rate, market and currency
Policies and procedures

Transport: High initial capital costs. Electrical trucks/construction vehicles are significantly more expensive.
Subsidies on EV`s are expensive for the state of Norway, and increased subsidies of electric vehicle increase traffic and will make it harder to reach the zero-growth target for car traffic. Furthermore, the financial mechanisms in the city growth agreement where fossil fuel cars are tolled heavier to pay for public transport and soft measures are threatened by the high increase of EV`s that pay significantly less.
Seaborne transport: Higher operational costs on renewable vessels.
Differentiated pricing schemes in the harbour (not a barrier but opportunity)
Extremely high capital costs to switch engine in vessels.
Waste: Immature marked, and underdeveloped business model.
EG: Denmark subsidises biogas, resulting in transporting manure and slam from aquaculture over the boarders instead of developing biogas-production locally.

Behavioural:
Public acceptance
Will to change, knowledge and experience
Waste: Slow behavioural transformation.
Transport: People`s time and economic constraints in the use of public transport
Support and acceptance og road tolls, restrictions on car use and the rush hour-fee.
Energy: Energy actions are today pricy and unaffordable for a large part of the inhabitants.
The financing support is poor, and ENOVA prioritizes industry over private actions.
Energy Poverty and social innovation. National support scheme on electricity (just?)
The private housings in Norway are largely powered by hydropower today, and efficiency measures will therefore not reduce carbon footprint. However, the lack of energy could be discussed and included efficiency in private housings, to release power for other purposes. The investments needed in building new renewable productions should be compared to the investments needed to streamline private houses. Almost all private houses in Norway are old and lack energy efficiency measures.
CCS: Who are to pay for the high investment costs? The citizens? How to maintain support from the citizens. Could a carrot be associated?

3 Part B – Pathways towards Climate Neutrality by 2030

3.1 Module B-1 Climate Neutrality Scenarios and Impact Pathways

This section is the most challenging one. It uses part A as a strategic basis forming potential areas and perspectives with regards to portfolio design. It has been a discussion whether this part should be known or potential actions, because this in the end is a discussion of whether it is realistic or not. We have during this working period conclude that a next step would be a deep dive into the potential, to further explore which actions could be undertaken although maybe not realistic at this stage, whether it is due to lack of value chains, immature technology, will to change or financing.

In this section, some actions are known actions, actions under implementation or actions identified but still not adopted. To further reduce emissions by 2030, actions are needed to shift and improve towards more sustainable options. If the city can work systematically in the different action's field of emission sources and across the systematic leveller's, it will succeed in transforming the city not only from a climate point of view, but also from a social perspective.

Table 10 Impact pathways. Estimates of direct impact tonne CO2-eq are described in Module A 2.

B-1.1: Impact Pathways				
Fields of action	Systemic levers	Early changes (1-2 years)	Late outcomes (3-4 years)	Indirect impacts (co-benefits)
Energy systems	Technology/ Infrastructure	Reduction of natural gas for heating	Progressive change of the city's energy model, by increasing biogas share and phasing out use of fossil gas in local district heating	Reduction of energy bill expenditure Reduction of air pollution Enhancing quality of life Health improvements
		Increase use of renewable energy- and solar power production	More renewable energy and decreased peak power demand	Reduced Energy cost
		Thermal energy for heating of buildings	Release electrical power for other purposes	Reduced energy costs
	Governance & Policy	Emission-free municipal building and construction sites	Creating incentives for innovation towards a more sustainable construction sector	Innovation and development in the construction sector Reduction of air pollution Enhancing quality of life Health improvements
	Technology/ Infrastructure	Plan for improving energy efficiency in most buildings owned by Stavanger Municipality	Reduced energy used in many of the municipally owned buildings.	Reduction of energy bills Improved standard on older buildings
	Finance & Funding	Financial support for energy efficiency measures in private households	Reduce energy consumption	Reduce energy costs
Road Mobility & transport	Financing & funding	Incorporation of electric buses	Generating a more sustainable, attractive, and functional public transport service	Promoting the use of sustainable public transport Reduction of air pollution

		Electrification of the municipal vehicle fleet	Creating a more sustainable vehicle fleet	Renewal of the municipal vehicle fleet Reduction of air and noise pollution Health improvement Enhancing quality of life
		Soft measures and funding for shared mobility	More accessible mobility	Reduction of air and noise pollution Health improvement Enhancing quality of life
		Developing charging infrastructure for EVs	More accessible charging for citizens who do not have access to parking on own plot	More just transition Reduction of air and noise pollution Health improvement Enhancing quality of life
	Technology/ Infrastructure	Investing in infrastructure to increase use of walking, cycling and public transport	Zero growth in number of cars on the road	Time saving and less congestion Reduction of air and noise pollution Health improvement Enhancing quality of life
	Governance and policy	Reduce the need for car through compact urban planning to reduce travel distances between home, workplace and activities combined with car-restrictive measures.	Reduced car traffic volumes	Time saving and less congestion Reduction of air and noise pollution Health improvement Enhancing quality of life
	Social innovation	Mobility hubs and services	Increased use of new mobility services	Increased accessibility More available mobility

	Democracy & Participation	Changed use of public spaces e.g. less parking, pedestrian streets	Reduced car traffic volumes	More available public space More greenery Enhancing quality of life
Waterborne Navigation	Financing & funding	Incorporation of electric fast boats	Generating a more sustainable, attractive, and functional public transport service	Promoting the use of sustainable public transport Reduction of air pollution
	Governance/Policy	Using Environmental Port Index (EPI) to dynamic increase in prize differentiation so that Cruise ships prioritize low carbon solutions when in port	Copy EPI to other ship categories	Reduction of air pollution Reduction of noise pollution
	Technology/ Infrastructure	Onshore power on quay and charging buoys	Creating onshore infrastructure to enable green shipping	Reduction of air and noise pollution Health improvement Enhancing quality of life
Waste & circular economy	Technology/ Infrastructure	Investments in plants to turn animal and municipal waste to energy	Reduced use of natural gas and carbon binding. Work towards realization of CCS plant for waste incineration	Innovation and development Green job creation
	Learning & Capabilities	Increase populations knowledge of the benefits of recycling and how to properly recycle. Enhance citizens capabilities to repair and willingness to reuse. Reducing food waste	Continuous work - Increase populations knowledge of the benefits of recycling and how to properly recycle. Enhance citizens capabilities to repair and willingness to reuse. Reducing food waste	Less use of resources, improved circular economy
	Technology/ Infrastructure	Work towards more sustainable mass handling	Masses in the county are kept as high as possible in the resource pyramid	Less use of resources
		A thriving marketplace for selling and buying used building materials.	Implementing used building materials in new construction projects is common	Less use of resources, improved circular

			knowledge and practice in the region.	economy, less demolition of buildings
	Democracy and participation	A thriving large shopping centre for used goods for private citizens	Buying used goods is the first choice for citizens	Less use of resources, improved circular economy,
	Governance and policy	The municipal « Reuse-storage » is expanded from furniture to also include large amounts of building materials	The amount of used building materials in municipal construction projects is very high and renovating is the standard choice before tearing down.	Less use of resources, improved circular economy, less demolition of buildings
Built environmentE	Finance/funding	Support schemes for increasing energy efficiency of buildings	More energy efficient buildings	Reduced Energy cost
	Governance & policy	Increase reuse and repurpose of existing buildings	Waste reduction Less ned for demolition and new construction	Less need to build entirely new buildings in property development. Property development as part of identity creation
		Urban planning of new residential buildings and workplaces located in public transport zones and district centres	More people have the opportunity to use public transit, walking and cycling Shorter travel distances for everyday needs	Less need to build new infrastructure for citizens Less need to build new on green areas
	Technology/ Infrastructure Learning & Capabilities	Restoring and redeveloping already existing buildings is always the first choice of municipal construction project. This is also rooted in the municipal strategies and political ambitions.	Restoring and redeveloping already existing buildings is the first choice of all building projects, private and public. Knowledge and best practice are shared in between the developers	Less use of resources, strengthen new local business models, utilization of grey areas instead of green, increased knowledge of reused building materials
	Technology/ Infrastructure Learning & Capabilities	Through FutureBuilt 4-6 construction projects will have achieved at least 50 % reduction in emissions and serve as light	FutureBuilt is a permanent program and continues to showcase the ambitious de-	Higher quality building, higher flexibility in design and use, better

		house projects for other building developers	velopment projects in our region. Proving that it is possible to cut emissions and improve quality in city development through cooperation and innovation.	living conditions for habitants
Agriculture	Governance & policy	Increased use of organic food in the municipality's own operations	Close to reaching goal of at least 15 % of organic food in the municipality's own operations	Municipality as a reliable customer for farmers and businesses, ecological food accessible for inhabitants and municipality employees
		Increase number of farms and gardens with organic production	Reaching goal of at least 15 farms/gardens with organic production by 2030	Less harmful chemical in use, less hazardous runoff, more accessible ecological food locally and regionally, improved quality of food.
	Finance/funding	Grant opportunities which fund energy efficiency measures within agriculture	Increase energy efficiency within agriculture	Supporting local business initiatives, diversify the local economy, strengthening innovation and collaboration

3.1.1 Description of impact pathways

3.1.1.1 Energy systems

Norway has a long tradition of hydropower, which has given easy access to renewable energy. Still Norway has a limited power grid, which can make it hard to ensure enough power for industry development for certain areas. The main power grid was built out many years ago with 300 kilovolts as the highest voltage level. This electricity grid will be rebuilt to 420 kilovolts to make room for new consumption and new electricity production. Transformer stations were built in the 1950s and 1960s and need to be renewed. Lyse reinforces the network in our region. At the same time, it is important that Stavanger strives to become more energy efficient, which is an important part of the electrification process.

Still Stavanger has some energy which comes from non-renewable sources. Therefore, an important action is to increase the catchment area for local district heating. At the same time, it is crucial to phase out fossil fuel use in the local district heating. This is done by heat spill-off in waste incineration and increased biogas share. To also reduce the burden on the local power grid, actions such as increased use of solar panels on rooftops and increased energy efficiency of buildings are important.

In road transport Norway has come a long way in electrification of the private vehicle fleet. But there is still need for electrification of heavier vehicles and construction machinery. To help innovation in the building sector, Stavanger has therefore decided to demand that municipal building and construction sites must be emission free.

National efforts will also contribute to realizing this portfolio. Hereunder, fossil gas for building heating may be banned. The Norwegian Environment Agency submitted for consultation a proposal on a ban on the use of fossil gas for heating on construction sites in May 2024. If implemented, this will reduce emission from the construction phase of new buildings.

The municipality is working on a project that concerns the replacement of older lights with LED lighting in public parks and streets. This significantly reduces energy consumption. In addition, dimming tables are introduced, which reduces light pollution at night, and reduces energy consumption. Furthermore, a warmer colour temperature has been selected for the lighting. When you choose warmer colour temperatures, the lighting helps to reduce atmospheric light pollution, and good shielding prevents stray light.

3.1.1.2 Road Mobility & transport

Emissions from Road transport has had a rapid decline, mainly due to the implementation of biofuel use and an increase in use of electric vehicles. There has also been a decline in road traffic. The traffic has increased since the corona pandemic but is still at a lower level than inn 2015. As shown in part A and **Feil! Fant ikke referansekilden.** A 72 percent reduction from 2015 to 2030 can be achieved given that the described efforts and assumptions are fulfilled.

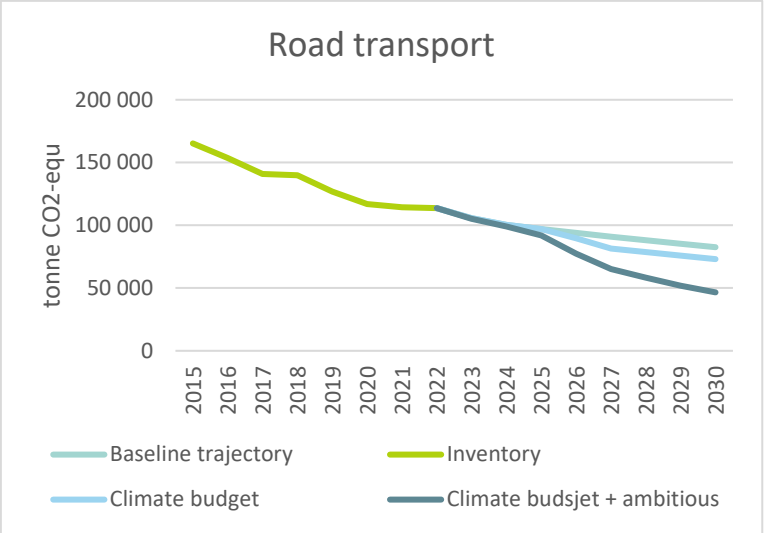

Figure 8 Sector specific trajectory Road traffic. See part A of the CCC for description of included measures and assumptions.

To reduce emissions from road transport it is important to increase the uptake of EVs, and electrification of the public transport system. However, it is not enough to electrify private cars. Car oriented urban planning leads to greater land use change and greater travel distances which increases emissions and energy use. Therefore, it is necessary to plan for an urban development which caters for sustainable travel modes.

The urban planning strategy in the land-use part of the municipal master plan has a clear strategy for more compact urban planning. Densification is planned along important public transit lines and local centres. This will help to reduce travel distances between home, workplace and activities which combined with car-restrictive measures will reduce car use.

As part of the land-use part of the municipal master plan the city council passed a new transport and mobility strategy in June 2023. The strategy places the mobility pyramid, see **Feil! Fant ikke referansekilden.**, and active transport as the basis for planning and development. The strategy's goal is that it is easy to travel environmentally friendly in Stavanger both for people, when transporting goods and when providing services. It assumes a lower share of car drivers than 30 % and that greenhouse gas emissions from vehicles must be reduced by 100 % by 2040.

Figure 9 The mobility pyramid with prioritization of road users

3.1.1.3 Waste & circular economy

Stavanger's main goal is for resources to be reused, recovered or destroyed with the least possible environmental impact, and that the amounts of waste are kept as low as possible.

Of the total amount of waste, approximately one per cent was reused in 2023, which is roughly the same level as the previous year. This quantity is expected to increase significantly in the coming years, due to ongoing efforts and initiatives to support these goals. The amount of household waste decreased from 396 kg/inhabitant in 2022 to 368 kg/inhabitant in 2023. This is the best result since registration of the amount of waste began in 2002.

To further reduce waste, it is important to facilitate reuse of items and materials. Stavanger municipality has had their own internal "reuse warehouse" This reduces both the amount of new furniture bought and the amount of old furniture thrown out. The municipal waste company (IVAR) has also been running a reuse store since 2008, where they sell useable goods that citizens have thrown away. Due to its popularity the company is in the process of upgrading their facilities to sell more used goods. IVAR opened Norway's largest recycling center called R:elsk, which is 3,200m^2 on 28 July 2024. IVAR's research shows that the reuse potential is 5,000 tonnes a year. The aim is to sell 2,000 tonnes of reusable goods in the new recycling center by 2025 and reach 5,000 tonnes before 2030.

At the same time there are ongoing initiatives in the private sector to start a reuse warehouse available for all developers and contractors.

It is also important for more sustainable handling of excavated material from construction sites. This has a potential to provide significant cuts in emissions of greenhouse gases. Measures includes reuse, material recovery, improved logistics and reduced extraction of new building materials. The municipality, as planning authority, is obliged to follow the intentions in the Regional Plan for mass management in Jæren 2018-2040. The plan's aim is sustainable handling of waste from building and construction activities in the region. Stavanger municipality is part of the working group of Rogaland Resource forum, which is a forum that will contribute to the follow-up of the action program in the regional plan for handling of this excavated surplus material. The forum will facilitate that masses in the county are kept as high as possible in the resource pyramid so that the resources can be utilized as best possible and contributes to the least possible strain on nature and surroundings.

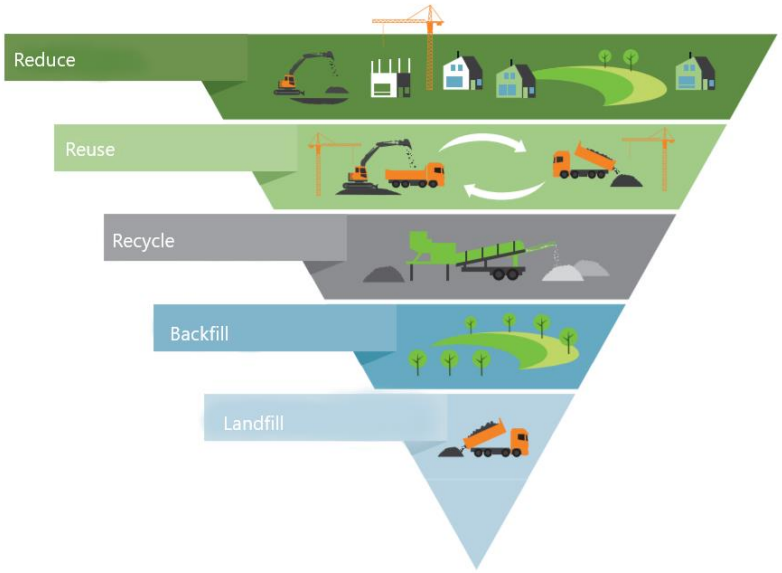

Figure 10 Modified illustration from regional master plan, Rogaland County Municipality / Berit Sømme

The municipality's work must secure that surplus masses are handled in accordance with laws and regulations, and that masses defined as waste is recycled or delivered to a legal waste facility. This responsibility belongs to the municipality both in the role as land developer and as planning authority.

Lyse has carried out a feasibility study for the implementation of carbon capture (CCS) at the waste incineration plant “Forus Energigjenvinning”. The study shows that this is technically feasible and can be realized within a few years.

The facility is located in a neighbouring municipality, Sandnes. As described in section 2.1.5, the estimated emission reductions and possible sequestration from biogenic waste is calculated based on the ownership shares of Lyse and IVAR (intercommunal companies) at the two combustion lines, and Stavanger's ownership share in these companies. The estimated effects in section 2.1.5 are based on a concept where the facility capacity is 100 000 tonne waste per year, which is the current capacity. They are also evaluating a concept with increased capacity, 150 000 tonne waste per year. With this solution, the potential to cut fossil CO_2 is increased from 35 000 to 60 000 tonnes of CO_2 eq, which according to ownership at the facility amounts to 24 000 tonnes of CO_2 equivalents as Stavanger’s calculated share. The building of a larger facility will not contribute to closing the emission gap, as it will mitigate the expected increased emissions due to increased amounts of waste incineration. However, a larger facility is expected to increase possible sequestration of biogenic CO_2, where 36 000 tonnes of CO_2 is the calculated share for Stavanger.

Lyse are working towards a possible investment decision in approximately 1,5 years time at the earliest, as commercial and governmental framework conditions are currently unclear. The two most important sources of income for a CO_2 capture plant based on waste incineration are avoided taxes for the fossil portion and the sale of carbon removal certificates for the biogenic portion. The position of *KAN CO_2*, the industrial cooperation with partners with Norwegian waste incineration plants, state that a rapid initiation of incentives for the capture of CO_2 is necessary for the realization of CCS. This includes establishment of a clear and distinct framework for CO_2 removal and ensuring that the costs of CO_2 capture and storage can be covered by predictable sources of income. In order to prevent inappropriate transport of waste, new measures must be assessed against a Nordic/Northern European market for waste.

3.1.1.4 Built environment

To reduce emissions from the built environment, it is important to increase energy efficiency of existing buildings and have an urban planning strategy which increases compact development and repurpose existing buildings in new developments.

Stavanger municipality has a clear strategy to reduce energy use and enhance share of renewable energy in the municipality's buildings. The municipality of Stavanger is in the process of energy certifying it`s municipal buildings and assessing the energy performance of the buildings ventilation, heating, and cooling systems, which both are activities that the municipality is required to do by law. Simultaneously the municipality plan to do a comprehensive energy assessment of the same buildings to identify energy efficiency measures that can be done so that the municipal buildings become more energy efficient. The city has mapped the potential for solar roofs on its own buildings. Solar systems have been established on 10 buildings, and 12 new systems are being planned. According to the plan, 20 new facilities are to be established per year. The city administration has also had energy saving support schemes targeting citizens funded by the climate and environment fund, such as support for heat pumps and renewal of windows.

The land-use part of the municipal master plan also has provisions that new residential buildings and workplaces are to be in public transport zones and local districts centres. This gives more people the opportunity to use public transport. At the same time travels distances decreases, so that more people can walk or cycle for their everyday needs. However, it is also important to reduce emissions from new urban developments. Therefore, the land-use part of the municipal plan also includes provisions that developers must map potential for reuse of existing buildings. By reusing buildings or part of buildings, there is a huge potential to reduce emissions in the building sector.

Stavanger has also in 2023 joined as a partner municipality in FutureBuilt. This is an innovation program that uses pilot projects to change the way buildings and urban areas are developed, believing that good examples are important for making a change. Stavanger's aim in joining is to help ambitious developers realise their pilot projects that shares our common goal: to be 10 years ahead and 50 % better than the rest of the construction industry. Through the program the municipality seeks cooperation with both public and private developers who wished to contribute to a greener and better construction industry. The plan is to prove that it is possible to develop projects that have major climate gas reductions, high quality architecture, reused materials, low energy use and positive contributions to the citizens daily life.

Reusing and redeveloping old buildings is a key factor to achieve climate neutrality within the built environment. The construction of new buildings creates emissions within all scopes, and therefore all scopes need to be addressed. As of today, both the municipal organisation and the private sector are in the early stages of changing the construction industry into a circular industry. This is still a new field of expertise in Norway and the changes takes time. None the less we have plans and strategies on how to get there. The City of Stavanger has their own "reuse division" that works to increase the reuse of both furniture and building materials and private initiatives for the private sector is also being developed, with the support of the municipality. The path to ensure near zero demolition is a long one, but we are focusing on it every day, making permanent changes to our strategies, attitudes and plans for development.

3.1.1.5 Agriculture

Stavanger's agricultural landscape is diverse, with the municipality leading in sheep farming, egg, chicken, and tomato production. About 36 % of the land area in Stavanger is farmland. Emissions recorded in this sector stand out as they originate from biological processes in livestock and soil and have been relatively stable over the years.

According to an analysis by the Norwegian environment agency, *national* agricultural emissions can be cut by 1,8 million tonnes of CO_2-eq. by 2035. Most of the reduction is linked to a reduced meat consumption and reduced food waste. It is assumed that agriculture, as far as possible, adapts production

in line with the changes in the demand. The emission reductions in this measure apply to methane from the digestion of livestock and emissions of greenhouse gases from the storage and spreading of livestock manure and the use of mineral fertiliser.

The effect of changing consumption habits to be inline with the Norwegian dietary guidelines, is the most important measure within the agriculture sector. However, this measure assumes that a change in demand will also change feedstock production accordingly. This presumption is not necessarily likely in a global market context, although the agricultural sector in Norway is highly regulated.

Other identified measures include, amongst other, reducing food waste, various fertilizer measures, manure storage measures and the use of ethane inhibitors.

By downscaling the identified national measures and effects for the agricultural emissions to the local context of Stavanger, a rough estimate is that agricultural emissions could be reduced by approximately 25 percent in 2030, compared to the baseline trajectory. This is excluding the effects of possible biogas/biocoal-plants, for which individual calculations have been done in Stavanger's climate budget.

An important measure in Stavanger will be to treat the manure in biogas plants, allowing biogas from the manure to replace fossil energy sources (natural gas). In line with national goals, at least 25 % of the liquid animal manure should go to biogas plants by 2030.

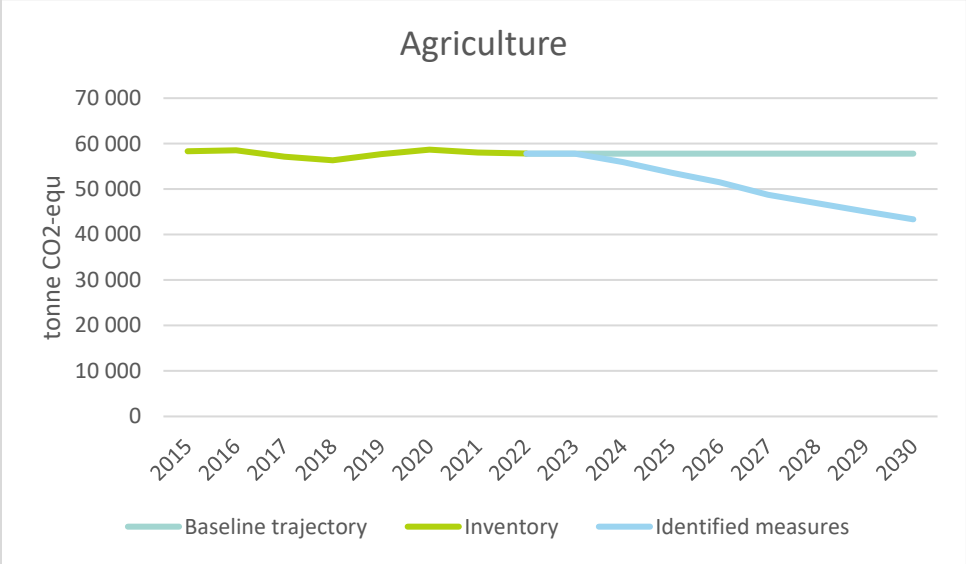

Figure 11 Sector specific trajectory Agriculture. See part A of the CCC for description of included measures and assumptions.

Emissions from agricultural machinery is placed in emission sector Other Mobile Combustion. According to the Norwegian environment agency, it is very uncertain how big the potential for the phasing in of electric agricultural machines is until 2030. They have however assumed that electrification can reduce emissions from machinery in agriculture by 10 percent in 2030. This effect is not included in the trajectories in 2.1.3.Upscaling the requirement for biofuel use is however included.

The agricultural office in the municipality reports that 80 percent of the measures in municipal thematic plan for climate and environment in agriculture have been initiated and there are ongoing efforts to meet the goals set in the plan. Stavanger is further exploring possibilities for emission reductions in this sector, also through discussions with the NZC.

3.1.1.6 *Waterborne Navigation*

In the emissions inventory, emissions from all traffic within Stavanger's territory is included, and is not limited to vessels going to shore. Since the boarder is 12 nautical miles outside the shoreline, emissions from different kinds of vessels passing through is therefore included. Stavanger municipality has limited means of regulating these emissions. However, given the assumptions in the calculations in part A, emissions from Seaborne navigation can be reduced by approximately 67 percent from 2015 to 2030. Stronger IMO efforts not reflected in the calculation, which can cut the emissions further.

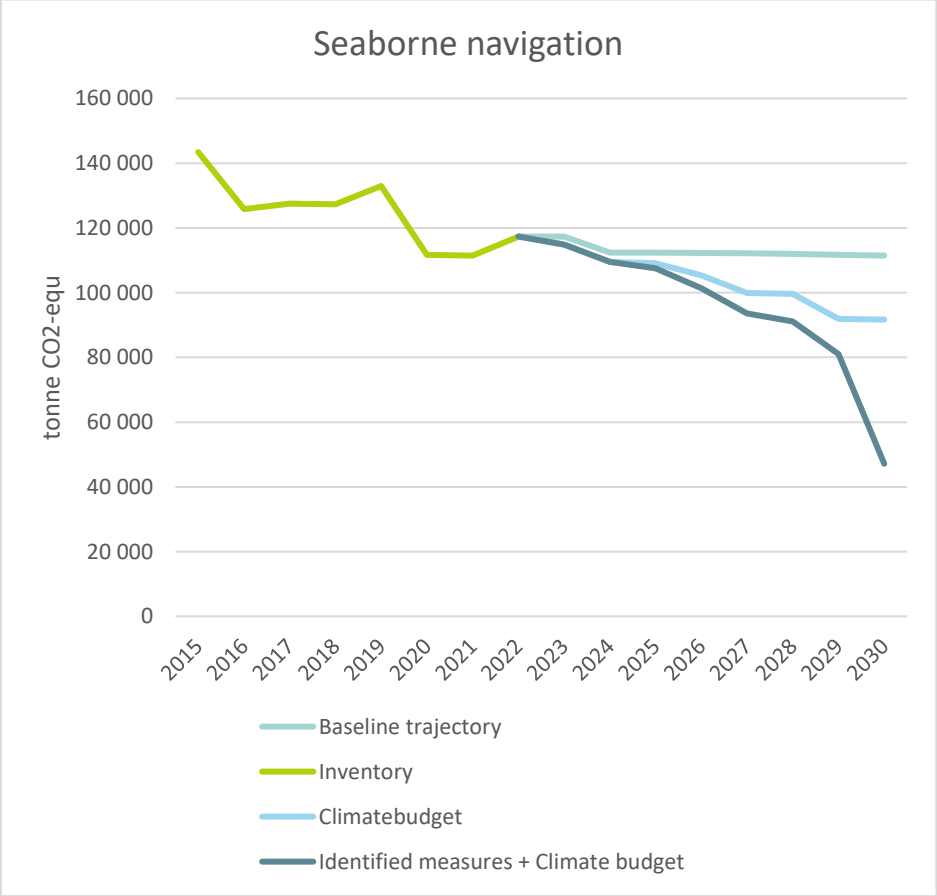

Figure 12 Sector specific trajectory Seaborne navigation. See part A of the CCC for description of included measures and assumptions.

Passenger ships- ferries and speedboats

Passenger ships is the largest ship category contributing to emissions from waterborne navigation. There is a ferry-line between Mortaviga (Stavanger municipality) and Arsvågen (Bokn municipality) which accounts for approximately 25 percent of shipping emissions in Stavanger municipality. The ferry-line is administered by the Norwegian Public Roads Administration and consists of four ferries that mainly run on LNG (Liquefied natural gas), as well as a fifth supplemental ferry on high-traffic days. Today's contract runs until 31 December 2024. The Norwegian Public Roads Administration has the option to extend the contract by up to five years. It is not known whether this option will be exercised on the connection, or if there will be a requirement for low/zero emission solutions in the next tender process for the connection. One possible measure is the transition to liquid biogas. If there are no changes by 2030, the shipping sector will not be able to reduce emissions with an 80 % emission reduction from 2015 to 2030. The ferry-line will be replaced by the E39 Rogfast road connection in 2033. The E39 Rogfast project will be the world's longest and deepest undersea tunnel. In the projection with other

identified measures, it is assumed that emissions from this ferry line will be eliminated by 2030, even though it is not certain until 2033.

In the proposal to the national transport plan (NTP), the Government states that they are assessing *requirements* for zero emissions for new purchases of ferries from 2024 and fast boats from 2025. In 2023, the Ministry of Transport, in collaboration with the Ministry of Climate and Environment, submitted a proposal for a new regulation on zero emission requirements for ferries and speedboats at public consultation. The ministry received several consultation responses and is working to follow up the case.

There is an extensive county municipal boat route offer in Rogaland with both speedboat and ferry. Rogaland County Council is responsible for the ferry lines connecting county roads. Some lines have already transitioned into zero emission solutions.

The transition to zero emission fast boats can be challenging. For instance, the 5 express boat routes between Stavanger and Ryfylke is today fuelled by MGO. The tender for the route was advertised by the public transport company Kolumbus on behalf of the county for a duration of 10+2 years in the summer of 2022. This process was cancelled, as it was expected that the result would have been a ten-year contract with operation on fossil fuel well into the 2030s. The period was changed to three years and tendered out again. The result is that the same company using the same technology received the contract, with the hope that technological development will give us more environmentally friendly boats before we reach 1. January 2028.

There is uncertainty about what will be the future fuel technology for fast boats. If the government introduces a requirement for zero-emission material for high-speed boats, the county council may be obliged to advertise the next contract (from 2028/2030) with a zero-emission requirement, depending on the entry into force of any requirement.

In connection with the cancelled competition, Kolumbus revealed that a transition from diesel-powered to zero-emission speedboats could entail an annual cost increase of up to 40 percent, even after promises of state support from Enova and the Norwegian Environment Agency. That would mean that zero-emission materials would not have been competitive with fossil materials. It is unknown how these costs will develop in the coming years, and, according to the county, the state has so far not shown sufficient ability or willingness to provide the county council with predictable compensation for additional costs in connection with the transition to zero-emission materials. This illustrates that the green transition for this segment may be dependent on many systemic levers working together (Governance & Policy, Technology & Infrastructure, Finance & Funding).

Leisure boats

In Stavanger's draft for Thematic plan for small boat harbours, it is stated that marinas shall be environmentally friendly and reduce greenhouse gas emissions. The plan describes possible climate measures for leisure boats in Stavanger, with reference to climate and the environment's action plan. Identified possible measures are to develop a support scheme aimed at electric boats to cover a percentage of the purchase or conversion cost, and to consider establishing shared boat solutions in the municipality. The plan is due to go on public hearing and thereafter being forwarded for political decision.

The port authority has set up charging facilities to offer the leisure boats when visiting Stavanger.

Berthing

A large part of the emissions from the shipping sector in Stavanger comes from berthing. Emissions from berthing can be impacted through the Port of Stavanger through establishment of shore power for large and smaller vessels within well known and tested standards, which also is a mature technology. However, uncertainty around sufficient power capacity can set limits on the possibility implementing a complete supply of shore power.

Several charging facilities has been installed to supply supply-vessels, passenger boats, and ferries when at dock, and a bigger operation around cruise ships are at a starting point. Discussions around berthing points and different fuels will be a part of the future dialogues.

3.1.1.7 Other impact sectors

There is not specified impact pathways for all emission sectors. The rationale behind this is to focus on establishing and developing selected portfolios as a start. If the experience is that it is beneficial to structure efforts through the use of portfolio designs, this can be further expanded to other area in coming years. As shown in Part A, there are however also efforts for emission reductions in the remaining sectors. Efforts in the area green infrastructure and nature-based solutions is included in 3.2, B-2.3: Summary strategy for residual emissions.

3.2 Module B-2 Climate Neutrality Portfolio Design

B-2.1: Description of action portfolios - textual or visual		
Fields of action	Portfolio description	
	List of actions	Descriptions
Energy systems	Increase biogas share.	Increase in biogas share as a result of increased production from IVAR's two plants. Estimates that half of the increase entails a reduction in natural gas consumption in Stavanger, including in the greenhouse industry
	Expansion of the district heating network	Transition from natural gas to district heating. Expansion of the district heating network effective from 2025.
	Phasing out fossil gas in local district heating	Phasing out of fossil gas in Lyse's local district heating plants by 2030. Including Søra Bråde biocoal plant: production of heat and biocoal from municipal green waste, replacing natural gas use from 2026.
	Emission-free municipal building and construction sites	Emission-free municipal building and construction sites and emission-free machines/equipment in Stavanger municipality by 2025.
	Energy certification of municipal buildings	Energy certification of municipal buildings combined with a comprehensive energy assessment to identify energy efficiency measures
	Local district cooling	Refrigeration plant in Stavanger East, extensions in Jåttåvågen. reduce energy consumption (electricity) and climate-driving refrigerants for customers.
	Energy production	Upgrading the hydropower plants in Røldal-Suldal (RSK).
	Transition from natural gas	Geothermal energy - 120 new geothermal wells will provide campus at UiS with heating and cooling starting in 2024. Phasing out of natural gas as a source for heating buildings
	Replace propane as an energy source for heating buildings	Propane is used for heating larger buildings. Propane is a hydrocarbon and is a source of CO2 emissions. Worley Rosenberg are looking at the possibility of switching to RES.
	Development of the power grid	Lyse will invest in infrastructure so that customers in the region will get enough power for electrification,

		business development and restructuring of the transport sector
Road Mobility & transport	Make Stavangers vehicle fleet emission free.	The city of Stavanger's vehicle fleet strives to be emission-free by 2025. There are still 222 petrol and diesel cars to be replaced by 2025 (all departments including enterprises). Worley and FKRA will replace dieseil-powered trucks and forklifts to biodiesel or electrical. IVARs car fleet strives to be emission free by the end of 2024, while 40 % of FKRA`s fleet will be zero-emission by 2030.
	Modal shift from car to public and active transport	Reduce car share to 30 % through compact urban planning to reduce travel distances between home, workplace and activities combined with car-restrictive measures.
	Mobility hubs and services	The municipality allocates space for new mobility hubs in land use planning which will be developed in cooperation with mobility service enterprises
	Developing charging infrastructure for EVs	The municipality will develop charging infrastructure accessible for the public, targeting citizens who are dependent on curb side parking
	Electrification of road public transport	Through new contracts for public transport for bus for the region of Nord-Jæren, Rogaland County Council will implement electrification of road public transport. Estimates 5 % private buses that will not be electrified.
	BRT-system ("Bussveien")	Nord-Jæren is planning and building Europe's longest Bus Rapid Transit (BRT) system. When the project is finished, it will have a total of 50 km where bus is prioritised over other traffic. In 2026 most of the stretch between Stavanger and the city of Sandnes will be finished.
	Bicycle highway (« Sykkelstamveien »)	Between Stavanger and the city of Sandnes there is ongoing construction of a total of 14 km of bicycle highway. It will connect the two cities with the Forus area, where around 40 000 workplaces are located. The goal of the project is a modal shift from car to bicycle for journeys to and from work. The project will be completed in 2026.
	Investments in bicycle infrastructure	As part of the city growth agreement, there is allocated funds for investments in bicycle infrastructure in Nord-Jæren.
	Investment in pedestrian infrastructure and traffic safety	As part of the city growth agreement, there is allocated funds for investments in pedestrian infrastructure and traffic safety in Nord-Jæren.
	Investments in public transport	As part of the city growth agreement there is allocated funds for investments to improve the flow of public transit. Projects which improve where there are the most passengers or delays are prioritized.
	Mobility package	The mobility package will raise citizens awareness of existing and new mobility solutions, amplify existing services and create new mobility solutions.
	Investments in vehicles	Renovasjonen IKS will purchase 38 large zero-emission renovation trucks, and 3 smaller renovation trucks. IVAR has made a 5-year agreement with Stangeland machine for annual waste transport. 60% of the assignment is to be done with electrical trucks.

Waterborne Navigation	On-Shore power facilities for cruise ships	Emission reductions from shore power facilities for cruise ships at the shore quay from 2026
	Electrification of water-borne public transport	Rogaland County Council will implement electrification of fast boats and ferries calling in Stavanger: Electrification of the Ryfylke ferry, the Ryfylke routes, the Hommersåk connection, Finnøy and Vassøy connection
	Battery on ship	Møkster will install batteries on two new vessels, increase battery capacity and provide training on battery use for the vessels
	Vessel improvements	Møkster establishes new operating routines for emission reductions for the ships. Introduce propeller wash every 6 months, hull wash every 8-12 months and speed optimization
	CCS on PSV	Pilot project with CCS for Platform supply vessel will provide 60% capture of CO2. Based on new technology, knowledge and experience, the next plant at PSV will be able to achieve a CO2 capture of 80 % - avoiding emission at source point.
		.
Waste & circular economy	Repurpose of municipal furniture	Stavanger municipality has had their own internal “reuse warehouse” that has been operating for about 2 years. This reduces both the amount of new furniture bought and the amount of old furniture thrown out.
	Production of biogas from animal waste	Bio Jæren wants to establish a plant for the production of biofertiliser, biosoil and biogas at Grødaland in Hå from animal manure, with biogas production of up to 150 GWh of biogas. Finnøy Bioenergi is planning a village facility for livestock manure of 15 GWh. Assumes that 2 5% of the biogas is used in Stavanger municipality and displaces natural gas use.
	Production of biocoal from municipal green waste	Søra Bråde biocoal plant: production of biocoal from municipal green waste
	Increase operation of re-use store from municipal waste company (IVAR)	The municipal waste company (IVAR) have been running a reuse store since 2008, where they sell useable goods that citizens have thrown away. Due to it’s popularity the company is in the process of upgrading their facilities to sell more used goods. IVAR will open a new recycling center in autumn 2024, Norway's largest at 3,500 m^2.
Built environment	Electricity saving initiatives	Replace streetlights to led, different savings initiatives, retrofitting municipal housing. Felleskjøpet will Install a heat pump to use waste power from the factory and new radiators in the main building and has annual objectives to reduce consumption of energy in production per unit produced by 5 % by 2030

	Increase use of renewable energy- and solar power production	Potential for solar power on existing buildings.
	Support schemes for increasing energy efficiency of buildings	Stavanger municipality offer support schemes for citizens to change windows older than 1987 in housing.
	Densification in public transport zones and district centres	The land use part of the municipal master plan plans densification and building of new residential areas and workplaces along the new Bus Rapid Transit system and in city- and district centres
	Increase reuse and repurpose of existing buildings	The land use part of the municipal plan requires developers to document potential for reuse and repurpose of existing buildings when developing new zoning plans
	FutureBuilt	Through FutureBuilt 4-6 construction projects will have achieved at least 50 % reduction in emissions and serve as light house projects for other building developers
Agriculture	Increase number of farms and gardens with organic production	Goal of at least 15 % farms/gardens with organic production by 2030
	Increased use of organic food in the municipality's own operations	Goal of at least 15 % organic food in the municipality's own food operations
	Implementation of all projects awarded funding for energy efficiency within agriculture	Increase energy efficiency within agriculture
Scope 3 emission	Emission reductions in the value chain	The businesses in Stavanger also focus on emissions from goods and services the businesses purchase from others. Port of Stavanger facilitate port activity with low greenhouse gas emissions and work actively with climate accounting and projections, procurement. Worley working with the suppliers to receive green transport (upstream). Companies reduce its emissions from flights and working on reducing the amount of waste through creating incentives and systems for reuse.

3.2.1 B-2.2: Individual action outlines

The source for cost by CO_2 unit market * is the report M-2539 from the Norwegian Environment Agency, and costs by CO_2 unit marked ** is from the report Klimakur 2030 from the Norwegian Environment Agency. In both cases, the values show Norwegian general cost evaluations, not project specific considering Stavanger's local context.

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Fossil-free Road public transport
	Action type	Physical and spatial interventions Technical interventions Procurement actions
	Action description	Electrification of buses in Nord-Jæren, as part of electrification of the public transit system. Impact and cost are calculated for Stavanger, not the entire region of Nord-Jæren
Reference to impact pathway	Field of action	Transport and Mobility
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Generating a more sustainable, attractive, and functional public transport service
Implementation	Responsible bodies/person for implementation	Rogaland County Council
	Action scale & addressed entities	National, Regional, Municipal, Citizen
	Involved stakeholders	Rogaland County Council, Kolumbus AS, Stavanger, Sandnes, Randaberg and Sola municipalities
	Comments on implementation – consider mentioning resources, timelines, milestones	It is assumed that the start of the new bus contract for Nord-Jæren will take place on 1 July 2026, and that from then on, the buses will be battery-electrically operated throughout this contract. Estimates 5 % private buses that will not be electrified. In the current financial plan, Rogaland County Council has not allocated sufficient funds to cover the additional operation costs of electric buses. However, costs for investments in charging infrastructure have been allocated. If the state does not provide increased funds to cover such possible additional costs until zero-emission materials are fully competitive with fossil alternatives, it will be extremely demanding for a county municipality such as Rogaland to handle.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel

	GHG emissions reduction estimate (total) per emission source sector	9 500, road transportation
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	Early estimate 32,1 – 123,7 MNOK per year (2,8 - 10,8 million €), this only covers operations and not investments in charging infrastructure. 500 NOK/tonne*

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Electrification of waterborne public transport
	Action type	Physical and spatial interventions Technical interventions Procurement actions
	Action description	Fossil-free fast boats and ferries calling in Stavanger: Electrification of the Ryfylke ferry, the Ryfylke routes, the Hommersåk connection, Finnøy and Vassøy connection
Reference to impact pathway	Field of action	Transport
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Generating a more sustainable, attractive, and functional public transport service
Implementation	Responsible bodies/person for implementation	Rogaland County Council
	Action scale & addressed entities	National, Regional, Municipal, Citizen
	Involved stakeholders	Government, Rogaland County Council, Kolumbus AS, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	The government has signalled that boats should be zero-emission by 2025 and ferries as fast as possible, however this has yet not been decided. Dependent on the government's decision, the following ferries can become electric • Finnøy ferry, from 2029 Rogaland County Council have decided that the following ferries and fast boats will be electrified • Vassøy ferry, as fast as possible The following ferries and boats have already been electrified • Ryfylke ferry, in 2022 • Fast boat Stavanger-Hommersåk, in 2022 (only one of two boats, the other wil be electrifed as fast as possible)

		Dependent on government decision and/or technological and cost-related development, the fast boats in Ryfylke can become electric from 2028.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuels
	GHG emissions reduction estimate (total) per emission source sector	15807 tonne, waterborne navigation
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO2e unit	1000 NOK/tonne for ferries, 2000 NOK/tonne for speedboats*

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Measures to facilitate fossil-free port operations for cruise boats
	Action type	Physical and spatial interventions Technical interventions
	Action description	Shore power for cruise boats.
Reference to impact pathway	Field of action	Transport
	Systemic lever	Technology/ Infrastructure
	Outcome (according to module B-1.1)	Creating onshore infrastructure to enable green shipping
Implementation	Responsible bodies/person for implementation	Port of Stavanger
	Action scale & addressed entities	Municipal, Companies
	Involved stakeholders	Port of Stavanger, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	The Port of Stavanger (Stavangerregionen Havn) will establish electric shore power facilities at the shore quay for cruise ships, reducing the needs for ships to run their own diesel generators. There is a barrier for implementing this action concerning available power supply in the future because of grid capacity.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	3 720 tonne, waterborne navigation
	GHG emissions compensated (natural or technological sinks)	n/a

	Total costs and costs by CO_2e unit	500 – 1500 NOK/tonne**

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Electrification of municipality vehicle fleet
	Action type	Procurement
	Action description	Stavanger municipality's vehicle fleet strives to be emission-free by 2025.
Reference to impact pathway	Field of action	Transport
	Systemic lever	Finance and funding
	Outcome (according to module B-1.1)	Creating a more sustainable vehicle fleet
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	Stavanger municipality has still 222 petrol and diesel cars. The municipality has a goal to replace these by 2025 (all departments including enterprises) Barriers for implementing are founding through the yearly budget passed by the city council. Political desire to invest in other projects or measures can delay the implementation.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel
	GHG emissions reduction estimate (total) per emission source sector	280, road transportation
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	1 500 NOK/tonne *

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Increase biogas share
	Action type	Technical interventions
	Action description	Increase in biogas share because of increased production from IVAR's two plants. Estimates that half of the increase entails a reduction in natural gas consumption in Stavanger, including in the greenhouse industry
Reference to impact pathway	Field of action	Energy
	Systemic lever	Technology/

		Infrastructure
	Outcome (according to module B-1.1)	Progressive change of the city's energy model, by increasing biogas share and phasing out use of fossil gas in local district heating
Implementation	Responsible bodies/person for implementation	IVAR
	Action scale & addressed entities	Municipal, Public entities
	Involved stakeholders	IVAR and Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	IVAR produces today biogas equivalent to 30 GWh per year. Planned expansion for the nest 4-5 years at the two existing biogas production sites can increase the production up until 100 GWh each year
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	1 940 tonnes, heating
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Reduction of natural gas for heating
	Action type	Technical intervention
	Action description	Transition from natural gas to district heating
Reference to impact pathway	Field of action	Energy
	Systemic lever	Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Progressive change of the city's energy model, by increasing biogas share and phasing out use of fossil gas in local district heating
Implementation	Responsible bodies/person for implementation	Lyse NEO
	Action scale & addressed entities	Municipal, Public entities
	Involved stakeholders	Lyse NEO, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	Expansion of the district heating network which will be finished in 2025. Lyse NEO together with Stavanger municipality is responsible for expansion of the district heating network. Construction of the expansion of the district heating network is underway and will be finished in 2025. New buildings and buildings in the influence area will be connected to the district heating network.

Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	3 256 tonnes, heating
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Production of biogas from animal waste I
	Action type	Technical intervention
	Action description	Bio Jæren wants to establish a plant to produce biofertiliser, biosoil and biogas at Grødaland in Hå from animal manure, with biogas production of up to 150 GWh of biogas.
Reference to impact pathway	Field of action	Energy
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Reduced use of natural gas and carbon binding
Implementation	Responsible bodies/person for implementation	Bio Jæren
	Action scale & addressed entities	Municipal, Public entities, Companies
	Involved stakeholders	Bio Jæren, Stavanger municipality, citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	Assumes that 25 % of the biogas produced by this new facility is used in Stavanger municipality to displace natural gas use. Conservative estimate and may be updated later.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	7 750 tonnes CO_2-eq. in sector heating from displacing natural gas within city boarder.
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	1 000 NOK/tonne *

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Production of biogas from animal waste II
	Action type	Technical intervention
	Action description	Finnøy Bioenergi is planning a village facility for livestock manure of 15 GWh.

Reference to impact pathway	Field of action	Energy
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Reduced use of natural gas and carbon binding
Implementation	Responsible bodies/person for implementation	Finnøy Bioenergi
	Action scale & addressed entities	Municipal, Public entities, Companies
	Involved stakeholders	Finnøy Bioenergy, Stavanger municipality, citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	Assumes that 25 % of the biogas produced by this new facility is used in Stavanger municipality and displaces natural gas use. Conservative estimate and may be updated later.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	850 tonne in sector heating, by displacing natural gas. 270 tonne reduction in sector agriculture, reduced emissions from cattle manure and pig manure compared to normal manure handling. Within city boarder.
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	1 000 NOK/tonne*

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Phasing out fossil gas in local district heating
	Action type	Technical intervention
	Action description	Phasing out of fossil gas in Lyse's local district heating plants by 2030. Including Søra Bråde biocoal plant: production of heat and biocoal from municipal green waste, replacing natural gas use from 2026.
Reference to impact pathway	Field of action	Energy and Waste & circular economy
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	Progressive change of the city's energy model, by increasing biogas share and phasing out use of fossil gas in local district heating
Implementation	Responsible bodies/person for implementation	Lyse
	Action scale & addressed entities	Municipal, Public entities
	Involved stakeholders	Lyse, Stavanger municipality, Citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	Lyse's local district heating plant will phase out fossil gas by 2030. Søra Bråde will produce heat and biocoal from municipal green waste from 2026. There is ongoing evaluation of available wood chips which

		can be used in the production of heat where the rest product will be biocoal.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	3 930
	GHG emissions compensated (natural or technological sinks)	1 300 (biocoal from Søra Bråde, estimate to be updated)
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Emission-free municipal construction sites
	Action type	Other interventions
	Action description	Emission-free municipal building and construction sites and emission-free machines/equipment in Stavanger municipality by 2025.
Reference to impact pathway	Field of action	Energy
	Systemic lever	Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Creating incentives for innovation towards a more sustainable construction sector
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	Municipal, Companies
	Involved stakeholders	Stavanger municipality, companies
	Comments on implementation – consider mentioning resources, timelines, milestones	Stavanger municipality will require that municipal building and construction sites are emission free in the procurement processes from 2025.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel
	GHG emissions reduction estimate (total) per emission source sector	2 300
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	1 000-2 500 NOK/tonne*

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Modal shift from private car to public and active transport. Reduce car share to 30 %
	Action type	Physical/spatial intervention

	Action description	Reduce the car share to 30 % through compact urban planning to reduce travel distances between home, workplace and activities combined with car-restrictive measueres.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	Governance & policy
	Outcome (according to module B-1.1)	Reduced car traffic volumes
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	National, Regional, Municipal, Citizen
	Involved stakeholders	Stavanger municipality, County Governor, Rogaland County Council, Citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	The modal share of car drivers in Stavanger is 41 % (ref National Travel Survey 2023). The target in the municipal master plan is to reduce the mode share of private car to 30 %, and increase mode share of walking, cycling and public transit. Investments through the City Growth Agreement will increase the flow of road public transit and better walking and cycling infrastructure. At the same time the urban planning will be based on proximity, to reduce the need for transportation. To reduce car use it is however necessary with car restrictive measures. Citizen engagement with this issue is very important. An example of this is the “Road Toll Rebellion” which had an impact at the local elections in 2019. If the citizens don’t accept car restrictive measures, it will be hard to implement.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel
	GHG emissions reduction estimate (total) per emission source sector	7 200 tonne CO_{2eq} (assuming development in electrification and biofuel use according to description in “other identified measures”. (if assuming todays share of electric cars and biofuel use the effect of this measure would be approx. 14 100 tonne CO_{2eq}.). Sector Road transport – passenger cars.
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	n/a

B-2.2: Individual action outlines
(Fill out one sheet per intervention/project)

Action outline	Action name	Infrastructure to enable reduced private car use
	Action type	Physical/spatial interventions
	Action description	Investing in infrastructure as part of the city growth agreement: • Building a bus rapid transit system for the region • Investing in cycling infrastructure • Investing in walking infrastructure • Investing in public transport infrastructure
Reference to impact pathway	Field of action	Transport & mobility
	Systemic lever	Infrastructure
	Outcome (according to module B-1.1)	Zero growth in number of cars on the road
Implementation	Responsible bodies/person for implementation	Rogaland County Council, The Norwegian Public Roads Administration, Norwegian Railway Directorate, County Governor, Municipality's in Nord-Jæren
	Action scale & addressed entities	National, Regional, Municipal, Citizen
	Involved stakeholders	Rogaland County Council, The Norwegian Public Roads Administration, Norwegian Railway Directorate, County Governor, Municipality's in Nord-Jæren, Kolumbus AS and inhabitants
	Comments on implementation – consider mentioning resources, timelines, milestones	The city growth agreement consists of several large infrastructure investments projects, but also investment for smaller bicycle and walking infrastructure. For the larger projects, important milestones are: • Bus rapid transit system between Stavanger-Sandnes finished in 2026 • Bicycle Highway Stavanger-Forus-Sandnes finished 2026 For the smaller infrastructure projects for walking and cycling it is allocated funds for investment until 2033.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	Covered in table B-2.2. for action *Modal shift from private car to public and active transport*
	Total costs and costs by CO_2-e unit	In the investment package, there is set aside funding for the period 2019-2029, where the different projects a funded with • Bicycle Highway 1 436 MNOK • BRT-system 10 240 MNOK

		• Cycling infrastructure 1 159 MNOK • Walking and traffic saftey infrastructure 1 159 MNOK • Public transit infrastructure 2 087 MNOK Because of cost increase, change of project framework and unexpected events during the construction phase the final cost of each project have changed since 2019. The financing above refers to the funds allocated in the City Growth Agreement in 2019. The final funding for the different projects is decided through portfolio management.

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Mobility package: Soft measures to enable reduced private car use
	Action type	Awareness campaigns and physical interventions
	Action description	Soft measures and actions for shared mobility to reduce private car use
Reference to impact pathway	Field of action	Transport & mobility
	Systemic lever	Finance & funding
	Outcome (according to module B-1.1)	Increased use of new mobility services
Implementation	Responsible bodies/person for implementation	Rogaland County Council, Kolumbus AS, Municipality's in Nord-Jæren
	Action scale & addressed entities	National, Regional, Municipal, Citizen
	Involved stakeholders	Rogaland County Council, Municipality's in Nord-Jæren, Kolumbus AS and inhabitants
	Comments on implementation – consider mentioning resources, timelines, milestones	The mobility package is financed through the City Growth Agreement with 50 MNOK each year. The mobility package will raise citizens awareness of existing and new mobility solutions, amplify existing services and create new mobility solutions. Important actions are • HomeWorkHome: Targeted against businesses and companies in Nord-Jæren. Employees get discount on public transit fares and city bike combined with awareness campaigns. • City bike: Implementation of electric city bikes in Nord-Jæren
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a

	GHG emissions reduction estimate (total) per emission source sector	Covered in table B-2.2. for action *Modal shift from private car to public and active transport*
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	Allocated 50 MNOK each year. Total of 300 MNOK for the period 2024-2029.

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Action Group for Economic Development and Sustainability
	Action type	Network for key private stakeholders
	Action description	Through the mission cities mobilization work, and increased climate regulation from the EU and nationally, the City of Stavanger and the University collaborates in organizing meetings and engages research to work on the barriers for emission cuts.
Reference to impact pathway	Field of action	Collaboration
	Systemic lever	Governance & policy, Democracy & Participation
	Outcome (according to module B-1.1)	Increased understanding of barriers to emission cuts. Broader toolbox and network to solve barriers
Implementation	Responsible bodies/person for implementation	City of Stavanger, University of Stavanger
	Action scale & addressed entities	Regional, Municipal
	Involved stakeholders	Approx 10 % public and 90 % private key companies of all sizes
	Comments on implementation – consider mentioning resources, timelines, milestones	The Action Group was formed February 2024 and will have had conducted 3 meetings by the end of May. This work is not funded apart from dedicated personnel from the municipality and university. The group focuses on one the barriers that private enterprise themselves have reported each meeting, and the participants themselves decide on the subjects for further meetings through polling and feedback. The goal of the project is to create a gras roots movement where business-to-business contact is easy, and business-to-government is based on correct information and proper dialogue. There is also an aim to use this work in research, so that we can broaden the knowledge of barriers to emission cuts and what competence is needed for becoming climate neutral.
Impact & cost	Generated renewable energy (if applicable)	Not applicable

	Removed/substituted energy, volume, or fuel type	-
	GHG emissions reduction estimate (total) per emission source sector	-
	GHG emissions compensated (natural or technological sinks)	-
	Total costs and costs by CO_2e unit	-

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Installing solar energy on municipal buildings
	Action type	Technical interventions
	Action description	Instalment of solar energy on existing buildings owned by Stavanger municipality
Reference to impact pathway	Field of action	Built environment
	Systemic lever	Technology/infrastructure
	Outcome (according to module B-1.1)	More renewable energy and decreased peak power demand
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality, municipal owned enterprises, citizens
	Comments on implementation – consider mentioning resources, timelines, milestones	Potential for solar power on municipal owned buildings were mapped in 2022. On 10 buildings there is already installed solar energy and 12 constructions on 10 buildings are under planning. It is planned to install solar power on up to 20 buildings each year.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Support for changing old windows
	Action type	Technical intervention
	Action description	Citizens can apply for funding to the municipality to change windows older than 1987 in housing.
Reference to impact pathway	Field of action	Built environment
	Systemic lever	Financing/funding

	Outcome (according to module B-1.1)	More energy efficient buildings
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	Municipal, citizens
	Involved stakeholders	Citizens, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	From April 2024 citizens can apply to the municipality for funding for changing windows from 1987 or older in housing. The municipality covers 2 000 NOK per window, but maximum 60 percent the cost of per window. It is secured 4 MNOK for this support scheme. The scheme last until the funding is used up.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	Total cost of the support scheme is 4 MNOK.

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Increase reuse and repurpose of existing buildings
	Action type	Spatial intervention
	Action description	The land use part of the municipal master plan includes provision for developers to investigate potential for reuse and repurpose in development in zoning plan for existing buildings
Reference to impact pathway	Field of action	Spatial interventions
	Systemic lever	Governance and policy
	Outcome (according to module B-1.1)	Waste reduction Less ned for demolition and new construction
Implementation	Responsible bodies/person for implementation	Developers, Stavanger municipality
	Action scale & addressed entities	Regional, municipal
	Involved stakeholders	Developers, Stavanger municipality, citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	The new land use part of the municipal master plan was passed by the city council in 2023. It includes a provision to investigate potential for reuse and repurpose in new zoning plans for existing buildings., The provision mandates that the developers document that they have done an investigation

		on the potential for reuse and repurpose. However, it is up to the developer to decide if they want to propose repurpose in the zoning plan
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Developing charging infrastructure for EVs
	Action type	Spatial intervention
	Action description	Stavanger municipality has passed a Strategy for charging infrastructure 2022-2026. The strategy states that the municipality will stimulate and facilitate building of charging infrastructure for EVs in housing associations and in areas where citizens are dependent on curb side parking. The municipality will also facilitate building of fast charging station, with effect ranging from 50 kW up to 200 kW
Reference to impact pathway	Field of action	Mobility and transport
	Systemic lever	Financing and funding
	Outcome (according to module B-1.1)	More accessible charging for citizens who do not have access to parking on own plot
Implementation	Responsible bodies/person for implementation	Citizens, Stavanger municipality, private charging companies
	Action scale & addressed entities	Municipal
	Involved stakeholders	Citizens, Stavanger municipality, private charging companies
	Comments on implementation – consider mentioning resources, timelines, milestones	The municipality has developed to charging stations in Stavanger who are accessible for the public. The public owned enterprise Stavanger Parking has installed charging infrastructure in all of their parking garages, and for some curb side parking spaces. In total there has ben installed 202 chargers (158 in parking garages and 44 for curb side parking) The municipality has mapped areas where there is the most use and potential for charging infrastructure. Based on this mapping more

		public charging infrastructure can be implemented in the future.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Developing mobility hubs
	Action type	Spatial intervention
	Action description	A mobility hub is a place where citizens have access to shared mobility solutions, such as electric scooters, electric city bikes and shared cars.
Reference to impact pathway	Field of action	Mobility and transport
	Systemic lever	Social innovation
	Outcome (according to module B-1.1)	Increased use of new mobility services
Implementation	Responsible bodies/person for implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality, mobility enterprises, citizens
	Comments on implementation – consider mentioning resources, timelines, milestones	In the land use part of the municipal master plan and in zooning plan's location and space have been allocated for development of mobility hubs. These are strategically placed, to offer increased mobility for citizens. The municipality has opened four mobility hubs. The municipality has a continuous work of opening new mobility hubs. This work is based on experiences from other cities with mobility hubs, such as Bergen, Oslo, and Bremen.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a

	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	FutureBuilt
	Action type	Technical intervention
	Action description	FutureBuilt is an innovation programme and learning arena, which shall contribute to developing areas and buildings which have a higher standard for meeting climate and environmental goals.
Reference to impact pathway	Reference to impact pathway	Built environment
	Systemic lever	Technology/infrastructure Learning & Capabilities
	Outcome (according to module B-1.1)	FutureBuilt is a permanent program and continues to showcase the ambitious development projects in our region. Proving that it is possible to cut emissions and improve quality in city development through cooperation and innovation.
Implementation	Implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality, private contractors, and developers
	Comments on implementation – consider mentioning resources, timelines, milestones	Futurebuilt is funded for three years, and will during this time period help realise at least 6 projects, which will be innovation projects to cut emissions in the building sector
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	5,5 MNOK.

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Reuse-center for waste
	Action type	Business model
	Action description	The municipal waste company (IVAR) have been running a reuse store since 2008, where they sell useable goods that citizens have

		thrown away. Due to it's popularity the company is in the process of upgrading their facilities to sell more used goods.
Reference to impact pathway	Reference to impact pathway	Waste & circular economy
	Systemic lever	Democracy and participation
	Outcome (according to module B-1.1)	Reduced the amount of waste and reuse of furniture and building materials.
Implementation	Implementation	IVAR
	Action scale & addressed entities	Municipal
	Involved stakeholders	IVAR, citizen
	Comments on implementation – consider mentioning resources, timelines, milestones	IVAR has located a premises where they plan to sell used goods, which have been saved from municipal waste sites. The reuse store will open in 2024
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Municipal reuse storage
	Action type	Technical intervention
	Action description	The municipal reuse storage has been operating since 2022 and has been focused on reusing furniture internal for the municipal organization. The reuse-storage is underway of being expanded to also include construction materials which will be used in the
Reference to impact pathway	Reference to impact pathway	Waste & circular economy
	Systemic lever	Democracy and participation
	Outcome (according to module B-1.1)	A thriving large shopping centre for used goods for private citizens
Implementation	Implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality, developers, contractors

	Comments on implementation – consider mentioning resources, timelines, milestones	The reuse storage for furniture has been operating since 2022 and is well known by the employees in the municipality. When changing furniture, employees have first to see if available reused furniture is suitable for the need before new furniture can be bought. The storage expanded to include building materials in 2024 and made a new hire, making it two employees working on coordinating for using reused materials in municipal building projects and working on including the private sector.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	3 mill. 2024-NOK (0,26 mill. 2024-€)

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Energy certification and improving energy efficiency of municipal owned buildings
	Action type	Technical intervention
	Action description	The municipality of Stavanger is in the process of update the energy certifying of it`s municipal buildings and assessing the energy performance of the buildings ventilation, heating, and cooling systems, which both are activities that the municipality is required to do by law. Simultaneously the municipality plan to do a comprehensive energy assessment of the same buildings to identify energy efficiency measures that can be done so that the municipal buildings become more energy efficient.
Reference to impact pathway	Reference to impact pathway	Energy systems
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	Reduced energy used in many of the municipally owned buildings.
Implementation	Implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	The municipality is in the process of energy certifying municipal owned buildings. During this process there will also be done an energy

		assessment, which will form the basis for further actions
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Increase use of organic food in the municipality's own operations
	Action type	Procurement actions
	Action description	Increase usage of organic off in the municipality's operations. That includes all food served in setting such as meals in kindergarten, school lunch and meals in elderly care
Reference to impact pathway	Reference to impact pathway	Agriculture
	Systemic lever	Governance & policy
	Outcome (according to module B-1.1)	At least 15 % organic food in the municipality's own operations
Implementation	Implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	At least 15 % share of organic food in the municipality's own enterprises by 2030. Will be implemented in collaboration with municipality's procurement department.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	More organic food production

	Action type	Procurement actions
	Action description	Increase number of farms and gardens with organic production
Reference to impact pathway	Reference to impact pathway	Agriculture
	Systemic lever	Governance & policy
	Outcome (according to module B-1.1)	At least 15 % farms/gardens with organic production
Implementation	Implementation	Farmers
	Action scale & addressed entities	Municipal
	Involved stakeholders	Farmers, Stavanger municipality, Rogaland County Governor, Rogaland County Council
	Comments on implementation – consider mentioning resources, timelines, milestones	There are currently eight producers engaged in either partial or fully organic production. Training and guidance will be provided for the farmers who wish to engage in organic farming and otherwise be supported through contact exchange between restaurants, food producers and organic producers initiated by the city.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Energy efficiency in agriculture
	Action type	Grants
	Action description	Give grant opportunities which fund energy efficiency measures within agriculture
Reference to impact pathway	Reference to impact pathway	Agriculture
	Systemic lever	Finance/funding
	Outcome (according to module B-1.1)	Increase energy efficiency within agriculture
Implementation	Implementation	Stavanger municipality
	Action scale & addressed entities	Municipal
	Involved stakeholders	Farmers, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	In 2023 funding was awarded to 57 farmers to implement energy efficiency measures. For every municipal NOK received, the agriculture actors have invested nearly 5 NOK, totalling at an implementation of projects costing about 48,9 MNOK. The projects must be implemented within November 1st, 2024.
Impact & cost	Generated renewable energy (if applicable)	n/a

	Removed/substituted energy, volume, or fuel type	n/a
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	Installation of batteries in 3 vessels
	Action type	Technical interventions
	Action description	Installation of batteries in 3 vessels. These ships will become hybrid ships. That means that one of the main sources of power for electrical propulsion of the vessel is based on electrical energy storage (batteries).
Reference to impact pathway	Field of action	Waterborne navigation
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Creating infrastructure to enable green shipping
Implementation	Responsible bodies/person for implementation	Møkster
	Action scale & addressed entities	National, Companies
	Involved stakeholders	Charter, ENOVA, Equinor
	Comments on implementation – consider mentioning resources, timelines, milestones	Expected implementation is in 2024 for 2 ships and 1 in 2026. Implementation is depending on available onshore power supply. It also requires a high investment rate, which can act as a further barrier for implementing.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	Estimated reduction of 9 000 tonne CO_{2eq} per ship, which means a total of 27 000 tonne CO_{2eq}. The ships will for the most time be operating outside the 12 nautical mile zone of Stavanger and will therefore not reduce emissions in Stavanger.
	Total costs and costs by CO_2-e unit	Estimate is 40 MNOK per ship. 4500 NOK/tonne

B-2.2: Individual action outlines

(Fill out one sheet per intervention/project)		
Action outline	Action name	Onshore power supply
	Action type	Technical intervention
	Action description	Installation of electric chargers at quay.
Reference to impact pathway	Field of action	Waterborne navigation
	Systemic lever	Technology/Infrastructure Finance & Funding
	Outcome (according to module B-1.1)	Creating onshore infrastructure to enable green shipping
Implementation	Responsible bodies/person for implementation	Møkster
	Action scale & addressed entities	National, Municipal
	Involved stakeholders	Møkster, Port of Stavanger, Stavanger municipality
	Comments on implementation – consider mentioning resources, timelines, milestones	Møkster shipping will works towards that their ships which can receive land power, will receive land power up to 80 % of the time it is at quay for each vessel. Timeframe for this goal is 2026-2028. Barrier for implementing is available onshore power supply and available grid capacity.
Impact & cost	Generated renewable energy (if applicable)	n/a
	Removed/substituted energy, volume, or fuel type	Fossil fuel
	GHG emissions reduction estimate (total) per emission source sector	n/a
	GHG emissions compensated (natural or technological sinks)	n/a
	Total costs and costs by CO_2-e unit	n/a

3.2.2 B-2.3 Summary strategy for residual emissions

B-2.3: Summary strategy for residual emissions
Stavanger passed its updated municipal master plan in 2023. The part regulating land use, includes provisions and strategies to preserve natural carbon sinks: • Guiding provision on land and biodiversity offsets • New goal to redistribute no more than 24 acres of agriculture land for other land-use objectives in detailed zoning plans each year, and to physically alter/urbanize no more than 66 acres of agricultural land pr year. In the new master plan (2027) acres of agricultural land zoned for development should be significantly reduced. • First gen map of carbon rich areas to estimate effect of planned land use change • Green plan – Plan for green infrastructure, natural diversity and outdoor recreation

Guiding provision for area neutrality for natural values
The new land-use part of the municipal master plan includes a guiding provision to include the principle of area neutrality for natural values in future land use planning. This is a novel land use management system. In this framework, developed areas are re-developed, natural areas are left undeveloped, and those natural areas that are developed must be compensated by the restoration of developed areas to a more natural state. The goal of this system is to balance the maintenance of biodiversity and nature's contribution to people lives, while allowing development and urbanization to continue in stride with expected population growth. In essence, area neutrality applies the logic of "net zero" to land use change. Therefore, this land use management system will over time prioritize the protection of nature in urban development.

As this is a novel framework for land use management in Stavanger, the municipality will in the following year develop methods for area accounting and implementing it in land use planning.

New goal to redistribute no more than 24 acres of agricultural land for other land-use objectives in detailed zoning plans each year
The new land-use part of the municipal master plan includes an enhanced goal to stop land take, soil sealing and urban sprawl on agricultural land.

Increased carbon binding through better soil health in agricultural land offers both possibilities and challenges. In Stavanger we find areas with very carbon rich soil types, including anthrosols. Soil contains two to three times as much carbon as the atmosphere which means that relatively small changes in carbon stock in the soil can have a significant impact on CO_2-levels in the atmosphere. Intensive agricultural methods reduce the amount of carbon in soil. Actions to lock carbon in soils and increase agricultural land as carbon sinks is needed.

The enhanced goal to reduce redistribution of agricultural land is the most important of these measures, as it preserves areas that acts as carbon sinks and will become increasingly important in the future.

Map of carbon rich areas
As part of the new land-use part of the municipal master plan, carbon rich areas in the municipality have been mapped, shown in figure 13. The master plan also includes a guiding provision that by change in land-use objectives should the emission caused by land use change be quantified. The map is being updated with enhanced data to support the work developing the next municipal master plan for land (and sea) use (planned revision of the municipal master plan by 2027). Carbon rich marine sediments in the sea are currently being mapped by NGU (Geological Survey of Norway). Supplementing mapping of carbon rich marine nature such as seagrass meadows, kelp forests and coastal wetlands will be mapped during 2024.

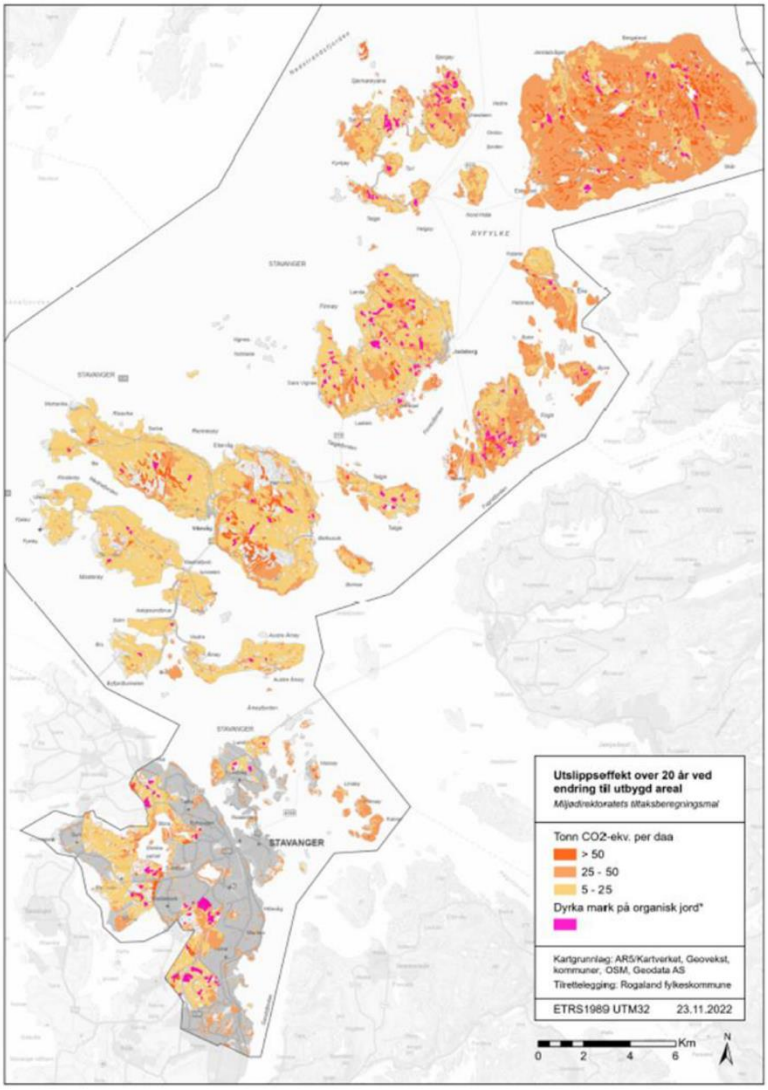

Figure 13 Map of carbon-rich areas in Stavanger municipality.

Explanation of the map: The map depicts potential emission by land use change over a 20-year period. Pink areas are agricultural land on organic soil. The characteristics of the soil impacts if these areas act as carbon sinks, or releases carbon to the atmosphere. Yellow areas have stored 5–25-ton CO_2-eq. per acre, orange areas have 25-50 ton CO_2-eq per acre and red have over 50 ton CO_2-eq. per acre.

Green plan – Plan for green infrastructure, natural diversity and outdoor recreation

As part of the new land-use part of the municipal master plan, Stavanger municipality worked with and passed the “Green plan”. This plan is a strategy for creating a connected and accessible urban and regional nature systems, natural diversity, sustainable urban development, and preservation of ecosystems. The plan contains several strategic themes, but the most important for protecting carbon sinks are:

- Nature and landscapes: Protecting nature and landscapes and strengthening natural diversity on land and water
- Trees: preserve and develop a varied and species rich stock of trees

Protection and restoration of nature can both result in increased carbon storage, increased natural diversity and better adaptation to climate change. Intact nature is the worlds largest carbon storage, and the worlds best carbon capture system. In Stavanger there is large parts with open pastures, heather and cultivated land. The carbon capture capacity can be very high on pasture, since between 50 % and 80 % of the biomass in grass is in dense networks of thin roots.

For carbon capture it is therefore important to preserve important nature types such as forests, bogs, heather-heaths and pastures as part of the natural diversity. Stavanger municipality is further developing *Green Plan Part 2*, which will investigate concrete actions to fulfil the goals set in the Green Plan. Among other things, part 2 will investigate actions for restoration of nature, development of nature potential map and strategy and principles of urban agriculture.

Long-lived forests – uptake in soil and standing wood mass
The municipality has a strong focus on the conservation of trees and forests. It is important to have long-lived forests, where there is a high absorption of CO_2 in the soil and in the standing wood mass. The municipality has engaged in active forest management for several decades, with, among other things, tree species changes, supplementary tree plantings and new plantings.

Where the municipality cuts down trees, these trees are replaced with deciduous forests and heat-loving wood species. The municipality only cuts the alien species sitka spruce (Picea sichensis) and other tree species that do not belong to our region.

Active forest management is an important contribution to absorbing and storing CO_2, because there are large areas. The areas are also important outdoor areas for the residents of the municipality. It is therefore important that these areas remain undeveloped, and that one has sufficiently large contiguous areas.

Review of older area plans
Go through old area plans with regard to taking out relevant development areas where there are very carbon-rich areas.

Coastal heather and selected cultural landscapes in agriculture
The municipality takes care of coastal heather and selected cultural landscapes in agriculture. Selected cultural landscapes aim to take care of particularly valuable cultural landscapes regarding, among other things, biological diversity and cultural history. In Stavanger municipality, Rennesøy is the selected area.

The coastal heath areas, which are the result of burning and grazing animals over generations, are maintained through these management methods.

Heather has a high carbon content in the soil, which has been built up since the last ice age. Each square meter of heather contains between 15 and 20 kg of carbon. The soil in the coastal heaths also contains large amounts of carbon which has accumulated over several hundred years.

To take care of the heathers and the selected cultural landscapes, the municipality carries out, among other things, the restoration of heaths and their care in addition to providing advice to landowners.

Wetland restoration in collaboration with the NGO the Norwegian Hunters and Fishermen's Association - Rogaland
The overall aim of the project is to restore and improve the natural state of streams that are currently piped, channelled or otherwise altered in a negative way for the natural environment and wetlands. This is how we want to improve the ecological condition in and by the watercourse, as well as improve the conditions for natural diversity and anadromous fish. The measures will have positive ripple effects for outdoor life, climate adaptation, stormwater and floods, natural diversity, fish production and other important functions in the catchment area.

The project is financed through applied for and allocated funds from the Norwegian Directorate of Water and Energy (NVE), own municipal funds from the annual program as well as own efforts. In addition, the Norwegian Hunters and Fishermen's Association - Rogaland provides a significant volunteer effort in both planning, design and implementation.

Both planned and implemented measures also ensure natural water purification, climate adaptation and, in some cases, relief from stormwater management in the water and sewage system. This provides great social benefit. In addition to the positive societal benefits, the restoration project can be linked directly to national and international goals and agreements. The project responds directly to the UN's sustainability goals no. 14

Life in the ocean and no. 15 Life on land, as well as the national strategy for the restoration of waterways 2021-2030. Here, a target has been set to restore at least 15 % of degraded waterways in Norway during the period. The UN has also designated the period 2021-2030 to World Decade for Ecosystem Restoration. The municipality's watercourse restoration project responds directly to this call.

The nature in Stavanger municipality has a rich natural diversity. Today, terrestrial areas are highly cultured and urbanized. The municipality has been characterized by agriculture for several thousand years, and the natural diversity is adapted to this. Over the past 20-30 years, this agricultural landscape has changed with fewer grazing animals and more intensive farming. As a result, the landscape is more monotonous and affected by fertilizer-use, while large areas are characterized by overgrowth.

Several important cultural landscapes stand out as important for natural diversity, especially on the island Rennesøy. Furthermore, there are important wooded southern slopes on several of the islands in the municipality which have great solar radiation and a plant and insect life of national value. There are many nutrient-rich wetland areas that have a very rich natural diversity. Stavanger municipality has always had a rich population of seabirds, both in summer and winter.

The sea areas in the municipality have many important areas for natural diversity and range from species-rich eel grasses to rare deep-sea corals. The fjords in the municipality have always been rich in marine life, but increased nutrient runoff and heavy fishing mean that life in the sea has changed.

In summary, the municipality has a rich natural diversity of national value, but it is threatened by deconstruction, agriculture, aquaculture and other human influences in addition to climate.

Provisions on water and edge zones along waterways in the new municipal plan
In connection with the preparation of the municipal plan, which was adopted in 2023, a set of regulations and guidelines on water and edge zones along waterways was drawn up.

The purpose of these provisions and guidelines is that water must be managed with a view to the protection and sustainable use of water and water ecosystems. This is so that the areas will achieve a good ecological condition.

This will prevent erosion and safeguard the ecological function of the waterways and ensure a habitat for plants and animals. In the new provisions, it has been decided that one must always assess whether closed, canalised or physically affected waterways can be reopened or restored.

From specific provisions, it has been decided that it is not permitted to erect buildings and facilities in areas up to 50 meters along watercourses with year-round water flow.

Management of carbon-rich marine habitats
<u>Eelgrass (Zostera marina)</u>
Stavanger municipality has large populations of eel grass beds in several places. This is considered our own underwater rainforest. In addition to being an important hiding place and food dish for several marine species, eelgrass beds are a very important carbon store.

Through its high primary production, the eelgrass absorbs large amounts of carbon dioxide and nutrient salts, which are converted into carbon-containing biomass and plant matter. Due to slow decomposition in the sediments, they are also important as a carbon store. The plants' root system also contributes to the stabilization of sediments and thus prevents erosion in the sea.

Seagrass beds are one of the world's most valuable marine ecosystems with all the important ecosystem services.

<u>Kelp forest</u>
Kelp forests are relatively common to see along most of the coast in Norway and Stavanger. The kelp forests consist of large kelp species that grow below the intertidal zone. The kelp forest is important because it cap-

tures CO_2 from the ocean, and the carbon is removed from the cycle when dead kelp leaves sink and are buried in the depths. In this way, the kelp forests along the Norwegian coast store approximately 1.7 million tonnes of CO_2 each year. These further forms carbon-rich sediments in deep water areas which have a very high absorption of CO_2 if these are left alone.

If these ecosystems are removed or destroyed by the plants disappearing or dying, the whole process will be reversed and there will be a net emission of CO_2 into the atmosphere.

Stavanger municipality engages in active management of eelgrass meadows and kelp forests by providing professional input to regulatory plans for consultation, mapping locations for eelgrass meadows and their condition and informing citizens about the importance of these meadows.

Control of alien species
In line with climate change, several alien species have established themselves in Stavanger municipality, which is causing great damage to our natural diversity. With a milder climate, more species gain an advantage.

The alien species are extremely adaptable and capable of spreading, difficult to kill and outcompete our native species - including heat-loving broadleaf trees such as oak, ash and beech. These are very long-lived trees that are very important for carbon storage.

It is especially the species Japanese knotweed (Reynoutria japonica) and Salmonberry (Rubus spectabilis) that are very problematic, as these are very widespread in the region and are very time- and resource-consuming to combat.

Stavanger municipality has a very extensive program to combat these species, among other things, and a dispensation has been granted from the ban on the use of pesticides for use on Japanese knotweed. Salmonberry are combated by manual weeding.

Planting and conservation of urban trees
Trees in urban areas play an important role when it comes to absorbing and storing CO_2 and other substances. The trees act as air purifiers, and use and evaporate water, which gives more space in drain pipes and prevents flooding. A 100-year-old beech tree (Fagus sylvatica) with a height of approximately 25 meters and a tree crown of 15 diameters has approximately 800,000 leaves. These have an area as large as two football pitches, and on a sunny day the tree can absorb over 18 kilograms of CO_2. To replace a tree of this size, almost 2 500 young trees must be planted.

In the "Management plan for urban trees - strategy part", adopted by the Stavanger municipal council on 01.02.2021 (case 18/2021), it was decided, among other things, that trees should be considered necessary infrastructure in line with other technical infrastructure, and that urban trees larger than 90 cm in trunk circumference must be preserved and that trees must be mapped and marked with consideration zones as far as this can be done. This was confirmed and further followed up in the new municipal plan with regulations and guidelines that have increased the legal protection for city trees.

In 2017, it was decided that 1 000 new trees should be planted in a district, as part of the promise of living conditions and the green infrastructure. This is being worked on continuously, at the same time that city trees are planted in urban areas in all parts of the municipality during all major rehabilitation of streets, roads and facilities. There is a requirement that these trees get sufficiently good growing conditions and volume for root propagation using cell systems, skeleton soil or other methods.

Over the years, the budget for the conservation and rehabilitation of old city streets, as well as the budget for new planting of city trees, has increased considerably and it is a priority area of effort.

Overall green structure
In the municipal plan, there are provisions that define the maximum distance to the overall green structure for everyone. There should be no more than 300 meters to the local walking area or green corridor leading to larger green areas. From residential areas, schools and kindergartens there must be good access to areas for play and activity. This is an important measure to reduce driving.

The municipality has had this strategy since the first green plan was adopted in 1992, then with a distance of 500 meters to the nearest green corridor. In the municipal plan of 2023, this card was reduced to 300 metres.

3-30-300 rule
Research shows that green surroundings in cities have several positive effects. It is good for both physical and mental health, and for the climate. As a new rule of thumb for the city's green structure, the 3-30-300 rule is proposed.

The 3-30-300 rule is intended to ensure that all residents have adequate access to green spaces and can enjoy the benefits of trees and vegetation. The rule is described with the following three guidelines:
• at least 3 trees within sight of each home
• at least 30 % tree cover coverage in the neighbourhood/district
• a maximum distance of 300 meters between housing and green areas.

The rule offers guidelines for cities to promote equitable access to nature. It stipulates that individuals should be able to see three trees from their home, have 30 % tree cover in their neighbourhood, and live within 300m of a high-quality green space. An implementation of the 3-30-300 rule in the municipality's strategic work with green structure should be a goal to achieve a greener living and urban environment and in the contribution to better health and well-being, as well as climate adaptation.

Understanding of neighbourhoods for the crown coverage, size of green area for 300m distance and definition of visual range from each home must be defined more precisely in follow-up analyses. Several cities in Sweden have started to use this rule, both as a basis for planting trees and for further development of the green system. Since several cities have started to use the 3-30-300 rule in the development of green structures, it will eventually also be possible to compare Stavanger with other cities.

A map analysis of tree canopy coverage has been carried out for each basic district in Stavanger. An analysis has also been carried out on how many residents have access to green areas larger than 5 daa within 300m of their home. The result shows that 89 % of the inhabitants have access to green space, but only 84 % have access to municipal green space. 11 % of the population do not have access to green space within 300m of their home.

In the further work with the 3-30-300 rule in Stavanger, it must be clarified in more detail how we are to understand the objective and how it is to be measured. green space for the neighbourhoods.

The interconnected green structure
Green corridors and connections are an important part of the city's green structure. These create connections between the city's and towns' residential areas and various green areas, as well as the larger ones, such as hiking terrain and shoreline. Coherent blue and green areas strengthen the city and towns to become more resistant to climate change, as well as increase the quality, the accessibility and connection for people, animals and plants.

Dense development and pressure on green areas in central urban areas means that the function and value of the coherent green structure for people and biodiversity becomes more important than ever time. By safeguarding the area, care and operation, important outdoor areas for people and habitats for animal and plant species can be strengthened and further developed, and negative interventions in the areas prevented.

Urban nature
Urban nature is the biological diversity in the city or in the settlement that contributes to the experience of nature, provides ecosystem services, and is part of the city's ecosystem. Nature in the city has a smaller scale and less diversity than the large open spaces and is primarily characterized by the fact that it is strongly influenced by humans. Species can still adapt to ecosystems, and you can also find species-rich pockets in the city.

Caring for nature in the city is just as important for the people who live in the city as it is for biodiversity. Urban nature is important for people's health and quality of life and can contribute to making the urban environment more resilient with climate change such as cleaning the air, reducing noise and mitigating floods. In densely

built-up areas, edge zones and corridors are important dispersal routes for plants and animals, and they form a network of green areas with short distances and varied sizes and qualities are ecologically robust. Trees as pointwise elements can tie together green areas in a dense city, as well as being a growing and habitat for mushrooms, mosses, lichens, insects and birds.

To secure these areas, the municipality will, among other things, plan for the care of wild gorse and scrub as qualities in the local environment and use nature-based solutions in the use of vegetation and stormwater management in all public outdoor spaces.

Updating the knowledge base
Decommissioning and land use changes are the biggest threats to important habitats that bind carbon. By improving the knowledge base about carbon-rich areas and important nature, the municipality will have a better management tool to be able to plan and carry out developments where this is best in terms of climate and nature considerations.

Stavanger municipality generally has a good knowledge base, but there is a need for supplementary surveys. Compared to other municipalities, Stavanger has a good knowledge base when it comes to sea areas. Many of the areas are modelled or predicted, so physical surveys are needed to verify this.

When it comes to mapping nature on land, this is done according to the NiN- methodology (Nature in Norway). This system devalues urban nature, and further (preferably national) work must be done to develop better indicators for urban nature qualities.

In addition, the municipality is also carrying out a comprehensive survey of all urban trees and their ecological benefits. This is done through an extended analysis of the tree species, the size of the trees, the place of growth and other factors - which will give concrete estimates of how much storm water each tree can absorb, how much CO_2 each tree can absorb and how much the municipality can save in expenses just by leaving the trees standing.

Half of Stavanger's sea floors have been mapped for carbon rich sediments in 2023/2024. The volatility of the carbon in these sediments have been tested on multiple sites by NGU. If we find ways to protect these areas from physical disturbance, the sediments can in time potentially be transported to deeper seabed areas by natural processes. These deep-sea areas have the potential to act as long time carbon sinks.

Conservation areas/protected areas
Stavanger municipality has delegated management responsibility for 27 nature conservation areas following a decision by the Norwegian Environment Agency on 1 January 2020. These include wetland areas, nature reserves and seabird reserves. In addition, the protection process for two more new areas has started, including the lake "Mosvatnet", which is centrally located in the municipality. This is planned to become a nature reserve, which is a strict form of protection according to §37 of the Norwegian Natural Diversity Act.

Conservation areas and protected areas are very important because these help to secure natural assets of international, national and regional value.

The municipality works actively with forest protection both in conservation areas and in open areas, and uses both its own and state funds, and requested funds for the care and restoration of these areas. As a follow-up to the Green plan, the municipality will work further to protect several new areas, in various forms of protection. This is to meet the goal in the nature agreement, which states that, among other things, 30 percent of the globe's land and sea areas must be protected or preserved by 2030.

Climate quota projects with twin cities
Since 2007, Stavanger has had project collaboration on climate measures in two of Stavanger's twin cities, Nablus in Palestine and Antsirabé in Madagascar. The projects aim to compensate for emissions from flights undertaken by Stavanger municipality employees. The financing is until NOK 100 000 per city per year. In Nablus, tree planting and citizen involvement are central parts of the project. 2023 and 2024 have been characterized by political unrest in Palestine.

Due to political unrest in Antsirabé, the climate quota project has been on hold for several years, but in 2023 two smaller projects were completed, reforestation and restauration of the municipal plant nursery. The goal is to gradually reintroduce the activity here as well.

Quantification of carbon sinks
Available data from the Norwegian Environment Agency regarding emission/uptake inventory for Forestry and other land use is described in chapter 2.1.1.1.

Stavanger have ongoing efforts to quantify carbon sinks and the effects possible measures can have for carbon offsets. For instance, when revising our municipal area plan in 2023, areas previously designated as future areas for buildings was converted back to staying as green areas. The effect of this what calculated to be in the order of 25 000 tonnes of CO_2-equivalent of avoided emissions, as a result of preserving the carbon stock in the soil. Although this is a very important measure, it will not contribute to a visible reduction in emissions in the climate budget, since this is a measure to avoid a future increase in emissions.

Stavanger is working towards area neutrality for natural values in future land use planning. The municipality will in the following years develop methods for area accounting. This will be an important knowledgebase for the quantification of sinks. We are also, together with the other largest cities in Norway, lobbying for national authorities to assist in providing tools and a better knowledgebase for municipalities, to ensure that the methods used are aligned across the cities.

The quantification of carbon sinks is an area to further investigate during the mission process.

3.3 Module B-3 Indicators for Monitoring, Evaluation and Learning

Annually, Stavanger produces a status report for climate and environment, to identify and communicate development for more than fifty indicators within different sectors. These annual reports are presented for political consideration for Stavanger city council. The reports are also published at Stavanger's webpage. The annually updated climate budget also serves as an important monitoring tool, where the latest GHG inventory, as well as existing and new measures are evaluated. In addition, Stavanger has developed a climate barometer, inspired by Oslo, to communicate development within the climate field to the audience. There are also indicators within climate and environment included in the internal control system of the municipality. The purpose of reporting is to evaluate progress towards goals set in the climate and environment plan and identify areas with need for enhanced efforts. The status of the measures in the climate and environment action plan is also updated annually.

A selection of already implemented indicators which will serve as indicators to monitor and evaluate progress for the city contract is included below. Indicators which are not already included in the CDP reporting has been prioritized in table B-3.1, since for instance a detailed emission inventory is already made available to the NZC though the CDP reporting.

B-3.1: Impact Pathways							
Outcomes/ impacts addressed	Action/ project	**Indicator No.** (unique identified)	Indicator name		Target values		
					2025	2027	2030
(List early changes/ late outcomes	(List action/ pilot project if applicable)	(Indicate unique identifier)	(Insert indicator name)		(List one value per indicator)	(List one value per indicator)	(List one value per indicator)

and impacts to be evaluated by indicator)							
Energy systems	Biogas share	1	Biogas share: Biogas sale to buyers within the city / total gas sales from lyse				100
Energy systems	Emission-free municipal building and construction sites	2	Share of emission free municipal building and construction sites		100	100	100
Mobility and transport	Modal shift from car to public and active transport	3	% travellers by public transport, bicycle and walking				70 %
Mobility and transport	Electrification of the vehicle fleet	4	Share of electric cars, registered in Stavanger		40,6 %*	51,5 %*	67,9 %*
Mobility and transport	Incorporation of electric fast boats	5	Emissions from waterborne navigation – category “passenger”				0
Waste and circular economy	Reusing resources	6	Percent of household waste sorted for material recycling				75 %
Waste and circular economy	reuse of consumables	7	Qualitative description of efforts				Increased reuse of consumables
Built environment	Solar power production/Increase renewable energyproduction	8	Installed effect kWp solar energy				Goal: The utilization of local renewable energy resources is increasing

*These goals are not politically adoptet, but based on necessary percentage to reach assumptions in calculations to meet the goals in the national transport plan 2022-2033.

B-3.2: Indicator Metadata	
Indicator No: 1	
Indicator Name	Biogas share

Indicator Unit	%
Definition	Biogas sale to buyers within the city Compared to total gas sales from lyse
Calculation	Biogas sale to buyers within the city / total gas sales from lyse
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	heating
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	Specify co-benefit
Is the indicator useful for monitoring the out-put/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy systems
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Lyse
Is the data source local or regional/national?	local
Expected availability	April
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger

B-3.2: Indicator Metadata	
Indicator No: 2	
Indicator Name	Share of emission free municipal building and construction sites
Indicator Unit	%
Definition	Share of emission free municipal building- and construction sites within the construction area (non-road machines)
Calculation	Number of emission free municipal building- and construction sites/total number of municipal building- and constructionsites
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Other mobile combustion
Does the indicator measure indirect impacts (i.e., co- benefits)?	yes
If yes, which co-benefit does it measure?	Reduced noise, reduced local air pollution
Is the indicator useful for monitoring the out-put/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy systems
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no

Data requirements	
Expected data source	Internal
Is the data source local or regional/national?	local
Expected availability	Today includes reporting from the “buildings development” department. To be extended to also include reporting from “water and wastewater” and “sports and the outdoor environment “ departments
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Internal KPI, management reporting

B-3.2: Indicator Metadata	
Indicator No: 3	
Indicator Name	% travellers by public transport, bicycle and walking
Indicator Unit	Percent
Definition	% travellers by public transport, bicycle and walking
Calculation	(travellers by public transport, bicycle and walking/total travellers)*100
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Indirectly by reducing need for car transport
If yes, which emission source sectors does it measure?	Transport
Does the indicator measure indirect impacts (i.e., co- benefits)?	yes
If yes, which co-benefit does it measure?	Health, reduced local air pollution
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Mobility & transport
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	National travel habits survey (RVU)
Is the data source local or regional/national?	Nationally collected, data collection and results are local
Expected availability	april
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger

B-3.2: Indicator Metadata	
Indicator No: 4	
Indicator Name	Electrification of the vehicle fleet
Indicator Unit	%

Definition	Share of electric cars, vans and heavy-duty vehicles registered in Stavanger
Calculation	(# electric cars/# cars)*100
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	transport
Does the indicator measure indirect impacts (i.e., co- benefits)?	[yes/no]
If yes, which co-benefit does it measure?	Specify co-benefit
Is the indicator useful for monitoring the out-put/impact of action(s)?	[yes/no]
If yes, which action and impact pathway is it relevant for?	Mobility & transport
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Statistics Norway
Is the data source local or regional/national?	Nationally collected, data local
Expected availability	April
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger, climate barometer

B-3.2: Indicator Metadata	
Indicator No: 5	
Indicator Name	Incorporation of electric fast boats
Indicator Unit	Tonnes CO_2-eq.
Definition	Emissions from waterborne navigation – category “passenger”
Calculation	Based on AIS data and emission factors
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Waterborne navigation
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	Specify co-benefit
Is the indicator useful for monitoring the out-put/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Mobility & transport
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	The Norwegian environment agency
Is the data source local or regional/national?	local
Expected availability	January
Suggested collection interval	annually

References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Climate budget, Annual report climate and environment for Stavanger

B-3.2: Indicator Metadata	
Indicator No: 6	
Indicator Name	Material recycling
Indicator Unit	Percent
Definition	Percent of household waste sorted for material recycling
Calculation	(household waste for material recycling + household waste for energy recovery)/total waste *100
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Indirectly, since it will reduce emissions from household waste at waste incineration plant
If yes, which emission source sectors does it measure?	Waste and wastewater, Sandnes municipality
Does the indicator measure indirect impacts (i.e., co- benefits)?	yes
If yes, which co-benefit does it measure?	Reduced need for new production
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Waste and circular economy, Reusing resources
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	IVAR
Is the data source local or regional/national?	local
Expected availability	april
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger

B-3.2: Indicator Metadata	
Indicator No: 7	
Indicator Name	Reuse of consumables
Indicator Unit	Qualitative description
Definition	Description of efforts to increased reuse of consumables
Calculation	Qualitative description of efforts
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	

Does the indicator measure indirect impacts (i.e., co- benefits)?	yes
If yes, which co-benefit does it measure?	Reduced cost for citizens xxx
Is the indicator useful for monitoring the out-put/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Waste and circular economy
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Employees at Stavanger municipality
Is the data source local or regional/national?	local
Expected availability	march
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger

B-3.2: Indicator Metadata	
Indicator No: 8	
Indicator Name	Solar power production
Indicator Unit	kWp
Definition	Installed effect kWp solar energy
Calculation	
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	Fields of action according to GHG inventory format – Module A-1
Does the indicator measure indirect impacts (i.e., co- benefits)?	yes
If yes, which co-benefit does it measure?	Energy security
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Built environment
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Lyse
Is the data source local or regional/na-tional?	local
Expected availability	March
Suggested collection interval	annual
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Annual report climate and environment for Stavanger

4 Part C – Enabling Climate Neutrality by 2030

4.1 Module C-1 Governance Innovation Interventions

The Stavanger region is involved in two of the EU Missions, Stavanger municipality with climate-neutral and smart cities and Rogaland County with climate adaptation. In addition, regional work is underway to become one of 100 living labs in Mission Soil. The district has also been chosen as one of 100 European regional innovation valleys. The anchoring and resources are lacking for a good follow-up of the work across organizations in our region. It will be important to organize a system of governance with better involvement of businesses and citizens is key. It is also important to work closely with knowledge institutions and academia to succeed in the work on climate neutrality (and climate adaptation) because it requires the development of new knowledge regionally and locally.

When Stavanger has been designated as one of 112 climate-neutral cities by 2030, and Rogaland County Municipality has become one of 300 climate-adaptable regions by 2030. This means that we have great potential to develop a green and attractive society, which is climate-robust, inclusive and innovative. This also provides room for ground-breaking innovation, restructuring in the business world and completely new forms of cooperation that also include the region's residents to a greater extent. The community missions require new ways of working to develop the whole of society in a green and attractive direction by 2030. Together we will deliver for both the region's residents, the municipalities, business, and academia.

Stavanger municipality is working on finalizing its climate contract for the city, which will contain obligations, action plan and financing plan, and Rogaland County municipality is already well underway in receiving technical support from the EU to facilitate the development of a climate-resilient society by 2030. To exploit the position and opportunities these initiatives provide for the actors in Rogaland, there is a need for more cooperation regionally, nationally and internationally. This work will be unifying and necessary to achieve system change within the various sectors and behavioural change among citizens - green restructuring of society.

To exploit the potential of the position the region has now taken, an even closer and strengthened cooperation must be built. Capacity challenges are already a problem, and it is therefore important to have close cooperation between all actors and avoid sectoral thinking in the further work with community missions for a green transformation of society. Good contact has been established with Rogaland County council, Stavanger municipality and the management at University of Stavanger, UiS. However, it is important to have an even stronger and more engaged management anchoring for a joint utilization of the opportunities that exist related to the missions and a “Mission Board/Mission Task Force” that can contribute with knowledge and anchoring in the region.

In this work with a collaborative governance model that includes institutional design (horizontal links between city institutions, vertical links to other levels of government, roles, responsibilities, ground rules, processes) there is an ongoing three-part strategy work focusing on impact by working collaboratively, building and orchestrating a city ecosystem where local citizens, businesses and all necessary stakeholders can contribute to the change needed:

1. A short-term race to build up an overview of important initiatives and involve leaders in the region in relation to the work with the various community missions, as well as coordination of the investments in the implementation of the two community missions. A further development of a joint Urban Growth Agreement or task force-type organization and which includes a regional Mission Board (advisory) is relevant for the work with community missions.
2. Take advantage of the opportunities for collaboration and funding through national and European research and innovation projects. Ongoing dialogue, workshops and targeted work aimed at participation in Horizon Europe and international projects. Building the knowledge base and the ecosystem through closer involvement of knowledge institutions. Develop solid knowledge

environments about climate neutrality and climate adaptation in the region and further contribute to competence development, scaling up and implementation of System innovations.

3. A long-term process that will involve the whole of society. It will require larger gatherings, both physical and digital, as well as a strategic coordination of climate investments in our region, both in the municipal sector, in academia, among voluntary organizations and in the business world/investor environment to achieve system innovation to achieve transformative change within complex system.

A joint Mission Board with pillars with its own organizational unit/ task force for Mission Cities and climate adaptation that will assist, coordinate, mobilize and run measures that require regional cooperation so that Stavanger can become climate neutral in 2030, as well as that the region will become a climate adaptable region. The task force reports to an advisory regional Mission Board (top management). This is proposed to consist of top-level managers from Stavanger municipality, Rogaland County council, the University of Stavanger, NORCE, the voluntary sector, as well as representatives from business and finance.

Intervention group
Sustainability network group consisting of businesses that will explore opportunities and barriers for system changes and emission reductions. The overall aim of this initiative is to initiate a collective movement and promote dialogue between actors with different professional fields about practical challenges for emission reduction. The group must have a practical and action-oriented approach that focuses on current challenges related to emission reductions and practical solutions that enable policy changes in laws and regulations for the authorities.

C.1.2: Sample Table: Relations between governance innovations, systems, and impact pathways					
Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
(Indicate name of intervention)	(Describe the substance of the intervention)	(Refer to barriers and opportunities identified in Module A-3)	(List leaders and all stakeholder involved and affected, referring to the stakeholders mapped in Module A3)	(Describe how intervention enables climate neutrality)	(Indicate how intervention helps achieve the impact listed in Module B-1)
Local transition Team	…	…	…	…	…
Local Mission Board					
National Dialogue Forum for Mission Cities					
Task Force Stavanger					
National Platform (DOGA(NRC/DEP)					

4.2 Module C-2 Social Innovation Interventions

The right to participate in the development of new policy and actions are in Norway secured through legislation. The legislation mandates that actions with significant effects must go trough a public hearing process. This empowers whose who are directly impacted by new actions and organizations, businesses and other citizens. Also concerned authorities must be included in the public hearing process. This secures that different actors can voice their opinions and concerned authorities can give their professional statement.

Legislation[10] secures those proposals for actions with significant effects, proposals for new legislation and public investigations/reports have to go through public hearing processes. The planning and buildings act also secures that plans for the built environment also must go through public hearing processes.

However, this legislation secures the bare minimum of participation in policy development and implementation of new actions. Citizens often complain that it is hard to know about ongoing public hearing processes about cases which impacts their life. At the same time the cases are often complex with many documents, which makes it hard for private citizens to engage in important cases.

Municipalities in Norway have therefore a long tradition of different actions for social participation and empowerment of citizens, to get them to engage and participate in policy development. The table below list several different actions in Stavanger municipality, which can be used in the further implementation and development of the Climate City Contract.

[10] https://dfo.no/fagomrader/utredning-og-analyse-av-statlige-tiltak/krav-til-involvering-og-horing

C.2.1 Sample Table: Relations between social innovations, systems, and impact pathways					
Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
(Indicate name of intervention)	(Describe the substance of the intervention)	(Refer to barriers and opportunities identified in Module A-3)	(List leaders and all stakeholder involved and affected, referring to the stakeholders mapped in Module A3)	(Describe how intervention enables climate neutrality)	(Indicate how intervention helps achieve the impact listed in Module B-1)
NEB-STAR	The New European Bauhaus (NEB) is a creative and cross-disciplinary EU-initiative which links the European Green Deal with the experience and urban spaces. As one of six European cities, Stavanger has been chosen as a lighthouse city. NEB-STAR gives the city a novel way of thinking on living and habitation. During the project period there will both be testing and suggestions for how inhabitants and other actors can impact change and implement the municipality plans and mission.	Creates new ways of social participation in urban development	Stavanger municipality, Stavanger University, Norwegian University of Science and Technology, Nordic Edge, Veni, Smedvig, Helen & Hard, Operator ICT Praque, Ungt Entreprenørskap, Utrecht municipality, Technical University of Delft, DOGA, Norge unlimited, Pedersgata utvikling, Stavanger sentrum, Czech Technical University, Praha	NEB-STAR is based on social innovation and participation from the inhabitants for development of two test-areas in Stavanger. By including citizens in new ways for development of urban spaces, it can help engage and make them responsible in necessary actions to reach climate neutrality	NEB-STAR can be a tool to include citizens in *transformation of urban space*
Områdeløft/ Områdesasting	The Area-regeneration are targeted for districts	Opportunity to reduce social differences	Stavanger municipality, Storhaug Unlimited,	By including, enabling and mobilizing citizens	Health improvement Enhancing quality of life

(Area-regeneration)	in Stavanger municipality who have a higher proportion lower income group or with lower living standards The Area-regenerations are program to make the districts better places to live and work. The area - regeneration from site development, since it is not only about the physical surroundings. The Area-regeneration mobilizes human resources, through citizens and other actors. In the Area-regeneration program the municipality will together with local resources contribute to physical, social and environmental improvement over time. Now there is an Area-regeneration program for three districts in Stavanger: Storhaug, Kvernevik and Hillevåg		Kvernevik Unlimited, Pådriv Hillevåg and citizens	and local actors to increase physical, social and environmental improvement over time. This helps to move Stavanger towards a just climate transition	
Storhaug and Kvernevik Unlimited	Storhaug Unlimited and Kvernevik Unlimited are part of the Area-regeneration program.	This is a program which will help to create jobs for individuals who wish to start up as social entrepreneurs	Eutropian, Stavanger municipality, Storhaug Unlimited, Kvernevik Unlimited, and citizens	By enabling citizens and actors to realize social entrepreneurship, this can be an important	Job creation Enhancing quality of life

	Storhaug and Kvernevik Unlimited supports people and actors who have ideas for how to solve social challenges on Storhaug and Kvernevik for enabling social entrepreneurship			effort to help move towards a just transition.	
UngLab (YouthLab)	YouthLab is a participation method developed by Stavanger municipality, where youths are recruited to interview other youths. This has proved to be an effective way to ensure participation and feedback from youths on different themes and topics.	Opportunity to gain insight from an age group which can be hard to gain insight to for adults	Stavanger kommune	YouthLab gives the opportunity to gather insight from an age group, that otherwise adults often have a hard time gaining access to. For public acceptance of (radical) climate measures, it is important to include the voice of all the age groups, and the YouthLab can be an important tool for this. As an example YouthLab was used in 2023 for evaluating the effect of a test-period of 6 month with free public transit for inhabitants in Stavanger. One of the effects being measured were the climate effect of free public transit.	Job creation

Stedskompasset (The Place Standard Tool)	The Place Standard Tool is a tool was developed in Scotland by experts in public health, urban planning and architecture. It has been implemented in Stavanger and used as part of the Area-regeneration project. The Place Standard tool is a tool to get information on citizens opinion and feelings on a range of topics. In this way it is a multi-tool, which acts as a tool for site-development, public health, co-creation and participation	A cost-effective way to gain insight on inhabitants view on livelihood and how it is living in an area. This will be valuable information for planners in future planning and transformation of areas To much emphasis on questionnaire data over qualitative data means that planners do not gain insight on issues they do not know are important for the inhabitants	Stavanger kommune	The Place Standard Tool is a cost-effective tool to gather opinions and feedback from the inhabitants on certain topics. In this way the Place Standard Tool can become an important tool for citizen participation on climate action in their local environment	Health improvement Enhancing quality of life
The Plan Portal hhttps://minside.stavanger.kommune.no/planportal	In 2024 Stavanger municipality launched its new digital plan portal. Now, all the municipal plans and formal hearings are located at one place online. This makes it easier to access for both citizens, developers, politicians and employees. This online portal also makes it possible to see	Makes it easier for citizens to gain information and participate in the process of making plans Lack of awareness of the solutions among the inhabitants can be a barrier for use of the Plan Portal	Stavanger municipality	To have an overview over thematic plans and zoning plans in the municipality can be extremely challenging for citizens. By locating all the municipal plans in one portal, which links the plan at what stage of the hearing process the plan is, it makes it more accessible for citizens.	Raising awareness of plan processes More effective plan processes

	and reuse hearing responses across different plans			This makes it easier for citizens to engage and give feedback to new plans. This helps to include the citizens voice in the plans, and can help citizens engagement for plans and actions which cater towards climate neutrality	
My page (Min side)	Stavanger municipality aims to provide relevant digital self-service solutions for citizens, businesses, and organizations. The goal is for citizens, organizations, and businesses to find their relevant and functional services digitally and to be able to operate these on a suitable user interface.	Makes it easier for citizens to gain information, participate and give feedback to the municipality. Lack of awareness of the solution among the citizen	Stavanger municipality	"Min side" could be a key tool for residents, organizations, and businesses to engage in and contribute to achieving climate goals by providing easy access to eco-friendly services and resources. It can also serve as a platform to track and improve their own environmental impact through personal climate and energy-saving initiatives. Additionally, "Min side" ensures a secure log-on process and offers a personalized experience, tailoring eco-friendly options and initiatives to individual users, thereby promoting	Enhancing quality of life

				a more sustainable lifestyle in alignment with climate goals.	
Agile piloting (Kvikktest)	Agile piloting, or Kvikktest is an approach introduced in Stavanger to engage with up to five companies simultaneously for six-month-long experiments aimed at exploring diverse solutions to specific challenges or needs. This method fosters collaborative learning with the private sector, accelerating urban innovation by testing and learning together in a structured environment. It allows cities to proactively understand the spectrum of possibilities before committing to specific solutions, thereby enriching their decision-making process.	Opportunity to quickly test new solutions and compare them	Stavanger municipality	One of the distinctive aspects of Kvikktest is that it serves as a strategic outpost for the city granting us a window into the methods and learnings that companies acquire throughout the process. The insights we gain from a Kvikktest is different from what we would gather through our own efforts in the field. By engaging with smaller companies, we're not just outsourcing tasks; we're insourcing wisdom about the specific area. These collaborations allow us to see a challenge trough five different lenses.	Innovation and development
Mitt nabolag (My neighbourhood) hhtps://mittnabolag.stavanger.no/?locale=no	My Neighbourhood is a digital portal where citizens can voice their opinion about different district, themes or individual actions	Makes it easier for citizens to gain information, participate and give feedback to the municipality.	Stavanger municipality	My Neighbourhood is a digital solution, which makes it easy to gather feedback from citizens. In 2023 as part of the Area-regeneration pro-	Raising awareness of plan processes More effective plan processes

		Lack of awareness of the solution among the citizen		gram in Kvernevik citizens could suggest and vote over actions in the district which should get funding. As a result, 200 000 NOK were shared between 8 different actions In the future it is possible to build on these experiences and include citizens in distribution of funding for local climate actions	
Snakkeboblå (The talking camper)	The talking camper initiative is a way to engage easier with citizens and get oral feedback. A camper has been designed with talking bubbles in different languages. The goal is to catch the attention of passing walkers, and the different languages helps to reach international inhabitants. In this way the camper becomes a mobile meeting place between inhabitants and the municipality	Makes it easier to encounter groups and individuals which can be hard to reach in participation processes However, there is a limit on how many people can be reached with methods such as the talking camper.	Stavanger municipality	For many citizens it can be a threshold to register and give feedback in a hearing process online. By creating mobile meeting places between inhabitants and the municipality it creates the opportunity to also receive feedback from citizens who can be hard to reach online. In the future the camper can be used to encounter citizens when creating new climate actions	Raising awareness of plan processes Social participation
Aldersvennlige samfunn	Stavanger has become a member for WHO's	Opportunity to find new ways to engage, work	Stavanger municipality, WHO, citisens	As other European cities, Stavanger faces a	Enhancing quality of life

(Age Friendly City)	global network for Age-Friendly Cities and Communities, and is also creating an action plan for an "Age Friendly City"	and prepare for an aging society		future with an aging population. This creates both challenges and possibilities. Through the effort of being an Age friendly City, Stavanger has actions which support participation, information, transportation and habitation for the elderly. To reach climate neutrality it is important to include all age groups, and also target the increasing elderly population to ensure that they also can make choices which reduces emissions.	Health improvements
Citizen Panel	Stavanger municipality will test a new citizen panel to give those between 60 and 80 years a clearer voice in the development of the society	Opportunity to gain insight from a specific age group which otherwise can be hard to reach by other digital solutions	Stavanger municipality	To transform to a climate neutral society, it is important to include all age groups. By creating a citizen panel targeting older age groups, it becomes possible to access experiences and voices of this age group. This in turn makes it easier to tailor and include them in climate actions and ensure a just transition	Raising awareness of plan processes Social participation

ENERGY4ALL	ENERGY4ALL aims at developing energy configurations as a common pool resource, testing the community dimension in the design and implementation of emergent Positive Energy Districts (PED) and Energy Communities (EC).	Opportunity to gather information on how to create positive energy districts	Eutropian, University of Stavanger, Stavanger municipality, local industry (Skretting and Felleskjøpet) and international partners from Italia and Hungary will work together in transforming a neighborhood (Hillevåg) in Stavanger.	The project will explores how utilise waste heat from the industry, citizen-centric needs, and inclusive governance model through supportive toolboxes for the design and implementation of participatory energy governance and replicable pathways will work together in transforming a neighbourhood (Hillevåg) in Stavanger.	Energy4all can be a tool to include citizens in design and transformation of PED.e
Real green things (Grævla grønne greier)	Reel Green Things is an initiative from Stavanger municipality and is an innovation project where youth is communicating with other youth The youths working in Reel Green Things show how simple it actually is to be climate and environmentally friendly. This is done through a podcast and posting on social media, which are the area the other youths are spending their time	Opportunity to reach and engage young people	Stavanger municipality	The goal of the project is to inspire youth in Stavanger to take more sustainable choices in their everyday life, an at the same time rise awareness among individuals, private enterprises and organisation for what they can do to become more environmentally friendly	Innovation and development of new communication tools and methods

ClimateTicTac (Klimatikktakk)	ClimateTicTac is an innovation project which test different methods to create engagement among employees in the municipality for a green transition. The goal of the project is to • Give relevant information to employees in the municipality of actions towards a green transition • Motivate the employees to make green choice in new and ongoing projects • Impact attitudes thwoards sustainability • Communicate the good stories about new work in the green transition	Opportunity to reach and engage employees in Stavanger municipality	Stavanger municipality	The project will help create awareness and engagement for the sustainability goals and will give the employees increased knowledge about the green transition and how they can contribute. The knowledge created in this project can be used in other municipalities in Norway.	Innovation and development of new communication tools and methods
Community Centers (Bydelshusene)	In Stavanger there are eight different town halls, for the different districts in Stavanger	Opportunity for inhabitants to gain access and organize meetings	Stavanger municipality	By creating easily accessible meeting spaces for the inhabitants, it lowers the threshold for organizing	Social participation

	The town halls are public accessible meeting places for activities, meetings and culture. Citizens can rent the town halls for big and small gatherings.	Lack of awareness and knowledge of the service can be a barrier for use		meetings and gatherings bottom up, which enables democratic participation.	
VOF	VOF is a digital map-based solution where inhabitants can report on faults on roads, green space, renovation, water, sewage and more	Opportunity to gather information and feedback from the inhabitants Lack of awareness and knowledge of the service can be a barrier for use	Stavanger municipality	By enabling citizens to easily engage with the municipality and report on faults, it helps with keeping the public infrastructure in good condition, which is important for climate adaptation. At the same time, the method behind VOF can be further developed and can become an important tool for crowdsourcing in the future.	Better communication between citizens and the municipality
Data Lake	The Data Lake Project is now receiving and handling data from more than 50 sources. A steady current of needs is reported in by "owners" through a gateway that is open for all service areas of Stavanger Municipality. These use-cases are	Opportunity to collect, store and utilise data in new ways	Stavanger municipality	By modelling, combining and analysing data from different sources, the Data Lake produces reports that give a better fact base and foundation for decision makers and other users. E.g.: Use-cases from surveillance of waterways and sea-level in	Innovation and development

	handled by an agile project team dedicated to the tasks in this project. Since the start of the Data Lake Project, more than 400 use-cases have been processed the last 3-4 years. The solutions are often a result of co-work between the service area who places the order, and the Data Lake Team itself. The different use-cases are evaluated to see what kind of impact the solution will create, and this helps the team to make choices and do prioritising that gives the best return on investment - also seen from an environmental and sustainable point of view. An administration structure secure that SWOT-analyses are done, as well as Data Protection Impact Assessments when needed, to ensure GDPR compliance.			combination with weather data, gives valuable information for preparedness of unwanted events, like floods. Another example of use-case is a set of reports that helps the management of medical emergency rooms to plan how to staff and equip their services. These are efforts that reduce the usage of resources. Reports from the Data Lake will also optimize (minimize) heating, ventilation and lighting in buildings owned by the municipality. Further in the pipeline: Data from Fleet Management can in combination with Shift Planning Data be used for creating new predictions that optimize usage of vehicles. The Data Lake will be an important hub for	

				open and semi-open data with good quality, which can be processed and create new value and knowledge for several purposes in the years to come.	

C-2.2: Description of social innovation interventions

Actions for climate change are multifaceted and can impact peoples lives in many different ways. To boost acceptance of new policy decisions and regulation it is important to ensure that citizens have sense of inclusion in the process of policy making.

As part of the New European Bauhaus, Stavanger is developing new ways of ensuring citizen empowerment and inclusion in site development which will help to reach climate neutrality. The lessons learned from this project will impact and inform future actions and programs to ensure empowerment and community lead initiatives. Other interventions such as the Area-regeneration programs are also important in this regard since it gives the opportunity for skills and capacity building in the local community.

A large part of the municipality's policymaking is made through the creation of plans. These plans can be both thematic plans and actions plans targeting specific policy themes, but also area- and detailed zoning plans which set the framework for the future development of urban space. The city of Stavanger has a long history of developing tools and approaches to support increased involvement of civil society and the wider community. However, it can often be hard to get feedback and secure inclusion from citizens in hearing processes. It is important that citizens are aware of ongoing plan-creation process and know when and where to voice their opinion. The creation of solutions such as *the Plan portal* and *My neighbourhood* and others helps to lower the threshold and makes it easier to inform and engage citizens.

At the same time, it is also important to ensure that marginalized groups and groups which often not are voiced in public haring processes have a way to give input in the policymaking process. Low threshold activities such as the *Talking camper van* are example of this, and which can be built upon in the future. Creation of a *Citizen panel*, such as the citizen panel for those between 60-80 is also an example, which can be expanded to be targeted towards groups which voices are important to include in the policy making process towards a climate neutral society.

5 Outlook and next steps

This section should draw any necessary conclusions on the CCC Action Plan above and highlight next steps and plans for refining the CCC Action Plan as part of the Climate City Contract in future iterations.

Plans for next CCC and CCC Action Plan iteration

The main priority for the next year is to establish and to consolidate the solid mission governance structure that is needed to handle to journey towards net zero, both locally and nationally. Both processes are going forward and further elaborated below and, in the AP.
Stavanger acknowledges that whilst starting the implementation phase of the already detected measures, a comprehensive process using the Theory of Change as a method strategically is needed to find new activities and portfolios for the remaining 30% emission gap. This also means including new stakeholders. Finding additional measures have proven difficult. Some emissions are hard to abate, for instance related to agricultural processes, and in many cases relying on research and new technology. This is also a question of political willingness to implement different measures. Stavanger are hoping future work through the mission can be a part of finding new solutions to cut emissions exploring possibilities though partnerships and EU projects. This is also a political question, in addition to the ongoing efforts described in the action plan.
Due to this consolidation phase, Stavanger envisage an iteration of the CCC in autumn 2025, to update with the new governance structure and new portfolios and activities to bring the city a step closer to net zero. An iteration in autumn 2025 would also preferably contain a more structured timeline towards 2030.

6 Annexes

The annexes contain any textual or **visual material** to the 2030 Climate Neutrality Action Plan as necessary.

Excel-file containing emissions data

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Enabling City Transformation **Climate City Contract**

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of Stavanger

City of Stavanger

The content of this document reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

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Introduction

Introduction

Addressing environmental issues is not new to Stavanger. In 1988 the city appointed its first environmental protection manager, and the environmental department has been working diligently for more than 20 years already. The first Climate and Environmental plan was adopted in Stavanger by the City Council in 2010, and in 2018 they adopted the current plan which, among others, states the 80% reduction target in emissions compared to 2015.

A political initiative prompted Stavanger to explore how joint European efforts could help achieve the city's climate ambitions. The decision to send an expression of interest and to start the process was stated March 2021 had the full support of the city council.

The pledge came from an acknowledgment that to achieve global climate goals it is crucial to deepen the global collaboration.

This acknowledgement stems from the international focus Stavanger have had for the last 50 years, as one of Europe's most important energy cities. Through active participation in international networks and partnerships like Eurocities, Net Zero Cities, DUT, ERRIN, Energy Cities, European Ports Initiative, WECP, and others, the city has gained invaluable knowledge and shared its experiences globally.

Insights have also been gained and shared through project participation, where the H2020 Smart Cities and Communities project, Triangulum, resulted, among others, in the Central Energy Plant, which collects heat from the main sewer tunnel to heat the town hall quarter. It also provided invaluable ripple effects like Nordic Edge and a holistic and cross-sectorial approach to our operations. These experiences are what Stavanger society now needs to build on at a larger scale in a mission context.

The city of Stavanger also has extensive knowledge and expertise in technology within the energy and maritime sectors. These capabilities need to be further explored in the context of the mission.

Goal: Climate neutrality by 2030

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Goal

Local level

In 2021, the mayor declared the commitment to the Mission´s objective of reaching climate neutrality by 2030. This objective aligns well with the city's stated ambition to reduce emissions by 80% compared to 2015, and to become fossil-free by 2040. A strategy to account for the remaining 20% of residual emissions will be investigated as part of the mission, as Stavanger does not yet have a quantified goal for carbon sinks.

The current politically adopted target in Stavanger differs somewhat from the mission target, stated in the EoI. This has several explanations:
In 2020 the municipality was merged with 2 neighboring municipalities, which somewhat changed the content and terms of the plan. The target was kept, but negotiations left agriculture outside the plan.

For the sake of the mission, the city wanted "the full picture" and have thus included the biogenic emissions in this CCC. In addition, Stavanger's allocated contribution to four emission sources located outside the city boundary have been included. These four are:

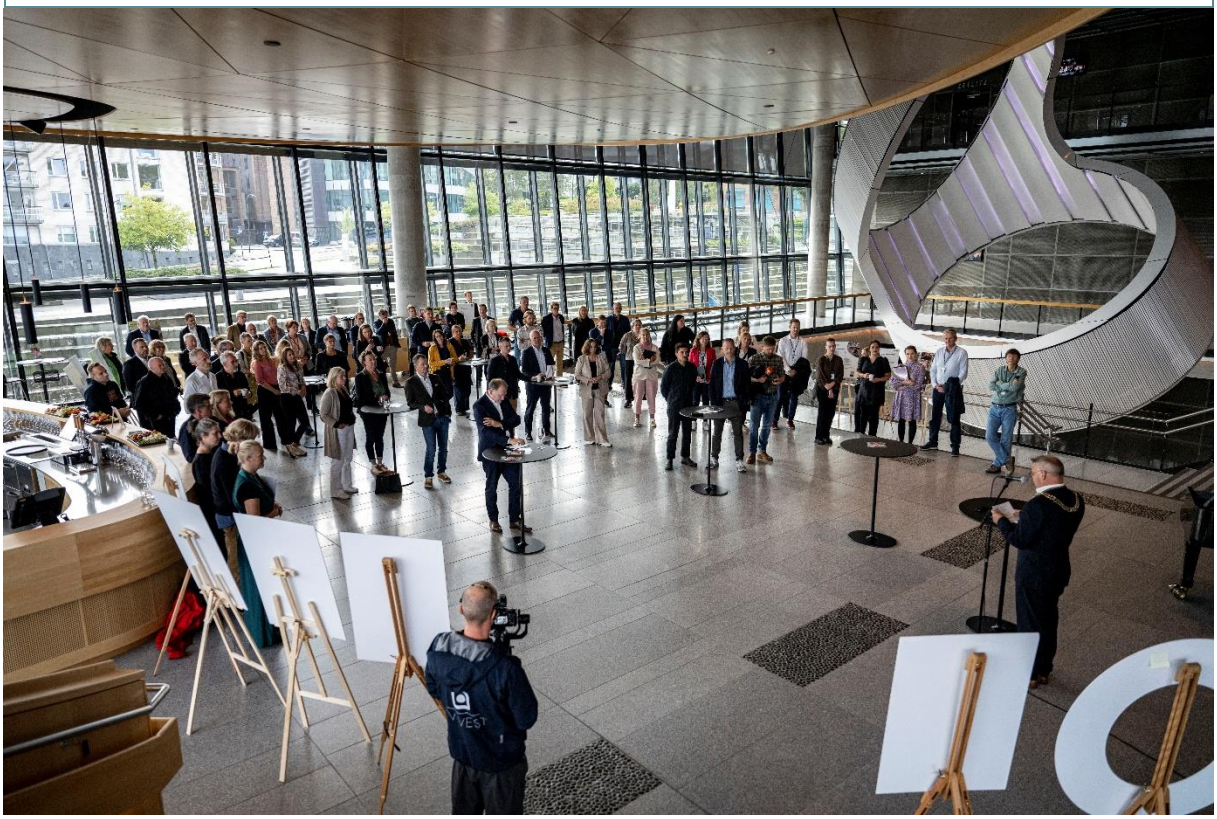
- Waste incineration in Sandnes municipality
- Waste landfill in Sola/Klepp municipality
- Wastewater treatment in Randaberg municipality

- Aviation in Sola municipality

National level
Norway´s national ambitions are aligned with the EU's, aiming to reduce emissions by 50-55% by 2030 and become climate neutral by the same year. Stavanger, Trondheim and Oslo are taking a lead role, inviting the national government to co-govern the mission, and enable the cities to explore the impact pathways to net zero.

Although an associated member of the EU, these ambitious, corresponding goals at EU, national and city levels, inspire confidence in achieving a successful transformation in collaboration with all city stakeholders, including citizens.

Co-benefits identified in the CCC vary from reductions in energy expenditure and air pollution to improvements in quality of life, health, innovation and development in the construction sector. This includes raising standards in older buildings, promoting a more just transition, reducing congestion, creating green jobs, improving the circular economy, reducing the need for new development in green areas, increasing design flexibility, and enhancing living conditions for residents. It also mentions aspects like the municipality being a reliable customer for farmers and businesses, improved access to ecological food for residents and municipality employees, reduced us of harmful chemicals, less hazardous runoff, and better local and regional availability of ecological food. Additionally, it's about supporting local business initiatives, diversifying the local economy, and strengthening innovation and collaboration.



Strategic priorities

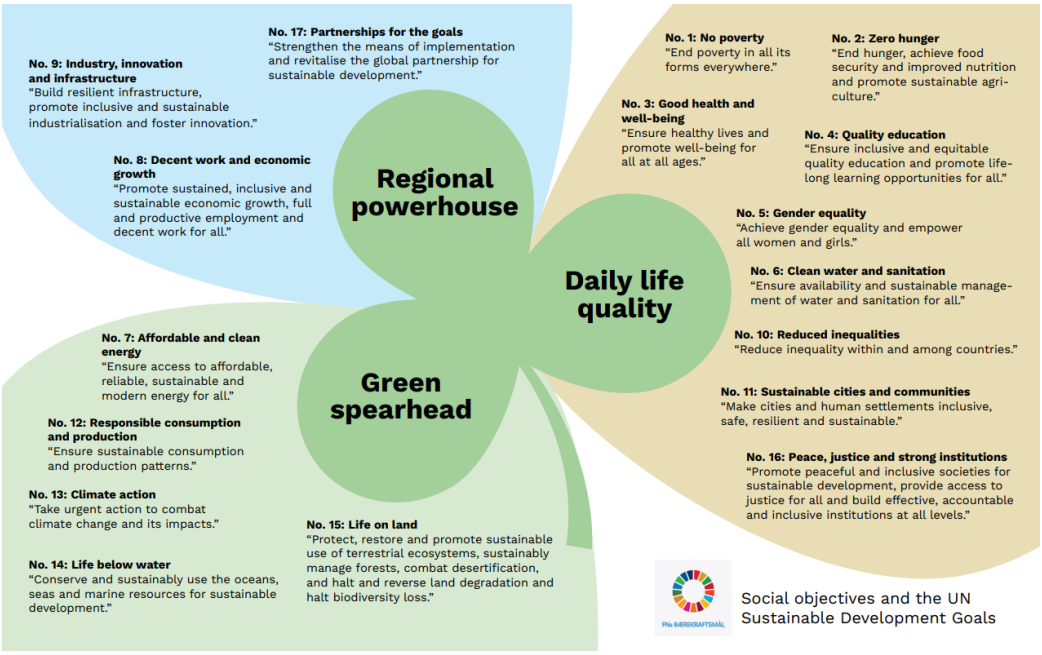
Strategic priorities

Introduction

The main priority for the next year is to establish and consolidate the solid mission governance structure needed to manage the journey towards net zero, both locally and nationally. Both processes are moving forward and are further elaborated below and, in the AP.

Stavanger acknowledges that whilst starting the implementation phase of the already identified measures, a comprehensive process using the Theory of Change as a strategic method is needed to find new activities and portfolios to address the remaining 30% emission gap. This also means including new critical stakeholders. The network for business and sustainability, established and coordinated by the City of Stavanger, will facilitate the process of including and engaging stakeholders. The network will continuously welcome interested actors from a multitude of industries, clusters, organizations and academia. Day-to-day challenges, new project opportunities within sustainability and emission reduction will be discussed during the meetings and activities coordinated by the network. Some of these actors are signatories of this CCC as supporters, while others are partners. In future iterations there will be more partners and more supporters.

The main strategic principles for Stavanger, and guiding this CCC are the SDG`s, which has been adopted into the municipal master plan, the "local Green Deal".
The social part of the plan serves as the overarching management document for the municipality. The plan's strategic priority is based on the three-leaf clover model:



Social objectives and the UN Sustainable Development Goals

Daily life quality: This focuses on giving children and youths a good start, enabling them to manage the everyday life and adulthood. Stavanger aims to develop active local communities where residents can thrive throughout their lives.

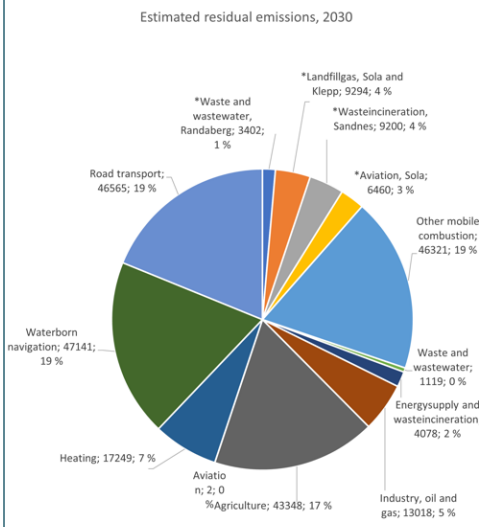
Regional powerhouse: This highlights Stavanger's role and responsibility as the regional capital. Stavanger seeks to continue developing competitive and diverse businesses across the entire region.

Green spearhead: This means that Stavanger will be a frontrunner in creating a climate- and environmentally friendly society, conserving nature, and protecting biodiversity and cultural landscapes.

The avoid-shift-improve framework is important in the transition to a climate neutral society. The framework is based on

- Avoid: Avoid and limit the activity
- Shift: Change how activities are carried out.
- Improve: Enhance technology and resource use

The IPCC first proposed this framework for the climate agenda. Norwegian national authorities have adopted this as a guiding principle for all emissions sectors, and Stavanger is following suit. The CCC as a steering document, and the mission as a method must be holistic.



Emission Reduction Scenarios towards 2030

To achieve climate neutrality by 2030, Stavanger society must focus on the transport sector and agriculture. This is thoroughly described in the impact pathways section in the AP. However, more actions will be needed, and there is a need to structure actions more systemically into portfolios ready for investments. This will be seen in correlation with the broader governance process described below. Additionally, there are some other overarching areas that are crucial for Stavanger to focus on to reach climate neutrality.

The figure visualizing the residual emissions in 2030 serves as a clear reminder that more actions are needed to achieve neutrality. These will also be a part of future iterations of the CCC.

Evaluation, Learning and Citizen Involvement/Engagement

To ensure a continuous relevance for and adaption to societal transformations, new legislations and new technologies, a key strategic priority is evaluation, learning and citizen engagement. The lighthouse project NEB-STAR[1] (2022-2025) and the Creating Actionable Futures[2] project (CrAFt, 2022-2025), both part of the New European Bauhaus (NEB) initiative of the European Union, provide valuable experiences and collaborations for this strategic work in the coming 2-3 years.

The objective is to make CCC relevant for a wider and broader group of stakeholders, and ensure a just climate transition by:

- Utilizing and building on existing, transdisciplinary and multi-level networks for public, private, R&D and NGO stakeholders, where processes of mutual learning, exploring, testing, developing and scaling occur.
- Involving other targeted stakeholders such as nature, citizens, social and creative entrepreneurs, pupils and students, in co-creation and bottom-up initiatives, in line with the NEB-value of inclusion and the principle of justice.
- Adapting CrAFt's NEB Impact Model[3] to the three-leaf clover to align transformation goals and identify co-benefits to support processes of decision-making, designing, evaluating and attracting new types of investments.

[1] NEB-Star // Beautiful. Sustainable. Together. (nebstar.eu)

[2] CrAFt - Creating Actionable Futures (craft-cities.eu)

[3] CrAFt NEB Impact Model Summary.docx (craft-cities.eu)

- Using data and digital tools to collect, analyse and visualize data to provide a deeper understanding, insight and knowledge, which in turn support decision-making, effective reporting and dissemination. Leveraging tools like Barcode and Urban Belonging, along with other digital NEB tools, enables data-driven decision-making towards sustainability and climate neutrality.
- Being visible and active in the city by using test areas and pilot projects. Citizens and stakeholders should feel involved in the CCC through events, temporary meeting places, exhibitions, and testing opportunities.

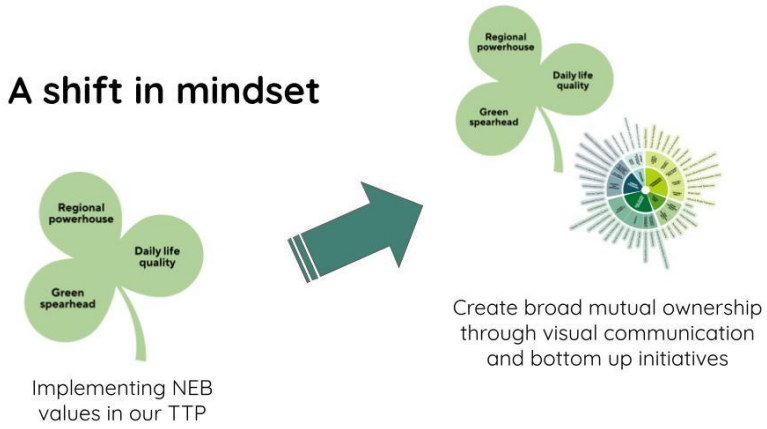


Fig: Co-creation and new perspective led to a shift in mindset during the NEB-STAR project, illustration of the three-leaf clover and CrAFT's Impact Model.

Knowledge Development, Expert Support Network and Dialogue Exchange
In the follow-up of the CCC it will be crucial to have expert dialogues on thematic challenging areas, initiated and managed by the NZC, like the one Stavanger already is a part of on AFOLU. Bringing together multi-level, multi-city and experts around the same table is essential to reaching climate neutrality. Stavanger envisions that this method will be applied systematically to all thematic areas and that all existing networks and partnerships will be utilized.

The main partner for knowledge development for this CCC is the University of Stavanger (UiS), which has *green transition* as its overall ambition. UiS will contribute to society´s transition through research, artistic development, education and innovation. They will help to facilitate a transitioning of the employment market, the development of new industries, and lay the foundation for a more sustainable and diverse society. A priority will be given to research directly related to sustainable development, with a focus on interdisciplinary research collaborations that support the green transition. Sharing knowledge and fostering critical, constructive debate will be essential to accelerating a faster and more equitable transition.

Circularity

For the Stavanger community, an important strategic priority is circularity in the broadest sense. IVAR has been working for years to change attitudes moving from seeing garbage as waste to recognizing it as a resource. The Stavanger region has worked with material recycling from households for many years and has solid systems in place. The next step is to look more closely at waste from local businesses, at the entire value chain, and reducing the overall carbon footprint. This also includes producing low-carbon or recyclable plastics. This requires responsible purchasers of plastics, like Lærdal, which has a unique collaboration with IVAR to improve sustainability in value chains. (A tight circular value chain.)

Another exciting example is in an industrial area, where 2 industrial partners release waste heat. They are now wanting to explore how this heat can be used in a positive energy district. A pilot project, funded through DUT, is looking into these possibilities. This area, which scores low on the

living conditions survey, has also been proposed as the location for a long-awaited bathing facility. Imagine if the waste heat could be used for the benefit of the residents here!

Carbon can also be a resource. Norway is exploring how this can be achieved and is working to take responsibility by stimulating and creating new markets. The head office of Northern Lights is located in Stavanger. Northern Lights collects and transports carbon to a permanent storage reservoir, 2,600 meters below the seabed.

Resilience – how to tackle climate risks?

Stavanger is in the process of revising the community section of the municipal masterplan. A key priority is to further assess the city's vulnerability to different climate risks and how to address these. Climate risk was previously associated primarily with physical risks, and Stavanger has long been committed to climate adaptation work. Stavanger was recently ranked as the municipality in Norway with the highest efforts towards adaptation. The municipality will work to broaden its perspective, addressing transition risk, implementation risks and liability risk more systemically. As Norway`s "oil city", now known as an "energy city", Stavanger may also face reputational risk due to its association with industries contributing to climate change or failing to mitigate to climate change. In 2014, the city was deeply affected by a dramatic drop in petroleum prices - by almost 50% in six months -. resulting in the loss of at least 34,000 oil jobs within two years. This had widespread ripple effects, from the housing market to personal well-being. This experience highlights a different understanding of climate risk, emphasizing work force resilience. The local R&I community has been recognized as an EU Regional Innovation Valley, focusing on renewable energy and reducing the region´s dependence on fossil fuel. Developing new markets and value chains is a crucial part of the climate neutrality mission.

This region has also experienced the consequences of enforcing new policies. When a car toll with rush hour fee was introduced, citizens mobilized and formed a new political party "No to tolls", resulting in the removal of the rush toll. This illustrates the importance of including the citizens in transition processes and considering the broader definition of "climate risks" – beyond just physical (climate) risks.

Nature as part of the solution – working simultaneously on the climate- and nature-challenge

Stavanger is working strategically to create connected and accessible urban and regional nature systems, promote natural diversity, ensure sustainable urban development, and preserve ecosystems. Protecting carbon sinks involves safeguarding nature and landscapes, enhancing natural diversity on land and water, and maintaining and developing a diverse, species-rich tree population.

Protecting and restoring nature can lead to increased carbon storage, greater natural diversity, and improved adaptation to climate change. Intact nature is the world's largest carbon storage, and the best carbon capture system. Stavanger is working towards area neutrality for natural values in future land use planning and will develop methods for area accounting in the coming years. This will provide an important knowledge base for quantifying carbon sinks, a topic that will be further explored during the mission process.

Land management and energy needs

In terms of land management, the municipality holds both significant power and responsibility. Standing firm in the decision to preserve nature and agricultural land, can be challenging amid strong pro-development interests. At the same time, Stavanger, as a region, seeks more industry, increased value creation, and job creation. Growth requires both land and energy, and the pressure to develop local renewable energy is expected to rise

Hydropower is Norway´s primary energy source, and several climate measures involve electrification. A notable example in the Norwegian context is the rapid growth in electric vehicles. As more

measures are being implemented, such as the electrification of ferries and construction sites, it is becoming clear that electricity is a scarcity. The strain on the grid is becoming evident, highlighting the need for grid upgrades, which has implications for land use and nature. The growing pressure to develop local renewable energy may lead to larger conflicts regarding land use.

Ensuring a sufficient energy supply while simultaneously achieving land preservation goals will be a strategic priority.

Digital Twin

Stavanger started to work on its digital twin in 2018, testing different formats and streamlining the import of various data layers and formats into the model. In 2020, “Unreal Engine”, was adopted, and Stavanger created its own digital twin. Utilizing this offers the municipality significant advantage in visualizing city planning and environmental challenges. By enabling the visualization of simulations and analytics, the digital twin supports more sustainable urban planning, allowing the municipality to assess the impact of new projects before they are built. This improves decision-making by giving politicians and other decision makers the potential to prioritize green spaces, reduce emissions, conserves resources, and make better plans for the municipality`s citizens.

Digital twins can also play a critical role in climate resilience. By visualizing natural events such as floods, landslides, or rising sea levels, the municipality can better prepare for and address these challenges, potentially reducing environmental damage.

Finally, by enabling virtual testing, digital brainstorming and simulations visualization, digital twins reduce the need for physical prototypes, minimizing material use and environmental disruption, while helping people make better choices. This combination of sustainable urban planning, efficient resource management, climate resilience, and reduced physical testing, positions digital twins as a powerful tool for municipalities aiming to lead an environmentally conscious development.

Sustainable Tourism “coolcation”

Sustainable tourism is a key strategy for Stavanger to achieve climate neutrality by 2030. Several actions are already underway and planned to make Stavanger a more sustainable tourism destination. Stavanger is one of 8 Baltic Sea Region (BSR) destinations applying for funding from Interreg, through the CliNeDest project. The goal is to co-create a Climate Smart Business Toolkit. Furthermore, the city works on sustainable tourism in collaboration with local businesses, destination management companies, and tourists to promote the greening of the sector. . A significant partner in this effort is DNT, the Norwegian Trekking Association, which promotes sustainable approaches to nature through guided tours, courses and information. One upcoming project, “Sustainable Destinations”, will receive funding from Innovation Norway, the City of Stavanger and Rogaland County. Led by the regional destination management company, Region Stavanger, the project will officially start in September 2024. The project will be structured by 5 categories, each with numerous based on criteria based on the Sustainable Development Goals (SDGs), and additionally indicators. The categories are destination management, strategic foundation, conservation of nature, culture and the environment, and strengthening social values and economic sustainability. These objectives will steer the destination development and tourism strategy until 2027, and the work of the DMC will be measured by Innovation Norway. Key stakeholders include DMC Region Stavanger, the City of Stavanger, local businesses, tourists, Rogaland County, transportation and mobility companies, researchers and civil society, all crucial for creating a sustainable tourism value chain

Process and principles

Process and principles
Given the broad scope of the mission, it is essential to anchor it at the highest level, including the City Council, and Norwegian Government, to ensure alignment across the departments, ministries and other stakeholders. This can be particularly challenging in Norway, where sectors are often divided into well- functioning and independent silos. Tasks requiring cross-functioning responsibilities, governance, and long-term budgeting are complex but manageable with proper structuring. A scientific report on mission as a tool, commissioned by the Norwegian Ministry of Knowledge in 2022, highlights the Ministry of Finance's special role in public allocations. This means that the Ministry of Finance should actively participate in such social tasks.[4] The document from the State of Norway shows that the Mission now has been anchored at the highest level and outlines coordination with - and linkage to - the other ministries and stakeholders. It emphasizes *the Ministry of Local Government and Regional Development`s awareness of the need for multilevel governance and coordination in the follow-up of this Mission, and the Ministry will take an initiative* to exploring ways of achieving this. The work will be aligned with other national strategies and initiatives, and potential changes in laws and regulations. To fully support the cities in their transition, the Ministry has involved Design and Architecture Norway (DOGA), an agency for innovation and value creation, to develop the national platform for Cities Mission activities in Norway. Multi-Level engagement, governance, and mission-based pathways are essential to support the cities' transition. Norwegian stakeholders recognize that achieving the Cities Mission goals will require extensive capacity building across several dimensions. Norwegian municipalities enjoy high levels of autonomy, covering both spatial and societal planning – an element to keep in mind when operating in a Norwegian Mission context. The dialogue has identified existing support structures and areas needing more collaboration and joint capacity building based on the NZC Climate Transition Framework. The four suggested focus areas for capacity building are: multi-level governance, on implementation (and private/public collaboration), innovation capacity, and on working mission based. Capacity on Multi-level Governance: Multi-level dialogue, strengthened buy-in and a mutual commitment to focus areas and needs affected by different governance levels, that cannot singlehandedly be solved locally. • Alignment of different perspectives, goals and narratives across different levels, moving from finger-pointing to collaboration • Shared problem solving on highlighted and prioritized topics • Need-based and an enabling policy development Suggested activities (starting point): • Test new co-creation processes where the cities work together with the ministries on regulation, policy and governance related issues. • Secure regular meeting points, information sharing and dialogue for alignment • Co-development of a mutual statement from the both the mission- and follower cities, highlighting focus areas where focus on multi-level governance is needed • Connect the regional authorities for the mission cities to the dialogue

[4] NIFUrapport2022-7.pdf

The Stavanger region is involved in two of the EU Missions, in addition to being chosen as one of 100 European regional innovation valleys (RIV). However, there is a lack of anchoring and resource allocation for effective follow-up and governance of these initiatives across organizations in our region. Establishing a governance system with better involvement of businesses and citizens is crucial for success. Collaboration with knowledge institutions and academia is also vital for advancing climate neutrality and adaptation, as it requires the development of new regional and local knowledge.

Stavanger has explored various approaches to the Cities Mission but has not yet established a governance system. It is crucial to realize climate neutrality and creating an effective governance system is a key priority.

The CCC process has engaged all relevant stakeholders in the city at all levels (see further elaborations in the AP). Although many initiatives, methods and formalized agreements are in place, the mission process has highlighted the need for a new governance system steering the cross-sectorial process towards climate neutrality.
This acknowledgement has been supported at top level both administratively and politically, and an extensive process has been initiated to implement and iterate the CCC and other Mission-related activities.

Throughout the next year (2025), we will establish a City Missions Transition Team consisting of representatives from main partners and stakeholders. Supported by academic experts on public sector innovation, co-creation, and citizen involvement, we will aspire to optimize collaboration across silos and sectors and achieve faster decision-making processes. The aim of this transition team is to work cross-sectorial with partners and relevant stakeholders to identify challenges and project opportunities, and to secure funding. The development and launch of the team will itself be a co-creation process based on what we have learned through previous cross-sectorial initiatives in the region. We will seek funding and support for this establishment through the Enabling City Transformation (ECT) programme.

The Climate City Contract was treated and politically adopted in four committees:

- The Committee on Climate and Nature 3.9.2024
- The Municipal Committee 3.9.2024
- The Chairmanship 5.9.2024
- The City Council 9.9.2024

It was further decided that the CCC is to form the basis of revision and preparation of new relevant municipal plans, and that a governance model for the mission cities will be developed.

Regardless of the final structure, it will include all partners in the CCC and relevant stakeholders mapped out in the city's climate neutrality ecosystem to ensure effective organization and governance of the mission process after submission.

• Signatories Partners

The table below enlists the signatories who are committing to this CCC with activities and investments, and thereby to help the city achieve its goal to reach climate neutrality by 2030. Specific agreements that articulate the details of the climate action(s) between the municipality and signatories are added to the individual contracts. The number and relevance of signatories' commitments is likely to increase over time.

Name of the signatory (organisation)	Sector / Domain / Level of operation[2]	Legal form	Name of the responsible person	Position of the responsible person
City of Stavanger	Public sector	Municipality	Henrik Halleland	Acting Mayor
Rogaland County	Public sector	County	Ole Ueland	County Mayor
Stavanger Port Authority	Intergovernmental/Port	Intermunicipal enterprise	Odd Bjørn Bekkeheien	Const. Port Director
IVAR IKS	Waste/wastewater treatment	Intermunicipal enterprise	Ingrid Nordbø	CEO
University of Stavanger	Academia	University	Klaus Mohn	Rector
LYSE AS	Intergovernmental/Energy	Limited Company (Ltd.)	Eimund Nygaard	CEO
Nordic Edge	Innovation cluster	Limited Company (Ltd.)	Terje Eide	CEO
Worley Rosenberg	Shipyard and engineering	Limited Company (Ltd.)	Tine Hegre	Director Safety & Sustainability Specialist
Simon Møkster Shipping	Maritime shipping company	Limited Company (Ltd.)	Anne Jorunn Møkster	CEO
Stavanger Turistforening	Tourist Association	Association	Preben Falck	Manager
Felleskjøpet Rogaland Agder	Agricultural cooperative	Cooperative enterprise	Per Harald Vabø	CEO

Renovasjonen IKS	Waste collection	Intermunicipal enterprise	Arild Olsen	Const. CEO
Royal Norwegian Ministry of Local Government and Regional Development	Public Sector	Government	Erling Sande	The Minister

• Signatories Supporters

The table below enlists the signatories who are committing to support this CCC, and thereby to help the city achieve its goal to reach climate neutrality by 2030. Specific agreements that articulate the details of the climate action(s) between the municipality and signatories are added to the individual contracts. The number and relevance of signatories' commitments is likely to increase over time.

Name of the signatory (organisation)	Sector / Domain / Level of operation[4]	Legal form	Name of the responsible person	Position of the responsible person
Stavanger Region European Office	Member organization	Association	Runa Monstad	Director
Lauvsnes Gartneri	Agriculture	Limited Company (Ltd.)	Jan Terje Vignes	CEO
Grieg Seafood	Aquaculture	Public Limited Company (PLC)	Liv Marit Årseth	Public Affairs Officer
Viking Fotball	Football Club	Limited Company (Ltd.)	Svein Helge Liknes	Public Affairs Officer
Base Gruppen	Property Development	Limited Company (Ltd.)	Lars Petter Einarsson	Communication and information officer
D2 Productions	Merchandise producer	Limited Company (Ltd.)	Daniel Engen	Co-founder
Stavanger Utvikling KF	Property Development	Municipal Enterprise	Hans Kjetil Aas	CEO
Forus Business Park	Property Development	Limited Company (Ltd.)	Stein Racin Grødem	CEO

NorSea Group	Supply Chain Manager for Offshore Industry	Limited Company (Ltd.)	Renate Marie Klemetsen Jakobsen	VP ESG
Skretting AS	Feed production for aquaculture	Limited Company (Ltd.)	Leif Kjetil Skjæveland	Manager of Sustainability and Public Affairs
Rogaland Taxi AS	Transportation	Limited Company (Ltd.)	Svein Svimbil	CEO
The Chamber of Commerce in the Stavanger region	Association	Association	Harald Minge	CEO
Energy Transition Norway	Cluster	Cooperative	Egil Aanestad	CEO
Ostehuset AS	Restaurant	Limited Company (Ltd.)	Hanne Berentzen	CEO
BluePlanet AS	Cluster	Limited Company (Ltd.)	Eivind Helland	CEO
Lærdal Medical AS	Medical Equipment Producer	Limited Company (Ltd.)	Arne Seglem Larsen	Executive Director People and Sustainability
Stavanger Sentrum AS	Commerce	Limited Company (Ltd.)	Kristin Gustavsen	CEO
Nysnø klimainvesteringer AS	Finance and investment	Limited Company (Ltd.)	Solveig Espedal Sundsdal	Senior Associate
Smedvig Eiendom AS	Property Development	Limited Company (Ltd.)	Cecilie W. Melbye	CEO
Aldente AS	Communications and commerical	Limited Company (Ltd.)	Kristin Koll	CEO
Region Stavanger	Destination Management Company	Association	Per Morten Haarr	CEO

Maritime Cleantech	Cluster	Association	Øystein Huglen	Head of Innovation and Project Development
Grønn By	Association	Foundation	Mariann Bjørnelv	CEO
NHO (Norwegian Trade Association)	Business- and employer organization	Association	Tone Grindland	Regional Director
Arda Energy AS	Technical Consulting Services	Limited Company (Ltd.)	Egil Vigdel	CEO
Rogaland Teater AS	Theater	Limited Company (Ltd.)	Ellen Math Henrichsen	Theatre Director
Validè AS	Business Consulting	Limited Company (Ltd.)	Anne Cathrin Østebø	CEO
Faber Bygg AS	Property Development	Limited Company (Ltd.)	Jan Arild Wathne	CEO
Innovation Dock AS	Innovation support	Limited Company (Ltd.)	Linn Vorkinn	COO
Backe Rogaland AS	Property Development	Limited Company (Ltd.)	Sjur Elling Hana	CEO
Rødne & Sønner AS	Maritime transportation	Limited Company (Ltd.)	Lars Andre Rødne	CEO
Gladmat	Fair and exhibition services	Limited Company (Ltd.)	Maren Skjelde	CEO

City of Stavanger

Declaration of further commitment to the Cities Mission

The City Council declared its full support to the Cities Mission on September 9th, 2024

I, Henrik Halleland, the acting mayor of the city of Stavanger, hereby declares on behalf of the city our commitment to the EU Cities Mission.

The Climate City Contract was treated and politically adopted in four committees:

The Committee on Climate and Nature	3.9.2024
The Municipal Committee	3.9.2024
The Chairmanship	5.9.2024
The City Council	9.9.2024

It was further decided that the CCC is to form the basis of revision and preparation of new relevant municipal plans, and that a governance model for the mission cities will be developed.

I declare the commitment to the objective of the Mission, to reach climate neutrality by 2030. The objective corresponds well with the city`s stated ambition to reduce its emissions by 80% compared to 2015, and to become fossil free by 2040. The 20% residual emissions will be accounted for as part of the city`s participation in the mission.
Furthermore, the national Norwegian ambitions are aligned with those of the EU: To reduce emissions by 50-55% by 2030 and become climate neutral within the same year.

With Norway being an associated member of the EU, these ambitious, corresponding goals on EU, national and city level, gives a Norwegian city the confidence needed to carry out a successful transformation in collaboration with all city stakeholders, including citizens.

Henrik Halleland
Acting Mayor of Stavanger

Commitments

Letter of Intent to support the City of Stavanger in its ambitions to become climate neutral by 2030.

Rogaland County hereby declares its strong interest to participate and to support the city of Stavanger in its efforts to become one of Europe's 100 first climate neutral cities by 2030, which implies the ambitions stated by the city council 26.11.2018 to reduce its emissions by 80% compared to 2015, and to become fossil free by 2040. Furthermore, it corresponds well with the national Norwegian ambitions that are aligned with the EU`s – to reduce emissions by 50-55% by 2030, and in addition to become climate neutral within the same year.

Mission Cities aims to meet the target set in the Paris Agreement, and the Sustainable Development Goals. Mission Cities acknowledges that cities play a pivotal role in achieving climate neutrality due to the notion that they account for 65% of the energy consumption worldwide and more than 70% of CO2 emissions.

Rogaland County acknowledges that climate neutrality can be reached only through a wide cross-sectoral, cross-governmental level and cross-border cooperative effort, and hereby states that it will participate to this task.

That includes

- Participation in the development, implementation and iteration of a non-binding, but highly committing "Climate City Contract".
- Participation in monitoring, evaluation and learning activities, to further strenghten the process towards Climate Neutrality.
- Participate in stakeholder and business dialogues with city representatives.
- Enable strategic alignment in plans towards the overall goal of Climate Neutrality.
- Sharing capacity and competence within frames agreed upon within the climate city contract.

Specific for Rogaland County:

Public Transportation Electrification:

- Transitioning ferry routes to battery-electric vessels (e.g., Ryfylkeferja, Vassøysambandet)
- Introducing electric express boats (e.g., MS Medstraum on Byøyene-Hommersåk route)
- Planning for potential zero-emission vessels on The fast boats Ryfylke routes from 2028/2030

Stavanger kommune

Sustainable Building and Construction:

- Aiming for emission-free construction sites in building projects
- From 2024, weighting climate and environmental considerations at least 30% in public procurement for construction projects

Phasing Out Natural Gas in Schools:

- Planning to transition three schools from natural gas to biogas or district heating by 2026
- Expected to reduce emissions by 333.5 tons of CO_2-eqv

Bus Fleet Electrification:

- Electrification of bus route 3 in 2022, reducing annual emissions by 800 tons CO_2-eqv
- Plans for a new bus contract starting July 1, 2026, aiming for full battery-electric operation
- Potential reduction of approximately 7,700 tons CO_2-eqv from bus operations in Stavanger

Infrastructure Investments:

- Allocated 160 million NOK for charging infrastructure for buses in Nord-Jæren during 2025-2026

Ole Ueland
Mayor of Rogaland County

Henrik Helleland
Acting Mayor of Stavanger